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Volume

# II

# WINGED *Shield,* WINGED *Sword*

A History of the United States Air Force

Bernard C. Nalty  
Editor

# **Winged Shield, Winged Sword**

**A History**  
of the  
**United States**  
**Air Force**



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**Volume II  
1950–1997**

**Bernard C. Nalty**  
General Editor

Air Force History and Museums Program  
United States Air Force  
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# Foreword

The History of the United States Air Force is more than a tribute to the men and women responsible for the advancement of military aviation. Individual heroes do emerge, air battles are recounted, and record-setting flights described, but the book also deals with the ideas and decisions that have made the U.S. Air Force the professional military organization it is. Activity in the lecture hall and on the flight line, in the corridors of government and in aeronautical research facilities, and in both peacetime and during wars have helped shape the institution, influence its conduct, and fix its goals.

The Air Force continues to serve the country effectively and efficiently because its men and women understand that experience provides the foundation for progress. More than any other military organization, the U.S. Air Force searches out and listens to the experience history offers. Few problems arise from a void or occur without precedent; and while every challenge possesses its unique aspects, the perspective of time and the careful consideration of what already has succeeded or failed inevitably improves the effectiveness of today's decisions and the quality of planning for the future.

History is therefore important to the Air Force; the recorded past is a foundation for doctrine, policy, strategy, tactics, equipment development, organization, force structure, and virtually every other element of air power. This volume, published in commemoration of the fiftieth anniversary of the Air Force as an independent service, is especially valuable. Not only should it both inspire and enlighten the members of the Air Force, it should also serve as a convenient source of information for those outside the service who are interested in the origin, growth, evolution and application of American air power.

RICHARD P. HALLION  
Air Force Historian



# Preface

Throughout its first century, military aviation helped advance the interests of the United States. From a curiosity, fragile and of uncertain value, the warplane has become a devastating weapon. Moreover, ballistic missiles and surveillance satellites have joined aircraft in this aerial array. In these volumes, we try to describe and analyze, in the context of national policy and international rivalries, the evolution of land-based air power since the United States Army in 1907 established an Aeronautical Division responsible to the Chief Signal Officer. This work, in addition to commemorating the Air Force's fiftieth anniversary, also commemorates almost one hundred years of progress in the design and use of aerial weaponry. By placing airmen and their machines in an appropriate context, it provides a clearer understanding of the central role of the Air Force in current American defense policy.

Early in the conceptualization of this work, we decided that a collaborative effort would make the best use of whatever special skills or knowledge each of us might possess. We knew, however, that successful collaboration requires a plan, and the blueprint was the work of Warren A. Trest, then the chief of the Histories Division, Office of Air Force History. He devised a basic outline for the book, and after his transfer elsewhere in the Air Force history program, Bernard C. Nalty saw the design through to its completion. Under the general guidance of these two, we wrote, reviewed, and revised each chapter. A panel of historians and military officers reviewed the manuscript, which then underwent the final revisions that these distinguished individuals suggested.

The history is divided into two volumes. Volume I, containing the first 12 chapters, begins with balloons and the earliest heavier-than-air machines. It carries the story through World War II to the establishment of the United States Air Force as a service separate from, but equal to, the Army and the Navy. Volume II picks up the narrative at the Korean War, takes it through the War in Southeast Asia, the Gulf War, to the drawdown following the end of the Cold War.

A number of men and women helped produce the volume. Capt. Susan Cober, USAF, and her successor as office librarian, Capt. Lucinda M. Hackman, USAF, obtained needed books from libraries throughout the Washington area. Rita Victoria Gomez provided information on the role of women in military aviation, and Eduard M. Mark shared the results of his research on aerial interdiction during World War II, the Korean conflict, and the Vietnam War. The late Marcelle Size Knaack made available the information she had collected

## **History of the United States Air Force**

Carlín, John H. Cloe, Charles J. Gross, Bob W. Rush, David W. Shircliffe, Robert J. Smith, Thomas S. Snyder, and Bernard J. Termena. The typists, word processing specialists, and computer operators who struggled with the seemingly endless succession of drafts and disks included: Elaine Ahearn, Fontella D. Worthington, SSgt. John Wyche, Sgt. James A. Branham, Sgt. Glenn B. Reynolds, SrA. Rosalyn L. Culbertson, Amn. Terry R. Nance, and Debra A. Moss.

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Part IV

A Decade of  
Deterrence,  
1950-1960



## Chapter 13

# The Air War Over Korea

Wayne Thompson

**B**efore dawn on Sunday, June 25, 1950, communist North Korea attacked South Korea, storming across the improvised border that divided the peninsula into two countries. Some five years earlier, when Japan surrendered, the United States had proposed that American forces disarm Japanese forces in Korea south of the 38th parallel and Soviet troops perform the same task north of that line. Once the Japanese had been disarmed and repatriated, Korea was at last to become independent after almost 50 years of domination by Japan. This scenario depended on continued cooperation between the Soviet Union and the United States, but the wartime alliance soon collapsed. Instead of a unified nation, two rival states came to share the Korean peninsula. The Soviet Union supported the Democratic People's Republic of Korea, or North Korea, under the leadership of Kim Il Sung, a shadowy figure who had fought the Japanese and fled to the Soviet Union where he apparently served in the armed forces. The United States stood behind the Republic of Korea, or South Korea, headed by 70-year-old Syngman Rhee, an implacable foe of the Japanese, who had earned a doctorate at Princeton University before World War I, returned to his homeland only to be expelled in 1921 by the Japanese, and spent the next

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25 years in exile campaigning for Korean independence. When the newly constituted national assembly elected Rhee president of South Korea in August 1948, the United States terminated the military government that had ruled the South and began withdrawing its occupation forces.

Syngman Rhee and Kim Il Sung headed opposing governments on an arbitrarily divided peninsula. The 38th parallel did not conform to any natural feature that might have separated North from South. In fact, the two Koreas complemented each other; in the North were the industries developed by the Japanese, while in the South, where two-thirds of the people lived, the principal activity was farming. Given the interdependence of the two regions and the ambitions of their leaders, some sort of clash was inevitable. Soon insurgents directed from the North were challenging the authority of President Rhee, who responded by trying to suppress all dissent in the South, whether communist-inspired or not.

To maintain the independence of South Korea, American military advisers trained and equipped a lightly armed force, basically a constabulary, believed capable of maintaining order and if necessary resisting an invasion, although too weak to embark on the liberation of North Korea. Confidence in the defensive ability of the South Korean armed services later seemed hard to justify, for the nation had only 100,000 soldiers, who lacked tanks and heavy artillery; a small coast guard; and an air force that consisted of fewer than 20 liaison aircraft or trainers, with just 36 of 57 pilots fully qualified to fly them. In contrast, North Korea had an army of at least 130,000 combat troops, who were supported by some 500 tanks and artillery pieces ranging in size to 122 millimeters. The North Korean air arm possessed 132 combat airplanes supplied by the Soviet Union, all first-line types during World War II, including the Ilyushin Il-10 attack aircraft and the Yakovlev Yak-3 and Yak-7 fighters.

Although North Korea depended on the Soviet Union and South Korea needed the assistance of the United States, both Kim Il Sung and Syngman Rhee were capable of independent action. Rhee's popularity stemmed in part from his denunciation of an American plan, revealed in December 1945, for the creation of a provisional government under a five-year international trusteeship as a step toward self-government. Rhee succeeded in marshaling demonstrations against what he considered a new form of colonialism, and the scheme collapsed, undermined as much by increasing hostility between the United States and the Soviet Union as by the opposition of the South Korean leader. Similarly, Kim could ignore the fact that his Soviet sponsors considered him a counterweight to the influence of Chinese communism and turn to China when the Soviet Union seemed lukewarm to his ambitions for unifying Korea.

As the decade of the 1940s drew to a close, Korea seemed less important than several potentially dangerous areas that competed for the attention of the American government. In the aftermath of the Berlin blockade, the Truman administration had concentrated on Europe, even though its basic national policy

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called for opposing the spread of communism anywhere in the world. The United States had already begun to invest heavily in the economic recovery of western Europe and to encourage a military alliance against possible Soviet aggression there. Accomplishing these goals in Europe while strengthening the American position in the Far East at the same time seemed impossible, for the President was determined to prevent the budget deficits that he believed would produce inflation and economic dislocation. In Asia, therefore, the wisest course seemed to be to avoid specific commitments, except to the defense of Japan, in the hope of creating uncertainty among the Chinese and Soviet leaders as to how the United States might react in a crisis. Unfortunately, American ambiguity did not cause hesitation, but instead gave the clear impression of indifference to the fate of South Korea.

Often singled out as being especially unfortunate in its probable interpretation by North Korea and its allies is a speech by Secretary of State Dean G. Acheson in which he declared that the Philippines, the Ryukyus, Japan, and the Aleutians formed the limit of the American defensive arc in the western Pacific. Whether trying to create uncertainty among the communist leaders or to emphasize America's belief in the possibility of a peaceful settlement of the friction between the two Koreas, he may well have given the impression that South Korea would not be defended. Such a conclusion, however, might also have been drawn from the withdrawal of American occupation troops and, afterward, from congressional indifference to economic aid for South Korea.

Because of the strategic importance of Japan, the United States maintained there a seemingly large occupation force, consisting of four of the Army's ten divisions, but all four were understrength, only partially equipped with tanks and artillery, and poorly prepared for combat. These divisions formed the Eighth Army, under Lt. Gen. Walton H. Walker, who was directly responsible to the Commander in Chief, Far East Command, General of the Army Douglas MacArthur, who also served as Supreme Commander, Allied Powers, in the continuing occupation of Japan. When North Korea attacked the South, MacArthur's Far East Command was responsible for the defense of Japan, the Philippines, and the Ryukyus. Since the withdrawal of the occupation troops from South Korea, the general was concerned only with the administrative and logistic support of the Korean Military Advisory Group and the American embassy at the capital city of Seoul. To assist with the mission of the Far East Command, the Navy provided the Naval Forces, Far East, under Vice Adm. C. Turner Joy. The equivalent Air Force organization was the Far East Air Forces, commanded by Lt. Gen. George E. Stratemeyer.

Resembling a genial college professor, General Stratemeyer bore responsibility for maintaining a mobile striking force in support of Army and Navy operations throughout MacArthur's Far East Command. To accomplish this, he had available more than 400 combat aircraft assigned to air bases in Japan, Okinawa, Guam, and the Philippines. As was true of the ground forces, the

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General of the Army Douglas MacArthur (left), Commander, Far East Command, and Lt. Gen. George E. Stratemeyer (right), Commander, Far East Air Forces.

largest concentration of aerial strength was in Japan, where the Fifth Air Force, under Maj. Gen. Earle E. “Pat” Partridge, was flying eight squadrons of F-80s, two of B-26 light bombers (known as A-26s during World War II), and three of F-82 Twin Mustang all-weather interceptors. One squadron of F-51s from the Royal Australian Air Force shared Iwakuni airfield on the island of Honshu with Partridge’s B-26s, but the Australians reported directly to MacArthur as Supreme Commander, Allied Powers, and merely maintained liaison with Stratemeyer’s headquarters. Assigned to the Far East Air Forces and located in Japan were a variety of rescue aircraft and three squadrons of transports. A group of B-29s, equipped solely for conventional bombing, was based on Guam and belonged to the Twentieth Air Force, also a part of Stratemeyer’s Far East Air Forces.

Although the Fifth Air Force gave the impression of aerial might located near the scene of the fighting in South Korea, this was largely an illusion. Most of its aircraft were F-80 jet fighters, which did not have the range to intervene effectively from their normal bases in Japan; and Partridge’s airmen had little practice supporting troops in combat. This deficiency resulted from the recent emphasis within the Air Force on strategic bombing; the merger of the tactical and air defense missions in the Continental Air Command, which greatly complicated training in the United States; and the lack of space for large-scale exercises involving air and ground units on Japan’s densely populated islands.

In Korea the kind of local attack anticipated by the framers of NSC-68 had indeed occurred. Clearly the policy of the Truman administration to resist the further expansion of communism demanded intervention, regardless of the region and the possible impact on the defense budget and the nation’s economy.

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Yet, even as the President and his advisers drew a parallel between communist aggression in the Far East and the Nazi conquest of Czechoslovakia (where the western democracies had failed to take a stand that might have prevented World War II), the administration realized that other wars might erupt, possibly in western Europe, considered the principal object of Soviet ambitions. Aggression in Asia had to be stopped, though not at the risk of losing Europe to communism.

When news of the North Korean offensive reached Washington on the evening of June 24, Secretary of State Acheson informed the President, who was visiting his hometown, Independence, Missouri. Mr. Truman agreed to invoke the principle of collective security and try to internationalize the response to the North Korean attack by appealing to the United Nations, then meeting in a temporary headquarters at Lake Success, New York. Because the Soviet delegate to the United Nations Security Council had walked out in protest of the refusal to accept a representative from communist China, he could not exercise his nation's right of veto, and in his absence the United Nations called on North Korea to withdraw beyond the 38th parallel. When that resolution was ignored, with the Soviet delegate still absent, the Security Council on June 27 called on the members of the United Nations to provide South Korea with whatever assistance might be required to repel the invasion and restore peace to the peninsula. The resolution formed the basis for a United Nations Command, activated on July 24, headed by MacArthur with the assistance of the staff of the Far East Command. Even as United Nations commander, however, he was responsible ultimately to the President of the United States rather than to the Secretary General of the United Nations or the Security Council.

By the time the Security Council had called for the United Nations to join forces in defense of South Korea, American aircraft already were flying missions over the embattled country. After returning from Missouri to Washington on June 25, President Truman approved the use of American air and naval forces to help defend South Korea. The Joint Chiefs of Staff set up a teletype conference with MacArthur and relayed to him the President's decision to intervene. While the Chief Executive was reaching this decision, the question of neutralizing Soviet air bases had been addressed. Gen. Hoyt S. Vandenberg, the Air Force Chief of Staff, raised the possibility that atomic bombs might be necessary for this purpose, but Truman saw no need to do more than draft plans for the eventuality.

The authorization to employ air power, even though armed only with conventional weapons and limited to targets in South Korea as the President directed, seemed to have a dramatic effect on General MacArthur, at a time when Seoul, the South Korean capital was about to be abandoned to the advancing enemy. General Partridge found MacArthur to be "almost jubilant" and confident that vigorous action by the Fifth Air Force would drive the North Koreans back in disorder.<sup>1</sup> MacArthur directed Partridge to attack tanks, troop concentrations, and

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Lt. Bryce Poe II standing by his RF-80.

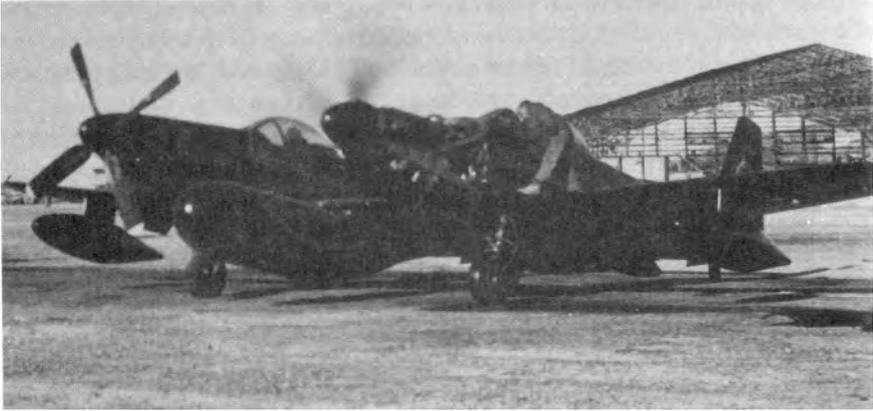
other military targets south of the 38th parallel, while also maintaining the aerial defenses of Japan in the event the Soviet Union should extend the war.

Partridge promised that light bombers would hit targets in South Korea on Tuesday, June 27, the third day of the North Korean attack, but he could not meet his self-imposed deadline. A half-dozen of the B-26s were providing air cover for a ship pressed into service to evacuate American civilians from the port of Inchon, and bad weather forced those sent against enemy armor to turn back. Not until Wednesday morning, June 28, after 1st Lt. Bryce Poe II had flown the Air force's first jet combat reconnaissance mission in an RF-80, did twelve B-26s make the first American air strike since the invasion. The bombers hit the railroad yard at Munsan near the 38th parallel and then strafed tracks and highways nearby. Later in the day four B-29s patrolled the four main routes over which the North Koreans were advancing, attacking targets of opportunity.

Despite weather that had forced the B-26s to turn back, on Tuesday, June 27, Air Force transports, escorted by fighters, began flying American civilians out of Kimpo airfield near Seoul. At about noon, five North American F-82s encountered five Yaks over Kimpo and downed three of the Russian-built fighters. A few hours later, eight North Korean Il-10s tried to strafe the airfield, but four F-80s, operating at extreme range to protect the evacuation, destroyed four of the attackers. Some 2,000 Americans were evacuated, half by ship and half by air.

A few minutes before the F-82s had destroyed the first of the Yaks over Kimpo, the commander of the Far East Air Forces, General Stratemyer, returned to Japan from a visit to Washington. Although the initial victories of the

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Mechanics check out the left engine of this North American F-82 Twin Mustang at a field in Korea.

Fifth Air Force in aerial combat over Kimpo encouraged him, he believed that the airfields in North Korea would have to be attacked as quickly as possible. The importance of airfields was confirmed on June 28, when Yaks strafed Suwon airfield, some fifteen miles south of Seoul, and destroyed or damaged a B-26, an F-82, and a C-54. Despite the danger at Suwon, MacArthur was determined to visit the place. It had become the command post for the liaison group that he had sent to Korea to report on the situation; and one member of the group, Air Force Lt. Col. John McGinn, had improvised a tactical air control center to handle American aircraft in the vicinity. En route to Suwon on Thursday, June 29, MacArthur approved Stratemeyer's request for authority to strike airfields north of the 38th parallel. Late that same day, as MacArthur was driving back to Suwon from the Han River where he had seen the flood of South Korean troops and refugees streaming away from Seoul, eighteen B-26s dropped fragmentation bombs on the airfield at Pyongyang, the North Korean capital. The B-26s returned without loss, their crews claiming to have destroyed or damaged twenty-five aircraft on the ground and one in the air. News of MacArthur's decision and the resulting attack had not reached Washington several hours later when Truman approved air strikes north of the 38th parallel. The authorization reached MacArthur on June 30 when he returned from Suwon.

Naval aircraft soon joined in attacking the North. When the war broke out, two aircraft carriers, the American *Valley Forge* and the British *Triumph*, along with their supporting warships, were available in Far Eastern waters. The two carriers and their escorts met at Buckner Bay, Okinawa, and steamed toward Korea as Task Force 77, commanded by Vice Adm. Arthur D. Struble of the U.S. Navy. Admiral Joy, who had discussed possible future operations with Struble, conferred with Generals MacArthur and Stratemeyer and agreed to use carrier

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aircraft against targets in the vicinity of Pyongyang, far beyond the battleline. Consequently, on July 3, British and American squadrons based on the carriers raided the airfield at Haeju and the airfield and rail facilities at Pyongyang; and on the 4th, Struble launched a second day of strikes against targets near the North Korean capital. From the west coast of Korea, Task Force 77 steamed by way of Okinawa to the Sea of Japan, where on July 18 its aircraft blasted the oil refinery and storage tanks at Wonsan, North Korea, touching off spectacular fires.

Although these early naval air operations were largely confined to the North, Partridge had the mission of attacking the enemy throughout the Korean peninsula, and Stratemeyer set about providing him the necessary men and aircraft, drawing first on the resources of the Far East Air Forces. While Partridge shifted his F-80s—some fitted with locally manufactured jettisonable fuel tanks to extend their range—to airfields in Japan nearer Korea, Stratemeyer brought in other F-80s from the Philippines and took steps to acquire F-51 Mustangs. The comparatively slow Mustang with its liquid-cooled piston engine was vulnerable to ground fire during strafing missions, but it could operate from the short, unpaved airstrips in southern South Korea. The Australian government entrusted to Stratemeyer's control a squadron of F-51s based in Japan, the first military unit made available by a member of the United Nations other than the United States for the defense of South Korea, and the Far East Air Forces began taking Mustangs from storage for assignment to the South Korean Air Force or to a provisional squadron being formed by the Fifth Air Force in Japan. Generals Stratemeyer and Partridge could not expect immediate help from the United States, for no reserve of combat-ready aircraft and trained crews was immediately available. General Vandenberg was able, however, to send two groups of B-29s not scheduled for incorporation into the Strategic Air Command's atomic strike force as reinforcements for the group that had deployed from Guam to Okinawa to be nearer targets in Korea. Also at hand were some 1,500 F-51s, half in storage and half assigned to the Air National Guard. On July 5, the first American ground unit sent to South Korea, a reinforced battalion of perhaps 500 men, placed itself in the path of an advancing North Korean division 20 times its size. By that time, a total of 145 Mustangs had been retrieved from the Air National Guard and prepared for shipment by sea to Japan where Air Force pilots would undergo transitional training before flying the aircraft in combat.

Along with two groups of B-29s, Vandenberg sent to the Far East a veteran of World War II, Maj. Gen. Emmett O'Donnell, who had commanded B-17s during the unsuccessful defense of the Philippines and later led B-29 strikes against Japan. After arriving in Japan, he established the Bomber Command of Far East Air Forces, consisting initially of three groups of B-29s. The mission of bomber command encompassed long-range interdiction and destruction of strategic targets, essentially the work done by a similar organization in World

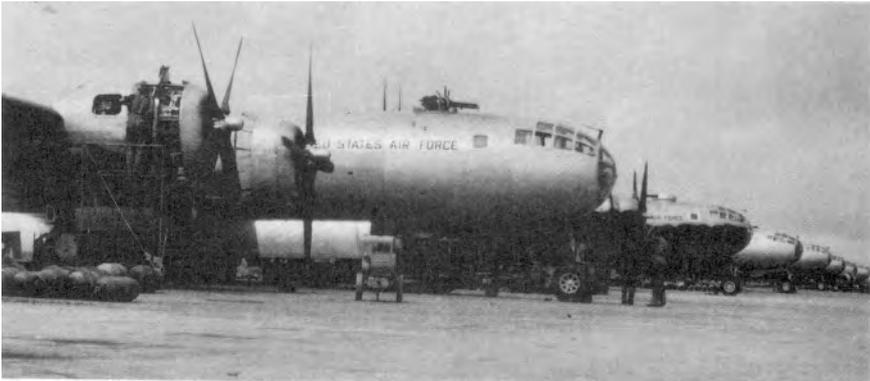


North American F-51 Mustangs, loaded with bombs and rockets for ground attacks, prepare for a flight over North Korea.

War II, and O'Donnell brought with him an appropriate list of targets. Tactical air operations—air superiority, close air support, and interdiction in the vicinity of the battlefield—were the responsibility of Fifth Air Force under General Partridge.

The situation on the ground was becoming too dangerous to permit the division of labor between O'Donnell's bomber command and Fifth Air Force that Stratemeyer had approved on the basis of Air Force doctrine. In the first ground combat of the war by American soldiers, the reinforced battalion assigned to slow the North Korean advance had been overwhelmed in a matter of hours, and a hard-fought delaying action by an entire regiment might gain no more than seventy-two hours. A race was developing between American troops arriving in greater numbers and the advancing enemy. MacArthur and his staff believed that every available aircraft should be used to slow the North Koreans until a defensive perimeter could be established around the port of Pusan in southernmost South Korea. On occasion the headquarters of the Far East Command insisted that the B-29s attack areas close to the battlelines through which the enemy was advancing. Stratemeyer complied but objected to the use of the big bombers against targets better suited to fighter-bombers. Vandenberg, in the Far East on an inspection supported his subordinate, according to Stratemeyer "very explicitly and masterfully" explaining the difference between tactical and strategic air operations.<sup>2</sup> After listening to the Air Force Chief of Staff, MacArthur conceded that it was indeed wasteful to use B-29s against the hard-to-locate targets normally hit by fighter-bombers, but in the present emergency he felt he had to hit the enemy with every available airplane. As a result, his headquarters directed that the B-29s be dispatched in mid-July against bridges, road junctions, and troop concentrations within 60 miles of a critical segment of the front lines.

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Ground crews on Okinawa ready their B-29s for another mission over Korea.

The argument against using strategic bombers in this basically tactical role was taken up by Maj. Gen. Otto P. Weyland, chosen by Vandenberg to serve as Stratemeyer's vice commander for operations. Weyland had earned a brilliant reputation for providing close air support during World War II, when his XIX Tactical Air Command functioned as a part of Vandenberg's Ninth Air Force during the thrust through France in 1944. Confident that his job was to "run the air war," the new vice commander reached Japan in late July 1950 and immediately began whittling away at the influence of MacArthur's chief of staff, Maj. Gen. Edward M. Almond, in the selection of targets for the B-29s.<sup>3</sup> Like almost everyone else on MacArthur's joint staff, Almond was an Army officer. He had, however, attended the Air Corps Tactical School at Maxwell Field in the 1930s and therefore considered himself an expert in military aviation, and for him military aviation included the B-29s, which he felt free to use as he deemed necessary. Since Almond's principal concern was the ground forces fighting in Korea, he tended to ignore the need to disrupt the flow of North Korean supplies and reinforcements, and he concentrated almost exclusively on the battlefield. Convinced that Stratemeyer's discussions with MacArthur and Almond were going nowhere, Weyland took matters into his own hands. Without telling Stratemeyer, he sent a critique of target selection to MacArthur's deputy for operations. As Weyland expected, the memorandum was passed to Almond, who responded by repeating the argument that he needed the B-29s to meet battlefield emergencies. Weyland countered by pointing out that, even though the Pusan perimeter was taking shape and growing stronger, "emergencies" were becoming almost routine. Perhaps, he suggested, Almond needed an airman to determine how the B-29s could be most effective. The army officer agreed that this sort of help might be useful, but he would not give up his access to the bombers. Instead he compromised, retaining control over one group of B-29s while releasing the other two to attack targets chosen by Far East Air Forces. As

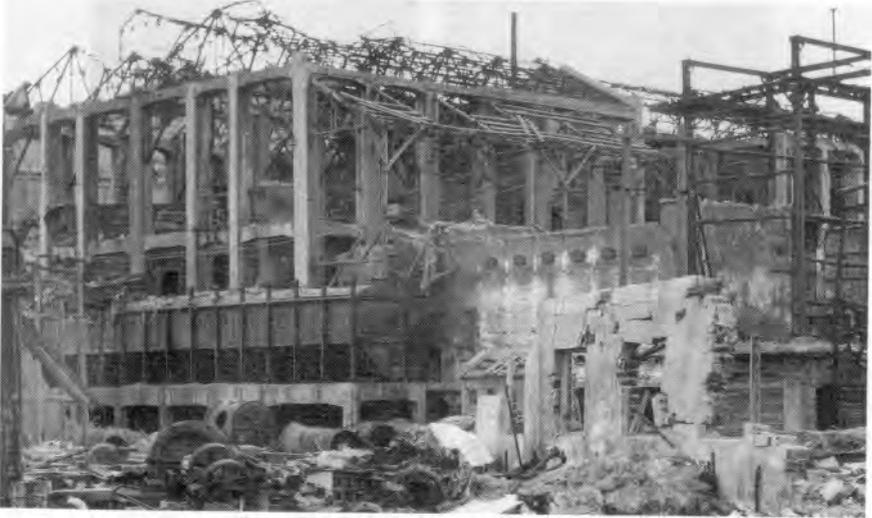


Maj. Gen. Emmett O'Donnell (left), Commander, Far East Air Forces Bomber Command, and Maj. Gen. Otto P. Weyland, Far East Air Forces Vice Commander for Operations.

the North Koreans rushed supplies southward to sustain the offensive, MacArthur agreed that all three groups should be used for long-range interdiction, and B-29s heavily damaged several railroad yards and bridges during August.

While Weyland was working in Tokyo to shift the focus of B-29 operations away from the battlefield to targets in North Korea, Vandenberg was making preparations in Washington for a strategic bombing campaign against the North that was modeled after similar operations in World War II. He persuaded the Joint Chiefs of Staff to send to the Far East two additional groups of B-29s for attacking industrial targets north of the 38th parallel, increasing Bomber Command to five groups totaling more than 100 Superfortresses. The Joint Chiefs also provided a target list, prepared like the one already given General O'Donnell by intelligence specialists of the Strategic Air Command. The principal targets on the second list were the chemical plants at Hungnam, believed to produce radioactive material (for the Soviet atomic energy program) as well as conventional explosives and fertilizer; the munitions factories at Pyongyang; an oil refinery at Wonsan; and the oil storage facilities at Rashin. Before his B-29s were diverted almost exclusively to targets closer to the battlelines, O'Donnell had bombed the port of Wonsan and a nitrogen plant at Hungnam. Because of their compact size—only the capital of Pyongyang, with a population of 500,000, had more than 100,000 inhabitants—and lack of fireproof buildings, North Korean towns seemed almost as vulnerable to fire bombs as the cities of Japan, which O'Donnell had helped reduce to ashes during World War II. This time, however, the Truman administration would not let him use incendiaries against cities and instructed him to minimize civilian casualties, depriv-

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This nitrogen fertilizer plant was one of the targets hit by B-29 bombers in the early months of the war.

ing the enemy of a propaganda issue. The use of fire bombs proved unnecessary that summer, for in mid-September after about one month of systematic bombardment, Stratemyer announced that practically all the strategic industrial targets in the country had been destroyed by high explosives alone. Since American fighters had wiped out the North Korean air force and the enemy had few antiaircraft guns, B-29 crews could concentrate on accurate bombing. The big problem was weather, for clouds often closed in over the B-29 bases during the course of a mission, and in such conditions, landing was the most dangerous part of the flight.

One of the targets on the list approved by the Joint Chiefs of Staff, Rashin, escaped destruction. Because the town, located in northeastern North Korea, was within 20 miles of Soviet territory, the State Department insisted that any attack on the oil storage tanks there be carried out in good weather using optical bombsights. The Joint Chiefs of Staff agreed, but word of the requirement for visual aiming failed to reach General O'Donnell. When his B-29s attacked on August 12, they attempted to bomb with radar through a thick overcast but succeeded only in scattering their explosives on the outskirts of town. A second mission, dispatched ten days later after O'Donnell had been reminded of the restriction, found Rashin again hidden by clouds and had to bomb an alternate target. At this point, given the administration's policy of trying to confine fighting to the Korean peninsula, the State Department questioned the wisdom of retaining on the target list a city that close to the Soviet Union. The Joint Chiefs of Staff agreed to its removal, apparently assuming that oil or other cargo



Bombs cover the Rashin railyard, August 1951.

shipped through Rashin could be destroyed at some other point during its passage down the eastern coast of Korea. The decision aroused no debate within military circles at the time, although in the late spring of 1951, after China had intervened in the war and MacArthur had been replaced, critics of the Truman administration learned of the immunity given Rashin and denounced the decision as a flagrant example of political interference in military matters. In August 1951, a year after the first raid, with an alarming volume of supplies stockpiled at the city's railyard, Gen. Matthew B. Ridgway, MacArthur's successor, obtained permission from President Truman to bomb Rashin. After waiting for clear skies, B-29s attacked on August 25, dropping 300 tons of bombs, 97 percent of which struck within the rail complex.

While the arguments of Generals Stratemeyer, Weyland, and Vandenberg that the proper missions for the B-29s were long-range interdiction or strategic bombardment resulted in attacks on places like Wonsan and Pyongyang, the danger persisted into August that the North Koreans might mount a massive assault and break through the Pusan perimeter. When the enemy crossed the Naktong River at midmonth and threatened the important road junction of Taegu, General MacArthur summoned Stratemeyer to his office and directed him to carpet bomb an area totaling 27 square miles through which reinforcements and supplies were

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passing to exploit the Naktong bridgehead. O'Donnell's planners divided the rectangle into 12 squares and dispatched a squadron of B-29s to saturate each one with bombs. In less than half an hour on August 16, from an altitude of 10,000 feet, 98 B-29s dropped 960 tons of high explosives, raising blinding clouds of smoke and dust that prevented any sort of damage assessment from the air. Enemy fire from both banks of the river prevented patrols from entering the bombed area, but hostile artillery fire slackened from within the heavily bombed area. Prisoners captured later in the fighting revealed, however, that the bulk of the North Korean force had already crossed the Naktong when the bombs started falling. Despite a lack of immediate intelligence on the results of the August 16 attack, MacArthur wanted to launch a second bombardment on the near shore of the river until dissuaded by his subordinates. Generals Walker, Stratemeyer, and Partridge all insisted that the B-29s be used only against known targets, no matter how serious the emergency; dumping bombs blindly onto the countryside was not likely to do any good.

During the successful defense of Taegu, fighter-bombers and B-26s did more to check the enemy than did the massive carpet bombing by B-29s. North Korean troops were strafed as they tried to ford the Naktong. Air strikes destroyed underwater bridges built to carry trucks and foot traffic and supported counterattacks against the hostile lodgment east of the stream. Since air power first intervened in Korea, interdiction and close air support by tactical aircraft had helped gain time for the United States to rush troops to the peninsula and stabilize the battlefield there. In support of the early delaying actions, fighter-bombers and light bombers strafed attacking North Korean infantry and destroyed Soviet-built tanks approaching the battlefield or actually firing into American positions. On July 10, for example, a flight of F-80s descended beneath the clouds and discovered a long line of North Korean tanks and trucks halted before a demolished bridge. Responding to the sighting, the Fifth Air Force diverted every available aircraft—F-80s, B-26s, and even F-82 interceptors—to batter the column with bombs, gunfire, and rockets. This improvisation deprived the advancing enemy of more than 150 badly needed vehicles, a third of them tanks.

To control the entire spectrum of tactical aviation and make sure that bombs and gunfire were delivered when and where they were needed, the Fifth Air Force followed a doctrine that had evolved during World War II but had been modified later to reflect the emergence of the Air Force as a separate service. The principal agency of coordination was the joint operations center, where representatives of the Army and Air Force received requests from the commanders of ground units, matched targets with the available aircraft and ordnance, and used the communications net provided by an Air Force tactical air control center to arrange strikes. Routine requests—for example, strafing and bombing in support of a counterattack the next day—were incorporated into operations orders issued each day; but in an emergency, the center communicated directly with pilots in the vicinity, with the headquarters of ground units, or with nearby airfields. The

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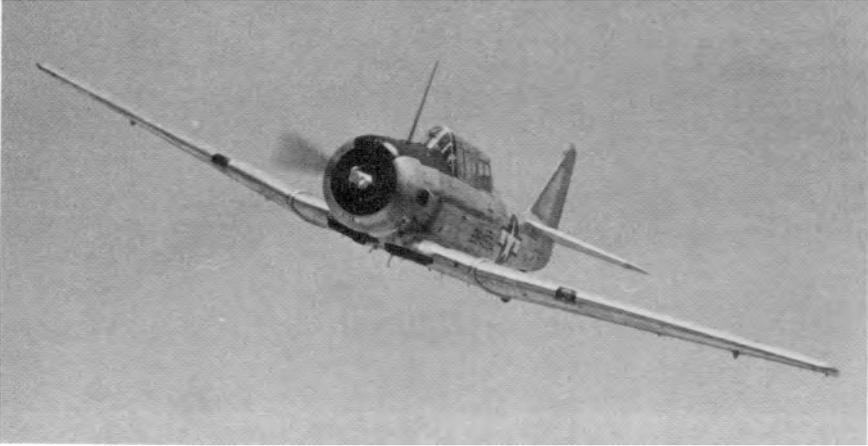
Taxiing on a pierced steel ramp, a Lockheed F-80 Shooting Star passes other F-80s in sandbag revetments.

center launched aircraft or diverted those already aloft to new targets. It did not attempt, however, to control individual strikes but handed the aircraft to a tactical air control officer operating from a radio-equipped jeep and assigned to a particular ground unit. This officer was an experienced pilot familiar with the difficulty of locating a target from the air, with the characteristics of the supporting aircraft, and with the munitions they carried. As a pilot, he was able to communicate with other pilots in language they understood. Such in brief was the mechanism for controlling tactical aviation that Partridge intended to use in Korea.

Problems arose at the outset. Based on experience in World War II, Partridge planned to establish an advance headquarters alongside Walker's command post in Korea, but this could not be done before the North Korean offensive had been slowed, if not stopped. Not until July 24 did the two headquarters begin functioning side by side in the comparative security of Taegu. During the first week of August, however, the enemy threatened even that town, forcing the Eighth Army to move its command post halfway to Pusan. Because the site selected by General Walker was crowded and lacked adequate communications with Japan, the advance headquarters of the Fifth Air Force continued all the way to Pusan.

Meanwhile, Partridge had opened in Korea a joint operations center to take the place of the improvised tactical air control system that had functioned at Suwon until the airfield there was overrun. He placed the center at Taejon, site of the headquarters of the first American infantry division sent to the peninsula. At the time, mid-July, the division was so desperate for officers in its battalions that none could be assigned permanently to the joint operations center, although the staff sections did share information with the airmen. When the North Koreans overwhelmed Taejon, the center shifted to Taegu, remaining there after higher headquarters had left the town.

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In Korea, the T-6, first used by the Air Corps in 1938 as the BC-1 trainer, carried observers in the second seat during tactical air control missions.

While the joint operations center was being set up in Korea, the Fifth Air Force sent a handful of radio-equipped jeeps to the peninsula for use by forward air controllers. To call in a strike, however, the control parties had to drive far enough forward to see the target, for the radios were too heavy to carry and lacked the equipment for remote transmission. Since the sight of a jeep on the skyline was an invitation for the enemy to open fire, the tactical air control parties sustained heavy losses during the early fighting. To replace them, the Fifth Air Force turned to airborne controllers in light aircraft. When these observation craft proved easy prey for propeller-driven North Korean fighters, the North American T-6 trainer, known as the AT-6 during World War II, was pressed into service as a vehicle for forward air controllers. This aircraft had the speed to escape the Soviet-built Yaks and the maneuverability to enable the controller to peer beyond ridge lines into valleys hidden from a control party on the ground. The Mosquitoes, as the controllers in the T-6s were called, came to provide the principal means of controlling close-in air strikes, eclipsing the jeep-mounted control parties that had been so successful during World War II.

A further complication not experienced by tactical airmen during the liberation of Europe was partnership with the Navy and Marine Corps. Difficulties began on July 4, when Admiral Struble continued for a second day his carrier-based attacks on Pyongyang. Before the previous day's bombing, the commander of Task Force 77 had advised Admiral Joy of the planned attacks at Haeju and Pyongyang, and Joy passed the information to Stratemeyer, who asked only that the naval aircraft confine activity on July 3 to the vicinity of the capital and leave the rest of the peninsula to the Fifth Air Force. Struble, however, decided on his own to hit Pyongyang again, a decision that compelled Stratemeyer to

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cancel a B-29 strike planned for that city on the same day. The incident convinced the Air Force general that he needed tighter control over air strikes by the Navy, especially those that might be delivered against targets close to the front lines. Stratemeyer therefore asked MacArthur for operational control over the Navy's carrier aircraft, in effect assigning them a status similar to the squadrons of the Fifth Air Force. Admiral Joy objected on doctrinal as well as practical grounds. He did not believe that the recent agreements on roles and missions would permit another service to exercise direct control over naval aviation, especially when operating at sea, or that the joint operations center could maintain adequate control of Navy as well as Air Force aircraft. From the Navy's point of view, the joint operations center seemed best suited to aerial operations scheduled in advance and spread over a wide front. Granted that the center could juggle assigned aircraft in an emergency, doubt persisted among naval aviators that it could funnel any large number of strikes into a small area without overloading its communications channels. Although he wanted no part of Air Force control and remained wary of the joint operations center, Admiral Joy recognized the need for closer coordination of tactical aviation. Consequently, on July 15 he agreed to place the carrier aircraft under the "coordination control" of the Far East Air Forces, an ill-defined arrangement under which he did little more than provide Stratemeyer's headquarters with Admiral Struble's plans for carrier strikes.<sup>4</sup> He thus avoided Air Force control, but naval aircraft approaching the battlefield had to report to the joint operations center for assignment to a Mosquito controller.

Some of the Navy's fears concerning the joint operations center proved justified. The volume of radio traffic at times inundated the system, and important messages intended for Task Force 77 sometimes failed to arrive in time. Moreover, the job of handling close air support by naval aircraft fell to already overburdened controllers, who might be trying to meld F-80 fighter-bombers, based in Japan and already short of fuel, with longer range, propeller-driven attack planes that despite their greater endurance had to return to their carriers and land before dark. After this shaky beginning, cooperation improved. The carriers tried to send a more even flow of aircraft over the battlefield, and naval airborne controllers in Douglas attack aircraft joined the Air Force controllers in T-6s to direct air strikes. Not until 1951, however, did Task Force 77 send pilots to the joint operations center on a regular basis as liaison officers, and the establishment of direct communications between the center and the task force was similarly delayed. The war was within a month of ending before the Navy in 1953 allowed its representative at the joint operations center to make binding commitments on targets and sorties.

Meanwhile centralized control of tactical aviation as prescribed in Air Force doctrine had also been challenged by the arrival early in August 1950 of a Marine brigade and its supporting aircraft group. The Marine Corps believed that its ground units, whether regiments, a hurriedly formed brigade like the one

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sent to Korea, or divisions, should operate in conjunction with an aircraft group or, in the case of a division, an aircraft wing. Because of the nature of amphibious warfare in which the marines specialized—a small beachhead seized with the help of naval gunfire and air support and then expanded to accommodate artillery—Marine Corps airmen had extensive training in the close support of infantry. Pilots, air controllers, and commanders on the ground were accustomed to working together and understood the benefits and dangers of air strikes in close proximity to friendly troops. Whereas Marine Corps aviation thought in terms of supporting Marine ground units fighting on a comparatively narrow front, the Air Force in Korea employed aircraft for interdiction, reconnaissance, and close air support from the Pusan perimeter near the southern tip of the peninsula to the Yalu River in the North and from one end of the battleline to the other. In terms of interest and training—close air support had a lower priority in the Air Force than in the Marine Corps—as well as geographic concentration, Marine Corps pilots supported ground forces better than their Air Force counterparts. Because the skills of Marine airmen were so highly prized, General Partridge sought close cooperation with the Marine squadrons, which at first were flying missions from aircraft carriers off the South Korean coast. He requested and received a liaison officer from the aircraft group who helped the joint operations center find suitable targets for any Marine strike aircraft that were surplus to the needs of the brigade.

To the annoyance of Generals Stratemeyer and Vandenberg, the American press lavished praise on Marine airmen for doing an excellent job of close air support, as indeed they were, albeit on a comparatively small scale. However skilled these first Marine Corps pilots to fight in Korea were in their specialty of close air support, they could not by themselves maintain control of the skies over the peninsula or carry the weight of ordnance delivered by the much larger Fifth Air Force over a much larger area. Like close air support, interdiction contributed to the defense of the Pusan perimeter, sometimes spectacularly, as when a motorized column went up in flames; at other times all but invisibly, as when downed bridges delayed the arrival of badly needed ammunition or reinforcements. General Walker, moreover, expressed satisfaction with the work of the Air Force, declaring: “I will lay my cards right on the table and state that if it had not been for the air support we received from the Fifth Air Force we would not have been able to stay in Korea.”<sup>5</sup>

By mid-September the North Korean offensive had clearly failed; the United Nations forces had survived savage blows and grown steadily stronger. The first phase of the Korean fighting had ended. MacArthur’s belief, expressed to Partridge in the early days of the conflict, that American air power would prevail, turned out to be mistaken. Fighting the North Koreans to a standstill required the combined efforts of the air, land, and sea forces of several nations, with South Korea and the United States making the greatest contributions. Air power did, however, provide essential help as the United Nations Command



A burning North Korean fuel truck hit by an F-51 near Kumchon.

stopped the enemy drive. The burned-out hulks of hundreds of tanks destroyed by air strikes marked the invasion route, and B-29s had damaged the North Korean transportation network and destroyed whatever industry the nation possessed. Although handicapped by primitive airfields in South Korea, the Combat Cargo Command of Far East Air Forces flew in men and cargo from Japan and evacuated almost a third of the 13,000 American soldiers sent to Japan to recuperate from their wounds. The Military Air Transport Service flew the trans-Pacific routes, delivering among other things a new and more powerful rocket launcher used by American infantrymen against North Korean tanks in the fight for Taejon during mid-July. In addition, the transport service conducted weather reconnaissance, provided weather forecasts for use by the Army and Air Force, and dispatched rescue detachments that served under the operational control of the Far East Air Forces. The Air Force had drawn heavily on the experience of the Army Air Forces in helping check the advance of a North Korean army that fought with the weapons and tactics of World War II. Establishing the Pusan perimeter was just the beginning, however; as early as the first week of July, MacArthur had been thinking of employing the basic tactics that had served him so well against the Japanese in the South Pacific. He ordered that planning begin for an amphibious landing in Korea well beyond the battlefield.

The objective that MacArthur selected to open the second phase of the war was Inchon on Korea's west coast, the ocean gateway to Seoul. His amphibious spearhead was the 1st Marine Division, which absorbed the brigade that had fought to defend the Pusan perimeter. MacArthur placed his chief of staff,

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A wounded serviceman is loaded into Combat Cargo Command aircraft for evacuation to a rear area hospital.

General Almond, in command of the 40,000-man invasion force, designated X Corps, which included the Marines and an Army division from Japan. The attack at Inchon cut off the North Korean forces retreating from the Pusan perimeter, where the Eighth Army launched its own offensive on September 16, the day following the assault at Inchon. Less than a third of a North Korean force numbering 100,000 escaped from the trap and again crossed the 38th parallel, this time in headlong retreat. So complete was the enemy's collapse that on September 27, not quite two weeks after the Inchon landing, President Truman authorized MacArthur to pursue the beaten enemy north of the parallel separating the two Koreas, and South Korean troops promptly advanced into the North. The United Nations never explicitly approved an invasion of North Korea, however. The General Assembly, reflecting the concern of some members that to advance northward was to invite the Chinese to intervene, adopted an ambiguous compromise resolution to the effect that "all appropriate steps should be taken to ensure conditions of stability throughout Korea."<sup>6</sup>

As the United Nations forces advanced beyond the 38th parallel, air power performed a variety of missions. Navy and Marine Corps aviators had provided cover for the Inchon landings, while the Fifth Air Force supported the Eighth Army throughout the advance from the Pusan perimeter to the border with North Korea. Once across the parallel, easily the most spectacular air operation was the dropping of the 187th Airborne Regimental Combat Team at two road junctions north of Pyongyang to cut off a retreating North Korean column and free a large number of American prisoners of war traveling with it in two trains. A sharp fight occurred, but the sudden appearance of the airborne force did not

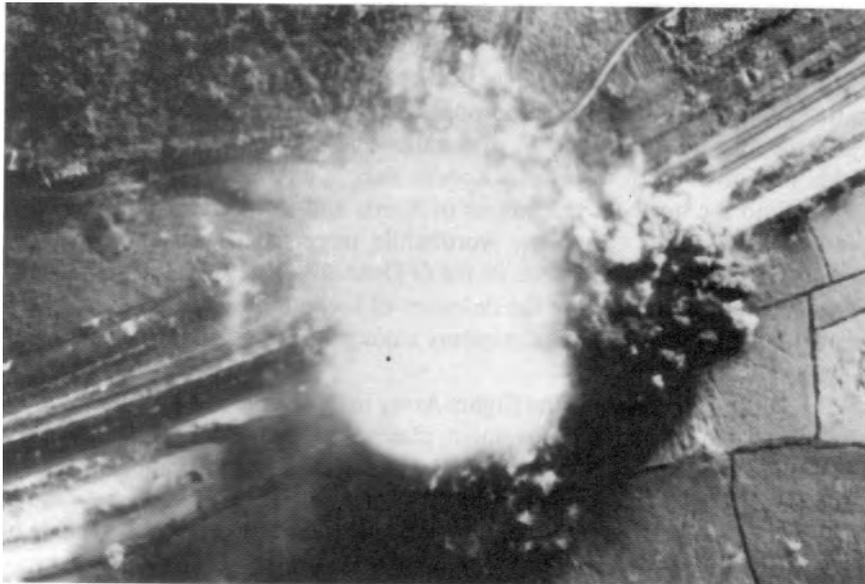
## The Air War over Korea

prevent the enemy from murdering 100 prisoners on one of the trains; the other continued northward with its captives. Besides dropping the airborne infantry, the roughly 140 transport aircraft of the Far East Air Forces parachuted supplies to the advancing United Nations troops and flew men and cargo—as much as 1,000 passengers and 1,000 tons of supplies on a busy day—from Japan to airfields in Korea. With the North Korean People's Army straggling in small groups into the northern mountains of Korea and town after town falling to Walker's advancing army, few worthwhile targets existed for the fighter-bombers of the Fifth Air Force or for O'Donnell's B-29s. Aerial reconnaissance, so helpful in charting the defenses of Inchon, now faced the infinitely more difficult task of locating the enemy among the mountains of northernmost Korea.

The advance that carried the Eighth Army to Pyongyang and beyond formed one arm of another pincers movement, planned as a repetition of the assault at Inchon. While the Eighth Army pushed northward, General Almond's X Corps would reembark at Inchon and Pusan, sail around the peninsula, and land at Wonsan on the east coast. Once ashore it would cross the mountainous spine of Korea to link up with the main body of the Eighth Army at Korea's narrow waist. The plan went badly awry, however. While resistance before the Eighth Army was crumbling, minefields off Wonsan delayed the landing of X Corps for two weeks; Almond's troops did not come ashore until November 4, after South Korean forces advancing along the coast had captured the port. The planned pincers movement now became a race to the northern border of North Korea, the Yalu River, by parallel columns with a rugged mountain range between them.

The separation of the Eighth Army and the X Corps, which still included the 1st Marine Division, brought about a change in the relationship between the Fifth Air Force and Marine Corps aviation, which had been reinforced to become the 1st Marine Aircraft Wing. In October, General Weyland, still serving as Stratemeyer's vice commander for operations, raised the question whether the Marine aircraft wing, when supporting X Corps in northeastern North Korea, would come under the control of the Fifth Air Force. Initially MacArthur's headquarters said no, apparently intending to repeat at Wonsan the arrangement at Inchon, where Marine Corps and Navy squadrons supported the landing. Weyland thereupon argued that the Fifth Air Force was responsible for supporting X Corps and should control the Marine Corps aircraft, which would operate from bases ashore during the advance to the Yalu. He proposed that Partridge extend his coordination control over the 1st Marine Aircraft Wing, agreeing, however, to commit the wing primarily to the support of X Corps and to provide from the Fifth Air Force any additional sorties that Almond's command might require. During the final advance by the United Nations Command to the Yalu, the Navy's carrier-based aircraft, like the B-29s of the Far East Air Forces, would conduct general support. On October 16, when the first elements of X Corps set sail for Wonsan, MacArthur's headquarters approved the

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This exploding ammunition train was hit by 500-pound bombs dropped from a B-29.

arrangement, which went into effect five days later as the amphibious force was steaming offshore, waiting for the minefields to be cleared.

The plan to have the Fifth Air Force exercise coordination control over the Marines did not work as well as Weyland had hoped. Communications between the joint operations center and the X Corps command post proved unreliable, and Almond declined to assign officers to the center on a permanent basis. Partridge imposed a further burden on the fragile communications net by insisting that X Corps submit each day a formal request for air strikes; this long and complicated message became the basis for a detailed order directing the 1st Marine Aircraft Wing to fly missions that it would have flown anyway. In the middle of October, resistance in northeastern Korea was light, and the cumbersome exchange of messages amounted to little more than an inconvenience. At the end of November, however, China intervened in force, attacking the troops advancing from Wonsan and those pushing toward the Yalu after capturing Pyongyang, ending the pursuit of the defeated North Korean army that had begun on September 15 and 16 with the landing at Inchon and the counterattack from the Pusan perimeter.

The Chinese intervention jolted a United Nations Command that already had begun canceling requisitions for ammunition and clearly was thinking of victory parades rather than further combat. Indeed, two of the five groups of B-29s assigned to Far East Air Forces returned to the United States in October. On the 15th of that month, before the Wonsan invasion force had left port, General

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MacArthur arrived at Wake Island where he assured President Truman that the Chinese were no cause for concern. China had threatened to enter the war if the United Nations forces drew too near to the Yalu, but these warnings were dismissed as propaganda. Not even the sighting on October 18 of 100 fighters parked on the airfield at Antung in Manchuria caused alarm.

When the Chinese struck, they attacked piecemeal. On October 25 and 26, they hit South Korean troops who had probed as far as the Yalu, and on the 29th the South Koreans who had captured Wonsan reported encountering Chinese troops along the east coast. Other more serious contacts occurred on November 1. When F-80s attacked the airfield at Sinuiju on the southern bank of the Yalu, they found 15 Yaks on the ground there and lost one of their number to antiaircraft fire, some of it believed to have come from Antung across the border in Manchuria. On that same day, also in the vicinity of Sinuiju, Yak fighters of a reconstituted North Korean air arm attacked a B-26 and a T-6 but failed to down either, and four MiG-15 jet fighters bearing Chinese markings darted across the Yalu and jumped four F-51s, all of which escaped. When night fell at Unsan, some 75 miles east of Sinuiju, Chinese infantry attacked both American and South Korean units, inflicting severe casualties. The Chinese were not merely reinforcing the defeated North Koreans but were taking over the war. Instead of some 17,000 troops, as MacArthur's staff believed, as many as 180,000 had already entered North Korea, traveling by night when American aerial reconnaissance could not detect them and remaining hidden during daylight.

American attention focused on Sinuiju, the bridges there, and the other spans that crossed the Yalu elsewhere. Partridge wanted to avenge the loss of the F-80 on November 1 by setting the town ablaze with incendiary bombs, chasing back into Manchuria any Chinese MiGs that might intervene, and attacking the airfields from which the Chinese jets had come. Until the extent of the Chinese involvement became clear, MacArthur was reluctant to challenge the administration's prohibition against attacking China, and he vetoed the bombing of Sinuiju, which he hoped to capture intact and turn over to the government of a unified Korea. With a peacetime population approaching 100,000, many of whom had fled across the Yalu, the town would serve as the anchor of a defensive line established along the river.

Even as he sought to spare Sinuiju for use by the new Korea's armed forces, MacArthur approved the destruction by aerial bombardment of the other towns and villages in the border region that might harbor enemy troops or supplies. To compensate for the withdrawal of the two groups of B-29s, O'Donnell's bomber command relied on incendiaries to multiply the damage done by the remaining three groups. The administration apparently was no longer concerned by the propaganda advantage that might accrue to the government of North Korea if fire bombs were used. During the first week of November, the bombers ignored Sinuiju in the west and Rashin in the east but hit the other two large towns in the border region, leveling Kangye and damaging Chonjin.

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Although still confident that he faced a comparatively small number of Chinese, MacArthur could not ignore the passage of additional troops over the bridges linking China with North Korea. On November 5 he therefore directed Stratemeyer to devastate the area between the front lines and the Yalu River, attacking the town of Sinuiju, dropping the “Korean end” of all the bridges leading from Manchuria, and then destroying every village, town, factory, or military installation, exempting only Rashin and the hydroelectric plants that supplied current to China. Sent in a routine targeting report filed a few hours before the B-29s were to take off on the first of the missions, the directive might have gone unnoticed until after the first strike had Stratemeyer not alerted Vandenberg that stray bombs aimed at Sinuiju or the bridges might explode on Chinese territory. The issue reached the desk of President Truman, who felt an attack like this should be delivered only if the lives of American soldiers were at stake. Thus far, the Chief Executive had received no such justification. MacArthur was therefore asked why the series of operations was suddenly so important. He responded by giving the Joint Chiefs of Staff a vivid description of Chinese troops pouring across the bridges in days to come. To delay the bombing, he warned, would threaten the “ultimate destruction of the forces under my command.”<sup>7</sup> Despite the possibility of provoking China into broadening the conflict, perhaps by a move against Taiwan, the President felt he had no choice but to approve the strikes against Sinuiju and the bridges.

On November 8, 79 B-29s struck Sinuiju, 9 trying unsuccessfully to drop the bridges and the other 70 saturating the city with more than 500 tons of incendiary bombs, released in clusters. “General O’Donnell indicates,” Stratemeyer recorded in his diary, “that the town was gone.”<sup>8</sup> Aerial reconnaissance later found that about 60 percent of the city had been destroyed. No B-29s were lost on the raid against Sinuiju and its bridges, and 1st Lt. Russell Brown, flying cover in an F-80, shot down a MiG-15 during the first all-jet dogfight. Enemy antiaircraft artillery kept the B-29s above 18,000 feet, an altitude that made it impossible to hit the Korean end of the two bridges, highway and railroad, between Antung and Sinuiju. A further complication was MacArthur’s insistence that the bombers follow the course of the stream to avoid violating Chinese airspace. At day’s end both bridges remained open, although the approaches from the Korean side had sustained damage.

Throughout the rest of November 1950, the dozen bridges over the Yalu proved to be durable targets. Navy aircraft managed to destroy the highway span at Sinuiju, but seven other structures, including the railroad bridge at Sinuiju, defied all efforts to destroy them, even with radio-controlled bombs, relics of World War II that had a guidance system prone to failure. Few B-29 bombardiers had any experience using the bombs, which they had to track all the way to the target, disregarding MiGs and antiaircraft fire. Even if greater accuracy had been attained, the 1,000-pound guided bombs lacked the explosive power to destroy these solidly built bridges. Before heavier guided bombs could

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be sent to the Far East and crews trained to use them, the Yalu froze, enabling men and supplies to cross without using the bridges. One of the first of the 12,000-pound guided bombs to arrive in the theater of operations badly damaged a railroad bridge at Kangye, some 25 miles inside North Korea. In March, after the ice had thawed, the B-29s resumed their attacks on the bridges across the Yalu, damaging a few but not the railroad span at Sinuiju.

During the early strikes against the Yalu bridges, fighters from north of the river frequently climbed to high altitude over Manchuria, dived into North Korea to make a firing pass at the American bombers, and then fled back across the border. MacArthur complained about allowing the enemy to enjoy this Manchurian sanctuary, but the possibility that aerial incursions north of the border might trigger a violent response by China or the Soviet Union had become a source of concern to America's European allies. American aircraft had already violated Chinese or Soviet airspace three times: on August 27, two Mustangs had mistaken an airfield at Antung for one at Sinuiju and strafed the Chinese aerodrome; on the night of September 22, a B-29 dispatched to bomb Sinuiju hit the railyard at Antung; and on October 8, two F-80 pilots became lost and repeatedly strafed a Soviet air base in Siberia. Violations of communist air space were considered potentially dangerous provocations of an enemy whose intentions were not yet clear. After the attack on Soviet territory, the commander of the fighter group involved was reassigned to Fifth Air Force headquarters and the offending pilots faced a court-martial that acquitted them.

Since the extent of Chinese involvement in Korea only gradually became clear, the United States agreed with its allies that extending the air war beyond the Yalu would be unwise, especially in light of rumors that the Soviet Air Force would respond to American attacks against airfields in China. The Truman administration, although it almost certainly would have retaliated against the air bases had the Chinese mounted an aerial attack on the United Nations forces, did not want to provoke raids of that kind. American flyers were never authorized to enter Chinese or Soviet airspace. Pilots sometimes ignored this prohibition when in hot pursuit of a MiG seeking refuge over China, and on at least one occasion they confused facilities across the Soviet border with targets in North Korea.

After the first attacks by Chinese troops in late October and early November, quiet settled over the North Korean battlefields; the new enemy seemed to have vanished as suddenly as he appeared. After pausing two weeks to regroup, MacArthur on November 24 launched an offensive that he believed would drive the enemy across the Yalu and into China. He was confident that the United Nations Command could rout the Chinese, now estimated to number about 70,000, and the slightly larger remnant of the North Korean People's Army. In fact, some 300,000 Chinese, along with the defeated North Koreans, opposed a United Nations force of 200,000 men, half of them South Korean troops.

The Chinese counterattacked on November 25, striking the main body of the Eighth Army and then X Corps. After four days, MacArthur ordered the forces

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north of Pyongyang to withdraw, although he hoped that Almond could maintain a salient in the flank of the advancing enemy. Marine Corps aviation and the Navy's carrier task force concentrated on assisting the troops in the northeast, who were falling back on Hungnam, a port about fifty miles north of Wonsan. In the emergency, Partridge suspended the existing procedures for coordination and allowed the commander of the 1st Marine Aircraft Wing to direct air operations in that sector, acting independently of the joint operations center. In addition, the Fifth Air Force placed varying numbers of sorties by fighter-bombers and light bombers at the disposal of the Marine Corps officer. Partridge's remaining aircraft, aided by the B-29s, tried to relieve the pressure on General Walker's Eighth Army. Commanded by Maj. Gen. William H. Tunner, who had directed the recent Berlin Airlift, the combat cargo element of the Far East Air Forces flew into airfields that were about to be abandoned in the retreat and brought out equipment and supplies that Walker's troops would otherwise have had to destroy. Along the east coast, Tunner's airmen parachuted the components of a bridge that, when assembled, enabled the 1st Marine Division to cross a gorge blocking the line of retreat to Hungnam. Without the bridge, the unit might well have lost much of its heavy equipment. After a gallant fight to reach the port, Hungnam had to be abandoned, with the last of Almond's troops sailing safely from the harbor on December 24. The presence of the marines and soldiers on the Chinese flank no longer made sense; they were needed in South Korea to stabilize the front as United Nations forces abandoned Pyongyang, retreated across the 38th parallel, and abandoned Seoul. Each successive retreat further complicated tactical air support by depriving Partridge of his advance airfields and reducing the time that fighter-bombers could harry the enemy's advance.

The bleak news from Korea deeply troubled President Truman and his advisers. After a meeting at the White House on November 28, when the Chinese offensive was just beginning, the danger of sustained air attacks from the sanctuary of Manchuria was discussed. The possibility of retaliation in the event of such attacks was very much on the President's mind, so much so that during a press conference on November 30, he answered a reporter's question about the use of atomic bombs by stating that there had "always been active consideration" of their employment.<sup>9</sup> This offhand remark, though clarified by a White House press release pointing out that the President had not authorized the use of atomic devices and that only when he did so would MacArthur "have charge of the tactical delivery of the weapons," produced two immediate effects.<sup>10</sup> General MacArthur, who had just approved a message requesting B-29s capable of dropping atomic bombs, set his headquarters to work on a list of potential targets in China and, should the conflict spread, in the Soviet Union. At the same time, Mr. Truman's words upset America's allies in the North Atlantic Treaty Organization, who initially supported the collective defense of South Korea as proof of American determination to abandon isolationism and participate in the defense of nations threatened by communist aggression. The enthusiasm of the



South Korean soldiers board a C-54 during evacuation of a threatened airfield in December 1950.

Europeans was fast abating, for they feared that the war in Korea might at best absorb American resources needed by the North Atlantic Treaty Organization or at worst give the Soviet Union an excuse to attack western Europe. Prime Minister Clement H. Atlee of Great Britain flew to Washington for reassurance.

While MacArthur planned, albeit tentatively, for atomic warfare and Truman responded to the concerns of the European leaders who recoiled at the prospect of such a conflict, the Air Force moved to solve a tactical problem, countering the Soviet-built MiG-15, which in terms of speed and maneuverability outperformed the F-51s and F-80s in action over Korea. Even as the Chinese drive gathered momentum, the Fifth Air Force received an aircraft, the North American F-86 Sabre, that more than matched the MiG-15 in performance. Soon after Chinese MiGs (manned in the earliest days by Soviet pilots) first intervened in the air war, General Vandenberg ordered a wing of seventy-five Sabres ferried by aircraft carrier to the Far East. They had their first encounter with the MiG-15 on December 17, 1950, when Lt. Col. Bruce Hinton shot one down. Five days later, the commander of the 4th Fighter-Interceptor Wing, Lt. Col. John C. Meyer, led eight Sabres against fifteen MiGs, downing six of the enemy at the cost of one F-86.

During the next 30 months, F-86 pilots received credit for the destruction of 792 MiGs and 18 other enemy aircraft. Of the 218 Sabres lost during the war, the Air Force attributed 76 to MiGs, 19 to ground fire, 15 to unknown enemy action, 13 to unknown operational causes, and the rest to mechanical failure or accident. Although the lighter MiG could climb faster, the Sabre could outrun it in a dive and was more responsive to the controls when approaching the speed of sound. The Sabre's canopy afforded better visibility than that of the MiG, which suffered from a restricted field of vision and an inferior defrosting system. Neither aircraft had really adequate armament. The Sabre's six machineguns did not cause enough

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damage, often hitting the enemy without bringing him down, and the MiG's cannon fired too slowly to be accurate against a fast-moving jet. Modifications to the F-86 enhanced its performance against the MiG, which did not improve much during the course of the war. To reduce drag during tight turns, engineers at North American Aviation replaced the wing slats that extended automatically at low speed with a fixed leading edge. Hydraulic controls also increased agility, but the greatest boon to maneuverability was the so-called flying tail, a horizontal stabilizer that moved as a unit and was far more effective than the smaller elevators on the early F-86. A more powerful engine and a radar gunsight also helped make the later F-86 a more formidable fighter. The MiG, however, still had better acceleration and enjoyed the sanctuary of the Manchurian border.

Although the F-86 was a splendid fighter, its overwhelming success against the MiG in Korea resulted in large measure from its superior pilots, many of them veterans of World War II. Colonel Meyer, for example, was a leading ace in the European Theater of Operations with twenty-four kills; he added two victories in Korea. Similarly, Lt. Col. Francis Gabreski and seventeen other aces of the previous war increased their totals in the Korean fighting. Ten men who had a few victories in World War II became aces in Korea, including Maj. James Jabara, whose fifteen kills earned him second place among the aces of the Korean War. The leading ace, with sixteen, was Capt. Joseph McConnell, who had been a B-24 navigator during World War II. He survived the air war over Korea only to die while testing a new model of the F-86. Against experienced pilots like Gabreski, Meyer, and Jabara, the Chinese sent class after class of trainees, and the Soviets also rotated inexperienced pilots into the theater. Each group began timidly and only gradually made bolder forays across the Yalu as experience increased. Only a few of the Chinese and Soviet pilots attained the level of skill common among their opponents.



A flight of North American F-86 Sabres over Korea.

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The F-86 pilots had to devise new tactics for jet combat along the Yalu. The big offensive fighter sweeps of the last years of World War II gave way to small defensive patrols. Since the Manchurian airfields could not be attacked, the F-86s did not engage the enemy over his bases as had been done in both World Wars. The initiative thus passed to the Chinese, with the Americans reacting to the enemy's incursions by establishing barrier patrols or by scrambling interceptors when warned by radar. Because of the short range of the MiG-15 and the location of the Chinese airfields it used, the heaviest fighting took place in "MiG Alley" in northwestern North Korea along the Yalu River from the Yellow Sea to the Sui-ho Reservoir, an area that included the towns of Sinanju and Sinuiju. The short range of the F-86, less than 500 miles with jettisonable fuel tanks, meant that no time could be wasted in assembling large formations. Patrols of four F-86s arrived in MiG Alley at five-minute intervals and remained for about 20 minutes, less if they engaged in combat.

Although American tactics proved successful, Chinese air power remained an ominous threat throughout the fighting. Soviet support had enabled China to increase its jet fighter strength to as many as 1,000 aircraft, three times the peak number of F-86s. MiGs occasionally penetrated the screen of F-86s along the Yalu, and U.S. fighter protection disappeared entirely for several weeks. Early in 1951, the United Nations forces abandoned Seoul; and on January 2, about to be deprived of Kimpo airfield just outside the capital, the F-86s withdrew to Japan. Not until they returned to South Korea in February could the Sabres again reach MiG Alley; but in the interim, American bombers and fighter-bombers achieved varying degrees of success pounding the enemy and his



A boat is loaded on a Fairchild C-119 Flying Boxcar in the evacuation of equipment from Kimpo airfield.

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A railroad bridge on the Pukchin River disappears under a salvo of bombs.

lengthening supply lines without the F-86 screen. B-29s cratered Pyongyang airfield after the enemy recaptured it and bombed towns suspected of sheltering Chinese troops. In January a raid on the city of Pyongyang set raging fires but failed to inflict the complete devastation that the bomber command expected. More encouraging results were attributed to tactical aircraft. During the first five days of January, the Fifth Air Force claimed that some 2,500 daylight sorties by fighter-bombers had killed 8,000 Chinese, while B-26s, experimenting with flares provided by the Navy and dropped from Air Force C-47s, added to the death toll with night attacks.

All in all, air support during the retreat was uneven—weakest in the west during December, when airfields like those around Pyongyang had to be abandoned and mountains of supplies and equipment destroyed, but more effective in the east where aircraft carriers were close at hand and the evacuation more orderly. Once Marine Corps and Air Force fighter-bomber units reestablished themselves in southern South Korea in early January, they launched fiercer attacks than during the previous month. B-29s remained a powerful element in the American air armada because the recently evacuated airfields of North Korea were in no condition for use by MiGs, whose short range kept them well to the north of retreating United Nations forces.

The cumulative effect of attacks on the enemy's logistics network, which intensified as December ended and January began; stiffening resistance on the ground, to which close air support and battlefield interdiction contributed; and the very speed of an advance that outran its supply lines combined to slow the Chinese advance beyond Seoul. By mid-January the long retreat had ended. The

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front stabilized some forty miles south of the South Korean capital, and the Eighth Army prepared to counterattack under a new commander, Lt. Gen. Matthew B. Ridgway, who had taken over after General Walker died in a jeep accident on December 23, 1950. Ready to take part in Ridgway's planned advance was X Corps, which had rejoined Eighth Army after the withdrawal from Hungnam.

Since X Corps had returned to the battlefield in South Korea, Partridge might have vigorously reasserted coordination control over the 1st Marine Aircraft Wing through the joint operations center, but he did not. As a result of the savage fighting in northeastern Korea, he recognized that the Marine Corps air and ground components formed a unified team. He therefore continued the practice he had established during the retreat to Hungnam, exercising his authority through the commander of the Marine aircraft wing, with the operations center rarely making other than minor adjustments to plans submitted by wing headquarters. In an emergency Marine Corps aircraft could be directed to attack wherever they were needed, but because Ridgway chose to advance methodically in successive stages, emergencies were few. Indeed, by the end of June the Eighth Army had recaptured Seoul and advanced a short distance into North Korea. The war thereupon entered a new phase, a stalemate broken by limited though vicious attacks, which lasted into 1953.

Air power proved invaluable in the limited United Nations offensives that established an essentially permanent battlefield generally along the 38th parallel north of Seoul. As the United Nations Command fought its way northward, the Far East Air Forces flew as many as 1,000 sorties in a single day. Marine Corps airmen joined them in close air support, under the direction of airborne controllers, and in battlefield interdiction. In terrain that was more open than along the Yalu, aerial reconnaissance kept track of hostile activity, for instance, reporting the enemy's withdrawal from Chunchon just south of the 38th parallel, thus facilitating the advance. B-29s of the Far East Air Forces bombed the road and rail junctions through which supplies reached the Chinese and North Korean units, and troop carrier squadrons dropped the 187th Airborne Regimental Combat Team in the vicinity of Munsan-ni, some 25 miles northwest of Seoul. Assessing the effectiveness of air power in front of his unit, especially the strikes handled by airborne controllers in their T-6s, Lt. Col. Gilbert J. Check, commander of the 27th Regimental Combat Team, said, "The close support and coordination between air and ground units . . . can well serve as a standard for future operations."<sup>11</sup>

The Chinese intervention struck a mortal blow to the administration's lingering hope that the budget could be balanced by reining in defense spending. Amid the optimism of late October, plans were being made to shift troops from the Far East to Europe once the last spark of North Korean resistance had been extinguished. The offensive designed to accomplish this goal began in late November. Scarcely had MacArthur predicted victory by Christmas, when the

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C-119s drop supplies to United Nations troops in Korea, January 1951.

United Nations Command was everywhere retreating before a massive and well-trained Chinese army. On December 15, President Truman declared a national emergency, committing the United States to the expense of a continuing military buildup.

This marshaling of men and resources, however, was directed as much toward the defense of Europe as toward the war in Asia, for the Chinese offensive had persuaded the administration to settle for less than victory in Korea. To launch another drive to the Yalu against Chinese forces seemed far too costly, not only in terms of American lives lost but also because it would require troops and equipment that could better be used to bolster the defenses of a more vital region, western Europe. Preserving the independence of South Korea without allowing the conflict to spread replaced the defeat of North Korea as the aim of the war. By the time the United Nations troops had begun counterattacking after halting the Chinese advance, the destruction of the enemy's army seemed prohibitively expensive. A better solution appeared to be a negotiated settlement that would end the fighting and ensure the continued independence of South Korea.

General MacArthur, however, would accept nothing less than complete victory. His concern that the Eighth Army would have to evacuate the peninsula vanished by mid-February, and he denounced the acceptance of a stalemate in Korea. By mid-March, after Ridgway's troops had dealt the Chinese several sharp blows, MacArthur told reporters that the mission of his command was to unify the two Koreas. Although the President in the discouraging days following China's intervention had issued a directive warning against unauthorized

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statements on the conduct of the war, MacArthur received no rebuke. Since Ridgway's Eighth Army was approaching the 38th parallel, Truman hoped to capitalize on the reversal of Chinese fortunes, and possibly forestall an enemy counterthrust, by offering to negotiate an end to the fighting. Learning in advance of the President's plan, MacArthur torpedoed it, issuing a ringing declaration that in effect invited China to choose between surrender and defeat. On March 24, Truman reminded the general of the directive against public statements on the conduct of the war, but by that time MacArthur had engaged in an even more serious act of insubordination. Four days earlier he had replied to a request from Representative Joe Martin, a Republican from Pennsylvania, for his views on the military policy of the Democratic administration. On April 5 Martin released MacArthur's response, which clashed with the views of the Truman administration on almost every point. Differing publicly with the administration was serious; interjecting those differences into domestic politics was outrageous, especially since MacArthur had flirted with the Republican Presidential nomination while serving in the Southwest Pacific in 1944. On April 9, after obtaining the concurrence of the Joint Chiefs of Staff, the President directed the Department of the Army to recall MacArthur.

Ridgway replaced MacArthur and Lt. Gen. James A. Van Fleet assumed command of Eighth Army. Both Ridgway and Van Fleet had great confidence in Eighth Army. Indeed, Van Fleet hoped to execute a landing similar to that at Inchon, this time on the east coast, and repeat the success of September 1950. Ridgway shared the belief that the Chinese in Korea could be defeated, although at a great, perhaps prohibitive cost. The victory, moreover, might well prove meaningless, for Ridgway supported the administration's view that western Europe was the decisive ideological and military battleground in the fight against communism.

General MacArthur returned from the Orient while the Republican leadership, which resented the "loss" of China to communism, was attacking the Democrats for becoming entangled in the North Atlantic Treaty Organization. His appearance seemed a godsend, for here was a popular hero who rejected the idea of Europe first and believed that the Chinese Nationalist armies, although driven from the mainland to a refuge on the island of Taiwan, had received sufficient training and equipment since that debacle to defeat the more numerous Chinese communists. During a hearing before the Armed Services and Foreign Relations Committees of the Senate on the subject of American policy in the Far East, MacArthur demanded that the administration choose among three courses of action: surrender, stalemate, or victory. Surrender was unthinkable. Stalemate, in effect continuing the kind of limited operations begun by Ridgway in February, would kill Chinese, but as time passed American casualties would inevitably mount, making the war progressively less popular and harder to sustain. The only alternative was victory, which could be won by extending the war to mainland China, using Nationalist troops and American air and naval forces.

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The Joint Chiefs of Staff rallied behind the President. During the retreat from the Yalu, they had considered a strategy similar to MacArthur's, but only as a last resort if the Chinese overran the Korean peninsula. The Joint Chiefs did not share MacArthur's confidence in the Nationalist forces. The danger of a Chinese triumph had passed, the front had been stabilized, and the Eighth Army had returned to the offensive. As a result, the uniformed leaders of the armed forces were shifting their attention from a secondary theater to the main task of protecting Europe against the Soviet Union, the nation they considered the principal antagonist. The Joint Chiefs were willing to accept a limited war in Korea because they believed that extending the war into China would work to the advantage of the Soviet Union, tying down air, ground, and naval forces needed to support and strengthen the American allies in Europe or to retaliate in case of Soviet aggression. Especially telling was the testimony of General Vandenberg, who combined subtle criticism of MacArthur with a blatant appeal for appropriations when he lamented the fact that his "shoestring air force," though it could devastate the cities of China if directed to do so, would sustain losses that would prevent it from simultaneously deterring or punishing aggression by the Soviet Union.<sup>12</sup>

The members of the two Senate committees, with a majority of Democrats, voted along party lines to vindicate the administration's policy. Despite the acclaim that greeted MacArthur on his return from the Far East, his proposal to expand the conflict aroused little public support. The populace had grown disenchanted with the war in Korea, however much it might admire the general who had directed the advance from Australia to Japan during World War II, served as viceroy over the defeated Japanese, and more recently planned the masterful attack at Inchon. The administration seemed correct in its belief that the best hope was a negotiated settlement; the other side seemed willing to talk, for on June 23, 1951, the Soviet Ambassador to the United Nations publicly called for armistice talks.

Since neither the communist forces nor those of the United Nations could win the war without bloody and dangerous escalation, the idea of negotiations seemed attractive to both sides, but neither would risk negotiating from a position of weakness. Consequently, limited—but often ferocious—battles continued to be fought throughout the process of fashioning a cease-fire. Three months of preliminary discussions at Kaesong in North Korea resulted in the establishment of a small demilitarized zone and the beginning of formal truce negotiations in October 1951 at Panmunjom, a village just south of the 38th parallel. When representatives of the two sides first met at Kaesong, perhaps a million men were serving on the Korean peninsula; when the talks finally ended at Panmunjom, that number had doubled, largely the result of Chinese reinforcements and the formation of new South Korean divisions.

While tens of thousands of these troops battled along the 38th parallel, the cease-fire negotiations proceeded slowly. The principal obstacle to progress was



Chinese and North Korean prisoners in a United Nations camp, Pusan, Korea.

Chinese insistence that all prisoners held by the United Nations be returned to communist control. Many of the captured North Koreans preferred to stay in the South; former Nationalist soldiers impressed into the communist ranks wanted to join their friends and relatives on Taiwan; other Chinese were simply disenchanted with life under communism; and the hard core of Chinese dissidents persuaded or pressured still others into refusing repatriation. The governments of North Korea and China feared a severe blow to their prestige if any sizable number of the 100,000 or more prisoners should refuse to return to a homeland that propagandists celebrated as a paradise for peasants and workers. Both nations therefore insisted that all prisoners be repatriated as a condition of any armistice. This was unacceptable to American authorities, including President Truman, whose collective conscience was haunted by the memory of East Europeans forcibly repatriated to Soviet-occupied territory after World War II.

The ensuing deadlock left some 12,000 prisoners—among them 7,000 South Koreans, 3,000 Americans, and almost 1,000 British—in the hands of the enemy. The treatment they received varied according to the time and circumstances of their capture. The North Korean army, whether advancing arrogantly or in panicky retreat, spared little concern for prisoners, at times taking none or shooting those already in custody. Army Maj. Gen. William F. Dean, himself a prisoner of the North Koreans, recalled that American pilots who parachuted safely after bombing or strafing towns north of the 38th parallel could expect no mercy from any civilians who might capture them. Whereas the treatment afforded by the North Koreans fluctuated between cruelty and neglect, the

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Chinese saw the prisoners as a valuable propaganda tool, especially the 200 Air Force pilots or air crewmen among them. The Chinese exerted pressure on some of these airmen, and on other prisoners as well, to confess that the United States was practicing germ warfare by dropping insects or infected materials on North Korea. In addition to discrediting the United States, the confessions of germ warfare provided an explanation of recent epidemics of typhus and other diseases that diverted attention from the possibility that the maladies had accompanied the Chinese armies into North Korea. While preventing an international committee of the Red Cross from investigating the charge of germ warfare, the Chinese used torture and starvation to break the resistance of several Air Force prisoners.

The exploitation of captives by the Chinese was investigated by the Department of Defense, which cooperated with Eugene Kinkead, an American journalist, in the writing of *In Every War But One*, a book that in effect blamed the victims as much as it did the captors who abused them. The author argued that only in the Korean War had members of the United States military that were held prisoner by the enemy collaborated willingly, suffered a breakdown in discipline and morale, and failed to accomplish a “respectable number” of escapes. He maintained that prisoners of other nationalities had shown greater powers of resistance; that of the American armed forces, he was most critical of the Army and least so of the Marine Corps. As for the Air Force, he charged that, of the 59 individuals from whom the Chinese had tried to extort confessions of germ warfare, 38 had cooperated to some degree, with 23 providing usable propaganda. Even as he condemned the overall conduct of the prisoners, he admitted that not enough recognition had been given to those who had resisted. Kinkead’s solution, and that of the Department of Defense, was a code of conduct that emphasized resistance and escape, backed by training and indoctrination to achieve these ideals.<sup>13</sup>

Albert Biderman, a sociologist employed for some years by the Air Force, challenged the analysis by Kinkead and the Department of Defense in his book, *March to Calumny*. With the perspective provided by the passage of almost a decade, Biderman compared the behavior of the various nationalities imprisoned by the Chinese and concluded that the Americans did about as well as the others. True, lapses in discipline had occurred and morale had sagged, but much of the so-called collaboration had consisted of cooperating to the least extent possible, such as signing a peace petition or listening to lectures, to avoid mistreatment or possibly death while the truce talks proceeded to their ultimate conclusion. Biderman insisted that the critics had overlooked the fact that many soldiers had been captured in the dead of winter and undergone a demoralizing and debilitating march to the prison camps along the Yalu. Nor had the investigators, in his opinion, understood the ruthlessness of the Chinese in using terror to obtain what proved to be a short-lived harvest of germ warfare propaganda. Given the lack of sympathy for the prisoners among a populace whose towns

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F-86 Sabres take off on a mission over North Korea.

and villages had been bombed and the inability of the average American to blend in with Korean farmers or laborers, he was surprised that escapes had been attempted and that at least three had succeeded. All in all, Biderman's analysis was less alarming, less of a condemnation, and more accurate than the official view set forth by Kinkead.<sup>14</sup>

While the truce talks dragged on, stymied over the issue of the repatriation of prisoners, air power carried out three general missions: supporting United Nations forces engaged in frontline combat; preparing plans to attack restricted targets in North Korea, such as the hydroelectric plants, in the event that the negotiations collapsed; and preventing the Chinese from massing men and supplies in an attempt to break the stalemate. Essential to all these was maintaining air superiority, the job of the F-86s that patrolled MiG Alley. The missions were being carried out under new leadership, however. General Stratemeyer suffered a heart attack in May 1951 and turned the Far East Air Forces over to Partridge, who served for three weeks until Weyland took over for the remainder of the war. Similarly, Maj. Gen. Edward J. Timberlake, Partridge's vice commander, became interim commander of the Fifth Air Force pending the arrival of Lt. Gen. Frank F. Everest. Command of the Fifth Air Force thereafter became a one-year tour, with Lieutenant Generals Glenn O. Barcus and Samuel E. Anderson succeeding to the assignment. Once responsibility for the operation of the combat cargo organization passed in February 1951 from Tunner to Brig. Gen. John F. Henebry, a recently mobilized reservist, that too became a year's tour of duty. Commanders of Bomber Command were replaced at four-month intervals after Brig. Gen. James E. Briggs took over from General O'Donnell in January 1951.

The standardized tour for most senior commanders reflected an Air Force decision that individuals should serve for a definite period or number of missions

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to maintain morale, efficiency, and aggressiveness. During 1950, a shortage of pilots and crewmen frustrated this policy, but once personnel became available and the Army adopted a fixed tour in Korea, the Air Force could put such a plan into effect without running short of trained men or undermining morale in another service. The actual length of time that an officer or enlisted man spent in Korea depended upon his assignment and the needs of the Air Force. The Strategic Air Command, for example, usually required a six-month tour, but beginning in 1952 an outstanding crew might be rotated a month early, whereas one that was slow to achieve proficiency could be held for a seventh month.

Of the missions conducted under the umbrella of air superiority, interdiction took on special significance in the spring of 1951. As General Ridgway's troops probed toward Seoul and beyond, the enemy's supply lines seemed to present an especially vulnerable target, for they stretched 150 miles or more from the Yalu to the vicinity of the 38th parallel. Designed to take advantage of this apparent vulnerability was Operation Strangle, which shared the name of a similar interdiction campaign conducted in Italy seven years earlier. The choice of this name, which promised so much, represented an effort to stir the enthusiasm of certain senior ground officers who had a jaundiced view of aerial interdiction and doubted that air strikes and armed reconnaissance could achieve the announced goal of paralyzing enemy transportation between the railheads of southern North Korea and the battlefield. In retrospect, a better name might have been Operation Lasso, for air power hobbled the enemy through interdiction without totally destroying his capacity to resist, and to do even that required the combined exertions of both air and ground forces.

In the Korean version of Operation Strangle, Fifth Air Force, assisted by the Navy's carrier task force and the 1st Marine Aircraft Wing (and to a limited extent by Bomber Command), tried to deprive the Chinese and North Korean forces of essential supplies. Air Force F-80s and F-84s flew most of the strikes, conducting armed reconnaissance against the roads, bridges, and tunnels that carried truck convoys. The Republic F-84 Thunderjets had arrived in late 1950 with the F-86s. Although inferior to F-86s in air-to-air combat, the F-84s bolstered Fifth Air Force's daylight ground attack capability. Meanwhile B-26s patrolled the highway net during darkness. Strangle began on May 31 and extended through July without having a noticeable effect on the enemy buildup in front of the Eighth Army. Several factors contributed to the disappointing results. The emerging stalemate on the ground, which relieved tactical aircraft of the burden of providing a large volume of close air support, also reduced the enemy's consumption of munitions and other cargo, thus undermining the effectiveness of aerial interdiction by leaving the enemy less dependent on his motorized supply lines. Since the Chinese and North Koreans neither mounted nor were forced to repel large-scale attacks, they could adjust their supply effort to take advantage of the main weakness of Operation Strangle—an inability to conduct sustained attacks by night or in bad weather. Traffic moved with near impunity through



Republic F-84 Thunderjets on their way to bomb targets in North Korea.

darkness or rain, for aircrews had to rely on flares or moonlight to locate targets. Damaged roads and bridges were quickly repaired or bypassed, and the damage inflicted from the sky was not as severe as hoped because intense anti-aircraft fire reduced bombing accuracy in daylight. Nevertheless, interdiction continued, although against a broader range of targets, at times accompanied by great fanfare and arousing unrealistic expectations.

Except for occasional attacks on bridges or segments of highway in connection with Operation Strangle, the B-29s normally contributed to interdiction by conducting daylight raids on rail lines, marshaling yards, or warehouses. After October 1951, when MiGs slipped past patrolling F-86s and downed five B-29s in a single week, the bomber command began attacking exclusively at night. The change of tactics enhanced the safety of men and aircraft but decreased bombing accuracy. Fortunately, because of the recurring bad weather in Korea, the command had already set up a short-range navigation system, the shoran network of radio beacons on the ground. This aid to aerial navigation enabled the bombers to locate and attack such area targets as large villages, rail complexes, or warehouse districts. In response to shoran-guided night raids, the enemy employed radar-controlled searchlights in conjunction with anti-aircraft batteries. Electronic warfare ensued, during which B-29s, the underside of the wings and fuselage camouflaged with black paint, relied on chaff and jamming transmitters to frustrate radar operators on the ground.

When the change from day to night tactics occurred, the B-29s were in the midst of another systematic interdiction effort. This campaign, for a time also called Operation Strangle, began in August 1951 and was directed against the rail net. Enthusiastic advocates on the staff of Fifth Air Force, believed that air

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B-29s of the 19th Bomb Group on the ramp at Okinawa.

attacks could constrict the volume of rail traffic, forcing the enemy to rely on trucks, which were in short supply and carried less cargo than freight cars. Some of these officers went so far as to predict that Chinese and North Korean troops, deprived of essential food and ammunition, would have to retreat to shorten vulnerable lines of supply. F-84s joined F-80s in attacking various rail choke points while B-29s bombed bridges, but the big bombers had to attack at night using shoran. As had happened in the earlier Operation Strangle, anti-aircraft fire affected the accuracy of fighter-bombers, and work crews moved swiftly to repair damage or build bypasses.

Although the second Operation Strangle did not achieve its most optimistic goal of forcing the enemy to retreat, the attacks prevented the accumulation of enough supplies to mount a major offensive. As a result, rail interdiction continued into 1952 but without the ill-starred title of Strangle. An intensified and redesignated program of rail interdiction, Operation Saturate, began on February 25 and became a race between American airmen trying to obliterate the rail lines and Korean laborers trying to repair them. On a single mission, as many as forty B-29s hit a bridge, a mission that formerly might have been assigned to eight of the bombers; and fighter-bombers lavished 500 or more bombs on a single length of track. This kind of work from both Air Force and Marine squadrons, impressive though it was in terms of effort, could maintain no more than six cuts on North Korea's main rail lines, too few to do more than inconvenience the enemy.

During Saturate, intelligence analysts found one segment of rail line that seemed especially vulnerable to B-29s using shoran. The target was a railroad overpass at Wadong on the main east-west supply route. Here, deep in a gorge,

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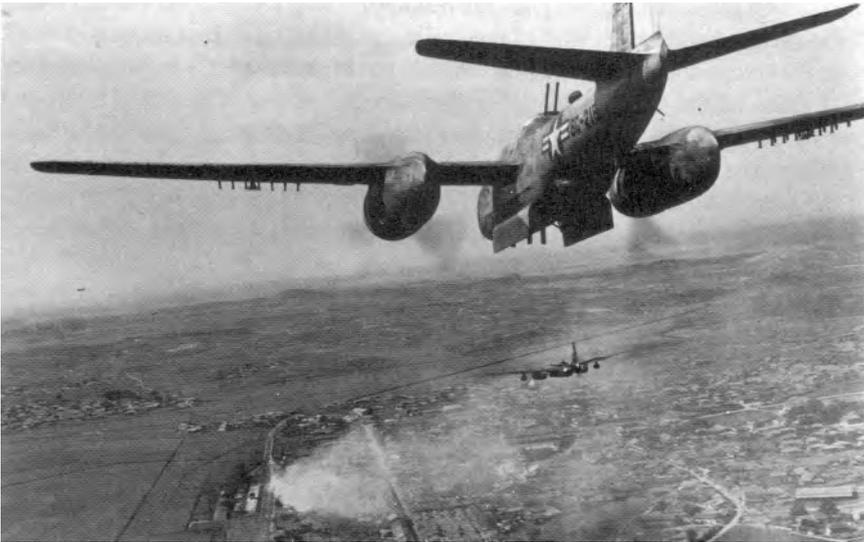
the railway crossed a highway, so that bombs missing the railroad viaduct might detonate against the rock wall of the defile, causing landslides that would block both the tracks and the road. Unfortunately the bridge proved hard to hit and the rock sides of the gorge were all but impervious to the effects of 500-pound bombs. After six weeks of effort, from January 26 through March 11, 1952, 1,000 tons of high explosives had produced no landslides, and only one percent of the bombs hit either the viaduct or the highway it crossed. American intelligence estimated that during the attacks the road had been blocked for just seven days and the rail line for four.

What was needed to improve the effectiveness of interdiction was not more bombs dropped from high-flying B-29s but a low-altitude aircraft that could locate and destroy truck convoys and trains moving at night. As early as the first Korean version of Operation Strangle in the spring of 1951, Air Force B-26s and Marine Corps night fighters had patrolled assigned roads or rail lines and attacked traffic by the light of flares. To help the B-26s carry out nighttime armed reconnaissance, Fifth Air Force tried to adapt a Navy-developed searchlight used during World War II by airships searching for submarines. Capt. John S. Walmsley was shot down as he used the light to illuminate a train for another B-26; his heroism in the face of antiaircraft fire resulted in the posthumous award of the Medal of Honor. Because the light attracted fire from the ground, B-26 crews came to rely on flares for night attack. Claims of trucks destroyed mounted into the thousands, but verification of the damage inflicted at night proved so difficult that no evaluation of the effectiveness of nighttime interdiction was possible.

The difficulty of conducting demonstrably effective aerial interdiction gave ammunition to those critics who wanted the Air Force to use more of its aircraft for close air support and use them more effectively. The Fifth Air Force in Korea had come to emphasize interdiction because the enemy seemed more vulnerable to attack along his exposed lines of supply and communications than in his bunkers on the battlefield. In contrast, Army commanders wanted air strikes to supplement mortars and artillery in the battles that flared suddenly and subsided throughout the period of stalemate. A solution proposed by Army officers serving in Korea was to have a Marine Corps fighter squadron assigned to each of the three Army corps in Korea. General Weyland succeeded in blocking this end run past the joint operations center, but he did change the allocations of sorties between interdiction and close air support. During the two Strangle operations, the Fifth Air Force flew ten times as many interdiction as close support sorties, which declined to fewer than 500 a month. After the spring of 1952, Air Force close air support sorties averaged about 2,000 per month, or nearly half the number of interdiction sorties.

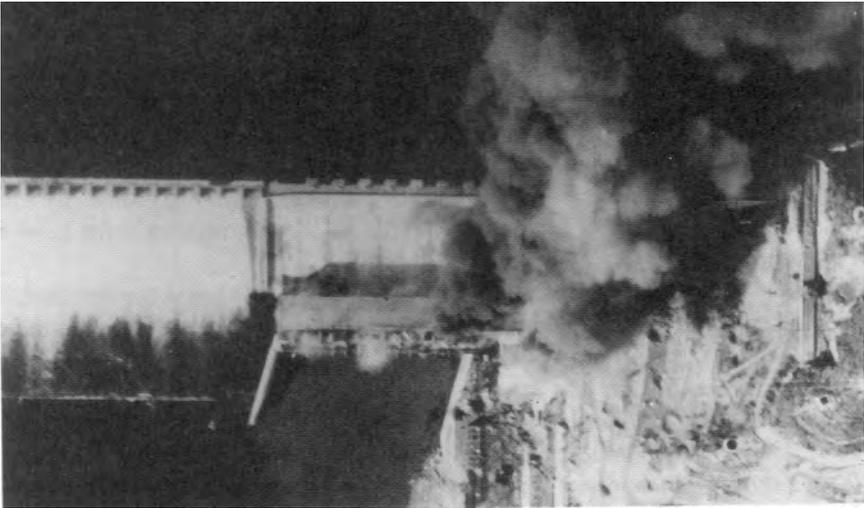
Moreover, an improved command and control network enabled the Fifth Air Force to respond more quickly to calls for emergency support than it had in the early months of the war. A request from a tactical air control party assigned to

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On an interdiction mission, Douglas B-26  
Invaders bomb a North Korean railway.

a regiment could pass through division and corps headquarters and reach the joint operations center at Seoul in as little as 10 minutes. From the joint operations center, which approved or rejected the requests, instructions went next door to the tactical air control center, in effect the communications link that forwarded orders to the appropriate wing headquarters or to aircraft already aloft. The responding pilot first checked in with one of the recently established tactical air direction posts, which were assigned to each American corps and equipped with radar for handling night strikes. In daylight the pilot then proceeded to the forward air controller selected by the joint operations center, reporting for instructions to a fellow aviator who might be flying in a T-6 or on the ground with a tactical air control party. The total time between initial request and the resulting fighter strike was around 40 minutes, possibly less, depending upon whether the aircraft was diverted from another mission or launched from an airfield where it had been standing alert. At night, instead of assigning the strike to a controller on or above the battlefield, the joint operations center usually relied on a tactical air direction post located about 10 miles behind the lines. This control agency used radar to guide the attacking aircraft, usually B-26s or B-29s with radar transponders for easier tracking, against a predetermined target, perhaps troops advancing through some previously plotted area or a suspected Chinese command post. Close support of ground forces remained an important mission throughout the war, one that was carried out by dedicated airmen, none more so than Maj. Charles Loring. On November 22, 1952, he



A post-strike reconnaissance photograph of the Sui-ho hydroelectric plant on the Yalu River.

flew his crippled F-80 into a gun emplacement that was firing on American troops. Major Loring was posthumously awarded the Medal of Honor, and Loring Air Force Base, Maine, was named in his honor.

Beginning during the summer of 1952, after a year of stalemate, the air war over Korea entered a new phase, an attempt to employ air power to pressure the Chinese into accepting an armistice satisfactory to the United States. The arrival of a new United Nations commander, Gen. Mark W. Clark, who replaced Ridgway in May 1952, signaled an expansion of the air effort, for Clark believed that the deadlock at Panmunjom had to be broken and that aerial pressure afforded the least costly means of doing so. As a result, Clark accepted Weyland's recommendation to attack the hydroelectric plants in North Korea, cutting off power throughout the country and impressing on the leadership the consequences of delaying a settlement. The Fifth Air Force and Task Force 77, with Weyland as coordinating agent, drew up plans for such a campaign. So impressed were the members of the Joint Chiefs of Staff that they persuaded President Truman to include the Sui-ho powerplant on the Yalu River in the list of targets. With a general election to take place in November, the President, too, was eager to achieve a cease-fire. Air Force and Navy fighter-bombers attacked 17 hydroelectric generating plants in four separate complexes—Sui-ho, Chosin, Fusen, and Kyosen—during the last week of June 1952. After more than 1,200 sorties, 11 of the generating facilities lay in ruins; North Korea experienced a nearly total loss of electric power lasting two weeks and did not achieve its former level of generating capacity before the end of the war, some 13 months

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later. The destruction of the Sui-ho powerplant, one of the largest hydroelectric facilities in the world, also reduced Manchuria's supply of electricity by nearly a fourth. During the attacks, anti-aircraft fire succeeded in downing only two aircraft, both flown by naval aviators who were rescued, and there were no losses to MiGs. Indeed, on the first day of the raids, most of the 250 MiGs based at Antung, within 40 miles of Sui-ho, fled farther into Manchuria as though under the impression that their airfields might be the target. Although tactically successful, the disruption of the power grid did not bring progress in the talks at Panmunjom.

When the bombing of the hydroelectric plants failed to break the deadlock in the truce negotiations, the United Nations Command launched air attacks against other targets. During the summer of 1952, Air Force and Navy aircraft carried out the two biggest raids of the war, both against Pyongyang, North Korea's capital. These were the first major attacks on the city since January 1951, shortly after Chinese forces had captured it, when more than a hundred B-29s dropped incendiary clusters in an unsuccessful raid. The failure of the January attack to destroy more than a third of the city was attributed to snow retarding the spread of flames and an excessively tight bombing pattern. When attacking in 1952, Air Force bombers did not drop incendiary clusters, judged less accurate than high explosives and more likely to cause widespread collateral damage. The Truman administration wanted accuracy against Pyongyang, mainly to protect American prisoners of war believed held there. Other towns harboring large concentrations of enemy troops or stocks of supplies were attacked with incendiary clusters or napalm, along with high explosives.

On July 11, 1952, United Nations fighter-bombers flew 1,200 sorties and B-29s flew 54 against the North Korean capital. Radio Pyongyang attributed 7,000 casualties and the destruction of 1,500 buildings to this raid, and reports from intelligence agents indicated that a direct hit had destroyed the headquarters of the North Korean Ministry of Industry. Despite the effects of this attack, Generals Weyland and Clark decided to send 1,400 sorties by Air Force and Navy fighter-bombers against surviving warehouses, barracks, and public buildings in Pyongyang. Delivered on August 29, this additional blow satisfied a request by the Department of State for some dramatic military action during a visit to the Soviet Union by China's premier, Chou En-lai (Zhou Enlai). The American ambassador to Moscow, George Kennan, suggested that if the Chinese could be pressured into increasing their demands for aid from the Soviet Union, the Soviet leadership might decide that the nation's resources would be strained and urge China to accept a truce. Unfortunately, the August raid on Pyongyang was no more successful than the July attack in prodding the Chinese toward a truce.

The conflict in Korea had dragged on for more than twenty-seven months and had become a political issue by November 1952, when the United States held a Presidential election. The Republican candidate, Gen. Dwight D.

## The Air War over Korea

Eisenhower, the supreme Allied commander in Europe during World War II, faced a Democrat, Governor Adlai E. Stevenson of Illinois, who lacked military experience. Eisenhower called for greater South Korean participation in the fighting and promised that if elected he would go to Korea, presumably to find a solution to the impasse there. He was elected, went to Korea late in November without waiting to take the oath of office, and returned determined to break the stalemate in the talks at Panmunjom. The likeliest means of doing so was through military pressure, but conventional air and ground operations had failed to force China and North Korea to agree to an acceptable cease-fire. Consequently his thoughts turned first to Nationalist China and then to the atomic bomb.

Immediately after taking office in January 1953, President Eisenhower announced that the United States Navy would no longer patrol the waters separating the Nationalists on Taiwan from the Chinese mainland. Since the outbreak of war in Korea, American warships had in effect neutralized Taiwan, preventing Chiang Kai-shek (Jiang Jieshi) from trying to realize his dream, however unrealistic, of invading the continent. Now Chiang was unleashed, and those who joked about his prospects of reconquering China missed the purpose of this action. By means of this essentially symbolic gesture, Eisenhower was showing his willingness to widen the war if an armistice did not soon emerge.

Regarding the possibility of using atomic weapons in a wider war, the new President moved more slowly. He consulted the Joint Chiefs of Staff, who initially offered conflicting advice: Vandenberg suggested that atomic bombs, if used, be directed against Manchuria as well as North Korea; Bradley warned that a renewed ground offensive without atomic firepower would produce a staggering toll of American casualties; and Gen. J. Lawton Collins, now the Army Chief of Staff, said that recent tests in the Nevada desert indicated that Chinese troops deeply entrenched along a 150-mile front would provide a poor target for tactical nuclear weapons. The administration considered a variety of options for increasing the pressure on China, but by the end of May 1953 it had become obvious that any intensification of military pressure would extend the war to China and that an attack on China would require the use of atomic weapons.

Although willing to expand the conflict and use atomic bombs if that became necessary, the President and his advisers tried first to exert a more subtle form of pressure that might make it unnecessary to broaden the fighting. President Eisenhower and his Secretary of State, John Foster Dulles, saw to it that word reached the Chinese government of America's willingness to resort to nuclear weapons to break the impasse, hoping that the threat alone would persuade China to accept a suitable armistice.

As the Eisenhower administration was shaping this policy, other events affected the future of the two Koreas. On March 5, 1953, Stalin died, ending three decades during which the Soviet Union conformed to the dictates of this one

## History of the United States Air Force

man. Georgi Malenkov, nominally the successor of Stalin, lacked the power to rule without the consent of certain of his colleagues, notably Lavrenti F. Beria, the head of the secret police. The struggle for control of the Soviet Union took precedence over the conduct of an aggressive foreign policy, and Malenkov called for an easing of tensions with the West. Indeed, he may have pressured China and North Korea to end the war. By the end of March, China displayed its willingness to compromise by agreeing to an exchange of sick and wounded prisoners. Because of the humanitarian character of the action and the small number involved—7,300 men, 90 percent Chinese and North Korean, the rest soldiers of the United Nations Command, including just 149 Americans—the issue of forced repatriation did not surface.

While the President and his advisers discussed the possible use of the atomic bomb, the conventional air war against North Korea continued, as B-29s and Fifth Air Force fighter-bombers attacked a new target—the nation's irrigation dams. General Clark, in looking for new ways to pressure the enemy, discovered twenty of these structures, none of which had yet been attacked. Early in 1953, the Far East Air Forces concluded that breaching all of the dams would utterly destroy an entire year's rice crop. Both Clark and Weyland viewed such a campaign as the ultimate form of aerial pressure, and when the truce talks again stalled, they decided to go ahead. During May 1953 air attacks shattered three dams, releasing impounded water that not only swept away rice plants but also flooded roads, rail lines, and even an airfield. Indeed, General Clark insisted that the destruction of just the first of the three dams to be attacked "was as effective as weeks of railroad interdiction."<sup>15</sup> Yet, as was true with damaged rail lines, laborers quickly repaired the breaks, and North Koreans lowered the level of water behind the dams so a rupture would not release a wall of water like that which caused so much damage in the first three attacks. However, reducing the volume of water behind the structures also reduced the water available to irrigate the rice crop that fed the people of North Korea.

Aware of the threat of atomic war, unsure of the new leadership in Moscow, and bled by sustained fighting, the Chinese in early June 1953 seemed ready to sign an armistice satisfactory to the United States. But what Americans found suitable did not please South Korean President Rhee, who balked at accepting a permanently divided Korea. To demonstrate his displeasure, he permitted some 25,000 North Koreans in United Nations prisoner of war camps to "escape," actually drafting a sizable number into the South Korean army. Perhaps to punish Rhee for his intransigence or merely to gain the initiative before the fighting ended, the enemy launched the most savage offensive since the first year of the war. In response, Air Force close air support sorties increased by 40 percent to almost 7,500 during June; MiGs appeared over North Korea in greater numbers than before, but suffered their greatest losses—F-86 pilots claimed more than 100, including 16 on June 30 alone. Meanwhile, fighter-bombers and B-29s continued to batter North Korean airfields. Earlier, airfields

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had been hit to prevent the Chinese from deploying the short-range MiGs close to the battlefield; now the purpose of the attacks was to prevent the communists from increasing aerial strength in the weeks before the signing of an armistice that would forbid the shipment of additional military equipment into Korea. The Chinese succeeded, however, in hiding an estimated 200 aircraft in the countryside near Sinuiju.

Representatives of China, North Korea, and the United States signed an armistice on July 27, 1953. South Korea refused to sign, but threats to cut off American aid apparently persuaded the Rhee government to honor the truce. As expected, the prisoner exchange proved embarrassing to the communists, who had at last abandoned their demand for forced repatriation. Of more than 20,000 Chinese prisoners in the hands of the United Nations, two-thirds rejected repatriation, whereas only 21 of the 3,000 Americans in enemy hands chose to remain behind, along with 327 South Koreans and one British serviceman.

There may be no single, unambiguous reason why the Chinese and North Koreans finally relented on the prisoner issue and ended the war. President Eisenhower believed in retrospect that his threat to wage atomic war against China was decisive. Other factors contributing to a settlement may have included the death of Stalin and the uncertainty that followed as his possible successors grappled for power. Yet, had Stalin lived and Eisenhower not threatened to use the atomic bomb, the cumulative cost of the fighting might nevertheless have forced China to yield. The United Nations Command, which lost some 450,000 killed or wounded, estimated that Chinese and North Korean military casualties were at least three times greater. Of the four major participants,



A group of released prisoners are welcomed on their return to freedom.

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America's losses of 35,000 killed and 100,000 wounded were by far the least. The South Korean armed forces suffered some 300,000 casualties, but despite this toll of dead or wounded, most of South Korea had been sheltered since mid-1951 from the desolation of war. As a result of that period of freedom from enemy occupation, along with the training and military assistance provided by the United States, when the fighting ended South Korea's army was twice as large as North Korea's and was growing faster.

The air war had been very destructive. Far East Air Forces estimated that it had killed nearly 150,000 North Korean and Chinese troops and destroyed more than 950 aircraft, 800 bridges, 1,100 tanks, 800 locomotives, 9,000 railroad cars, 70,000 motor vehicles, and 80,000 buildings. This damage was inflicted at the cost of 1,200 airmen killed and 750 aircraft destroyed by the enemy. For the first time, air supremacy and the helicopter permitted the frequent rescue of aviators shot down behind enemy lines, thus reducing the death toll. The Air Rescue Service retrieved 170 Air Force pilots or crewmen from enemy territory, more than 10 percent of those who went down there.

As General Bradley pointed out during Senate hearings into American policy in the Far East, the existence of sanctuaries benefited both sides. Chinese air bases in Manchuria were not attacked, but Chinese aircraft did not bomb or strafe the front-line positions of the United Nations forces and made no effort to disrupt the enormous volume of cargo moving through South Korean ports to the battlefield. Had the United States attacked Manchuria, however, the Soviet Union might have given the Chinese long-range bombers capable of striking targets in South Korea or even Japan from bases north of the Yalu. Similarly, neither side attacked the other's ocean-going shipping, although the Americans did wage war on the North Korean fishing fleet. No communist power challenged the passage of the ships and aircraft that carried a million tons of American military supplies across the Pacific each month, depositing their cargo in huge depots in Japan, which themselves would have been vulnerable to air attack. American forces had worked a logistical miracle in supplying the United Nations Command, but they did so without air and naval opposition.

American airmen dropped more than 500,000 tons of bombs during the war, all directed against targets in Korea. Far East Air Forces, including Fifth Air Force, contributed two-thirds, an amount that exceeded the weight of the conventional bombardment of Japan in World War II. Yet, the weight of bombs expended in Korea was less significant than the weapon not used, for the first country to acquire nuclear weapons and use them in combat had this time withheld them and engaged in a limited, conventional war.

The outbreak of fighting in Korea and the nature of the conflict there caused the Air Force to separate the Tactical Air Command from the Continental Air Command. Although the Air Force made this concession to the needs of limited, conventional warfare, it did not develop aircraft specifically for tactical operations. In spite of the need for a higher performance aircraft to replace the T-6



B-29s of the Far East Air Forces bombing  
North Korea during January 1951.

and operate from crude airstrips, none was forthcoming, nor was an attempt made to develop special types for close air support or night interdiction. The ideal tactical fighter was envisioned officially as a multipurpose aircraft capable of strafing, dropping bombs, and engaging enemy fighters. Even the F-86, which had proved so deadly against the MiG in aerial combat, appeared in a fighter-bomber version that saw combat late in the war. The emphasis on versatility ran counter to the beliefs of Colonel Gabreski and like-minded veterans of MiG Alley who were convinced that the air battles of the future would be won by a fast day-fighter, stripped of all nonessential equipment, easy to fly, and simple to maintain. Clarence L. "Kelly" Johnson, an engineer for Lockheed aircraft, designed the F-104 to be just such an airplane; but it rapidly gained weight, increased in complexity, and by the time production ended appeared as a fighter-bomber.

In many ways the Korean conflict proved frustrating for the Air Force. A combination of terrain and camouflage thwarted aerial surveillance during the Chinese buildup south of the Yalu River in October and November 1950. A fleet of aging B-29s destroyed almost every vestige of industry in North Korea, but armaments from nations whose factories could not be bombed satisfied North Korea's needs. Absolute control of the air did not ensure victory on the ground, for the enemy's transportation system survived sustained air attacks and provided the volume of supplies necessary for an essentially static war, marked after the spring of 1951 by only limited offensives. The emphasis should be placed, however, on the accomplishments of air power: supplying the ground forces; eliminating the threat of aerial attack on the movement and logistical

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support of the United Nations Command; and, in general, serving as a means, less costly in American lives than a succession of even limited offensives, of maintaining pressure on the enemy in a war that rapidly became unpopular in the United States. Perhaps the conventional bombing of North Korea gave the Chinese and Soviet leadership a hint of the destruction that would result from the atomic warfare that President Eisenhower was threatening.

The Air Force had entered the war committed to the heavy bomber armed with atomic weapons; to a strategy of deterrence; and, should deterrence fail, to a retaliatory strike designed, insofar as aircraft and numbers of weapons permitted, to destroy the enemy's capacity for war. Far from undermining these principles, three years of limited warfare had reinforced them, persuading the leadership of the Air Force that the United States should stand ready to attack the Soviet Union and not divert its strength against aggression by proxy. As a result, during the Senate hearing that followed the relief of MacArthur, when Vandenberg complained about his shoestring Air Force, bemoaning its inability to wage atomic war against both the Soviet Union and China, he was more concerned about worldwide deterrence or retaliation than tactical operations in Korea. Moreover, in his opinion the North Korean invasion of the South did not mean that deterrence had failed—after all, the Soviet Union had not taken advantage of the war in the Far East by attacking elsewhere—but suggested that the deterrent force should be made stronger. He saw the Soviet Union as the main enemy in any future war, and the industrial base that supported it could be destroyed only by using nuclear weapons. The threat of total devastation seemed the likeliest means to prevent aggression by the Soviet Union and its satellite states, or so it appeared in 1953.

## Chapter 14

# The Emergence of the Strategic Air Command

Walton S. Moody

Jacob Neufeld

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In the spring of 1950, before North Korea invaded the South, NSC-68 enunciated a national strategy of deterrence, based on the belief that the Soviet Union would not risk aggression if certain the United States would retaliate with overwhelming nuclear superiority. Because of the overriding importance of maintaining a deterrent mission and the sluggish pace of aircraft production even during the Korean War, Gen. Hoyt S. Vandenberg, the Air Force Chief of Staff for almost that entire conflict, cautioned against wasting scarce bombers and sustaining casualties pecking at the periphery of communist power in the Far East and thus diminishing the ability to lay waste the industrial centers of the Soviet Union, which he maintained would be the principal enemy in any major war.<sup>1</sup> Clearly the importance of deterring a nuclear war required that the Strategic Air Command, the instrument of deterrence, benefit, in terms of both leadership and weapons development, from the best talent available to the Air Force.

Among the weapons this talent provided to the Strategic Air Command, as it expanded into a global deterrent force, were lighter and more compact atomic weapons, a result of the Sandstone nuclear tests at Eniwetok Atoll in the Pacific

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during the spring of 1948. This series of detonations heralded not only the obsolescence of the bulky weapons in existing stockpiles but also the transfer of weapons manufacture from the laboratory to the factory. The earlier bombs, besides being unwieldy, were hand crafted by scientists and engineers; technicians fabricated the new lighter ones. For the Strategic Air Command, the appearance in the early 1950s of more numerous and more compact atomic bombs had two effects. The first and more immediate result was the sharing of the nuclear mission with the Tactical Air Command; once fissionable material became available in sufficient quantity, fighter-bombers, medium bombers, and tactical missiles began liberating the strategic strike force from the mission of retardation, which amounted to long-range atomic interdiction rather than true strategic warfare. The second effect was the emergence in the late 1950s of the intercontinental missile, fitted with the new lightweight warhead, as a partner of the bomber in the deterrent force.

Another advance in technology, which intensified the effect of the mass production of smaller nuclear weapons, was the rapid progress toward the development of hydrogen bombs that would raise destructive yields from the range of kilotons to megatons, from the equivalent of thousands of tons to millions of tons of chemical explosives. The hydrogen bomb derived its force from the energy released by the fusion of the heavier isotopes of the hydrogen atom to form new elements, a reaction occurring only when the intense heat generated by a fission device acts upon those isotopes. Because of the use of nuclear fission to generate heat, the hydrogen bomb was sometimes described as a thermonuclear weapon, but as time passed the distinction between nuclear and thermonuclear blurred in popular usage, so that nuclear war became a conflict involving the use of atomic and hydrogen devices, both of which tended to be categorized, however inaccurately, as nuclear weapons.

The incentive for the American development of a hydrogen weapon was the Soviet detonation of an atomic bomb, detected in September 1949 by an Air Force WB-29 gathering samples of the air currents over the northern Pacific. Soviet possession of nuclear weapons seemed to justify a quantum jump in American nuclear technology. The debate concerning development of the new bomb touched upon the morality of using so devastating a weapon, its impact on the already dim prospects for the international control of atomic energy, its usefulness in war and as a deterrent, and the technical obstacles to its development. Ultimately, President Harry S. Truman, on January 31, 1950, decided to go ahead with work on a bomb that the scientists aware of the project were already calling the Super. In deciding to proceed, the Chief Executive sided with Edward Teller and his associates against a group of men who had helped create the atomic bomb and whose symbolic leader was J. Robert Oppenheimer.

Formidable obstacles stood in the way of the Super. By the summer of 1950, when North Korean troops invaded South Korea, advocates of the new bomb like Teller and Stanislaus Ulam, a brilliant mathematician, seemed stymied by

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Craters from atomic bomb tests at Eniwetok Atoll.

the very laws of nature, for it appeared theoretically impossible, even with the atomic trigger, to generate the heat necessary to make the weapon work. The problem, however, proved to be rooted not in nature but rather in the complexity and volume of the calculations that had to be performed. Work continued, and by mid-March 1951 Teller was confident that a thermonuclear bomb could be built. His approach to the problem was verified by a detonation that spring at Eniwetok Atoll, a full-scale laboratory experiment. The prototype of a hydrogen device, containing in oversize form all the components that would have to be drastically reduced in dimensions and encapsulated within the casing of a bomb, was exploded at Eniwetok on October 31, 1952, generating the equivalent of 10.4 million tons of TNT. The blast vaporized the island of Elugelab, leaving a crater two miles deep and a mile across. A workable bomb was not yet available, however, when Truman left office in 1953.

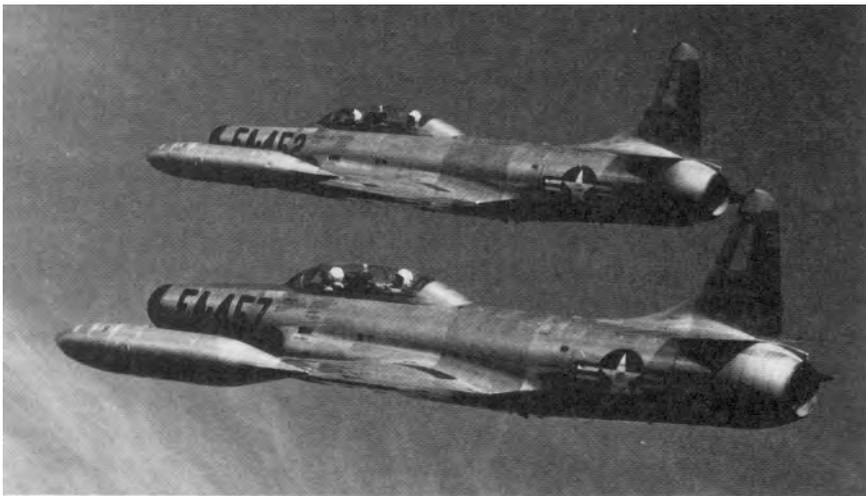
Well before the blast that eradicated Elugelab, a number of scientists were considering the possibility that the very power of a hydrogen bomb might prove self-defeating. Even the most destructive of the atomic bombs, to say nothing of the Super, seemed ill-suited to the battlefield, especially in a war fought in densely populated western Europe. This was the concern of Project Vista, for which the Air Force enlisted the help of the California Institute of Technology and its president, Lee R. Dubridge, a physicist who had specialized in radar during World War II. Aided by more than a hundred technical specialists, including Lt. Gen. Elwood R. Quesada, a veteran of both the Tactical Air Command and the nuclear tests in the Pacific, the study group began deliberating in the summer of 1951 and completed its work in the following February. Among the contributors to the project's report was Oppenheimer, who now lent his prestige to a recommendation that comparatively low-yield nuclear weapons should be developed for use on the battlefield. Although the Atomic Energy Commission

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had begun expanding its production facilities, the work was far from finished, and the leadership of the Air Force feared that the diversion of reactor capacity to produce fissionable material for tactical weapons would hamper the stockpiling of high-yield bombs for the Strategic Air Command. Indeed, Oppenheimer's attitude was interpreted as hostility to the deterrent force.

Ironically, the Soviet detonation of an atomic bomb, even as it spurred research in developing the hydrogen bomb, which became the principal weapon in the Strategic Air Command's nuclear arsenal, also revived interest in air defense, which the Air Force had slighted while strengthening the Strategic Air Command. The diversion of money from the deterrent force to fund air defense, a possibility that troubled Secretary of the Air Force Thomas K. Finletter, did not receive serious consideration, however. The Strategic Air Command enjoyed an overriding priority, and President Truman expanded the budget so that the Air Force could also buy radar and jet fighters designed to intercept enemy bombers. One such interceptor, the Lockheed F-94, saw action in the Korean fighting; but the principal role envisioned for this aircraft and two other interceptors, the Northrop F-89 and the North American F-86D, was protecting the United States. To help direct the nation's air defense, an improvised system of radar warning and control took shape, followed by a radar warning line begun late in 1950 just north of the Canadian border. In January 1951 the Air Defense Command regained its independent status, separate from the Continental Air Command, ending the attempt to merge in the same organization tactical aviation, air defense, and the training of reserve components.

Further improvement of American air defenses, under way when Truman left the White House, resulted indirectly from the establishment in 1952 of the



Lockheed F-94 Starfire interceptors.

## Emergence of the Strategic Air Command

Lincoln Laboratory, a joint venture of the Air Force, the other armed forces, and the Massachusetts Institute of Technology to conduct research in the field of electronics. The steering committee for the new laboratory invited a number of distinguished scientists to form the Summer Study Group, which met in the summer of that year to predict and solve the problems of air defense during the 1960s. The group issued a report advocating the construction of a distant early warning radar line along the Arctic Circle from Greenland to Alaska, with outposts in Hawaii and Scotland. The estimated cost of this radar net, which would give six-hour warning of bombers approaching from the Soviet Union, was \$370 million for construction and \$106 million annually for operation.

Secretary Finletter had earlier expressed concern that the study group might get out of hand, and to those, like him, who feared the diversion of funds from the deterrent force, it seemed to have run amok. The panel's insistence that the warning network be operating in 1954, when the Soviet Union was expected to have enough atomic bombs and bombers to wage nuclear warfare, collided head-on with the Air Force policy of incremental improvements in air defense as funds became available, gradually moving the radar screen from the major industrial cities and the Atomic Energy Commission's facilities northward through Canada and ultimately to the vicinity of the Arctic Circle. Although the study group did not suggest diverting money from the Strategic Air Command, Finletter feared that such a reordering of priorities might prove necessary if the administration heeded the advice of the panel and its most prominent consultant, Oppenheimer.

Once again the prominent physicist advocated a course of action that collided with Air Force policy. Besides advocating tactical atomic weapons, perhaps at the expense of higher yield bombs needed for the Strategic Air Command, and opposing the development of the hydrogen device, he had argued for a heavy investment in air defense that might draw money away from the deterrent force. Oppenheimer thus became a symbol of opposition to the Air Force and nuclear deterrence. During 1954, when his past association with communists and his conflicting explanations of these contacts resulted in a formal hearing to revoke his security clearance, Air Force witnesses had no trouble detecting a pattern of behavior hostile to what they considered the best interests of the United States. To the leadership of the Air Force, Oppenheimer seemed to embody opposition to the very things on which the survival of the United States depended—the hydrogen bomb, the strategy of deterrence, the Strategic Air Command, and by inference the Air Force itself. Both David T. Griggs, a physicist and the Chief Scientist of the Air Force, and Maj. Gen. Roscoe C. Wilson, the deputy assistant for atomic energy on the Air Staff, testified against Oppenheimer in the proceedings that led to the withdrawal of his security clearance, barring the acknowledged leader of the team of scientists that developed the atomic bomb from further work in the field of national defense.

Meanwhile, Finletter's concern that money would be diverted from the Strategic Air Command to pay for the expanded air defenses proved groundless.

## History of the United States Air Force

Truman, at the end of his Presidency, endorsed building the Distant Early Warning Line, but at a slower pace than the Summer Study Group had recommended, and he declined to make money available. Funding of the program would await the new Congress and the Republican administration headed by Dwight D. Eisenhower.

Although spurred by the detonation in 1953 of a Soviet hydrogen bomb, the new administration incorporated air defense into a military policy that rested upon the Strategic Air Command. Under Eisenhower, the nation forged ahead with a program of air defense more ambitious than the Distant Early Warning Line proposed by President Truman, though not at the expense of nuclear deterrence. The new plan proposed that two radar warning networks, reporting to a centralized command and control system, guard the polar approaches to the United States. When all the components began functioning as scheduled early in 1962, the Distant Early Warning Line would detect aircraft approaching over the polar vastness, the second radar line farther south in Canada would confirm their course and numbers, and controllers on the ground, using the best digital computers of the late 1950s, would be able to direct interceptors against them.

Even as the system began taking shape, organizational changes occurred in the nation's air defenses. In 1954, the Air Defense Command, which three years earlier had been cut free of the Continental Air Command, became the Air Force component, indeed the main element, of the Continental Air Defense Command, an organization responsible to the Joint Chiefs of Staff, for whom the Air Force acted as executive agent. The Air Defense Command thus functioned as part of a joint organization, for Army antiaircraft weapons, both missiles and guns, took part in the defense of the continent, and Navy radar picket ships, as well as Navy and Marine Corps aircraft, guarded the seaward approaches. Indeed, the Army agreed that its antiaircraft weapons, when working in conjunction with interceptors, should come under Air Force control. In 1957, with Canada strengthening its air defenses, the Continental Air Defense Command became the American component of the North American Air Defense Command, a combined headquarters in which Canada participated as a full partner. Although actual construction did not begin until 1961, the Eisenhower years saw the start of planning for a huge underground command post to house the computers, display screens, and communications gear required for North American air defense. The structure, located deep within Cheyenne Mountain, near Colorado Springs, Colorado, cost \$124 million and took five years to complete.

From the outset of the Eisenhower Presidency, the leadership of the Air Force tried to decide what air defense could actually accomplish. In 1955, the acting commander of the Air Defense Command, Maj. Gen. Frederic H. Smith, Jr., a staff officer and commander of fighter units in the Southwest Pacific and the Philippines during World War II, predicted the development of a defensive system capable of inflicting "an attrition rate of greater than 90 percent upon at-

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The Combat Information Center at the headquarters of the Continental Air Defense Command in 1957.

tacking forces of sizes up to 4,000 objects,” whether manned or pilotless aircraft, “unless the enemy achieves qualitative surprises.” Smith, moreover, believed that Gen. Curtis E. LeMay, who headed the Strategic Air Command, was subordinating the entire Air Force to the interests of his organization and, in doing so, was interpreting the role of air defense to fit the needs of the retaliatory force. “The best thing that the Air Defense Command can do for SAC,” LeMay insisted, “is to provide warning time.” Gen. Earle E. Partridge, who took over the Air Defense Command from Smith, was less optimistic than his predecessor about the impenetrability of the defensive screen but nevertheless saw three key missions for air defense. The first mission, described by Partridge as rooted in the principle that “the best defense is a good offense,” was to defend the bases of the Strategic Air Command. The second was to provide “reasonable and equitable protection for the key facilities, the population centers, and our industry.” The third and “primary objective” was to “convince the enemy that he should not attack.” What Partridge and those who shared his viewpoint did not explain was why the nation needed a second deterrent in addition to the Strategic Air Command.<sup>2</sup>

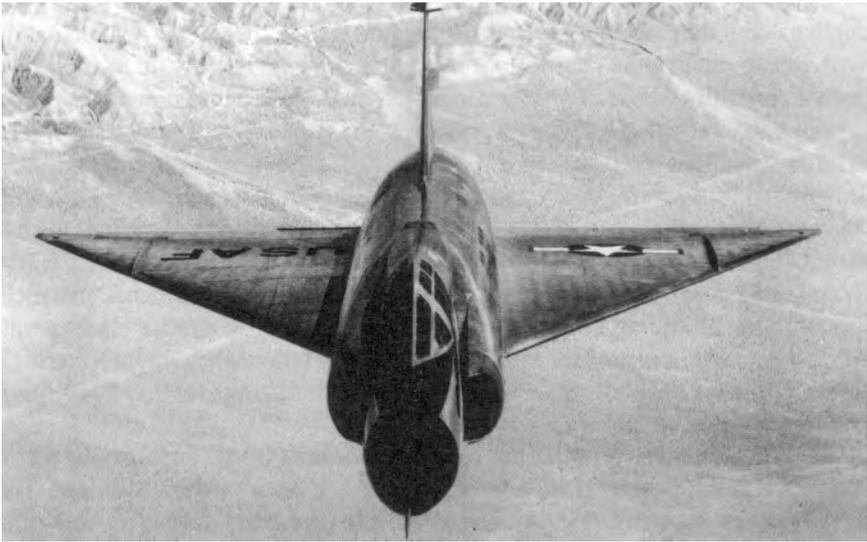
The Air Defense Command, for a variety of reasons, did not achieve all that Smith or Partridge had expected. Time and technology proved severe handicaps to the development of both interceptors and the means to control them. For instance, the supersonic interceptor sought for use with the automated control system, like the control system itself, turned out to be an elusive goal. To save time in developing the interceptor, the Air Force bought a set of drawings in lieu of a prototype and started work simultaneously on the airframe, the electronics, the weapons, and the support equipment for the delta-winged Convair F-106.

## History of the United States Air Force

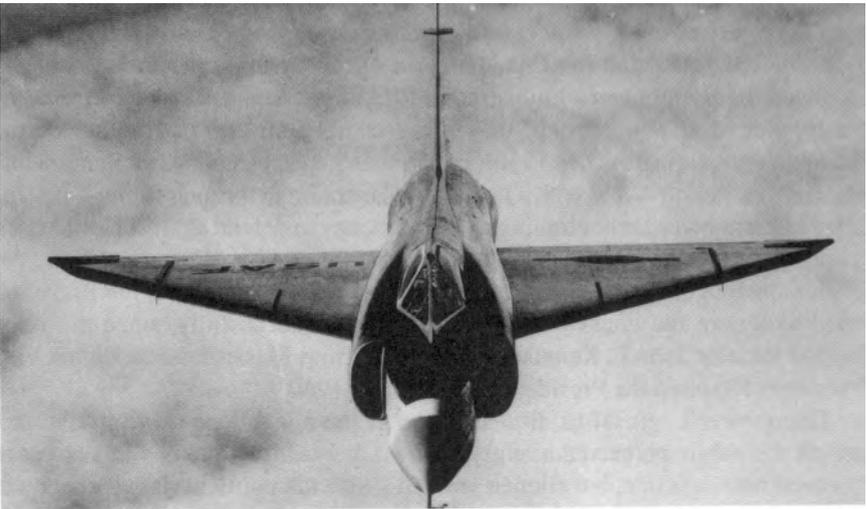
Realizing the complexity of the aircraft, the Air Force decided that Convair should go ahead with an interim interceptor, the F-102, to fill in until the F-106 was ready. The prototype of the F-102, however, proved incapable of flying faster than the speed of sound. Fortunately, the National Advisory Committee for Aeronautics, along with the Air Force and the Navy, had been studying supersonic flight, and one of the committee's engineers, Richard Whitcomb, had conducted wind-tunnel tests which revealed that a sweptwing airplane like the F-102 did not produce two separate shock waves for wing and fuselage, but a single strong shock wave just aft of the wing. As Whitcomb later explained, "while pondering these results it suddenly occurred to me (much like the proverbial light bulb over a person's head in a comic strip) that the shock wave and the associated drag for the fuselage-wing combination is the same as that for a simple fuselage alone that has the same longitudinal variation of cross-sectional areas as that of the fuselage-wing." The drag, which had slowed the F-102, could be eliminated, he concluded, "by shaping the fuselage in the vicinity of the wing section to reduce the total cross-sectional area."<sup>3</sup> The application of this so-called area rule gave the delta-winged F-102 and F-106, and other supersonic aircraft, a pinched-waist fuselage that inspired the term coke-bottle configuration because of the resemblance to the unique container then being used for Coca-Cola. Because of need to reduce drag and to solve other lesser problems, the interim interceptor did not become operational until 1956, only two years before the F-106. Similarly, the equipment for the computerized control of the air defense system had to overcome a number of obstacles, not the least of which was keeping the computers of that era, which generated great heat, cool enough to function in the tightly enclosed blast-proof shelters that protected them. The automation of air defense did contribute to the advance of data processing technology, but the network had scarcely begun functioning when improvements in circuitry made the existing computers obsolete.

Yet, in the last analysis, rapid advances in Soviet technology, rather than technical obstacles encountered by the American development effort, prevented air defense from securely protecting air bases and cities or serving as a genuine deterrent to attack. The Soviet jet bomber, revealed to western observers in Moscow during May Day ceremonies in 1955, greatly complicated the problem of interception because of its speed. Indeed, this new aircraft could in itself be interpreted as the kind of qualitative surprise to which General Smith, then the acting chief of the Air Defense Command, had referred that same year, but a worse shock was soon to come. On October 4, 1957, some five weeks after announcing the development and successful testing of an intercontinental ballistic missile, the Soviet Union launched an earth satellite called Sputnik, a nickname translated as companion or fellow traveler. With this 184-pound satellite, the Soviet Union not only got into space ahead of the United States, but also demonstrated to the American public that the threat from missiles was real. In fact, the very rocket that placed Sputnik in orbit might have delivered a weapon

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The Convair YF-102 (above) as designed with a straight fuselage and the F-102 (below) with a redesigned area-rule fuselage.



that could not be stopped by an air defense system of the kind being deployed to protect the United States from bombers.

Even though the technology of the day did not permit the interception of missiles, warning of missile attack seemed feasible. Such was the tenor of *Deterrence and Survival in the Nuclear Age*, the product of a Presidential committee headed by H. Rowan Gaither, who had to limit his participation because

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of the cancer that soon ended his life. Although charged with investigating the topic of civil defense, the group that prepared the Gaither Report expanded its horizons to include the concept of deterrence, drawing heavily upon studies of the vulnerability of bomber bases conducted by RAND, a research organization whose name reflected its purpose, research and development, or R and D. (An attorney, Gaither had helped set up RAND as a nonprofit corporation.) Influenced by Sputnik, by the much heavier Sputnik II launched later in 1957, and by the work done at RAND, the committee called for deployment of a land-based missile-warning network (which became the Ballistic Missile Early Warning System), acceleration of the development of intercontinental missiles, construction of aircraft shelters at bomber bases to protect against blast as well as radioactive fallout, and the building of blast and fallout shelters for America's urban populace. The estimated cost of these undertakings totaled \$44 billion over five years.

Newspapers were printing the recommendations of the supposedly secret Gaither Report even as Eisenhower received his copy of the document. The President resented this unauthorized disclosure (the actual report was not officially released for another twenty years), which he interpreted as an attempt to stampede the public and force the administration to embark on costly programs that he considered unnecessary. In seeking out those responsible, the Chief Executive could not help but notice the tall figure of W. Stuart Symington, the first Secretary of the Air Force, now a Democratic senator from Missouri and a possible candidate for the Presidency in 1960. Symington already had denounced the Republican administration for failing to take action to prevent the emergence of a "bomber gap" that would confer a strategic advantage on the Soviet Union during the late 1950s, but no such gap appeared. After Sputnik and the Gaither Report—and with a Presidential election in the near future—he criticized Eisenhower for continuing to spend money to defend against bombers instead of forestalling a "missile gap" that would open in the early 1960s, but events once again proved the senator wrong. In both instances, the President tried to ignore the clamor, in the latter case unsuccessfully, since the issue helped Senator John F. Kennedy, a Democrat from Massachusetts, defeat Vice President Nixon in the Presidential election of 1960.

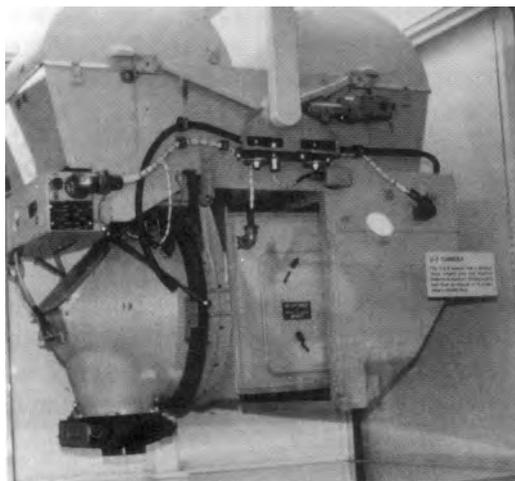
Eisenhower's refusal to discuss in detail the allegations of a missile gap, which the public perceived as a grave threat, helped frustrate Nixon's hopes to succeed him in office, but silence seemed worth the political risk. Eisenhower was protecting the secret of the nation's latest technique for gathering military intelligence, the U-2 spy plane, which in the late 1950s confirmed that neither a bomber gap nor a missile gap actually existed or was likely in the foreseeable future. In 1954, Lockheed Aircraft received a contract to produce a secret photographic reconnaissance craft that could cruise at extreme altitudes beyond the reach of the latest anti-aircraft rockets or turbojet interceptors. Responsibility for the project rested with the Central Intelligence Agency, although Col. Osmond J.

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Ritland, of the Air Force, joined Richard H. Bissell, Jr., of the intelligence organization, and Clarence L. "Kelly" Johnson, Lockheed's principal designer, in the triumvirate that directed the undertaking. At the Lockheed skunk works (a name borrowed from a foul-smelling and unapproachable industrial activity in the comic strip "Li'l Abner"), Johnson and his team of engineers first turned to the F-104, a stubby-winged supersonic fighter, trying to modify it for long-range, high-altitude flight. From this secret portion of the Lockheed plant, a radically different aircraft soon emerged, bearing only a superficial resemblance to the F-104 and featuring a wing better suited to a sailplane than a combat aircraft.

Indeed, the Lockheed designers produced a jet-propelled glider, delicate in structure, with a wing exceeding 500 square feet in area that could generate lift even in the thin air above 70,000 feet. No engine was available, however, that had functioned at altitudes that high. Since he could not wait for a manufacturer to develop one, Johnson turned to Pratt and Whitney, persuading that firm to modify the existing J57 engine to provide thrust even after the U-2 had climbed to a height where the air was only three percent as dense as at sea level. Using a special fuel developed by Shell Oil, the engine builder met the challenge, and in the summer of 1955 the U-2 flew for the first time. As impressive as the U-2 was from the standpoint of aeronautical engineering, its success in gathering intelligence depended upon the B-2 camera designed by James Baker. Scanning continuously, the device covered the ground beneath the aircraft from horizon to horizon. The resulting photographs at nadir had such fine resolution that a person looking at a picture of a golf course taken from an altitude of 10 miles was said to be able to detect individual golf balls on a putting green.

As the U-2 was entering service, the Central Intelligence Agency sponsored, and the Air Force conducted, a stopgap reconnaissance program using one of the oldest of aerial vehicles, the balloon. Beginning in January 1956, some six



The 36-inch focal length camera used in the U-2.

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months after the test flight of the spy plane, Air Force technicians loaded automatic cameras in gondolas suspended beneath large Skyhook weather balloons and during the next six weeks launched 516 of these makeshift reconnaissance vehicles from western Europe. The balloons drifted on the prevailing winds, passing eastward at very high altitude across the Eurasian land mass. Plans called for balloons that completed the crossing to be snagged in midair by C-119 cargo planes flying over the sea between Japan and Alaska. Since not all the cameras could be recovered in this fashion before the balloon lost buoyancy and settled on the ocean, the gondola was designed to remain afloat for 24 hours, all the while emitting a radio signal to attract recovery boats. The wind, unfortunately, controlled the path of the balloon, so that the pictures might as easily be of cloud cover or a Siberian forest as of an air base or factory. This program, which produced limited intelligence, was quietly canceled after strongly worded protests from the Soviet government, for the U-2 promised to be a far better means of gathering information. Perhaps the most valuable product of the balloon program was the use of aircraft to recover the gondola and its exposed film, a technique adapted for the midair retrieval of payloads ejected from reconnaissance satellites.

An incentive to the development of instrumented earth satellites was the International Geophysical Year, an 18-month period that began in the summer of 1957, during which participating nations, including the Soviet Union and the United States, agreed to explore the earth and space. The Army and Navy competed for the mission of launching the American satellite, with the Navy's Vanguard winning out, but failing in attempts to place an artificial satellite in orbit. Sputnik II, a satellite weighing 1,100 pounds, was launched on November 3, 1957, and carried a dog into orbit, though it was not designed to return the animal safely to earth. Not until January 1958 did the American Explorer I satellite begin orbiting the earth, launched by Jupiter, a variant of the Army's Redstone rocket, designed by a team headed by Wernher von Braun, who had worked on Germany's wartime V-2. Although less than one-hundredth the weight of Sputnik II, Explorer contained miniaturized sensors that, among other things, discovered the Van Allen radiation belt encircling the earth.

The Air Force, which all but ignored the competition to launch American satellites during the geophysical year, had shown an interest in satellites as instruments for surveillance as early as 1946, when RAND concluded that a "world-circling spaceship" was feasible, using a multistage rocket derived from existing technology to boost it into orbit. Subsequent research by RAND emphasized the importance of satellites in providing weather information and strategic intelligence essential for the employment of air power. Work on an American surveillance satellite began before Sputnik and Sputnik II, and such a vehicle was being tested by the end of the 1950s.

Although interest persisted in air defense and in missile warning, as did the commitment to surveillance with aircraft and satellites, deterrence continued to

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form the keystone of national military policy and the Strategic Air Command, as the principal deterrent, tended to attract the best the Air Force had. Numbers as well as quality reflected the importance of the command, which during the Korean War acquired more men and newer aircraft, even though none of the organization's first-line strategic bombardment squadrons took part in the fighting. LeMay, who led the Strategic Air Command throughout the war, carefully honed the cutting edge of the atomic strike force and provided just a few groups of B-29s, equipped solely for conventional warfare, to form the Bomber Command of the Far East Air Forces. Despite the limited participation in the fighting, which lasted from June 1950 to July 1953, the Strategic Air Command increased during the fighting from not quite 59,000 officers and enlisted men to more than 153,000, a rate of growth that slightly exceeded the overall increase in the Air Force from 411,000 to 978,000.

While the manpower of the Strategic Air Command was more than doubling, its inventory of aircraft kept pace. Throughout the early 1950s, the bomber remained the principal weapon of deterrence, as newer types entered the nuclear force, replacing the B-29s. Before the fighting ended in Korea, the Air Force accepted the last of the B-50s it had ordered, and 224 of these more powerful versions of the B-29 were on hand at the end of 1952. Also during the Korean War, the Strategic Air Command received the first of more than 1,000 B-47 Stratojets ordered from Boeing. Although a variety of problems surfaced as these bombers entered service, a fully trained wing of 45 aircraft deployed to the United Kingdom in June 1953. The B-36 remained the heaviest and had the longest range of the Strategic Air Command's bombers, and 30 of these aircraft were assigned to each of five heavy bombardment wings. To increase its speed, the B-36 had been fitted by the end of the Korean fighting with four jet auxiliary engines mounted in pairs in pods beneath the wings. Heavy bombers like the B-36 and B-50 carried out the policy of deterrence during the Korean War and immediately afterward; for the all-jet B-47 was just entering service, and a truly intercontinental jet, the eight-engine Boeing B-52, remained under development and would not appear until 1955.

As the B-29 disappeared from the bombardment squadrons, some were converted to KB-29 aerial tankers and joined the command's new KC-97s, tanker versions of the Boeing Stratocruiser commercial transport that employed the recently developed flying boom for transferring fuel to another aircraft. The KC-97s and the newly modified KB-29s formed a fleet of aerial tankers that in a single year, 1953, increased from 139 to 359. Along with the tankers, the Strategic Air Command of the post-Korean-War era operated reconnaissance versions of the B-36, the B-50, the B-47, the B-29, and the North American B-45 jet light bomber.

Besides bombers, tankers, and reconnaissance craft, the command also flew fighters. No longer needed to escort the bombers, since the operating altitude of the B-36 and the speed of the new B-47, along with the destructive power of

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The Republic F-84F Thunderstreak.

nuclear weapons, made it unnecessary to send escorted formations against a target, the fighters became nuclear bombers by virtue of recent advances in technology that reduced the weight and size of atomic weapons. Already in the process of converting its six fighter-escort groups (which soon would be redesignated wings) from the Republic F-84E to the improved F-84G, the command took advantage of the changes in technology and tactics and in 1953 began retraining the fighter-escorts as strategic fighters, with the mission of delivering nuclear weapons. During 1954 the sweptwing F-84F began replacing the slower, straight-wing G model and would remain in the command's inventory of aircraft until the fighter-bomber program came to an end in 1957, leaving the bomber as the key to deterrence.

While the Air Force missile program proceeded slowly and a small number of B-29s waged conventional warfare in Korea, General LeMay was converting the Strategic Air Command from the training organization he had inherited from Gen. George C. Kenney to a combat force ready to respond instantly and span the continents. Promoted from lieutenant general to general in October 1951, he was building a command far different from those he had led against the Axis. Gone were the huge combat boxes that had bombed Regensburg and other targets in Germany, the lead navigators and bombardiers upon whom a formation depended, and the endless stream of bombers that had roared low over Tokyo to set the city ablaze. Mass bombing became a thing of the past, replaced by multiple attacks with independent aircraft timed to confuse enemy defenses and

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Gen. Curtis E. LeMay,  
Commander in Chief,  
Strategic Air Command,  
October 1948–June 1957.



hit many targets as rapidly as possible. The individual bomber crew provided the key to the effectiveness of the Strategic Air Command. In short, each crew had to be as skilled as the lead crew in one of the large formations that the Eighth Air Force had dispatched against Germany in World War II.

To convince his crews of the need for intensive and realistic training, LeMay, shortly after taking command, had staged a high-altitude mock attack upon Dayton, Ohio, carried out in January 1949 under the surveillance of radar at nearby Wright-Patterson Air Force Base. The radar operators on the ground tracked the bombers, recorded the point where they would have released their loads, and calculated where the bombs would have landed. Rare was the weapon that would have detonated within a mile of the target. Bombardiers used to aiming at radar reflectors positioned on an otherwise deserted bombing range could not locate individual targets amid the radar echoes from a large urban area. In the past crews had practiced their various jobs, but never before had they been tested under conditions that even remotely resembled wartime. Over Dayton, they failed utterly; as LeMay later complained, "Not one airplane finished that mission as briefed. *Not one.*"<sup>4</sup>

Having revealed the failings of the command he had taken over, he began a program of alerts, exercises, and unannounced inspections that, by the end of 1951, had converted the command into a true nuclear striking force capable of prompt retaliation should deterrence fail. To encourage flying proficiency, he received permission to award temporary promotions to outstanding crewmen. Those who did not quite measure up he got rid of, often reluctantly and sometimes after a second or even a third chance, for he felt a strong loyalty to anyone who in the past had served him well. "When you got through the crust," said Lt. Gen. Clarence S. "Bill" Irvine, a long-time associate, "LeMay was really a soft touch."<sup>5</sup> As Commanding General of the Strategic Air Command, LeMay tried to improve the morale and well-being of those serving in the organization, setting up hobby shops and working with politicians and civic leaders to im-

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prove housing and schools for families. One problem that could not be solved was the separation of crew members from their families, an inevitable result of deploying bombers and tankers overseas.

Despite the presence of the long-range B-36 and increasing proficiency in aerial refueling, the Strategic Air Command of the early 1950s needed overseas bases, both to enable the short-range B-47 to penetrate deep into the Soviet Union and to permit the B-36, with its bomb capacity of forty tons, to attack several targets on a single mission. Only with the aid of these bases could the command deter aggression or, in the event of war, carry out its missions of destroying the atomic strike forces of the Soviet Union, impeding a thrust through western Europe toward the channel coast (the so-called retardation mission), and eliminating Soviet oil refineries and other industries necessary for modern warfare. The United Kingdom, where B-29s fitted out for conventional warfare had landed during the blockade of Berlin, afforded sites for bomber bases, as did Morocco, Spain, and the Arctic.

In response to the outbreak of war in Korea, which it was believed might precede communist aggression elsewhere, the Air Force dispatched two groups of B-29s to the United Kingdom as reinforcements for Maj. Gen. Leon Johnson's 3d Air Division. This expansion of the Strategic Air Command's strength in the British Isles created pressure to obtain additional airfields there so that General Johnson could better disperse his bombers. The government of the United Kingdom was starting to build up its own forces, however, increasing the need for facilities, and tactical units of the U.S. Air Force also began to arrive, joining the strategic forces and intensifying the competition for space. The demand for scarce materiel and labor to open and expand bases strained the struggling British economy; nevertheless, by the beginning of 1953, the U.S. Air Force had more than sixteen bases in the United Kingdom, six for use by bombers.

Troubled by the dependence upon overseas bases to fight a nuclear war against the Soviet Union, the Air Staff worried that the readily available British airfields could not support operations on so vast a scale and, moreover, were vulnerable to attack. Although the immediate focus remained on England as the site for major bases, the Iberian peninsula, northwest Africa, and the northernmost expanses of the Western Hemisphere also seemed promising. In the early 1950s, a semicircle of bomber bases, linked by other installations for deployment and support, took shape on the perimeter of the Soviet heartland.

The Arctic, however, presented the same difficulties of climate and terrain encountered a few years earlier when a handful of B-29s tried to operate experimentally from Alaska. In spite of the natural obstacles, Congress in 1950 voted funds to reopen or expand, with the cooperation of the Danish, Icelandic, and Canadian governments, the string of air bases built for World War II from Newfoundland and Goose Bay in Labrador, across southern Greenland, to Iceland. On October 1, in anticipation of the functioning of this chain of bases, the Joint Chiefs of Staff established the Northeast Command as a unified com-

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Because of the permanently frozen ground, buildings constructed at Thule required supports like these.

mand, with General Vandenberg as executive agent and the Northeast Air Command as the Air Force component. At the suggestion of Col. Bernt Balchen, an arctic explorer who had entered the air arm during World War II and now commanded a rescue unit in Alaska, Secretary Finletter proposed building a base at Thule, on the northwest coast of Greenland, 800 miles north of the Arctic Circle. At Thule the climate was far worse than at the bases farther south, but an outpost in northern Greenland would advance the bomber force some 1,500 miles closer to Soviet territory than the subarctic airfields. Although LeMay's staff expressed skepticism about the long-term value of Thule as a base for bombers, the Air Staff endorsed the proposal, which the Air Force approved. The Corps of Engineers, which was responsible for the actual work, recruited laborers in Minnesota for a secret project in the far north, and construction took place during the summers of 1951 and 1952. The base became operational in late 1952, on schedule, but with a cost overrun of \$50 million.

Construction in Morocco proved as difficult as the work at Thule, although politics rather than climate caused the trouble. The Strategic Air Command ultimately had air bases at Sidi Slimane, Nouasseur, Benguerir, and finally Boulhaut, but the project proved tedious, at times frustrating. In obtaining the right to build and in recruiting local labor, the United States had to deal with a French colonial administration that was losing its grip on a populace desirous of independence. The combination of a restless people and insecure rulers affected almost every aspect of the building program. An agreement to construct the bases was signed in Paris on December 22, 1950, and a month later the sites had been chosen, all in remote areas because French authorities hoped to isolate the Americans and prevent contact with Moroccans living in the cities, where opposition to colonialism was strongest. Besides being wary that familiarity with

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Nouasseur Air Base, Morocco.

Americans might somehow heighten the desire for independence, the colonial regime also feared that the American presence would bring higher wages and prices, upsetting a fragile urban economy. Political considerations thus forced the Americans to build the airfields far from the sources of labor and stocks of construction material, further impeding the efforts of the Corps of Engineers, which exercised supervision over the contractors, in its efforts to operate efficiently in a foreign society that had its own values and work habits.

When construction began, LeMay was calling for a “crash” effort, a term that invoked a comparison to the attempt to save the crew of a crashed airplane. The kind of intense activity that LeMay had in mind would have opened the bases to operational units by the end of 1951, but this goal proved unrealistic: the Strategic Air Command achieved limited use of just one of the bases by LeMay’s deadline. In May 1951, Maj. Gen. Archie J. Old arrived at Rabat, Morocco, to set up the headquarters of the Strategic Air Command’s 5th Air Division, and all seemed to be going well. He flew French guests to the new airfields at Sidi Slimane and Nouasseur on Bastille Day, July 14, the French national holiday—a choice of dates that could not have pleased the Moroccan nationalists. By the end of December, however, only Sidi Slimane hosted even a token force of B-36s. Regular rotation of B-29s and B-50s to Sidi Slimane, Nouasseur, and Benguerir did not begin until the following year, and at that time Nouasseur lacked decent quarters, recreational facilities, and even running water—unless the last category included the seasonal rains that gushed through badly built roofs and turned walkways into swamps. The Strategic Air Command did not take over Boulhaut until the summer of 1955. Cost overruns and shoddy work plagued the Moroccan project from the beginning, and in 1952 reports that recently completed runways were developing cracks attracted the attention of Congress. An investigation headed by Senator Lyndon B. Johnson, a Democrat from Texas, proved generally sympathetic toward an Air

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Force determined to get the bases finished in a hurry, but less so toward the private contractors responsible for the work and the Corps of Engineers that supervised them. The Secretary of the Army admonished the engineers, and Secretary Finletter had to acknowledge that the Air Force had not done all it should have to cut costs and ensure quality. The Strategic Air Command used the Moroccan airfields into the early 1960s, although paying a high price in repair and maintenance.

The bases in Spain, like those in Morocco, encountered political obstacles, albeit of a different kind, for the specter of revolution did not haunt the Iberian peninsula. Instead, the western democracies remembered that Francisco Franco, the Spanish generalissimo, had seized power in the 1930s with the help of two other dictators, Hitler and Mussolini. Despite the taint of this association, and largely because the fighting in Korea seemed to portend trouble in Europe, the leaders of the western nations decided that Franco was acceptable, and the Congress of the United States voted aid for his government. Adm. Forrest P. Sherman, then the Chief of Naval Operations, visited Spain in July 1951 and predicted tedious bargaining over the base rights. His assessment proved correct, in part because the illusion persisted that construction was proceeding swiftly and soundly in Morocco, making the Spanish airfields seem less important. In April 1952, talks got under way between Lt. Gen. Juan Vigan, representing Franco, and an American joint military group headed by Maj. Gen. August W. Kissner of the Strategic Air Command. Negotiations lasted more than a year, and not until 1957 did American bombers begin using the bases in Spain. In the late 1950s, the Strategic Air Command posted two squadrons of F-86 interceptors in Spain, for the Spanish airfields were vulnerable to hostile air power, even though the Pyrenees Mountains afforded some protection in the event of ground attack from eastern Europe.

The deployment of the strategic force to overseas bases raised anew the question of organizational responsibility. Normally air forces overseas were assigned to a unified command, but the bombers formed a major component of the retaliatory force. Consequently, the Strategic Air Command, a specified command for which General Vandenberg at the time was acting as executive agent on behalf of the Joint Chiefs of Staff, sought to apply the policy that had covered the B-29s sent to the United Kingdom during the Berlin crisis. Since the beginning of 1949, the B-29s in England had remained under the operational control of the Strategic Air Command, flying from bases belonging to its 3d Air Division. Assignment of the bombers to air divisions under the direct control of the Strategic Air Command became the accepted practice. As the overseas retaliatory forces expanded, LeMay early in 1951 established two more air divisions, the 7th and the 5th. Lt. Gen. Lauris Norstad, commanding U.S. Air Forces in Europe, objected unsuccessfully to the creation of these new headquarters. The approved plan called for General Old to command the 5th Air Division in Morocco and Brig. Gen. Paul T. Cullen the 7th, which would take the place of

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the 3d Air Division in the United Kingdom. In March 1951, Cullen and his staff boarded a C-124 transport bound for the British Isles, but the aircraft disappeared into the North Atlantic. Since the Moroccan airfields were not yet ready, Old temporarily took over the 7th Air Division with headquarters at South Ruislip, near London. He did not assume command of the air division in Morocco until May, when Maj. Gen. John P. McConnell arrived in the United Kingdom to replace him. Supplanted in England by the 7th Air Division, the headquarters of the 3d Air Division was reactivated on Guam during 1954, taking the place of the Bomber Command, Far East Air Forces.

When the overseas bases became available in the 1950s, the Strategic Air Command relied on the bomber as the instrument of retaliation required by the strategy of deterrence. The organization had been a force of bombers during the Truman Presidency, and it remained essentially so throughout the Eisenhower years. Along with the Korean War and the principle of deterrence, the Strategic Air Command formed a bridge linking the Truman and Eisenhower administrations. After taking office, Eisenhower turned first to stopping the conflict in Korea, a task that was not completed until the armistice of July 27, 1953. Once the Korean fighting ended, Eisenhower's obvious commitment to economy in government heralded a reduction in defense spending. Convinced, much as Truman had been, that the nation could spend itself bankrupt by ill-advised investments in weapons, Eisenhower was determined to achieve "security with solvency." He was committed, however, to certain expensive programs, like the maintenance of a powerful Strategic Air Command, begun in the Truman years. He also inherited some basic strategic principles from Truman, among them the deterrence of nuclear war and the containment of communism. Despite Republican speeches about rolling back the iron curtain, the Eisenhower administration actually remained content to check communist expansion, preferably without becoming involved in another limited conflict like the Korean War. The President, Secretary of State John Foster Dulles, and Secretary of Defense Charles E. Wilson shared with their predecessors the problem of avoiding higher taxes or a huge increase in the national debt while spending enough to accomplish these strategic goals. The cease-fire in Korea afforded a partial solution to the task of obtaining security without crippling expenditures, for Americans no longer were risking their lives in combat and the ground forces, which had done most of the fighting there, could now be reduced in strength. What was needed, however, was not the occasional reduction permitted by circumstances but a new approach to national defense that would protect the United States at an acceptable cost.

President Eisenhower therefore directed his Joint Chiefs of Staff to meet with officials of the Department of Defense and Bureau of the Budget to make a "new, fresh survey of our military capabilities." The task fell to Adm. Arthur W. Radford, who would become chairman, Adm. Robert B. Carney, the Chief of Naval Operations, Gen. Matthew R. Ridgway, the Army Chief of Staff, and

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Gen. Nathan F. Twining,  
Air Force Chief of Staff,  
June 1953–June 1957



Gen. Nathan F. Twining, the Air Force Chief of Staff. Twining, who had graduated from the Military Academy in the wartime class of 1918, brought a breadth of experience to the post. A pilot since 1924, he had ditched at sea in a B-17 in 1942 and spent six days on a life raft in the South Pacific before being rescued. Later in World War II he commanded the Fifteenth Air Force in the Mediterranean Theater and took over the Twentieth Air Force from LeMay shortly before the atomic attacks on Hiroshima and Nagasaki. After postwar tours in command of the Air Materiel Command and the Alaskan Command, he became Vice Chief of Staff, serving during the period when Vandenberg was suffering from the cancer that took his life in April 1954. Out of the deliberations in which Twining participated came the so-called New Look, a name suggested by a line of women's fashions created by Christian Dior in the late 1940s.

Instead of maintaining large land and naval forces, the new Eisenhower strategy called for the United States to emphasize its retaliatory might, the Strategic Air Command. The New Look that adorned the armed forces thus concentrated on the Air Force at the expense of the other services, especially the Army. Although conceding that American troops would be needed to bolster the defenses of friendly nations overseas and to serve as a symbol of America's commitment to its allies throughout the world, the President believed that the threat of nuclear destruction posed by the Strategic Air Command would deter a major war and, if sufficiently credible, lesser conflicts as well. In any crisis along the periphery of what the President and his advisers viewed as the Sino-Soviet Bloc, the United States would have the option of unleashing the B-47s and B-52s against the Soviet Union. Until the Soviet Union built a countervailing nuclear strike force, the mere threat of massive retaliation—a phrase attributed to Secretary of State Dulles—should prove adequate, and it would not be necessary to escalate a minor clash over access rights to Berlin, for example, into an atomic war. However dramatic the phrasing, and massive retaliation caught the public eye, the Eisenhower administration actually relied on a general threat

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rather than specific commitments, on bluff rather than showdown. Vice President Richard M. Nixon might vow that the United States would choose the time and place to retaliate against the Soviet Union rather than allow the Communists to pester the country with a myriad of protracted conflicts worldwide, but he was showing the world the highest card in America's hand in the hope that it need never be played.

Although the Eisenhower administration allowed all the services to enhance their firepower with nuclear weapons, the emphasis upon deterrence and retaliation ensured the continuing dominance of the Strategic Air Command. In effect, the Chief Executive endorsed a concept of air power antedating World War II, a belief that aerial bombardment could deliver the kind of sudden shock that would disable an enemy and force his immediate surrender. Air power had proved indispensable against Germany, but as a weapon of attrition rather than shock, wearing away the enemy's air force, his industry, his transportation, his supply of fuel, and ultimately the ability and willingness of his people to resist. With the destruction of Hiroshima and Nagasaki, however, the idea of air power as an instrument of shock took hold more strongly than before, since the airplane armed with the atomic bomb seemed able to strike a blow so cataclysmic that it would vaporize the victim's will to resist along with his cities and their inhabitants. The New Look, which emphasized the threat of massive retaliation, not only incorporated the view that air power could deliver a genuinely paralyzing blow but also assumed that the Soviet Union, considered the master of the communist world, shared this belief and would react accordingly when menaced by the overwhelming power of the Strategic Air Command. In this scheme of things the Air Force was dominant among the military services and the Strategic Air Command ascendant within the Air Force.

Scarcely had the New Look been adopted when scholars like William Kaufmann, who held a doctorate in political science from Yale and taught at Princeton before becoming affiliated with the RAND Corporation, began questioning the feasibility of massive retaliation as a means of deterrence, especially in the face of an expanding Soviet nuclear arsenal. How would the United States react, he asked, if the Soviet Union, which in the fall of 1953 had detonated a hydrogen bomb more advanced than the earlier American device, presented a choice of abandoning an overseas commitment or engaging in nuclear warfare against an adversary with comparable destructive might? Would America accept staggering damage as the price of avoiding humiliation? Others raised the possibility that the hydrogen bomb, which the United States tested in a workable form during the spring of 1954, signaled a revolution in military strategy; instead of providing a deterrent to aggression, it might so increase the damage that could be inflicted on the United States or on the Soviet Union that retaliation against any but an all-out attack would be an invitation to destruction.

In this fashion, the hydrogen bomb might become an umbrella under which the Soviet Union could, as Vice President Nixon feared, nibble away at the non-

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communist world. Considerations like these gave rise to another review of strategy as Eisenhower's first term was coming to an end, a reappraisal that commentators called the New New Look, but the administration's basic military policy remained unchanged. In defending the existing Eisenhower strategy, General Twining argued that the hydrogen bomb, far from being revolutionary, differed from atomic weapons only in its greater destructiveness. The strategy adopted in 1953, the airman believed, remained valid despite the new weapons and would provide the United States with a sound defense at an acceptable cost. "We cannot afford," said Twining, "to keep in our Armed Forces conventional forces for the old type of warfare plus those for atomic warfare. We have got to make up our minds one way or the other."<sup>6</sup> His way was to concentrate on nuclear deterrence, the administration agreed, and the New New Look, which differed scarcely at all from the original New Look of 1953 with its powerful strategic forces and small land army, prevailed for the balance of the Eisenhower years.

Reliance upon deterrence through overwhelming retaliation enabled President Eisenhower to hold defense expenditures throughout his two terms to about \$40 billion annually. From a maximum of 64 percent of federal expenditures during the Korean fighting, the share devoted to the armed forces declined to 47 percent by the time the Eisenhower administration left office. This kind of economizing, when coupled with the increasing cost and complexity of weapons, caused a scramble for something to be sacrificed, and the victim usually was the Army. The aggregate numerical strength of the armed forces declined by almost a million, and most of the saving came from cuts in the ground forces, although the Air Force and Navy sustained smaller reductions. While the Strategic Air Command was growing from some 158,000 officers and enlisted men in 1953 to more than 254,000 in 1961, the Air Force as a whole declined in strength from almost 978,000 to 815,000.

During the Eisenhower Presidency, the Strategic Air Command enjoyed the status of an elite force with the vital mission of deterring war by being ready to strike instantly. What is perhaps the best-known description of the ultimate purpose of the command—Peace Is Our Profession—came about by accident. A painter, who was supposed to put the legend Maintaining Peace Is Our Profession on a billboard announcing a recruiting campaign, found that he did not have room, and maintaining was the only word he could eliminate. Adopted in 1958 as the command's slogan, Peace Is Our Profession caught the spirit of the organization that LeMay had built, emphasizing both the purpose of nuclear deterrence and the professionalism of the force, its competence kept sharp by competition, inspection, and realistic exercises. When LeMay left the Strategic Air Command at the end of June 1957, he had done all he could to promote the efficiency, welfare, and enthusiasm of a command in which everyone from security guard, to chaplain, to aircraft commander devoted his energy to preparing for nuclear war.

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Convair B-58 Hustler, the Air Force's first supersonic bomber.

The new Commander in Chief of the Strategic Air Command was Gen. Thomas S. Power, a demanding individual, who deservedly or not had earned the reputation of being LeMay's hatchet man as well as his trusted lieutenant. The assignment awaiting LeMay was Vice Chief of Staff of the Air Force; he would deal routinely with the Joint Chiefs of Staff and the appropriate committees of Congress. In accepting duty at the Pentagon, he had the good of his old command sharply in mind, for as he later said, "I thought I'd have a chance in Washington to be closer to Congress, the Department of Defense, and the budget people."<sup>7</sup>

Throughout the LeMay era and during most of the seven years that Power commanded the organization, the Strategic Air Command relied upon the bomber. Indeed, the number of aircraft assigned reached a peak of 3,207 in 1959, a total that included 1,854 bombers, all of them jet-powered B-47s or B-52s. In 1960, as Eisenhower's second term drew to a close, the Strategic Air Command received its first supersonic bomber, the Convair B-58, which unfortunately would encounter a succession of technical problems during a decade of service.

To extend the range of its bombers, the Strategic Air Command relied upon a fleet of tankers that totaled 1,067 in 1959. More than a third of the tankers were Boeing KC-135s, a jet aircraft developed in conjunction with the compa-

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ny's highly successful model 707 commercial transport. Able to operate at high altitude where it encountered a minimum of turbulence, the KC-135 was fast enough to eliminate the danger that a high speed bomber might stall while slowing to refuel. To reduce the difference in speed between the older KC-97s and the aircraft they refueled, the piston-engine tankers were fitted with auxiliary jet engines.

The modernization of the aerial tanker fleet confirmed that the Strategic Air Command was shifting from reliance on overseas bases to the use of bases on American soil and aerial refueling. This reorientation was foreshadowed as early as 1952, when RAND questioned the assumptions that made overseas airfields seem essential. In establishing the bases in the United Kingdom, Spain, and North Africa, Air Force planners assumed that the Soviet Union, if it chose to go to war, would strike first at American cities. The strategic bombers based on the periphery of enemy territory would survive the initial onslaught and begin operating from their airfields much as B-29s had operated from the Marianas or B-17s from England during World War II. RAND, however, began pondering the likely results of a surprise attack not on the nation's populace or industries but on the overseas bases used by B-47s and B-50s of the Strategic Air Command. The study concluded that the overseas airfields lay within striking distance of light bombers stationed in the satellite nations of eastern Europe; thus the advance guard of the American strategic force could be wiped out by the enemy's tactical aircraft, leaving his long-range bombers untouched and ready to attack the United States. Like the battle fleet at Pearl Harbor a decade earlier, the American bombers deployed abroad served as a target as well as a deterrent.

While the RAND study was progressing inexorably toward the conclusion that most of America's strategic bombers should fly retaliatory missions from airfields in the United States and refuel at the bases in Morocco, Spain, or England after a strike, disaster struck Carswell Air Force Base, Texas. In September 1952, a storm generating winds of 100 miles an hour destroyed or damaged all the B-36s massed there. Fuel from ruptured tanks in the storm-battered aircraft collected in pools on the pavement, awaiting a spark to ignite a conflagration, but airmen succeeded in cutting off power in the electric lines that served the base. The tornado underscored what RAND was saying about the vulnerability of bases, for nature, furious though it had been, was less destructive than nuclear attack. If an atomic bomb detonated fully a mile away from the flight line had produced the onrushing wind, neither aircraft, nor hangars, nor the men who had turned off the current after the storm could have survived the sudden blast, the searing heat, and the hurtling debris. Because of the devastation at Carswell Air Force Base, the leadership of the Air Force was amenable to the suggestions presented in the RAND report when it appeared in 1953. The Strategic Air Command reacted by placing greater emphasis on aerial refueling; indeed, the command's planners discovered that even B-47s operating from

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Florida could refuel in the air en route to the Soviet Union, destroy their assigned targets and land at one of the overseas bases.

The network of overseas airfields remained largely intact, even though the emphasis shifted from basing large numbers of bombers to using them for tankers, for dispersal of small numbers of bombers, or for recovery of aircraft returning from nuclear strikes. Lt. Gen. Walter C. Sweeney, Jr., of the Strategic Air Command, maintained that Soviet awareness of SAC's global presence complicated their target planning and weakened their war effort. In 1957, the Strategic Air Command acquired the bases operated by the Northeast Air Command, which went out of existence, and one of them, Thule in Greenland, remained an important installation for another 25 years and more. In addition, the Strategic Air Command continued to operate the airfields in Spain, Morocco, and the United Kingdom into the 1960s. Guam became a base for strategic bombers in 1955, remaining so into the late 1990s.

Despite the inherent vulnerability of air bases and the bombers on them, the Strategic Air Command remained a retaliatory force, committed by national policy to responding to nuclear aggression. Consequently, Generals LeMay and Power had to assume the worst and plan for what came to be called a second strike, using the aircraft that had survived the initial Soviet onslaught. During the 1950s, the command adopted a number of innovations to make sure that the bombers not only survived in sufficient numbers but set out immediately for their assigned targets. Instead of concentrating its forces, the Strategic Air Command emphasized dispersal and readiness. Late in 1956, LeMay began putting a sizable number of bombers on alert, armed, fueled, and ready to take off, with the crews located in quarters adjacent to the aircraft. During 1957, Power extended the practice to the overseas bases under the Reflex Action program, which required that each wing of B-47s, whenever called upon, keep a detachment temporarily on alert in the United Kingdom, Spain, or Morocco, or on the island of Guam. Rather than fly exclusively from bases belonging to the Strategic Air Command, the B-47s, B-52s, and tankers began dispersing aircraft to bases operated by the Air Defense Command or Tactical Air Command. Further to reduce vulnerability and ensure rapid response, General Power's airmen were experimenting by the end of the decade with an airborne alert, keeping some bombers aloft at all times, armed and briefed to attack designated targets. The existence of an alert force, whether airborne or on the ground, that was armed and prepared to attack on command raised the possibility that the bombers might somehow slip the leash and cause the very war they were supposed to deter. The most important safeguard against an accidental war was the fail safe procedure that required every crew responding to an attack order to turn back upon reaching a certain point unless it had received a confirming order from appropriate authority.

Having adopted the policy of dispersal and alert, Power reorganized his bombardment units accordingly. In each wing the directors of operations and ma-

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teriel became deputy commanders, and maintenance specialists were taken out of the bomber squadrons and placed in separate units under the deputy for materiel, to be assigned as needed. Because centralized maintenance facilities could not ensure that a scattered force of bombers would be able to retaliate instantly, technicians accompanied the dispersed aircraft and worked on comparatively few B-47s or B-52s at several widely separated bases. Although costly in terms of personnel, this duplication of effort was essential to the readiness of the deterrent force.

Like maintenance, security became more difficult because the bombers were dispersed and ready to take off. An alert force served no purpose unless it was armed with nuclear weapons, and the presence of these bombs at Air Force bases created a need for impenetrable security. Believing that atomic weapons of the armed forces had essentially achieved a conventional status, President Eisenhower reversed the policy of his predecessor and began transferring custody of nuclear weapons from the Atomic Energy Commission to the strike forces. Although the new policy permitted the matching of weapons to targets, the change presented the Strategic Air Command with the problem of protecting these dangerous devices from saboteurs who, by detonating one of them, might eliminate an entire installation. Base security became a matter of vital importance and was tested frequently by disguised inspectors who tried to enter bases without the necessary documents or approach the flight line without authorization. At times the security process had bizarre results, as when a guard challenged Helen LeMay, the general's wife, in the backyard of the commanding general's quarters at Offutt Air Force Base and gave her the choice of pro-



These “intruders” were captured during a security exercise.

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ducing an identification card or accompanying him to the guard house. Even at the risk of occasional overzealousness, the security of bases and the weapons on them could not be left to chance.

As though being armed with nuclear weapons and ready for instant retaliation were not challenge enough, if deterrence was to work, the Strategic Air Command had to impress the nation's potential enemies with a convincing image of readiness and strength. During 1956, for example, the command launched three major exercises that could not have failed to impress a potential aggressor. In the first, eight B-52s flew nonstop around the periphery of the United States, refueled from KC-97 tankers, and covered 15,500 miles in 31 hours, 30 minutes. The other two closely related exercises involved a thousand aircraft, bombers and tankers, operating over the North American continent and its polar region. At times an exercise served as the response to a specific crisis—unrest in the Middle East during 1958 resulted in a nonstop flight from Guam to Morocco by a B-47 that refueled several times from aerial tankers—or provided a more general reminder to Soviet leaders of their nation's vulnerability to air power.

Beginning in 1948, competitions sharpened the skills of the teams of pilots, navigators, bombardiers, and electronic countermeasures specialists on whom deterrence depended. In June of that year, selected bomber crews took part in the first of what was intended as an annual contest, but the Korean war forced cancellation in 1950, the Cuban missile crisis and its aftermath in 1962 and 1963, and the Vietnam conflict and its consequences in 1967, 1968, 1972, and 1973. The bomber competition changed to keep pace with equipment and tactics, and consequently the individual awards came to reflect such specifics as electronic warfare, as well as navigation, the different mission profiles normally flown, and the various types of bombers. The major prize, awarded to the highest scoring bombardment wing, was the Fairchild Trophy, established in 1951 in honor of Gen. Muir S. Fairchild, who died of a heart attack in 1950 while Vice Chief of Staff of the Air Force. At various times the bombing contest has included crews and aircraft from the Tactical Air Command, as well as from United Kingdom and Australia. Conversely, representatives of the Strategic Air Command have occasionally taken part in competitions held by the Royal Air Force.

The bombing contest served as the model for other events staged by the Strategic Air Command. A competition for strategic reconnaissance units began in 1949; after 1952, the contestants vied for the P. T. Cullen Trophy, named for General Cullen, a specialist in aerial photography, who had died the previous year when a C-124 disappeared over the Atlantic. For a time, the reconnaissance units competed at the same time the bombers did, but the Cullen Trophy came to be awarded on the basis of sustained excellence throughout the year. The name of Col. Jesse H. Auton, killed in a crash at Offutt Air Force Base in 1952, graced a trophy for fighter units, which was awarded just once, in 1956,

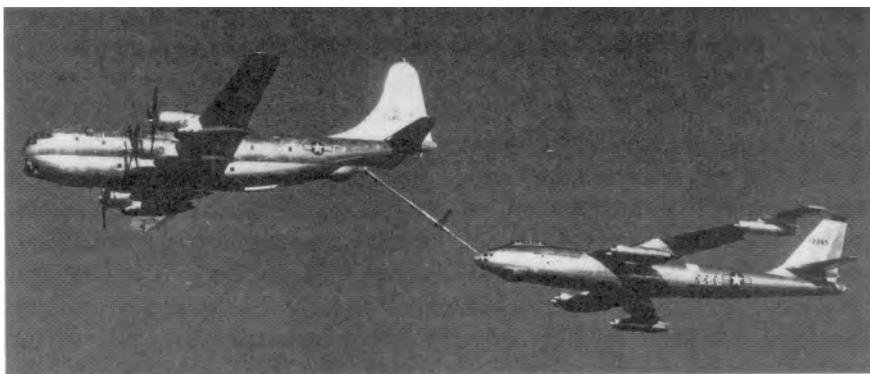
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before this type of aircraft was transferred out of the command. At stake in the aerial refueling contest was the Saunders Trophy, awarded for the first time in 1960, which commemorated Brig. Gen. Donald W. Saunders, killed in the crash of a KC-135 in June 1958. Reflecting the changing nature of the retaliatory force, a missile competition began in 1967; the prize was the Blanchard Trophy, which honored Gen. William H. "Butch" Blanchard, Vice Chief of Staff of the Air Force, who died in 1966.

In maintaining both the image and the reality of American retaliatory might, the Strategic Air Command faced three demanding tasks: alert, expansion, and training (which included exercises and competitions), all of them undertaken simultaneously, even though they were not always compatible. As a result of the incompatibility of tasks, aircraft and crews on alert at bases in the United States repeatedly left the training cycle for fixed periods, which normally included not only the time spent standing by to retaliate but also a few days to rest and catch up on administrative and personal matters put off during the alert. Deployments overseas, vital though they were, similarly tied up manpower and machines, even though flying was involved. Yet, to maintain an effective alert force, crews needed sustained training, especially those assigned to the new B-47s.

The Strategic Air Command expanded rapidly as B-47s rolled from the Boeing assembly line. The cadre of veterans could not suddenly provide crews for all these new jets, and young pilots who had just learned to fly fighters and veterans of aircraft other than the B-47 were assigned to man the new bomber. Because the B-47 was a demanding aircraft—loss of an outboard engine during takeoff could cause the aircraft to roll into the ground and its high stalling speed made refueling from the slower KC-97 a tricky job—the emphasis rested upon honing the skills of the pilot, sometimes slighting the copilot, particularly if the pilot was new to the aircraft.

To resolve as best it could the conflict among alert, training, and expansion, the Strategic Air Command centralized control over flying hours and types of



A B-47 slows to refuel from a KC-97.

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training, even to prescribing the number of touch-and-go landings. Pressure to meet the various requirements was great, and it focused on the wing commanders, who also had to cope with exercises and surprise inspections. Persisting tension and the disruption of family and personal life caused by deployments, exercises, and alerts (along with such minor annoyances as having to use private automobiles to travel from briefings to aircraft and alert shacks) were balanced against the abiding conviction that the Strategic Air Command was keeping the peace. For most, the satisfaction of doing an essential though difficult job was incentive enough; those who could not endure the pressure or make the necessary sacrifices soon found other careers.

Late in the Eisenhower years, ground-launched ballistic missiles began joining bombers in the weapons inventory of the Strategic Air Command. Along with their effect on missile warning and satellite programs, Sputniks I and II provided impetus for a struggling program of ballistic missile development, which started slowly, accelerated suddenly, and slowed once again. Although General LeMay, while Deputy Chief of Air Staff for Research and Development, conceded as early as 1947 that guided missiles would play a major role in the long-range future of the Air Force, progress in missiles was painfully slow compared to advances in aircraft design. Stubborn technical problems and competition for funds between proven types of weapons combined to frustrate development. Even as the Air Force was achieving independence, a shortage of funds compelled it to abandon its first long-range ballistic missile program and establish priorities among strategic weapons. The manned bomber took precedence, followed by air-launched missiles that might increase the bomber's effectiveness, with the technologically challenging intercontinental missiles bringing up the rear.

Two possible kinds of intercontinental missiles seemed feasible: pilotless jet aircraft like Germany's wartime V-1s or ballistic missiles employing rocket engines more powerful and complex than German V-2s. Even Theodore von Kármán, who had helped bring about many advances in aerial technology and was a trusted adviser to the air arm, believed in following the more conservative example of the V-1. The Air Force concurred, at least in part because these missiles operated within the atmosphere, clearly the domain of the service. Work started on two jet-propelled missiles, one a comparatively straightforward subsonic type designed by Northrop and the other a more sophisticated supersonic missile that North American designed. Meanwhile, progress on intercontinental ballistic missiles proceeded fitfully at best. Nevertheless, Convair, after 1954 a division of General Dynamics, introduced some potentially important weight-saving innovations in its experimental ballistic missile. For instance, the exterior of the tanks holding the fuel and oxidizer formed the skin of the rocket, and to avoid the weight of a rigid frame, the entire structure was pressurized, like a balloon. Despite progress of this sort, it seemed a genuinely formidable task to build a rocket powerful enough to hurl one of the five-ton atomic weapons of the

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immediate postwar years a distance of 5,000 miles with sufficient accuracy to hit even a city. Although such a weapon might challenge the bomber as the most effective instrument of deterrence in the future, the future seemed so distant that not even the outbreak of Korean War aroused a sense of urgency. President Truman appointed a missile "czar," K. T. Keller of the Chrysler automobile firm, but Keller saw himself as an adviser rather than an autocrat, made no demands, and merely encouraged the services to go ahead with their existing programs of research and development.

The Eisenhower administration revived interest in the ballistic missile, thanks largely to Trevor Gardner, chosen by Secretary of the Air Force Harold E. Talbott as his assistant for research and development. Gardner concluded shortly after taking office that airmen were underestimating the significance of the intercontinental ballistic missile in conjunction with the impending hydrogen warhead. A former executive in the aircraft industry like Talbott, Gardner discovered a consensus within the Air Force leadership that missiles would someday be important, but development was proceeding so cautiously and subjected to such frequent reviews that nothing seemed likely to be available when that day actually dawned.

Indeed, in 1953, shortly after the Eisenhower administration took office, yet another review was under way. In his zeal to cut spending, Secretary of Defense Wilson called for another look at the missile program; and the task devolved upon Gardner, who, unbeknown to Wilson, hoped to use the assignment to speed rather than slow missile development. Toward that end, he set up the Strategic Missile Evaluation Committee headed by John von Neumann, a mathematician who had devised a computer that helped Teller and his associates make the calculations that resulted in the hydrogen bomb. (During the deliberations concerning the missile program, von Neumann and his colleagues showed such a liking for tea that the panel came to be called the Tea Pot Committee.) While engaged in the manufacture of aircraft components, Gardner had been impressed with the work of Simon Ramo and Dean Wooldridge, who had directed missile research at Hughes Aircraft before leaving to set up their own company, and he now recruited them to serve as technical advisers to von Neumann's committee. From the outset, Gardner was looking for a group that would endorse his own strong views on the importance of missiles and the need to cut through the layers of decision making and review that had thus far impeded progress. The von Neumann panel did not disappoint him, for it recommended in February 1954 that the United States embark on an intensified program of missile development, justifying this course because of the Soviet Union's detonation of a hydrogen bomb during the previous summer and its access to a number of talented German rocket engineers pressed into service after World War II.

Capitalizing on the sense of urgency generated by the committee, Gardner persuaded the Air Force to establish a special organization, the Western

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Trevor Gardner (left), Assistant Secretary of the Air Force for Research and Development (February 1955–February 1956), and Maj. Gen. Bernard A. Schriever, commander, Western Development Division, later the Ballistic Missile Division (July 1954–June 1959).

Development Division, to rush the intercontinental ballistic missile to successful completion. This weapon became an exception to the normal practice of developing such items through the Air Research and Development Command, headed at the time by General Power before he replaced LeMay as commander of the Strategic Air Command. Chosen to head the Western Development Division was Brig. Gen. Bernard A. Schriever, who, as a result of his contributions to the ballistic missile program assignment, would emerge from the Eisenhower years as the dominant figure in Air Force research and development. Schriever agreed to the assignment only after he received full authority over the program as both commander of the division and deputy to Power.

One of the first problems that Schriever faced was Convair's management of the development of the liquid-propellant Atlas missile. As prime contractor for that weapon, Convair failed to convert almost a decade of experience with this kind of missile into decisive technical guidance for the other corporations involved in the project. To provide the necessary integration of effort, Schriever turned to the Ramo-Wooldridge partnership, choosing the new company to act as both technical adviser to and agent of the Western Development Division. In short, the general assumed ultimate responsibility for all decisions affecting missile development, except the actual letting of contracts, thus becoming, in effect, a missile czar for the Air Force. To expedite contracting, the Air Materiel Command set up a special procurement office at Inglewood, California, the site of Schriever's headquarters. For the rest of the decade, Schriever's organization, the Ramo-Wooldridge firm, and the special procurement office collaborated to direct the activities of a variety of contractors like Convair, General Electric,

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and Sperry Rand, using computers to coordinate the progress on the various missile components so that work proceeded logically and quickly on every element of the weapon system. Work went ahead at the same time on every component from the rocket engine, to the warhead and fuzing circuits, to the guidance mechanism. The practice of trying to save time by developing simultaneously the major components of a system had been used before, most notably in the Manhattan Project that produced the atomic bomb, but the technique became linked in the public consciousness to the Air Force missile program and to General Schriever, who coined the term "concurrency" to describe the process.<sup>8</sup>

Because the intercontinental ballistic missile program enjoyed a high priority as it pushed the limits of existing technology, Schriever could employ two contractors for every major component of the new weapon; should one design fail, a substitute would therefore be readily available. After becoming head of the Scientific Advisory Committee of the Department of Defense, von Neumann obtained approval for the construction of a second missile, using many of the alternate components, in the event that Convair failed to produce a satisfactory Atlas. The new weapon was Titan (later redesignated Titan I), and the Martin Company the principal contractor. Like Atlas, Titan I was a liquid-propellant rocket that had to be fueled shortly before launch.

A further complication affecting missile development arose early in 1955 when James R. Killian, Special Assistant to the President for Science and Technology and later the Chairman of the President's Scientific Advisory Committee, led an investigation that compared American and Soviet offensive and defensive strength in light of the acquisition by both nations of a thermonuclear bomb. The Killian committee, among its findings, recommended accelerating the development of an intermediate-range ballistic missile. Such a weapon, with a range of 1,500 miles, could take advantage of the work already done on the longer range missiles, enter service before Atlas or Titan I, and provide a retaliatory weapon capable of reaching a target in a fraction of the time required by a bomber. Because of its reaction time, Thor, as this weapon came to be called, seemed a likely deterrent to surprise attack. Killian, however, was not interested exclusively in the intermediate-range missile; persuaded that the Soviet Union was surging ahead in the development of strategic weapons, he recommended that the entire ballistic missile program receive an overriding priority.

Acknowledging the importance of the ballistic missile, the Eisenhower administration assigned the program the highest national priority. To increase efficiency, Gardner and Schriever recommended streamlining the administrative procedures governing the program. As a result, a committee headed by Hyde Gillette, Deputy Assistant Secretary of the Air Force for Budget and Program Management, looked into the need for change and recommended the creation of just two ballistic missile committees. Following the adoption of the Gillette reforms, only one panel in the Office of the Secretary of Defense and another in

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the Office of the Secretary of the Air Force could review, approve, or modify Schriever's overall development plan.

The centralization of management and administration notwithstanding, the ballistic missile program remained a risky undertaking that seemed certain to produce a complicated weapon requiring specially designed facilities and highly trained technicians. The temperamental nature of Atlas and Titan, both fueled with dangerously volatile liquids, inspired the Air Force to adopt another recommendation of the Gillette committee—involve General Schriever's organization in the operational use of the weapons. Air Force headquarters therefore directed the Western Development Division to cooperate with the Strategic Air Command, the Air Materiel Command, and the Air Training Command to achieve an initial operational capability, essentially the ability in the event of war to launch a number of prototypes armed with nuclear warheads.

The Air Force was concerned about the complexity of the missile once development was completed, but the Eisenhower administration worried about the soaring cost of the weapon. In the summer of 1956, the Air Force Ballistic Missile Committee, with Secretary of the Air Force Donald Quarles serving as chairman, revised the program to follow a "Poor Man's" approach and reduce the number of Atlas and Titan intercontinental missiles from 120 to 80 that would not become fully operational until mid-1961 at bases scattered throughout the United States.<sup>9</sup> Describing the revision only in this manner, however, placed undue emphasis on saving money and ignored the intelligence estimates which indicated that a lack of Soviet progress would permit the United States safely to slow the pace of its own intercontinental ballistic missile program. The scaled-down plan called first for achieving in March 1959 an initial operational capability of six missiles at Camp Cooke, California, a missile testing site. (In 1958, Camp Cooke was redesignated Vandenberg Air Force Base in memory of the former Chief of Staff.)

In the meantime, work went ahead on an intermediate-range ballistic missile. The Air Force, selecting Douglas Aircraft as the major contractor and following the same management practices used for the intercontinental types, had been developing Thor, using for the shorter range missile as many as possible of the components intended for Atlas. The Army nominally cooperated with the Navy, in keeping with the Eisenhower administration's desire for economy. In fact, however, an Army team headed by von Braun and other German expatriates at the Redstone Arsenal in Alabama devised an intermediate-range rocket, the Redstone, which evolved into the Jupiter, an intermediate-range ballistic missile rivaling Thor. At a time of spiraling costs, the idea of two services developing variants of the same basic weapon seemed wasteful in the extreme, but Secretary of Defense Wilson nevertheless tolerated the duplication until November 1956. At that time, he assigned the "operational employment" of all intermediate-range missiles to the Air Force, imposed a range limit of 200 miles on those missiles the Army developed in the future, but allowed the Redstone

## Emergence of the Strategic Air Command



Test launch of the Northrop Snark.

team to continue working on Jupiter until the weapon was ready for use by the Air Force. Despite Wilson's decision, von Braun and his team worked even harder in the hope, perhaps the expectation, that the Army missile would succeed and Thor fail. Actually, both Thor and Jupiter had the same tactical disadvantage—reliance on liquid propellants that were difficult to store and dangerous to handle—any difference between the two was likely to be marginal in terms of military value.

Offsetting to some extent the decision to entrust the employment of Jupiter to the Air Force, Secretary Wilson eliminated one Air Force missile project, the North American Navaho, a large pilotless aircraft designed to fly at twice the speed of sound. In prototype tests, a liquid-fuel rocket boosted the Navaho from its launcher and separated before turbojet engines, which would have been replaced by ramjets in operational models, sent the craft streaking toward its target. The Navaho project, canceled after nine and one-half years of work, produced advances in rocket technology, but not a workable weapon. Another pilotless aircraft, the subsonic Northrop Snark, survived Wilson's review of the missile program but proved inaccurate and unreliable, even though a few became operational and served briefly with the Strategic Air Command. Not until the 1980s, when the compact cruise missile and its revolutionary guidance system appeared, would this family of weapons, the object of so much effort in the years shortly after World War II, become a dependable part of the deterrent force.

Economizing and the resultant slowing of development had begun to affect the ballistic missile program in the fall of 1957 when the Soviet Union launched Sputnik, touching off a furor that soon accelerated missile projects and brought temporary fame to the Army's Jupiter as the launch vehicle for Explorer I, America's first satellite. Although Eisenhower remained calm throughout the

## History of the United States Air Force

crisis, reassured by film from the U-2's cameras, the missile program became a sensitive political issue. In these circumstances, hurriedly revised plans called for as many as 29 squadrons of Atlas and Titan I missiles, instead of eight under the discredited "Poor Man's" approach. Some of both types of missiles in the expanded force would be installed in blast-resistant silos of reinforced concrete from which they would be raised and launched. Although numbers fluctuated with time, and new types replaced earlier ones, the development and deployment of a sizable force of intercontinental ballistic missiles seemed assured.

Among the new missiles was Titan II, which used storable liquid propellants that, although highly toxic, could remain in the missile for long periods and need not be loaded immediately before launch, thus avoiding a touchy and time-consuming procedure. As a result, Titan II, if carefully monitored, could remain fully fueled in the protection of its silo until launched. Another addition to the missile force was a solid-propellant, intercontinental weapon called Minuteman, for which Boeing Aircraft was the principal contractor. Postwar research into tactical missiles had led the way for the development of large-grain, constant-pressure, constant-volume solid propellants, which could be stored for long periods and survive the normal shock of transportation and handling. By the end of 1957, tests had demonstrated that a large solid-fuel motor, weighing as much as 25,000 pounds, would burn smoothly inside a strong, lightweight case as much as five feet in diameter. Moreover, the direction of the gases generated by the burning fuel could be controlled by movable exhaust nozzles. This kind of rocket could remain in its silo ready to launch for an extended period before roaring aloft on a trajectory that would carry a warhead thousands of miles.

The management procedures that developed Atlas, the two Titans, and Minuteman could not have worked without General Schriever. He and his small group of Air Force managers were willing to trust their own judgment—influenced and implemented by a talented, carefully chosen team of military officers and civilians—to handle a program that in its complexity, if not in its challenge to the known boundaries of science, proved comparable to the Manhattan Project of World War II. He sought and received the responsibility and authority that made the program work. Yet, the circumstances surrounding his accomplishments were unusual, perhaps unique. The urgency that spurred missile development and the compelling desire for action emboldened the Air Force to modify an existing organizational structure by delegating great authority to a comparatively junior officer. Whether the Air Force in less than extraordinary conditions would have placed such trust in even an officer as talented as Schriever remains debatable at best. He more than likely would have had to ascend gradually to leadership within the research and development hierarchy. Moreover, the same urgency that thrust him into prominence resulted in spending that might otherwise have seemed wasteful; substitute components were developed as a hedge against failure, and these formed the basis for a second missile, Titan, in the event the Atlas program went awry. In the circumstances that prevailed during the

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Eisenhower years, especially in the aftermath of Sputnik, Schriever proved the ideal choice for a difficult and important job. As the Eisenhower Presidency was ending, the Air Force and Navy shared responsibility for development of intercontinental and intermediate-range ballistic missiles, and the Army was restricted to short-range weapons. In 1959, the newly organized National Aeronautics and Space Administration had absorbed the Army's von Braun group, whose rocket had launched the first American satellite.

Some three years before, the Navy had begun moving toward a solid-propellant, long-range missile, largely because the liquid-fuel types favored by von Braun were dangerous to handle on shipboard. Since surface ships were difficult to stabilize for launchings in heavy seas, the submerged submarine, unaffected by waves on the surface, seemed more attractive as a seaborne launch platform. Development of a missile-carrying submarine began, and by the end of the 1950s, the Navy was on the verge of testing a nuclear-powered submarine capable of launching while submerged a new solid-propellant missile, Polaris, with a range of some 1,500 miles. This weapon system of submarine and missile promised to increase the Navy's contribution to the deterrent force. Indeed, some naval officers were talking in terms of a finite deterrent based upon a limited number of Polaris missiles and submarines. Such a force would be just large enough to target the major Soviet cities, thus deterring war at a comparatively low cost by, in effect, taking hostage the principal cities of the Soviet Union.

Polaris and the finite deterrence had a strong attraction for a Chief Executive worried about the growing cost of an ever-expanding strategic force of expensive bombers and land-based missiles. The Navy's Polaris offered a solution to the recurring question of vulnerability and a ceiling on the size of America's deterrent force, with indestructibility taking the place of numbers. Granted that bomber bases and missile sites on land could be protected through dispersal and the costly process of hardening against the effects of blast and radiation, the Soviet Union could respond by expanding its strike forces, aiming additional warheads against individual targets, and by hardening its own air and missile bases. The deployment of Polaris, Navy planners insisted, would not trigger this sort of arms race. Assuming a rational potential enemy—ignoring possible advances in antisubmarine warfare, the obvious vulnerability of the ports used by the submarines, and the temptation for the Soviet Union to build its own Polaris submarines—Navy spokesmen argued that the Soviet leaders would not multiply their nuclear arsenal because no amount of new weapons could ensure the destruction of the Polaris fleet. Champions of the submarine-based system believed that enough Polaris missiles could be kept at sea to destroy some 200 targets, the number they considered necessary to deter aggression, and that deployment of this force would not cause an arms race. No wonder that an economy-conscious Maurice Stans, Eisenhower's director of the budget, asked aloud why the United States, if armed with Polaris, would need strategic bombers or land-based intercontinental missiles.

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Gen. Thomas D. White, who in July 1957 had succeeded Twining as Air Force Chief of Staff, led the counterattack against Polaris. After graduating from the U.S. Military Academy in 1920, White learned to fly, transferred from the Infantry to the Air Corps in 1927, and served as an air attaché and personal pilot for ambassadors at various diplomatic posts, including Rome and Moscow. Promoted to brigadier general in 1942, he held staff positions in the United States before being sent to the Pacific in 1944, taking command of the Seventh Air Force on Okinawa in June of the following year. His postwar assignments included chief of legislative liaison for the Air Force, membership on a number of interservice planning committees, Deputy Chief of Staff for Operations, and then Vice Chief of Staff. An accomplished linguist, he was considered thoughtful and well-educated, highly respected both inside and outside the Air Force.

White and others at Air Force headquarters realized that the coming of Polaris threatened to change the composition of the deterrent force, which for a decade had been synonymous with the Strategic Air Command. Facing this challenge, Air Force headquarters, influenced by ideas from RAND, embraced a new strategy emphasizing the greater accuracy of bombers and land-based missiles and calling for strikes on military targets, especially the enemy's nuclear strike forces. According to the scenario favored by the Air Force, the Soviet Union would attack first, directing its missiles and bombers against the American retaliatory force in order to protect its own cities from destruction and sparing much of urban America, except for the comparatively few cities near military targets. The United States, since its cities had survived largely intact, could restrict its retaliation to military targets, although in the process destroying some nearby cities, just as towns too close to American military installations had perished in the Soviet attack. To ensure that the United States was not the loser in the exchange of blows against military targets—and to threaten wider destruction if the enemy should ignore the strategic force and initially go after American cities—required not only a fleet of Polaris submarines but bombers constantly on alert and a vast array of missiles like Minuteman, poised for immediate launch from blast-resistant silos. The kind of finite deterrence that impressed the budget director could destroy only Soviet cities, leaving Soviet strategic forces intact and presenting an invitation to level American cities in retaliation. In contrast, ran the Air Force argument, the larger, balanced force of missiles and bombers could actually minimize the damage to both Soviet and American cities.

The damage-limiting strategy favored by the Air Force Chief of Staff, though it seemed logical to him, aroused the scorn of the outspoken General Power, now at the helm of the Strategic Air Command. According to RAND's Kaufmann, who had questioned massive retaliation and now advocated the new strategy, the general derided the idea of limiting the damage caused by nuclear warfare. "The whole idea is to kill the bastards," Power protested, for he believed in a swift and overwhelming strike against every base or city that contributed

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Gen. Thomas S. Power,  
Commander in Chief,  
Strategic Air Command,  
July 1957–November 1964.

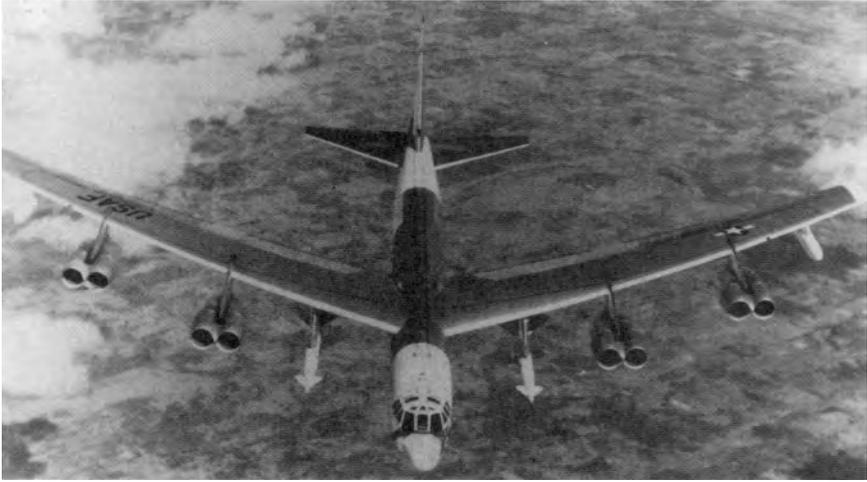


significantly to the warmaking capacity of the communist nations, assigning successive attacks against targets that he judged critical.<sup>10</sup> He expected his list of targets to expand as intelligence improved and consequently needed more warheads, missiles, bombs, and bombers to destroy with utter certainty every target identified. Furthermore, he hoped to incorporate Polaris into the overall plan, although in a subsidiary role; he might allow this weapon, like carrier aircraft, to attack seaports, shipbuilding centers, or other targets of interest to the Navy.

Although the concept of damage limitation encountered a cool reception from General Power, he agreed with Air Force headquarters that the Strategic Air Command should control the selection of targets for Polaris missiles. General White, as Air Force Chief of Staff, and General Twining, as Chairman of the Joint Chiefs of Staff, recommended that Power draft a joint war plan incorporating not only the land-based intercontinental ballistic missiles and the nuclear-armed aircraft of the Air Force and Navy but also the new Polaris missiles. Adm. Arleigh R. Burke, the Chief of Naval Operations, who considered the Air Force proposal an attempt to steal Polaris from the service that developed it, vehemently opposed this course of action. In the summer of 1960 the new Secretary of Defense, Thomas S. Gates, a former Secretary of the Navy, told President Eisenhower that in fifteen meetings since the first of the year the Joint Chiefs of Staff had failed to agree on the basic question of planning for nuclear war. Finding this impasse so frustrating that he complained aloud of the nation's failure to establish a single service in the reorganization of 1947, Eisenhower ordered Gates and the military to find a solution.

Difficult though the task was, Gates did manage to effect a compromise acceptable to the Air Force and Navy. His solution consisted of entrusting the targeting of Polaris missiles to a Joint Strategic Target Planning Staff headed by Power but including officers from the Army and Navy. The new staff took shape at Offutt Air Force Base, Nebraska, the site of Power's headquarters, and set to

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Boeing B-52 carrying a Hound Dog missile under each wing.

work on a national strategic target list and a single integrated operational plan based on it. Power, however, selected staff officers from the Strategic Air Command to occupy, as additional duties, the most important positions in the joint organization, where they dealt with the same aspects of intelligence and wartime operations as in their Air Force assignments. Thus circumscribed, the Navy's actual role was shaped at the working level, principally by Navy Capt. Gerald E. Miller and Col. William J. Crumm of the Air Force (who as a major general would die in the midair collision of two B-52s in 1967 during the Vietnam War). Despite the cooperation between Miller and Crumm, the members of the naval contingent remained outsiders, and the Joint Strategic Target Planning Staff did not function as a truly multiservice activity. Indeed, the first of its efforts proved to be nothing more than an enlargement of the old war plan to incorporate Polaris. Realizing that this was the best operational plan he could hope to obtain, the President approved the new version as his term of office ended.

Although President Eisenhower's concern for balancing the budget did result in a decline in overall Air Force strength while he was in the White House, the Strategic Air Command experienced no cuts in total personnel, strong evidence of its importance in the national strategy. Indeed, as the second Eisenhower administration neared its conclusion, the number of officers and enlisted men assigned to General Power's organization had increased. In 1960, the uniformed strength of the Strategic Air Command surpassed 240,000, principally because the policy of dispersal required more security and maintenance specialists at the outlying airfields. In contrast, the total number of aircraft declined by six percent from 1959 to 1960, reflecting a modernization that included the retirement of the B-36s and the oldest of the B-47s. The B-52, which remained in pro-

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duction into 1962, continued to enter service, along with the supersonic B-58, which found little favor with either LeMay or Power, who believed that it lacked the range for strategic operations. Bomber crews learned low-altitude tactics in order to penetrate hostile territory using undulations in the terrain to mask the enemy's radar. Moreover, the B-52 carried Hound Dog air-to-ground missiles that could be launched some distance from the target, Quail decoys designed to confuse enemy radar, and electronic countermeasures. Work had been canceled, however, on a supersonic replacement for the Hound Dog and on a decoy launched from the ground.

In 1960, the last full year of the Eisenhower presidency, the bomber remained the cutting edge of deterrence, whatever the future value of the missile. When the year ended, General Power had at his command 558 B-52s, 1,178 B-47s, and 19 B-58s that were supported by 1,000 aerial tankers, 400 of them jet-powered KC-135s. In contrast, the intercontinental missile force totaled just 30 Snarks and 12 Atlases. According to David Alan Rosenberg's essay, "The Origins of Overkill," printed in 1983 when he was affiliated with the University of Houston, the United States, assuming adequate warning, could have retaliated in 1960 with 3,500 nuclear weapons, destroying 1,050 targets from eastern Europe to the coast of China. His declassified research into official records further revealed that the Strategic Air Command's alert force, consisting of 880 vehicles (almost all bombers), could have deposited 1,400 weapons, totaling 2,100 megatons, on 650 targets. In maintaining this deterrent, the command operated 66 bases, 20 of them overseas. In terms of bases, weapons, targeting, and assigned personnel, the Strategic Air Command reflected the nation's dedication to a policy of nuclear deterrence.

During the decade of the 1950s, beginning in the Truman years and continuing through the Eisenhower Presidency, the Strategic Air Command turned back a number of challenges to its dominant position in American military planning. It had dispersed its aircraft and established an alert force after learning how vulnerable its bases were to surprise attack. It survived the threat that Air Force appropriations might be diverted from the deterrent force to air defense. Finally, as the Eisenhower years ended, it countered the Navy's arguments for finite deterrence, retaining the support of a Chief Executive disturbed by the expense of an expanding retaliatory force.

Using the development of Polaris as the occasion for action, Eisenhower tried unsuccessfully to impose order and economy upon a strategic force that he found chaotic in its planning, far larger than its Soviet counterpart, and costly in its upkeep. Yet, so important was the Strategic Air Command to the fate of the nation that arbitrary reforms seemed unwise; the best he could achieve was the creation of a planning group nominally of joint composition but actually dominated by General Power's officers. As it had when he took office, the war plan for a nuclear conflict still called for hitting the enemy with everything available in a vastly expanded arsenal.

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The nuclear deterrent that would carry out the war plan was becoming increasingly dependent upon a new breed of officer who supervised the development and deployment of weapons for the Strategic Air Command. General of the Army Henry H. "Hap" Arnold, Commanding General of the Army Air Forces during World War II and in the months immediately afterward, had foreseen this change. In what could be called his farewell to the Army Air Forces, he had suggested that in the independent air force of the future the scientist might prove as important as the pilot. Scientists and engineers did achieve a greater prominence in the early years of the U.S. Air Force, but pilots, who understandably emphasized air operations, continued to direct the organization and flying remained the reason for its existence. Nevertheless, a number of officers achieved high rank and exercised great authority less because of their flying skill than because of their technical or scientific training, which enabled them to manage the research or engineering projects that were becoming increasingly important in an age of technological innovation.

During the 1950s two figures emerged who embodied the best characteristics of the pilot as operator and pilot as manager; they were Generals LeMay and Schriever, two officers with different talents and interests who contributed to the emergence of the Strategic Air Command as the nation's main deterrent to nuclear war. LeMay, for instance, deprecated his brief involvement in research and development and summed up his career by stating that he had performed most of his duty in operations and command, with a few unpleasant tours in the Pentagon. In contrast, Schriever, a veteran of 63 bomber missions in the Pacific in World War II, dominated Air Force research and development for more than a decade, taking over the ballistic missile program, reorganizing it, and setting up the management procedures that produced and deployed the first operational weapons by the end of the 1960s.

LeMay, who detested public speaking and had no flair for small talk, normally wore a grim expression, a result in part of Bell's palsy, a deadening of the facial nerves, caused by flying for long, tense hours at high altitudes in the cold and drafty cockpit of the B-17 in World War II. Reticent by nature, he could spend the better part of an afternoon with a close friend and never utter a word. When he did speak, he could be blunt, even tactless, as he had as a young lieutenant—passing up the chance for harmless flattery, he answered the question of a member of a visiting Canadian aerobatic team by declaring that their elderly airplanes were "lousy" compared with newer American models. Despite his appearance and attitude, LeMay had a genuine concern for those he commanded. Determined that they go fully prepared into combat, he was stern and demanding, but in 1942 he tried to help the young crewmen assigned him deal with their fears, flying with them on dangerous missions and urging them to accept the mathematical likelihood of sudden death. After the war, as demonstrated by his emphasis on military recreation and housing, he showed a strong commitment to the welfare of the officers and men of the Strategic Air Command.

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LeMay proved himself a brilliant tactician, improvising if he had to, as when he massed his B-17s in large, unwieldy formations to compensate with massed firepower for the lack of escort fighters, or when he abandoned high-altitude precision bombing to level Japanese cities with fire bombs scattered from low altitude by night. Moreover, he was an inspirational leader. During the fighting in Europe, he took part in the first raid against a target in Germany—the bombing of the naval yard at Wilhelmshaven on January 27, 1943—and led the long-range strike against the aircraft factories at Regensburg, delivered on August 17 of that year in conjunction with the bombing of the ball bearing plants at Schweinfurt. Later, he flew with B-29s based in China that attacked the steel mill at Anshan in Japanese-occupied Manchuria. In operations as well as conversation, LeMay was inseparable from his organization, whether the 305th Bombardment Wing in the European Theater of Operations or the postwar Strategic Air Command; it was never “I,” as he told his biographer, Thomas Coffey, it was always “we.”

General Schriever, commissioned like LeMay from the Reserve Officers' Training Corps, held a degree in architectural engineering from Texas A&M, whereas LeMay's was in civil engineering from Ohio State University. After graduation, Schriever accepted a reserve commission in the field artillery, but transferred to the Air Corps after completing flight training. Following two tours of duty as a reserve officer, he flew briefly for an airline before applying successfully for a regular commission in 1938. Assigned to Wright Field during the following year, he served as a test pilot, completed the one-year course at the Air Corps Engineering School, and was sent to Stanford University where he earned a master's degree in aeronautical engineering. When he graduated in June 1942, six months after the Japanese attack on Pearl Harbor, his training, plus his earlier experience flying the B-18 bomber, resulted in his assignment as an engineering officer to a bombardment group in the Pacific.

While a colonel in the postwar Army Air Forces, his duties at headquarters brought him into contact with von Kármán, a scientific adviser to the air arm during the war and afterward, who introduced him to the principal aeronautical engineers and scientists of the day. Then in his mid-30s, Schriever became the leader of a group of younger officers with backgrounds in engineering who believed that the Air Forces and later the independent Air Force should engage more actively in scientific research as a means of developing new weapons. He believed in meeting the needs of military aviation by pushing technology beyond its existing limits instead of waiting for discoveries or new techniques and applying them to specific military requirements, but he approached this task with the skills of the manager rather than those of the scientist or aeronautical engineer. Intense, yet calm in time of crisis, he seldom displayed emotion; instead he quietly inspired others to accept his views. He often expressed a fear of “paralysis by analysis” and sought to avoid successive layers of management, preferring to assume responsibility rather than share it with review panels.

## **History of the United States Air Force**

As Arnold predicted, science and technology, important in the days of the Air Service when civilians like Alfred Verville and officers like Virginius Clark had exercised their talents as aeronautical engineers, became even more valuable to the modern Air Force. However, the engineer in uniform was being replaced by the manager, competent in his field and aware of the latest developments but entrusting technical duties to contractors and their employees. The day has passed when an officer like Col. Carl Greene could personally calculate the reinforcement needed for the overly fragile wing of a bomber, as he did for the Martin B-10. Engineering has grown too demanding a specialty and its tools too complex for other than a team approach managed by an officer like Schriever.

Schriever and LeMay complemented one another. LeMay, who became Chief of Staff, was the operator; he organized, trained, and deployed a force of nuclear-armed bombers capable of destroying targets anywhere in the world. Schriever, who retired as a four-star general in charge of the development and procurement of weapons for the Air Force, was the manager; he provided the deterrent force with a new weapon for keeping the peace, the intercontinental ballistic missile. Given the critical place of the Strategic Air Command in the strategy of deterrence, it is no surprise that they should have focused their very different abilities on that organization.

## Chapter 15

# The Air Force as an Institution

Walton S. Moody  
Warren A. Trest

**I**n the eight years he was President, Dwight D. Eisenhower's successes and failures in the field of national defense, along with his basic military policy, determined much of the institutional makeup and activities of the Air Force. Although failing to bring true interservice collaboration to the drafting of plans for nuclear war and unable to achieve genuine mastery over the defense budget, Eisenhower did change the way in which the defense establishment functioned. Not only did he make greater use of the National Security Council, he oversaw two reorganizations of the Department of Defense that had the cumulative effect of greatly strengthening civilian control by the Secretary of Defense over the nation's armed forces.

Eisenhower inherited his problems with defense expenditures from the previous administration. Beginning in 1952, during the last year of the Presidency of Harry S. Truman, the Joint Chiefs of Staff were supposed to agree annually on a Joint Strategic Objectives Plan to serve as the basis for the defense budget, but the system broke down at the outset. No one service would volunteer for reductions in programs that it considered vital so that another service might prosper. As a result, each submitted its own budget request, and these inevitably added up

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to more than the administration believed it could spend, so that the Secretary of Defense had to sit down with the service leadership and hammer out a compromise. After his reelection in 1956, Eisenhower established a ceiling and allowed the Joint Chiefs of Staff to apportion that amount, a practice that resulted in bitter quarrels over the development of ballistic missiles and the choice between nuclear and conventional forces. The Air Force tended to win these struggles at the expense of the Army, largely because of the primacy of the Strategic Air Command in the national strategy of deterrence. Just as planning for nuclear retaliation resisted interservice cooperation, so too did the making of a budget.

Eisenhower's first inaugural address in January 1953 included a pledge to endow the National Security Council with "the vitality to perform its statutory role." This promise was vague indeed, for the National Security Act of 1947, as amended two years later, merely stated, "The function of the Council shall be to advise the President with respect to the integration of domestic, foreign, and military policies relating to the national security so as to enable the military services and the other departments and agencies of the Government to cooperate more effectively in matters involving the national security."<sup>1</sup> While Army Chief of Staff and de facto Chairman of the Joint Chiefs of Staff during the Truman Presidency, Eisenhower had seen the National Security Council in action and come away convinced that the organization had not achieved its full potential. His predecessor in the White House seemed wary of the council, possibly looking on it, until the outbreak of war in Korea, as an attempt to limit the authority of the Commander in Chief and did not attend meetings regularly. Nevertheless, a product of the council, NSC-68, formed the foundation of the Truman administration's military policy of containment and deterrence after 1950.

As Chief Executive, Eisenhower intended to use the National Security Council to discuss and recommend policy, in the process providing alternatives



President and Mrs.  
Eisenhower leave their  
plane at National Airport,  
Washington, D.C.

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and seeking a consensus but avoiding meaningless compromise. Better, the new President believed, to be presented with honest differences sharply defined than to receive a recommendation that in its blandness offended none of the agencies whose representatives had framed it. To accomplish his purposes, he had some leeway under the law. Besides the permanent members listed in the amended statute—the President, the Vice President, the Secretary of State, the Secretary of Defense, and the Chairman of the National Security Resources Board—Eisenhower might appoint any cabinet secretary or under secretary, the head of any major agency of the executive branch, the secretaries or under secretaries of the military departments, the Chairman of the Munitions Board, or the Chairman of the Research and Development Board. The President added the Secretary of the Treasury and the Director of the Budget, who would apprise the National Security Council and the President of the financial burden of recommended policies, and the Director of the U.S. Information Agency, whose task it was to project abroad a favorable image of the United States, its diplomatic initiatives, and its military programs.

Despite the presence of three new members, the Chief Executive kept the National Security Council at what he considered a manageable size, about a dozen members, plus staff and advisers, so that sessions resembled what Robert Cutler, a consultant to the council during the Truman years and later Eisenhower's Special Assistant for National Security, described as a "pow wow." To maintain a sharp focus on the issues during meetings of the group, a National Security Council Planning Board, consisting of senior officers of each participating agency, established an agenda that offered succinct explanations of conflicting views regarding a course of action. If the full council, with the President or Vice President presiding, had debated a question without resolving it, Eisenhower might confer privately with the members who championed the opposing views before making a decision.

To make sure that the President's decisions were carried out, Eisenhower also increased the responsibilities of the National Security Council's Operations Coordinating Board, patterned after a similar body that had been used sparingly by the Truman administration. In effect, the coordinating board enabled the Special Assistant for National Security to ensure that agency plans to implement a Presidential decision were kept active, updated as necessary, and not filed and forgotten. The board and the special assistant did not, however, oversee the actual implementation of these plans.

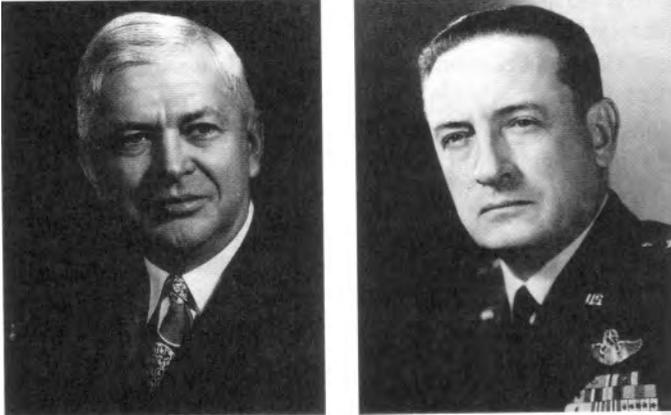
Besides pledging in the speech that set the tone for his first administration to overhaul the structure and function of the National Security Council, President Eisenhower had promised during his 1952 campaign for office to scrutinize the workings of the Department of Defense. In honoring this commitment, he pruned away some boards that cluttered the lines of authority and responsibility, acting on the conclusions of a panel on reorganization commissioned by Secretary of Defense Charles E. Wilson and headed by Nelson Rockefeller, who

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was a veteran of several diplomatic and advisory posts in the federal government and had a strong interest in national defense. The panel's report inspired a reorganization plan that Congress accepted in the summer of 1953. The more notable casualties of the plan were the Munitions Board and the Research and Development Board, both established by the National Security Act of 1947. The Rockefeller study concluded that the boards no longer performed the work intended, but served instead as mere forums for interservice debate. The reorganization assigned their responsibilities, and certain other duties, to six new civilian assistant secretaries of defense. These assistants reported directly to the Secretary of Defense, an arrangement that strengthened his authority, as did the decision to make the unified and specified commands responsible through the service secretaries to the Secretary of Defense. During a war or emergency, however, the civilian secretaries of the armed services could be replaced in the chain of command by the uniformed chief, the Air Force Chief of Staff, for instance, taking over from the Secretary of the Air Force. The uniformed service chief would thus direct the combat operations of a unified or specified command under the overall guidance of the Secretary of Defense and the Commander in Chief.

Although the Air Force as an institution supported the concentration of power in the hands of the Secretary of Defense, former Secretary of the Air Force Thomas K. Finletter warned that the reforms championed by President Eisenhower would result in a monolithic defense establishment that might prove hostile to air power, assigning parity among the services instead of treating the Army and Navy as auxiliaries of the air arm, which Finletter believed they were. The leviathan that Finletter opposed did not emerge as a result of the 1953 reorganization; indeed, concern persisted about the lack of coordination within the defense structure. As early as January 1957, Democratic Senator W. Stuart Symington of Missouri, another former Secretary of the Air Force, warned of "duplication, even triplification, among the three services in the development and production of missiles"; the launching of Sputnik later that year dramatically validated his complaint. Retired Lt. Gen. Elwood R. Quesada and Gen. Thomas D. White, who became Chief of Staff in the summer of 1957, joined former Secretary Finletter and others in arguing for the elimination of barriers between the services and even for the creation of a single service with one chief of staff. Radical reform of this sort—one service with a single chief of staff, which Secretary of Defense Wilson branded as a "dangerous thing" that would "risk military dictatorship"—had no real chance of adoption, but support for further centralizing authority in the hands of the Secretary of Defense gathered momentum until 1958.<sup>2</sup>

In 1958, the name of Rockefeller was once again associated with defense reform. A foundation supported by the family, at the time perhaps the wealthiest in the United States, produced a report charging that the Joint Chiefs of Staff, who, after all, were service chiefs as well as advisers to the Secretary of



Charles E. Wilson (left), Secretary of Defense, January 1953–October 1957, and Gen. Thomas D. White, Air Force Chief of Staff, July 1957–June 1961.

Defense, put parochial interests first in matters of strategy and weapons development. To correct this, the report recommended a further strengthening of the powers of the Secretary of Defense, especially in weapons development and procurement, and the designation of the Chairman of the Joint Chiefs of Staff, rather than the Joint Chiefs as a corporate entity, as the principal military adviser to the Secretary of Defense and the President. The objections of the Navy, which saw in this proposal the danger of a single chief of staff who might be either a figurehead or a tyrant, did not dissuade Eisenhower from appointing a committee, with Rockefeller among its members, to examine the subject of defense reorganization. Out of its deliberations came a plan, adopted in 1958, that increased the authority of the Secretary of Defense over both military operations and research and development.

Wary though he was of centralizing power, Eisenhower believed firmly in civilian control over the armed forces and came to agree with the panel that the three service secretaries, because of the narrow interests they represented, were obstacles to, rather than agents of, civilian authority. Consequently, the latest reorganization deprived the service secretaries of their operational role, instead making them administrators, spokesmen, and managers for their departments. The unified and specified commands continued to conduct actual operations, but authority now passed from the President and the Secretary of Defense through the Joint Chiefs of Staff to the unified and specified commands. This change meant, in effect, that the Department of the Air Force would recruit, train, equip, supply, and otherwise sustain the combat forces of the unified and specified commands, which took their orders from the Joint Chiefs of Staff acting for the Secretary of Defense and the President. The Chairman of the Joint

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Chiefs of Staff did not emerge as the sole military adviser to the Chief Executive and the Secretary of Defense, as the Navy feared, but his active participation in the deliberations and decisions of the Joint Chiefs was ensured.

Balancing his strengthening of the control exercised by the Secretary of Defense against his failure to win the battle of the budget, Eisenhower remained troubled by the “conjunction of an immense military establishment and a large arms industry,” a conflux of power that he believed “affected the very structure of society.” Therefore, as he was leaving office in 1961, he warned of the “acquisition of unwarranted influence, whether sought or unsought, by the military-industrial complex.”<sup>3</sup> His main concern clearly was the impact of the congruent interests of the armed forces and the armaments industry on the federal budget, for defense expenditures remained a fiercely contested battleground, with the Secretary of Defense trying to impose the will of the administration on the services.

The Air Force anticipated the budgetary struggle that characterized the transition from war to peace at the outset of the Eisenhower administration. As early as August 1952, the leadership of the Air Force prepared for an end to the fighting in Korea and the struggle for reduced appropriations that seemed certain to follow. Secretary of the Air Force Finletter; Roswell L. Gilpatric, the Under Secretary of the Air Force; Gen. Nathan F. Twining, the Vice Chief of Staff; and Lt. Gen. Laurence S. Kuter, the Deputy Chief of Staff, Personnel, conferred at Finletter’s summer home in Bar Harbor, Maine, to plan the expansion of the Air Force to 143 wings, which President Truman’s final budget, for fiscal 1954, would authorize but not fully fund. Absent was Gen. Hoyt S. Vandenberg, the Air Force Chief of Staff, who had just undergone surgery for cancer. These men believed that, after the fighting ended, the deterrent force would remain the heart of the new Air Force, indeed, of the entire military establishment; everything nonessential would be eliminated, including much of the ground and sea forces employed during the Korean conflict. The pillars of American security would be the Strategic Air Command, suitable forces (including tactical aviation) for the North Atlantic Treaty Organization, and the air defenses of the United States—striking testimony to the trust these men placed in air power. Finletter and the others believed that a defense establishment based on air power would cost roughly \$34.5 billion annually. Since the proposal so heavily favored aviation, Kuter cautioned against giving the impression in selling the program that “the Air Force is feeling its oats.”<sup>4</sup> Actually, high-pressure salesmanship proved unnecessary, for the Eisenhower administration eagerly embraced air power as a deterrent to war. The Air Force fell just six wings short of the 143 wings it desired, and it typically received about 40 percent of an annual defense budget averaging \$40 billion during the Eisenhower Presidency.

The postwar competition for money pitted the Air Force and the Strategic Air Command against the Army and, to a lesser extent, the Navy, which succeeded in strengthening its force of aircraft carriers and, after the development of com-

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pact nuclear bombs, succeeded in preparing carrier-based airplanes to deliver them, at least against targets related to naval warfare. Within the Air Force, the natural rival of the Strategic Air Command was the Tactical Air Command. During the decade, the two organizations came to share the nuclear mission, though not always harmoniously.

The use of nuclear weapons by the Tactical Air Command had a logic all its own; smaller nuclear bombs were becoming available, and the numerical advantage enjoyed by the armies of the Soviet Union and its European satellites required the use of the deadliest possible firepower to defend the nations of western Europe. Since the Strategic Air Command was preoccupied with large bombs and retaliation against distant targets, the Tactical Air Command began filling the need for nuclear firepower on the potential battlegrounds of Europe. As early as 1951, a small force of F-84G fighters and B-45 light bombers experimented with the tactics of dropping atomic bombs from comparatively low altitude. Out of these tests came toss-bombing, a technique of approaching at low altitude, climbing abruptly, releasing the bomb so that it would be lofted toward the target, and turning sharply away. In November of that year, Gen. John K. Cannon, who had commanded the Twelfth Air Force during the advance from the Mediterranean beaches of France into Germany and now headed the Tactical Air Command, created the 49th Air Division for the express purpose of impeding with nuclear attacks an enemy advance toward the English Channel. In the spring of 1952, Col. John D. Stevenson, who had taken part in planning for tactical nuclear warfare while on the Air Staff, arrived with the air division at Sculthorpe in England to assume this new and potentially vital mission.

The assignment of targets to nuclear-armed aircraft of two different commands, the Strategic Air Command and an overseas command like U.S. Air Forces in Europe, which employed forces trained by the Tactical Air Command, raised the possibility of duplication. Consequently, Gen. Curtis E. LeMay, the Commanding General, Strategic Air Command, during 1952 established two coordination centers, SAC Zebra in Europe and SAC X-Ray in the Pacific. Created at a time when the atomic stockpile had just begun to grow, these agencies and similar ones in other geographic commands ensured that theater and strategic nuclear forces would attack complementary targets and not duplicate their efforts. The coordinating centers survived into an era of atomic plenty, but were disbanded in 1961 with the advent of centralized joint strategic target planning.

The idea that efficient targeting could be guaranteed if all atomic operations were vested in a single command also surfaced in the early 1950s. Deputy Commanding General of the Tactical Air Force's Ninth Air Force, Brig. Gen. James Ferguson, who had served under General Quesada during the battle for France in 1944, suggested in 1953 that the kind of air support that nine years earlier had helped Gen. Omar Bradley's ground forces advance from Normandy eastward was no longer important. Tactical aviation, Ferguson now believed,

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Gen. Otto P. Weyland,  
Commander, Tactical Air Command,  
May 1954–July 1959.

should not serve as mere “long-range artillery” when it might “play an important role in the strategic mission.” After stepping down as Secretary of the Air Force, Finletter proposed that all forces capable of waging atomic warfare be grouped in a single command that might be called the “Strategic-Tactical Air Command.”<sup>5</sup> Gen. Otto P. Weyland, who in 1954 succeeded Cannon as commander of the Tactical Air Command, disagreed with the kind of fusion that Ferguson hinted at and Finletter suggested. During 1944, Weyland’s airmen supported Patton’s drive across France, and this experience convinced him that air power formed a single arc, with strategic operations against factories at one end and the strafing of hostile troops by fighter-bombers at the other. Each kind of activity reinforced the effect of the others, and the fact that strategic and tactical operations might at times overlap caused him no concern.

Pleased, perhaps, that his Strategic Air Command was rid of the mission of impeding a ground offensive against western Europe, General LeMay did not at first oppose the idea of a Tactical Air Command armed with nuclear weapons, despite his lack of enthusiasm for the aerial support of ground forces, the traditional mission of such an organization. As he saw it, the Air Force had the resources to “afford the luxury of devoting a substantial part of our . . . effort to the support of ground forces.” Although willing to accept the use of nuclear weapons by tactical air forces, he felt that supporting the ground forces was less essential to national survival than strategic operations and should not detract from the effectiveness of the Strategic Air Command. LeMay’s willingness to accept a Tactical Air Command armed with atomic bombs would change, however. When he sensed the possible erosion of retaliatory striking power, he sought a monopoly over the use of nuclear weapons in the Air Force. During 1953, therefore, the Strategic Air Command, after converting its escort-fighter wings to strategic fighter units, began training the pilots to drop nuclear bombs, an arrangement that prevailed until the fall of 1957 when the fighter units were disbanded. Citing the increase in the Soviet Union’s stockpile of nuclear

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weapons and the growth of the striking force capable of delivering them, LeMay by 1956 was arguing that all offensive air power, whether labeled strategic or tactical, should be combined to prevent "the launching of weapons of mass destruction against the United States or its Allies." This mission, he maintained, "transcends all other considerations because the price of failure may be paid with national survival."<sup>6</sup> For LeMay, the decision of Secretary of Defense Wilson to limit the Army to the development of missiles with a range of no more than 250 miles was not the restriction Army officers claimed it to be, but an opportunity to develop missiles suitable for battlefield support and interdiction, thus freeing the Air Force to concentrate its offensive aircraft for purposes of deterrence or retaliation.

LeMay's proposal to combine the Strategic and Tactical Air Commands into what he called an "Air Offensive Command" might conceivably have restricted the Air Force to strategic attack and long-range interdiction and thus resulted in the Army's assuming full responsibility for close air support, but his viewpoint did not prevail.<sup>7</sup> Even so the survival of the Tactical Air Command was not assured until a November 1957 meeting of the Chief of Staff, General White, with several of his commanders and advisers, both active and retired general officers. The decision came at a time of financial crisis. Earlier in the year, a number of development projects had reached fruition at about the same time, causing the Air Force to exceed planned spending for weapons procurement; but a debt ceiling imposed by Congress on the government as a whole precluded any hope of a supplemental appropriation. To ease the crisis, the Air Force delayed the granting of contracts, deferred purchases, fired civilian employees, and slowed recruiting. In the autumn, however, another threat to the budget arose; Sputnik raised the possibility of a large investment in missiles and missile warning, but President Eisenhower made it clear he would consider the matter carefully before asking Congress for more money to offset the Soviet accomplishment in rocketry. Until the President made up his mind or an alarmed Congress forced his hand, austerity would remain the watchword. Consequently, those attending the conference called by General White concentrated on dividing the available money and ignored questions of duplication in the missions of the commands. Considerations of what the Tactical Air Command could do in comparison to the Strategic Air Command or whether Weyland's organization had a local war mission comparable in importance to the role of the other command in general warfare took a back seat to the apportioning of budget cuts, with LeMay, now the Vice Chief of Staff, arguing that the Tactical Air Command should absorb the largest cut. General White settled matters when he announced that Weyland's command would not be starved of funds and that the Air Force would not allow the mission of air support in local or peripheral conflicts to pass by default to the Army. Despite the implication in White's decision that the Strategic Air Command would suffer its share of reductions, the only loss during 1957 consisted of 200 civilian jobs, while the organization's overall manpower was

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increasing by almost eight percent; moreover, during 1958, with an infusion of new funds, civilian employment within the Strategic Air Command increased by about 500 persons and total manpower increased by 10 percent.

Weyland succeeded in preserving an independent tactical organization by convincing General White of the versatility of the fighter-bomber in attacking troops, their bases, their supply lines, and the roads and railways over which they traveled—operations necessary in either a general war or in a conflict on the periphery of the Sino-Soviet bloc (as the alignment of communist states was then perceived) that did not bring the major powers into direct confrontation. To deter or, if necessary, fight a peripheral or limited war, Weyland devised the composite air strike force, which could deploy rapidly to any trouble spot in the world and reinforce America's allies. Such a strike force, tailored to a specific crisis, would consist of an appropriate combination of fighter-bombers, aerial tankers to refuel them, and tactical transports carrying spare parts, communications equipment, and support personnel. Weyland doubted, however, that limited war would be fought exclusively with conventional weapons; thus the fighter-bomber pilots of the composite air strike forces trained to use nuclear weapons in the event the crisis and the consequences of defeat justified such a course.

The composite air strike force was designed expressly for emergencies. In normal circumstances the Tactical Air Command provided trained squadrons for theater air forces, principally the Pacific Air Forces and the U.S. Air Forces in Europe. The theater forces bore the day-to-day responsibility for seizing and maintaining air superiority and supporting surface forces in the event of general or limited war. Here, too, the new battlefield nuclear weapons available to the composite air strike forces promised to be useful, if not essential. Few, if any, senior Air Force leaders believed that a local clash along the borders of the North Atlantic Treaty Organization, though it might begin with conventional armaments, would fail to escalate into nuclear war.

Missiles as well as aircraft contributed to the atomic striking power of the Tactical Air Command. The Martin Matador, first tested in 1949, was a winged missile powered by a turbojet engine and launched from a truck with the aid of a solid-fuel booster. Guided by radio signals from the ground and capable of delivering a high-explosive or nuclear warhead over a distance of 600 miles, the Matador attained a speed of 650 miles per hour on a trajectory that carried it to an altitude of 60,000 feet. An improved version, the Mace, entered service as the 1950s ended and was phased out after a decade.

Although overshadowed by the power of atomic weapons and the possibly dramatic use of the composite air strike force, tactical airlift, another responsibility of the Tactical Air Command, remained essential to the Army's mobility. For several years, the leadership of the Army had complained that the airlift provided by the Air Force was inadequate. This criticism applied to the Tactical Air Command, insofar as it was responsible throughout the decade for airborne



Douglas C-124 Globemaster that carried French troops to Indochina.

training and operations and aerial deployments within a theater of operations, such as the flying of troops and cargo between Japan and South Korea during the Korean fighting. Until 1957, along with its other transports, the command had operated four-engine Douglas C-124s to fly special missions carrying troops anywhere in the world, as in 1954 when these huge transports had ferried reinforcements from France to Indochina, where French troops were fighting the communist Viet Minh.

The Military Air Transport Service acquired the Tactical Air Command's C-124s in 1957 and, as a result, shared the responsibility for any shortcomings in providing airlift for the Army. Prior to 1957, the difference between the airlift operations of the Tactical Air Command and the Military Air Transport Service had been based on distance and timing. Transports of the Tactical Air Command operated in the various theaters, supported training exercises, carried out emergency troop-carrying missions regardless of distance, and reinforced the other organization as necessary. The Military Air Transport Service functioned as a global air line, traveling long distances on a regular schedule, but also flying special missions for the President and other officials. Since it was essentially an airline, the Military Air Transport Service relied in time of emergency on the commercial carriers that belonged to the Civil Reserve Air Fleet for additional aircraft, some fitted out for easy conversion from passenger to cargo service. In actual practice, the difference between tactical airlift and global air service tended to blur, in part because the Civil Reserve Air Fleet proved undependable at best. During periods of peak travel, the commercial airlines refused to lease their equipment to the government; and even at slack times, they were reluctant to expose their aircraft and crews to danger. As a result, transports of the Tactical Air Command at times had to take over regularly scheduled

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routes to free those of the Military Air Transport Service for emergency missions. Conversely, during the Berlin airlift of 1948, the Military Air Transport Service employed its larger aircraft when the task of supplying the city became too great for the tactical airlift in the theater.

During 1957, a reshuffling of responsibilities occurred. The Military Air Transport Service took over all C-124s and with them the responsibility for flying men and cargo from the United States overseas. With no large aircraft, the Tactical Air Command continued to conduct airlift operations within the overseas theaters and to provide support for airborne training and operations. Under the new arrangement, the Military Air Transport Service used its newly acquired C-124s to deliver bulk cargo or large numbers of troops that had been carried by the other command. The Tactical Air Command now flew three basic kinds of transports: the twin-engine, twin-boom Fairchild C-119, which verged on obsolescence; the twin-engine Fairchild C-123, which had limited range and cargo capacity; and the Lockheed C-130, which was proving to be an excellent aircraft with range enough to support the composite air strike forces and a spacious cargo compartment easily loaded through doors at the rear.

The acquisition of the C-124s by the Military Air Transport Service alarmed General Weyland, who believed the change would jeopardize his command's ability to meet the needs of the Army, but the transfer stood. His successor, Gen. Frank F. "Hank" Everest had no choice but to accept the reapportionment of equipment, and, as the principal contact with the Army on matters of airborne training and aerial deployment, he faced the task of demonstrating before a congressional subcommittee that the Air Force could provide the 1,200 tactical transports the Army said it needed. He did so, but only by counting 48 C-130s that had not yet been delivered and 720 old C-119s assigned to reserve units. The subcommittee chairman, Representative L. Mendel Rivers, a Democrat from South Carolina, concluded that both global and tactical airlift needed modernization, but the actual acquisition of new aircraft did not occur until John F. Kennedy became President.

Even as the issue of obsolescent equipment arose, the Air Force participated with the Army in a joint exercise that demonstrated the need for new transports. In conjunction with the Continental Army Command, the Military Air Transport Service conducted its most ambitious peacetime strategic airlift, Exercise Big Slam/Puerto Pine, from March 14 to 18, 1960. A primary purpose was to learn whether the command could greatly increase its peacetime aircraft utilization rate. The airlift force flew 50,496 hours, carrying 21,095 troops and 10,949 tons of equipment from the United States to Puerto Rico. The daily utilization rate rose from 2.5 hours per aircraft per day for troop carriers and almost five hours for cargo craft to an average of 7.5 hours each day for all transports. The exercise demonstrated that the Military Air Transport Service could conduct a large-scale operation on schedule despite poor weather. Although this was a relatively short-distance deployment and only about one-third of the organizational equip-



The propellor tips of this early model C-130A leave contrails in the damp air as it takes off.

ment was delivered by air, Big Slam/Puerto Pine also revealed the weaknesses of the command's transports—lack of speed, range, and carrying capacity.

Throughout the 1950s, components of the Military Air Transport Service handled several functions important to the success of the Air Force and directly or indirectly related to airlift. The Air Weather Service, which provided meteorological data for the Army as well as the Air Force, established weather centers for the major Air Force commands and operated some 300 weather stations, 24 mobile weather teams capable of deploying with Army or Air Force units, and seven aerial reconnaissance squadrons that performed such varied tasks as tracking hurricanes and collecting air samples that might contain debris from Soviet or Chinese nuclear tests. The Air Rescue Service conducted search and rescue missions on land or at sea, recovering crew members and passengers from crashed military or civilian aircraft and assisting the victims of accidents or natural disasters. A third component, the Air Photographic and Charting Service, prepared charts and photo mosaics and also produced and stored motion pictures and still photography. The Aerospace Cartographic and Geodetic Service assumed the map-making functions in the 1960s, until it was disbanded in 1972 and its functions absorbed by the new Defense Mapping Agency. The Aerospace Audio-Visual (later Audiovisual) Service remained a part of the Military Airlift Command, exercising responsibility for producing and storing all film and recordings. Finally, the Airways and Air Communications Service (which in 1961 became the Air Force Communications Service, an independent command) established and operated control towers, navigation aids, and communications networks.

Like the division of responsibilities among the operational commands, and the even more basic matter of funding, manpower constituted an important issue throughout the 1950s. During World War II, the Army Air Forces peaked at an aggregate strength exceeding two million, only to plunge with the coming of in-

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An Air Weather Service WB-29.

dependence to a low of some 306,000 officers and men before rising on the eve of the Korean fighting to slightly more than 400,000. During the course of the hostilities in Korea, however, the Air Force more than doubled in size, increasing from 411,000 in June 1950 to more than 977,000 in the summer of 1953. Obtaining recruits for the enlisted force, which grew to a wartime maximum of almost 847,000, proved no real problem. Faced by draft calls for the Army and Marine Corps and the accompanying specter of service as frontline infantrymen, along with the possibility (though it never occurred) of an end to deferments for college students, tens of thousands enlisted in the Air Force for a period of three years, even though the draft required only two years of service.

The desperate need during the war was for experienced pilots and aircrews, and to obtain these the Air Force turned to the reserve components and to qualified officers assigned to nonflying duty within the service. This pool of veteran airmen proved essential to the wartime buildup, but a tiny minority, mostly reservists training to fly B-29s against targets in North Korea, sought to avoid the assignment by claiming to suffer from "fear of flying." Many in this group were combat veterans of World War II summoned from their families and promising careers, who believed they would not again have to face an enemy. In general, they had no interest in a military career and only wanted to return safely and resume their normal lives. At first the Air Force merely grounded those officers who sought to be relieved from flying but later, reacting at least in part to General LeMay's insistence on courts-martial, the service exacted the penalty of separation without an honorable discharge, which deprived the individuals of veterans' benefits for the abbreviated tour of duty. Adoption of this policy coincided with a decline in the number of officers claiming fear of flying, but the reduction may have stemmed not from disciplinary measures but from an end to involuntary recalls of reservists and widespread, if belated, realization that there were no guarantees against service in Korea.

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In all, some 200,000 reservists were recalled to active duty during the Korean War; of these, less than two-tenths of one percent claimed to suffer from fear of flying. During the Korean conflict, the Air Force mobilized 22 wings from the Air National Guard and 10 from the Air Force Reserve. The units remained on active duty for varying periods in the Far East, the United States, or Europe. Another 15 organizations from the Air Force Reserve were summoned to active duty and then deactivated after their officers and enlisted men had been reassigned as replacements. Members of organized units accounted for about half the total called up from the reserve components; the others were mobilized as individuals and assigned as needed after reporting for duty. Manpower shortages would have crippled a number of operational units had it not been for the influx of reservists; indeed, some B-29 units of the Bomber Command, Far East Air Forces, did not have a full complement of bombardiers and navigators until September 1950, more than 60 days after the outbreak of hostilities, when newly mobilized reservists arrived.

The wartime growth in manpower was accompanied by a corresponding increase in the number of wings the Air Force was authorized to form and equip. When North Korea invaded the South, the Air Force had 48 wings of combat aircraft, but before the summer was out, General Vandenberg, the Air Force Chief of Staff, was informally asking the Joint Chiefs of Staff to endorse expansion to 140 wings. When support for this number failed to materialize, he formally requested, in August 1950, 130 wings of fighters, bombers, and transports. Even this smaller goal was too much for the Joint Chiefs, who approved 95 wings—an increase of almost 98 percent—as part of a balanced enlargement for all the armed forces. In November 1951, however, President Truman approved the goal of expanding to 143 wings by mid-1955, but the projected 50 percent growth in the number of wings was to be accompanied by a gain in manpower of roughly 14 percent, from an authorized 1,061,000 to 1,210,000. To accomplish the feat of staffing many more units with just a few more men and women, the Air Force immediately cut back on support and administration, until it was manning the 95 wings with a force of just 973,500. By mid-1953 when the fighting in Korea ended, the Air Force was operating 106 wings, even though its manpower had grown by only 4,000 to 977,500.

By the fall of 1952, one year after Truman raised the possibility of building up to 143 wings, General Kuter, at the time the Deputy Chief of Staff, Personnel, concluded that the Air Force could not continue to expand without establishing a realistic ratio between manpower and units. Administrative and service activities would inevitably expand as the Air Force approached 143 wings, so that a force of this size could not possibly operate with the projected 1,216,000. He believed, moreover, that the Department of Defense, regardless of which party won the 1952 elections, would not underwrite the cost of an Air Force large enough to man and support 143 wings of combat aircraft. As Kuter expected, the Eisenhower administration, after taking office, cut the overall ob-

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Gen. Earl E. Partridge, Far East Air Forces commander, pins brigadier general stars on Benjamin O. Davis, Jr.

jective from 143 to 120 wings, but it promptly resumed the policy of more from less by approving 110 wings, an increase of four from the 106 already organized and manned, and a manpower goal of 960,000, a decrease of 17,500, with both objectives to be met by mid-1954. At the same time that uniformed manpower declined, the number of civilians employed by the Air Force was also reduced from a wartime peak of 302,000 to 298,600.

The refusal to link manpower ceilings to the number of authorized wings persisted. By the end of 1953, the Joint Chiefs of Staff had submitted, and the President approved, plans for an Air Force that by mid-1957 would consist of 137 wings but only 975,000 officers and enlisted personnel. Attempts to reach a strength of 975,000 were complicated by the release of many of the airmen who had enlisted during the Korean War and served their three years and by the transfer to the Army of the last group of soldiers, some 28,000, mostly engineers, who had been serving with the independent Air Force. Nevertheless, the Air Force reached the goal of 137 wings in 1957 before declining in size as costs collided with the ceiling of roughly \$40 billion that President Eisenhower hoped to impose on annual defense spending. The buildup to 137 wings required that civilians take over an increasing number of tasks from the military. After falling below 300,000 in 1954, the number of civilians employed by the Air Force exceeded 350,000 in 1956 and remained well above 300,000 for the balance of the

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decade. The Air Force made extensive use of civilians with technical, clerical, and administrative skills in a variety of assignments throughout the service.

Mere numbers of men and women were not enough, however; the Air Force had to use its manpower efficiently. The ending of racial segregation contributed to efficiency because military personnel could be trained and assigned according to the needs of the service rather than by reason of race. The wasteful duplication of facilities required by segregation ended, as did many of the problems of morale resulting from the restricted opportunities available to blacks for promotion, training, assignment, and even recreation. Despite the banning of segregation, racial integration was far from complete, for black airmen tended to be recent recruits concentrated in the lower grades, and there as yet were few black officers and pilots. In 1954, Benjamin O. Davis, Jr., a graduate of West Point and the pilot training program at Tuskegee Army Airfield and a veteran of aerial combat in World War II, became a brigadier general, the first black airman to hold that rank; he retired in 1970 as a lieutenant general.

The efficient use of manpower did not produce an intensified effort to enlist or commission women, who had been assigned since 1948 to the Women in the Air Force, an organization modeled on the Women's Army Corps of World War II. The Women's Armed Service Integration Act of that year had established the Women in the Air Force (nicknamed the WAF) as a permanent component of the Air Force, but until the Korean War it had remained a small organization that provided mainly clerical help. Between 1950 and 1953 the size of the WAF tripled from 5,000 to almost 16,000. From this peak in 1953, however, it declined steadily to 9,500 in the last year of the Eisenhower Presidency. In contrast, the actual strength of the Air Force, distinct from the authorized strength,



A WAF sergeant in the control tower, Bolling Air Force Base, 1951.

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moved downward by fits and starts, with only 1953 and 1957 showing an increase over the previous year.

The Air Force could not afford a rapid turnover of manpower, regardless of rank, race, or sex, within the ceilings that Congress was willing to fund. Technicians who worked on jet engines, radar, or other complicated equipment tended to be young men when they began learning their jobs, and by the time they were in their thirties they had not only attained peak proficiency but also had reached the highest possible pay grade. Many airmen in this situation left the Air Force for private industry, which paid well for their skills and did not require the frequent separation from family that proved so difficult for married airmen. Secretary of the Air Force Harold E. Talbott, who took office in February 1953, estimated that the loss of trained manpower was costing the service about \$2.5 billion a year, based on an average of \$14,000 to train a replacement for each of the 180,000 persons who did not reenlist. Secretary Talbott, after traveling some 70,000 miles visiting Air Force bases throughout the world in search of the cause of the poor retention rate, declared inadequate housing and low pay to be the critical factors and proposed corrective action. He argued that the pay of the enlisted force had fallen far behind wages in industry and pointed out that many airmen were still living in temporary barracks built during World War II and expected to last no more than five years. Some of these structures had survived for twice their planned lifetime and defied further repair.

By himself, the Secretary of the Air Force might not have been able to persuade Congress to vote the necessary money for higher pay and better housing, but all the services faced the problem of retention, forcing the Department of Defense to begin in 1954 to call for appropriate legislation to build new housing, raise pay and allowances (especially for junior officers and middle-grade enlisted personnel), and provide more extensive medical care for dependents. Improvements in Air Force housing appeared almost immediately; by June 30, 1955, contracts for some 1,100 family dwellings overseas had been awarded and 720 units had been completed. Until this first increment of 1,100 was completed and contracts negotiated for still others, more than 2,500 trailers were shipped to Europe and North Africa to serve as interim quarters. These reforms had the desired effect, for as they were implemented, the reenlistment rate rose steadily until, by the end of 1956, 47 percent of the Air Force enlisted ranks either reenlisted after a four-year tour of duty or accepted an early discharge after two years to reenlist.

Among the institutional activities of the Air Force that had a special effect on its personnel were those of the Air Force chaplains and the office of Inspector General. Besides offering counsel to individual servicemen and members of their families, the chaplain provided a channel of informal and anonymous communication between the organization and its commander, for without violating the trust of those who confided in him, he could offer insight into the morale and at-

## The Air Force as an Institution

Harold E. Talbott,  
Secretary of the Air Force,  
February 1953–August 1955.



titudes of a command. The Inspector General afforded a formal mechanism for the investigation of grievances and for their prompt redress, if grounded in fact.

Safety, security, and intelligence were also concerns of the Inspector General. During the 1950s, the rate of major aircraft accidents per 100,000 flying hours declined from 36 to 10 and the resulting fatalities from 14 to six. However, reducing the frequency of accidents on the ground proved more difficult. Although accidents involving civilian employees peaked at 136,000 in 1952 and declined markedly thereafter to 50,000 in 1959, accidents involving military personnel hovered around 90,000 annually throughout the decade. Nevertheless, the Air Force received an award from the National Safety Council for a sharp reduction in accidents, principally those involving civilians, that occurred in 1956. The Inspector General was responsible through the Provost Marshal for the security of installations and through the Office of Special Investigations for some forms of intelligence, counterintelligence, and the prevention of fraud and waste.

Less direct in its impact on morale and manpower, though critically important, was the work of the Comptroller. In his domain was the Director of the Budget, who prepared the annual request for appropriations and any requests for supplemental funds, submitted Air Force protests to adverse decisions within the Office of Secretary of Defense, and oversaw the expenditure of the funds that Congress made available. These functions of the Comptroller's organization kept the Air Force going, but far more visible to the average airman was another part of his operation, the Air Force Finance Center, which handled pay and allotments.

In its struggle with problems of manning and retention, the Regular Air Force turned increasingly to the reserve components—the Air National Guard and the Air Force Reserve—that had proved so valuable during the Korean emergency. Indeed, 23 of the 27 wings in the postwar Air National Guard were reequipped with interceptors and given mobilization assignments to the Air Defense Command. Even before the Korean fighting ended, Air National Guard units

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A Massachusetts Air National Guard F-86, Barnes Airport, 1963.

were standing alert at their normal bases as part of the force of interceptors defending the United States.

Some Air Force officers, among them General Kuter when he commanded the North American Air Defense Command and Lt. Gen. Joseph H. Atkinson of the Air Defense Command, preferred that the Regular Air Force assume the entire burden of air defense. General Atkinson did succeed in preventing the reserve components from operating the Bomarc anti-aircraft missile, which could carry a nuclear warhead. This weapon, developed by Boeing in conjunction with the University of Michigan (hence the acronym based on Boeing-Michigan Aeronautical Research Center), was entrusted exclusively to crews drawn from the Regular Air Force throughout the missile's period of service, which encompassed the 1960s. Sharing the air defense mission with the Air National Guard saved money. In the Eisenhower era of the New Look and the New New Look, which emphasized offensive forces, saving money in air defense allowed more money to be allotted to the Strategic Air Command. After 1961, when the threat from Soviet bombers seemed to recede in an age of missiles, so too did the proportion of the Air National Guard's resources devoted to air defense. Although not yet sharing as directly as the Air National Guard in the missions of the Regular Air Force, the Air Force Reserve emphasized readiness, intensifying training and culling out those officers and enlisted personnel who were not immediately available for mobilization. From the end of the Korean conflict until the close of the decade, the manpower of the reserve components increased rapidly, the Air National Guard growing from 35,000 to 70,000 and the Air Force Reserve from 240,000 to 550,000.

Closely related to manpower was training, and the sudden influx of recruits early in the Korean War overwhelmed the existing training facilities. At Lackland



Part of the tents set up to handle the overflow of recruits at Lackland Air Force Base in 1951.

Air Force Base, Texas, where new enlistees reported for basic training, 70,000 recruits inundated the base early in 1951, filling all available housing, and some 400 tents were set up for the overflow. Rumors of illness, desertion, and even suicides gained enough notoriety to inspire an investigation headed by Senator Lyndon B. Johnson, a Democrat from Texas. The inquiry concluded that the command structure at Lackland had made the best of a bad situation, but criticized the Air Force for accepting a greater volume of recruits than it could handle. Even as the panel headed by Senator Johnson was studying the situation, corrective measures eased the overcrowding. Lackland was redesignated a reception center so that new airmen could be sent elsewhere for training, temporary training centers were established in New York and California, and enlistments were suspended during the last two weeks of January 1951.

The task facing the Air Training Command during the 1950s was training the greatly expanded Air Force that had to fight the Korean War, maintain a nuclear deterrent, and strengthen the North Atlantic Treaty Organization. During the summer of 1950, after the initial rush to enlist had abated somewhat, the command set up the Flying Training Air Force, which trained pilots, navigators, and radar observers, and the Technical Training Air Force, which produced mechanics and other technicians. Initially, the Flying Training Air Force was expected to train complete aircrews, relieving the operational commands of this responsibility, but the sheer number of trainees made this impossible. Consequently, beginning in the spring of 1952, the Crew Training Air Force took over the courses, including gunnery and instrument flying, that converted a pilot and the other specialists assigned to his aircraft into a smoothly functioning team. Handling crew training separately from the combat commands resulted in competition between

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operators and trainers for aircraft, spare parts, and maintenance specialists, a situation that grew worse as new aircraft entered the inventory. The Air Force therefore decided that a B-52 crew, for instance, could best be trained as a team by the Strategic Air Command, and the Crew Training Air Force was dissolved in mid-1957. During the following year, to save money, both the Flying Training and Technical Training Air Forces were abolished and their responsibilities returned to the headquarters of the Air Training Command.

Meanwhile, the stabilization of the battlefield in Korea during 1951 had failed to ease the task of the Air Training Command, for the expansion to 95 wings and beyond was under way. From the end of the Korean conflict until 1956, shortly before the peak of 137 wings was reached, the Air Force trained some 7,200 new pilots each year. Navigators, radar operators, and other non-pilot flying officers presented a unique problem. Many were reservists who had been called to active duty during the Korean War and did not intend to remain in the service. Moreover, with rare exceptions, pilots tended to monopolize promotions and important assignments, which discouraged navigators and others who flew but were not pilots from making a career of the Air Force. Consequently, successive classes of these specialists had to be trained to replace those who left the service each year.

As in previous wars, the Air Force turned to industry for technical training during the Korean fighting, spending more money for that purpose in 1952 than in any year since World War II. Once the influx of recruits had been absorbed and trained, however, the Air Force could again rely on its own schools, spending as much as \$20,000 and two years to train a technician in one of the more demanding specialties like electronics or jet-engine repair. When those who had enlisted because of the Korean War began leaving the service, the technical schools could not produce the necessary replacements and the commands had to set up extensive programs of on-the-job training. To obtain the longest possible service from its enlisted technicians, the Air Force compressed to as little as four weeks the formal basic training that recruits received on entering the service and cut some technical courses by as much as 17 days.

Professional military education, concentrated throughout the decade in the Air University, functioned during the Korean War on a reduced scale. By the time of the armistice in 1953, the Air War College, the Air Command and Staff School (later College), and the Air Force Institute of Technology were returning to normal capacities, and engineering students who could not be accommodated at the Institute of Technology were studying at civilian schools. Also, the Air Force was attempting to raise the educational attainments of its officers, perhaps half of whom had entered the service during World War II without graduating from college, by encouraging enrollment at civilian colleges or universities.

The emphasis on professional education continued after the war. Beginning in September 1954, the Air University offered a full range of instruction rang-

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The central portion of the Air Force Academy, Colorado Springs, Colorado.

ing from the Squadron Officers' School for junior officers, through the Air Command and Staff College for midcareer officers, to the Air War College, the capstone of the system, for senior officers. The Air Force Institute of Technology, moreover, received its accreditation as a school of engineering authorized to grant the bachelor's degree; as a result, it was expected to play a major role in raising the educational level of the officer corps. Unfortunately, none of the programs undertaken to increase the number of officers with college degrees worked as planned, not even the Air Force Reserve Officer Training Corps. The Reserve Officer Training Corps did produce college-trained officers, but comparatively few proved to be interested in either flying or a military career. The retirement of officers commissioned without college degrees during World War II, insistence on a degree for admission to officer training programs, and the establishment of an Air Force Academy eventually resulted in a cadre of college-trained professional officers. The Air Force Academy, which opened its doors at Lowry Air Force Base, Colorado, in 1954, moved to a permanent site near Colorado Springs in 1958, shortly before the first class graduated. With its opening, the Air Force no longer had to depend on the Naval Academy at Annapolis, Maryland, or the Military Academy at West Point, New York, as the normal source of Regular second lieutenants.

The Air Force Reserve Officer Training Corps produced most uniformed lawyers serving in the office of the Judge Advocate General. When the legal department of the Air Force separated from the Army in 1949, it had fewer than 400 commissioned lawyers, a number that tripled during the decade as the organization became more involved in contracting, legal aid, and the review of court-martial cases. Although the Air Force Reserve Officer Training Corps made this expansion possible, the legal arm shared with the rest of the Air Force the problem of retaining officers commissioned from this source.

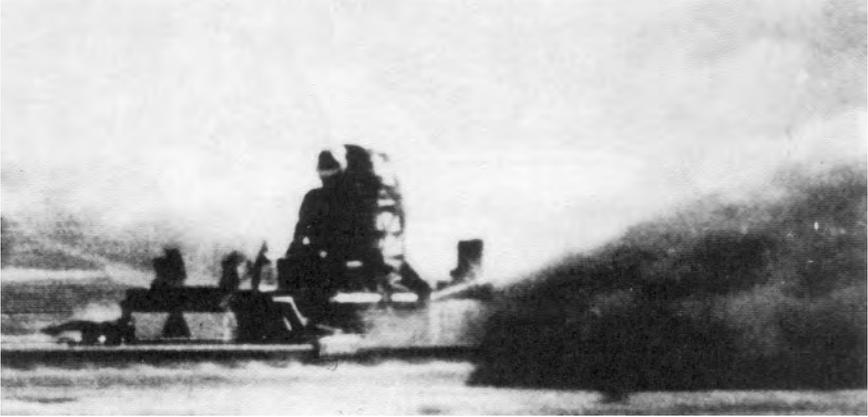
## History of the United States Air Force

Like the educational programs, the Medical Service of the Air Force underwent a reorientation during the 1950s. The second Surgeon General of the Air Force, Maj. Gen. Harry G. Armstrong, who succeeded Malcolm Grow in 1949 and served for five years, described the ideal aviation medical service as one “which is planned by air-minded doctors, . . . [is] geared to aeronautical operations, and . . . can be fitted into airplanes.”<sup>8</sup> Even during his tenure, this vision changed, for Air Force communities emerged on or near major bases, where the presence of families entitled to medical care imposed increasing demands upon the time and skills of Air Force doctors, nurses, dentists, and medical technicians. The trend was confirmed when Congress, as part of the reforms adopted to enhance the attractiveness of a military career, passed the Dependents' Medical Care Act of 1956, which made the Air Force a large-scale provider of community health care. By 1958, the Air Force Medical Service estimated that it was responsible for two million persons, including men and women in uniform, retirees, and dependents.

Expanded medical services required more professionals, but the Air Force had difficulty in attracting them. To help recruit doctors, the service offered cash bonuses, opportunities for research and specialization, and a variety of training courses. One measure for overcoming a shortage of nurses and technicians seemed little short of revolutionary at the time—men were accepted for these duties, previously largely reserved for women.

The increased emphasis on community health care did not end such normal medical activities as immunization, hygiene, aeromedical evacuation, and research. Indeed, research was especially important since aviation medicine stood at the threshold of space. Perhaps the most spectacular experiments were the deceleration studies conducted by Lt. Col. John Paul Stapp, who had himself strapped into a seat mounted on a rocket-propelled sled that hurtled down a set of rails and stopped suddenly in a trough of water. He gained insight into the forces encountered when ejecting from a jet aircraft or, although this was not his specific objective, when reentering the atmosphere in a spacecraft. Stapp's interest in space extended beyond the physiological effects of deceleration. While in charge of the Aeromedical Field Laboratory at Holloman Air Force Base, New Mexico, he helped revive high-altitude ballooning as a means to gather information on solar radiation, study the planets from beyond the earth's polluted envelope, and learn more about how humans functioned on the fringe of space.

The Army Air Corps had begun high-altitude ballooning in the 1920s, at first to reap the publicity from setting an absolute altitude record and later to advance scientific knowledge of the stratosphere, the spherical layer that embraces the earth between seven and 19 miles above the surface. In 1927, Capt. Hawthorne C. Gray, among the first to bridge the gap between publicity-seeking and science, ascended beyond 42,000 feet, only to die during his descent when his oxygen supply gave out. Seven years later, using a pressurized sphere supplied by



Lt. Col. John P. Stapp traveling over 600 mph in an open sled at Holloman Air Force Base, New Mexico, March 1953.

the National Geographic Society instead of the open basket that had carried Gray to his death, Capt. Albert Stevens, Maj. William E. Kepner, and Capt. Orvil A. Anderson reached 60,000 feet when their balloon began tearing. During a rapid descent, the balloon ripped open, but the three officers parachuted safely from the plunging capsule. In 1935, using new equipment, again with the cooperation of the National Geographic Society, Stevens and Anderson made scientific observations during an ascent that reached 72,395 feet, an altitude record that survived for 20 years.

With the space age about to dawn, Stapp was eager to return to the stratosphere, as was the Navy, which conducted a parallel series of experiments. After ascending in an open gondola, Capt. Joseph W. Kittinger of the Air Force parachuted from 76,000, 74,000, and 102,000 feet during 1959 and 1960 to determine the protection a pilot would need to eject from an aircraft at high altitude and survive. The tests were dangerous—two naval officers died in accidents related to launching or landing the huge plastic balloons, and Air Force 1st Lt. Clifton McClure had to be hospitalized after a flight in which he ascended to 80,000 feet and endured temperatures in excess of 150 degrees Fahrenheit for several hours when the insulation in his capsule failed.

Whether working with the Air Force Medical Service (as with Captain Kittinger's experiments) or with another agency, the Air Force Research and Development Command conducted applied research and developed weapons for the service. In most of its projects, the command functioned as a manager, working, for instance, with General Mills and the other firms that built balloons of mylar plastic for high-altitude research or with Bell Aircraft, builder of the X-1 rocket-powered aircraft in which Capt. Chuck Yeager became the first pilot to exceed the speed of sound.

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The Bell X-1, first manned aircraft to fly faster than the speed of sound.

The X-1 was one of a series of aircraft built and tested in collaboration with the manufacturer and the National Advisory Committee for Aeronautics, which was absorbed in 1958 by the National Aeronautics and Space Administration. Besides conducting research with supersonic aircraft, during the 1950s teams of military and civilian engineers and test pilots experimented with, among others, the Bell X-5 and its variable-sweep wing, the delta-winged Convair XF-92, and the sweptwing, semitailless Northrop X-4. The rocket-powered North American X-15, which ultimately flew at six times the speed of sound and reached altitudes beyond 300,000 feet, made its first test flights in 1959 and 1960. Work also began on an orbiting space glider, the Dyna-Soar (a contraction of the term dynamic soaring), designed to carry on where the X-15 left off.

Because of the complexity of modern aircraft and missiles, the Air Research and Development Command looked on them as integrated weapon systems. For airplanes, this meant not only the airframe and engines but also the fire control and navigation equipment, which would almost certainly involve different types of radar, the communications gear, and such ground equipment as auxiliary power units. The objective was to have all the components ready at the designated time and compatible with one another. In the case of weapon systems that were considered vital to the nation's defense, Air Force managers tried to compress the process of development, testing, and acceptance, sometimes successfully as in the ballistic missile program. At other times, as in the development of the jet interceptor, haste could be self-defeating.

Typically, work on a weapon system began when the development planning agency of the Air Staff became convinced that it was needed, and the Deputy Chief of Staff, Research and Development, handed the project to the Air Research and Development Command. Based on the Air Staff's concept of what the weapon was to do, the command prepared specifications and evaluated the

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responses from competing manufacturers. Once Air Force headquarters had decided on one of the designs, the command prepared a development plan, and the firm that won the contract began work, using money Congress made available.

Because of the huge investment required to build prototypes in the age of jets and missiles, the flying competitions that had occurred routinely in the 1930s and sometimes in the 1940s were no longer feasible. Decisions in the 1950s tended to be based on an evaluation of competing designs rather than on the actual performance of prototypes under test conditions. Once the design was approved and built, the resulting weapon system was tested and sometimes radically modified, as when the F-102, after the first of the aircraft had flown, required a thorough redesign of its fuselage into a coke-bottle configuration to achieve supersonic speed. The urgency with which a weapon was wanted, the technological challenge in developing it, and its place in the national military strategy affected a process that normally took between four and eight years.

If a weapon system had to be rushed into service, expensive shortcuts were available. During the late 1940s, two officers on the Air Staff, the Deputy Chief of Staff, Materiel, Maj. Gen. Orval R. Cook, and the Deputy Chief of Staff, Development, Maj. Gen. Laurence C. Craigie, worked out a concept for installing tools at the factory and beginning production even before testing was complete. When it worked, the idea saved time, but it was based on the assumption that the basic design would need only minor modification; problems like those encountered by the F-102 drove up costs in both time and money. In the ballistic missile program, Brig. Gen. Bernard A. Schriever, head of missile development, employed additional procedures to save time, notably concentrating responsibility in a few hands, reducing external review to a minimum, and investing in duplicate components that might not be needed.

Thirteen aircraft entered service or were under development during the 1950s: two light bombers developed for other forces, the Martin B-57, a British design, and the Douglas B-66, originally a Navy attack aircraft; two Boeing bombers, the B-47 and the B-52; the supersonic General Dynamics B-58; two transports, the Lockheed C-130 and Douglas C-133; and the so-called century series of fighters—the North American F-100, McDonnell F-101, Convair F-102 and F-106, Lockheed F-104, and Republic F-105. During this decade, the B-47 and B-52 were the embodiment of the might of the Strategic Air Command; but in the 1960s the B-58 failed to live up to expectations, obsolescence overtook the B-47, and the B-52 emerged as the command's premier bomber. Of the two transports, both powered by turboprop engines, the C-130 proved a dependable and valuable tactical transport, but the C-133 had a disturbing number of accidents and never realized its full potential as a long-range companion to the C-124 in carrying bulky cargo. Except for the F-102 and F-106, which were designed as interceptors and performed in that role, the fighters of the century series did not serve in the exact roles envisaged for them. Although the F-100A was a day fighter, the C and D models became nuclear

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The Lockheed F-104 Starfighter was the first aircraft to hold the world's speed, altitude, and time-to-climb records simultaneously.

fighter-bombers, but dropped only conventional munitions in the Vietnam War, a limited conflict. The F-101 was designed as a long-range escort for the Strategic Air Command, a mission no longer considered necessary in the age of the B-47 and B-52, and it performed as an interceptor and a reconnaissance craft. Kelly Johnson of Lockheed Aircraft intended the F-104 to be a lightweight day fighter, an American MiG, but the aircraft also served as a fighter-bomber for the Air Force, where it saw limited use. Indeed, the F-104 operated mainly in the air forces of America's allies, performing a variety of missions in addition to that of day fighter. The F-105 was a fighter-bomber from the outset, designed to carry nuclear bombs in an internal weapons bay, but in Vietnam it carried only conventional munitions stowed externally.

Although the Air Research and Development Command developed and tested weapon systems, the Air Materiel Command handled the closely related matter of procurement, along with maintenance and the storage and distribution of supplies. During the Korean War and the accompanying program of rearmament, production of military aircraft increased, but the limited nature of the conflict, the emergence of a sustained confrontation with the Soviet Union and the People's Republic of China, and the high cost and complexity of modern aircraft prevented the kind of headlong expansion that had occurred during World War II. The production of aircraft for civilian use could not be curtailed during a limited conflict as it had during that war; the output of civil aircraft averaged about 2,000 annually during the Korean fighting, and both commercial and general aviation expanded rapidly. Consequently, although wartime production more than tripled, it rose only from 3,000 military aircraft in 1950 to 11,000 in 1953. Luckily, some 400 aircraft were withdrawn from storage, refurbished at depots operated by the Air Materiel Command, and deployed to the Far East in the critical early months of the war.

## The Air Force as an Institution

When the Korean conflict broke out, the Air Force had a reserve of machine tools and factories left over from World War II, all of which helped the production effort. Moreover, manufacturers were encouraged by plans to expand the Air Force when peace returned—it reached a peak of 137 wings—which guaranteed that production would proceed at a steady pace throughout the decade. Continued aircraft production and the advent of missiles, with their requirement for new manufacturing facilities and techniques, created a demand for factory space. The government paid for new factories, and plants reactivated for the Korean War remained in operation after the emergency ended. Air Force-owned machine tools, whether acquired for World War II or purchased afterward, made a contribution to industrial efficiency throughout the period. Fortunately, the Air Materiel Command had begun shortly after Japan surrendered to invest in these tools, especially hydraulic presses for forging or extruding aircraft parts. As the 1950s ended, the aircraft industry was using nine heavy presses owned by the Air Force.

Managing aircraft maintenance and controlling the flow of supplies proved simpler during the Korean War, with only one battlefield, than in World War II. Cargo was shipped from the west coast of the United States and major maintenance performed there or in Japan. Not all support, however, was geared to the needs of the air war in the Far East. Even as the conflict raged, the continued cold war required constant readiness for instant action elsewhere in Asia, Europe, or the Middle East or even for defending North America against nuclear attack. This emphasis on readiness persisted after the fighting in Korea ended.

Logistics formed a vital element in maintaining readiness, but the Air Force reduced to a minimum the number of depots established throughout the world. Overseas bases were vulnerable to attack; and all depots, regardless of location, required a large work force and tied down a great volume of supplies, equipment, and spare parts. As a result, the Air Materiel Command tended to concentrate its activity at nine (later ten) major installations in the United States, employing air transport and electronic data processing equipment to speed distribution. Since air freight provided under contract by civilian firms had proved useful during the Korean War, the command expanded the service after the fighting ended, establishing a contractor-operated domestic airline that shuttled cargo among the logistics centers, the air bases from which supplies were flown overseas, and the major Air Force bases, especially those used by the retaliatory force. Airlift thus reduced time in transit, while new computers leased from firms like IBM or Remington Rand replaced the old card-punch business machines and provided a better, but far from perfect, control of inventories. Such innovations were expensive—the cost of logistics airlift rose from \$263,000 for a typical month in 1954 to \$1.5 million for a similar period in 1957 and the cost of renting computers approached \$23 million per year in 1960. The investment paid tremendous dividends in efficiency: instead of maintaining a large number of installations overseas, the command used the computer to locate an item in

## History of the United States Air Force

the United States, then flew it to its destination as quickly as it could be obtained from regional stocks.

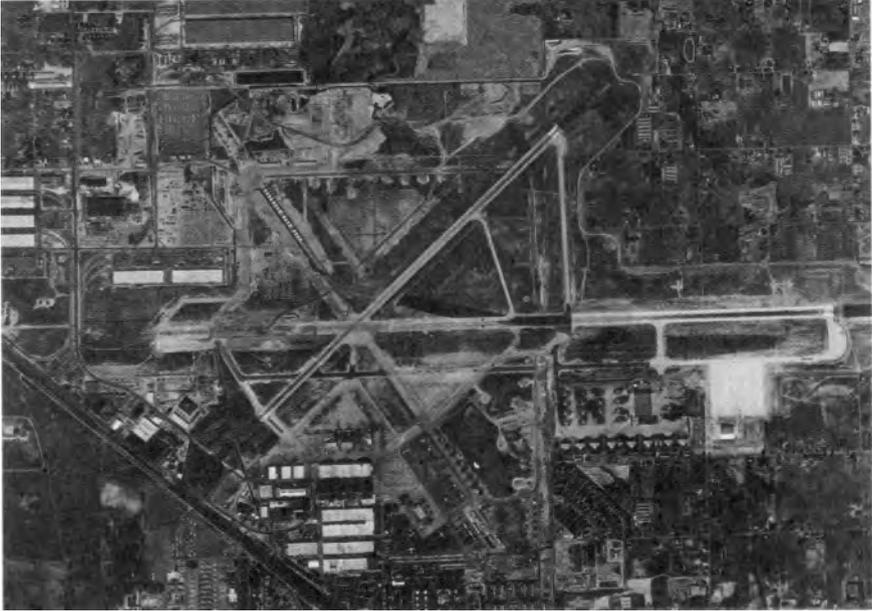
By 1960, the reduction of overseas logistics agencies was well under way but not yet complete. Military Assistance Programs had to be supported, and a certain amount of locally performed maintenance could not be avoided. Also, air commanders for the overseas theaters were reluctant to rely on logistics centers half the world away that they did not control. Not until later in the decade did the materiel agency begin operating worldwide in a centralized manner like the Strategic Air Command or Military Air Transport Service.

The concept of modern armaments as weapon systems changed the workings of the Air Materiel Command, although to a lesser degree than the Air Research and Development Command. To maintain control over the contractor responsible for integrating all the components into a functioning system, the Air Force established joint project offices (later weapon system project offices) made up of representatives from the command that was to use the system, the Air Research and Development Command, and the Air Materiel Command. These individuals worked together from the beginning of development, through testing, to actual production. Thus the Air Materiel Command could be certain of having the parts, tools, and trained persons needed for the support of an aircraft or missile. Also reflecting the emphasis on blending development and logistic support was the creation of parallel offices in the Air Materiel Command and the Air Research and Development Command dealing with aircraft systems, missile systems, and electronic systems. Moreover, each of the ten Air Materiel Areas, as the principal depots were called, concentrated on the maintenance and support of specific categories of weapon systems, although other work might also be performed there.

Indicative of the success of the logistics effort, the operational readiness rate of Air Force fighters rose as the 1950s drew to an end, with nearly all such aircraft showing substantial gains. Because of difficulty with the bombing and navigation systems, the F-105B, the newest fighter in the century series, proved a major exception to this trend. Another maintenance problem affecting readiness for war, the formation of ice in the fuel of B-52s and KC-135s operating at high altitudes, was temporarily corrected by installing fuel filters with bypass valves that allowed the liquid to circulate around any blockages, pending equipment to maintain fuel temperatures above freezing. By July 1960 heaters had been fitted to every B-52 and KC-135 engine in the inventory.

The 1950s combined war, peace, and cold war, and the Air Force reacted to each. Because the Soviet threat to western Europe overshadowed the fighting in the Far East and national policy forbade the use of nuclear weapons against the North Koreans or Chinese, the Air Force could not unleash all its firepower against the enemy as it had in World War II. The defense of western Europe competed for resources with the Korean battlefield; and, after the fighting ended, the security of the European nations continued to require men and air-

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McClellan Air Force Base, California, home of the Sacramento Air Materiel Area, September, 1956.

craft from the United States. Although the Air Force helped honor the nation's commitments from South Korea to West Germany, during the Korean fighting and afterward, nuclear deterrence enjoyed the highest priority in manpower, training, logistics, and in the development and procurement of weapon systems. The design of even the C-133 transport reflected the needs of the deterrent force, for its cargo bay was designed to accommodate an intercontinental ballistic missile for delivery from factory to using unit.

The missiles and bombers of the Strategic Air Command formed the cutting edge of deterrence, while the Air Defense Command served as a shield for missile launchers and bomber bases at a time when the threat from Soviet bombers seemed particularly grave. Other Air Force commands supported the deterrent and defensive forces, whether by sharing in the nuclear mission (as the Tactical Air Command came to do), developing and maintaining equipment, training men and women, or tending to the administration of a large and complex organization. Because of General Weyland's emphasis on the composite air strike force, the Tactical Air Command, besides providing trained squadrons for the Air Force commands overseas, would, as the decade ended, demonstrate its ability to respond to crises from Lebanon to Taiwan.

Such in general was the Air Force that each year spent some 40 percent of President Eisenhower's defense budget. The basic military policy characterized

## **History of the United States Air Force**

as the New Look and New New Look, in its distribution of funds, clearly emphasized the Air Force, especially the Strategic Air Command. The strength, status, and equipment of the Air Force reflected the President's determination to deter war through air power.

## Chapter 16

# Containing Communism

Walton S. Moody  
Warren A. Trest

**W**hen the Korean War broke out, the administration of President Harry S. Truman had adopted, but not yet funded, a policy of containing communism throughout the world, stationing forces overseas if necessary, but relying mainly upon the nuclear deterrent. The North Korean invasion of South Korea came as a surprise, but the United States avoided weakening the defenses of western Europe to meet the threat in the Far East. Quite the contrary, when the forces of General of the Army Douglas MacArthur advanced toward the Yalu River, the boundary between North Korea and Manchuria, and victory seemed within their grasp, the Joint Chiefs of Staff looked ahead to a transfer of forces from Asia to western Europe. Not even the Chinese intervention could reverse the order of priority that placed the defense of western Europe ahead of the war in Korea. Gen. Hoyt S. Vandenberg, the Air Force Chief of Staff, reflected the views of the administration when he warned that a war against China could, through attrition, weaken the nuclear deterrent and leave Europe at the mercy of Joseph Stalin, the Soviet dictator.

Although Korea did not supplant western Europe as the testing ground for the policy of containment, the outbreak of war forced President Truman to dis-

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President Harry S. Truman (left) and General of the Army Dwight D. Eisenhower, Supreme Allied Commander, Europe, in 1951.

regard the threat of inflation and spend more for national defense than he had intended. Since the administration's priorities had not changed, and concern persisted that the Korean conflict might serve as a diversion for a Soviet attack toward the English Channel, a part of the additional money helped strengthen the forces of the North Atlantic Treaty Organization. As MacArthur protested so eloquently after his relief from command in the Far East, the Truman administration was concentrating upon Europe, where there was no war, instead of upon Korea, where Americans were dying.

MacArthur's recall in the spring of 1951 fueled the fires of congressional dissent. The emphasis on Europe had aroused the lingering isolationist sentiment embodied in a number of Republican legislators, among them Senators Kenneth Wherry of Nebraska and Robert A. Taft of Ohio, the latter a leading contender for his party's Presidential nomination in 1952. Former President Herbert Hoover joined in the so-called Great Debate over American foreign policy by urging that the United States withdraw from Europe and Asia and become an impregnable "Gibraltar" among nations. Basically, the Hoovers, Tafts, and Wherrys argued for a strategy of deterrence based on air and naval power that could hold communism in check without the expense and diplomatic entanglements attendant upon stationing large numbers of troops abroad. The isolationist point of view did not prevail, however. General of the Army Dwight D. Eisenhower, recalled from retirement and the presidency of Columbia University to become Supreme Allied Commander in Europe, persuaded Congress that the buildup in Europe should continue.

When war erupted in Korea, the fighting there took precedence over the defense of Europe. The Air Force withdrew a troop carrier group from Germany



Republic F-84 Thunderjets at Fuerstenfeldbruck, Germany, early 1950s.

and sent it to the Far East, where it arrived in December 1950 after the Chinese had intervened. However, even though American air forces fighting the North Koreans had to be strengthened, Europe was far from forgotten. Reinforcements continued to cross the Atlantic and join the U.S. Air Forces in Europe. The comparative strength of the U.S. Air Forces in Europe and the Far East Air Force reflected the priorities assigned the two areas. In western Europe, the nations of the North Atlantic Treaty Organization were rebuilding their air forces, there was training but no fighting, and airlift became essential only in emergencies on a continent laced with roads, rail lines, and even canals that normally could carry troops and supplies. In Korea, the United States had borne the brunt of an actual air war that included fighter patrols, interdiction, close air support, an aerial shuttle of men between Japan and South Korea, and, on two occasions, airborne operations that required more than a hundred transports. Despite the disparity of effort between Europe and Korea between 1950 and 1953, when the fighting ended in Korea, the U.S. Air Forces in Europe had more than half the aerial strength of the Far East Air Forces.

The apportionment of long-range bombers between the two areas confirmed in striking fashion the value placed on Europe. During the summer of 1950, four groups of B-29s, in two separate deployments, joined the Bomber Command of the Far East Air Forces, but in the meantime, the Strategic Air Command reinforced Maj. Gen. Leon Johnson's 3d Air Division in the United Kingdom with two groups of these bombers. Despite the demands of the war in Korea, western Europe seemed in such grave peril that, in two mass flights during September and October of 1950, fighter-escort pilots of the Strategic Air Command delivered some 180 F-84Es from Bergstrom Air Force Base, Texas, to Fuerstenfeldbruck, Germany, landing five times en route to refuel.

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The ferrying of the F-84s, which replaced F-80s withdrawn to the United States and F-47s turned over to the Italian air force under the mutual defense assistance program, earned for the 27th Fighter Wing the Mackay Trophy, awarded annually for the most meritorious flight by a unit or individual of the U.S. Air Force. Originally donated by Clarence Mackay, a business executive and member of the Aero Club of America, the trophy was given for the first time in 1912 to Henry H. Arnold, then a young lieutenant, who had conducted a successful aerial reconnaissance during maneuvers in the vicinity of Washington, D.C.

The buildup of aerial strength in Europe continued into 1952. During the summer and fall of 1951, a troop carrier wing arrived in Germany to replace the group sent to the Far East, and a wing of F-86s deployed to the United Kingdom to protect the B-29s based there. In December a tactical fighter wing and a light bombardment wing, mobilized units of the Air National Guard, reached Europe; two other elements of the Air National Guard, a tactical reconnaissance wing and another fighter-bomber outfit joined them in 1952. When these four organizations reverted to inactive status, Regular cadres took over the aircraft, performing the same duties under different unit designations. In mid-1952, two additional wings, one of light bombers and the other of tactical fighters moved to Europe. During the two years after the Korean War began in June 1950, the U.S. Air Forces in Europe thus grew from three groups (excluding the 3d Air Division in England, which reported to the Strategic Air Command) to 11 wings, as the groups were redesignated, with 1,000 aircraft, and the assigned military manpower increased almost fivefold from 16,000 to 73,000.

With growth came reorganization. The U.S. Air Forces in Europe became a specified command in January 1951, the equal of the major Army and Navy organizations in Europe and like them reporting to General Eisenhower, then Supreme Allied Commander. The early air divisions were replaced by air forces—in the United Kingdom, the 3d Air Division (a name the elements of the Strategic Air Command on the island of Guam later assumed) reverted briefly to the U.S. Air Forces in Europe and formed the basis for the Third Air Force and on the continent the Twelfth Air Force replaced the 2d Air Division, with headquarters at Wiesbaden. The new Seventeenth Air Force set up its headquarters at Rabat, Morocco, in 1953 to control the tactical aircraft based in that country and at Wheelus Air Base in Libya. The relationship between the U.S. Air Forces in Europe and the North Atlantic Treaty Organization was close, as demonstrated by the selection of Lt. Gen. Lauris Norstad, who commanded the U.S. Air Forces in Europe, to take over the treaty organization's Allied Air Forces, Central Europe, built around the Twelfth Air Force. In the spring of 1951, however, the Twelfth Air Force became the major component of a new headquarters, the 4th Allied Tactical Air Force, commanded by the same American officer who headed the Twelfth Air Force.

Between 1950 and 1955, as the U.S. Air Forces in Europe grew rapidly in size, its area of responsibility also increased. By the end of 1955 manpower ex-



Wheelus Air Base, Libya.

ceeded 136,000—11,696 officers, 79,738 airmen, 5,159 American civilians, and 39,882 foreign nationals—an increase of nearly 400 percent from the 34,571 Air Force military and foreign or American civilian personnel serving in Europe when the Korean War broke out in the summer of 1950. In Germany, two fighter airfields, Fuerstenfeldbruck and Neubiberg, both within 150 miles of the Iron Curtain, and two airlift bases, Rhein-Main and Wiesbaden, were operating when the Korean fighting began. By the end of 1950, fighter bases at Sculthorpe, Lakenheath, Mildenhall, and Marham in the United Kingdom had also begun operating. In December 1955, combat aircraft of the U.S. Air Forces in Europe flew from 22 airfields: Aviano in Italy; Soesterberg in the Netherlands; Laon, Etain, Chambley, Chaumont, and Toul in France; Bitburg, Spangdahlem, Hahn, Sembach, Landstuhl, and Fuerstenfeldbruck in Germany; and Manston, Wethersfield, Woodbridge, Bentwaters, Shepherd's Grove, Sculthorpe, and Alconbury in the United Kingdom, as well as from Sidi Slimane in Morocco and Wheelus in Libya. New airlift bases were functioning at Neubiberg, Germany; Evreux and Dreux, France; and Prestwick, Scotland. A depot at Chateauroux in France joined Burtonwood in the United Kingdom and Erding in Germany. The military airfield at Athens, Greece, initially a terminal for the delivery of military assistance, became a support base; and two airfields were built in Turkey, one at Adana (redesignated Incirlik in 1958) and the other at Cigli, near Izmir. Units of the Strategic Air Command, at times, shared space at both Turkish airfields. The addition of bases in Germany occurred as that nation, which became the Federal Republic of Germany when the western occupation zones merged in 1949, was rearming; in 1955 it emerged as an independent state and a partner in the North Atlantic Treaty Organization. Expansion into Greece and Turkey followed the entry of those nations into the North Atlantic Treaty Organization in 1952. The easternmost of the bases operated by the U.S. Air Forces in Europe, at Dhahran, Saudi Arabia, lay outside the terri-

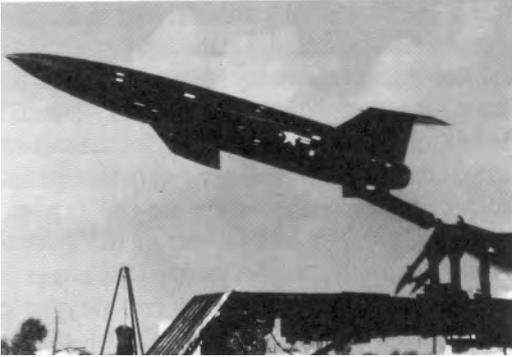
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tory of the treaty organization; the command was responsible for this airfield from 1954 until the agreement for its use to lapsed in 1961.

The ground forces of the North Atlantic Treaty Organization did not keep pace with the rapid increase of aerial strength, nor did the participation of the European allies match the overall American effort. In February 1952, when the U.S. Air Forces in Europe had more than 650 aircraft, representatives of the nations of the North Atlantic Treaty Organization met at Lisbon, Portugal, and approved ambitious plans for an international force that included 10,000 aircraft, 1,500 American, and 89 army divisions that could be in the field within 30 days of an order to mobilize. After agreeing upon this objective, the European nations held back, influenced by the attendant costs and by the death of Stalin in March 1953. Even so strong a believer in collective security as Winston Churchill, who became British Prime Minister again in 1951, soon advocated the substitution of air power and atomic weapons, supplied mostly by the United States, for large and expensive European land armies. What the European members of the North Atlantic Treaty Organization wanted was not so much the permanent presence of an overwhelming force of Americans as a large enough number to provide assurance that, in the event of a Soviet attack resembling the German invasions of 1914 and 1940, the United States would be a co-belligerent from the outset and would use nuclear firepower against the enemy's homeland.

Like Churchill and the other political leaders of western Europe, Eisenhower, once he became President, sought to save money by substituting atomic firepower for the more expensive land armies. Maintaining large forces in Europe represented a continuing drain on the American treasury, an expenditure whose negative effect was multiplied because it represented an infusion of dollars into rapidly improving foreign economies, money better spent to foster American economic growth. To slow this drain, the Eisenhower administration imposed reductions upon the ground and air forces assigned to the North Atlantic Treaty Organization. Consequently, in the middle of the decade, the U.S. Air Forces in Europe peaked at about 2,000 aircraft and 91,000 military personnel, along with 45,000 American and European civilians, before declining by the end of the decade to an aggregate strength in manpower of 87,000. Measures taken during the time of retrenchment included inactivation of two fighter-bomber wings, two troop carrier wings, and one fighter-interceptor wing.

Although atomic weapons, as a substitute for ground forces, promised to reduce the cost of defending Europe, nagging doubts remained about the feasibility of fighting a nuclear war on the continent. Project Vista, the inquiry into the defense of western Europe conducted in 1951 under the sponsorship of the Air Force and the California Institute of Technology, had called for the development of low-yield weapons for use on the battlefield, but even these might cause massive destruction and come close to depopulating the continent. A 1955 projection, described by Lawrence Freedman of King's College, London, in Peter Paret's *Makers of Modern Strategy: From Machiavelli to the Nuclear Age*,



Launch of a short-range Matador missile (above) and the static test of an intermediate-range Thor missile (right).



concluded that the detonation of 355 nuclear weapons during a Soviet attack through the Federal Republic of Germany would kill 1.7 million and injure 3.5 million Germans, excluding the victims of radiation. As Bernard Brodie, a scholar and believer in deterrence, observed in "More about Limited War," an article published in *World Politics* in October 1957, "a people saved by us through our free use of nuclear weapons over their territories would probably be the last that would ever ask us to help them."<sup>1</sup> Despite the obvious problem of collateral damage from nuclear weapons, no effort was made to strengthen the conventional forces of the North Atlantic Treaty Organization and thus lessen the reliance on atomic firepower. If anything, the destructive nature of battlefield nuclear weapons caused them to be regarded as a part of the deterrent force in the belief that the threat of their use, along with the threat of the more powerful nuclear and thermonuclear bombs in the arsenal of the Strategic Air Command, would prevent most forms of war and discourage the enemy from employing even battlefield nuclear weapons.

By the end of 1954, the U.S. Air Forces in Europe had about 200 aircraft capable of delivering atomic bombs; during that year the first tactical missile ca-

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pable of carrying a nuclear warhead, the Martin Matador, arrived in Europe. Within two years, some 20 wings of aircraft and missiles stationed in the United Kingdom, France, and the Federal Republic of Germany formed a parallel deterrent, a shorter range strike force to complement the Strategic Air Command. The strategy that evolved in the 1950s for a European war called for the tactical air forces based there to prevent the kind of destruction that western Europe had experienced in World War II by attacking the enemy as far to the east as possible, while ground forces defended along the eastern border of the Federal Republic of Germany. To describe this conflict, planners invoked the image of a sword and shield: if deterrence should fail, tactical aviation and the ground forces would form a shield that defended Europe, while the Strategic Air Command would thrust a sword into the vitals of the Soviet Union.

The North Atlantic Treaty Organization found this strategy so attractive that in 1957 it endorsed a proposal, advanced the previous year by Secretary of State John Foster Dulles, for an allied theater nuclear force to engage the enemy deep in eastern Europe. Adhering to his announced policy of treating atomic or hydrogen bombs as normal, though terribly destructive, weapons of war and assigning them to the commands that would employ them, President Eisenhower agreed to set up nuclear stockpiles in Europe for use by the allies. He insisted, however, that American officers have custody of the weapons, releasing them only in an emergency to representatives of the allied armed forces. The establishment of an allied nuclear force encountered problems from the outset. Most could be resolved fairly easily, for instance by locating the stockpiles where an ally could use the weapons quickly after receiving them from the American custodians, but one proved intractable.

Charles de Gaulle remained unyielding in his refusal to allow atomic weapons on French soil unless France had exclusive control. Chosen Prime Minister in 1958 and, on January 8, 1959, President of the newly created Fifth Republic, de Gaulle was determined that France become an equal of the great powers, and this was not possible if the United States could, as he saw it, veto the French use of nuclear force. This attitude, and the inefficiency of maintaining in Germany nuclear-armed detachments of units based in France, caused the United States to transfer by the end of January 1960 the fighter-bomber wings from Toul, Chaumont, and Etain to airfields in the United Kingdom recently used by the Strategic Air Command. By the end of 1960, compensating for the restrictions on bases in France, aircraft of the U.S. Air Forces in Europe flew from Moron, Torrejon, and Zaragoza in Spain.

When American intermediate-range ballistic missiles became available for the theater nuclear force, the United States insisted on retaining custody of the warheads, causing de Gaulle to reject the weapons. The British, however, agreed to operate four squadrons of Air Force-developed Thors; Italy and Turkey accepted Jupiters, developed by the Army's Redstone arsenal; and all three host nations provided crews, which American instructors trained. Since

American officers controlled the nuclear warheads, the actual launching of the weapons would have been a joint effort. In 1959 and 1960, the Thor squadrons went into place in the United Kingdom, with the Strategic Air Command providing technical assistance and training and also keeping custody of the nuclear components. By the end of 1960, thirty Jupiter missiles were in place in Italy, and the Jupiter sites in Turkey were under construction.

Even as Thor and Jupiter—along with Mace, an improved version of the Matador tactical missile—deployed, questions arose about the vulnerability of the theater nuclear forces. Given their proximity to bases in Soviet-dominated eastern Europe, were the missiles and aircraft a deterrent or a target? The intermediate-range ballistic missiles, which had to be fueled with dangerous propellants immediately before launch, seemed especially vulnerable to surprise attack. Also, could the United States continue indefinitely to maintain forces in Europe and endure the unfavorable balance of payments? This combination of military and economic concerns signaled a possible adjustment during the coming decade of the role and composition of the American forces, air as well as ground, that supported the North Atlantic Treaty Organization.

During a decade that was half rapid growth and half gradual retrenchment, the U.S. Air Forces in Europe conducted recurring exercises as part of the international force defending the continent. The air organization assigned liaison officers and forward air controllers to work with elements of the Seventh Army, the principal American ground force on the continent, which supplied liaison officers of its own to Air Force tactical fighter and reconnaissance units. When operating at full capacity, an air-ground operations school at Ramstein Air Base, Germany, a joint venture of the U.S. Air Forces in Europe and the Seventh Army, turned out 1,500 graduates in a year. The American units that would support the ground elements of the North Atlantic Treaty Organization honed their skills in gunnery and bombing at Wheelus Air Base, where good flying weather prevailed and a vast expanse of Libyan wasteland was at their disposal.

Besides preparing for a coalition war, the U.S. Air Forces in Europe tried to sell itself to the citizens of the nations of the North Atlantic Treaty Organization and of the other states in a region bounded by Norway, the United Kingdom, North Africa, and Saudi Arabia. At times, these efforts might involve relief operations, such as took place early in 1960 after an earthquake leveled the city of Agadir in Morocco and killed an estimated 12,000 persons. Other more nearly routine gestures of goodwill included exhibitions by the Skyblazers aerobatic team in F-100s, athletic contests, and concerts by the command's four bands. During 1958 and 1959, the musicians played almost 1,400 concerts before an estimated 15 million persons, even performing in Moscow during a brief thaw in the Cold War.

Whereas the U.S. Air Forces in Europe, after sudden growth followed by decline, stabilized at more than twice its 1950 strength, the Far East Air Forces underwent a rapid buildup during the Korean War, then experienced a sharp re-

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Clark Air Base, Philippines.

duction once the fighting ended. In 1957, shrunken in size, the command moved its headquarters from Japan to Hawaii, where it became the Pacific Air Forces, the Air Force component of the Pacific Command. In comparison to the Far East Air Forces of the Korean War, the Pacific Air Forces differed markedly in manpower, operational units, and geographic area. The wartime command, concentrated in South Korea and Japan, numbered some 70 squadrons and 112,000 military personnel, plus a large pool of skilled and semiskilled Japanese civilian workers; but the Pacific Air Forces of 1960 had only 35 squadrons and 100,000 officers, airmen, and American or local civilian employees scattered among 20 bases in a half-dozen countries within a huge triangle that included the Philippines, Hawaii, and Japan.

The Pacific Air Forces faced the task of training, in conjunction with regional air forces, to repel aggression anywhere in the vastness of the Pacific Command. A recurring means of emphasizing the common interest of the nations of the western Pacific and Southeast Asia in opposing communist expansion was the Pacific Weapons Conference, usually held at Clark Air Base in the Philippines. Airmen from the U.S. Air Force and Navy and their counterparts from South Korea, Thailand, Nationalist China, and the Philippines gathered at Clark to practice the latest fighter tactics. The air forces of Japan, Cambodia, South Vietnam, Great Britain, New Zealand, and Australia did not take part, but usually sent observers who became exposed to the latest techniques of aerial warfare and to the spirit of regional solidarity the United States was trying to foster.

Gen. Emmett O'Donnell, Jr., commander of the Pacific Air Forces, believed that communism was not the only threat to peace in Eastern Asia, noting that yearly typhoons, tidal waves, floods, and earthquakes cause vast destruction throughout the region. In the summer of 1959, for example, floods spawned by a typhoon inundated parts of Taiwan. The resulting relief operation was followed closely by another in September after a typhoon inflicted severe damage



An Alaskan Air Command Convair F-102  
Delta Dagger at Elmendorf Air Force Base, Alaska.

on the city of Nagoya, Japan. Similarly, in May 1960, the Pacific Air Forces assisted the Japanese left homeless by a tidal wave generated by a violent earthquake off the coast of distant Chile.

While the U.S. Air Forces in Europe and the Pacific Air Forces contributed to the defense of their assigned regions, two other major commands, the Alaskan Air Command and the Caribbean Air Command, helped protect the Western Hemisphere. A component of the Alaskan Command since 1946, the Alaskan Air Command worked closely with the Air Defense Command; beginning in 1956, two air divisions operating in Alaska formed an integral part of the air defenses of North America. Moreover, the Alaskan Air Command assisted in the construction of a radar at Clear, Alaska, designed to give North American Air Defense Command controllers a 20-minute warning of approaching missiles. The Clear site, where work began late in 1959, became operational in 1961, some two years before the third and easternmost of the ballistic missile early warning radars at Fylingdales in the United Kingdom. The first such radar, at Thule in Greenland, began operating in September 1960, but required five months to correct a tendency to give false alarms. Besides participating in the building of the missile warning network, the command provided advance bases for bombers of the Strategic Air Command. The Alaskan Air Command also began operating, through a civilian contractor, a tropospheric-scatter, long-distance telephone and telegraph network; its completion in March 1958 at a cost of \$140 million provided the first truly reliable means of communication linking all of Alaska.

The Caribbean Air Command, the smallest of the Air Force's overseas commands, administered the Air Force element of the mutual defense assistance program for Latin America, which included outright grants of military equipment, the sale of such items, and opportunities for enrollment in service schools

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in the United States or in courses offered in Panama, where the command had its headquarters. The command also supported other Air Force activities throughout Central America and South America, whether aerial mapping, joint training, or missions by air attaches. Moreover, it inaugurated a tropic survival school in Panama, which pitted students against an environment that could not be duplicated at Stead Air Force Base, Nevada, the site of the original course.

The new composite air strike forces of the Tactical Air Command, available on short notice for deployment almost anywhere in the world to meet the threat of war, complemented the overseas commands, already on the scene and instantly available for emergencies within clearly defined geographic regions. The possibility of limited wars, which had disturbed the Army as it contracted in size after the Korean War, helped inspire the New New Look at defense strategy by the second Eisenhower administration. Out of this review came a re-statement of the original New Look, a strategy that sought to deter aggression by emphasizing the threat of massive retaliation, using the new hydrogen bomb, when necessary. The Army dissented, arguing that it should be strong enough to respond flexibly in a crisis, not meeting every threat with nuclear firepower, but responding with conventional weapons in limited wars when the aggressor relied on conventional firepower. The Air Force, however, did not define limited war as a conflict fought with conventional weapons, but as a war that did not involve nuclear retaliation directly against the Soviet Union. According to the Air Force, the principle of nuclear deterrence applied to limited war, just as it applied to a conflict between the major powers; moreover, limited war could not be deterred if the United States ruled out nuclear weapons and fought with conventional munitions, as the Army urged. To deter limited aggression was the mission of the composite air strike force, which could, in the opinion of the Air Force, deploy promptly and retaliate as necessary with battlefield nuclear weapons. Endorsing this concept, Gen. Thomas D. White, the Air Force Chief of Staff, argued that, although his service should be able to fight using conventional weapons, it need not invest heavily in a kind of warfare that would become obsolete when, as he confidently expected, the Air Force view of limited war would become national policy.

The leaders of the Air Force remained confident that the threat of nuclear retaliation could deter war; the Strategic Air Command, they believed, would at the very least prevent a major war with the Soviet Union, and the composite air strike forces would discourage local conflicts too small to justify the attention of the strategic retaliatory force. The composite strike forces, with nuclear bombs an important part of their arsenal, engaged in exercises that prepared them for instant deployment. On November 10–12, 1959, for instance, a composite air strike force, reacting to a surprise alert, took off from Myrtle Beach, South Carolina, refueled at night in bad weather over the Atlantic, and arriving in France, ready for action, within 24 hours. Enough priority cargo, excluding fuel, accompanied the move to sustain the force for 30 days. In June of the fol-

lowing year, another such force deployed to the western Pacific, forming a major portion of the 1,100 men and 120 aircraft that took part in regional exercises in Thailand, in the Philippines, and on Taiwan.

Nuclear weapons might not, however, be equally useful in every crisis. Gen. Otto P. Weyland, an enthusiastic advocate of a Tactical Air Command armed with nuclear weapons and the organization's commander, conceded in 1957 that he could "visualize local war situations where the threat of only atomic retaliation would severely proscribe the U.S. bargaining position at the conference table and turn the mass of human opinion against us; whereas possessing a [means of] conventional retaliation could place world opinion on our side."<sup>2</sup> Weyland had been correct in suggesting that prompt retaliation with tactical nuclear weapons might not be a universally satisfactory response to aggression on a limited scale. In fact, by the time he raised this point in 1957, situations such as he envisioned had already arisen. Nevertheless, the Air Force continued to emphasize nuclear deterrence and, if deterrence failed, nuclear retaliation with strategic or tactical aircraft (or a combination of both), as circumstances might require. As the decade drew to a close, further experience suggested that nuclear bombs were so destructive in terms of radioactive fallout as well as fire and blast, and the revulsion against their use so widespread, that they could not, at least in the near future, be permitted to dominate the American arsenal. Because of the destruction and opprobrium they might generate, nuclear weapons could at times deter the nation considering their use even more effectively than they discouraged limited aggression; and in certain circumstances, perhaps only the use of conventional firepower would prove feasible.

Shortly after the Korean fighting ended, the Eisenhower administration first encountered the limitations inherent in using nuclear weapons in a conventional war. The arena was French Indochina, where France since December 1946 had been fighting the Viet Minh, as the communist-led Vietnam Independence League was called. The French people had little enthusiasm for preserving the Asian empire, and the nation's economy had not yet recovered from the effects of World War II. Consequently, since 1950, the French troops in Southeast Asia increasingly had depended on American military aid to prosecute the war. After the North Korean attack on South Korea, which seemed to be part of a worldwide pattern of communist aggression, the United States hurriedly established a Military Assistance Advisory Group at Saigon and increased the flow of military assistance for the fight against the Viet Minh. The Truman administration became involved so that France would have the war materiel needed to oppose the spread of communism in Asia, while at the same time remaining a vigorous member of the North Atlantic Treaty Organization and an active participant in the defense of Europe. Three basic assumptions influenced American policy: France was vital to the North Atlantic Treaty Organization; the French, if suitably aided, could prevail in Southeast Asia; and Indochina held the key to containing communism at the Chinese border. A Viet Minh victory over France

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Fairchild C-119 transports provided to the French.

would threaten Malaya, Thailand, and Burma, all of which might be overwhelmed. The United States also expected France to grant genuine autonomy to the associated states, as they had redesignated their Asian colonies of Vietnam, Cambodia, and Laos.

Despite the volume of American aid (approximately one-third of the war effort), French forces could not control much more than the southern half of Vietnam and the major cities of the North. During May 1953, the government of France sent a new commander, Gen. Henri Eugene Navarre, into Vietnam to defeat the insurgents, using the additional American aid that became available as the Korean fighting ended. The Far East Air Forces, beginning in 1952, had flown cargo into Vietnam and sent technicians there to perform maintenance on French aircraft. Once the armistice went into effect in Korea, the aid increased, and during January and February 1954, the Far East Air Forces provided bombers and transports on loan to the French and established detachments to assist with maintenance and supply.

As the American assistance increased, Navarre established a combat base at Dien Bien Phu, far beyond supporting distance of his main force. The French believed the enemy would exhaust himself in repeated attempts to overwhelm an impregnable fortress, but the Viet Minh isolated the French defenders, hammered them with artillery, and threatened to overrun their positions. President Eisenhower realized that the loss of Dien Bien Phu could demoralize the French, result in their defeat, and remove the main barrier to communist expansion in Southeast Asia; and he sought the advice of military and congressional leaders. When he consulted the Joint Chiefs of Staff, only the Chairman, Adm. Arthur W. Radford, gave unflinching support to intervention but recommended that the United States share with the French in the command of any campaign in Indochina. The Army Chief of Staff, Gen. Matthew B. Ridgway,

flatly opposed intervention, arguing that it could lead to a war that would absorb almost the entire active duty Army. Gen. Nathan F. Twining of the Air Force stipulated American control over training and operations, conditions that the French, whether he realized it or not, would never accept. Adm. Robert B. Carney, the Chief of Naval Operations, sided with Ridgway, and the Commandant of the Marine Corps, Gen. Lemuel C. Shepherd, warned that air operations would not be enough and that only American ground forces had a chance of redeeming the situation.

Despite the reluctance or outright opposition of the service chiefs, Admiral Radford kept pushing for intervention, and air power figured prominently in his plan to break the siege of Dien Bien Phu. After Army and Air Force staff studies of the possible use of atomic bombs triggered discussions that revealed a dearth of suitable targets, Radford proposed a powerful conventional strike by B-29s on the hills surrounding the isolated bastion. Brig. Gen. Joseph D. C. Caldera, bomber commander of the Far East Air Forces, visited Indochina and discovered that the French could not install the radio beacons needed to bomb accurately through the cloud cover that prevailed at Dien Bien Phu in the spring of the year. Moreover, the bunkers, siege trenches, and artillery emplacements that ringed the French outpost seemed better suited to attack by fighter-bombers than by high-flying B-29s, which led Caldera to propose a strike launched from aircraft carriers in the Gulf of Tonkin.

The President refused to invoke his executive authority to direct air strikes of any sort. He wanted both congressional and allied support but neither appeared; indeed, congressional leaders made their endorsement contingent upon international participation. Hope for some kind of allied venture lingered until Prime Minister Churchill declared that Great Britain, having granted independence to India, would not go to war to save Indochina for France. The British leader also recognized the danger, based on the premise of a unified communist bloc, that intervention against the Viet Minh in Southeast Asia might result in Soviet atomic bombs detonating in Great Britain.

Aided by weapons and ammunition from the Soviet Union and the People's Republic of China, the Viet Minh overwhelmed the defenders of Dien Bien Phu. Since it had not intervened, the United States could no longer oppose the French desire for an armistice, which was formalized by the Geneva Accords of July 1954. Like Korea after World War II, Vietnam was divided temporarily: a communist government under the leadership of Ho Chi Minh took over in the North and an anticommunist regime, soon headed by Ngo Dinh Diem, controlled the South. The French forces withdrew, except for a small group of advisers in South Vietnam, and an International Control Commission, with representatives from Canada, India, and Poland, monitored adherence to the terms of the agreement. The Geneva Accords also called for the Viet Minh to withdraw from the South and for elections throughout Vietnam within two years to unify the country, but neither provision was carried out.

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The United States and Great Britain offered assurance to France of their commitment to regional security after the French troops left. In September 1954, these three nations joined Australia, New Zealand, Pakistan, Thailand, and the Philippines in forming the Southeast Asia Treaty Organization. The treaty promised a collective response to external armed aggression against any member or against South Vietnam, Laos, and Cambodia, which had been prevented by the Geneva Accords from joining. Since the emphasis rested on defeating armed aggression, the nations of what had been French Indochina were expected to deal individually with problems of subversion from within. American military advisers and instructors rather than combat units would be stationed in Southeast Asia, but the United States could deploy mobile forces into the region if that course of action seemed necessary.

Having sought a mutual security arrangement for Southeast Asia, the United States participated in the military exercises necessary to lend credibility to the treaty organization. In 1959, for example, the United States, the United Kingdom, France, New Zealand, and the host country of Thailand joined in an especially ambitious maneuver. The air defense portion, held for the most part at Don Muang airfield near Bangkok, was judged successful when the defenders intercepted and downed in mock combat sixty of seventy-two aggressor aircraft. In addition, some two dozen transports shuttled cargo into a remote airfield to demonstrate the feasibility of supplying Thai ground forces by air. Even though atomic bombs had proved inappropriate to the crisis at Dien Bien Phu in 1954, the simulated use of nuclear weapons figured prominently in the scenario.

For American policymakers, the Southeast Asia Treaty Organization accurately reflected NSC-162/2, adopted by President Eisenhower in the fall of 1953, which committed the United States to provide a nuclear shield for regional defense, while the allies in the area assumed responsibility for countering local aggression or internal subversion. This division of labor was based on the belief that, given the existence of a nuclear balance which favored the United States, any armed conflict could be fought with atomic weapons. American planners also assumed that even the weaker and less technologically advanced of its allies could absorb and effectively use the military and economic aid supplied by the United States, thus becoming strong enough to carry out the task assigned them. During much of the 1950s the United States, ironically, but logically in the light of NSC-162/2, sought to equip and train many of its allies for conventional war while neglecting its own nonnuclear forces.

As early as the spring of 1954, the discussion of intervention in Vietnam had raised the possibility that not every crisis lent itself to an atomic solution. In the years that followed, critics repeatedly challenged the concept of nuclear deterrence of local wars. The first such test, which on the surface seemed highly successful, began after President Eisenhower early in 1953 announced that the Seventh Fleet, which his predecessor had given the mission of preventing ag-



Air Vice Marshal Krasae Indarnata (right) of the Royal Thai Air Force, Director of the 1961 SEATO exercise in Thailand, and Maj. Gen. Thomas S. Moorman, Jr., USAF, Deputy Director.

gression by either the Chinese Nationalists or their communist enemy on the mainland, would no longer shield the People's Republic of China from Nationalist attack. Eisenhower expected the pronouncement to help end the Korean War by increasing pressure on the leadership in Peking (now romanized as Beijing), but Chiang Kai-shek (Jiang Jieshi) used it as the occasion to renew his oft-repeated threat to invade the mainland. The People's Republic responded to Chiang's threats with military action against the offshore outposts held by the Nationalists. In August 1954 an amphibious raid on the Quemoy (Jinmen Islands), fewer than twenty-five miles from the nearest communist territory but more than one hundred miles from Taiwan, killed ten Nationalist soldiers; over the next few months, the communists directed steadily increasing levels of military activity against the islands. The communists began building new jet airfields on the Chinese coast near the Strait of Taiwan, inspiring concern that they might gain air superiority above the offshore islands. To meet this kind of threat, the Joint Chiefs of Staff approved a plan to reinforce the aerial strength of the Commander in Chief, Pacific. The Air Force conducted a show of force by rotating to Taiwan, in succession, the three squadrons of a fighter-bomber wing stationed in the western Pacific, demonstrating American resolve and providing valuable training without weakening air defenses elsewhere in the region.

Anxiety increased in January 1955, when nearly 4,000 troops from the mainland overran the small island of Ichiang (Yijiang), some 200 miles north of Taiwan, while as many as 200 aircraft at a time bombed the Tachen (Dachen)

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Islands, just to the south. The intensified hostilities caused President Eisenhower to declare that it was “time to draw the line” and that any invasion of Taiwan “would have to run over the Seventh Fleet.” After an attempt to resolve the crisis in the United Nations failed, the Chief Executive late in January obtained a congressional resolution authorizing him to employ American forces to defend Taiwan and, if necessary, other Nationalist possessions. He also signed a new treaty with the Nationalist government on Taiwan that committed the United States to the defense of Taiwan proper and the nearby Pescadores (Penghu Islands), but not the islands just off the mainland. In a supplementary understanding, however, the two governments recognized that the inherent right of self-defense extended to the offshore islands under Nationalist control. In return, the United States received Chiang’s pledge not to undertake unilateral military action against the People’s Republic of China.

In response to the increased communist pressure, the United States dispatched three aircraft carriers from the Philippines and an entire wing of Air Force fighter-bombers to Taiwan. What began as a show of resolve became an actual operation when, in February 1955, the Seventh Fleet helped Nationalist naval units evacuate 20,000 civilians and 10,000 soldiers from the Tachens and nearby islands, which were judged indefensible because of their distance from Taiwan and proximity to the mainland. No aerial combat occurred, however, for the communists chose not to challenge the evacuation. In the absence of aerial battles, the fighter-bombers left Taiwan shortly after the Tachens operation, but other Air Force fighter units began rotating to the Nationalist stronghold on a regular basis to demonstrate the continuing American commitment to its defense.

Tension persisted in the area, with the Nationalists sending reinforcements to the Quemoy and Matsu (Mazu) Islands, two groups that lay far to the south of the Tachens and much closer to Taiwan. Batteries on the mainland began a sporadic shelling of these two remaining offshore outposts, prompting new threats from President Eisenhower aimed at deterring invasion. Commenting on a statement by Secretary of State Dulles, the Chief Executive said during a news conference in March that the United States would use tactical atomic weapons if war broke out with the People’s Republic of China. The choice between war and peace now rested in the hands of Chiang Kai-shek on Taiwan and Mao Tse-tung (Mao Zedong), who ruled the mainland. At that moment, if the communists had attacked Quemoy or Matsu and the Nationalists had defended them, President Eisenhower would have been forced to either ignore his commitment to the government on Taiwan or to fight a nuclear war. Fortunately, such a choice proved unnecessary. Whether cowed by the possibility of atomic destruction or influenced by other factors, Premier Chou En-lai (Zhou Enlai) announced on April 20 that the People’s Republic of China had no desire to go to war with the United States. The shelling stopped, the crisis eased, but Chiang still held Quemoy and Matsu; the possibility remained that the islands would again be

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come the subject of contention, unless the threat of nuclear war had permanently damped the fires of China's ambition.

Scarcely had the flames of conflict in the Far East died away to embers, if not to ashes, when fighting broke out in Europe. During October 1956, after months of growing unrest, Hungary rebelled against Soviet oppression. On November 4, after vetoing in the United Nations Security Council an American resolution calling for Soviet forces to withdraw from Hungary, the Soviet Union brutally crushed the uprising, using more than 200,000 soldiers and 4,000 tanks. President Eisenhower made a personal appeal to Nikita S. Khrushchev, who headed the Soviet government, but dismissed the thought of intervening with military forces. Instead of attacking targets beyond the Iron Curtain, the Air Force flew emergency supplies to Austria for the Hungarians who had found a temporary haven there and transported thousands of the refugees to new homes in the United States.

In November, while Hungarians escaped across the border to Austria, aircraft of the U.S. Air Forces in Europe started the airlift to aid the refugees, and the Military Air Transport Service soon joined in the effort. In the first mission, a single C-119 landed at Zurich, Switzerland, picked up five tons of medical supplies and an "iron lung" (as the bulky mechanical respirators of that time were called), and delivered the cargo to Vienna, where thousands of escapees gathered. Other missions followed in rapid succession, as C-119s of the U.S. Air Forces in Europe flew more than 100 tons of medical items and other emergency material from depots in England, France, and Germany directly to Vienna or to Munich, where the cargo was transferred to trains bound for Austria. The equipment moved by this combination of air and rail transport from the command's depots to the refugee centers in Austria included bedding and food service equipment for 5,000 persons.

Meanwhile, the Tactical Air Command employed its C-124s to take over scheduled routes of the Military Air Transport Service in Europe and North Africa, thus releasing Lockheed C-121s and Douglas C-118s to carry refugees to the United States. In one of the two airlifts originating in Vienna, some 5,000 persons embarked on chartered commercial aircraft bound for the United States. In the second exodus, an even larger number traveled by rail to Munich and boarded a fleet of 110 military and 46 civil transports operating between there and McGuire Air Force Base, New Jersey. Of the 9,700 men, women, and children who completed the flight from Munich to the United States between December 11, 1956, and January 2, 1957, about two-thirds arrived at McGuire on transports of the Military Air Transport Service. This accomplishment was even more remarkable because of fog that hampered operations at Munich and winter storms in the vicinity of the Azores on the transatlantic air route.

The crisis in eastern Europe coincided with an attempt by France and Great Britain to undo Egypt's nationalization of the Suez Canal with military force. Egyptian President Gamal Abdel Nasser took over the canal corporation, which

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Hungarian refugees arriving in the United States, December 1956.

the French and British had in effect controlled, in part as an assertion of Egyptian sovereignty but also to obtain revenue to build a dam at Aswan on the Nile, a dam that the United States had refused to finance. Nasser's action alarmed the governments at London and Paris, for he endorsed independence for the French colonies in northwest Africa, accepted arms and other aid from the Soviet Union, and seemed a threat to stability in the region. In seeking to overthrow Nasser and his policies, the two European nations found a willing ally in Israel, which feared an Egypt armed by the Soviet Union and enriched by revenues from the Suez Canal. Since Egypt had been an enemy since Israel first gained its independence, collaboration with France and the United Kingdom seemed justified.

Israel struck first; on October 29, 1956, its army advanced into and within a few days overran the Gaza strip and almost the entire Sinai peninsula. After Nasser rejected an offer by the French and British to land troops, enforce a truce, and safeguard the canal—acceptance would have meant surrender—warplanes of the two European nations attacked the Egyptian airfields and in a single day destroyed almost all the Soviet-supplied aircraft based in the country. Ironically, the successful raids resulted in the closing of the canal, for Egyptian authorities immediately scuttled some thirty ships in the waterway, blaming the sinkings on Anglo-French aircraft.

Despite the utter defeat of the Egyptian air forces, the British and French could not exploit the advantage thus gained, for their airborne and amphibious troops did not reach the scene until November 5. When the invasion force finally landed, the Soviet Union threatened to use intermediate-range nuclear ballistic missiles against France and Britain unless the attackers withdrew. This

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saber-rattling was unnecessary, however, for the operation had already failed. By this time President Eisenhower had denounced the landings as aggression, and most neutral and western nations echoed his words. The United Nations dispatched a peace-keeping force that included no representatives from any of the major powers, and a cease-fire went into effect on November 7. Lacking the support or encouragement of the United States, France and the United Kingdom began withdrawing their troops.

Air Force transports not only helped evacuate United Nations observers and American citizens whose safety was jeopardized by the Israeli invasion but also flew contingents of the peacekeeping force to Naples, Italy, the United Nation's marshalling area prior to occupying the Suez region as a condition of the informal truce. The U.S. Air Forces in Europe evacuated some 500 persons from Amman in Jordan, Damascus in Syria, or Tel Aviv in Israel shortly after the fighting began and flew them to Athens, Greece, or Rome, Italy. When the truce-monitoring force began taking shape in late November and early December, the command dispatched aircraft to pick up more than 2,000 troops and 325 tons of cargo in Denmark, Norway, Sweden, and Finland. The Military Air Transport Service lent a hand by flying another 1,300 soldiers from Colombia and India to Naples.

In the Suez crisis, Great Britain and France had won the battles but lost the war and with it the remaining vestiges of influence over their former dependencies in the Middle East. American influence in the region also suffered because of the nation's strong ties to Israel, France, and the United Kingdom, but President Eisenhower believed the United States could nevertheless play an important role in the area. As his second term began, the Chief Executive hoped to fill the vacuum created by the Anglo-French loss of influence. Consequently, as in the recent Taiwan crisis, he asked Congress for a resolution pledging American military and economic aid to help deter Soviet aggression in the area. Known as the Eisenhower Doctrine, this resolution, adopted early in 1957, signaled a substantially increased American interest in the Middle East.

The doctrine was soon tested, for continuing instability in the region gave rise to fears of further Soviet penetration. Domestic problems plagued the Arab states, and hostility persisted between Israel and its neighbors. At one point in 1957, Syria seemed on the verge of becoming a victim of communism and thus posing a threat to Turkey, Iraq, and Jordan. President Eisenhower therefore alerted the Strategic Air Command and other Air Force commands and approved the deployment of fighters from Germany to Incirlik Air Base at Adana, Turkey. Although this crisis abated, the region did not remain calm for long.

The next outburst occurred in Lebanon, where Moslem admirers of Nasser rebelled at the prospect that President Camille Chamoun, a Christian, might try to extend his tenure in office, thus threatening Lebanon's delicate political balance between adherents of the two religions. Nasser's influence seemed omnipresent throughout the Middle East: besides the worsening turmoil in Lebanon, officers of the Iraqi army, inspired by Nasser's kind of nationalism,

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killed their nation's ruler and prime minister, and Saudi Arabia seemed to be slipping into the grasp of members of the royal family who supported the Egyptian president. Against this backdrop of strife and uncertainty, President Chamoun on July 14, 1958, appealed to President Eisenhower, who had agreed to intervene, if such action were necessary, to protect American lives and shore up the legal government of Lebanon.

The Sixth Fleet landed a battalion of marines at Beirut on the afternoon of July 15, followed by two more battalions over the next three days. The marines had participated in amphibious exercises with the Sixth Fleet since May, when Chamoun first indicated that he might need assistance. Navy fighters from the aircraft carriers *Essex*, *Wasp*, and *Saratoga* met no resistance flying air cover for the landings by the marines, although a few Lebanese pilots were in the air. Likewise, the amphibious troops encountered no military opposition, even though the Lebanese army received no advance warning that the marines were coming ashore. Because Gen. Fuad Chehab, the army commander, was Chamoun's political rival (although a fellow Christian), the president had not informed him of the landings.

Augmented by C-124s of the Military Air Transport Service, troop carriers based in western Europe landed the first complement of Army airborne troops at Beirut airport on July 19. The airlift continued through the first two weeks of August, with the final combined strength of the Army and Marine Corps contingents amounting to more than 14,000 men, a force larger than the entire Lebanese army. In all, transports operating from Europe flew 7,900 men and 8,000 tons of cargo to Beirut or Incirlik. The facilities brought in by air included a complete field hospital manned by 79 doctors, nurses, and technicians; a mobile communications center; and an engineer detachment that specialized in repairing bomb-damaged runways. Of course, when the operation ended, the flow of men and equipment had to be reversed, again using aircraft of the Military Air Transport Service and the U.S. Air Forces in Europe.

The army of Lebanon was sufficiently large and well-equipped to deal with the rebels, but Chehab proved reluctant to use force against his fellow citizens. Following voting by members of the parliament, Chehab succeeded Chamoun on September 23. Since another Christian became president, the office of prime minister remained in Moslem hands, according to the usual arrangement for balancing the interests of the two religions. Chehab's election removed the possibility that Chamoun would try to remain in office, preserved the religious balance, and offered hope of national reconciliation. The turmoil subsided, enabling the American troops to leave Lebanon by the end of October, after serving 102 days as a peacekeeping force.

Aside from the airlift of Army troops from Germany, the role of the Air Force in the Lebanon crisis was largely peripheral. Composite Air Strike Force Bravo, under command of Maj. Gen. Henry Viccellio, deployed from the United States to Incirlik Air Base at the outset of the operation. The full complement of air-



A Martin B-57B Canberra, a licensed copy of the English Electric Canberra, with its rotary bomb bay open.

craft—26 F-100s, 12 B-57s, 7 RF-101s and 7 RB-66s for aerial photography, and 3 WB-66s for weather reconnaissance—arrived by July 20, saturating the facilities at Incirlik. Since fighting between American and Lebanese forces did not break out and the Soviet Union made no attempt to intervene, the only missions flown by the strike force were air cover for Army troop movements, show-of-force flyovers of Beirut, aerial reconnaissance, and leaflet drops.

The experience in Lebanon revealed a number of weaknesses in the planning and execution of joint operations. Problems of command and control seemed especially serious from the Air Force point of view, for General Viccellio had in effect been excluded from the command structure. Although he commanded his strike force, which flew missions over Lebanon, he could not influence the decisions made by Adm. James L. Holloway, the Commander in Chief, U.S. Naval Forces, Eastern Atlantic and Mediterranean, who arrived on the scene early on July 16, or by Maj. Gen. Paul D. Adams, the Army officer who assumed command of all ground forces ashore in Lebanon. Naval air units took their orders from the control center on the command ship *Pocono*, and aircraft from the strike force had to do the same. Theoretically, Viccellio shared in the responsibility for providing air cover for operations in Lebanon, but with no Air Force tactical air controllers closer than Incirlik, all tactical aircraft in the vicinity followed Navy procedures.

The show of force in Lebanon involved military forces that proved ill-matched to what was essentially a political crisis. Illustrative of the problem,

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Admiral Holloway had an Army rocket battery return to Germany after it arrived in Beirut armed with nuclear warheads. Similarly, the composite air strike force reached Incirlik with crews proficient in the tactics of nuclear warfare but poorly prepared to use conventional weapons. The B-57 crews and F-100 pilots had to undergo additional training in delivery of conventional munitions after arriving in Turkey. The intervention in Lebanon not only revealed gaps in command and control but also raised anew the question if atomic and hydrogen bombs were indeed the solution to every emergency. In the Suez crisis, Eisenhower's opposition had been more effective than the threat of Soviet missiles in deterring the French and British. In Lebanon, forces trained and equipped for nuclear war had proved inappropriate for the kind of fighting that was likeliest to occur; and some 4,000 miles from the Middle East, another crisis involving the defense of Taiwan tested the efficacy of an American military policy based largely on nuclear weapons.

Possibly seeing the American involvement in the Middle East as an invitation to test the strength of the ties between the United States and the Nationalist government on Taiwan, the People's Republic of China renewed its threat to "liberate" the island from control by Chiang Kai-shek and his followers. In July and August 1958, during the height of the buildup in Lebanon, the communists added substance to their threats by increasing their air and artillery strength on the coast across from Taiwan and steadily intensifying the pressure on Big and Little Quemoy and the five islands of the Matsus. Despite the threat of nuclear war that was credited with helping end the earlier crisis, the communists on August 23 began bombarding the Quemoy islands with heavy artillery, effectively cutting off the normal flow of supplies to the islands. The Nationalists declared a state of emergency and asked the United States to increase military assistance (in particular, F-86s armed with heat-seeking Sidewinder missiles and, for the first time, F-100s). Chiang also sought the deployment of Air Force units, both to symbolize America's abiding defend Nationalist China and to render actual assistance in this latest confrontation. From the American point of view, however, the new crisis at first seemed another test of American resolve, dangerous only if the United States seemed reluctant to aid the Nationalists and defy the People's Republic.

The United States had ample time to study the deepening crisis and responded firmly, though cautiously. After the communist shells began pounding Quemoy, Secretary Dulles warned the Peking government against trying to seize the island but carefully avoided specifying what action the nation might take in response. In contrast to the crisis in 1955, the Eisenhower administration made no mention of nuclear weapons. The administration's strategy was to convince the People's Republic of China that the United States would defend Taiwan, while keeping both Chinese groups uncertain of the ultimate level of response. Since the earlier crisis, President Eisenhower and his advisers had grown increasingly wary of being maneuvered into fighting a major war in



John Foster Dulles (left), Secretary of State, and Gen. Laurence S. Kuter, Commander in Chief, Pacific Air Forces.

which the only beneficiary was likely to be Chiang Kai-shek. After the crisis abated, Eisenhower sought to preserve the nuclear threat. Even as he acknowledged that his main objective was to avoid American involvement in the fighting, he insisted that he was prepared to respond with any appropriate level of violence, including the use of nuclear weapons. At the time of greatest danger, however, he did not threaten nuclear retaliation and made it clear to the Nationalists and to his own subordinates that he would approve nuclear attacks only in the most extreme circumstances. Indeed, from the outset he showed deep concern about nuclear war, advising the Joint Chiefs of Staff to rely on conventional weapons.

Before the President had told the Joint Chiefs of Staff of the emphasis on conventional weapons, the American response had already begun. On August 24 and 25, the Joint Chiefs of Staff ordered the aircraft carriers *Essex*, from the Mediterranean, and *Midway*, from Pearl Harbor, to steam to the Taiwan Strait. The ships arrived in mid-September, bringing the strength of the Seventh Fleet to six aircraft carriers. The arrival of the two carriers and other reinforcements made the Seventh Fleet the largest naval force assembled since the Korean War. The Army deployed a Nike battalion to Taiwan, but the unit's anti-aircraft missiles were not operational until mid-October.

The Air Force deployments began on August 29, with the Military Air Transport Service providing the necessary airlift, although it had to hire civilian transports for some routine flights not directly related to the crisis. The excessive cost of the airlift contracts caused nonessential service in the Pacific to be curtailed. General Weyland assembled a reinforced composite air strike force—the more experienced of the available units were in the force sent to Turkey—and dispatched it from California to the far Pacific. The aircraft of the strike

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force included B-57s, F-100s, F-101s, and RF-101s, joining six RF-101s already on Taiwan. The flight, using aerial refueling, crossed the ocean by way of Hawaii and Midway or Guam to airfields in Taiwan, Okinawa, the Philippines, and Japan. The entire contingent was in place by September 12, increasing by 123 aircraft the operational strength of the Pacific Air Forces. The deployment, however, was far from routine—obsolescent KB-50 tankers led the way, slowing the elements they had to refuel; only one permanent weather station covered the area between California and Hawaii, and its forecasters failed to anticipate strong headwinds; a tropical storm hit Guam on September 2, delaying the deployment by twenty-four hours; and, finally, the supplies stockpiled en route had deteriorated because of the climate.

Other aircraft besides those of the task force were on the way. Gen. Laurence S. Kuter, Commander in Chief, Pacific Air Forces, ordered the 16th Fighter-Interceptor Squadron, equipped with F-86Ds, from Okinawa to Taiwan. Largely to boost the morale of the Nationalists, the Air Defense Command sent twelve F-104s, which were disassembled and loaded in C-124s. The Marine Corps contributed to the buildup by sending fifty-six aircraft from Atsugi, Japan, to reinforce Taiwan's air defenses and augment the Navy's carrier air groups. In addition, the Department of Defense transferred to the Nationalist air force six F-100Ds originally earmarked for Europe and sixty rehabilitated F-86s, all equipped with Sidewinder missiles.

Once again, the forces deployed by the United States did not meet the needs of the situation. President Eisenhower insisted that the aviation units respond with conventional firepower, except possibly in the event of an invasion, but the carrier groups and the composite air strike force had trained principally for nuclear war. Indeed, General Kuter, reasoning that a single B-36 could carry more 1,000-pound high-explosive bombs than a squadron of F-100s, tried unsuccessfully to get a squadron of the huge bombers released from the Strategic Air Command for him to use in conventional operations. Because of the President's reluctance to employ nuclear weapons, the Air Force and Navy commanders hurriedly adjusted their planning to reflect his attitude. General Kuter, moreover, expressed concern that American airmen were at a disadvantage because of a critical shortage of conventional munitions and because the communists enjoyed a numerical advantage in aircraft.

As American strength increased, gunners of the People's Republic of China continued shelling the offshore garrisons on Big and Little Quemoy, making resupply extremely hazardous. During September, the Nationalists made three unsuccessful attempts to deliver cargo by sea or air. However, with American naval escort, subsequent efforts to supply the garrisons succeeded. In October, the communist Chinese announced a one-week cease-fire, ostensibly a humanitarian gesture to permit deliveries to the civilians on the islands. Afterward, sporadic shelling resumed, then abated as the crisis gradually eased. The American forces deployed to the western Pacific to meet the emergency returned by year's

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end to their normal stations without entering combat, and the Quemoy and Matsu Islands remained under the control of the Nationalist government.

Satisfied that the American deployments had deterred aggression against Taiwan, President Eisenhower was pleased to find Chiang Kai-shek more amenable than expected to American advice to exercise restraint. In return for a pledge of additional artillery from the United States, the Nationalists agreed to reduce the size of the offshore garrisons, reassuring the People's Republic of China that they would not use the islands to mount an invasion of the mainland. In a meeting with Secretary Dulles during October, Chiang also agreed to a "renunciation of force," again to assuage communist fears of an invasion. The Eisenhower administration believed the fine showing made by Nationalist airmen during the crisis affirmed the policy of attaining the objectives of the United States, in this instance containment of Chinese communism, by arming and training friendly indigenous forces and then backing them with American air, naval, and nuclear support. Of all the emergencies that had occurred since Eisenhower took office—Dien Bien Phu, Taiwan on two occasions, Hungary, Suez, and Lebanon—the Taiwan crisis of 1958 provided the best example of this policy in action, but even here the President proved reluctant to threaten, let alone use, nuclear weapons, even though they formed a key element in his strategy.

Had a major attack on the offshore islands occurred, American air commanders were ready to neutralize the enemy's air forces by striking their coastal bases, but the lack of approval to conduct nuclear strikes from the outset could have greatly hindered operations. Since no invasion materialized, the aerial engagements of the 1958 Taiwan confrontation were limited to occasional encounters between the air forces of the two Chinas. The Nationalist pilots scored a disproportionate number of kills in the few battles fought, even though American rules of engagement allowed them to act only in self-defense. In roughly twenty-five aerial encounters, mostly between F-86s and MiG-17s, the Nationalist fighters destroyed thirty-two enemy aircraft while losing only four. The communists apparently limited their air operations to the coastal areas of the mainland, for the heaviest fighting occurred when escorted Nationalist reconnaissance flights were jumped while photographing possible targets on the territory of the People's Republic of China. Nationalist pilots gained the advantage in these encounters because of better training and discipline and the heat-seeking Sidewinder missiles. The fighting did not last long enough to reveal whether the air force of the People's Republic used the encounters to train pilots as it did during the Korean conflict.

Central to the successful deployments of Air Force units, the Military Air Transport Service proved generally adequate for both the crises that arose in 1958—the confrontations in Lebanon and Taiwan. That might not have been so, however, had American forces become involved in actual hostilities in either the Middle East or the Orient or had a third emergency arisen. The Military Air

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Ching Chuan Kang Air Base, Taiwan, Republic of China.

Transport Service turned on both occasions to commercial carriers with disappointing results. In each instance, the cost of contracting seemed unduly high, and during the Lebanon crisis, civil carriers refused to fly troops or cargo there unless the President declared a national emergency, thus making the federal government financially responsible for destroyed or damaged aircraft.

Unlike the composite air strike force sent to Turkey, which inundated the facilities at Incirlik, the one sent to the Far East was dispersed among several airfields. Nevertheless, the arrival of Air Force and Marine Corps aircraft severely taxed the bases available on Taiwan, Okinawa, and Luzon in the Philippines. Both emergencies pointed to the need for well-equipped forward bases stocked for conventional operations. Poor communications was a critical problem in the Taiwan operation. Throughout the crisis, a lack of telephone and teletype circuits and equipment hampered American units; forced to depend on the local communications net, the Air Force units encountered barriers of language, security, and reliability.

Command arrangements for air operations in defense of Taiwan and the offshore islands, although different from those established in Lebanon, were no less confusing. Once the composite air strike force arrived in his theater, General Kuter integrated it into the existing structure of the Pacific Air Forces but then relinquished operational control to Vice Adm. Ronald N. Smoot, the commander of the Taiwan Defense Command, who functioned as a deputy of Adm. Harry D. Felt, the Commander in Chief, Pacific.

Admiral Smoot established a combined operations center on Taiwan for the centralized control of elements of the Army, Navy, and Air Force. Brig. Gen. Fred M. Dean, the senior Air Force officer on the island, was designated as air defense commander and reported to the admiral, but in fact, Dean was not the sin-

gle manager for defensive air operations. He had no authority over the aircraft of the Seventh Fleet and shared control over the Marine Corps aircraft sent to Taiwan, even though their primary mission was air defense. In spite of objections by the Air Force, the commander of the Seventh Fleet obtained Admiral Felt's permission to incorporate the Marine Corps fighters into his aerial strike force when they were not flying air defense missions. Since the carrier forces were tailored for nuclear operations, which the President had ruled out, the Navy needed the Marine Corps pilots, who were trained in conventional warfare.

Taiwan had survived, again retaining its independence and control over the offshore Quemoy and Matsu islands, but the Air Force and Navy debated who had won the victory. Understandably, the Navy emphasized the importance of its carriers. General Kuter conceded that the highly publicized naval concentration had a strong psychological effect on the communists, but he pointed out that the flight of a composite air strike force across the Pacific and the sudden arrival of a dozen F-104s produced the same kind of impact. General White, the Air Force Chief of Staff, had yet another explanation. Ignoring President Eisenhower's reluctance to use nuclear weapons and the basic question of the suitability of the atomic bomb for warfare that did not pit the United States against the Soviet Union, he declared that the ominous presence of the Strategic Air Command forced the People's Republic of China to suspend operations against the Quemoy and Matsus.

On the whole, the second Eisenhower administration brought improved prospects for prolonged peace between the United States and the Soviet Union until the final year of his Presidency. Emergencies did arise, but not even those in Lebanon and Taiwan during 1958 involved a direct confrontation between the two great powers. Another conflict not involving the Soviet Union occurred in May 1958, as the turmoil in Lebanon was worsening, when a mob attacked the motorcade carrying Vice President Richard M. Nixon and his wife through the streets of Caracas, Venezuela, demonstrating the widespread anti-American sentiment in Latin America. The Nixons escaped and calm returned, but not before President Eisenhower ordered troops and ships into position for a possible rescue attempt. In January 1959, in what proved a great source of frustration for American policymakers over the years, Fidel Castro took control of the Cuban government after a two-year guerrilla campaign. The son of a wealthy planter, Castro proclaimed himself a Marxist and established strong economic and military ties with the Soviet Union.

Early and ambiguous signs of a rift between the People's Republic of China and the Soviet Union began to appear in the twilight years of the Eisenhower Presidency, but the sundering the communist bloc lay several years in the future. In the summer of 1959, the People's Republic of China, apparently as ambitious as ever, may have provoked a new Indochina conflict when civil war broke out between the Royal Laotian Army and the Pathet Lao, a communist faction. The members of the Southeast Asia Treaty Organization did nothing, and Laos ap-

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pealed to the United Nations for help. Meanwhile, General White recommended unsuccessfully that the United States throw off the restraints imposed by the settlement that had ended the Indochina war in 1954 and immediately launch a vigorous program of military advice and assistance to the government of Laos. The Joint Chiefs of Staff advised intervention, if Laos requested the help of the Southeast Asia Treaty Organization, and reviewed the contingency plan that the Pacific Command had prepared. Both the Air Force and Army representatives objected to the plan and obtained changes that put an Army general in command, increased the size of the Army contingent, and included Air Force combat as well as airlift units. As the Chiefs reviewed the plan, Admiral Felt, the Commander in Chief, Pacific, was assembling in the Philippines a force of marines and the Air Force transports necessary to fly them into Laos. The crisis subsided, however, after a group from the United Nations visited the kingdom in September 1959, and since intervention no longer seemed justified, the United States confined its assistance to giving the Laotian government a few C-47 transports, some L-19 observation aircraft, and other military equipment.

By the spring of 1960, East-West cooperation seemed to be flourishing. Khrushchev, the Soviet leader, toured the United States in the late summer of 1959, and a summit meeting scheduled for Paris in May 1960 included Eisenhower, Khrushchev, and the leaders of France and Great Britain. On May 1, 15 days before the meeting was to begin, a Soviet surface-to-air missile downed a U-2 near the city of Sverdlovsk. During interrogation, Francis Gary Powers, the civilian pilot, acknowledged publicly that he had been on a reconnaissance mission for the Central Intelligence Agency, contradicting a hastily contrived cover story that his U-2 was a weather reconnaissance craft that had strayed off course. In time, the Soviet government would exchange Powers for Rudolf Abel, a spy captured in the United States; but the immediate response was anger, as Khrushchev demanded an apology and the summit meeting collapsed. In the aftermath of the U-2 incident, the Soviet Union reacted violently to routine reconnaissance missions, in July shooting down an Air Force RB-47 in the Arctic over the Barents Sea. Like Powers, the two survivors of the downed RB-47 were released after President Eisenhower left office. Khrushchev's actions foreshadowed a further heightening of tensions between the Soviet Union and the United States. In September 1960, he delivered a vituperative attack on the United States before the United Nations General Assembly; and in January 1961, as the United States prepared to inaugurate John F. Kennedy, its newly elected President, the Soviet leader made yet another speech, this one widely interpreted as an encouragement of "wars of national liberation" against the western powers.

Despite the U-2 incident, differences between the United States and the Soviet Union could still be resolved short of armed conflict. In the summer of 1960, the Air Force transported a portion of the United Nations security contingent to the Congo, helping to forestall a Soviet attempt at penetrating the conti-



A Lockheed U-2 reconnaissance aircraft.

ment of Africa. Within a week of receiving its independence from Belgium, the Congo erupted in violence and anarchy. The decision of the United Nations to send troops drawn from African and other nations aligned with neither the United States nor the Soviet Union relieved the Eisenhower administration of any obligation to intervene on the ground. The Soviet Union, however, sought to establish a presence by sending airmen and technicians to assist one of the contending factions, an adventure that ended in failure.

Most of the United Nations soldiers dispatched to the Congo arrived in Air Force transports that also flew in food and evacuated American citizens and other civilians menaced by the violence. Because of heavy demands on the comparatively few transport assigned to the U.S. Air Forces in Europe, the Air Force deployed 59 of the huge C-124s from the Military Air Transport Service. During a two-month period ending in September 1960, the Air Force carried into the Congo more than 16,000 troops from 16 nations. This support of the United Nations peacekeeping effort demonstrated that airlift could be as important as fighter-bombers, depending upon the nature of the crisis.

By 1960, signs of change appeared in American military thinking. After a succession of crises in which the use of nuclear weapons had for one reason or another been ruled out, the Army and its Chief of Staff, Gen. Maxwell D. Taylor, argued that more money should be spent on conventional forces for limited war. The Navy tended to agree, though not completely. Thomas S. Gates, Jr., while Secretary of the Navy before becoming Secretary of Defense, suggested,

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“Given a shield of mutual deterrence, power to prevent limited aggression and win limited war becomes decisive.”<sup>3</sup> Although willing to claim for the Marine Corps a share of the limited-war mission, the Navy had not lost sight of the role of Polaris in the deterrent force; referring to the missile system, Adm. Arleigh A. Burke, the Chief of Naval Operations, said, “As long as an enemy knows that no matter what kind of blow he may first strike at us, he will himself be destroyed in reprisal, then he will not rationally decide to start a war.” If American and Soviet nuclear might should in effect cancel one another, the Marine Corps, like the Army, might be essential in winning a conventional war fought under that umbrella, but maintaining deterrence was vital to the nation and, since Admiral Burke hailed Polaris as a retaliatory weapon “invulnerable to preemptive attack,” vital also to the Navy.<sup>4</sup>

The Air Force, although increasingly aware that the threat of nuclear weapons might not deter every conflict and that their use might not always be appropriate, had not yet absorbed the lessons of Lebanon or the second Taiwan crisis. A service position on limited war would have to await the advent of the Kennedy administration, which elevated General Taylor to the status of military adviser to the President and made conventional warfare, especially counterinsurgency against wars of national liberation, something of a military fad. Until that time, the Air Force, in the public statements of its senior leaders like General White, clung to the strategy of deterrence, while replacing massive retaliation against cities with counterforce targeting, which, in theory at least, limited the damage inflicted in a nuclear war. Although the single integrated operational plan did not incorporate the idea of sparing cities, insofar as possible, and attacking military targets, the Air Force at the end of the 1950s envisioned in its official statements a retaliatory strike that would eliminate an attacker’s capacity to make war, wiping out missile sites, command centers, air bases, logistics complexes, and other military installations—thousands of individual targets, all destroyed with utter certainty. According to the Air Force, the ability to level a comparatively few cities, as the advocates of Polaris recommended, might not be enough, for despite smoldering ruins and charred inhabitants, the enemy would have the capacity to fight on. Only America’s absolute ability and unqualified willingness to eradicate an enemy’s military infrastructure could keep the Soviet Union in check. Limited conflicts, however, might be discouraged or won by threatening to unleash, or actually employing, a lesser degree of destruction against the aggressor. Such was the institutional reasoning of the Air Force, as revealed to the public and Congress, when the second Eisenhower administration faded into history.

Part V

The War in  
Southeast Asia,  
1960-1975



## Chapter 17

# Flexible Response: Evolution or Revolution?

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**J**ohn F. Kennedy, who became the thirty-fifth President of the United States in January 1961, inherited policies that affected the organization and employment of the Air Force. At the heart of these policies were three principles that originated during the Presidency of Harry S. Truman and had become so embedded in American political thought that they seemed beyond challenge: containment of communism; support of regional security compacts, especially the North Atlantic Treaty Organization; and deterrence of war through the threat of nuclear retaliation. Although the new administration accepted these tenets, it ultimately refined the priorities and plans that lent substance to the theories of containment, collective security, and deterrence.

Throughout the presidential campaign, Kennedy charged the administration of Dwight D. Eisenhower (in which his opponent, Richard M. Nixon, had served as Vice President) with allowing fiscal concerns to dictate military policy and thus causing an alleged missile gap (which proved nonexistent). The charge that budgets determined strategy produced a preelection flurry of spending; Eisenhower and his advisers reacted by releasing appropriated money that they had chosen to withhold, thus increasing the funds available for, among

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other things, the Army's conventional forces and the Navy's Polaris submarine program. Despite the sudden availability of funds, the issue of solvency at the price of security persisted. Indeed, Robert S. McNamara, the incumbent president of the Ford Motor Company, whom Kennedy chose as Secretary of Defense, promised "to recommend the size and type of military establishment required to protect the national security without regard to arbitrary budget ceilings and that, having done this, to provide the military establishment of the appropriate size and type at the lowest possible cost."<sup>1</sup> In brief, the new administration intended to link the defense budget to the agreed national strategy, hardly a novel idea.

To accomplish this very goal, President Eisenhower had tried, like Truman before him, to obtain from the Joint Chiefs of Staff a strategic objectives plan on which defense spending would be based, but with no greater success. The services could not agree, and Eisenhower had to settle for imposing a ceiling on expenditures and allowing the Joint Chiefs to apportion that amount among the armed forces. Despite this setback, in 1959 Secretary of Defense Neil McElroy experimented with a new approach to the budget, attempting to arrange the requests from each service according to mission. He tried, albeit unsuccessfully, to organize the budget in terms of continental air defense, atomic retaliation, strategic reserve, forces overseas, and reserve components. He found the Army enthusiastic—in fact, Gen. Maxwell D. Taylor, the recently retired Army Chief of Staff, suggested a similar approach in his 1959 critique of national military policy, *The Uncertain Trumpet*. The Air Force was lukewarm to this approach, and the Navy opposed the idea. Once again, as in the case of the Joint Strategic Objectives Plan, the armed forces, as represented by the uniformed service chiefs, rejected an attempt to tailor appropriations to fit a coherent national strategy.

Secretary Thomas S. Gates, Jr., who succeeded McElroy, was somewhat more successful. He managed to persuade the Joint Chiefs of Staff to agree to joint strategic target planning, but this reform, as carried out at the headquarters of the Strategic Air Command under the direction of Gen. Thomas S. Power, merely expanded the old war plan to accommodate Polaris, the Navy's newest strategic weapon, and kept the key staff positions securely in Air Force hands. No hard choices were made in the interest of economy or efficiency.

Since McElroy's budgetary reforms failed to be adopted, the Eisenhower administration continued to follow procedures that, in Secretary McNamara's view, actually hampered the defense of the nation. President Eisenhower and his incumbent Secretaries of Defense tended to step aside after establishing a ceiling on the defense budget, allowing the Joint Chiefs to divide this amount among the services and the services to decide how to spend what they received. This process produced uneasy, often irrational, budget agreements after debates that pitted Air Force proponents of nuclear weapons against Army advocates of conventional armaments. Within the Air Force, bomber enthusiasts might

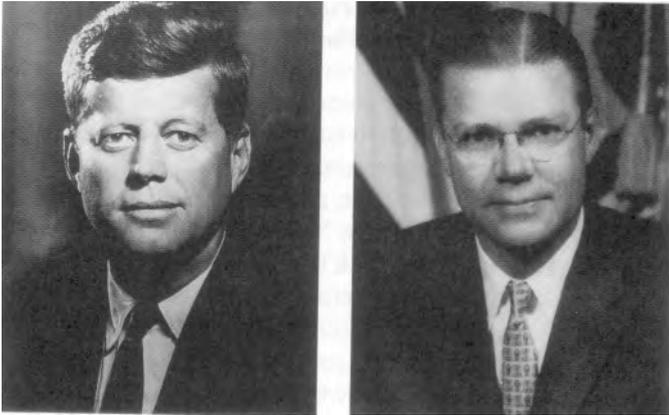
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square off against missile men, or the Navy's aviators might compete for funds with submariners. In these circumstances, the new Secretary of Defense believed, the unorthodox solution or revolutionary weapon that had no constituency tended to lose out to programs already staffed and funded. He was convinced that innovation and efficiency suffered, for each service tended to conduct its programs, especially research and development, with scant regard for the efforts of the others. Moreover, all the services had, in his opinion, become entirely too adept at inserting the "thin edge," using a justifiable and comparatively inexpensive request to crack the shell of the budget, and later applying leverage to break it open and extract additional money. For the Air Force, the thin edge might be a request for an aircraft that, when granted, would serve to justify the building of bases and the recruiting and training of air crews and maintenance specialists. Indeed, Allen C. Enthoven, Assistant Secretary of Defense for Systems Analysis under McNamara, suggested that General LeMay, as Chief of Staff, tried to insert the thin edge by using the percentages of increase in one type of aircraft and in operational wings, some equipped with those very airplanes, to justify a comparable increase in bases and manpower. Since the Joint Chiefs of Staff had failed to deal with these practices, McNamara believed that only the Secretary of Defense, whose authority had greatly increased with the 1958 reorganization of the Department of Defense, could reconcile budget with strategy. He proposed to be far more aggressive than Eisenhower's defense secretaries.

In carrying out his ideas, McNamara turned for assistance to Charles J. Hitch, the head of the economics division at Rand, who had devised what came to be called the Planning-Programming-Budgeting System. McNamara chose Hitch as Assistant Secretary of Defense (Comptroller) and relied on him, and the system he championed, to provide the information necessary to bring the budget into line with national objectives. Hitch's Planning-Programming-Budgeting System, in effect, asked these questions: How does a program contribute to carrying out the national strategy? How badly is it needed and what is an appropriate cost? What are the alternatives and how do they compare in terms of cost and performance? In finding answers, a civilian staff responsible to the Secretary of Defense and independent of the services subjected the competing courses of action to a rigorous analysis so that the Secretary of Defense would be able to recommend a "cost effective" program that promised the greatest return militarily for the resources invested.

The secretary's recommendations concerning weapons and forces went forward to the Commander in Chief in the form of a Draft Presidential Memorandum. The number submitted each year varied according to the number and nature of the programs being considered. In 1961, for instance, Secretary McNamara prepared just two, one dealing with strategic forces and the other with general purpose forces, but by 1968, the year in which he resigned, the annual total had risen to 16. McNamara forwarded his recommendations for major

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John F. Kennedy (left), President of the United States, January 1961–November 1963, and Robert S. McNamara, Secretary of Defense, January 1961–March 1968

support programs such as pilot training or the acquisition of certain types of noncombat aircraft in a Draft Guidance Memorandum. His office circulated both kinds of documents among the services for comment so that the version that reached the President would reflect not only the views of the Secretary of Defense and his analysts but also any dissent on the part of the services or the Joint Chiefs of Staff.

After approval by the President, the proposals were included in both the annual budget and a five-year defense program dealing with ten functional areas: strategic forces, general purpose forces, sealift and airlift, intelligence and communications, reserve components, research and development, supply and maintenance, training and medical services, administration, and foreign military assistance. This projection listed the current year's costs and afforded an insight into the consequences of today's decisions in terms of manpower and spending. McNamara believed that the five-year plan would frustrate any attempt to insert the thin edge and apply leverage later. Within the ten planning categories, each system or other item was treated as a program element—a combination of men, machines, and installations contributing to the national security. Within strategic forces, for example, the Minuteman program element included the missiles, their launch sites, their transporters, and the men who operated, delivered, and maintained them.

The new administration believed that the Secretary of Defense, using procedures like the Planning-Programming-Budgeting System and agencies like an office of systems analysis, could evaluate the issues rationally and coordinate defense expenditures with national policy. Secretary Gates had worked toward a similar goal, meeting frequently with the Joint Chiefs of Staff and urging them

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toward a consensus on targeting for nuclear warfare that would avoid wasteful duplication of effort. In contrast to the exercise of persuasion that Gates had favored, McNamara proposed to obtain the facts from his analysts, reach a logical conclusion, and impose that decision on the services. The new Secretary of Defense favored a direct, perhaps autocratic, approach, relying on his own judgment, which reflected the work of his systems analysts, then telling the Air Force and the other services which of their projects were worth continuing and at what level of funding.

The centralization of authority within the Department of Defense, usually in the person and office of the secretary, was not new to the Kennedy administration but was the culmination of a process that began with the Truman Presidency. In 1949, when investigations of the attack on Pearl Harbor revealed that information from intercepted and decoded Japanese messages had not reached the American commanders there, Truman established an Armed Forces Security Agency responsible for cryptography and cryptanalysis within the Department of Defense. Three years later, this organization became the National Security Agency and began supervising or conducting these intelligence activities for the entire government.

Centralization continued during the second Eisenhower administration, when, following the orbiting of the two Soviet Sputniks, Secretary of Defense McElroy in 1958 established the Advanced Research Projects Agency to direct long-range programs of basic research in space technology, whether oriented toward military or nonmilitary goals. The Advanced Research Projects Agency retained its original role for just a short time, however. The passage in August of the Defense Reorganization Act of 1958 established the Office of Director of Defense Research and Engineering in the Office of Secretary of Defense and conferred an advisory rather than supervisory role upon the Advanced Research Projects Agency in its dealings with the armed services. The Director of Defense Research and Engineering (after 1977 the Under Secretary of Defense for Research and Engineering) ultimately became the focal point for all such projects within the department, not only advising the Secretary of Defense but also supervising the efforts of the services. The Advanced Research Projects Agency also yielded authority to the National Aeronautics and Space Administration, which formally took over the civilian space program in October 1958; and in September of the following year, the Air Force assumed responsibility for the principal military space programs that agency had conducted. By the time the Kennedy administration took office in 1961, the Advanced Research Projects Agency was engaging exclusively in research and development.

Despite the transfer of operational programs from the Advanced Research Projects Agency, the process of consolidation survived. In May 1959, before McElroy resigned as Secretary of Defense, he established the Defense Atomic Support Agency (since 1972 the Defense Nuclear Agency). Responsible for the military applications of nuclear energy, the agency replaced the Armed Forces

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Special Weapons Project, itself the successor to the Manhattan District of the Army Corps of Engineers, which had developed the atomic bomb. Aside from the change of name, the principal difference between the special weapons project and the atomic support agency was a new requirement that service representatives report to the Joint Chiefs of Staff as an institution instead of to the individual service chiefs. The decision of Secretary Gates in May 1960 to set up a Defense Communications Agency was, perhaps, even more radical. Invoking an amendment to the Defense Reorganization Act of 1958 that empowered him to promote economy and efficiency by merging into a single agency any supply or support activity conducted by two or more of the services, he established the new organization to exercise control, subject to the Joint Chiefs of Staff and the Secretary of Defense, over the entire military long-distance communications network.

The centralization of authority in the Office of Secretary of Defense went forward under McNamara, who used the same amendment to consolidate control over intelligence, supply, and contract auditing. On August 2, 1961, he established the Defense Intelligence Agency to absorb the overlapping intelligence functions of the military services, and on the last day of that month he set up the Defense Supply Agency to take over the management of certain common categories of supply that the services had handled individually. Then, in 1965, the Defense Contract Audit Agency began reviewing contracts involving any element of the Department of Defense for the Assistant Secretary of Defense (Comptroller).

An example of Secretary McNamara's policy of centralization that reflected a national strategy to meet the various kinds of aggression with an appropriate degree of force was his creation of the U.S. Strike Command with headquarters at MacDill Air Force Base, Florida. The new command traced its origins to the previous administration when both the Air Force and Army Chiefs of Staff, Generals Thomas D. White and Maxwell Taylor, had proposed a joint headquarters to plan for emergencies like the Lebanon crisis, which a composite air strike force and the troops and naval forces available near the scene handled on an ad hoc basis. McNamara selected Gen. Paul D. Adams of the Army, a veteran of the Lebanon landings, to command the new headquarters. His Air Force deputy was Lt. Gen. Bruce K. Holloway, whose experience in tactical aviation included service in Chennault's air campaigns in China during World War II. Air Force participation in the U.S. Strike Command did away with the need for the composite air strike forces that Gen. Otto P. Weyland had devised for emergencies while commander of the Tactical Air Command. The Strike Command, for more than ten years after its founding in 1961, carried out the mission of preparing either to reinforce the overseas commands or to deploy independently in an emergency. Finally, in January 1972, the organization ceased to exist; existing overseas commands assumed some responsibilities, and the U.S. Readiness Command took over the mission of providing a combat-ready strategic reserve.

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Gen. Maxwell D. Taylor,  
Chief of Staff of the Army,  
June 1955–June 1959.



The establishment of the U.S. Strike Command signaled a change in basic military thinking foreshadowed, however faintly, in the New New Look. As President Eisenhower began his second term, the nation's military leaders addressed, but did not answer, the question whether deterrence could be absolute when the Soviet Union developed a nuclear arsenal comparable to that of the United States. The Army believed that conventional warfare would become more likely with the approach of a nuclear parity enabling each side to inflict crippling devastation on the other and urged that the United States prepare for conventional fighting. The Air Force, however, maintained that the retaliatory force would continue to deter war for the near future and should retain the overriding priority it had enjoyed during the decade just ended. The Navy was ambivalent, committed to both nuclear retaliation with Polaris and conventional warfare with the Marine Corps. In the absence of a consensus, the New New Look became a continuation of the original New Look, the basic strategy of deterrence adopted by the first Eisenhower administration. By failing to agree, the Joint Chiefs postponed a decision on preparing for the day when America's overwhelming nuclear dominance began to fade.

President Kennedy's search for rational courses of military action, which avoided both nuclear incineration and abject surrender, focused on conventional warfare for precisely defined objectives; he became a believer in matching response to provocation. This solution, called flexible response, reflected the thinking of General Taylor, the Army Chief of Staff from 1955 to 1959. To that end, he argued for stronger conventional forces while in uniform and continued to press the issue after retiring. In *The Uncertain Trumpet*, he outlined a strategy of flexible response that would enable the United States to "respond anywhere, any time, with forces appropriate for the situation."<sup>2</sup> Taylor proposed reforming the military establishment so that conventional forces would share the same priority as the nuclear deterrent; the former would be as ready to deal with nonnuclear attempts to breach or undermine the barriers of containment as the

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Brig. Gen. Noel F. Parrish, Director,  
Research Studies Institute, Air University,  
July 1961–September 1964.

latter was to retaliate against an all-out attack. To this end he advocated “heroic measures,” such as closing the alleged missile gap, developing and deploying the Army’s antiballistic missile system, embarking on an extensive program of civil defense, and taking advantage of the aggregate manpower of the United States and its allies throughout the world to overcome the numerical advantage currently enjoyed by the conventional forces of the Soviet Union, China, and the communist states of eastern Europe.

Such were the main features of the Taylor plan. He suggested, however, that for the short term, four “quick fixes” could compensate for America’s neglect of conventional warfare: improved planning and training for limited warfare; the development of a mobile, intermediate-range ballistic missile for use by the Army’s field forces; better protection of the Strategic Air Command through the dispersal of its bombers, some always on airborne alert; and initiation of a program to provide at least a portion of the populace with shelter against radioactive fallout. By readily embracing Taylor’s quick fixes, though not his heroic measures, Kennedy in effect did what the Joint Chiefs of Staff had been unable to do and began preparing for the day when American and Soviet nuclear retaliatory forces neutralized each other. He accepted conventional warfare as an attractive alternative to an all-out conflict of nuclear strikes and counterstrikes that would inflict crippling damage on all the combatants.

Through their writings, Taylor and other Army officers sought to change the course of American military policy by offering new ideas to the public and to the political leadership. The director of the Air University’s Research Studies Institute, Brig. Gen. Noel Parrish, recognized the effectiveness of this campaign, which began in the mid-1950s at the Army War College, and complained that his own service, instead of emphasizing “brains and foresight” as the Army had done, continued to stress “the big operator,” as embodied in the Strategic Air Command. Although the Army had indeed seized the intellectual initiative, Parrish may have been unfair to his service. To justify its claim to manpower and

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money at a time when an aging New Look faced a vigorous public challenge, the Air Force had little choice but to defend the old strategy based on overwhelming retaliation, even though, within the service, officers like General Weyland had begun questioning the policy. Taylor, moreover, emerged as a spokesman for change on the eve of a Presidential campaign when the Democratic candidate was seeking ways to emphasize how his military policies differed from those of the previous administration; in such circumstances, the impact of the Army general's fresh and plausible strategy was greatly multiplied.

The movement toward a strategy of flexible response received a strong push from Nikita S. Khrushchev, the leader of the Soviet Union. In January 1961, while addressing a conference of the world's communist parties in Moscow, he vividly described the effects of nuclear warfare and declared that such a conflict could not be considered a useful means of advancing the cause of communism. He added, however, that "liberation wars and national uprisings" deserved support and would hasten what he described as an inevitable triumph over the capitalist system. To Secretary McNamara, who regarded the speech as a declaration of Soviet policy, and to President Kennedy, who urged his advisers to "read, mark, learn, and inwardly digest" these views, Khrushchev appeared to be threatening subversion, guerrilla warfare, and insurrection all along the perimeter of the noncommunist world. Conventional armaments seemed better suited than nuclear retaliation to meet the danger from an enemy that used an armed minority concealed among the populace and apparently dedicated to economic or social changes.

Despite threats from Khrushchev and Presidential support, the quick fixes proposed by General Taylor had mixed results. The Army profited the most, sharpening its planning and training for limited war, developing the organization and tactics for a new air cavalry equipped with helicopters and other aircraft, and acquiring the Pershing intermediate-range ballistic missile. The earlier experiments with an airborne alert paid off with increased protection of the Strategic Air Command even before the change of administrations, for during 1960 the number of bombers and tankers aloft and ready for action amounted to one-third of the total force. The designation and stocking of public fallout shelters and building of backyard shelters enjoyed a brief vogue, only to succumb to an easing of international tensions, as affirmed by a ban on some forms of nuclear testing, and to inherent contradictions, such as emphasizing fallout but ignoring heat and blast in major cities where, in the event of an all-out war, nuclear weapons were almost certain to explode. From time to time into the 1980s, interest surfaced concerning shelters and even the evacuation of cities, but planning remained tentative at best.

Whether advocating quick fixes or heroic measures, General Taylor was an important source of ideas on military matters for the Kennedy administration and later for that of Lyndon B. Johnson, the Vice President, who became President in November 1963 after Kennedy was assassinated in Dallas, Texas.

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Taylor was not, however, the only person who helped shape the military thinking of the two Presidents and the views of Secretary of Defense McNamara, who served and advised both. McNamara, in particular, seemed inclined to listen to analysts, like William Kaufmann from Rand. Kaufmann earlier contributed to the idea, which General White endorsed as Air Force Chief of Staff during the Eisenhower administration, that counterforce targeting and mutual restraint would spare to a great extent the cities and urban populace of the opposing nations during a nuclear war.

The Kennedy administration shared the uneasiness that Eisenhower and Secretary Gates had expressed when presented with a plan for retaliation calling for obliteration of the enemy's society, in the process raising clouds of radioactive debris that would rain down on friend, foe, and neutral alike. Illustrative of this tendency to plan for truly cataclysmic retaliation is the story, told in Fred Kaplan's *The Wizards of Armageddon*, about a briefing of Secretary McNamara by General Power, the Commander in Chief, Strategic Air Command, and Director, Joint Strategic Target Planning Staff. In describing the single integrated operational plan, Power indicated that he would have to destroy much of Albania's populace because of a Soviet radar located in that nation. "Well, Mr. Secretary," the general is supposed to have joked, "I hope you don't have any friends or relations in Albania because we're just going to have to wipe it out."<sup>3</sup> Although the account may be apocryphal, McNamara did come away convinced that the plan for nuclear war was irrational and called for far greater violence than was necessary to defeat the probable enemy. Eisenhower and Gates had tried to interject reason by means of budgetary restraint and joint targeting, but in McNamara's opinion they had failed utterly. The new Secretary of Defense revealed his solution during the spring of 1962 in a speech before the foreign ministers and defense ministers of the North Atlantic Treaty Organization and again, publicly, in a commencement address at the University of Michigan at Ann Arbor. McNamara's proposal was counterforce, the reliance on a retaliatory arm that could survive the initial strike, destroy the attacker's remaining military strength, and retain sufficient power to begin leveling urban targets should the enemy persist in his aggression.

Secretary McNamara was determined that flexible response, whether at the nuclear or conventional end of the spectrum, would be subject to the direction of the Commander in Chief, his Secretary of Defense, and the Joint Chiefs of Staff. During 1962 he set in motion the studies and issued the basic directives to establish a National Military Command System. The elements of this system would ultimately include a National Military Command Center at the Pentagon, an alternate center some distance away, the National Emergency Airborne Command Post (initially a specially equipped version of the KC-135 tanker), the National Emergency Command Post Afloat, and the survivable communications networks linking these with the unified and specified commands and with other important headquarters.

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Operators aboard the airborne command post, 1960.

In summary, the pillars of the military policy of the Kennedy administration were use of the defense budget to further national aims, centralization of authority in the Office of Secretary of Defense, and adoption of a strategy of flexible response. The administration also had to resolve two items of unfinished military business from the Eisenhower administration. One dealt with space and the other sought cooperation with other nations, especially the Soviet Union, in controlling and reducing armaments.

Part of the American reaction to the dramatic appearance of the Sputniks in the night sky was the establishment of a civilian space agency. Although Congress realized that, as Professor Walter A. McDougall has written in his history of the race into space, “the military side of space technology, like pitching in baseball, was seventy-five to ninety percent of the game,”<sup>4</sup> the legislators agreed with President Eisenhower that the armed forces should not direct the nation’s space program. Although determined to continue the military space program, including the surveillance satellites that would detect a surprise attack, the Chief Executive saw compelling reasons for creating a nonmilitary space program operated by a new civilian agency. He was reluctant, for example, to release the additional money to the services and raise the stakes in the annual battle of the budget. He assumed that a new agency would be more amenable to fiscal restraint than were the armed forces, experienced in the ways of budget making and with supporters already in place in industry and on Capitol Hill. He believed, moreover, that the United States needed a nonmilitary program dedicated to the advancement of science and the exploration of space, to mapping and communication by means of satellites. Functioning separately from military activities, these space operations would be conducted in a spirit of candor

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and international cooperation that would contrast sharply with the secrecy shrouding Soviet efforts. Finally, he hoped to forestall, in vain it would prove, charges that the United States was militarizing space. In short, Eisenhower intended to promote the peaceful uses of space, accepting such defensive measures as surveillance satellites but seeking to prevent an arms race involving orbital offensive weapons.

The best solution to the need for a civilian organization seemed to be to project into the space age the venerable National Advisory Committee for Aeronautics, with its forty-year tradition of essentially civilian control but close cooperation with the military. Already the committee was engaging in research into the problems of space flight at the urging of its director, Jimmy Doolittle, and others. A former Regular officer in the Air Service and Air Corps, Doolittle had resigned, entered the reserve, been called up for World War II, and risen to the rank of lieutenant general before returning to civilian life, where he was a respected engineer and administrator. Indeed, his very presence on the committee symbolized its unique mixture of civilian and military members and research projects. Effective October 1, 1958, legislation abolished the National Advisory Committee for Aeronautics and established in its place the National Aeronautics and Space Administration. Thus did the nation embark on a second space effort, public in nature, that proceeded alongside the continuing and largely secret military program for which the Air Force remained primarily responsible.

Unlike Eisenhower, who believed that the ultimate source of the nation's strength was its economy and pushed for a balanced budget, Kennedy was convinced that the continued power of the United States depended on winning a competition with the Soviet Union that extended into space, a competition that could alter the course of human history. The new Chief Executive spoke of a "contest of will and purpose as well as force and violence," and in 1961, as a powerful demonstration of American resolve, he committed the nation to landing a man on the moon and returning him safely to earth—a goal he proposed to meet by the end of the decade.

The glare of publicity that encompassed the proposed landing on the moon tended to blind observers to the fact that Eisenhower had already established the basic space programs that future Presidents would follow, although with their own modifications and changes of emphasis. As John Logsdon, a historian of American space policy, pointed out in an essay published by the National Aeronautics and Space Administration to commemorate twenty years (1961 to 1981) of "spacefaring," the Eisenhower administration set up three "functions" within the two broad categories of the military and civilian uses of space. The military category included two of the functions, one a generally open and well publicized program dealing with missiles and later such projects as a manned spacecraft and an orbiting laboratory, and the other a closely held secret. The civilian category embraced the third function, which consisted of the highly publicized programs of the National Aeronautics and Space Administration to ex-

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Eugene M. Zuckert,  
Secretary of the Air Force,  
January 1961–September 1965.



plore the universe with manned spacecraft and automated probes. Under Eisenhower, wrote Logsdon, “the government developed and maintained separate and distinct institutional structures for each function, not only in terms of line agencies within the executive branch, but also in terms of policy review, budget development, and congressional oversight.”<sup>5</sup> Eisenhower, at the end of 1960, established in the Defense Department a civilian organization responsible for reconnaissance satellites that became the National Reconnaissance Office.<sup>6</sup>

More important to the Air Force than racing the Soviet Union to the moon was Kennedy’s interest in the military applications of space technology, including the surveillance, navigation, and communications satellite systems. The next logical step beyond these automated satellites seemed to be manned flight, a military equivalent of the highly publicized efforts of the National Aeronautics and Space Administration that would first place a man in orbit around the earth, then send him to the moon and bring him safely back. Early in 1961, before Navy Commander Alan B. Shepard, Jr., took the first tentative step toward the moon by making a suborbital flight from Cape Canaveral, Florida, the new Deputy Secretary of Defense, Roswell L. Gilpatric, advised Secretary of the Air Force Eugene M. Zuckert that the military mission in space would go to the Air Force, provided it reorganized its machinery for research and development and acquisition. Actually the administration had no real alternative to the Air Force; the National Aeronautics and Space Administration was wholly committed to the preliminaries for the manned mission to the moon, and the Air Force was already responsible for much of the remaining military space activity. At most, Gilpatric’s remarks highlighted the importance of a consolidation of research and development, testing, and procurement already underway within the Air Force. In March 1961, prior to the official announcement that the Air Force had entrusted logistics to one command and assigned research and development, testing, and procurement to another, Secretary McNamara formally placed the air arm in charge of future space research and development in the Department

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of Defense. Though excluding space reconnaissance, this decision acknowledged the importance of military missiles and satellites and enabled the Air Force once again to begin testing the limits of technology, this time applied to manned spacecraft with military uses.<sup>7</sup>

An expanded role for the Air Force had seemed an all but inevitable result of the Kennedy administration's interest in the military aspects of space as the service was already involved in three related developmental activities—military satellites, a manned spacecraft with a military purpose, and booster rockets for these vehicles. This work had begun during the Eisenhower years, when boosters based on Thor and Atlas missiles had placed military and civilian satellites, as well as experiments related to travel by humans in space, in orbit. Even the X-20, the manned spacecraft being developed by the Air Force, traced its roots to work done in conjunction with the National Advisory Committee for Aeronautics during the Eisenhower Presidency and ultimately to a concept for an orbital bomber that originated in Hitler's Germany. When Bell Aircraft began designing the X-20 using the German studies, it hired Walter Dornberger, an engineering officer brought over from Germany after the war, who had directed the V-2 missile program. The manned spacecraft proposed by Bell, clearly intended as an offensive weapon, bore the nickname of ROBO, short for rocket bomber. The nickname finally chosen, Dyna-Soar, was far more consistent with Eisenhower's commitment to the peaceful uses of space, which in effect banned offensive weapons in orbit. A contraction of the term "dynamic soaring," this name reflected the flight profile of the one-man delta-shaped space glider. Ultimately named X-20, for its test and research mission, it was to be boosted into orbit by a rocket, reenter the atmosphere after orbiting the earth, and glide to a controlled landing. Boeing Aircraft emerged as the prime contractor for the projected spacecraft, which, although much smaller, resembled the Space Shuttle of the 1980s in general appearance and in method of operation.

As plans for the Dyna-Soar took shape, the Air Force continued working on instrumented military satellites and, to lift them into orbit, produced the Titan III family of boosters based on the Titan II ballistic missile. At the heart of these rockets was a two-stage core section derived from the Titan II and an upper stage, called the transtage, that varied according to mission. Titan IIIB, for example, consisted of just the core section plus a specialized transtage. The most powerful booster in the family, Titan IIIC, consisted of the core section with solid-propellant boosters attached on either side. Ultimately, Titan IIIC variations appeared that retained the strap-on solid boosters but used different transtages.

Titan IIIC possessed the thrust needed to launch the Dyna-Soar, but the manned spacecraft did not have a specific purpose. Was it a surveillance platform like some of the unmanned satellites? If so, what could its pilot do that could not be done more efficiently by automated sensors? Was it destined to become some sort of orbiting attack vehicle? If so, did the technology for that pur-

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pose exist, and how would such a weapon square with President Eisenhower's declaration that the United States would use space solely for peaceful purposes? Once again Secretary McNamara examined a projected weapon system in terms of mission and the alternate means of performing it. He decided that the Dyna-Soar was inferior to automated satellites in maintaining surveillance, more costly in that role than the unmanned vehicles, and also less useful than earth-based missiles for deterrence or retaliation. Moreover, whatever its actual use, the well-known origins of the X-20 as an orbital bomber threatened to accelerate the arms race, and McNamara canceled Dyna-Soar late in 1963.

Even though the small Dyna-Soar, either as a surveillance vehicle or as a research test-bed, could not promise a degree of effectiveness that would justify the cost of development, McNamara continued to believe in a military role for man in space. As a substitute, he endorsed the Manned Orbiting Laboratory, which would determine through experimentation exactly what a military spacecraft and its crew could do. The Titan IIIC would have launched the large cylindrical laboratory mated to a two-man Gemini spacecraft, developed by the National Aeronautics and Space Administration as a bridge between the early one-man Mercury capsules and the three-man Apollo capsules, designed for the flight to the moon and back. Despite the use of the Gemini, which had not been developed with Air Force funds, the estimated cost of the laboratory soon approached \$1.5 billion, causing Secretary McNamara to emphasize surveillance rather than research to produce tangible dividends as quickly as possible. As work progressed on Apollo, however, the smaller Gemini seemed increasingly less attractive, and the war in Southeast Asia required more and more money and attention, resulting in a lowering of the priority for the military program to put a man in space. Moreover, delays resulting from the competition for funds propelled the laboratory's cost upward. In 1969, during the early months of the Nixon administration, Secretary of Defense Melvin Laird cancelled the Manned Orbiting Laboratory. Military astronauts continued to venture into space, but they did so, as they had since 1961, on board vehicles of the National Aeronautics and Space Administration.

The second item of unfinished business facing the Kennedy administration in 1961 was the unattained goals of arms control and disarmament. Controlling nuclear arms internationally had been viewed as a means to enhance national security since President Truman endorsed the Baruch Plan in 1946. That proposal, named for Bernard Baruch, a financier and adviser to a number of Presidents, represented the combined efforts of scientists, government officials, and diplomats and called for the control of nuclear weapons by a supranational body. Adoption of the proposal would have deprived the United States of control over the weapons it had built and forbade it to build others and would have ended the development of nuclear bombs in every other country, including the Soviet Union, none of which had yet produced such a weapon. Joseph Stalin, the Soviet dictator, promptly seized on the apparent imbalance—a United States

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that had built the atomic bomb but would have none, compared to a Soviet Union that had not built one and could never do so—as justification for rejecting the proposal. President Eisenhower, sharing Truman’s interest, sponsored a number of arms control plans designed to increase the nation’s security, including the Atoms for Peace plan. Introduced in 1953 and revived four years later, this proposal led to the establishment in 1957 of the International Atomic Energy Agency of the United Nations, which promoted the peaceful uses of the atom and to enforce safeguards against the diversion to weapons manufacture of fissionable material made available under the agency’s auspices. In 1955 Eisenhower proposed his Open Skies plan of mutual aerial inspection as protection against a surprise nuclear attack. Unlike Atoms for Peace, which had no impact on the nuclear balance except possibly to discourage the spread of such weapons, Open Skies seemed to confer an advantage on the United States by exposing to the overhead camera territory that Soviet officials believed should remain inviolate. Since the information that might ease tensions in a time of crisis could also fatten the target folders of the Strategic Air Command, the Soviet Union rejected Open Skies. Subsequent disarmament plans offered by both nations during the Eisenhower Presidency also failed. The critical issue in the disarmament negotiations was the insistence of the United States that teams of inspectors with appropriate monitoring equipment verify compliance; Soviet authorities considered these technicians spies and refused to consider allowing them to enter the country.

In the meantime, concern shifted from the seemingly unattainable goal of disarmament to the dangers of radioactive fallout, a change of emphasis resulting in part from a tragic accident. When the United States tested its first true hydrogen bomb in 1954, wind-borne debris fell on a Japanese fishing boat, the *Lucky Dragon*, bringing illness and death to its crew. Alarmed by the fate of the fishermen, various members of the United Nations proposed restrictions on nuclear weapons tests, the major source of radioactive fallout. The Eisenhower administration at first insisted that any ban on testing should be a part of a disarmament agreement, but when the Soviet Union suggested that restrictions on testing might be treated as a separate first step toward a broader agreement on arms control, the President not only reconsidered but also offered to negotiate a ban solely on testing in the atmosphere. Progress came to a halt, however, following the downing of a U-2 on Soviet territory in May 1960, the capture of its pilot, and the collapse of the summit meeting scheduled for Paris. Instead of entering into a formal agreement, the United States and the Soviet Union each voluntarily declared a moratorium on atmospheric testing that remained unbroken when Eisenhower left office in January 1961.

President Kennedy continued the effort to reach an accommodation with the Soviet Union on armaments. He appointed a special assistant for the purpose, as his predecessor had done, and obtained congressional authorization for the Arms Control and Disarmament Agency, which supported diplomatic negotia-

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tions but did not actually conduct them. John J. McCloy, the new President's adviser on disarmament, met with Valerian Zorin, a Soviet deputy foreign minister, and negotiated a statement of principles governing disarmament; but the two men did so only by agreeing to ignore the basic issue of verification by inspection. Kennedy, like Eisenhower, wanted a general agreement limiting armaments, but, as indicated by Eisenhower's experience and the omission of so critical a point from McCloy's agenda, the best the new President hoped for was some form of prohibition on nuclear testing.

The banning of nuclear tests became a study in contradictions, with dangerous crises and apparent reverses ultimately contributing to progress. The likelihood of such an agreement seemed remote indeed during the first week of September 1961, before Zorin and McCloy had issued their statement of principles, when the Soviet Union began a series of above-ground detonations that included a fifty megaton device. Presumably, the purpose was less to test weapons than to test the resolve of an American President, just forty-three years of age, facing Khrushchev's threat to put an end to the Western presence in Berlin, after failing to overthrow Fidel Castro with a force of Cuban exiles at the Bay of Pigs earlier that year. Yet, even the Soviet Union's breaking the voluntary moratorium on nuclear tests in the atmosphere contributed at least indirectly to a situation in which the benefits of reducing radioactive fallout outweighed the disadvantages of accepting limitations on nuclear testing.

Khrushchev's decision to resume testing came as a rude jolt to those nations campaigning in the United Nations for some form of control. Although Kennedy viewed the Soviet action as a gesture of contempt, calculated to create the impression that the United States had lost the initiative in world affairs, concern about radioactive fallout was worldwide. Consequently, he at first confined his response to so-called laboratory experiments, conducted underground to contain debris and radiation, and did not allow atmospheric testing until the spring of 1962. In the summer of that year, the President heeded the advocates of testing ban and proposed two possible treaties for accomplishing that purpose. One was a comprehensive agreement that provided for inspections by visiting technicians from the signatory states. The other banned only those tests in the atmosphere that could be detected by monitoring equipment located on the territory of the signers and operated by their citizens.

The shock of the Soviet resumption of atmospheric testing nudged the two principal nuclear powers toward a test ban; a potentially more dangerous situation propelled them into an agreement. In the autumn of 1962, the Soviet Union attempted to use Cuba as a base for ballistic missiles aimed at the United States; before the crisis ended, the two nations faced the fearful vision of nuclear war. Ironically, this most serious of Soviet-American confrontations since the beginning of the cold war produced an easing of tensions between the two nations. Kennedy's success in forcing Khrushchev to remove the missiles without having to fight greatly increased his confidence in himself, his advisers, and the na-

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A portion of a reconnaissance photo with evidence of missiles in Cuba.

tion's nuclear might. Conversely, the brush with nuclear war persuaded the Soviet leadership that the recent policy of exerting pressure to test the United States and its Chief Executive could result in miscalculation and catastrophe.

Other considerations, besides American nuclear strength, argued for greater Soviet restraint in dealings with the United States, including the increasing bitterness in relations between the Soviet Union and China and the thousand-mile border between those two nations. The hazard to public health caused by nuclear testing in the atmosphere also helped bring the United States and the Soviet Union closer together. Restrictions on atmospheric testing appealed to the United States and to the Soviet Union, both troubled by the danger of radioactive fallout. Moreover, the United States was secure in its nuclear superiority, and the Soviet Union could better redress the unfavorable nuclear balance by production and deployment than by developing and testing new weapons. A ban on testing, besides symbolizing an easing of tensions between the United States and the Soviet Union, could deflect criticism directed at the two nations and focus it on any other state, such as China, that might embark on its own nuclear program.

The idea of a test ban proved popular with an American electorate that had so recently faced the prospect of nuclear war. In Presidential speeches, mention of banning the tests unfailingly drew applause, but American military leaders, who had urged immediate resumption of atmospheric nuclear tests after the Soviet Union ended its moratorium in the late summer of 1961, proved reluctant converts. Gen. Curtis E. LeMay, Air Force Chief of Staff, called Gen. Nathan F. Twining from retirement to head a panel examining possible restrictions on nuclear testing summarized the military objections. Twining and his colleagues expressed concerns based on uncertainty about the comparative status of American and Soviet nuclear technology. The Soviet Union, in part because of the recent explosion of the fifty megaton device, seemed ahead in high-yield weapons but appeared to lag behind the United States in warheads of lower

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Gen. Curtis E. LeMay,  
Air Force Chief of Staff,  
June 1961–January 1965.



yield, unless it had made advances by means of secret laboratory experiments. Secretary McNamara sought to allay these doubts and received the endorsement of the Joint Chiefs of Staff in return for a pledge that the United States, if it agreed to a ban on atmospheric tests, would conduct a comprehensive program of underground experiments and promptly resume detonations in the atmosphere if the Soviets broke the treaty. General LeMay tried, but failed, to add another condition that called for conducting, immediately before the ban went into effect, a series of atmospheric tests that would include the detonation of a missile warhead directly over a hardened missile site and a test of the lethal effects of an antiballistic missile against an incoming reentry vehicle.

Enjoying both public support and a qualified endorsement from the Joint Chiefs of Staff, the administration easily obtained the Senate's ratification of a treaty restricting nuclear tests on September 24, 1963, with eighty Senators voting for the pact and only nineteen against. The United States and the Soviet Union formally exchanged the instruments of ratification on October 10 of that year, and the agreement immediately took effect. The treaty relied exclusively on a nation's ability to detect violations with monitoring equipment operated on its own soil or in outer space. Each signatory in this fashion verified whether the other was honoring its pledge "to prohibit, to prevent, and not to carry out any nuclear weapon explosion, or any other nuclear explosion, at any place under its jurisdiction or control," whether in the atmosphere, underwater, or in outer space.<sup>8</sup>

Although the new administration hailed its military policies as a break with the past, President Kennedy built on a foundation prepared by his predecessor. The views of the two administrations diverged sharply, however, on the bureaucratic procedures for providing the Commander in Chief with the information he needed to make intelligent decisions on politico-military subjects. Whereas Eisenhower preferred a permanent staff structure that fed him the facts he needed for major decisions, Kennedy came to rely on advisory bodies tailored to a

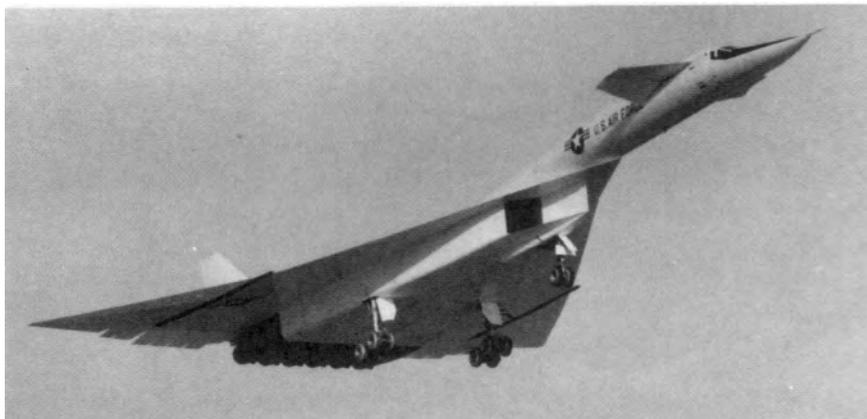
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particular topic or crisis. During the Eisenhower years, the National Security Council served as his principal advisory body, presenting him, as Eisenhower had insisted, with any sharply dissenting views on the part of the armed services and their leaders that he could consider in reaching a decision. In the opinion of Kennedy and his advisers, this procedure produced not advice but endless debate. To avoid a needless rehashing of service positions, the Kennedy administration sought to “de-institutionalize” the National Security Council, retaining little but the name, abolishing both the Planning Board and the Operations Coordinating Board, and relying on ad hoc committees formed by representatives of the various agencies or departments of the Executive Branch to reach a consensus and advise the President on matters of national security. Members of the National Security Council did not head these committees, which were entrusted to a senior person from one of the participating organizations. The committee system reached its zenith in the Executive Committee that during the late autumn of 1962 advised the President as he sought the removal of Soviet ballistic missiles from Cuba and supervised the carrying out of his decisions. Similarly, when the Vietnam war expanded after Kennedy’s death, President Johnson adopted the practice of lunching each Tuesday with a handful of advisers, civilian and military, to chart the conduct of the fighting.

In brief, the defense policies of the Republican and Democratic administrations differed little in their ultimate objectives. Under Kennedy and Johnson, however, the National Security Council did not enjoy the stature it had enjoyed under Eisenhower, a symptom, perhaps, of an impatience with formalized bureaucracy that also manifested itself in the increased authority of the Secretary of Defense. From the outset, McNamara seemed more willing than McElroy or Gates to exercise the full power of an office that had been greatly strengthened by Eisenhower’s Defense Reorganization Act of 1958. Here at last was a genuinely strong Secretary of Defense, the kind of civilian leader that various senior officers of the Air Force had been recommending since the drafting of the National Security Act of 1947. McNamara in 1961 was a person successful in industry, confident of his executive judgment, surrounded by advisers of his own choosing, and, most important, trusted by the President.

In making the budget a tool of national strategy, Secretary McNamara normally was careful to base his decisions on a comparison of the probable contributions to national security made by alternative programs. (The one glaring exception was the TFX or tactical fighter experimental.) When he recommended against development of the B-70 bomber, a project in which the Air Force had invested great effort and emotion, he compared that bomber, designed to fly three times the speed of sound at an altitude of 70,000 feet, with the intercontinental ballistic missile. The B-70, he concluded in 1961, was the less effective weapon. Not only did it rely on long and vulnerable runways, whereas the missile erupted from a hardened silo or submerged submarine, it faced the threat of surface-to-air missiles (which in 1960 had downed a high-flying U-2), it re-

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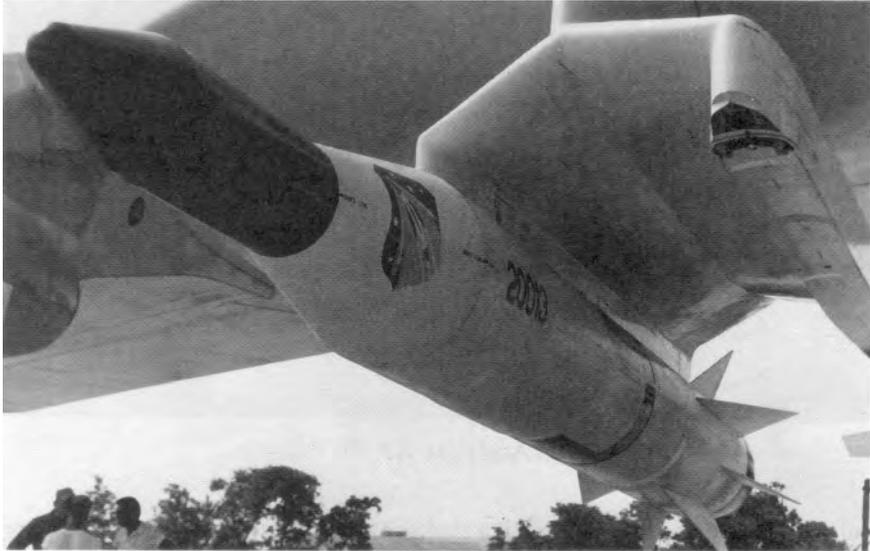
The North American XB-70 Valkyrie.

quired two or three hours to reach a target instead of 15 to 30 minutes, and because of its speed and altitude could not engage mobile targets any more than a missile could.

To save the supersonic bomber, the Air Force countered by proposing a new mission, reconnaissance-strike, which consisted of finding and destroying any Soviet missile sites or airfields that had survived a counterforce retaliatory strike, and designated the revised aircraft the RS-70. McNamara's systems analysts again compared the aircraft to the intercontinental ballistic missile and reached the same conclusion: the missile could destroy surviving targets more effectively than the RS-70. In theory, the analysts conceded, the manned aircraft should have an advantage in finding an airfield or missile complex that remained operational; but, given the technology of the time, sensors did not exist that enabled the crew members of an RS-70, traveling perhaps 2,000 miles per hour, to scrutinize the territory over which they were passing. Consequently, the aircraft would be as dependent as the missile on targeting data prepared before the war began. Since intercontinental missiles had already been developed, investment in the RS-70 seemed unnecessary. The Kennedy administration did, however, approve construction of three XB-70s, later reduced to two because of spiraling costs, as supersonic research aircraft.

This process of comparing alternatives doomed the Skybolt missile, another project favored by the Air Force. Air Force advocates of Skybolt—designed to have a range of 1,000 miles after being launched from an airborne B-52 bomber—argued that it would enjoy flexibility and immunity from attack lacking in missiles launched from a fixed site. The systems analysts, however, decided that it was more vulnerable than Minuteman and Polaris, since the bomber that carried it could be attacked at its base or while en route at subsonic speed to the launch point. Turning to another mission, they found Skybolt too costly

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The Skybolt missile under the wing of a B-52 bomber.

to develop as a replacement for the bomber-launched Hound Dog, a short-range missile intended to suppress air defenses. The Skybolt might well have enhanced the effectiveness of the B-52 as an Air Force weapon, but in the opinion of the Secretary of Defense it could not perform a mission that increased the security of the United States nor advance overall national strategy.

Secretary McNamara did not apply this comparison process to the TFX, which traced its origins to the Eisenhower years and was launched as a development project before systems analysis was fully operative. Various ad hoc panels of Air Force and Navy officers studied the proposed “common” fighter for almost a year, but it did not face the kind of scrutiny by professional analysts independent of the services that subsequent major weapon systems endured. The aircraft originated in two requirements: one from the Navy for a fighter that could remain aloft for long periods and protect the fleet with air-to-air missiles and that of the Air Force for a truly revolutionary tactical fighter. Lt. Gen. Frank F. Everest, who had commanded the Fifth Air Force for a year during the Korean War and later served as deputy commander and commander of the Tactical Air Command, argued the case for a supersonic fighter that could fly unrefueled across the Atlantic and, once in Europe, operate from a grass runway of just 3,000 feet. In contrast, existing supersonic jets like the F-100 or F-105 required refueling to cross the Atlantic and depended on two-mile runways of reinforced concrete to take off and land.

By end of the 1950s, American aviation technology could meet much of Everest’s challenge. Aircraft designers could combine supersonic speed with a

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The Bell X-5 experimental aircraft with pivoting wings.

subsonic transatlantic cruising range, but they could not incorporate the ability to land and take off in a short distance from an unimproved airstrip because only a large and heavy aircraft could possess the other two seemingly contradictory features. The solution lay, or so it appeared, in the variable-sweep wing and the turbofan engine. A wing that could be swept sharply back for supersonic operation or extended forward for long-range flight (and for takeoffs and landings) had been the subject of experiments conducted by the National Advisory Committee for Aeronautics from 1952 through 1954 using the Bell X-5. In this aircraft, the wing pivoted at the center line as the sweep changed, requiring a structure within the fuselage.

Engineers discovered that they could save this space, perhaps for electronics or to accommodate a two-man crew, by rotating the wing not at the center line, as in the X-5, but externally on both sides of the fuselage, although the solution involved a weight penalty, requiring two smaller pivots and drive mechanisms instead of a larger single one. Consequently, a fixed structure known as a “glove” formed part of the fuselage and contained the crucial pivots for the movable outer sections of the wing. In the turbofan, or bypass engine, air compressed by a fan at the front was routed around the combustion chamber and mixed with the hot exhaust, increasing the volume of air passing through the engine, and with it the thrust, at a minimal cost in fuel consumption. This new engine technology, although not yet applied to supersonic aircraft, had proved successful in tests. All in all, the combination of variable-sweep wing and turbofan engine to link bursts of supersonic speed with long-range subsonic flight seemed to present no insurmountable obstacle to America’s aeronautical engineers. Seeing no great difficulty in development and having decided against the

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Navy's proposed subsonic defensive fighter, Secretary McNamara embraced the TFX proposal as being capable of producing a true multipurpose aircraft, serving not only the needs of the Air Force but those of the Navy as well.

On occasion since the establishment of the Air Force, both services had successfully used the same aircraft. The F-86 air superiority fighter of Korean War fame became the Navy's FJ-2, and the Air Force B-66 was essentially the Navy's Douglas A3D. Furthermore, in early 1962 McNamara convinced the Air Force to cut short the production run of the F-105 and instead buy the Navy's McDonnell F4H, because he considered it better suited for conventional operations than the F-105, which had been designed as a fighter-bomber with nuclear warfare in mind. First designated the F-110 for the Air Force, it was redesignated the McDonnell Douglas F-4 when the original manufacturer merged with Douglas Aircraft and Secretary McNamara adopted a uniform system for numbering all military aircraft. Although reluctant at first to make the change to the F-4, the Air Force soon became enthusiastic about the Navy fighter, which had greater maneuverability than the F-105 and proved more effective in aerial combat with Soviet-built fighters over North Vietnam, especially when a cannon was added to supplement its air-to-air missiles.

The TFX clearly impressed McNamara as a logical advance in aircraft technology, an airplane to purchase in large numbers for the Air Force and the Navy and an ideal subject for a fixed-price contract. Such an agreement established a target cost that ensured a negotiated profit. If the firm succeeded in delivering a satisfactory product on time and at a lesser cost, the profit increased, but it diminished in the event of failure. Any change in the timetable, the desired performance, or the projected cost required further negotiation between buyer and manufacturer. McNamara believed that the fixed-price contract provided incentives to save time and money, without sacrificing performance, and would help him meet his objective of providing a "military establishment of the appropriate size and type at the lowest possible cost."<sup>9</sup>

Gen. Bernard A. Schriever, in charge of developing and acquiring weapon systems for the Air Force, dissented from this view, not because he foresaw any unusual difficulties in the process of development but because of what he considered an inherent failing in this kind of contract. Such an agreement, the general warned, might well impede the application of new technology even as it controlled costs. Although the Air Force could request and pay for changes in the TFX or other weapon system, he feared that the fixed price and the time-consuming need to negotiate changes would have the effect of freezing the design, so that by the time the product appeared it would represent technology that was four or five years old.

Actually, the impact of a fixed-price contract was but a minor point of contention between McNamara and the services. By the end of 1961, the Secretary of Defense faced two services that disagreed with him, and with each other, about the multipurpose design of the aircraft. The Navy did not want the TFX,

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A General Dynamics F-111 with its wings swept forward.

seeing no need for the combination of long range and supersonic speed at low altitude; and the Air Force had reservations about the airplane, viewing it as essentially a nuclear fighter-bomber to replace the F-105 rather than a true all-purpose fighter. Despite the lack of enthusiasm on the part of the potential users, McNamara remained convinced that the same basic airplane could not only use air-to-air missiles to defend the fleet from hostile aircraft, but also gain air superiority, conduct interdiction, and provide close air support for the Air Force and the Navy.

In October 1961, the aircraft industry was invited to submit proposals for the TFX. Six manufacturers responded, but the competition narrowed to designs by Boeing and General Dynamics, the latter assisted by Grumman, for three decades a builder of airplanes for the Navy. Following a lengthy evaluation, Secretary McNamara in November 1962 announced the award of the TFX contract to General Dynamics, overruling the unanimous opinion of the Air Force and Navy officers who participated in the final evaluation of the two designs. The company would build the F-111, as the TFX had been designated, in two versions, the F-111A for the Air Force and the F-111B for the Navy. Despite differences that reflected the operating methods of the two services, the two models would share the same basic airframe and engines, thus achieving what the Office of Secretary of Defense called “commonality.” The principal external difference between the two would be a longer fuselage in the Air Force’s A model for the Air Force, in part to accommodate different electronics; and a longer wing in the F-111B to provide better performance at low speed. The armament and the related fire-control radar also would differ, reflecting the mission of the B model to defend the fleet against aerial attack.

As it turned out, the F-111B never saw service. The pivots and the drive mechanism for adjusting the sweep of the wings so increased the weight of the airplane that not even a strenuous program of weight reduction could bring it

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within the limits imposed by the catapults, arresting gear, and elevators used to launch, recover, and position aircraft on board the Navy's carriers. Besides creating difficulties in landing, launching, and handling, every added pound reduced the range, the payload, or both. The F-111A intended for the Air Force was also heavier than desired, but engine problems, rather than the excess weight, hampered its development. The turbofan engines proved so sensitive to changes in the pressure of the air entering them that the inlets had to be redesigned to solve the problem of compressor stalls. As a result, the Air Force could not begin operating its F-111s until 1967.<sup>10</sup>

Meanwhile, critics of the F-111A questioned the wisdom of risking an aircraft worth \$8 million on dangerous missions such as close air support or battlefield interdiction that, though important, did not require all the electronics built into the fighter. Responding to this criticism, McNamara offered as a less costly substitute for these purposes the A-7, an attack aircraft developed for the Navy by Ling-Temco-Vought. Opposition to that alternative centered around General LeMay, who argued against investing in a subsonic airplane suited only for conventional warfare, in effect a single-mission aircraft, when the supersonic F-111, once it overcame its teething troubles, had the potential to engage enemy fighters and deliver nuclear weapons as well as high explosives against a broad variety of targets. After LeMay retired, the new Secretary of the Air Force, Harold Brown, bought a limited number of the less costly but less versatile A-7s, primarily for conventional bombing in Southeast Asia. Although ultimately successful, Brown encountered strong opposition from those who, like LeMay, wanted the best possible performance and the greatest versatility built into every Air Force aircraft.

Although the basic F-111 failed to do all that McNamara expected, an extensively modified version of the F-111A became a strategic bomber. Fitted with new electronics and additional fuel tanks, its wings and fuselage lengthened, the aircraft emerged as the FB-111A, but like the fighter version it, too,



The Vought A-7D Corsair II.

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experienced extraordinary developmental problems. The engine stalling that delayed deployment of the fighter-bomber version was compounded by problems in devising the avionics for the bomber. Work on the FB-111A as a replacement for the oldest of the B-52s began early in 1966 when the necessary funds were reprogrammed; the first aircraft entered service with the Strategic Air Command in October 1969, but the first operational unit was not organized, equipped, and ready for combat until January 1971.

The program that provided the Air Force with the F-111, FB-111, and the electronic warfare version called the EF-111 was controversial from the start. In 1963, a year before the first F-111A flew, the Senate Permanent Investigations Subcommittee, under the chairmanship of Senator John L. McClellan, a Democrat from Arkansas, spent ten months examining the circumstances surrounding the award of the contract. On the surface, the subcommittee raised the question of political influence. Had General Dynamics received the contract because it was based in Texas, the home of Vice President Johnson and a state that had voted for Kennedy, whereas Washington and Kansas, the sites of Boeing's activities, had both supported Nixon? Moreover, Secretary of the Navy Fred Korth, also a Texan, had been an officer of one of a number of banks that had put together a loan for General Dynamics. Similarly, Deputy Secretary of Defense Gilpatric had been a partner in a law firm retained by General Dynamics, though it turned out that the lawyers had also done work for Boeing. The charges of political interference in the contracting process could not be proved, and McNamara insisted that he had made his decision after a detached and careful comparison of the two competing designs, basing it on the complexity of the technology being proposed and the estimated costs.

As Robert J. Art has suggested in *The TFX Decision: McNamara and the Military*, the issue was not political influence, but the rejection by a civilian Secretary of Defense of the findings of a panel of senior Air Force and Navy officers, who unanimously selected Boeing over General Dynamics. A Congress used to relying on the testimony of the uniformed leaders of the armed forces, and for the most part satisfied with the information that the generals and admirals provided, had difficulty accepting the judgment of a newly appointed Secretary of Defense who preferred his own analysis, supported exclusively by other civilian officials, to the views of officers who had devoted twenty or thirty years to the defense of the nation. At the time, however, McNamara's judgment could not be tested; no competing aircraft had been built so that the one manufacturer might demonstrate the superiority of his design over the other. Cloaked though it was in the charge of political influence, the investigation raised doubts that McNamara's decisions were likely to be as sound as those of professional officers experienced in the procurement and tactical use of weapon systems.

The development program revealed that the Secretary of Defense had unrealistic expectations of the TFX. He simply wanted too much performance, on

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too many disparate missions, from a single aircraft; it really was immaterial whether Boeing or General Dynamics received the contract. Neither could have done the job, even partially, without cost overruns, delays, and technological setbacks. McNamara's error was his failure to examine the TFX coldly in terms of national security and to identify and compare alternatives. He made commonality the principal justification for the F-111, rather than whether it could contribute better than some other aircraft to the security of the United States. Furthermore, the charges leveled by Senator McClellan—the challenging of McNamara's judgment by impugning the honesty of others in the Department of Defense—merely made the Secretary of Defense even more determined that the project would succeed.

In the field of procurement, perhaps the greatest budgetary challenge to the Secretary of Defense and his advisers came when the potential manufacturers competed to become the principal contractor for a major weapon system, after the various alternatives had been analyzed in terms of cost and ability to carry out a specific mission. Experience had shown that a corporation might submit an unrealistically low bid and rely on the Air Force or other service to rescue it once work had begun; in effect, the product became a hostage to ensure payment. Even if the bid were accurate, the purchasing service might require costly, though necessary, changes to a weapon system in the course of development or even production. Consequently, the final cost of a major weapon system often bore only a passing resemblance to the price agreed on when work began. Analysts at Rand concluded that, during the 1950s, cost increases of 200 to 300 percent and extended development time were not the exception but the rule. The problem stemmed to some degree from radical advances in technology that produced intercontinental ballistic missiles and supersonic aircraft, but Secretary McNamara was convinced that poor management played a key role. Although aware that he could not set a cadence for the march of technology, he believed he could improve management.

McNamara therefore adopted a new procedure called the Total Package Procurement Concept. According to this innovation, the same firm assumed principal responsibility for both development and production, but the selection of the contractor and his performance were carefully monitored. The process began with what was called Concept Formulation, during which the Office of Secretary of Defense, assisted as necessary by outside engineering and management consultants, established the mission of a particular weapon system, the details of its desired performance, the probable cost, and a realistic timetable for completion. Next came contract definition in which manufacturers submitted plans based on the established concept. The firms offering the likeliest proposals qualified for short-term, fixed-price contracts to write extremely detailed plans that encompassed the development, testing, production, logistic support, and overall cost of the weapon system. The winner of what admittedly was a "paper competition" received a contract that sought to impose strict control over

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schedules, costs, and the performance of the product. However, the Air Force or other service had to be able to react to the unforeseen, authorizing and paying for any changes in performance or scheduling that needed to be made after the agreement had been signed. Despite this opening for revision, Secretary McNamara believed that careful supervision by his office and by the services would reduce or eliminate cost overruns.

Of McNamara's reforms, total package procurement represented the most dramatic break with the recent past. Principally in the Air Force intercontinental ballistic missile program (and in developing the Navy's Polaris, as well), Eisenhower's defense secretaries had been willing to decentralize. In the case of Air Force missiles, authority was entrusted to General Schriever, who wielded this power with a minimum of oversight from the Pentagon; the Office of the Secretary of Defense, although it might adjust schedules and even funding, tended to review rather than direct his work. McNamara, however, chose to rely on his own analysts to establish the need for and characteristics of weapon systems and then to negotiate detailed contracts specifying performance, scheduling everything from the testing of components to final production, and fixing the cost. The kind of supervision he exercised was far more intrusive than anything done by his immediate predecessors. The huge Lockheed C-5A transport became the test case for total package procurement, and advocates of the concept could claim, at most, only partial success.

The troubled C-5 program stood out in sharp contrast to the successful development of the Lockheed C-141 Starlifter, which first flew in December 1961, well in advance of the new management techniques. A high-wing transport powered by four turbofan engines, the C-141 was, in terms of technology, a logical advance from the first generation of jet transports rather than a sudden shattering of previous limits on size or performance. The Starlifter could carry 154 troops a distance of 4,000 miles or accommodate 7,000 cubic feet of cargo. Rollers in the floor of the cargo compartment raised or lowered to facilitate the



Troops of the Army's 1st Infantry Division wait to board a Lockheed C-141A.

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loading of either flat-bottom pallets or wheeled vehicles through an opening at the rear of the cargo bay. Because the Military Air Transport Service had an immediate need for an intercontinental jet aircraft with a spacious cargo compartment easily accessible from the rear, the C-141 entered service in the spring of 1965, as soon as crews and aircraft became available, even before operational testing was completed.

Although rushed into service, the C-141 encountered only minor problems, such as the failure of components of the landing gear or the loss of cabin pressure through leaks around the cargo door at the rear of the cargo compartment. All in all, its maintenance record was average for a jet aircraft of its size and complexity. The satisfactory results may have stemmed at least in part from an Air Force decision to revive the Lead the Force procedures used with the first B-47s and B-52s. As a result, a few designated C-141s flew an unusually large number of hours and underwent frequent inspections designed to reveal any problems, like corrosion, that might result from extended usage. Launched in 1964, the Lead the Force program for the C-141 lasted into 1968.

The C-5 Galaxy bore a superficial resemblance to the other Lockheed product; it, too, was powered by four turbofan engines suspended from the high wing and was loaded by means of a ramp from the rear, although the nose of the C-5 also opened to provide access to the cargo compartment. The two aircraft differed markedly in size: the C-141 carried its load in an area measuring roughly 70 by 10 by 10 feet; the C-5 had a main compartment encompassing 121 by 19 by 13 feet with additional space on an upper level. The wingspan of the C-141 measured 160 feet and the fuselage 145 feet; the measurements of the C-5 were 222 and 247 feet, respectively. At first glance, the C-5 resembled a C-141 on a larger scale, but appearances were deceiving. The differences in external size between the two aircraft resulted in an almost fivefold increase in usable volume, from 7,000 cubic feet in the C-141 to more than 34,000 feet in the C-5. Greater volume meant that a heavier load could be carried, but required a reinforced structure, increasing the empty weight from 137,000 pounds to 323,000 pounds. As the aircraft grew heavier and its fuselage bulkier, a greater proportion of its power (approximately twice the thrust of the C-141), was needed simply to propel the airframe. Lockheed could not merely scale up the C-141, but faced the difficult and costly task of striking a compromise among strength, range, and carrying capacity, all of which were affected by weight. Something had to give way, and the Air Force agreed that range and cargo capacity should be preserved at the expense of strength. This decision resulted in a lighter wing structure, which proved more vulnerable to corrosion and affected the service life of the aircraft. Lockheed submitted an unbeatably low bid, either deliberately or because the firm underestimated the magnitude of the task ahead. Whichever the reason, costs soared, and the Air Force, which needed the C-5, had little choice but to pay for changes in a supposedly ironclad contract, thus making good the company's losses.<sup>11</sup>

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An Army H-47 helicopter is loaded into a Lockheed C-5 Galaxy .

Even the enthusiastic supporters of the total package procurement concept acknowledged that the final cost of the C-5 program exceeded the agreed price of almost \$3 billion by some sixty percent. They conceded that McNamara's advisers underestimated the cost and complexity of the program; but they also felt that the Air Force had all too willingly accepted responsibility for changes made during the course of development and failed to take a hard line in negotiations with the manufacturer. Such an interpretation, however, overlooked the need of the Air Force for a product that only Lockheed could supply. Speaking in defense of his service, General Schriever blamed the new procedures, arguing that locking the manufacturer into a fixed-price contract so early in the procurement cycle actually encouraged unrealistic bidding, since the firm realized that the selection committee was under such pressure to control costs that it could scarcely reject the lowest bid, no matter how suspicious the amount might seem. The first C-5 was delivered in 1968, after McNamara left the Department of Defense, but he was well aware by the time of his departure that costs were out of control. Looking back on the Total Package Procurement Concept, he would concede that it was only a start toward what he termed "realistic contracting."

Total package procurement did not survive the C-5 program. Various factors contributed to its demise, not all of them having to do with the extent to which this technique failed to control costs. The concept was linked to the C-5, and this aircraft, besides falling victim to highly publicized cost overruns, had been envisioned as part of a worldwide deployment system that no longer enjoyed public or political support. The huge transport was to have operated in con-

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junction with a fleet of fast deployment logistics ships to project American power throughout the world in keeping with the concept of flexible response, which called for introducing the appropriate level of force in time to prevent a crisis from becoming a major conflict. With an increasingly unpopular war dragging on in Southeast Asia, involvement in limited conflicts no longer enjoyed widespread acceptance. Indirectly at least, the fighting in Southeast Asia resulted in the cancellation of the ships, cast a shadow over the C-5, and prevented total package procurement from being judged solely on its merits.

Since the debates that resulted in the creation of an independent Air Force in 1947, airmen had tended to support a national military establishment headed by a strong Secretary of Defense. This attitude reflected a confidence that the civilian leader could not help but acknowledge the dominance of air power and would arrange his priorities accordingly. As early as 1953, however, Secretary of the Air Force Thomas K. Finletter warned of the danger that a future Secretary of Defense, his authority over the department strengthened by that year's reforms, would fail to realize that sea and ground forces were auxiliaries of air power and apportion funds on the basis of what Finletter considered a dangerous misperception.

Clearly, Robert S. McNamara proved to be a strong Secretary of Defense, but he tended to exercise that forcefulness in the way that Finletter had feared. Far from accepting the Air Force evaluation of air power, McNamara demanded reasoned proof, and for him the essence of proof was measurement, whether the comparison of one weapon or program against an alternate designed for the same purpose, of costs against estimates, or of progress against a succession of phase lines or milestones. He wanted facts not feelings, evidence rather than doctrine, and cold analysis rather than the fruits of personal experience. He had, moreover, no grasp of the importance of tradition and symbols in the military service, never quite understanding, for instance, why one service might demand a unique kind of button or belt buckle or a different color of shoe.

Even as he centralized authority in himself and his office, absorbed the information developed by his analysts, and made decisions that at times seemed arbitrary, Secretary McNamara denied that he was some kind of human computer kept alive by quantification. He insisted, for example, that he valued intuition, but it was his own intuition that seemed to prevail. The uniformed leadership of the armed forces, used to working out their programs largely on their own in the context of the overall defense budget, suddenly had to justify such actions for the secretary and his civilian analysts. Most of these analysts were young and highly educated and came to be called the "whiz kids," a term derived from "The Quiz Kids," a radio show on which a panel of precocious children routinely answered questions that would have stumped most adults. Also known in their time as whiz kids were the members of a group of young veterans back from World War II, McNamara among them, who had studied business methodology, applied the lessons while in the uniform of the Army Air Forces,

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and later revived a badly managed and apparently moribund Ford Motor Company.

The whiz kids at Ford had arrived with only an academic understanding of the automobile industry, and those at the Pentagon had a similar lack of acquaintance with military and naval matters. At Ford, the automobile experts had resented the questions and judgments of outsiders, and the same feelings blossomed at the Pentagon, where brash young men, who showed little deference toward rank or lines of command, demanded that senior officers prove a need for programs that represented the embodiment of service doctrine. Dissatisfied officers swapped stories like that about the civilian analyst who paid an unannounced visit to the office of a lieutenant general, found that he was not in, and arrogantly preempted his chair to await his return. Civilians impatient with the competing service bureaucracies dismissed the professional soldiers, sailors, or airmen as captives of the uniform they wore and the specialties they pursued, whether bomber generals of the Air Force or carrier admirals of the Navy. In these circumstances, the whiz kids saw themselves as intellectual policemen, enforcing objectivity through the dispassionate comparison of the programs advanced by the services.

What the civilian analyst saw as impartial appraisal looked like misguided meddling to the military professional who had failed to sell a program he believed was important. In 1963, two years before his death, General White, a former Air Force Chief of Staff, described the whiz kids as “pipe-smoking, tree-full-of-owls . . . so-called defense intellectuals.” He did not believe that “these overconfident, sometimes arrogant young professors, mathematicians and other theorists” had “the worldliness or motivation to stand up to the kind of enemy we face.”<sup>12</sup> Curtis LeMay expressed similar sentiments after his retirement from the Air Force, but the civilians he castigated would have argued that they had the facts and that what the general represented was merely the doctrinaire self-interest of one of the services.

In sum, Secretary McNamara, backed by his team of analysts, became the adversary of the Air Force rather than its agent; not the relationship that so many airmen over the years had expected of a strong Secretary of Defense. The hostility, moreover, was heightened by the confrontational manner that McNamara adopted. Losing a program for lack of funds, essentially what happened during the Eisenhower years was bad enough; but having to have that program compared to an alternative and found wanting was worse, for in the latter instance McNamara publicly rejected the doctrine and collective judgment of the service.

The antagonistic relationship between the Office of Secretary of Defense and the services greatly complicated the work of Secretary of the Air Force Zuckert, whose tenure between 1961–1965 saw, among other things, the beginning of the F-111 program, the cancellation of Skybolt, and the redirection of the B-70 program from a weapon system to a vehicle for aeronautical research. As both a member of the Kennedy and Johnson administrations and the civilian head of

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the Air Force, he found himself caught between conflicting institutional pressures. He could be sure that, no matter how carefully considered, his major decisions would never please both his political superiors and the service he represented. Yet, the knowledge that he could not satisfy everyone may actually have given him a greater opportunity to exercise his own judgment; in any event, his record could be interpreted as evidence of independence. When included by the Secretary of Defense in the selection process for the choice of a firm to build the TFX, he had sided with McNamara in choosing General Dynamics over Boeing, but he worked with LeMay to marshal evidence in support of the Air Force contention that the B-70 should be developed for the reconnaissance-strike mission. As a result of McNamara's penchant for centralization and the Defense Reorganization Act of 1958, which removed the service secretaries from the line of command, Zuckert functioned for the most part as an administrator, making sure that the Air Force could supply trained and equipped units to the unified and specified commands.

Even as he centralized authority, though with results infinitely less satisfactory than the Air Force had in the past hoped for, Secretary McNamara tried to establish a basic military strategy of flexible response applicable to general nuclear war as well as to limited conventional fighting. The interpretation of nuclear deterrence fashioned over the years by the Kennedy and Johnson administrations also proved a disappointment to the uniformed leadership of the Air Force, for counterforce targeting, which in the spring of 1962 seemed almost certain to become national policy, did not prevail. Although at first attracted to a strategy that held out the promise of saving American cities from nuclear destruction in the event of war, McNamara soon developed strong reservations concerning this approach to retaliation. He concluded that the Soviet Union, judging from the public statements of its leaders, would not exercise restraint and spare, insofar as possible, American cities while destroying only missile sites, air bases, and other military targets. Even if the Soviet Union accepted mutual counterforce targeting, such a policy, if pushed to the extreme, would in effect allow the probable enemy to determine the size and cost of the American retaliatory force, for the United States would have no choice but to match every improvement in the Soviet arsenal, whether an increase in numbers or a hardening of sites. Moreover, an American retaliatory force powerful enough to destroy its Soviet counterpart might well instill fear of a preemptive strike, a nuclear equivalent of the German attack on the Soviet Union in the summer of 1941. Counterforce targeting might thus fuel a headlong nuclear arms race at best, or at worst encourage the Soviet Union to launch a surprise attack of its own, a nuclear Pearl Harbor.

Finite deterrence, a strategy advocated by naval officers enthusiastic over Polaris, had appealed to the Eisenhower administration. Whereas counterforce deprived the United States of the initiative in maintaining its strategic forces, which would expand or contract (though the latter seemed unlikely) at a pace set

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by the potential enemy, finite deterrence limited the nation to a one-shot, all-or-nothing retaliation. If the strategic arsenal contained only the bombs and warheads necessary to attack those targets, mainly cities, whose destruction would inflict what was judged to be unbearable pain on an enemy, the entire force would have to be launched simultaneously to ensure the desired result. Secretary McNamara sought something between an essentially open-ended counterforce and a finite deterrent, in effect, an affordable nuclear array strong enough to deter aggression while providing flexibility of employment should deterrence fail.

The search for a cost-effective, yet flexible, deterrent led McNamara to reconsider nuclear parity which, due to recent American preparations for conventional warfare, seemed to offer stability rather than an increased likelihood of limited war. The nuclear powers, he reasoned, would behave with restraint if each knew that the other could absorb a preemptive strike and still retaliate with deadly effect. Consequently, he finally decided on a retaliatory force of fixed size that could attack either a devastating combination of urban and military targets or hit the military installations first and, if that did not break the enemy, systematically begin destroying cities and industries until the enemy succumbed. To achieve this middle ground between counterforce and finite deterrence would, McNamara believed, require a retaliatory force of 1,000 Minuteman missiles; 54 Titan IIs; 656 Polaris missiles; 600-odd B-52s, the oldest of which would be replaced by FB-111s, but not on a one-for-one basis; and, for the duration of their useful lives, about 80 B-58s. Changes in technology that increased the effectiveness of missiles or aircraft could, of course, alter these numbers.

After establishing this force in the mid-1960s, Secretary McNamara began modernizing the weapons. The new FB-111 appeared on the scene, although the total number of bombers decreased; multiple warheads were fitted to improved Polaris missiles; multiple, independently targeted reentry vehicles were developed for a more powerful Minuteman, and launch sites and warheads were hardened against the various effects of nuclear detonations. The multiple warheads increased nuclear firepower without requiring additional missiles and hardening enhanced survivability, discouraging a preemptive attack.

The strategy of assured destruction, as McNamara's compromise between counterforce targeting and finite deterrence came to be known, sought a kind of nuclear stability between the United States and the Soviet Union. While weapons improved—Polaris and Minuteman each evolved through three models—McNamara wanted to avoid any technological gamble that might trigger another cycle in the arms race. Even though Khrushchev boasted, entirely without substance as events proved, that Soviet antimissile weapons could hit a fly in space, McNamara was reluctant to deploy a system that, in effect, pitted defensive nuclear warheads against incoming nuclear warheads. Nevertheless, he allowed research on long-range and short-range defensive missiles and a new target acquisition radar that were the major components of an antiballistic missile system, though he was far from enthusiastic about the undertaking. Even if

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Technicians at Vandenberg Air Force Base assemble the multiple reentry warhead package for an intercontinental ballistic missile.

the formidable technological obstacles were overcome, he believed that the system could at best provide no more than the illusion of protection and that decoys, multiple warheads, and even additional ballistic missiles could easily and cheaply defeat such a system. Furthermore, the deployment of an antiballistic missile system could trigger an expansion of the Soviet missile forces to such a degree that the loss of American lives in a war fought with the system in place would exceed the number of deaths that would occur without it.

Congress, however, rejected this line of reasoning, overrode McNamara's objections, and voted funds for deployment. The Secretary of Defense responded with a plan for a skeletal system that, he explained, would defend not against the Soviet Union, which had the capacity to expand and improve its missile force, but against China's comparatively feeble missile array. Henry L. Trewhitt, a generally sympathetic journalist who wrote of McNamara's "ordeal" in the Pentagon, believed that the Secretary of Defense used the threat from China to avoid a linkage to the Soviet Union that might escalate the arms race, to satisfy a Congress in which support ran high for antiballistic missile defenses, and to gain time to reach an agreement with the Soviet Union banning the deployment of such a weapon. The total cost of deployment, an estimated \$5.5 billion, would ultimately buy the same basic shield, covering essentially the same areas, whether the threat came from the Soviet Union or from China.

In his attempt to reorient the armed forces toward an overall military policy of flexible response, McNamara achieved his greatest success with the nation's conventional forces. Besides institutionalizing flexible response in the U.S.

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Strike Command, he obtained the weapons necessary for nonnuclear, limited warfare. For the Air Force, the new policy meant the acquisition of transport aircraft to help deploy a reorganized and expanded Army. Scarcely had the new administration taken office when it directed Boeing to complete seventeen KC-135s already on the production line as transports rather than aerial tankers and ordered thirteen additional transports for a total acquisition of thirty C-135s. The number of C-130Es ordered increased from fifty to ninety-nine, an investment in tactical airlift that was paid for in part by the cancellation of twenty-six shorter range C-130Bs. Later in 1961, production of the intercontinental C-141 began, followed in 1964 by concept formulation for the C-5, which, had all gone according to plan, would have been teamed with a flotilla of fast deployment logistics ships.

The termination of the F-105 and the decision in February 1962 to buy F-4s instead changed the nature of the tactical fighter force by replacing an aircraft designed for nuclear war with a more versatile type. Originally, Secretary McNamara had hoped to use the Navy's Douglas A-4, a lightweight airplane that was easy to maintain and carried a prodigious weight of munitions, as the substitute for the F-105. The A-4, however, was an attack aircraft, pure and simple, and not a fighter-bomber. In contrast, the F-4 could battle enemy fighters for air superiority as well as attack a variety of ground targets.

Air Force involvement in flexible response covered the entire spectrum of potential violence from retaliation with nuclear arms, through campaigns using conventional weapons, to unconventional or guerrilla conflicts fought among the forests and villages of undeveloped nations on the perimeter of the Soviet Union or China. As part of the reaction of the Department of Defense to Khrushchev's threat of wars of national liberation, the Air Force became involved in supporting the Army's counterinsurgency arm, the Special Forces. At first the 4400th Combat Application Crew Training Squadron at Eglin Air Force Base, Florida, performed the mission. This unit, however, became the 1st Air Commando Group (later a wing) and assumed the additional responsibility of training foreign air forces to conduct counterinsurgency operations. In April 1962, the Air Force institutionalized these activities in the Special Air Warfare Center at Eglin Air Force Base, which developed doctrine, tactics, and equipment for counterinsurgency, besides conducting training and deploying operational units.

Less revolutionary than evolutionary, the military policies of the Kennedy administration did not always work out as the Air Force had hoped. A strong Secretary of Defense, advocated since 1947 by the uniformed leadership of the Air Force, proved in the person of Robert S. McNamara to be convinced of his own judgment rather than persuaded to adopt the collective viewpoint of that service. McNamara and his advisers succeeded for the most part in making military appropriations conform to a strategy of flexible response. Resistance to this process—or more precisely to the impersonal and at times arrogant man-

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ner in which it was carried out—surfaced early and at times triumphed, as evidenced by McNamara's reluctant deployment of an antiballistic missile system and the scrapping, after he left the Department of Defense, of total package procurement with only a single test. Even success at times bred failure, as when key elements of a military space program that McNamara generally favored—first Dyna-Soar and, following his departure, the Manned Orbiting Laboratory—succumbed to the kind of analysis that he had initiated. Whatever the fate of individual undertakings, the Kennedy-Johnson years and McNamara's stewardship resulted in greater operational flexibility for the Air Force, especially with respect to conventional warfare. For better or for worse, the Air Force of the mid-1960s differed markedly from that of the previous decade.

## Chapter 18

# The Air Force and Operations Short of War

Walton S. Moody  
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**T**he U.S. Air Force that helped defend the nation between 1960 and 1965 had changed radically in terms of mission, size, and equipment since gaining independence from the Army in 1947. By 1965 a powerful and highly trained Strategic Air Command lent credibility to the strategy of deterrence, and the Tactical Air Command and Military Airlift Command could reinforce the ground and air forces assigned to the various operational theaters in the event of emergency. In size, the Air Force increased from 305,827 men and women in 1947 to 824,662 in 1965. The number of aircraft declined sharply, from 25,090 to 18,300, but 2,720 ballistic and cruise missiles formed a part of the inventory in 1965. Moreover, the weapons of 1965 included supersonic aircraft and long-range bombers, along with intercontinental ballistic missiles, that in 1947 had existed only in the imagination of engineers.

The nearest approach to a constant, as the Air Force experienced this era of change from 1947 to 1965, was the organizational structure of the service. After eighteen years, the same basic organizational pattern still prevailed. At the top, the civilian head and his immediate advisers formed the Office of the Secretary of the Air Force, while the uniformed leadership included the Chief of Staff, a

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Vice Chief of Staff, and an Assistant Vice Chief of Staff. Both the civilian and military components of the headquarters were assisted by the Air Staff, by the equivalent of a special staff, and by a board structure in which a variety of panels apportioned financial and other resources among programs that cut across the functional boundaries of the staff sections. Outside Air Force Headquarters, people, bases and other assets were assigned to a network of commands, domestic and overseas, supporting and operational.

Although the organizational principles remained essentially stable, the exercise of authority underwent change. The operational powers that the Secretary of Defense and the Joint Chiefs of Staff exercised on behalf of the Commander in chief had so increased, largely a consequence of the reorganization of the Department of Defense in 1958, that the Air Force and its civilian secretary were now responsible mainly for providing well trained, properly equipped, and efficiently administered forces to the unified and specified commands, which in time of war would do the actual fighting. The sharpened focus on the Joint Chiefs of Staff, through whom orders passed from the President and the Secretary of Defense to the unified and specified commands, resulted in a division of labor whereby the Air Force Chief of Staff tended to concentrate on matters involving the Joint Chiefs of Staff, the Vice Chief of Staff on the functioning of the Air Force, and the Assistant Vice Chief of Staff on the Air Staff and the other components of Air Force headquarters.

Despite the removal of the Secretary of the Air Force from the operational line of command, the Office of Secretary of the Air Force remained fairly stable in its organization, allowing, of course, for the merging or separating of the basic functions and the interchangeability of assistant secretaries and special assistants. In 1947 the office included the secretary, an under secretary, and two assistant secretaries—one for management and the second for civil, military, and diplomatic affairs (the latter became the Assistant Secretary (Civil Affairs) in 1949). In May 1951, a minor reorganization abolished the civil affairs function and divided its duties between the Assistant Secretary (Management) and the new position of Assistant Secretary (Materiel). The office of Assistant Secretary (Management) followed civil affairs into oblivion in 1954, with its responsibilities split between two new assistant secretaries, one dealing with financial management and the other with manpower, personnel, and reserve forces. The Assistant Secretary of the Air Force (Research and Development) came into existence in the spring of 1955, replacing the special assistant who had handled these matters. In March 1959, manpower, personnel, and reserve forces became the responsibility of a special assistant, and the office of assistant secretary for these subjects was abolished. The existing office of Special Assistant (Installations) increased in importance, however, largely because of the proliferation of missile launching sites, and in 1964 it merged with the materiel function under an Assistant Secretary (Installations and Logistics). Looking beyond 1965, the Special Assistant (Manpower, Personnel, and

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Reserve Affairs) became deputy under secretary in 1966 and two years later an assistant secretary; the Assistant Secretary (Installations and Logistics) survived until 1977, when the office was abolished and the work reassigned to the Assistant Secretaries (Research, Development, and Logistics) and (Manpower, Reserve Affairs, and Installations).

Besides the under secretary and the assistant secretaries, and later the special assistants and a variety of deputies, the Secretary of the Air Force relied at the outset on an Administrative Assistant, a General Counsel, and an Office of Information (redesignated the Office of Public Affairs in 1979). In January 1948, a legislative liaison operation was set up, followed in 1960 by the Space Systems Office. Looking ahead to 1980, an auditor was added along with an office that dealt with "small and disadvantaged" businesses, changes that reflected both greater concern over contracting and a policy of encouraging small businesses and those owned by members of racial or ethnic minorities. In short, the Office of Secretary of the Air Force reflected in its composition the priorities of the time (whether operational, as in space systems, or administrative, as in dealing with certain types of businesses); most of the necessary changes in structure were made by adding, eliminating, or reassigning duties within a generally stable framework of assistant secretaries and special assistants. In terms of manpower, the Office of Secretary of the Air Force totaled almost 550 officers, enlisted men, and civilians in 1965, half again the number assigned in 1947, but the peak strength of slightly more than 600 had come during the Korean War.

Air Force headquarters, consisting primarily of the Air Staff, numbered 5,200 in 1965, some 3,000 of them civilians, compared to some 4,000 officers, enlisted men, and civilians in 1947. Strength peaked not during the Korean conflict, but afterward, in 1956 and 1957 when 8,300 persons were assigned or employed there. The total then declined abruptly, with the elimination by 1960 of 3,000 spaces, about two-thirds occupied by civilians.

As was true of the Office of Secretary of the Air Force, the basic structure of the Air Staff remained surprisingly stable from 1947 through 1965, although the titles did change, with the duties shifted from one staff section to another. In January 1950, a Deputy Chief of Staff, Development, joined the four offices—the Comptroller and the Deputy Chiefs of Staff, Materiel, Operations, and Personnel—that made up the Air Staff in 1947. By 1960, however, planning and programming had been separated from operations and assigned to a new Deputy Chief of Staff, Plans and Programs. During this thirteen-year period, the Director of Intelligence, who had reported to the Deputy Chief of Staff, Operations, became an assistant chief of staff with access to the Chief of Staff of the Air Force. In 1961, the materiel function, under Lt. Gen. Mark E. Bradley, became the office of Deputy Chief of Staff, Systems and Logistics; and the Deputy Chief of Staff, Research and Technology, replaced the Deputy Chief of Staff, Development, but the duties remained the same, as did the incumbent, Lt. Gen. Roscoe C. Wilson; in 1963, however, the research and technology section,

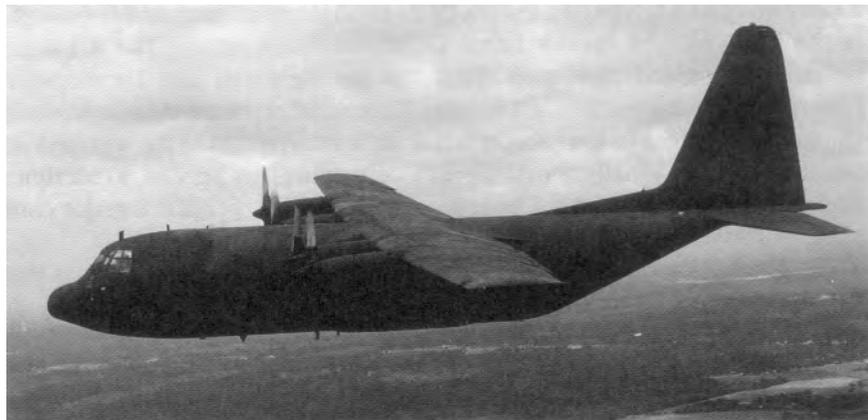
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now headed by Lt. Gen. James Ferguson, became the office of Deputy Chief of Staff, Research and Development. Early that year, planning rejoined operations under the Deputy Chief of Staff, Plans and Operations, Lt. Gen. David A. Burchinal, while the operational requirements function of the old operations section was incorporated with programming under Lt. Gen. Gabriel P. Disosway, Deputy Chief of Staff, Programs and Requirements. In yet another change in 1963, the Chief of Chaplains, Maj. Gen. Robert P. Taylor (a former Army chaplain who had survived a brutal imprisonment by the Japanese in World War II), moved from the status of a director under the Deputy Chief of Staff, Personnel, to the equivalent of an assistant chief of staff. In the spring of 1965, the operational requirements function moved again, to the Deputy Chief of Staff, Research and Development, and the Deputy Chief of Staff, Programs and Requirements, became Programs and Resources.

As demonstrated by the shuffling of some functions among the major staff sections and the elevation of others to the level of assistant chief of staff, the basic structure had proved its flexibility by 1965. The offices that formed the equivalent of a special staff, those at the level of assistant chief of staff, offered the greatest possibility for change whenever new problems arose or old ones were solved. At the time when missiles were being developed and bases built for them, an Assistant Chief of Staff for Guided Missiles and an Assistant Chief of Staff, Installations, exercised staff authority in these fields. When Operations Analysis became too important to remain a part of the operations function, it moved to this staff of specialists, where it joined the Scientific Advisory Board and the offices of Inspector General, Judge Advocate General, Surgeon General, and Assistant Chief of Staff (originally Special Assistant), Reserve Forces—all of which had been active almost from the founding of the independent Air Force. The old Air Adjutant General had evolved into the Director of Administrative Services (after 1968 the Director of Administration), but the original office of Secretary of the Air Staff continued to guide the flow of paperwork through that organization. A Chief Scientist still advised the Chief of Staff, and a secretariat, separate from the office of Secretary of the Air Staff, coordinated the work of the board structure. Such was the evolution of the staff system through 1965.

The roster of major commands also changed little during the decade ending in 1965, although in some instances, radical internal changes did occur, relating to responsibilities, weapons, and priorities. Since the 1958 reorganization of the Department of Defense, the Air Force was responsible principally for equipping, training, and administratively supporting its components of the unified commands and for the functioning of the Strategic Air Command, a specified command operated by the Air Force but reporting, like the unified commands, through the Joint Chiefs of Staff and Secretary of Defense to the Commander in Chief. During 1965, the Air Defense Command continued to function as the Air Force component of the North American Air Defense Command, in which

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An Air Force Reserve C-130.

Canada and the United States had combined their efforts. The Tactical Air Command provided trained fighter-bomber, reconnaissance, and troop carrier units for the Air Force component of the new U.S. Strike Command and for the overseas Air Force component commands—Pacific Air Forces, U.S. Air Forces in Europe, U.S. Air Forces, Southern Command (until July 1963 the Caribbean Air Command), and the Alaskan Air Command. The Military Air Transport Service, redesignated the Military Airlift Command in 1966, still functioned as a unified command, although the Navy's participation ended in 1967. The airlift organization exercised control over two air forces (one based on the East Coast, the other on the West), the Air Rescue Service, the Air Weather Service, the Air Photographic and Charting Service (redesignated the Aerospace Audio-Visual Service in 1966), a medical evacuation wing, a crew training wing involved in transition training for the C-141, and a wing of special mission aircraft used to carry senior officials of the government. The Air Force Reserve (until 1968 administered by the Continental Air Command) and the Air National Guard played an increasingly important part in the operations of the Tactical Air Command, the Military Air Transport Service, and, in the case of the Guard, the Air Defense Command.

Besides these operational agencies, the Air Force maintained several support organizations that also enjoyed the status of major commands, and here the greatest changes took place during the early 1960s. Still functioning in 1965 much as they had five or even ten years earlier were the Air Training Command, the Air University, the U.S. Air Force Security Service (which dealt mainly with electronic security), and the Headquarters Command, established in 1948, which provided administrative and logistic support for Air Force headquarters and acted as housekeeper for both Bolling Air Force Base in the District of Columbia, where the command was located, and Andrews Air Force Base in

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nearby Maryland. (Disestablished in 1976, Headquarters Command re-emerged in the mid-1980s as the Air Force District of Washington.) The Air Force Systems Command took over from the Air Research and Development Command and the Air Force Logistics Command replaced the Air Materiel Command, changes in 1961 that resulted from the overhaul of the weapons acquisition process. Finally, the Air Force Communications Service, a redesignation of the Airways and Air Communications Service, became a major command in 1961.

By 1965, a variety of support organizations, occupying lesser places than major commands, were categorized as separate operating agencies. They included the Air Force Academy; the Aeronautical Chart and Information Center, which produced navigational charts and target folders (some of its work based on film provided by the Air Photographic and Charting Service); the Air Force Accounting and Finance Center; and the Office of Aerospace Research. This last agency, formed in 1961, supervised basic scientific research sponsored or conducted by the Air Force, supplementing the work of the new Air Force Systems Command, which dealt with applied science in the form of research and development and weapons acquisition.

Although the roster of major commands changed little during the early 1960s, the relationships among the operational forces other than the Strategic Air Command and the Air Defense Command changed enough that jurisdictional lines, in some cases, blurred. A major result of the emphasis on flexible response was the concept of general purpose forces, those entities not devoted exclusively to defense or deterrence but able to wage limited warfare with conventional weapons. For the Air Force, the category of general purpose forces excluded the Strategic Air Command (until 1965, at least, when B-52s began dropping high-explosive bombs in Southeast Asia), the Air Defense Command, and support organizations like the Air Force Logistics Command and the Air Force Systems Command. The Military Air Transport Service not only provided long-range airlift for the military establishment but also reinforced the efforts of the cargo and troop carriers of the Tactical Air Command, crossing the boundary between general purpose and support. The general purpose forces definitely included the Tactical Air Command, the source of aviation units for the U.S. Strike Command, and the Air Force commands overseas, which also tapped the Tactical Air Command in the United States for aircraft and trained men. Moreover, the reserve components generally functioned as part of the general purpose forces, although a number of Air National Guard squadrons remained committed to air defense.

Even as the general purpose forces of the Air Force began to accept the role of reinforcing overseas commands in time of emergency with units suitable to confront the particular threat, one of the component commands, U.S. Air Forces, Southern Command, became deeply involved in counterinsurgency, an adjunct of the concept of flexible response. The organization deployed mobile

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Members of the Alabama Air National Guard at Elmendorf Air Force Base, Alaska, prepare for an aerial photography mission in RF-84s.

training teams to instruct Latin American airmen in civic action, a program that attempted to raise the standard of living through medical care, improvements in public health, and self-help projects, thus depriving insurgents of popular support.

The new emphasis on flexible response and global mobility resulted in a succession of exercises, often under the direction of the Strike Command, that involved one or more of the Air Force commands, at times assisted by the reserve components. The armed forces had, of course, conducted large maneuvers before the creation of the Strike Command in September 1961. Indeed, during August of that year, the Tactical Air Command, the Military Air Transport Service, and elements of the Air Force Reserve, along with the Army's 82d and 101st Airborne Divisions conducted Swift Strike, an exercise in the Carolinas that included the dropping of more than 15,000 parachute troops. The Military Air Transport Service, using its new, long-range C-130Es, dropped approximately two paratroops for every one that leaped from transports of the Tactical Air Command, testifying to the increasing involvement of the transport service in tactical operations, instead of only long-distance delivery of men and cargo. The new Strike Command staged its first exercise in December 1961 at Fort Drum, New York, conducting a small-scale test of air and ground forces in cold-weather operations. Of the subsequent exercises that took place in the United States, perhaps the most ambitious was Desert Strike, held in the West and Southwest during 1964 and involving 100,000 soldiers and airmen. Fifteen squadrons from the Tactical Air Command flew from a total of 25 airfields scattered between Texas and Oregon, and the Military Air Transport Service carried

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out some 2,500 sorties in conjunction with tactical transports, delivering 33,000 troops and 24,000 tons of cargo as part of the exercise. At times, the rugged terrain of Alaska tested the airmen and soldiers, as in Exercise Northern Hills, held in June 1965.

Those exercises involving a deployment to foreign bases provided an especially realistic test of the ability of the Air Force general purpose forces, backed as necessary by the reserve components, to reinforce the likely theaters of war and conduct conventional operations. During the early 1960s, western Europe seemed a probable battleground; and in Long Thrust IIA, an impressive test of readiness for conventional war conducted in January 1962, new C-135 transports flew an infantry battle group of roughly 1,400 men from McChord Air Force Base, Washington, to Rhein-Main Air Base in Germany. The flight, which followed an Arctic route, took ten and one-half hours, compared to a minimum of 32 hours for slower piston-engine aircraft that had to refuel while on a longer and more southerly course. In October 1963, Big Lift tested two elements of flexible response: the Army's plan to stockpile at depots in Europe enough supplies and equipment for as many as two divisions airlifted from the United States plan and the Air Force's ability to deploy tactical aircraft across the Atlantic rapidly. The Military Air Transport Service flew 15,000 troops of the 2d Armored Division from Fort Hood, Texas, to Europe in 63 hours, despite headwinds caused by a tropical storm passing off the coast of the Carolinas. When the division's components landed, they drew their tanks and other heavy equipment from the previously stocked depots. The Tactical Air Command deployed three squadrons of fighter-bombers and a composite reconnaissance unit as a part of Big Lift. Yet another exercise of the conventional forces took place in Denmark during 1965, when transports from the Tactical Air Command and the Military Air Transport Service dropped 2,300 paratroops in the largest airborne operation on the continent since World War II.

Latin America served as the site for similar exercises, some involving long-range airlift. Banyan Tree III, in February and March 1962, required Air Force transports to fly an Army task force to Panama, supply it, then return it to the United States. Late in 1964, the U.S. Air Forces, Southern Command, conducted a joint exercise in Peru with forces from five nations besides the host country—Argentina, Bolivia, Colombia, Paraguay, and Venezuela.

The Air Force general purpose forces participated in other exercises all over the globe. The Pacific Air Forces, for example, conducted Air Cobra, held in Thailand as part of a show of force ordered by President John F. Kennedy in the spring of 1962 to deter the communist faction in Laos. During the spring of 1964, Air Force fighter squadrons and transports staged through Incirlik Air Base, Turkey, in an exercise involving Iranian troops, an American airborne brigade, and ships of the U.S. Navy operating in the Persian Gulf. During maneuvers conducted at Taiwan in October 1964, some 2,500 Chinese Nationalist paratroops jumped from transports of the Pacific Air Forces.

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Besides joining the Tactical Air Command and Military Air Transport Service in some of the major exercises, the reserve components trained on their own for the swift deployments expected of the nation's general purpose forces. Possibly the most ambitious exercise of this sort occurred in 1964 when the Air National Guard used its own resources to conduct a nonstop transatlantic flight with two tactical fighter wings and a reconnaissance wing refueling en route from KC-97 aerial tankers. Less spectacular, but equally important, was the work of the transport squadrons of the Air Force Reserve and the Air National Guard. Both components took part in exercises involving troop carrier units of the Tactical Air Command, such as King Crab VII and Polar Strike in Alaska during 1964. Moreover, the longer range transports flown by the Guardsmen and reservists, especially the C-124s of the Air Force Reserve, supplemented aircraft of the Military Air Transport Service on transpacific routes to Japan, the Philippines, Thailand, and South Vietnam. The C-124s alone flew 11 million ton-miles over the Pacific in the year that ended in June 1965, indicative of the heavy volume of cargo heading westward and the importance of the reserve components in delivering it.

The deployment of units from the United States as short-term reinforcements overseas, vital to flexible response, gave the Air Force an attractive alternative to the permanent stationing of entire wings in Europe. As early as 1959, the leadership of the Tactical Air Command had suggested withdrawing the fighter wings, together with their maintenance and administrative elements, from overseas, individual squadrons, with a minimum of such support, would then rotate back to the foreign bases for short periods. In an emergency, the rest of the wing



Members of the Air National Guard examine this RF-84 at Ramstein Air Base, Germany, shortly after it flew nonstop from Maine in August 1964.

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could quickly reinforce the squadrons and bring the mechanics and administrators needed for sustained operation. After becoming Chief of Staff, Gen. Curtis E. LeMay commissioned a study, nicknamed *Clear Water*, that enthusiastically recommended the rotation of comparatively small units overseas and their rapid reinforcement in time of crisis. LeMay became a strong advocate of this practice, which closely resembled what he had done with the B-47s when he led the Strategic Air Command. Operationally, rotation reduced vulnerability to surprise attack by scattering a comparatively small force of tactical aircraft—whether fighter-bombers, transports, or reconnaissance craft—among several airfields, while the main force remained beyond reach of Soviet medium-range bombers and missiles. Such a practice also reduced the flow of American currency into Europe, since the maintenance, supply, and administrative functions needed by permanently stationed wings, which collectively employed a sizable number of local civilians in peacetime, remained in the United States except in emergencies, when compact support elements would deploy, leaving their dependents behind. *Clear Water* presaged dual basing in Europe, which, beginning in 1966, called for the rotation of squadrons, but required that specific airfields be kept in readiness for the designated reinforcing units. In effect, the operational wings of the Tactical Air Command selected for deployment to Europe in an emergency had bases both in the United States and overseas.

Since the concept of flexible response relied on long-range airlift for rapid movement in time of trouble, the Military Air Transport Service continued to emphasize its strategic airlift operations, even though it became more deeply involved in tactical activity. In 1963, the command took over the air routes that the U.S. Air Forces in Europe had operated to Africa and the Middle East, a change that reduced the financial drain by entrusting these activities to a command based in the United States and performed its maintenance and administrative activities there, instead of one that was stationed in Europe where the crews, the technicians, their dependents, and the local civilian employees poured money into the regional economies. During the following year, the long-distance routes in Europe and the Pacific also came under the control of the Military Air Transport Service. Soon the deepening military involvement in Southeast Asia generated transpacific airlift requirements that forced the service not only to turn to the reserve components but also to realign its own aerial resources. As a means of increasing the capacity of aeromedical evacuation flights from the far Pacific, C-135s that had delivered men or equipment were rigged as hospital aircraft for the return flight to the United States. On domestic evacuation flights transferring patients from the West Coast to hospitals elsewhere, the transport service substituted the four-engine Douglas C-118 for the smaller Convair C-131. In addition, C-124s based on the West Coast as troop carriers were pressed into service hauling bulky cargo across the Pacific.

Throughout the 1960s the Military Air Transport Service conducted emergency, humanitarian, and routine operations, often in concert with the reserve

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components or squadrons of the Tactical Air Command. Routine, however, did not mean dull; besides the always risky overwater flights beyond Hawaii, the service regularly took part in Antarctic operations where the new C-130Es proved invaluable in sustaining the exploration and study of that ice-bound continent. President Kennedy authorized emergency flights to India in November 1962 after Chinese forces, when probing the ill-defined Himalayan border, encountered resistance from Indian troops and launched an offensive that for a time threatened to penetrate south of the mountain chain. Although he concentrated on verifying the removal of Soviet offensive missiles from Cuba during this period, the President dispatched a thousand tons of automatic weapons and ammunition by air from Rhein-Main airfield in the Federal Republic of Germany to Calcutta. A dozen C-130s deployed temporarily to India to carry troops and cargo within the country until the crisis subsided during 1963. The response to the Congolese civil war, which flared anew in September 1961 and lasted for three years, involved a mixture of emergency and humanitarian actions by the Military Air Transport Service and the Tactical Air Command. Indeed, during the climactic actions of November 1964, transports of the Tactical Air Command sent from Pope Air Force Base, North Carolina, dropped Belgian paratroops to free the European civilians held hostage by one of the contending factions and later flew the former captives out to safety. Humanitarian flights delivered assistance to victims of earthquakes in Iran, Yugoslavia, Alaska, and El Salvador; floods in Morocco and on Guam; and a blizzard in Texas. The reserve components conducted the largest humanitarian airlift in their history during the New Year season of 1965, flying 1,406 tons of food, fuel, medicine, sandbags, and construction equipment to fight floods in the northwestern United States.

Although airlift operations captured the greatest attention, other components of the Military Air Transport Service made useful, if rarely publicized, contributions to the Air Force and the nation. During the early 1960s, the Air Weather Service, which operated more than 400 facilities to provide forecasts and other data to the Air Force and the Army, entered the space age. Besides beginning to receive signals from weather satellites, the organization, in its probes of the upper atmosphere, replaced balloons with instrument-laden sounding rockets that soared beyond 200,000 feet. The Air Rescue Service, in the midst of modernization, acquired the new twin-rotor Kaman HH-43 helicopter to rescue the victims of crashes in the immediate vicinity of air bases. In addition, the Air Photographic and Charting Service continued a worldwide photomapping effort that surveyed areas as widely separated as the Orinoco River of South America, the Hawaiian archipelago, and the nation of Ethiopia.

The commitment to flexible response magnified the importance of tactical air operations and the need to deploy troops and aircraft anywhere in the world. The Military Air Transport Service emerged as a kind of magic carpet for the rapid movement of men and equipment, and the organization trained to carry out this mission. However, the emphasis on conventional warfare (along with

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A Kaman HH-43 Huskie rescue helicopter picks up a piece of fire-fighting equipment.

the desire to rotate even tactical airlift units rather than deploy large units more or less permanently at greater cost in dollars and vulnerability) nudged the service into operations that a few years earlier would have been performed by troop carrier units of the Tactical Air Command. In short, the Military Air Transport Service, although remaining the agency for long-range or strategic airlift, at times became a component of the general purpose forces.

The Strategic Air Command underwent a number of changes between 1960 and 1965 that reflected McNamara's commitment to flexible response and his belief that the intercontinental ballistic missile was a more efficient and effective deterrent than the long-range strategic bomber. Because of the destructive capacity of the retaliatory force and the rapid reaction time and irrevocable nature of missiles, the Secretary of Defense emphasized close control. Like so many of the military policies of the Kennedy administration, this recognition of the importance of control traced its roots to the Presidency of Dwight D. Eisenhower, when the Strategic Air Command conducted a six-month test of an airborne command post. The experiment proved successful, and in February 1961 the command began operating a fleet of three specially equipped KC-135s. Each of the modified tankers flew an eight-hour mission until relieved by another of the aircraft, and the radio equipment on board enabled a battle staff to maintain contact with the Joint Chiefs of Staff and every base and

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aircraft operated by the Strategic Air Command. Looking Glass, the nickname of the airborne command post, served as an alternate in the event the underground facility at Offutt Air Force Base should be destroyed. In April 1962, the command addressed the possibility that the command posts of subordinate units might also be put out of action and placed auxiliary airborne command posts at Barksdale Air Force Base, Louisiana, headquarters of the Second Air Force; Westover Air Force Base, Massachusetts, headquarters of the Eighth Air Force; and March Air Force Base, California, headquarters of the Fifteenth Air Force. Four months later, the Post Attack Command and Control System—Looking Glass and the auxiliaries—added modified B-47 radio relay aircraft based at Mountain Home Air Force Base, Idaho; Lincoln Air Force Base, Nebraska; Lockbourne Air Force Base, Ohio; and Plattsburgh Air Force Base, New York. In the spring of 1965, the operation at Lockbourne and Mountain Home ended, and KC-135s replaced the less efficient B-47s at the other two locations. In a further extension of airborne command and control, a launch control team in a modified KC-135 during 1967 fired a Minuteman missile from a test site at Vandenberg Air Force Base, California. Airborne command and control centers thus acquired the ability to launch both missiles and bombers of the Strategic Air Command's retaliatory force.

The Strategic Air Command also developed an automated information retrieval system linking all its command posts in North America. This network stored in its computers information on the status of aircraft and missiles, with the data instantly available to commanders and staff officers. The automated network, which began functioning in March 1965, provided printouts of telephone and radio messages, which could be disseminated as easily as information received by teletype.

Despite its preference for missiles, the Kennedy administration was determined to get the best possible use from the existing bomber force, especially the B-52s and their supporting tankers. In 1961, with an airborne alert already being maintained, President Kennedy issued instructions that 50 percent of the bombers should be ready on 15-minute notice to take off on their wartime missions. Increased readiness, however, coincided with decreasing numbers, as the command followed Secretary McNamara's instructions to accelerate the retirement of its B-52Bs, B-47s, and KC-97 tankers. The last B-52, an H model, rolled from the assembly line in 1962; its turbofan engines were almost 50 percent more powerful than the turbojets on the B-52Bs. However, until the advent of the FB-111 program in 1965, no bomber would be on order or in production for the Strategic Air Command. Similarly, the Air Force acquired its last KC-135 in January 1965 and had to wait more than 15 years for a successor, the McDonnell Douglas KC-10, first delivered in March 1981. From 1960 through 1965, the total number of operational aircraft assigned to the Strategic Air Command declined from 2,992 to 1,490, as the Air Force retired more than 1,000 bomber, reconnaissance, and electronic warfare versions of the B-47;

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more than 650 KC-97s; and 50 C-124s used to carry cargo for the commands. The aggregate number of B-52s increased during the period from 538 to 600, despite the loss of the oldest of these aircraft, the KC-135 fleet grew from 405 to 665, and the number of B-58s increased from 19 to 93. The B-58, however, would begin its phaseout in 1966, along with other older models of the B-52.

The retirement of the B-47s and the KC-97 tankers that refueled them and the appearance in growing numbers of the longer range B-52s and KC-135s contributed to a reassessment of the Strategic Air Command's use of overseas bases. The Reflex Action program, under which B-47s deployed in small numbers to distant locations, decreased sharply in 1963 and 1964, and ended altogether in 1965. The three Moroccan bases at Nouasseur, Benguerir, and Sidi Slimane shut down first, but Reflex Action operations continued at Torrejon, Moron, and Zaragoza in Spain; Brize Norton, Greenham Common, Fairford, and Upper Heyford in the United Kingdom; Elmendorf Air Force Base, Alaska; and Andersen Air Force Base, Guam. During 1964, B-52s replaced the B-47s at Guam, and the smaller bombers by year's end were rotating to only five bases—Moron, Torrejon, Brize Norton, Upper Heyford, and Elmendorf. The last B-47 was removed from alert status on December 31, 1965, and in 1966, after the bombers no longer operated from Spain, the Strategic Air Command transferred the Sixteenth Air Force and the three Spanish bases to the U.S. Air Forces in Europe.

The KC-97s began leaving the alert force in 1963, when the tankers ceased operating from Bermuda and three locations in Canada. During the transition, the tankers continued to deploy on a rotating basis to Namao Royal Canadian Air Force Station, Alberta; Goose Bay, Labrador; Ernest Harmon Air Force Base, Newfoundland; and Sondestrom Air Base, Greenland. Reflex Action tanker operations at Namao and Sondestrom ended in 1964, and KC-135s replaced the KC-97s in rotating to Goose Bay. Ernest Harmon was the last base to support the older tankers, which finally left the alert force in November 1965. Between the closing of the Moroccan air bases in 1963 and the elimination of the B-47 and KC-97 from the alert force in 1965, the number of overseas bases operated by the Strategic Air Command declined from fourteen to seven located in Guam, Puerto Rico, Labrador, and (into 1966) Newfoundland and Spain.

Although difficult to maintain and unforgiving of pilot error, the B-58, with aerial refueling from the KC-135, proved during the early 1960s to be a spectacular symbol of the retaliatory force. In May 1961, Maj. William R. Payne, with Capt. William L. Polhemus and Capt. Raymond Wagener as his crew, flew a B-58 from New York to Paris in just over three hours, about one-tenth the time Lindbergh had required to cover the same route in 1927. One week later, however, all three officers died when their B-58 crashed during a routine aerial demonstration at the Paris Air Show. Another B-58, piloted by Capt. Robert G. Sowers, with Capt. Robert McDonald as navigator and Capt. John Walton as defensive systems operator, flew from New York to Los Angeles and back in under

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five hours, averaging 1,044 miles per hour despite slowing three times to refuel from KC-135s. Still another B-58, piloted by Maj. Sidney Kubesch, took off from Okinawa, flew to Japan, then set an eastward course for London that passed over Alaska and northern Canada. Landing at Greenham Common after refueling five times in midair, the supersonic bomber established a Tokyo-to-London speed record, averaging 938 miles per hour.

The B-52 demonstrated its potential for wartime operations by making well-publicized long-distance flights. In January 1962, a B-52H, commanded by Maj. Clyde P. Evely, flew 12,532 miles from Kadena Air Base, Okinawa, to Torrejon Air Base, Spain, without refueling, shattering a distance record that had endured for 16 years. Later that year, another turbofan-powered B-52H flew a total of 11,337 miles over a route that began and ended at Seymour Johnson Air Force Base, North Carolina, eclipsing the record for unrefueled flight over a closed course set in 1960 with an earlier model of the B-52.

Exercises and competitions continued into the early 1960s insofar as emergencies permitted. The Cuban missile crisis of 1962 and the increasing involvement in the war in Southeast Asia resulted in cancellation of the bombing and tanker competition for the three years ending in 1964. The 1965 bombing contest was the last in which the B-47 participated, but the tanker competition was not revived in 1965. Since November 1961, the Strategic Air Command had functioned as the single manager of aerial refueling operations for the Air Force, and the intensification of tactical air operations in Southeast Asia required the services of tankers that might otherwise have competed. An unusual noncombat emergency, so brief it was scarcely disruptive, occurred in March 1964, when U-2s, RB-47s, and camera-equipped B-58s photographed the damage caused by a violent earthquake in Alaska. The processed photographs taken by B-58s, the product of a 5,751-mile round-trip flight from Carswell Air Force Base, Texas, reached authorities within 24 hours.

The arrival of the intercontinental missile as an integral part of the nuclear deterrent produced a marked change in the Strategic Air Command. The first such missile, a pilotless jet aircraft called the Snark, went on alert in March 1960, but it proved an interim weapon of dubious reliability and effectiveness and served only until June of the following year. The ballistic missile emerged as the weapon of the future, though it required further development and modification before becoming fully satisfactory.

The first generation of intercontinental ballistic missiles consisted of three models of the Atlas and the Titan I, all propelled by the combustion of highly volatile liquids. The three variants of the Atlas were the D, stored, fueled, and launched on an exposed pad; the E, stored horizontally in a so-called coffin that afforded some protection against blast and fallout, then raised to the vertical, fueled, and launched; and the F, stored in an underground silo of steel-reinforced concrete (like the Titan I), then raised to the surface on an elevator, fueled, and launched. The Atlas shared a common weakness with Titan I—the use of a pro-

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An Atlas F is lifted to the surface during a test of the hoisting system, which could position the missile for launch within minutes.

pellant that could not be stored in the missile and had to be loaded immediately before launch. Fueling was supposed to take 15 minutes, roughly the warning time that the ballistic missile early warning radars of that era were expected to provide, but such a deadline was hard to meet with an agent like liquid oxygen, which could burst into flame if it came into contact with oil or grease spilled at the launch site.

The first Atlas D missiles went on alert in 1959 when a training squadron at Vandenberg Air Force Base assumed a combat mission; within two years the Air Force had deployed four squadrons, making a total of thirty D models available for war. Because they lacked protection against blast or radiation and had to be fueled minutes before launch, the D models were retired during 1964. Secretary McNamara in November of that year directed that, by July 1965, the rest of this generation of intercontinental ballistic missiles be removed from the inventory of weapons. Atlas E, totaling twenty-seven missiles in three squadrons, had been fully deployed and operational since November 1961; Atlas F, with seventy-two missiles in six squadrons, since December 1962; and Titan I, with fifty-four missiles in six squadrons, was installed in its silos between April and September 1962. The last of the Atlas and all of the Titan I weapons were removed from their launch sites between early January and mid-April 1965 and shipped to storage areas for possible use as boosters for space vehicles. No missile that had to be loaded with propellant immediately before launch remained in the deterrent force; the Thor and Jupiter intermediate-range weapons were also retired, their removal coinciding with the resolution of the Cuban missile crisis. After a brief period of service, in some instances as little as two years, the entire first generation of liquid-fueled ballistic missiles passed from the scene.

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Construction of underground silos for Titan missiles in Colorado.

The hectic program of development, acquisition, and deployment that had produced these weapons cost an estimated \$17.5 billion, but if the missiles helped change Soviet designs on Berlin or plans for a bridgehead in Cuba, they justified the investment.

The retaliatory force needed a missile that could remain encased in a protective shelter until moments before launch and be fired by simply igniting fuel already in place. The second generation of intercontinental ballistic missiles, Titan II and Minuteman, fulfilled this requirement. Both the liquid-propellant Titan II and the solid-fuel Minuteman could stay in concrete silos for long periods and be launched with the closing of an electrical circuit. The entire Titan II force, 54 missiles in nine squadrons, went into underground silos between early June and the end of December 1963. The Minuteman I system, 16 squadrons with 50 missiles each, entered service between December 1962 and June 1965; of the total, 150 used the Minuteman A missile and the remaining 650 the longer range B model. By the end of December 1965, the Minuteman II system was being installed in underground launchers in the vicinity of Grand Forks Air Force Base, North Dakota. This latest variant of Minuteman featured a still more powerful rocket, an improved reentry vehicle, and penetration aids to frustrate a possible Soviet antiballistic missile defense.

Even before the addition of 200 Minuteman IIs brought the total force to the planned strength of 1,000 (which occurred in November 1966), the Air Force began to modernize the Minuteman I missiles, raising them to the standard of the newer weapons. Secretary McNamara, despite his obvious reliance on Minuteman, rejected mounting missiles on specially built railroad cars for launching from previously surveyed sidings. Likely public opposition to having

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nuclear weapons move routinely by rail through the nation's cities and the tremendous cost of improving the railroad infrastructure and control system to handle the traffic safely proved to be convincing arguments against the plan. (In the late 1980s, the plan for rail-mobile strategic missiles reappeared, but called for weapons and trackage only on military reservations, some distance from towns and cities.)

As Minuteman was becoming the principal weapon in the missile force, the leadership of the Strategic Air Command changed. Gen. Thomas S. Power retired on November 30, 1964, succeeded by Gen. John D. Ryan, Vice Commander in Chief of the organization. General Ryan, during World War II the commander of a bombardment group and later the executive officer of a bombardment wing, served immediately after the conflict in the Air Training Command before returning to bombers. He participated in the atomic tests in the Pacific during 1946, served as a wing and air division commander in the Strategic Air Command and as the command's Director of Materiel, and commanded the Sixteenth Air Force in Spain and the Second Air Force at Barksdale Air Force Base. In 1963 he became Inspector General of the Air Force, serving in that capacity for a year before returning to the headquarters of the Strategic Air Command as Vice Commander.

On the last day of January 1965, General LeMay, the officer who had forged the Strategic Air Command into a shield of deterrence and sword of retaliation, retired as Air Force Chief of Staff. Like LeMay, the new Chief of Staff, Gen. John P. McConnell, had been a fighter pilot in his youth before devoting the most productive years of his career to bombardment. During World War II, McConnell held assignments in the Training Command and served in Southeast Asia and China, for a time as a staff officer in the headquarters of Lord Louis Mountbatten, the Allied commander for Southeast Asia. McConnell joined the Strategic Air Command in 1950 as the Deputy Commander of the Third Air Force, later became its commander and then took over the Seventh Air Division when it succeeded the Third Air Force as the striking force of the Strategic Air Command in the United Kingdom. In 1957, after four years as the Director of Plans for the Strategic Air Command, he commanded the Second Air Force at Barksdale Air Force Base. He returned to the headquarters of the Strategic Air Command as Vice Commander in Chief in 1961. During the following year, he became the Deputy Commander in Chief, European Command, with the rank of general. Appointed in 1964 as Vice Chief of Staff of the Air Force, he succeeded LeMay on February 1, 1965.

These changes occurred during a time of uncertainty for the Strategic Air Command. The missile force expanded from a dozen Atlas Ds and 30 Snarks in December 1960 to almost 900 Minuteman and Titan II weapons just five years later, and planners had not determined the demands of the new systems in terms of maintenance and operation. For example, the Air Force established an ambitious program of college courses for launch crews on the assumption that crews

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Gen. John D. Ryan (left), Commander in Chief, Strategic Air Command, December 1964–January 1967, and Gen. John P. McConnell (right), Air Force Chief of Staff, February 1965–July 1969.

would have plenty of time for study while in their underground capsules monitoring the status of the missiles for which they were responsible. However, the demands of the missile systems, whether to track down false signals or simply to verify that all was well, took up so much time that the education project was abandoned.

As the missile force grew in size, the bomber force declined from 1,700 to 800 aircraft in five years. The shrinkage of the bomber force ended the incentive program established by LeMay in 1949 to retain skilled crew members when an expanding fleet of bombers dominated strategic target planning. In December 1965, McConnell canceled spot promotions, directing that those who currently held them would revert to their normal rank on June 30, 1966. Ryan, however, obtained an exception that enabled him to follow a precedent that Power had established and reward with temporary promotions the winning crews in the annual bomber competition. Consequently, the victors in the 1966 contest, received spot promotions. In 1967, reflecting the growing importance of missiles, the Strategic Air Command, in its first intercontinental ballistic missile competition, tested guidance alignment and launch procedures but stopped short of an actual firing. Although intercontinental ballistic missiles overshadowed bombers as instruments of retaliation, deterrence remained the accepted means of dealing with the perceived threat from the Soviet Union, and the Strategic Air Command, whatever the balance between bombers and missiles, continued to be the nation's principal deterrent, a status unchanged since the establishment of the Air Force.

The Air Defense Command, while approaching the goals established for it during the previous decade, experienced changes in the early and middle 1960s that affected its mission and ultimately its function as a major command. The

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F-102s of the Texas Air National Guard over Kelly Air Force Base, Texas.

radar barrier protecting North America from surprise attack by bombers neared completion, with coverage provided by the distant early warning line, a second radar line in Canada, and the so-called semiautomated ground environment that controlled actual interceptions. The Air National Guard continued to participate in the air defense of North America, although in 1961, mobilization to meet a crisis over the status of Berlin took precedence; at the time, some of the squadrons standing alert to intercept bombers were transferred to the Tactical Air Command for movement to Europe. By the end of 1965, however, air defense activity had returned to normal; during that year, units of the Air National Guard flew 30,000 hours on 38,500 interceptions, either during exercises or when unauthorized aircraft actually entered restricted airspace.

In October 1961, the bomber defenses, though not totally complete, participated in Sky Shield II, an exercise in which a force of 250 bombers, attempting mock attacks against missile sites, were detected by radar and intercepted by fighters that flew a total of 6,000 sorties. The headquarters of the North American Air Defense Command pronounced the exercise, the largest to be held in the western hemisphere, 99.9 percent successful. Later that fall, at Tyndall Air Force Base, Florida, the Air Defense Command conducted another of its periodic William Tell exercises, competitions for fighter-interceptor crews and the controllers who directed interceptions from the ground. During the 1961 contest, 96 percent of the missiles fired from interceptors hit the remotely controlled target drones. In the 1983 William Tell exercise, a team from the Air National Guard emerged as a winner for the first time, taking the F-102 competition.

Despite the successful exercises and competitions, the Air Force decided in 1960 to correct the major weakness of the semiautomated ground environment, the computers at the heart of the system. On the verge of obsolescence even as

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they were deployed, they could not survive the effects of nuclear weapons and would have to be replaced or supplemented by newer and more powerful models that could operate in hardened structures. At first, the Air Force planned to deploy a backup interceptor control system that would provide fewer but more efficient control centers capable of taking over if the original network failed. By 1962, however, further improvements in computer technology persuaded Secretary McNamara to rely exclusively on the back-up system, which he later scaled down in size as radar improved and the threat from bombers diminished.

Since the semiautomated system was largely in place when the backup system appeared, the Air Force proposed converting the older network into a national air traffic control system capable of handling civilian and routine military flights. The Federal Aviation Agency (after 1967 the Federal Aviation Administration), in the process of developing its own traffic control mechanism, was reluctant to adopt for purposes of collision avoidance a system originally intended to put missiles fired from interceptors on a collision course with enemy bombers. Although Congress advocated a single national system developed and operated jointly by the Air Force and the Federal Aviation Agency, that goal could not be reached. The semiautomated ground environment system could not cope with the volume of civil air traffic generated, for instance, by the major airports in the northeastern corridor extending from Washington, D.C., to Boston; and the two agencies could not devise a satisfactory plan for placing civilian air controllers under military command in time of emergency. The effort did, however, produce such benefits as consultation between the Air Force and the Federal Aviation Agency on system design, the transfer of certain semiautomated facilities in the northern plains from the Air Force to civilian use, the sharing of radar information in the southeastern United States, and agreement on procedures for civilian controllers to take over responsibility for Air Force fighters that merged with civilian traffic after conducting interceptions.

The defenses against bombers underwent other changes to enhance efficiency besides the development and deployment of the backup interceptor control mechanism. Improvements in radar enabled the Air Force to thin out the distant early warning line, closing sites without reducing the area of surveillance. Moreover, Lockheed EC-121 Super Constellations with a new airborne radar took the place of the Texas Towers, radar sites converted from oil-drilling platforms that had proved fatally vulnerable to storms off the Atlantic coast of the United States.

Since the Soviet bomber threat had not evolved as rapidly as the most pessimistic American predictions, the radar net guarding against air attack seemed adequate to Secretary McNamara as did the standard interceptors, the F-101, F-102, and F-106, even though they incorporated the technology of the mid-1950s. Nevertheless, modernization seemed likely in 1964 when a curtain of secrecy was lifted to reveal the twin-jet Lockheed YF-12 that carried the latest in fire-control equipment and could attain an altitude of 80,000 feet and a maxi-

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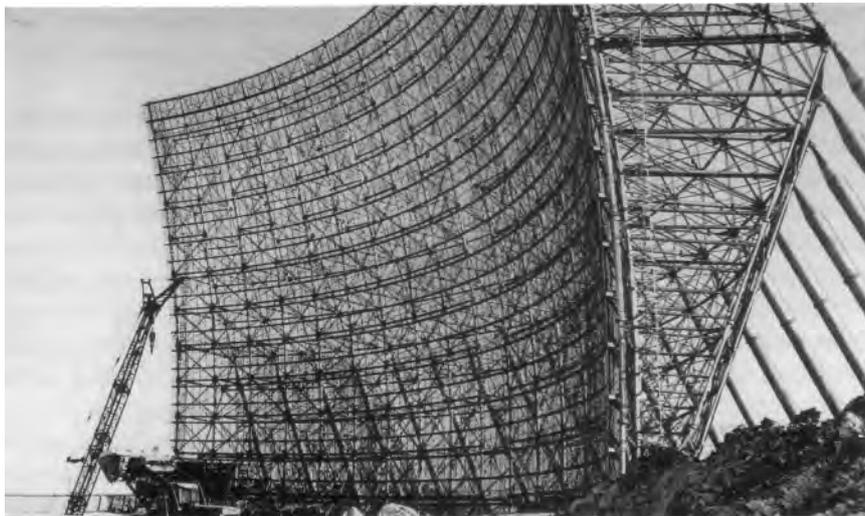
Radar installation at Texas Tower 2 (left) and the Lockheed SR-71.

imum speed of Mach 3. The basic aircraft, however, came to serve a purpose other than intercepting bombers, for it was developed as a supersonic, high-altitude reconnaissance craft, the SR-71. Believing that the threat from Soviet bombers did not justify the investment, the administration of President Lyndon B. Johnson authorized construction of only three revolutionary YF-12s.

Even though the missile gap proved to be an illusion, these intercontinental weapons became more dangerous with the passage of time, and the Air Force during the early 1960s took precautions against the growing threat. The ballistic missile early warning system, with sites at Clear, Alaska; Fylingdales in the United Kingdom; and Thule in Greenland, became operational at this time, providing a fifteen-minute warning of missile attack. Over-the-horizon radar, a technique unveiled in 1964 for extending the surveillance range by bouncing the electronic signals between the earth and the ionosphere, roughly doubled the warning time. Spacetrack, also revealed in the early 1960s, employed new radars, optical devices, and cameras to locate and plot the course of satellites. Lastly, the command post within Cheyenne Mountain in Colorado to which the missile and satellite surveillance or warning nets reported (and the bomber defenses, as well) commenced operation in 1966.

The Air Defense Command by 1965 had entered an era of change that ultimately resulted in a reorientation toward space and away from bomber defense. The aging of the interceptor force, the unsuccessful attempt to merge the control of interceptors with civilian air traffic control, and the greater emphasis on missile warning and space surveillance did not, however, stem from the Kennedy-Johnson-McNamara concept of flexible response. Rather, the root causes were the changing nature of the threat, since Soviet bombers now appeared less dangerous than missiles, and improvements in radar for missile warning and satellite tracking.

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Construction of the ballistic missile early warning system radar at Clear, Alaska. The completed antenna is 165 feet high and 400 feet long.

Although the evolution of the Airways and Air Communications Service of the Military Air Transport Service into a major command started during the Eisenhower years, the process was not completed until the early days of the Kennedy administration, with its strong commitment to the theory of flexible response. Aware of its dependence on global communications, the Air Force in 1958 centralized procurement and logistic support of communications equipment at the Air Materiel Command's Rome Air Materiel Area in New York and research and development at the Electronic Systems Division of the Air Research and Development Command. (This division of labor reflected the relationship between the two commands that prevailed until the spring of 1961, when procurement joined research and development as a responsibility of the Air Force Systems Command and the Air Force Logistics Command took over maintenance and supply.) Another step toward an independent communications command occurred in 1959, when the Airways and Air Communications Service became the single manager for all nontactical communications operated by the Pacific Air Forces and the Alaskan Air Command. The transition ended on July 1, 1961, when the organization officially became a major command, even though it retained the title of Air Force Communications Service. With components deployed throughout the world, the service provided air traffic control and navigation aids for military aircraft, brought together the long-distance communications of the Air Force (radio, teletype, and telephone), operated communications networks on Air Force bases, and deployed mobile teams capable of performing these services during a war or other emergency. However, the re-

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sponsibilities of the new command did not include the communications networks of the Strategic Air Command and the Air Defense Command, which were devoted to warning and retaliation.

The activities of the Air Force Communications Service were many and varied. In 1962, for instance, it relieved the Army of responsibility for the Alaska Communications System, which handled a combination of military and commercial traffic throughout the state (and traced its origins to a telegraph line laid out by Billy Mitchell in 1901 and 1902). The Military Affiliate Radio Service, a voluntary organization of amateur shortwave operators who military supplemented long-distance communications in an emergency, began functioning in 1964 under the direction of the communications service. Following the Alaskan earthquake in the spring of that year, the shortwave network provided emergency radio contact with the contiguous United States, and throughout the war in Southeast Asia, linked servicemen overseas with their families at home. During the early 1960s, the transmission of data rather than verbal messages became increasingly necessary. Consequently, the communications service devised and began operating an automated digital information network that could convert to a standard format, transmit, and receive messages originating from teletypewriters, punched cards, accounting machines, and paper or magnetic tape. The Air Force Communications Service turned the digital network over to the new Defense Communications Agency but continued to manage the system for the Department of Defense. In 1963, the communications service began managing an automated voice network, based on a long-distance telephone system used by the Army, that linked offices and installations throughout the defense establishment. Although entrusting management of the digital and voice networks to the Air Force, the Defense Communications Agency relieved the communications service of responsibility for leasing commercial circuits.

The Air Force Communications Service did not become the Air Force Communications Command until November 1979, after it had functioned as such for almost eighteen years. By the time its title changed, the organization had sold the Alaska Communications Service to a private firm, although retaining into the 1980s a less extensive network within the state that, like its precursor, served both military and commercial users. In 1976, the Strategic Air Command finally called on the service to manage its communications net; in effect, a communications specialist became a deputy to the Commander in Chief, Strategic Air Command. Moreover, the disbanding of the Aerospace Defense Command brought its communications under the management of the communications service beginning in October 1979. Meanwhile, the worldwide digital network was fully computerized by 1979, although the Department of Defense made no similar investment in the voice network.

Another reordering of the responsibilities of major commands resulted in the overhaul of weapons procurement. On March 18, 1961, President Kennedy formally approved the establishment of the Air Force Systems Command under the

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leadership of Gen. Bernard A. Schriever. Until then a lieutenant general heading the Air Research and Development Command, Schriever received his fourth star on April 1. The new organization assumed responsibility for weapon systems from research and development through testing and evaluation—the basic tasks performed by the Air Research and Development Command, which the systems command replaced—and also took over systems procurement, formerly the work of the Air Materiel Command. The materiel command, like the Air Research and Development Command, disappeared from the organizational charts, replaced by the Air Force Logistics Command, which assumed all its predecessor's duties except procurement. These changes established the concept of the weapon system organizationally, with the acquisition of weapon systems becoming the responsibility of the Air Force Systems Command, while the Air Force Logistics Command provided supply and maintenance for them.

The acquisition of spare parts, always a source of friction between the development and materiel functions, remained so after the reorganization. At first, the systems command prepared the order for the basic supply of spare parts for the systems it was developing, but the logistics command ordered subsequent supplies. This demarcation proved too vague, however, and after a trial of about three months, the Air Force Logistics Command became responsible for all purchase, storage, and distribution of spare parts.

The formation of the Air Force Systems Command and its assumption of the procurement function from the old Air Materiel Command marked the culmination of years of study and negotiation within the Air Force. Schriever played the dominant role as he attempted to apply what he perceived as the lessons of the missile program to the development and acquisition of all other Air Force weapon systems. He endorsed “a philosophy of concurrence” in which all the elements of a system, such as the industrial production base, “site construction, installation and checkout, flight testing, and training were all undertaken as rapidly as possible within a very narrow and overlapping schedule.”<sup>1</sup> Reduced to its simplest terms, concurrence (usually called concurrency) required that the same agency plan and carry out according to a precise schedule every phase of weapon system acquisition from research and development, through testing and evaluation, to procurement and assignment to the operating command.

Schriever was not alone in urging that acquisition be treated as a unified process and assigned to a single command. A panel presided over by H. Guyford Stever, head of the Air Force Scientific Advisory Board, reached the same conclusion in mid-1958, recommending that the new organization practice the same decentralization of authority that the Air Research and Development Command had used during the missile program. Indeed, Schriever tried to decentralize when he took over in 1959, reserving coordination and long-range planning for his headquarters while giving the chiefs of the operating divisions authority over planning, programming, and budgeting within their spheres of responsibility.

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During May 1959, immediately after Schriever took charge of the Air Research and Development Command but before he could try out on a larger scale the ideas of decentralization that had worked so well in the missile program, LeMay, then Vice Chief of Staff, set up a committee to examine the feasibility of applying to other weapon systems the management techniques Schriever had used for missile development. Despite LeMay's obvious interest, neither the work of this committee nor a succession of other studies could resolve the basic issue of unifying the acquisition process under one command. Schriever continued to recommend unification of this kind, but he could not create a consensus within the Air Force for so radical a move. What finally served to justify the creation of the Air Force Systems Command and the long-debated realignment of systems acquisition and logistic support was the Kennedy administration's promise that the Air Force would have responsibility for the military mission in space, provided that it actually overhauled the weapons acquisition process. The assignment of responsibility to a single command, under active consideration for three years, at last took place.

Despite Schriever's commitment to decentralize, the new Air Force Systems Command felt the effects of an internal and an external centralization of authority. Internally, tension developed between the command's headquarters and the operating elements that, according to Schriever's theory of organization, were to be largely autonomous. In effect, Schriever tried to institutionalize decentralization, almost a contradiction in terms, since the impulse of every institution is to centralize. This tendency to exercise supervision from higher headquarters surfaced despite his determination to rely on the functional divisions of the command and to have each system project office handle its programs from concept through acquisition, exercising responsibility for internal operation and detailed planning. Unfortunately, the various levels of authority from the commander on down had to know what went on in the project offices, and the phenomenon of institutional centralization asserted itself, beginning with Schriever, who called for comparatively few reports, and accelerating under his successors, whose need to know generated a glut of paperwork.

The external pressure on the Air Force Systems Command originated with Secretary McNamara, who exercised unprecedented authority over weapon systems procurement, the responsibility of Schriever's organization, in an attempt to hold defense contractors to established objectives of time, performance, cost, and mission. In part, the reviews and reports demanded of the systems project offices resulted from a requirement to advise the Office of the Secretary of Defense of progress and problems. The history of the Air Force Systems Command could therefore be interpreted as a struggle between the original impulse to decentralize and the subsequent internal and external imperatives to exert unified control.

Like the Air Force Systems Command, the Air Force Logistics Command was affected from the outset by Secretary McNamara's policy of centralizing au-

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thority in his office. For the former, centralization meant a loss of autonomy in directing the acquisition process; for the latter, it meant surrendering to the new Defense Supply Agency responsibility for electronic and electrical equipment. Some 400,000 individual items formerly purchased, stocked, and distributed by the Air Materiel Command now came under the management of the new agency, which took over one small depot (at Gentile Air Force Station, Ohio) and almost 9,000 jobs from the Air Force Logistics Command. During the 1960s, the number of major depots would shrink from nine to five, a result of the consolidation of maintenance activity, the creation of the Defense Supply Agency, and the transfer of procurement activities to the Air Force Systems Command. The Air Materiel Areas closed during the decade were the Air Materiel Areas at Rome, New York; Middletown, Pennsylvania; San Bernardino, California; and Mobile, Alabama. The areas still functioning in 1970 were Warner Robins, Georgia; Sacramento, California; San Antonio, Texas; Oklahoma City, Oklahoma; and Ogden, Utah. The total strength of the logistics command declined from about 181,000 at the time of its establishment in 1961 to 141,000 in 1965 and 134,000 when the decade ended. The ratio of civilian employees to officers and airmen hovered around eight to one throughout the 1960s.

The Air Force Systems Command also acquired test sites, contract management offices, and industrial facilities that had been a part of the old materiel function. Nevertheless, the separation of acquisition from logistics could not be absolute, for supply and maintenance had to be considered during research and development, through testing, and into production and use. To ensure the necessary harmony between two activities that contributed to the success of a weapon system, the Air Force Logistics Command set up detachments at the major divisions of the Air Force Systems Command that had responsibility for aeronautical systems, space systems, ballistic systems, and electronic systems.

Judging from the long debate prior to the merging of research and development into an organization for weapons acquisition, the Air Force remained as determined in the early 1960s as it had been in the late 1940s to advance the boundaries of military technology. Since General Schriever embodied this determination and headed the new systems command, it was logical that General LeMay and Secretary of the Air Force Eugene M. Zuckert turn to him to address the "imponderable factors" like "the uncertainties as to the nature of development of military activity in space" that would affect the Air Force in the decade ending in 1975. To conduct the kind of investigation that the Chief of Staff and the Secretary of the Air Force wanted, Schriever set up a study group at the headquarters of his command's Space Systems Division at Los Angeles, California, and embarked on Project Forecast. For nine months beginning in 1963, representatives of some forty agencies and activities of the government, including all the armed services, labored alongside researchers from ten "think tanks" and twenty-six universities to predict the impact on the Air Force of probable technological advances. The actual work was done by a series of pan-

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els that considered the hostile threat, systems analysis, and national policy, system capabilities, costs, personnel resources, and twelve specific areas of technology.

Issued in 1964, the report of Project Forecast advocated such advances in technology as the use of new alloys and composite materials in aircraft engines and airframes, a greater reliance on computers throughout the Air Force, improved guidance mechanisms for missiles, new equipment for fighting at night and in bad weather, and devices to increase aerodynamic lift by controlling the boundary layer, the razor-thin current of air passing over an airfoil. In addition to these examples of long-term research applicable to a variety of weapons or activities, Project Forecast called for the development the short-range attack missile, an air-launched weapon less complicated than the ill-fated Skybolt. The short-range attack missile entered service in 1972, and in six years replaced both the Hound Dog defense suppression missile and the Quail decoy on board the B-52s. Since Project Forecast looked only as far ahead as 1975, its report endorsed a number of innovations already on the drawing board, among them the variable-sweep wing being installed in the F-111, the C-5A transport, the manned orbiting laboratory, and an advanced bomber, which after decades of travail entered service as the B-1. Some recommended programs failed to take shape during the critical period between 1965 and 1975, for example, a hypersonic aircraft capable of traveling six times the speed of sound and transports and reconnaissance aircraft capable of vertical takeoff and landing. In terms of specific systems, Project Forecast had mixed results, but the report lent emphasis at a critical time to the use of titanium in aircraft, the development of new alloys, and the substitution of man-made materials for metals. Asked to summarize the results of the project, Schriever maintained that Project Forecast had identified a number of areas where technological advances could be made, including materials, propulsion, flight dynamics, guidance, and computers.

All in all, flexible response had little immediate impact on procurement or logistics before 1965. Indeed, the very overhaul of weapons acquisition, which produced the Air Force Systems Command and the Air Force Logistics Command, would probably have occurred regardless of the national military policy. The Air Force Logistics Command, however, responded to the rapid deployment aspects of flexible response by preparing kits that could be loaded in transports and flown overseas to sustain operations from primitive airfields, but there was not much of an investment in the new counterinsurgency units, the Air Commandos, which were equipped with old aircraft, including the Douglas light bomber that had served as the A-26 in World War II and the B-26 in the Korean conflict. Similarly, interest in conventional fighting did not trigger the urgent development and stockpiling of munitions.

During the 1960s, the Air Force demonstrated the kind of flexibility prized by Secretary McNamara and Presidents Kennedy and Johnson when it joined the other services in responding to three crises, each resolved short of war by a

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Communist border guard peers through barbed wire atop the Berlin Wall.

response tailored to the specific situation. Although the doctrine of flexible response provided a new theoretical framework for military actions designed to contain communism, some of the operations undertaken by the Kennedy and Johnson administrations resembled those of the Eisenhower years. However much Eisenhower might have brandished nuclear weapons, especially at the outset of his Presidency, he did not use them and accomplished the goal of stopping possible communist expansion by less cataclysmic means. Such was the pattern in crises from Taiwan to Lebanon, so that even before flexible response became national policy, the United States tailored military reaction to meet the specific provocation. Nuclear weapons were a deterrent, a means of retaliation, a weapon of last resort, but clearly not the weapon of choice.

The first of the three challenges to flexible response arose in the late spring of 1961 and involved a threat to the continued presence of the Western allies in Berlin, which lay deep inside the German Democratic Republic (the official name of communist East Germany). Emboldened, perhaps, by the failure in April 1961 of an American-sponsored invasion of Cuba by refugees opposed to communist regime of Fidel Castro, a singularly ill-planned and inadequately supported venture, Soviet premier Nikita S. Khrushchev renewed the pressure on Berlin. On June 3, during a meeting at Vienna, Austria, he revealed to President Kennedy a plan to sign a peace treaty ceding the entire city of Berlin

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to the German Democratic Republic, thus terminating the joint occupation of the former Nazi capital, an arrangement stemming from the Allied victory in World War II.

Since the crisis built gradually, Kennedy had time to select a course of action designed to preserve the Western presence in Berlin without recourse to war. As the President sought an appropriate response, Gen. Lauris Norstad, the Supreme Allied Commander in Europe, suggested that an increase in aerial strength on the continent would be faster, less expensive, more dramatic, and more effective in terms of demonstrating firmness than the dispatch of vast numbers of American ground troops. In effect, the general proposed a flexible response, since infantry and armored units could follow if Khrushchev chose to ignore the resolve behind the deployment of tactical aircraft. When Kennedy decided to follow the general's advice and respond first with a dramatic gesture, signs appeared that the Soviet leader might be testing Kennedy's determination rather than actually seeking East German control over all of Berlin. Khrushchev began agitating for restrictions on Western aerial access to Berlin and early in August unexpectedly sealed off the Western portions of the city to prevent entry by the inhabitants of communist territory. Arguments about air transport and the building of the Berlin Wall suggested long-term harassment, not the actions of a man following a timetable for incorporating the city into the German Democratic Republic.

Despite these indications—at best encouraging, at worst ambiguous—the planned augmentation of aerial strength went ahead, first by squadrons of the Tactical Air Command and later by mobilized elements of the Air National Guard. Beginning on September 5, the Tactical Air Command sent across the Atlantic the first of four squadrons of F-100s, a total of 72 aircraft. A second contingent of 72 aircraft, 36 F-100s and an equal number of F-104s, arrived in Europe in mid-December. Both groups refueled en route from aerial tankers; to complete the move, the administrative specialists, the mechanics, and their necessary equipment crossed the ocean in C-124s.

Congress passed a resolution authorizing the mobilization of 250,000 members of the reserve components. Although the President signed the resolution, the Secretary of Defense on August 25 announced that only 148,000 would be called to active duty, roughly three-fourths of them to serve with the Army, about 27,000 with the Air Force, and 8,000 with the Navy. The Air Force's share, which consisted mainly of federalized units of the Air National Guard that reported for duty on October 1, provided the equivalent of 36 fighter, reconnaissance, or airlift squadrons; eight weather flights; a tactical control group; and a variety of support elements. Plans called for the elements of the Air National Guard to deployment across the Atlantic in two groups, but the second was not needed. The contingent that did deploy included a tactical air control squadron flown to Europe by the Military Air Transport Service, a tactical reconnaissance squadron flying 20 RF-84Fs, and seven tactical fighter squadrons

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The South Carolina Air National Guard's F-104s were carried in C-124s during the unit's deployment to Spain in November 1961.

with a variety of obsolete aircraft—78 F-86s, 104 F-84s, and 16 T-33s. Since most of the airplanes lacked the equipment for aerial refueling, the pilots landed to refuel at bases in Newfoundland, Greenland, Iceland, Scotland, the Azores, and Spain. Three squadrons of early model F-104s also were earmarked for duty in Europe, but the Air National Guardsmen flying them did not challenge the Atlantic. The headquarters of the Tactical Air Command, which planned the deployment, decided that the short range of the F-104As, along with their inability to refuel in flight, made a transatlantic flight entirely too risky. As had been done during the Taiwan crisis of 1958, the F-104s were disassembled, loaded into C-124s, and carried overseas, along with the men who operated and maintained them. By December 12, the last of the F-104s had been reassembled in Europe and test flown.

The arrival of the Air National Guard units taxed the capacity of the bases in western Europe. France, however, offered a unique solution. When the government of Charles de Gaulle insisted on control over any nuclear weapons located in the country, the United States removed the fighter-bombers assigned in France, first shifting just the strike elements to forward bases in Germany but later moving entire operational wings to either the United Kingdom or the Federal Republic of Germany. However, under these circumstances, the French government agreed to the presence of Air National Guard units armed with conventional munitions on these abandoned airfields.

France proved cooperative in time of crisis, but the threat to Berlin failed to spur the West European members of the North Atlantic Treaty Organization to increase their conventional forces. The United States, moreover, could not in-

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President John F. Kennedy (left) and Prime Minister Harold Macmillan.

definitely bear the high cost of maintaining the forces (including some 40,000 troops to bring the Army units up to full strength) deployed to Europe to meet the emergency. Necessity thus encouraged the stationing of comparatively small contingents in Europe and a sharpening of the ability to reinforce them rapidly. For aviation units, this meant the acceptance of the recommendations of the Clear Water study and, within a short time, the adoption of dual basing. In the meantime, both France and the United Kingdom were developing nuclear strike forces of their own, both to enhance national prestige and to substitute a cheaper deterrent for large and expensive land armies.

The United Kingdom's planned nuclear arm had a distinctively American coloration, since the British warhead originally was to be fitted to an American Skybolt ballistic missile, but launched from a bomber designed and built in Great Britain. Skybolt would have prolonged the operational life and enhanced the retaliatory might of British bombers, enabling the British government to avoid the expense of developing a ballistic missile entirely on its own. Secretary McNamara, however, canceled the Skybolt program on the eve of a conference between President Kennedy and British Prime Minister Harold Macmillan. McNamara simply did not believe that Skybolt, yet to be successfully tested, justified the investment required to perfect it, especially since it was wedded to the bomber, a weapon he held in low regard. Although he had warned the British government of the possibility of cancellation, his abrupt announcement came as a shock to Macmillan, taking away a weapon in which the Prime Minister had publicly expressed great confidence. In seeking a face-saving alternative for the British leader, the Kennedy administration turned to Polaris, offering that mis-

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sile for installation in submarines built in the United Kingdom, a substitution that proved acceptable.

To the embarrassment of McNamara and the British leader, the Air Force tested Skybolt the day after the plan to substitute Polaris was announced, declaring that the air-launched ballistic missile had functioned perfectly and landed squarely on target, the first success in six test firings. Actually, as the Department of Defense quickly pointed out, the test missile's reentry vehicle did not have a heat resistant nose cone and burned up during flight. The claim that Skybolt had been on target was a projection based on performance before the reentry vehicle disintegrated. If General Schriever, whose command conducted the test, hoped in this manner to save Skybolt, he failed, for Secretary McNamara refused to reconsider his decision.

Polaris also figured in two other problems involving nuclear weapons and the North Atlantic Treaty Organization. The installation of Polaris missiles in French submarines, just as they would be fitted into British craft, seemed to the American government a means not only to dissuade de Gaulle from developing his own nuclear force but also to demonstrate that no special relationship existed between the two English-speaking nations that might place France at a political or economic disadvantage. Moreover, a multilateral nuclear force made up of crews from the member nations of the treaty organization, operating either submarines or surface ships carrying Polaris missiles with warheads essentially under American control, would forestall any attempt by the Federal Republic of Germany to develop nuclear weapons of its own. This Polaris-based political strategy proved disappointing. Germany did not create its own retaliatory force, but the decision was due to the confidence felt at the time in the American deterrent and not to an ill-conceived multilateral force that existed briefly and only on paper. The prospect of receiving Polaris missiles did not stop de Gaulle from seeking economic autonomy by excluding Great Britain (temporarily, events would prove) from the European common market, nor from seeking military independence by developing a French deterrent based on missile systems launched from silos or from submarines. This quest for self-sufficiency reached its zenith when France withdrew from the military structure of the North Atlantic Treaty Organization in 1967, directing the foreign armed forces based in the country, including the U.S. Air Force reconnaissance and airlift units, to relocate elsewhere by April 1.

During the late summer of 1962, when the Berlin crisis had gone into remission, Cuba became the focus of attention, presenting the second challenge to the Kennedy administration's policy of flexible response. Rumors hinted that the Soviet Union, which had provided the Castro government antiaircraft missiles and other essentially defensive weapons, was also emplacing ballistic missiles, complete with nuclear warheads, in Cuba. If true, this would mark the first time the Soviets had deployed weapons of this type outside their own territory. In a conversation with Anatoly Dobrynin, the Soviet Ambassador to the United

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States, Attorney General Robert F. Kennedy, the President's brother, warned that the United States was watching the activity in Cuba closely, and the appearance of offensive missiles, the younger Kennedy said, would have "the gravest consequences." The ambassador replied that Cuba was receiving only defensive weapons and also gave the impression that Khrushchev would do nothing to embarrass the President during the campaign leading to the congressional elections of November 1962. The administration, since it had no real evidence to the contrary, took Dobrynin at his word and assured the public that the Soviet Union was supplying only defensive weapons to Cuba.

Aerial reconnaissance photographs soon belied these assurances, however. On October 14, two U-2 high-altitude aircraft flown by Air Force Majors Rudolf Anderson, Jr., and Richard S. Heyser returned with pictures of a medium-range ballistic missile launch site in a field near the town of San Cristobal. Despite Dobrynin's assurances to the contrary, offensive missiles were present in Cuba, along with some 20,000 Soviet troops to install and operate them. For the Soviet leadership, this bold move served two obvious purposes. First and more important, the presence in Cuba of medium-range and intermediate-range ballistic missiles, along with Ilyushin Il-28 jet-powered light bombers, subjected the United States to possible attack at a time when Soviet intercontinental weapons were few and unreliable. Second, even though Cuban authorities had no control over the missiles, the very deployment of these weapons demonstrated a Soviet commitment to protect the island from future invasion.

Once the Soviet action stood revealed, President Kennedy convened a group of officials to advise him and carry out his decisions. The membership of this Executive Committee varied, but its core included Robert Kennedy; Secretary of State Dean Rusk and other representatives from that department; John R. McCone, the director of the Central Intelligence Agency; Vice President Lyndon Johnson; Secretary of Defense McNamara; and Gen. Maxwell D. Taylor, formerly the military adviser to the President and now the Chairman, Joint Chiefs of Staff. In a series of meetings that began on October 16, the first of the sessions carefully concealed from the public, this committee helped fashion a national strategy aimed at eliminating the weapons, preferably by pressuring Khrushchev into removing them but if necessary by destroying them. Several courses of action, undertaken singly, successively, or in combination, seemed likely to accomplish this goal.

One possibility involved a trade—the withdrawal of the Soviet weapons from Cuba in return for the recall of the American Jupiter missiles from Turkey, an arrangement that Soviet authorities seemed to favor. The President decided, however, that he could not give the appearance of withdrawing the weapons in response to pressure generated by Khrushchev's deployment of offensive weapons to Cuba, placing himself in an ironic situation. Months before he had authorized negotiations with the government of Turkey for removing the Jupiters, liquid-fueled and vulnerable to attack. The missiles in Turkey, like the Jupiters in Italy and

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Reconnaissance photograph showing missile equipment in Cuba.

the Thors in Great Britain, were mere stopgap weapons until enough Polaris submarines were at sea (and Minuteman weapons in their silos) to take over their targets. The Jupiters remained in Turkey, however, and now Soviet insistence postponed their departure. The United States would remove the missiles, but their withdrawal would not be linked officially to events in Cuba.

When consulted by the Executive Committee, the Joint Chiefs of Staff favored a surprise aerial attack to destroy the ballistic missile sites along with the anti-aircraft missiles and other weapons defending them. Gen. Walter C. Sweeney, whose Tactical Air Command would carry out the strike, acknowledged that perhaps ten percent of the offensive weapons would survive a non-nuclear attack and that any attack would inflict casualties among Cuban civilians (and also among the Soviet technicians). The use of tactical nuclear weapons in a preemptive bombing, although mentioned as a possibility, did not receive serious consideration. Instead of directing an immediate air attack with conventional munitions, followed if necessary by an invasion, the Chief Executive chose to begin with a naval blockade, which he termed a quarantine.

President Kennedy announced the quarantine on October 22 in a televised address and explained the seriousness of the threat; cities in the United States as far north as Washington, D.C., he pointed out, lay under the shadow of the medium-range missiles in Cuba, and the larger intermediate-range weapons could hit any target between Hudson Bay, Canada, and Lima, Peru. For the present, he told his audience, the quarantine seemed the best course to follow. This option postponed the inevitable confrontation and moved it out to sea. Kennedy established a demarcation line where American warships would stop vessels bound for Cuba—whether Soviet, East European, or under charter—and conduct a search for military cargo related to the missiles or bombers. If any prohibited items were found, the ship would be ordered to change course for a port not in Cuba. Khrushchev

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U.S. Navy destroyer intercepts a Soviet cargo ship carrying missiles.

thus had a brief period of grace before the ships reached the demarcation line to consider whether to risk some more violent response by the United States or to recall vessels carrying weapons and begin dismantling the missile complexes.

Meanwhile, the United States began a series of actions that lent credence to its demand for removal of the missiles and bombers. Preparations went forward for air attack and invasion, if the quarantine should fail. Marines reinforced the American base at Guantanamo Bay near the southeastern tip of Cuba and engaged in amphibious exercises off Puerto Rico rehearsing possible landings on Cuban beaches. Six Army divisions went on alert, and the Air Force Reserve provided 14 squadrons of transports to carry invasion troops and their equipment. Air Force RF-101 and Navy F8U-1P tactical reconnaissance aircraft began low-altitude flights over Cuba to complement the continuing U-2 surveillance. In addition, the Tactical Air Command quickly planned strikes to destroy the missiles and support an invasion.

To reduce vulnerability to surprise attack, the Strategic Air Command dispersed nuclear-armed B-47s among some forty airfields and maintained B-52s on airborne alert. All the available ballistic missiles stood ready for a countdown that would culminate in launch. If war had come, however, the targets of these aircraft and missiles would not have been in Cuba, for when President Kennedy announced the quarantine on October 22, he had vowed, "It shall be the policy of this nation to regard any nuclear missile launched from Cuba against any nation in the Western Hemisphere as an attack by the Soviet Union on the United States, requiring a full retaliatory response upon the Soviet Union."<sup>2</sup>

The blockade went into effect on October 24, and ships believed to be carrying offensive weapons to Cuba slowed immediately to postpone or, the administration hoped, avoid a confrontation. Nevertheless, the situation remained

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dangerous—work proceeded on the missile sites, apparently at an even faster pace, and on the 27th, a surface-to-air missile downed a U-2 over Cuba, killing Major Anderson, who had helped discover the presence of the ballistic missiles. Despite the tension, the more violent levels of flexible response—the air attack tentatively planned for October 30 and the subsequent invasion—proved unnecessary, for the Soviet Union did not challenge the quarantine and on the 28th agreed to remove the offensive weapons from Cuba, essentially in exchange for an American pledge not to invade the island.

Why did the Soviet Union agree to abandon a strategy that had brought the continental United States within missile range? Proponents of deterrence argued that the overwhelming American retaliatory force ensuring the destruction of the urban framework of Soviet society forced Khrushchev to back down. Since neither the bomber gap nor the missile gap had materialized, the Soviet Union had perhaps 200 bombers and 35 intercontinental missiles, in contrast to the 1,600 bombers and 200 missiles available to the Strategic Air Command. Advocates of conventional forces maintained, however, that the Soviet leadership had reacted to the prospect of an invasion of Cuba in overwhelming strength, supported by tactical aviation and naval forces. President Kennedy, using the principles of flexible response, had strategic and general purpose forces exert complementing pressures. The strategic retaliatory forces menaced the Soviet heartland, discouraging a missile attack from Cuba or an armed attempt elsewhere, for example at Berlin, to divert attention from the weapons in Cuba, and the general purpose forces guaranteed that the Cuban bastion would be untenable in a war restricted to the island, even if the United States should withhold its nuclear might. In responding to Khrushchev's challenge, President Kennedy did not have to choose between devastating force and no force at all, for the United States now had the conventional strength that afforded nonnuclear options ranging from blockade through air strikes to invasion.

The attempt by the Soviet Union to set up missiles within range of the urbanized United States ended in failure, and Khrushchev came away from the crisis convinced of the vital importance of intercontinental ballistic missiles based within the Soviet Union. As a Soviet official at the United Nations told an American diplomat during the time the offensive weapons were being withdrawn from Cuba, "You Americans will never be able to do this to us again." The United States, however, had eliminated a potentially serious threat, even though, as Khrushchev kept repeating, success came at the price of continued acceptance of the Castro regime in Cuba, which achieved its objective of security from invasion. Although the deterrent to attack provided by the Soviet missiles no longer existed, Cuba received an American promise not to invade. Unlike Castro, Khrushchev did not emerge unscathed from the crisis, for the withdrawal of the missiles from Cuba undoubtedly contributed to the Soviet leader's downfall just two years afterward, when Leonid Brezhnev took over as First Secretary of the Communist Party and Alexsei Kosygin became premier.

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The third crisis began on April 24, 1965, when a rebellion erupted at Santo Domingo, the capital city of the Dominican Republic. The announced purpose of the uprising was to restore to office the elected president, Juan Bosch, overthrown some 18 months earlier by a military junta headed by Col. Elias Wessin y Wessin. The acting president, Donald Reid Cabral, went into exile, but Wessin rallied the military to oppose the return of Bosch. Fighting raged in Santo Domingo, causing President Johnson to order marines ashore to protect the American embassy and evacuate non-Dominicans whose lives might be in danger. The Chief Executive became convinced, however, that the rebellion, although initially "committed to democracy," had fallen into "the hands of Communist conspirators." On April 28, he dispatched airborne forces and additional marines to the strife-torn capital, lest the Dominican Republic become another Cuba.

The decision to send elements of the Army's 82d Airborne Division, based at Fort Bragg, North Carolina, came at an awkward time for the tactical airlift units at adjacent Pope Air Force Base that flew the troops to the Dominican Republic. Some of their C-130s, rigged for a demonstration of the delivery of cargo by parachute, had to be unloaded to accommodate men and equipment selected for the deployment. Moreover, the loading ramps were crowded, the lighting was barely adequate for working at night, and the loadmasters tended to be inexperienced. Despite these problems, on the afternoon following President Johnson's decision to intervene, after 18 hours of hard work, the first of 144 C-130s took off for Ramey Air Force Base, Puerto Rico, the staging area for the operation. Meanwhile, six C-124s from the Military Air Transport Service carried equipment too bulky for the smaller transports.

As the stream of C-130s approached Ramey Air Force Base, the officer in charge of the airlift, Brig. Gen. Robert L. Delashaw, received orders to divert the aircraft to San Isidro airfield, which served Santo Domingo and was in the hands of Wessin's military. Using the communications equipment in a transport fitted out as an airborne command post, the general issued the necessary instructions, but after 79 of the C-130s had landed and unloaded, another diversion became necessary. Cargo so choked the ramps at San Isidro that Delashaw sent the remaining transports to Ramey, as originally planned. Throughout the night, soldiers at San Isidro burrowed into the piles of equipment, sorted it, got it into the hands of the proper units, and landings resumed at dawn. On April 30, the final elements of a reinforced airborne battalion landed; three other contingents of varying size arrived by May 4. In all, the Air Force transported 12,000 troops and 7,500 tons of cargo, a deployment that required 915 sorties by 304 C-130s and C-124s.

This airlift was the Air Force's most spectacular contribution to the intervention by the United States in the Dominican Republic, although other aerial activity took place. During the initial airlift, for instance, a squadron of F-100 tactical fighters deployed from Myrtle Beach Air Force Base, South Carolina,

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to Ramey Air Force Base, refueling en route from KC-135s. Between May 2 and May 28, the fighters stood ready in Puerto Rico, first to protect the transports and then to support, if necessary, the troops in the Dominican Republic. Twelve F-104s assigned to intercept any aerial foray from Cuba joined the F-100s at Ramey. In addition, the Air Force sent a C-130 equipped as a mobile radio station to San Isidro and established other more secure communication links. Special air warfare units, flying a few utility aircraft and old transports, dropped propaganda leaflets and broadcast by loudspeaker in an effort to induce the rebels to cooperate. Air Force RB-66 and RF-101 reconnaissance aircraft photographed the area, but their work was handicapped by cloudy weather, restrictions on flights that the rebels might consider provocative, and a shortage of photo-processing equipment.

Before the Dominican crisis eased, the United States landed more than 30,000 soldiers and marines, who not only kept the rebels in check, but also prevented the military junta from annihilating the opposition. Wessin's resignation from the military regime removed what its opponents considered a living symbol of oppression and helped clear the way for a formal truce. The Organization of American States approved a proposal by the United States for an inter-American peacekeeping force; and late in May, the Tactical Air Command began flying in small contingents from Brazil, Honduras, Costa Rica, Nicaragua, and El Salvador that totaled some 1,700 men, equal to about one-tenth of the soldiers and marines from the United States who remained in the country. Violence flared sporadically into 1966, however, and not until June of that year did the Organization of American States agree to withdraw the 8,200 peacekeeping troops, 6,200 of them from the United States. The last soldier of the U.S. Army departed in mid-September, leaving the recently elected Joaquin Belaguer in the office of president.

Three times during the early 1960s the United States had faced differing challenges and each time selected a response that removed or neutralized the immediate danger without resort to war. Moreover, each action adopted included the possibility of escalation, should greater violence prove necessary. The North Atlantic Treaty Organization could conceivably have resorted to war if Khrushchev and the East Germans had actually attempted to drive the Western allies from Berlin. Far more likely, however, was stronger action against the Soviet forces in Cuba had the quarantine failed, especially since other options existed short of nuclear war. Although the Dominican emergency was more political than military, giving rise to the specter of a Marxist Dominican Republic rather than a nuclear missile attack, the force President Johnson sent to Santo Domingo could have shown less restraint in dealing with the rebels. In these three instances, flexible response, beginning at a lesser level of conventional violence but remaining ready to increase the pressure, achieved the desired results, preserving the Western presence in Berlin, eliminating the Soviet missiles from Cuba, and forestalling a revolution in the Dominican Republic.

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Would flexibility automatically ensure success? Summarizing, albeit melodramatically, the rapid maneuvering that resulted in the removal of the Soviet missiles from Cuba, Secretary of State Rusk said, "We're eyeball to eyeball and the other fellow just blinked."<sup>3</sup> A strong rival with much to lose faced overwhelming nuclear strength, along with locally superior conventional forces, and made a prompt and reasoned choice not to risk possible devastation. Such was the reality behind Rusk's image of one nation staring down another. The question now arose whether the threat or even the reality of increasing violence would have the same effect when an enemy had less to lose and the United States less to gain. What if the danger to the United States was at most indirect, the crisis was of long duration, and the nature of the threat and the opinion of humankind made the likelihood of the ultimate violence, the use of nuclear weapons, extremely unlikely, if not impossible? In short, would the kind of combined military and political strategy that forced the Soviet Union to remove its offensive weapons from Cuba also succeed against the Democratic Republic of Vietnam, commonly called North Vietnam?

## Chapter 19

# The War in Southeast Asia, 1961-1968

John Schlight

**W**hen President John F. Kennedy took office in January 1961, communist-led wars of national liberation loomed on the horizon. Earlier that month, Nikita S. Khrushchev, the Soviet leader, had endorsed this kind of warfare before a world communist conference in Moscow, and Kennedy interpreted the speech as a warning to the West and a definitive statement of Soviet policy. Consequently, the new Chief Executive could not help but be concerned about the attempt of one communist faction, the Pathet Lao, to seize control of the kingdom of Laos and the attempt of another communist force, the Viet Cong, to overthrow the government headed by Ngo Dinh Diem in the Republic of Vietnam, also called South Vietnam. Although warned by his predecessor, Dwight D. Eisenhower, that Laos held the key to control of Southeast Asia, Kennedy soon became convinced otherwise, for close study revealed that the kingdom was sorely divided with no strong anticommunist leadership. He quickly concluded that the best the United States could hope for in Laos was neutrality, however fragile, in which the communist and noncommunist factions offset each other politically and militarily.

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Kennedy and his advisers concluded that, in comparison to Laos, South Vietnam afforded a more favorable battleground in what they viewed as a worldwide struggle against communist-inspired insurrections. President Diem, despite challenges by armed political factions and mutinous army officers, had remained in power since 1954 as prime minister or president, and American military advisers already were in place with the South Vietnamese armed forces. Moreover, Kennedy believed, incorrectly as was soon revealed, the Southeast Asia Treaty Organization had a special interest in the independence of the Republic of Vietnam. Logic therefore persuaded the youthful Kennedy to choose the more stable nation of South Vietnam as the site of a major American effort to contain communism.

Although the Diem regime seemed strong in comparison to the government of Laos, the Viet Cong posed a far greater threat than the Pathet Lao. Like the Kennedy administration in the United States, the leadership of the Democratic Republic of Vietnam, or North Vietnam, nudged Laos into the wings and thrust South Vietnam to center stage for the next act of a drama that began in 1946 with the uprising against the French. The North Vietnamese intended to unite all of Vietnam under the control of the communist regime at Hanoi, thus winning the victory denied them by the Geneva Conference of 1954, which resulted in two Vietnams, North and South. North Vietnam's principal instrument for that purpose was the Viet Cong, the name a contraction of a term that meant Vietnamese communists. Originally composed mainly of South Vietnamese, some trained in the North, the nature of the revolutionary forces changed over time, for the Hanoi government in the spring and summer of 1959 established routes of supply by sea along the coast and overland through southern Laos to sustain the war. The maze of roads and trails in Laos came to be called the Ho Chi Minh Trail, after the leader of North Vietnam, and served not only to supply and reinforce the Viet Cong, but also, later in the war, to introduce combat units of the North Vietnamese Army into the South. The North Vietnamese, however, had not yet taken over the fighting; during 1960 the Viet Cong waged war with perhaps 4,000 full-time soldiers backed by twice as many part-time guerrillas, but the numbers were increasing.

The presence of so large a force, with its ability to carry out ambushes and assassinations with near impunity, testified to a deep-rooted dissatisfaction with the Diem government. To a typical peasant, the Saigon regime seemed a far-off entity that imposed taxes and enforced arbitrary rules, but failed to address issues, like the ownership of land, that were truly vital to rural villagers. However stable it might appear in comparison to Laos, Diem's Republic of Vietnam was beset by rivalries—the landless against those who owned the land, Catholics (among them Diem) against the more numerous Buddhists, persons who had fled the communist North against natives of the South, and finally Diem's family (his brother Ngo Dinh Nhu and Nhu's wife) against the nation's politicians and the American diplomats and military advisers in what became a struggle for the ear of an increasingly suspicious and arbitrary ruler.

## The War in Southeast Asia, 1961-1968

Whatever his failings, Diem headed a functioning government, and this fact helped South Vietnam obtain the support of an American administration that had “twenty Vietnams a day to handle,” according to Attorney General Robert Kennedy, the President’s brother.<sup>1</sup> Nonetheless, not even crises of the magnitude of the Soviet threat to force the West from Berlin obscured the serious shortcomings Diem and his government displayed in their struggle against an insurgency sustained from the North. In fact, as early as 1961, Gen. Maxwell D. Taylor (at the time, military adviser to the President, but subsequently Chairman, Joint Chiefs of Staff, and U.S. Ambassador to the Republic of Vietnam) argued for sending American ground troops, but Kennedy chose not to involve the United States to that extent. The President believed that Diem, with American advice, backed by economic aid and military assistance, could defeat the Viet Cong in battle and embark on programs to improve the lot of the peasants, winning their loyalty by providing them both land and security. This decision represented a middle course: the President did not want to risk charges that he was losing Vietnam, as President Harry S. Truman allegedly lost China. However, he also did not want a major war in Southeast Asia when Khrushchev was exerting pressure elsewhere and America’s general purpose forces were not yet fully organized, trained, or equipped in accordance with the doctrine of flexible response.

The activity of the U.S. Air Force in what became South Vietnam began during France’s struggle to retain control of Indochina. In return for active French participation in the North Atlantic Treaty Organization, the United States supported France’s ambitions in Southeast Asia, sending munitions, aircraft, and mechanics and other technicians to repair and maintain the American-supplied equipment. In 1955, after the victory of the communist Viet Minh and the division of Vietnam into North and South, the U.S. Military Assistance Advisory Group, Indochina, active since 1950, and its air section, formed in 1951, became the Military Assistance Advisory Group, Vietnam. Thus, since the departure of



The U.S. Military Assistance Advisory Group, Saigon, in 1954.

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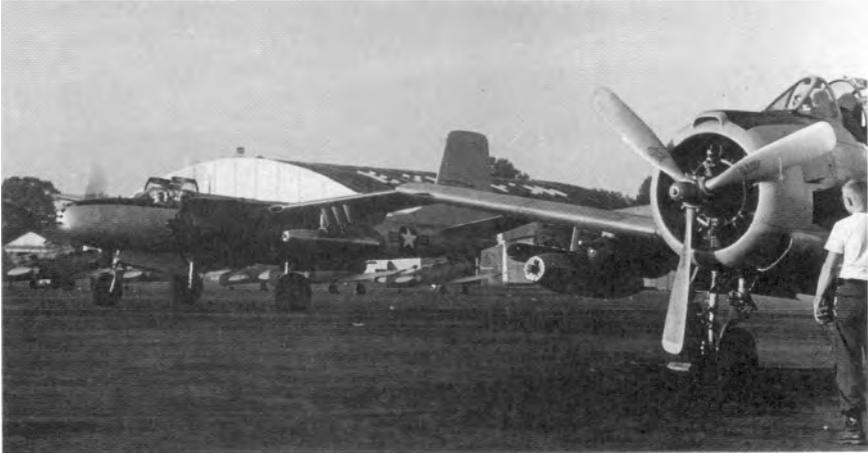
the French advisers, a comparative handful of Air Force officers and enlisted men had worked to strengthen the South Vietnamese Air Force. By early 1961, six squadrons were ready for combat—one fighter, two transport, two liaison craft, and one helicopter. Meanwhile, people and supplies moved down the Ho Chi Minh Trail; and as many as 15,000 Viet Cong were armed, supplied, and active in the vicinity of Saigon, the capital city, and elsewhere in the South. By this time, the armed forces of the Republic of Vietnam resembled their American models with ground, sea, and (as the existence of the six squadrons testified) air components, but the Viet Cong still fought exclusively as a guerrilla army, organized and trained to strike swiftly, preferably from ambush, and to engage in calculated acts of terrorism.

General Taylor conceded that his recommendation to send combat troops carried the risk of depleting the Army's strategic reserve and setting the nation on a course of action with an unpredictable outcome. Consequently, the Kennedy administration chose to encourage the development of a stable society and a self-sustaining economy as prerequisites for the defeat of communism in South Vietnam, but took a few military measures in 1961 to signal American support for the Diem government, to increase the effectiveness of the South Vietnamese armed forces, and to lay the foundation for future American deployments, should they become necessary. Among these measures, a Combat Development and Test Center at Saigon evaluated equipment and techniques for counterinsurgency and some 400 soldiers of the Special Forces, the Army's counterinsurgency arm, built defensive outposts along the border with Laos to challenge the infiltration of men and supplies over the Ho Chi Minh Trail.

The Air Force buildup during 1961 had the same basic purposes of symbolizing American concern, improving the military skills of the South Vietnamese, and preparing for a possibly greater involvement by the U.S. Air Force. In September, the first permanent unit, a combat reporting post, with 67 officers and airmen assigned, installed radars at Tan Son Nhut Air Base, which also served as Saigon's airport, and began monitoring air traffic and training South Vietnamese to operate and service the equipment. This organization formed the nucleus of what became a tactical air control system for a vast fleet of South Vietnamese and American aircraft. During the following month, four RF-101s and a photo processing unit joined the combat reporting post, with the reconnaissance craft flying photographic missions over South Vietnam and Laos within a few days of their arrival. The aircraft soon began working with a similar photo reconnaissance detachment based at Bangkok, Thailand.

The assignment of advisers and the various other measures taken in support of the Republic of Vietnam had little military effect. Clashes with the Viet Cong became more frequent, and the enemy began using battalions in pitched battles instead of dispatching small raiding parties or lashing out from ambush. Consequently, the American involvement in South Vietnam changed from giving advice and technical assistance to serving as a partner in prosecuting the war. The

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Farm Gate aircraft at Bien Hoa Air Base, South Vietnam, in 1962: a T-28, right, a B-26, left, and a row of T-6s in the background.

President demonstrated this limited partnership in October 1961 when he sent a special Air Force detachment to South Vietnam that flew combat missions even as it trained Diem's air arm. By mid-November this Air Force counterinsurgency unit, called Farm Gate, had assembled a collection of elderly C-47s, T-28s, and B-26s at Bien Hoa Air Base near Saigon. The transports conducted reconnaissance or psychological warfare missions; the bombers and armed trainers attacked the Viet Cong, ostensibly to train South Vietnamese airmen. Soon, U.S. Army helicopters carried South Vietnamese troops into action, as American door gunners fired at the enemy and Farm Gate bombed and strafed in support of the operation.

The Kennedy administration was not yet ready, however, to acknowledge how rapidly the American share in the partnership was expanding. Besides being limited, with comparatively few Americans performing certain carefully defined duties, the new activity was deniable. Until forced to do so by casualties and reports in the press, spokesmen for the administration refused to acknowledge that Americans were fighting the Viet Cong except unavoidably and in the course of their training duties. To preserve the illusion that combat was somehow a by-product of the training function, Farm Gate aircraft wore South Vietnamese insignia and usually carried a South Vietnamese, nominally a trainee, when conducting strikes or other combat missions. Moreover, Farm Gate received instructions to undertake only those combat operations beyond the ability of the South Vietnamese Air Force with its C-47s and T-28s supplied by the U.S. Air Force or Douglas AD-6 attack bombers (later redesignated A-1Hs) obtained from the Navy. Separate organizations directed Farm Gate's two missions. The Air Force section of the Military Assistance Advisory Group, Vietnam, super-

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A South Vietnamese Air Force A-1, April 1962.

vised the training function, while the 2d Advance Echelon, organizationally an element of the headquarters of the Thirteenth Air Force, controlled combat operations. In November 1961, Brig. Gen. Rollen H. Anthis, vice commander of the Thirteenth Air Force, became the first head of the 2d Advance Echelon.

Following the creation during February 1962 of an American unified command, the U.S. Military Assistance Command, Vietnam, under Gen. Paul D. Harkins of the Army, Anthis became the air commander in Vietnam as well as the representative of the Pacific Air Forces for all Air Force matters throughout Southeast Asia. Despite the increased responsibilities given Anthis, the strong Army orientation of the staff of the new assistance command disturbed Air Force leaders at every level and presaged difficulties for the Air Force in its future efforts to organize air power in Southeast Asia in the way that it considered most efficient.

Shortly after these organizational changes in South Vietnam, the major powers concerned with the fate of Laos—the United States, the Soviet Union, and the People's Republic of China—agreed at Geneva in July 1962 to respect the neutrality of the kingdom, damping the violence there. In the future, however, warfare would erupt in northern Laos, where neither the United States nor the Democratic Republic of Vietnam chose to invest the resources necessary for a clear-cut victory, and in the southern part of the country, where the Ho Chi Minh Trail came under sustained attack as an extension of the fighting in South Vietnam.

Despite the neutralization of Laos and encouraging reports from South Vietnam, the new Air Force Chief of Staff, Gen. Curtis E. LeMay, grew skeptical of existing policy, questioning the effectiveness of the existing partnership in a war being fought exclusively against the Viet Cong. He believed that the

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limited scope of the fighting and the emphasis on economic and political reform represented a “quick fix” that merely postponed the day of reckoning.<sup>2</sup> In contrast to Taylor, who proposed sending ground forces into South Vietnam, the Air Force officer argued that the war in the South could be won and the tensions in Laos resolved only through prompt and firm military action directed against North Vietnam. Reversing the frequently heard argument that political and economic reform in the Republic of Vietnam would provide the foundation for a military victory there, LeMay maintained that only the removal of the threat from the North could produce the conditions that would result in stability, prosperity, and assured independence.

During January 1962, as LeMay offered this approach to the war, a detachment of a dozen Fairchild C-123 transports arrived in South Vietnam to deliver supplies to distant outposts, like those established by the Army Special Forces along the border with Laos, and to drop South Vietnamese parachute troops in operations against the Viet Cong. Called Mule Train, the unit operated ten C-123s from Tan Son Nhut Air Base and two from Da Nang. In March, however, control of the detachment’s aircraft passed to the recently formed assistance command, and a combination of factors altered the original mission. The head of the assistance command, General Harkins, preferred the Army’s newer but slightly smaller de Havilland CV-2 Caribou transports for supplying distant outposts, taking one of Mule Train’s jobs. The other mission, dropping paratroops, was important at first but faded as the helicopter replaced the parachute as the preferred method of airborne attack. For a time, five of Mule Train’s C-123s, six C-47s flown by Americans, and 500 South Vietnamese paratroops formed a task force for immediate employment by an air operations center of the tactical air control system, but this fire brigade had disbanded by the time the detachment made its first drops in December 1962 and January 1963. Meanwhile, Viet Cong ambushes disrupted travel by highway, so the C-123s inherited the vital task of carrying passengers and cargo throughout the country. By June 1962, when a second detachment of Air Force transports arrived at Tan Son Nhut, the number of monthly sorties had risen to more than 1,100 from the 296 of January, almost a fourfold increase since Mule Train first went into action.

Three C-123s equipped for defoliation missions using herbicides believed to be harmless to people and animals had accompanied the original Mule Train detachment. In January 1962, near Bien Hoa Air Base, the aircraft tried unsuccessfully to destroy the foliage along a highway that might conceal Viet Cong ambush parties. During the following month, one of these aircraft crashed while on a training mission, causing the first Air Force fatalities of the war—Capt. Fergus C. Groves II, Capt. Robert D. Larson, and SSgt. Milo B. Coghill. In the meantime, investigations determined that the Bien Hoa mission had failed because the herbicide was effective only during the growing season. The schedule for spraying was revised accordingly, and a second test, conducted during September and October in the Ca Mau peninsula, killed 90 percent of the vegetation along a wa-

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U.S. and South Vietnamese crew members push a load of rice out the back of a C-123, while a combat photographer records the operation.

terway. President Kennedy thereupon approved aerial spraying of herbicides to deprive the enemy of concealment, but he prohibited the aircraft from attacking the Viet Cong's food crops, which were believed also to feed peasants whose loyalty might yet be gained by the government at Saigon. Before the defoliation missions ended in 1971, crops, too, were sprayed in both Laos and South Vietnam, and a bitter controversy had begun concerning the effects of the most widely used defoliant, agent orange, on human beings.

With the proliferation of aircraft during 1962, the Air Force attempted to bring them all under its tactical air control system. From the viewpoint of the Air Force, the most efficient use of aircraft, conventional and helicopters, was with a single operations center that moved them around to keep pace with a changing situation; the least efficient was assigning them permanently to a unit or geographic area. In January of that year, the 2d Advance Echelon (which became the 2d Air Division in October) opened an air operations center at Tan Son Nhut and ancillary air support operations centers at Da Nang and Pleiku. Theoretically, the Vietnamese, with American assistance, were to learn to run the centers, which were capable of scheduling, directing, and monitoring all flights in the country, but attempts to encourage Vietnamese participation encountered obstacles. President Diem, who had thwarted a military coup in 1960 and survived a 1962 bombing attack on the presidential palace by dissident members of his air force, insisted on a decentralized military structure with loyal officers in key positions to prevent a coordinated uprising by the military. He parceled out control of



A C-123 flying a defoliation mission over a road in South Vietnam, February, 1962

South Vietnamese aircraft among the four corps commanders, who grew used to having their own air support and resisted centralization. With the corps commanders inserted into the control mechanism, the comparatively junior officers of the South Vietnamese Air Force dared not alter the system. As a result, the Americans simply took over the control centers, imposing on their own initiative the slight degree of centralized control, mainly over air traffic rather than air strikes, that did exist. The actual direction of air strikes was the job of South Vietnamese forward air controllers, but they, too, were junior officers hesitant to give advice to the more senior ground commanders. Moreover, the communications network that held the tactical air control system together was at first inadequate; not until late 1962 did the Americans install reliable radio and teletype links.

The U.S. Military Assistance Command opposed placing the Army's helicopters and other aircraft under a control system operated by the Air Force. Basically, General Harkins rejected centralized control for the same reason that General Anthis recommended it—to promote efficiency and effectiveness. Air Force officers tended to think of these qualities in terms of the ability to manipulate scarce resources to meet changing needs, but for an Army officer, placing the necessary tools, including helicopters, in the hands of the troop commander who would use them increased efficiency and effectiveness. Acting consistently with his service's doctrine, Harkins assigned his helicopters to the senior Army officer in each corps area.

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Throughout 1962 the Air Force supported the South Vietnamese by attacking Viet Cong training areas, troop concentrations, supply depots, and sampans; by bombing and strafing in support of ground operations; and by improving aerial reconnaissance. The Department of State vetoed plans to provide South Vietnam with a few jet reconnaissance craft, viewing the move as a violation of a prohibition in the Geneva Accords of 1954 against South Vietnam's acquiring jet aircraft. In retrospect, given the buildup that later occurred, this concern seems trivial, but in 1962, the United States was moving slowly into the unknown, gradually strengthening its commitment, and seeking to justify its every act. Opposition from the diplomats prevailed, and the South Vietnamese air force began to activate a reconnaissance squadron of modified C-47s at Tan Son Nhut. During the two years that passed before the converted transports became fully operational, the U.S. Air Force filled the gap with its own RF-101s.

When 1962 ended, more than 11,000 Americans served in South Vietnam, a third of them members of the Air Force, and during the first seven months of 1963, several additional Air Force units entered the country. In April, for instance, a third Mule Train unit of C-123s began flying out of Da Nang, and in July, a new tactical air support squadron at Bien Hoa began training South Vietnamese forward air controllers in Cessna O-1 observation craft. At mid-year, roughly 5,000 Air Force personnel were in South Vietnam, about a third of the total American military strength in the country, the same ratio as in December of the previous year. In May, however, as the total number of Americans approached 15,000, Secretary of Defense Robert S. McNamara announced that some advisers would leave South Vietnam by the end of that year.



South Vietnamese Air Force O-1 observation aircraft.

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As plans proceeded for at least token reductions, the Air Force contingent reorganized. Initially, most Air Force units sent to South Vietnam were ad hoc detachments like Farm Gate or Mule Train, borrowed from regularly constituted outfits in the United States or elsewhere. As commander of the 2d Air Division, General Anthis dealt with over a dozen separate major units. To remedy this, the detachments were converted in July 1963 into squadrons and assigned to a small number of groups. Farm Gate became the 1st Air Commando squadron, a component of the Pacific Air Forces. The three Mule Train units at Tan Son Nhut and Da Nang became troop carrier squadrons assigned to a troop carrier group newly established at Tan Son Nhut. The 33d Tactical Group at Tan Son Nhut and the 34th at Bien Hoa performed administrative and maintenance tasks and set up detachments at smaller, outlying airfields, the 33d assuming responsibility for Can Tho and Nha Trang and the 34th for Soc Trang and Pleiku. The 23d Air Base Group performed the same duties at Da Nang, reported directly to the 2d Air Division, and placed a detachment at Qui Nhon.

The 1963 National Campaign Plan, drafted by the military assistance command and approved by Diem, called for operations that would break the Viet Cong resistance in subsequent years. In general, the document all but ignored aviation and emphasized rooting out the Viet Cong through many small, locally controlled ground operations. Although the plan called for closer cooperation between the military assistance command and the South Vietnamese Joint General Staff, it did not place the 2d Air Division in charge of all aerial operations in the country. In July 1963, disregarding requests from the headquarters of the Pacific Air Forces in Hawaii to bring Army aviation under Air Force control, Harkins created his own air operations section to supervise Army and Marine Corps aviation, mainly helicopters. Two separate air control systems now existed, one for the Army and Marine Corps and the other for the Air Force. Even though the South Vietnamese air arm was theoretically subject to the Air Force system, the Vietnamese corps commanders frustrated efforts to exert centralized control. For example, the Air Force generally could not employ South Vietnamese aircraft for interdiction strikes against base areas because these missions tended to clash with the interests of the largely independent corps commanders.

By the summer of 1963, the Kennedy administration had discovered that Diem possessed an almost limitless capacity to disappoint. Instead of demanding a vigorous campaign against the Viet Cong, he rewarded commanders whose units suffered the fewest casualties, a move designed to maintain his popularity by shielding the populace from one of the effects of the war. Yet, even as he courted popularity in this fashion, he deepened the divisions within the country by using the armed forces to suppress the Buddhists. Worse, he pushed stubbornly ahead with a program of involuntary resettlement that failed utterly to provide land ownership or security for the peasants uprooted from their villages and collected in supposedly more defensible hamlets. In November of that year,

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a group of army officers, with the tacit approval of the American government, overthrew Diem. President Kennedy, who had hoped, perhaps believed, that the coup would result in exile or possibly a formal trial for Diem and his brother, was shocked when the successful plotters killed the two men. Within eight months of these murders, the entire South Vietnamese and American leadership changed.

In the United States, President Kennedy was assassinated on November 22, and responsibility for American policy in Southeast Asia devolved on the former Vice President, Lyndon B. Johnson. In January 1964, Maj. Gen. Joseph H. Moore became the new commander of the 2d Air Division. Gen. William C. Westmoreland, advancing from the grade of lieutenant general and the post of deputy commander, took over the U.S. Military Assistance Command in June, and General Taylor stepped down as Chairman, Joint Chiefs of Staff, replacing Henry Cabot Lodge as ambassador to the Saigon government. During February, Adm. U. S. Grant Sharp assumed command of the Pacific Command, the parent organization of Westmoreland's military assistance command. Although the United States continued to support South Vietnam throughout these changes, the prospects of achieving stability and security by means of a partnership faded as the junta that had toppled Diem collapsed and one government succeeded another in dismaying succession at Saigon.

In March 1964, the Pathet Lao overran the Plain of Jars in the northern part of Laos, shattering the calm that had settled on the country after the Geneva conference of 1962. In reaction, the Johnson administration transferred some T-28s to the Royal Laotian Air Force and established an Air Force detachment at Udorn in Thailand, some forty-five miles south of Vientiane, the administrative capital of Laos, to train Laotian pilots and maintain their aircraft. After Pathet Lao gunners downed an U.S. Navy reconnaissance jet in June, eight F-100s struck an antiaircraft position on the Plain of Jars, opening a second Air Force war in Southeast Asia, although one that did not achieve the importance of the fighting in South Vietnam.

Within South Vietnam, the early months of 1964 were a time of expansion, training, and comparative quiet. By midyear, the South Vietnamese Air Force had grown to thirteen squadrons—four fighter, four observation, three helicopter, and two C-47 transport. The South Vietnamese followed the practice of the U.S. Air Force, organizing the squadrons into wings, with one wing located in each of the four corps tactical zones at Can Tho, Tan Son Nhut, Pleiku, and Da Nang. In response to the desire of his American air advisers for centralized control, Col. Nguyen Cao Ky, commander of the South Vietnamese Air Force, assigned the wings to geographical areas rather than to individual corps commanders, thereby retaining some measure of influence over their use without alienating the ground generals. The increase in the number of aircraft available to Ky was somewhat deceiving, however, for difficulty in training South Vietnamese pilots, the worn-out condition of the fighters, and the inefficiency



A shipload of Douglas A-1 Skyraiders in Saigon.

of the air request net limited strikes to about half the number actually requested by the ground forces. The situation brightened somewhat after midyear, when A-1 Skyraiders replaced the combat-weary T-28s and B-26s in both the U.S. and South Vietnamese Air Forces. Reaction times improved with the streamlining of the air request net to reduce the number of echelons that had to approve immediate air strikes, those delivered to meet emergencies on the battlefield.

While the South Vietnamese Air Force modernized and increased in size, the unsuccessful National Campaign Plan of 1963 gave way to the following year's National Pacification Plan, designed to extend security by working outward from the areas held by the government. General LeMay, impatient with yet another slow and limited strategy, still preferred immediate interdiction strikes in South Vietnam, air attacks on the guerrillas in Laos, and the bombing of North Vietnam and the mining of its harbors. As the latest scheme for pacification lost momentum and the South Vietnamese encountered stronger resistance, the administration gave ideas like LeMay's more consideration.

In July 1964, planners from the Joint Chiefs of Staff and the Hawaiian headquarters of the Pacific Command prepared a three-phase contingency plan for aerial attacks on North Vietnam. Although the United States continued to emphasize operations on the ground, the plan for air action was ready if needed. Under the plan, the Commander in Chief, Pacific, would direct the air war against the North from Hawaii rather than the Commander, U.S. Military Assistance Command, Vietnam. That contingency planning of this sort seemed necessary reflected a growing American conviction that the partnership with the armed forces of South Vietnam was not prevailing on the battlefield.

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During the months immediately following the murder of Diem, no strong leader emerged from among the various military men trying unsuccessfully to unite the populace and govern the country. As a consequence of the recurring political upheaval, the tempo of the war against the Viet Cong slowed, but the enemy could not take full advantage of the chaos, for the overthrow of Diem and the collapse of the resettlement program satisfied the grievances that had motivated many peasants to support the insurgency. Ho Chi Minh and his advisers became convinced that if South Vietnam were to be absorbed quickly into the North, regulars from the North Vietnamese Army would have to march south and reinforce the Viet Cong, injecting discipline and improving effectiveness. At almost the same time that North Vietnam considered escalating the conflict, the Johnson administration lost patience with South Vietnamese progress and started to search for a means to shore up the government at Saigon or, failing that, for some unilateral means to confront Ho Chi Minh and make him blink, as Khrushchev had blinked at the height of the Cuban missile crisis.

The summer of 1964, however, seemed a poor time to take independent action against North Vietnam. The President, who faced an election in November, had cast himself as advocate of peace in contrast to his probable Republican opponent, Senator Barry M. Goldwater of Arizona, who was both a major general in the Air Force Reserve and a vocal advocate of stronger military action in Southeast Asia. Like President Kennedy, who had wanted neither the blame for losing Vietnam nor a major war on his hands, Johnson sought to contain communism without becoming involved in a conflict that drained the treasury and crippled the social programs he intended as his legacy to the nation. Moreover, the exact scope of the struggle for Southeast Asia defied prediction, especially since the administration was largely unaware of either the widening fissure in what was still described as the Sino-Soviet bloc or the historic rivalry between China and Vietnam. Therefore, the President and his advisers, both military and diplomatic, remained wary lest China, if the survival of North Vietnam were threatened, intervene as it had in Korea in 1950. Johnson hoped for a national consensus about America's role in Southeast Asia and widely shared popular support for a feasible course of military action that would serve as a deterrent to Hanoi. Ironically, the navy of North Vietnam inadvertently helped shape public opinion much as Johnson desired.

Support among voters toward the nation's involvement in Southeast Asia became more widespread after North Vietnam unexpectedly challenged the presence of American warships in waters off its coast. The North Vietnamese Navy reacted as an American destroyer, the USS *Maddox*, conducted a routine reconnaissance mission at the same time that South Vietnamese naval craft were harassing installations on the coast of North Vietnam. On the afternoon of August 2, 1964, three torpedo boats attacked the *Maddox*, scoring a hit with a single round from a machinegun, but missing with torpedoes. Gunfire from the destroyer and attacks by aircraft from the aircraft carrier *Ticonderoga* sank one of

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the boats and badly damaged another. After this action, the *Maddox* joined another destroyer, the USS *C. Turner Joy*, and resumed the patrol, both to obtain intelligence and to demonstrate American insistence on the right of free passage in international waters. At no time did any American reconnaissance ship steam closer than five miles to North Vietnamese territory, a distance significant because the French, when they ruled the area, had claimed territorial waters extending just three miles, and North Vietnam had not announced different restrictions. On the night of August 4, as the two destroyers continued the patrol, torpedo boats again appeared, shadowed the American warships, then closed at high speed.

In a confused action that lasted beyond midnight, two of the attacking boats were believed sunk and one badly damaged, but both destroyers emerged unscathed. Besides ordering carrier aircraft to bomb the bases used by the torpedo boats, President Johnson, in the event of future attacks by North Vietnam, obtained congressional authorization for appropriate retaliation in the Tonkin Gulf Resolution, which passed the House of Representatives unanimously and encountered only two dissenting votes in the Senate. He also ordered a force of Air Force jets into Southeast Asia in the event of a North Vietnamese or Chinese response to the carrier raids. The actions in the Gulf of Tonkin and their immediate political consequences did not at once change the course of the war; indeed, events unfolded so gradually that only in retrospect can the resolution be seen as a major turning point, a grant of authority that made the President solely responsible for the conduct of American policy in Southeast Asia and enabled him, as long as the North persisted in trying to conquer the South, to use force as he saw fit.

The aircraft dispatched by the Air Force as part of the American reaction to the fighting in the Gulf of Tonkin reached their new bases quickly. Within the space of days, 12 F-102s arrived in South Vietnam, their number divided between Tan Son Nhut and at Da Nang; 8 F-100s joined the F-102s at Da Nang, and two squadrons of B-57 bombers landed at Bien Hoa. More aircraft flew to other locations in Southeast Asia and the western Pacific: in Thailand, 10 F-100s went to Takhli Air Base and 8 F-105s to Korat; two squadrons of Tactical Air Command F-100s arrived in the Philippines; RF-101s deployed to Okinawa; 48 C-130 transports were apportioned between Okinawa and the Philippines; and the Strategic Air Command flew 48 KC-135 tankers from Hawaii to Guam to refuel the jet fighters should they go into action.

Despite the arrival of reinforcements in the Far East, combat operations remained restricted to South Vietnam, carried out by air commandos in propeller-driven aircraft well suited for fighting insurgents. The deployment of the jets served primarily as a demonstration of American resolve, not unlike the reinforcement of tactical aviation units in Europe at the time of the Berlin crisis. Of greater tactical importance was the arrival of a squadron of 25 A-1Hs, obtained by the Air Force from the Navy, which joined the original Farm Gate detach-

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ment at Bien Hoa, and the deployment of another squadron of 16 C-123s to Tan Son Nhut.

Whatever their immediate military value, the B-57s deployed to Bien Hoa afforded a tempting target. On November 1, 1964, Viet Cong guerrillas with mortars infiltrated the base during darkness, killed 4 American servicemen, wounded 72, and destroyed 5 and damaged 13 of the 18 B-57s located there. Ambassador Taylor called for prompt retaliation, though not necessarily for the kind of sustained bombing campaign outlined during July in Hawaii, for he worried that such an air offensive might well trigger a communist offensive on the ground that would overwhelm the feeble South Vietnamese government. Unlike an extended air campaign, a sharp retaliatory blow might serve as a warning to the North without undue risk to the South as well as a prod to move the Saigon regime toward greater cohesiveness and efficiency. In short, the United States might attack the North to retaliate for the assault on Bien Hoa and then promise continued bombing in return for political, economic, and military reforms on the part of the leadership at Saigon. The Joint Chiefs of Staff, however, disagreed with Taylor and recommended a series of strong and immediate actions to increase American participation in the war. Their recommendations included air attacks against the infiltration route through southern Laos and the immediate deployment of marines and soldiers to defend Da Nang, Tan Son Nhut, and Bien Hoa against future hit-and-run attacks. They also recommended strikes by carrier aircraft, Air Force fighter-bombers, and B-52s against airfields, the oil storage tanks at Hanoi and Haiphong, and then, in rapid succession, the remainder of a list of 94 North Vietnamese targets identified by American planners. Since the Presidential election would take place on November 3, Johnson chose to do nothing. Although he had retaliated after the Tonkin Gulf incident, a response to the attack on Bien Hoa could have suggested further involvement, defaced his image as a man of peace, and reinforced Goldwater's claims that the United States was already in a shooting war and should do whatever was necessary to win.

Once reelected, Johnson initiated planning for a "tougher program" of gradually escalating military action to begin, if necessary, early in 1965.<sup>3</sup> As was so often the case, the administration's proposed course of action represented a mean between two undesirable extremes. Just as Kennedy had chosen assistance to the South Vietnamese as a compromise between sending American ground forces and losing the country to the Viet Cong, Johnson now tried to find a middle way between mobilizing the United States and intervening with every conventional weapon available to the general purpose forces (a worst-case scenario far beyond what the Joint Chiefs of Staff recommended) and withdrawing from South Vietnam, an alternative that no recent administration had seriously entertained. During the Cuban missile crisis, moreover, the threat of escalation had worked. While the announcement and enforcement of a quarantine had been sufficient, a succession of other options remained, but Khrushchev



The remains of a B-57 after the Viet Cong mortar attack at Bien Hoa in November 1964.

blinked before it became necessary to bomb the missile sites, invade Cuba, or, if missiles actually were launched from the island, to retaliate with nuclear weapons against the Soviet Union.

When President Johnson at last approved action to discourage the increasing aggressiveness of the communist forces in the South, he authorized an aerial attack against the Ho Chi Minh Trail to signal Hanoi of America's determination to sustain South Vietnamese independence. On December 14, some six weeks after the attack at Bien Hoa, F-100s, RF-101s, and F-105s based in Thailand hit the infiltration route in a section of the Laotian panhandle in an operation nicknamed Barrel Roll, but the bridge that the fifteen aircraft tried to destroy escaped damage. The Air Force had now embarked on its third air war in Southeast Asia; bombing in the panhandle of southern Laos, essentially an extension of the fighting in South Vietnam, joined the air wars in South Vietnam and northern Laos.

Attacks against Americans in South Vietnam continued. On Christmas Eve 1964, the bombing of a residence for American officers in Saigon brought the United States again to the brink of bombing the North. Taylor's deputy ambassador, U. Alexis Johnson, joined Westmoreland in urging retaliation despite the obvious weakness of the South Vietnamese government, but once more the President demurred. He agreed, however, that Air Force jets, either based in

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Officers' residence in Saigon after the December 1964 bombing.

South Vietnam or rotating to airfields in Thailand, could carry out strikes within South Vietnam (heretofore they had attacked only in Laos), provided that Ambassador Taylor approved each mission and the South Vietnamese could not hit the particular target.

The administration's reluctance to engage the North ended on February 7, 1965, when the Viet Cong attacked an American detachment near Pleiku, killing eight and wounding 104 American soldiers. Johnson removed all remaining restrictions on the use of jets in South Vietnam and ended the requirement, dating from the time of Farm Gate, that a South Vietnamese observer or trainee must be on board an aircraft during combat operations. More important, when Air Force and Navy aircraft bombed North Vietnamese military installations on the 7th and 8th, the United States at last retaliated directly against North Vietnam for an attack in the south. On February 10, terrorists killed 23 Americans when they blew up a barracks at Qui Nhon, triggering a second wave of bombing against the North. Finally, on the 13th, President Johnson approved an operation called Rolling Thunder, a limited and carefully paced program of air strikes that more closely resembled the graduated response to the presence of Soviet missiles in Cuba than the current recommendations of the Joint Chiefs of Staff for a vigorous and extensive bombardment. Despite the reliance on gradual escalation, the Johnson administration struck directly at the North in an attempt to save South Vietnam unilaterally, regardless of the weakness or incompetence of the government at Saigon, abandoning a policy of partnership with the South

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Vietnamese that worked toward political stability and economic progress as conditions leading to a military victory in the South. The Air Force now had four distinct air wars on the mainland of Southeast Asia, as the offensive against North Vietnam took its place alongside the attacks in South Vietnam and in northern and southern Laos.

The air war inside South Vietnam, the oldest of the four, changed dramatically in the spring of 1965 when American ground troops began to enter the country. These troops would soon clash with the recently arrived North Vietnamese regulars of the people's army, who had gone into action in late December 1964, defeating the South Vietnamese at Binh Gia. The government in Hanoi had not reacted to the initial bombing of military targets in the North as Johnson had expected, for instead of blinking, Ho Chi Minh continued to infiltrate men and supplies into the South and exerted increasing pressure against the Saigon regime. Nevertheless, the administration believed that South Vietnam could be saved in spite of its weakness; the means of salvation would be a gradual intensification of the air war against the North and the introduction of American soldiers and marines into the South.

The first American troops to land were marines who came ashore in March; this contingent was soon reinforced, and the first Army unit, an airborne brigade, arrived in May. By the end of June, the administration had approved a force of forty-four combat battalions for service in South Vietnam. The troops, however, did not have a definite mission. Ambassador Taylor believed they should protect the airfields, which he considered to be prime targets for the Viet Cong now that Rolling Thunder had begun, and provide secure bases for use by revitalized South Vietnamese forces in operations against the enemy. He argued that by adopting his "enclave strategy,"<sup>4</sup> the United States would remain the partner of the South Vietnamese, encouraging them with advice and material assistance to take an increasingly active, ultimately decisive, role in preserving their independence. In contrast, Westmoreland, disturbed by a succession of South Vietnamese reverses, intended to take advantage of American mobility and firepower to engage the North Vietnamese and the conventional or "main force" units of the Viet Cong anywhere within the nation, creating a shield behind which the South Vietnamese could train and organize, provide for the security of airfields and other installations, and pacify the countryside, earning the loyalty of the peasants. Westmoreland's strategy, which came to be characterized as "search and destroy," had the unfortunate effect of relegating the armed forces of the Republic of Vietnam to at most a nominal partnership in the defeat of the communists.<sup>5</sup> The general proposed to break the insurgency with American forces, while training the South Vietnamese to finish off any remaining opposition and then provide for the security of their nation.

The establishment of enclaves may well have placed the American forces permanently on the defensive, depriving them of their mobility; but the most telling arguments against such a strategy were practical and immediate. There

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simply was no time to invigorate the South Vietnamese. In mid-1965, the communist forces seemed on the verge of attacking from the highlands on the Laotian border to the coast, cutting the republic in half. To meet this danger, Westmoreland's idea was adopted, but its execution required air support and large numbers of troops. As the size of the American ground forces rose steadily from 23,000 at the end of 1965 to 536,000 four years later, the mission of the Air Force shifted from advising and training, while carrying out those combat missions beyond the capability of the South Vietnamese, to full-scale combat in support of American and South Vietnamese ground troops in an open, if undeclared, war against the North Vietnamese and Viet Cong.

The deepening of the American commitment in 1965 coincided with the appearance at Saigon of stable, though not necessarily incorruptible, leadership. One of the ruling generals, Nguyen Van Thieu, became chief of state in June, and another, Nguyen Cao Ky, commander of the South Vietnamese Air Force, took over as premier. The flamboyant Ky, with his pistols and self-designed uniforms, seemed the dominant figure, overshadowing Thieu, who occupied a basically ceremonial office. Appearance did not reflect reality, however, for Thieu eased Ky into the vice presidency in 1967 and became the only candidate for president. Four years later, he frustrated Ky's bid for the presidency, remaining in office until 1975, when he fled as his nation collapsed. For almost a decade, Thieu clung to power and, according to his enemies, amassed a fortune in the process.

As General Westmoreland moved ahead with his plans for search and destroy operations, he avoided creating a combined South Vietnamese and American military command. Such an idea did not appeal to the Saigon government, which refused to entrust its troops to foreigners, although at times American advisers took over even large units, in fact if not officially, and Westmoreland and his generals saw few, if any, South Vietnamese competent enough to assume responsibility for American lives. In arguing against a combined American and South Vietnamese command arrangement, Westmoreland warned that it would give credence to communist claims that the South Vietnamese were puppets of the United States, stifle South Vietnam's ability to develop military leaders of its own, and impede the aggressiveness of American commanders. Consequently, the South Vietnamese retained their own military structure in which their air force was responsive mainly to their army.

The United States Air Force was not fully equipped, suitably trained, nor doctrinally prepared for the situation in Southeast Asia. The transition from massive retaliation to flexible response and the shift from nuclear to conventional weapons remained incomplete. As a result, the Air Force dropped high-explosive bombs from aircraft like the F-105 that had been designed for nuclear war and had to create and transport to Southeast Asia the stocks of conventional munitions needed for the conflict. The first tasks facing the service, however, were to set up a workable organizational structure in the region, improve the

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area's inadequate air bases, create an efficient airlift system, and develop equipment and techniques to support the ground battle.

Starting with the buildup in mid-1965, the Air Force, while continuing to conduct the four air wars, adjusted its structure in Southeast Asia to absorb incoming units. Temporarily deployed squadrons became permanent in November; a wing structure replaced the groups; and in February 1966, the reconnaissance force in South Vietnam, which had grown to seventy-four aircraft of various types, was concentrated in a wing at Tan Son Nhut. In March, the 2d Air Division became the Seventh Air Force, its commander, Gen. William W. Momyer, serving as Westmoreland's deputy commander for air operations.

Commissioned in 1939 after training as an aviation cadet, General Momyer had served as a fighter pilot in World War II, downing eight of the enemy in combat over North Africa, Sicily, and Italy. After commanding a fighter wing and later an air division in Korea, he went on to a series of staff and command assignments that culminated in his appointment during 1964 as head of the Air Training Command. He had the reputation of being able to present his ideas forcefully and clearly, certainly a desirable trait in a headquarters where the Air Force felt its views were being slighted. As commander of the Seventh Air Force, he directed operations originating in Thailand through a deputy stationed at Udorn Royal Thai Air Base. The agency through which General Momyer and his successors controlled operations from Thailand came to be called the Headquarters, Seventh/Thirteenth Air Force, for Momyer's Seventh Air Force exercised operational control, but administrative support was entrusted to the Thirteenth Air Force at Clark Air Base in the Philippines. The division of authority satisfied the pride of the Thai government, which wanted to avoid the appearance that the American squadrons based in the country were subordinate to an organization in South Vietnam.

As jet aircraft took over the larger bases, Nha Trang became the home of the helicopters and the conventionally powered types like psychological warfare craft and gunships. Tests during the advisory years had shown that the venerable C-47, converted into a gunship by installing in the left side of the fuselage a multibarrel machinegun (or Gatling gun) that was fired by the pilot, could be a deadly weapon against ground troops, especially at night when the modified transport could attack by the light of its own flares. Four squadrons of O-1 Bird Dog observation craft, three of which had just arrived, and the four squadrons of C-123 transports were positioned throughout the country.

The poor condition of the air bases in South Vietnam delayed the deployment of the jet fighter squadrons scheduled for 1965. Only Tan Son Nhut, Bien Hoa, and Da Nang had runways that could accommodate the jets; improvements on these airfields and construction of three new ones along the coast at Cam Ranh Bay, Phan Rang, and Qui Nhon began in 1965. The U.S. Military Assistance Command, Vietnam, controlled all construction within the country, and the acquisition of workers and material for airfields had to vie with other construction

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projects. By the end of 1965, four Air Force squadrons of F-4 Phantoms were using a temporary airstrip at Cam Ranh Bay. Progress at the other two sites was slower, however, largely because the assistance command was concentrating on the ground war and giving a comparatively low priority to Air Force facilities, although a contributing factor may have been the desire of Admiral Sharp, the Commander in Chief, Pacific, to make greater use of carrier-based rather than land-based aircraft. A squadron of Air Force Phantoms began flying from Phan Rang in March 1966, but heavy rains damaged the field, postponing until October the arrival of additional jets. Qui Nhon proved unsuitable as a location for the remaining base, and in February 1966 the site was changed to Phu Cat, 15 miles to the north. A temporary strip was opened there by the end of the year, but the 10,000-foot runway was not finished until March 1967.

The problems encountered in building these three bases led the new Air Force Chief of Staff, Gen. John P. McConnell, to secure approval for the Air Force to build a fourth base. For the first time, the Air Force, rather than the Army's Corps of Engineers, contracted for and supervised the construction of an air base, the installation at Tuy Hoa along the South Vietnamese coast. In June 1966, the firm of Kidde and Company began work at the site, and in the middle of November, forty-five days ahead of schedule, the first of three F-100 squadrons occupied the field.

The increased demand for aerial transport engendered by these deployments overwhelmed the four C-123 squadrons in South Vietnam. Since materiel and equipment jammed the aerial ports, the Pacific Air Forces in April temporarily assigned four C-130 Hercules transports from Japan and Okinawa to help eliminate the backlog. Once in the country, however, the newly arrived transports found plenty to do, and, as the pace of airlift operations increased, their number grew first to thirteen and later to thirty. Scheduling and maintenance for the C-130s were still performed outside South Vietnam, and the Seventh Air Force found it difficult to mesh their activities with those of its own C-123s. General Momyer tried to integrate the C-130s into the existing airlift system, but the Pacific Air Forces retained control, arguing successfully that these long-range aircraft had to serve the entire Pacific theater. On the other hand, an agreement between the Chiefs of Staff of the Army and the Air Force in April 1966 enabled Momyer to take over the Army's Caribou transports, which continued to supply isolated outposts as their principal mission. Air Force crews and mechanics moved onto the Army airfields and gradually installed their own maintenance, supply, reporting, and operating procedures. By the beginning of 1967, 80 C-7s, as the Caribou transports were redesignated, belonged to the Air Force, forming a new wing with squadrons stationed at Cam Ranh Bay, Phu Cat, and Vung Tau.

Instead of the headquarters of the assistance command, the Joint Chiefs of Staff established priorities for fighter sorties in South Vietnam. Friendly forces actually fighting the North Vietnamese or Viet Cong had first call on these air-



A de Havilland C-7 Caribou lands on a dirt airstrip.

craft for close air support. Missions to suppress enemy defenses near landing zones selected for helicopters had second priority, and escorting friendly truck convoys, helicopters, and aerial transport came third. Finally, if resources permitted, the fighter-bombers conducted interdiction strikes against enemy supply depots, base areas, and troop movements. Unlike the Army, the Air Force valued interdiction more highly than close air support, but the military assistance command, reflecting the Army's emphasis on aiding troops in contact with the enemy, adopted an accounting system that lumped both battlefield and long-range interdiction with close air support in the category of combat support. The Air Force was thus frustrated in its attempts at gathering statistics to support its arguments that interdiction should receive a higher priority. In fact, the official priorities meant little because there was no shortage of aerial firepower, and almost every mission flown in South Vietnam, except for training and purely administrative flights, helped the war on the ground in some way.

Since the end of the Korean War, the Air Force had given little thought to close air support and had dismantled the tactical air control system that successfully directed strikes on the battlefields of World War II and Korea. Rebuilt for Vietnam, the system included operations centers at the appropriate levels of command, liaison parties assigned to ground commanders, and forward air controllers directing strikes from light observation craft. Early in 1966, the Air Force, accepting the inevitable, agreed that Army helicopters would be outside

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the system, and they remained so for the rest of the war, as did the Navy's carrier aircraft. Attempts to train South Vietnamese forward air controllers failed, and the Seventh Air Force in 1965 apportioned its four squadrons of O-1s, making one squadron of thirty aircraft available in the tactical zone of each corps. The number of regional air operations centers, renamed Direct Air Support Centers, was increased to four, one for each corps headquarters.

The war in Southeast Asia was fought according to rules of engagement that were designed to ensure that firepower was used only to advance American policy, whether battering the enemy in Laos and South Vietnam, where precautions had to be taken to protect friendly forces and spare the local populace whose support and security were at issue, or attacking in the North, where selective and gradually escalating violence was intended to prod Ho Chi Minh into calling off his plans to conquer the South. The rules of engagement for South Vietnam dictated at first that fighters could attack only when directed by forward air controllers, a measure adopted to prevent accidental killings and maimings, whether of friendly troops or of the very noncombatants whose loyalty the Saigon government was trying to gain. The only exceptions to the requirement for a forward air controller were certain free-fire zones occupied by the enemy and from which noncombatants were believed to have fled. Recruited from the ranks of fighter pilots, the forward air controllers had to adjust skills honed for supersonic flight to the far different demands of the slow-flying Bird Dog used to conduct visual reconnaissance and control air strikes. They learned to mark targets with rockets, to navigate by reading maps, and to orchestrate several flights of fighters simultaneously approaching a target. To conduct successful visual reconnaissance, the forward air controllers had to become intimately familiar with their assigned geographic areas, observing the eating, sleeping, working, and traveling routines of the local inhabitants and learning when crops were planted, harvested, processed, distributed, and stored. These pilots came to recognize signs that pointed to the enemy's presence, even though his forces could not be seen—the sudden disappearance of the men of a village that could signal a muster of part-time Viet Cong guerrillas, indications that roads or trails had been used during the night, footprints along a shoreline, shadows that revealed a camouflaged man-made structure, and tell-tale marks of human presence like camp fires or flocks of birds suddenly taking flight.

Although most strikes handled by the forward air controllers were "preplanned" at least 24 hours in advance, one third were "immediates" flown in response to emergency calls for help. The Air Force experimented with different techniques to reduce the time it took for jets to respond with immediate strikes, keeping some aircraft on alert at air bases and, whenever necessary, diverting others from preplanned missions. Responsiveness steadily improved, and by 1966, Air Force fighters normally were on the scene within 30 minutes of the time they were summoned. From the standpoint of the efficient use of resources, the Air Force preferred preplanned sorties to immediates and encouraged the

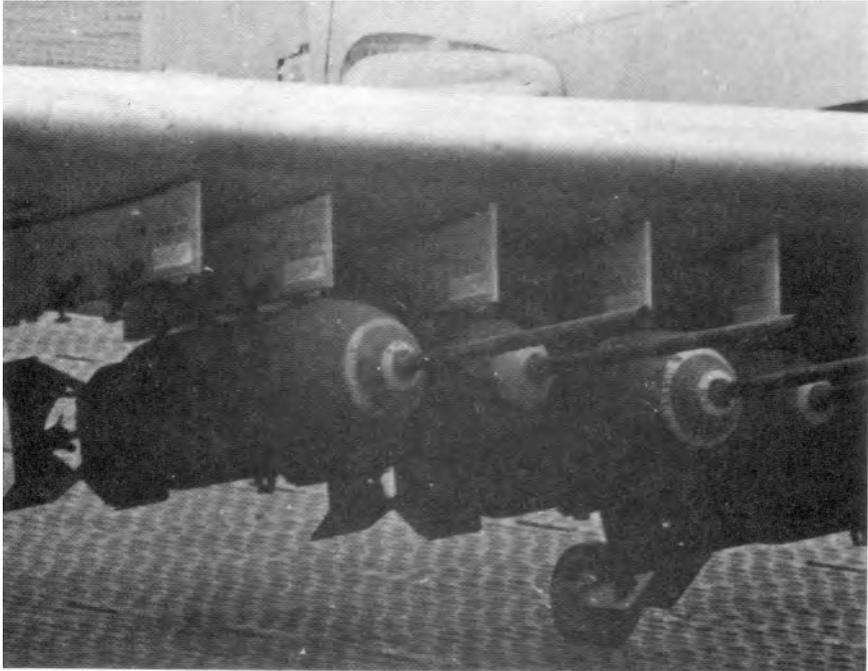


An Air Force forward air controller in a Cessna O-1 Bird Dog seen from the cockpit of another O-1. The rockets under the wings are used to mark targets for bombing.

Army and the South Vietnamese to call for emergency strikes only when absolutely necessary. Not only did the strike planned in advance usually take less time from takeoff to the dropping of bombs, the diversion of a fighter-bomber to meet an emergency upset the orderly and economical use of air power by opening a gap or reducing the effort somewhere in that day's schedule of strikes. Moreover, aircraft diverted from one target to another frequently arrived with less than ideal types of bombs. Fighter-bombers or attack aircraft carried varying combinations of 250-, 500-, and 750-pound high-explosive bombs, napalm canisters, antipersonnel bombs, rockets, and 20-mm ammunition, and emergency calls normally left no time to change munitions. Finally, a pilot diverted to a new and unfamiliar target might require a fairly detailed orientation from a forward air controller or from someone on the ground before he could attack.

When the air war in South Vietnam began to intensify in 1965, the Air Force used standard ordnance from its limited inventory of conventional weapons. Unfortunately, the high-explosive general purpose bombs tended to detonate among the treetops in the triple-canopy jungle that often concealed the enemy and had too compact a bursting radius to efficiently kill widely dispersed troops. Researchers at the Air Force Systems Command therefore developed new types of munitions, introducing 11 in 1965, 24 during the following year, and seven in 1967. The Air Force also developed new fuzes that allowed general purpose bombs to penetrate jungle canopy and explode only on contact with the ground. Cluster bombs, which dispensed hundreds of small fragmenting bomblets, be-

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Bombs fitted with extensions that caused them to explode above the ground, rather than creating a crater.

came the principal weapon against enemy personnel. One type of cluster bomb released a nonlethal gas over a 600-yard area, temporarily incapacitating those in its path. This type, the CBU-19, proved particularly effective in air rescue operations, since it hindered enemy troops closing in on a downed flyer without increasing the risk to his life. By 1968, the Air Force had developed an arsenal of guided bombs, the so-called smart weapons. One type, for example, sought out targets spotlighted by a laser beam, whereas another relied on the contrast between the target and its background to home on the desired object.

Despite the improvements in munitions, fighting at night and in bad weather remained a major problem for Air Force pilots. Flares dropped by gunships and observation aircraft illuminated the battlefield to some extent, but flares often failed to ignite, and the parachutes from which they hung frequently drifted away from the scene of the fighting. Consequently, it was difficult for forward air controllers to achieve coordination among the flareships, the fighters, and the troops on the ground. A great advance in accuracy resulted from the introduction in 1966 of a ground-based radar bombing system, Combat Skyspot, which guided the pilot to the target and told him when to drop his bombs. By early the following year five such sites were directing pilots to unseen targets.

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So accurate was the radar that the rules of engagement were relaxed to allow pilots to use either this system or a forward air controller, and Combat Skyspot directed about one-quarter of the total strike missions flown during the war.

In June 1965, B-52s of the Strategic Air Command joined tactical aircraft in supporting the battle on the ground, greatly increasing the aerial firepower available for the war. Thirty of the big bombers, specially fitted with external bomb racks, had been standing by at Guam since the attacks on the *Maddox* and *C. Turner Joy* in the event the air campaign proposed by the Joint Chiefs of Staff was carried out and the aircraft had to deliver conventional attacks in North Vietnam. When the air war against the North began, Air Force fighter-bombers and the Navy's carrier aircraft conducted the strikes, and the B-52s remained idle. General Westmoreland, looking for more efficient means of large-scale bombing, asked that these bombers hit the enemy in South Vietnam. During the remainder of the year, the B-52s flew more than 1,500 sorties in the South, raining vast tonnages of high explosives on area targets like troop concentrations, bases, and supply dumps. These Arc Light strikes began with 30-plane missions, but the number of aircraft in each formation declined as the frequency of operations increased. The first sorties against targets in southern Laos did not take place until December 1965, and the following April the B-52s dropped their first bombs on North Vietnam. The B-52s began to use the Combat Skyspot system in July 1966; by the end of the year, it was the huge bombers' primary aiming method. The number of B-52 sorties in the South increased to 4,290 in 1966 and to 6,611 and 15,505, respectively, in the following two years.



A Boeing B-52 Stratofortress releases a load of 750-pound bombs over South Vietnam, October 1965.

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Throughout this period, 75 percent of the Arc Light missions struck South Vietnam, another 20 percent hit southern Laos, and five percent bombed logistic targets in North Vietnam like the mountain passes that funneled men and cargo into southern Laos en route to South Vietnam.

Although Westmoreland had a high opinion of Arc Light, not all Air Force commanders shared his enthusiasm. To some, using B-52s for essentially tactical purposes diverted them from their principal mission of strategic deterrence. Others, notably General Momyer, believed that the bombers were being employed indiscriminately and inefficiently. Since intelligence of the enemy's formations and logistic depots in South Vietnam was not always reliable, many missions seemed to be wasted. To prevent this wastefulness, Momyer maintained that B-52 strikes should be restricted to clearly identified targets and that his Seventh Air Force should control the bombers rather than the Joint Chiefs of Staff and the Strategic Air Command through the military assistance command. Momyer felt that, without actual control of the bombers, he was responsible for coordinating his tactical aircraft with the B-52s even though he did not have sufficient authority or information to do so. Since the B-52s were flying tactical missions, usually long-range interdiction but occasionally the support of outposts under attack, the existing command structure weakened the single management of tactical aviation, a principle that he strongly supported, and resulted, as he saw it, in a less than efficient operation.

Westmoreland's zeal for Arc Light strikes remained undiminished, despite Air Force objections and a paucity of measurable results. Because of the nature of the targets, many only suspected rather than verified concentrations of men or supplies, he could not calculate the effect on the enemy to determine that a certain level of effort met his needs. As the number of known and suspected targets proliferated, he requested more and more B-52 missions. The authorized monthly sortie rate rose to 450 by March 1966, to 650 in November, and to 800 by February of the following year. When he asked for a further increase to 1,200 in early 1967, the Strategic Air Command became concerned with the impact on its worldwide nuclear forces. To avoid sending more bombers to the theater, some of those already in the western Pacific moved to U Tapao, Thailand, closer to the battleground than Andersen Air Force Base on Guam, reducing the distance to the Arc Light targets and enabling the same number of B-52s to fly a greater number of sorties. By the middle of 1968, 56 bombers were flying from Guam and 28 from Thailand, supported by KC-135 tankers operating from U Tapao and Andersen, as well as from bases on Okinawa and Taiwan. Despite the greater use of the Thailand-based bombers, the Strategic Air Command worried about the consequences of rotating B-52s between the United States and the distant Pacific. With more bombers dropping conventional bombs in Southeast Asia, fewer were available to carry out the Single Integrated Operational Plan. To overcome this deficiency, planners sometimes had to increase the number of nuclear targets assigned to an aircraft.

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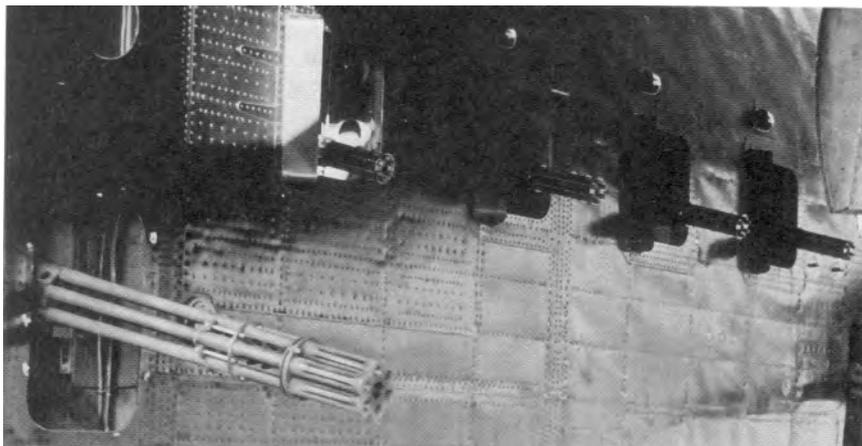


Boeing B-52s and KC-135s on the ramp at U-Tapao Air Base, Thailand.

A myriad of aircraft other than heavy bombers and fighter-bombers supported the ground war, among them transports equipped for spraying, psychological warfare craft that dropped leaflets or broadcasted from loudspeakers, transports converted into gunships, and helicopters. A squadron of 14 gunships, designated AC-47s, was activated late in 1965; and early in the following year, the aircraft were flying out of Tan Son Nhut, Bien Hoa, Nha Trang, Da Nang, Binh Thuy, and Pleiku. For three years the AC-47s participated in all types of combat support missions, defending fortified villages and outposts against ground assaults, attacking enemy soldiers locked in combat with friendly troops, escorting road convoys, dropping flares for attacking fighters, flying armed reconnaissance, interdicting the movement of enemy forces and supplies, and even directing air strikes. By the end of 1968, however, these earliest gunships were giving way to more heavily armed types like the AC-119, primarily used in South Vietnam, and the AC-130, principally for interdiction in southern Laos.

Although the Army flew the vast majority of the helicopters in South Vietnam, the Air Force used a few helicopters for search and rescue missions and for special operations. Before 1965, the Air Force had sent several Kaman HH-43s to South Vietnam and Thailand, but their relatively short range restricted them mostly to local base rescue. In a typical operation of that era, T-28s escorted the helicopters and a Grumman HU-16 amphibian served as an airborne command post and supervised the rescue. The intensification of the air war in 1965 brought a dramatic increase in the number of downed airmen; indeed, Air Force helicopters made 93 rescues in the second half of the year com-

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The left side of an AC-119 gunship with a 20-mm Vulcan cannon and four 7.62-mm miniguns visible.

pared to 29 during the first six months. A permanent search and rescue center was formed at Tan Son Nhut, and newer, longer range helicopters—Sikorsky HH-3s, nicknamed Jolly Green Giants—began flying from there and from Bien Hoa, Da Nang, Pleiku, and Binh Thuy, as well as from four airfields in Thailand. Transport aircraft, initially C-54s, but later C-130s, took over on-the-scene control from the HU-16s. As A-1s replaced the T-28s, they assumed the role of escorting the rescue helicopters. By 1967 the Air Force had 50 aircraft dedicated to rescue operations in Southeast Asia. Efficiency improved as the numbers increased; for example, successful experiments with aerial refueling from specially equipped C-130s extended the range of the HH-3s, enabling them to make sustained searches and to reach downed airmen who otherwise would have been dependent on their own survival skills. Late in 1967, larger and more powerful helicopters, Sikorsky HH-53s, began replacing the older Jolly Green Giants. By the end of 1968, over 1,500 persons, 45 percent of them downed airmen, had been rescued from the jungle or the sea.

Following their deployment in 1965, Air Force units first helped hold the enemy at bay as other American forces entered the country; by the early months of 1968, the Air Force had participated in 75 large-scale ground operations and hundreds of smaller battles. The first major clash between American soldiers and North Vietnamese regulars occurred in mid-November 1965, when the newly arrived 1st Cavalry Division (Airmobile) located an enemy formation as it swept through the Ia Drang Valley. During the battle, American soldiers inflicted severe casualties and forced the survivors to retreat across the border into Cambodia. During the most savage of the fighting, the Air Force conducted 330 sorties to disrupt counterattacks and help dislodge the North Vietnamese; all



A Sikorsky HH-3E on a rescue mission over Southeast Asia.

told, tactical aircraft flew 753 sorties during a month of searching out and attacking the enemy and B-52s almost a hundred. However, airlift by the Air Force proved as critical as aerial firepower, for the division could not resupply itself with its own aircraft exclusively, unless it diverted helicopters to the task of hauling cargo from depots in the rear to the forward supply points. Air Force C-123s and C-130s allowed Army aviators to redeploy, reinforce, and supply the battalions fighting in the Ia Drang Valley by delivering fuel and ammunition to the division's dumps, where the cargo was transferred to helicopters for the flight into the valley. Had the Air Force transports been unable to maintain the level of supplies, the operation might well have ground to a halt; instead, the fighting continued until the North Vietnamese fled from the battleground. In its first real test, the strategy of search and destroy seemed to work.

The struggle in the Ia Drang Valley taught different and sometimes conflicting lessons to the major participants. To the headquarters of the military assistance command, a month of searching and a few days of fighting had produced a great victory; indeed, the disparity in casualties, an estimated ten North Vietnamese killed for every American, seemed to demonstrate that the U.S. Army could fight a successful war of attrition, making use of mobility and firepower to exhaust a comparatively primitive foe. Believers in airmobility hailed the campaign as a vindication of that concept, although they were concerned that the helicopter force, and the maintenance and logistics base supporting it,

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needed strengthening to deal with a likely proliferation of assaults by troops landed, supplied, given fire support, reinforced, and finally withdrawn by helicopter. The headquarters of the Seventh Air Force viewed the Ia Drang action as proof that airmobile forces, considering the number of helicopters available and their limitations in firepower and carrying capacity, needed vigorous support from the command's transports and fighter-bombers and from B-52s, as well. The leadership of North Vietnam, although taken aback by the speed and fury of the attack into the Ia Drang Valley, remained determined to fight on, if necessary for twenty years. Enemy field commanders had reflected this determination by employing tactics designed to neutralize air strikes by hugging American positions so that strafing or bombing endangered friend as well as enemy.

All of these views reflected some facet of the truth. The American troops, although some small units had barely escaped annihilation, had outfought the enemy. The helicopter was a remarkable weapon—in one instance vaulting American soldiers over an ambush the enemy had prepared on a road—but it lacked the striking power and capacity of an airplane, and helicopters and the men to fly them would soon be in short supply. The airmobile division, like every other Army formation, required support from the Air Force, and in subsequent operations there normally was close cooperation between Army and Air Force planners. Finally, the North Vietnamese realized that neither determination alone nor reactive tactics could bring swift victory on the field of battle; like the assistance command at Saigon, the communist leaders in Hanoi were beginning to think in terms of a war of attrition. Perhaps the major lesson taught by the battle in the Ia Drang Valley was that the war would be long and bitter.

As 1965 drew to a close, three distinct tactical air control systems existed side-by-side in South Vietnam: one operated by the Air Force with nominal participation by the South Vietnamese, one by the Army for its helicopters and other aircraft, and the third by the Marine Corps. The system used by the marines, designed initially for amphibious operations in which air strikes complemented naval gunfire during the landing and the exploitation of the beachhead, ensured a prompt response by Marine Corps airmen to requests from marines on the ground (and, as recently as the Korean War, from Army ground troops as well). The Marine Corps mechanism of air control functioned smoothly, the result of training that produced a genuine air-ground team; the competence of marine aviators to support marines on the ground was not in doubt. General Westmoreland, however, had reservations about the ability of the Marine Corps system to support rapidly unfolding search and destroy missions that might involve swift movement on the ground and require cooperation with the Air Force, with the Army and its air arm, and with South Vietnamese forces.

During Operation Harvest Moon in December 1965, Westmoreland became concerned when crowded air space and a breakdown of communication with controllers kept Marine Corps fighters circling helplessly, preventing a South Vietnamese unit from receiving the air support it had requested. Fortunately, the

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South Vietnamese managed to reach Air Force forward air controllers assigned to the same area. Even though these Air Force officers had not attended the briefings preceding the operation and were unfamiliar with call signs, radio frequencies, and the location of ground troops, they quickly became oriented and soon organized the necessary air strikes. During this operation, Air Force controllers working their assigned areas complained of intrusions by Marine Corps aircraft. The marines believed that situations like these could be avoided simply by more thorough planning before an operation, but Westmoreland decided that the fault lay in the existence of separate Air Force and Marine Corps control mechanisms. He therefore told his air commander, General Momyer, to find a way to incorporate Marine Corps aviation in the Air Force tactical air control system without arousing controversy. The quest took two years and produced just the kind of interservice argument that Westmoreland hoped to avoid.

Having prevented an enemy takeover of South Vietnam in 1965, the assistance command went on the offensive in 1966. Operating behind a thin screen of border outposts designed to monitor and to some extent impede infiltration, American units, assisted by South Vietnamese troops, used their mobility and firepower to destroy the enemy's bases, kill his soldiers, and shatter his military formations, although not to seize and hold territory. Search and destroy operations of this sort were intended to enable the South Vietnamese to operate more freely against essentially guerrilla forces and extend government control into the countryside. American success depended on winning a war of attrition designed to wear down the organized North Vietnamese and Viet Cong forces; success for the South Vietnamese would stem from providing security and services to an increasing segment of the populace.

Beginning in January 1966, in the largest search and destroy operation of the war to that time, the 1st Cavalry Division (Airmobile), a South Vietnamese division, and a South Korean battalion spent six weeks dislodging the enemy from entrenched coastal positions 300 miles north of Saigon between Qui Nhon and Quang Ngai in I Corps and II Corps. Air Force C-130s flew cargo into a forward airfield with access to the several battlefields of the campaign. Over 600 sorties by fighter-bombers cleared the way for the American advance and helped extricate the ground forces from ambushes and other forms of counterattack. Several thousand of the enemy died while being driven from the rich rice-growing lowlands.

Bad weather always posed problems for the fighter-bombers, and the Viet Cong and North Vietnamese took advantage of it. Early in March 1966 the enemy overran a special forces camp in the A Shau Valley of I Corps, two miles from the Laotian border, a part of the screen that detected and harried North Vietnamese infiltration. Making use of cloud cover that imposed a 200-foot ceiling and largely frustrated Air Force attempts to provide close air support, the enemy seized the camp. This was a serious loss, for the valley became a logistics base with roads connecting it to the Ho Chi Minh Trail across the border.

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Despite occasional American or South Vietnamese forays in later years, the A Shau Valley remained an important conduit for reinforcements and supplies sent from the North.

When the seasonal rains turned the Laotian trails to mud in June 1966, the communists shifted their infiltration effort to the demilitarized zone, where good weather had dried the roads. The enemy's apparent strategy was to pour troops into the northern provinces of South Vietnam to draw American forces northward and clear the way for attacks farther to the south. Instead of rushing headlong toward the demilitarized zone as the enemy seemed to expect, Westmoreland used his ground forces against the North Vietnamese units that had entered the country and unleashed air power against the routes of supply and infiltration. During the ground portion of the campaign, called Operation Hastings and conducted between July 15 and August 3, the Air Force supported the South Vietnamese Army, while Marine Corps airmen assisted marines on the ground, an arrangement that on this occasion worked reasonably well because the ground forces were located within readily definable areas. Aside from the occasional emergency call from marines for Air Force strikes and a collision between a Marine Corps helicopter and an Air Force observation craft, there were few problems of coordination between the two air arms.

North of the area of Operation Hastings, directly above the militarized zone, the Air Force opened an interdiction campaign called Tally Ho on July 20. Westmoreland, to avoid the problems of coordinating both Air Force and Marine Corps aircraft in a small area, accepted Momyer's recommendation that he turn down an offer by the marines to participate in this latest aerial effort. By early August, Marine Corps ground units had driven the enemy back into the demilitarized zone while tactical aircraft of the Air Force continued to strike lines of supply and communication. B-52s joined the interdiction campaign in mid-September, multiplying the firepower of the fighter-bombers, which kept harassing the North Vietnamese until November when the return of the seasonal rains to this region caused the enemy to shift his activity to the infiltration routes of southern Laos. The aerial action in Tally Ho demonstrated that the light O-1 observation craft could not be used to direct strikes in the heavily defended coastal plain, and they were shifted to the western mountains where anti-aircraft guns were less numerous. On the plain, Air Force fighter-bombers conducted armed reconnaissance, attacking the enemy without benefit of forward air controllers until jet fighters were substituted for the O-1s in Tally Ho and similarly defended areas. During the interdiction campaign, marine artillery firing long-range missions sometimes interfered with forward air controllers conducting visual reconnaissance or directing strikes. For this reason, missions occasionally were canceled, as when an Air Force controller, bracketed by artillery shells above and below his aircraft, hastily departed from the region. Obviously, coordination between the Air Force and the Marine Corps gunners was less than perfect.

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A Lockheed C-130 Hercules sets down on a dirt strip during Operation Birmingham, April 1966.

The southward shift of the main action during November 1966 triggered Operation Attleboro in an area north of Saigon. For several years the enemy had built up his forces near the capital and had created two heavily fortified military complexes, War Zones C and D, some 40 miles north of the city. Despite repeated attacks, the North Vietnamese and Viet Cong clung to these redoubts; not even a savage pounding by B-52s in 1965 could dislodge them. Several ground operations in 1966—Silver City in March, Birmingham in April, and El Paso II in June—penetrated the base areas and cleared at least portions of them, but each time the enemy returned in strength to rebuild bunkers and reestablish the headquarters. On November 1, two American divisions entered the zones and, assisted by more than 1,700 tactical strikes and 225 Arc Light sorties, drove the communists back across the Cambodian border. In three weeks of vicious fighting, Air Force transports delivered more than 11,000 troops and 9,000 tons of cargo.

In these major battles and scores of smaller skirmishes during 1966, Air Force fighter-bombers flew over 74,000 sorties and B-52s flew 4,500. Airlift units conducted 13,600 sorties, reconnaissance 59,000, forward air controllers 27,500, and Air Force helicopters flew 13,500 sorties carrying passengers and cargo, saving downed airmen, and evacuating the wounded.

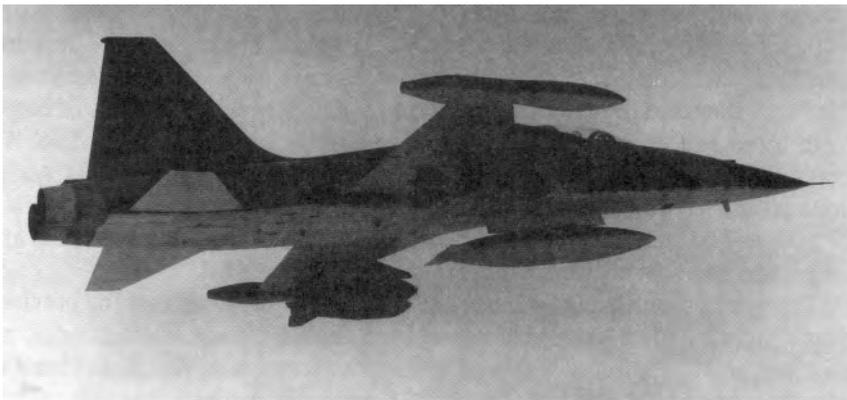
The war in South Vietnam during 1967 followed the pattern of the previous year's fighting. The enemy returned from his sanctuary in Cambodia, regrouped, and by February was back to previous strength in War Zone C and an adjacent stronghold, the Iron Triangle. A sweep of the Iron Triangle by two American divisions, called Operation Cedar Falls, took place that month, ac-

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accompanied by some 1,100 tactical air strikes and 126 sorties by B-52s. Although the operation destroyed the huge network of bases, tunnels, supply dumps, and training camps that constituted the Iron Triangle, the defenders retreated westward into War Zone C and the Americans pursued.

Operation Junction City, essentially a follow-on to Cedar Falls, took place between February and May when the two divisions that had invaded the Iron Triangle pushed on into War Zone C, assisted by Air Force tactical fighters, B-52s, and transports. The pursuit began with C-130s dropping 845 American parachute troops at the rear of the enemy to seal off the escape routes to Cambodia. The advance continued, first through the central and western parts of the zone and then to the east, capturing supplies, destroying bunkers, and sealing caves. For the first time in the war, B-52s departed from their usual role of area bombing and flew planned missions in support of troops engaged with the enemy. In addition to the rain of bombs from these big aircraft, the defenders reeled under the effect of napalm, high explosives, rockets, and cluster bombs dropped during the 5,000-odd sorties flown by F-100s, B-57s, F-4s, and the recently introduced F-5s, which the Air Force flew extensively in 1965 and 1966 before turning them over to the South Vietnamese in 1967. More than 2,000 sorties by Air Force transports provided the assault troops with supplies and reinforcements throughout an operation that was believed to have destroyed a third of a North Vietnamese division and driven the survivors eastward into War Zone D. Since the objective of the offensive was attrition rather than the capture of territory, the Americans withdrew, and a new enemy division soon reentered the area and began restoring the defenses.

When the seasons changed in the spring, the fighting again shifted to the drier demilitarized zone where the North Vietnamese were resuming their infiltration. Marine Corps units in I Corps moved northward toward the zone, and Army troops took their place. In April C-130s airlifted 3,500 men and 4,000



Northrop F-5 with a load of 750-pound bombs over South Vietnam in 1966.

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tons of equipment of the Army's 196th Light Infantry Brigade from Tay Ninh to Chu Lai. At the same time, C-123s and C-130s flew food and ammunition into the northwestern outpost at Khe Sanh, where two marine battalions battled the enemy in the surrounding hills. Defeated in the west at Khe Sanh, the North Vietnamese then struck to the east, harassing the marine camp at Con Thien astride a main infiltration route just two miles south of the demilitarized zone. An 11-day marine attack into the zone, Operation Hickory and its subsidiaries, again demonstrated, in the view of the Air Force, the need for stricter control over participating air units. Initial confusion whether the Air Force or the marines would control air strikes in the upper half of the demilitarized zone deprived the ground forces of interdiction support for three days, although the close-in strikes delivered by marine aviators were unaffected.

Besides supporting Operation Hickory, the Air Force stepped up its interdiction of enemy movement in the Tally Ho area. In June 1967, forward air controllers successfully used jet fighters for the first time. Because the fiercely defended coastal strip had become too dangerous for the vulnerable O-1s, the controllers changed to two-seat F-100Fs carrying an observer and a pilot. In July and August, communist artillery batteries within the demilitarized zone intensified the bombardment of marine outposts, especially on Con Thien, and in September a major air campaign, Operation Neutralize, was directed against these guns. While the marines attacked by air and ground to keep the enemy off balance, Air Force fighter-bombers and B-52s went after the North Vietnamese artillery. Again, the coordination of two air organizations operating in a compact area proved difficult; some Air Force forward air controllers had to dodge marine aircraft and counterbattery fire, and marine artillerymen were compelled to withhold their fire, once for 24 hours, while the Air Force bombed targets inside the Neutralize area. The assignment of Air Force liaison officers to the control center operated by the Marine Corps resolved the problem, but this solution fell short of General Momyer's goal of centralizing control over the tactical aircraft of the Air Force and the Marine Corps. Whatever its shortcomings, Operation Neutralize was credited with destroying 146 enemy guns and damaging 183 others. The number of incoming rounds directed at Con Thien and other nearby outposts decreased significantly from 7,400 in September to 3,600 the following month, when the assistance command announced that the enemy's siege of Con Thien had ended.

Although the threat from the demilitarized zone abated, the North Vietnamese kept up their pressure along the borders of II and III Corps to divert attention, as events would prove, from the population centers of South Vietnam. Attacks during the remainder of 1967 against border outposts at Song Be, Loc Ninh, Bo Duc, and Dak To were repulsed because of close cooperation between air and ground. Throughout the year Air Force fighter-bombers flew more than 122,000 sorties and the B-52s a total of 6,600, increases of 48,000 and 2,100, respectively, over 1966's figures. Reconnaissance aircraft flew roughly 94,00

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A North American F-100 Super Sabre over a Viet Cong target in 1967.

missions, and 373,000 airlift sorties delivered men and supplies to the battle areas. Forward air controllers flew 43,600 sorties in directing fighter strikes, and other aircraft released flares, leaflets, and defoliants during more than 26,000 flights. Air Force helicopters performed 13,400 tasks, several of which might occur on a single sortie, while retrieving downed airmen, evacuating casualties, or carrying men and cargo.

The most serious of the border threats surfaced early in 1968 against the marine outpost at Khe Sanh. Unlike the earlier siege by artillery fire at Con Thien, the marines at Khe Sanh were encircled by North Vietnamese troops, and sufficient forces were not available to break through to the garrison. Consequently, General Westmoreland decided to use air power to disrupt an anticipated attack by the two enemy divisions that had massed around the outpost. Near the end of January, he launched a 10-week air campaign, Operation Niagara, so called because the torrent of explosives dropping from the sky was intended to resemble in volume the waters of those celebrated falls. Before the siege of Khe Sanh was broken at the end of March, Air Force, Marine Corps, and Navy aircraft flew some 24,000 tactical sorties against the forces surrounding the base. Flying 2,500 sorties by day and night, B-52s dropped almost 60,000 tons of bombs on trenches and artillery positions. Air Force transports landed 4,300 tons of supplies and 2,700 troops at the Khe Sanh airstrip, despite hostile mortar and artillery fire, and parachuted some 8,000 tons of cargo to the defenders.

As had happened previously when sorties by different services had to be coordinated in a compact area, the control mechanism broke down. Midway through the campaign, General Westmoreland designated General Momyer as

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A C-130 on the runway at Khe Sanh during the 1968 siege.

the single manager of all tactical aircraft in South Vietnam, both marine and Air Force, a decision that Admiral Sharp promptly approved. Despite the title of single manager, Momyer's authority was not absolute, for the aircraft of the Army and those operating from the Navy's carriers were excluded, and the marines could launch their own aircraft in response to emergencies that their ground units might encounter. This one concession to its needs did not satisfy the Marine Corps, which interpreted the action as a dismemberment of its air-ground team and carried the resulting protest all the way to President Johnson, who refused to overrule his commander in Vietnam. Although this arrangement went into effect too late to have any impact on Operation Niagara, it seemed to represent a major step toward the centralization of air power under the control of the commander of the Seventh Air Force. Before the year ended, however, the single manager system was compromised by the release of a specific number of sorties to the marines, initially for missions like escorting helicopters but ultimately to use as they saw fit.

While the siege of Khe Sanh continued, other communist forces moved largely undetected into position and attacked 5 major cities, 36 provincial capitals, 23 airfields, and many district capitals and hamlets. Taking advantage of the annual Tet holidays early in February, when most South Vietnamese soldiers were on leave to celebrate the lunar new year, the enemy struck a stunning blow. The purpose may have been to provoke a popular uprising throughout the South, in which case the offensive failed. The purpose, however, may have been to embarrass the American political and military leadership and under-

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mine public support in the United States for prosecuting an increasingly costly war, in which case the offensive succeeded. Only at Hue in northern South Vietnam did the attackers cling to their objectives for an extended period, and even there the city was retaken, but only after 25 days of savage fighting. Its recapture revealed the mass graves of local inhabitants murdered by the communist forces in acts of revenge or calculated terrorism that won no converts to their cause. At Hue and elsewhere, Air Force fighter-bombers launched carefully controlled strikes, but in crowded urban areas, collateral damage proved unavoidable, resulting in civilian casualties and perhaps 600,000 new refugees that strained the resources of the Saigon government. Outside the towns and cities, the aircraft bombed the enemy's storage dumps and troop concentrations and provided battlefield interdiction and close air support for the units fighting the Viet Cong and North Vietnamese attackers. Communist losses may have totaled 45,000, more than half of the regulars and guerrillas who participated in the offensive.

Costly though it was to the communists, the Tet offensive marked the point where the tide of events clearly turned in their favor, for the unexpectedly savage attack caused the United States to reexamine its partnership with the South Vietnamese and the dominant role it had assumed in a war to preserve the independence of South Vietnam. Although repulsed on the battlefield, the attackers by their very boldness lent substance to doubts that already had surfaced as the American people, who were beginning to feel the impact of a distant war, wondered whether the results were worth the sacrifices. The struggle, which cost almost \$33 billion annually, had fueled inflation and bloated the national debt. The number of Americans killed in action during the conflict approached 20,000, with almost half those deaths in 1967. Opposition to the draft, which had supplied many of the dead, was increasing. In October 1967, a week-long demonstration against the war singled out offices of the Selective Service System in various cities and culminated in large antiwar rallies at the Lincoln Memorial and the Pentagon. Although parades and mass meetings in support of the war and its objectives took place at New York City and elsewhere, numbers, determination, and media coverage seemed to favor the opposition. A segment of the populace, especially young people subject to the draft, had lost confidence in the assurances by the nation's leaders that the war was being won and that the continued independence of South Vietnam was a worthwhile objective. Particularly unfortunate, in view of the Tet offensive, were the optimistic statements made by General Westmoreland when he visited Washington in mid-November and reported publicly on the progress of the war. He described the situation in South Vietnam as very encouraging and declared that the United States was winning the war of attrition, only to have his words challenged by the sudden and widespread attacks.<sup>6</sup>

The Chairman of the Joint Chiefs of Staff, Gen. Earle G. Wheeler of the Army, saw the Tet offensive not as a blow to public confidence or to the morale

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of the Johnson administration but as an opportunity to restore the nation's strategic reserve of military manpower. He arranged for Westmoreland to call for an additional 206,000 troops, a request that relied for justification on the gloomiest possible interpretation of recent events. To provide such a force required a large-scale mobilization of the reserve components, which the President wanted to avoid. Such a major mobilization would have aroused the anger of those who opposed the war or questioned its importance, but would not have affected the military situation in South Vietnam, where conditions were by no means grave enough to require reinforcement on this scale. The bulk of the troops would have formed a reserve in the United States for possible emergencies outside Southeast Asia. News of the request reached the public, which assumed that all the additional men were destined for South Vietnam, further eroding of confidence in the military and political leadership and in the importance and eventual outcome of the war.

Instead of giving Westmoreland what he sought and mobilizing the reserve, President Johnson called on a group of trusted advisers, his so-called Wise Men, to review the nation's efforts in Southeast Asia and make recommendations for the future. The distinguished panel concluded that pursuing the existing policy would reinforce failure. As a result, the Chief Executive approved a final token increase in Westmoreland's forces, bowed to the growing public opposition to the war by declaring that he would not seek reelection, and approached the task of extricating the United States from a conflict that it had taken over not quite three years earlier. In mid-1968, American policy began to change. Although the ultimate objective remained an independent South Vietnam, the United States would strengthen the South Vietnamese, gradually disengage from combat, and in effect turn the war over to its ally.

The second air war took place in the skies over North Vietnam. Between March 1965 and the end of October 1968, Air Force and Navy aircraft conducted Operation Rolling Thunder, a bombing campaign designed to force Ho Chi Minh to abandon his ambition to take over South Vietnam. Over the objections of many Air Force leaders, the operation began primarily as a diplomatic signal to impress Hanoi with America's determination, essentially a warning that the violence would escalate until Ho Chi Minh "blinked," and secondarily as a means to bolster the sagging morale of the South Vietnamese. In the view of the Air Force, the campaign had no clear-cut military objective nor its authors any real estimate of the cost in lives and aircraft. General LeMay and others argued that military targets, rather than the enemy's resolve, should be attacked and that the blows should be rapid and sharp, with the impact felt immediately by the North Vietnamese Army on the battlefield as well as by the political leadership at Hanoi. Secretary McNamara favored the measured application of force and was convinced that the war could be won in the South. He initially emphasized strikes against the "extended battlefield," which consisted of South Vietnam and the areas immediately beyond its borders, instead of proceeding directly against

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Republic F-105 Thunderchiefs on a mission to Hanoi in 1966.

the targets—many deep within North Vietnam—advocated by LeMay. When Rolling Thunder failed to weaken the enemy's will after the first several weeks, the purpose, though not the pace, of the campaign began to change. By the end of 1965, the Johnson administration still used air power in an attempt to change North Vietnamese policy, but the bombing tended to be directed against the flow of men and supplies from the North, thus damaging the enemy militarily while warning him of the danger of greater destruction if he maintained the present aggressive course.

Although the bombing campaign was taking on more of a military coloration, forcing Ho Chi Minh to give up his goal of absorbing South Vietnam into a unified communist state remained the underlying purpose. The change in the conduct of the air war was not sufficient to satisfy LeMay and like-minded members of the military leadership, who believed that the United States could not end aggression with these strategies. The ill-conceived attempt to bomb Ho Chi Minh into being a good neighbor, in part the product of a cultural bias that perceived a militarily backward North Vietnam as succumbing to the use (if not the mere threat) of American might, had failed. McNamara's persistence in such an effort, even in the form of aerial interdiction, served mainly to estrange LeMay and other uniformed leaders from the civilian officials of the Department of Defense. In essence, the senior officers argued that military considerations should determine the use of force, whereas the civilians, typified by Secretary McNamara, insisted that selective pressure, controlled by them and combined with diplomatic overtures, would prevail and compel North Vietnam to call off its aggression in the South.

Within Congress, doubts about the McNamara policy mounted as the bombing dragged on without an appreciable effect on the leadership at Hanoi. At last in August 1967, after more than two years of Rolling Thunder, the Preparedness

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Investigating Subcommittee of the Senate Armed Services Committee began to probe the conduct of the air war. Under the leadership of John C. Stennis, a Democrat from Mississippi, the subcommittee provided a sympathetic forum where the admirals and generals presented their case for stronger action. In the words of Democratic Senator W. Stuart Symington of Missouri, a member of the subcommittee and the first Secretary of the Air Force, Rolling Thunder resembled an attack on an octopus; he, along with the other members of the subcommittee and the uniformed witnesses, believed in going for the head, which would mean an escalation of the bombing in terms of targets and tonnage. In contrast, Secretary McNamara argued unsuccessfully that attacking the head of the octopus was not necessary if all the tentacles were pounded to a pulp, as he maintained the limited bombing was doing. The consensus of the subcommittee was that the policy represented by Secretary McNamara had failed and that purely military considerations should prevail in selecting and attacking targets. Nevertheless, the hearings resulted in little more than an expansion of the target list, for the President undertook no dramatic escalation. The secret sessions did, however, destroy what remained of McNamara's credibility with Congress, contributing to his disenchantment with the war and edging him toward resigning, which he did early in 1968.

Besides opening divisions within the Department of Defense, the bombing contributed in some measure to the increasing opposition to the war and to the way it was being fought. Those among the populace who believed that the United States was doing too little could point to Rolling Thunder as an example of how American servicemen were risking their lives in operations that could not bring victory. At the opposite pole were those who felt that Rolling Thunder was unworthy of the United States, a form of war that unleashed the latest technology of violence against the civilian populace of North Vietnam. As the then-secret testimony before the Stennis subcommittee made clear, the nation's uniformed leaders did not advocate warfare against the population of the North, but attacks on undeniably military targets in crowded cities could not help but maim and kill noncombatants. Complicating any dispassionate judgment of the air war was the enduring myth that aerial bombardment was capable of unerring accuracy. Tracing its roots to the bombs-in-a-pickle-barrel legend of World War II, this myth had been reinforced by recent references to the surgical precision of aerial attack and by President Johnson's ill-advised remark that, whereas Viet Cong steel was plunged into flesh and blood, American bombs were directed only at steel and concrete. When an American reporter permitted to travel in North Vietnam sent back dispatches describing civilian casualties and the destruction of homes, the abiding belief of the American people in the precision of aerial bombing reinforced the enemy's propaganda.

When Rolling Thunder began in March 1965, strikes were limited to specific targets south of 20 degrees North latitude, but the area of operations rapidly expanded and the nature of the attacks changed. Within a few weeks Air Force

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fighter-bombers were flying armed reconnaissance in that same area, hitting targets of opportunity. The first target north of the 20th parallel was bombed in May, and by November a few strikes had been authorized north of Hanoi against the rail lines entering the country from China. Because it represented a use of military force for diplomatic purposes, Rolling Thunder was controlled directly from Washington. Targets were chosen in the White House, at times when the President was having lunch with a few key advisers. At first, squadrons in South Vietnam and Thailand carried out the strikes approved for the Air Force, but after the construction of new airfields in Thailand, all the raids against the North originated there. The fleet of aircraft the Air Force operated from Thailand grew from 83 to 600. At first, the main burden of carrying the air war to North Vietnam fell to the F-105, but the F-4C joined it in mid-1965 and the F-4D somewhat later; the F-111, the operational version of the TFX, served briefly in 1968. The first of the few B-52 strikes directed against the North during this period took place in April 1966 and pounded the infiltration routes exiting into Laos; the Air Force Chief of Staff, General McConnell, did not want to send these bombers against the Hanoi-Haiphong region where the defenses were strongest.

Until November 1965, Air Force and Navy aircraft alternated in attacking Rolling Thunder targets throughout the North, but beginning that month, six armed reconnaissance areas, called "route packages" were created, with each the responsibility of one of the two services. During April 1966, when infiltration into the South increased through the demilitarized zone, responsibility for strikes in the route package abutting the zone was turned over to General Westmoreland as part of South Vietnam's extended battlefield. Meanwhile, attacks continued, with certain exclusions, in the rest of North Vietnam. At vari-



An F-111 on a base in Thailand ready for a mission over North Vietnam.



The Hanoi petroleum storage yard after a raid by F-105 Thunderchiefs.

ous times, aircraft could not strike the potential targets within a 30-mile radius of Hanoi, those within 10 miles of Haiphong or 30 miles of the Chinese border, the MiG bases, and, until they demonstrated that they were actual weapons and not mere tokens of Soviet support, the surface-to-air missile sites.

The lists of authorized targets and excepted areas changed throughout the bombing campaign. In June 1966, for instance, fighter-bombers flew a series of powerful attacks against seven major petroleum storage areas, destroying some seventy percent of North Vietnam's tankage. The air war escalated further in February 1967 when aircraft hit powerplants, military airfields, and railway yards within the buffer zones around Hanoi and targets along the Chinese border. Nevertheless, Rolling Thunder was fought in flurries, with periods of escalation or intensified activity separated by pauses in the bombing designed to facilitate a North Vietnamese response through diplomatic channels. In actuality, the pauses allowed the enemy time to bind up his wounds.

During Rolling Thunder, Air Force and Navy aircraft frequently attacked the highway bridge at Thanh Hoa, but the raids proved futile. Workmen swarmed over the bridge by night or in weather too bad for follow-up bombing and repaired the damage, with traffic rerouted across a nearby underwater bridge whenever the steel structure could not be used. A captured naval aviator, whose aircraft was one of 16 shot down during the attacks on the Thanh Hoa bridge was blindfolded and in the dark of night placed in the back of an open truck. After a short drive, the truck stopped, his captors removed the blindfold, and he found himself in the middle of the river at Thanh Hoa, the truck parked on the

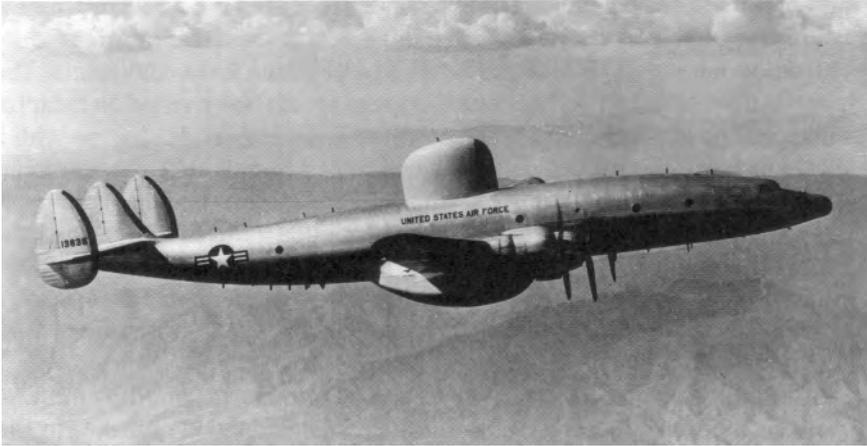
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underwater bridge that American intelligence had not yet detected. The Paul Doumer bridge, which carried the railroad and a highway over the Red River at Hanoi, came under attack during the enlargement of the target list that resulted from the hearings of the Stennis subcommittee. Air Force fighter-bombers succeeded in dropping three of the spans, but North Vietnamese laborers immediately set to work on an underwater replacement bridge.

Besides struggling successfully to repair bomb damage, whether to bridges or to powerplants, North Vietnam responded to Rolling Thunder by building a modern radar-controlled air defense system, perhaps the most formidable ever devised. Shortly after the bombing began, the number of North Vietnamese anti-aircraft guns of all calibers doubled to 2,000. The proliferation of these weapons forced the fighter-bombers after the first few weeks to change their tactics from low-level, high-speed bomb runs to higher altitude penetrations. The defenders, however, acquired a weapon, the surface-to-air missile, that could engage higher flying aircraft. Reconnaissance craft detected Soviet-supplied surface-to-air missiles for the first time in March 1965 and had identified 56 sites by the end of the year. Complementing the guns and missiles, the North Vietnamese Air Force had about 100 MiG-17s and MiG-21s, as well as a few MiG-19s, a collection of interceptors that began, during the following year, to pose a threat to the American fighter-bombers.

By the summer of 1966, the North Vietnamese were defending their territory with a radar-directed system of aerial defense that included interceptors, surface-to-air missiles, and anti-aircraft guns. In general, the enemy used his interceptors to harry the approaching fighter-bombers, forcing them to drop their bombs earlier than planned to rid their aircraft of the drag that impeded them in dogfights against the MiGs. To avoid the surface-to-air missiles, which were deadly at high altitude but could not change direction readily, the F-105s and F-4s dived sharply, a maneuver that placed them in the killing zone of the anti-aircraft guns. The weakest link in the enemy's defenses proved to be the radar that controlled the surface-to-air missiles and the largest of the guns. The Air Force exploited this weakness with a Navy-developed missile, the Shrike, that destroyed the transmitter by homing on the radar signals. Later, an improved missile of this kind, the standard antiradiation missile, replaced the Shrike as the normal means of forcing hostile radar to shut down. In addition, the Air Force used jamming transmitters, mounted in orbiting aircraft or enclosed in pods hung from the fighter-bombers, to conceal the genuine radar returns and confuse the North Vietnamese operators. Using antiradiation missiles and the electronic countermeasures, pilots neutralized the surface-to-air missiles, enabling the attackers to remain beyond the reach of anti-aircraft fire.

Along with the formidable defenses, the restrictions on targets helped determine the tactics employed by American air power during Rolling Thunder, for the pilots had to avoid trespassing in Chinese air space or damaging non-North Vietnamese shipping at Haiphong or some other port as they carried out the con-



A Lockheed EC-121 Super Constellation airborne warning aircraft.

tradictory mission of persuading Ho Chi Minh that North Vietnam could be destroyed, without actually destroying it. The Air Force at times used unusual tactics and techniques to compensate for the defenses and the prohibition, but had to accept the basic contradiction. Since airfields in North Vietnam were at times exempt from attack and those in China always so, the attackers could not destroy the MiGs on the ground, and aerial combat was inevitable. To improve the odds, radar-equipped EC-121s, military versions of the Lockheed Constellation transport, orbited over the Gulf of Tonkin and warned American pilots of the approach of hostile jets. A favorite maneuver of the North Vietnamese fighter pilots was to climb sharply, forcing the F-105s to jettison their bombs in expectation of a dogfight. Radar in the EC-121s detected these tactics, and a screen of F-4s, armed with heat-seeking missiles and flying at an altitude lower than the F-105s, could intercept the approaching enemy.

Perhaps the most spectacular tactical innovation occurred in January 1967, when 14 flights of F-4s posed as bomb-laden F-105s by using the appropriate radio call signs, approach route, altitude, and speed. Anticipating easy kills, the North Vietnamese attacked, and the Phantoms, primed for battle and unencumbered by bombs, destroyed seven of the MiGs in 12 minutes. Four days afterward, this time masquerading as weather reconnaissance craft, the F-4s again lured the MiGs into attacking and destroyed two more. Having learned the danger of overconfidence, the North Vietnamese began to rely on hit-and-run attacks, firing heat-seeking missiles from behind their intended victims, then bolting for safety.

For air-to-air combat, the Air Force normally used the multibarrel 20-mm cannon and three kinds of air intercept missiles—the AIM-9 Sidewinder, AIM-7 Sparrow, and AIM-4 Falcon—all supersonic and accurate at ranges

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varying from two to ten miles. The Sidewinder, first used in combat by Chinese Nationalist pilots over the Taiwan Strait in 1958, was a heat-seeking missile developed by the Naval Ordnance Test Station at China Lake, California. The Sparrow, developed by the Raytheon Company for the Navy, relied on radar for guidance. The Hughes Aircraft Falcon came in several models, some with a radar in the nose to track the victim, whereas others homed on the heat generated by the engines. To enhance the accuracy of the Sparrow and the radar-guided versions of the Falcon, McDonnell Douglas fitted a fire control radar in the F-4 to help highlight the target. Since the air intercept missiles were ill-suited for close-in fighting, some F-4Cs and all subsequent models of the Phantom carried a 20-mm gun either installed in a pod attached to the airframe or built into the aircraft.

After the Wise Men recommended against further escalation of the war, President Johnson conceded that Rolling Thunder had failed to make Ho Chi Minh relent. Hoping that a reduction of the bombing would succeed where intensification had failed and entice Hanoi into negotiating a settlement of the war, the President on April 1, 1968, ended the bombing north of the 19th parallel and halted it altogether on November 1. Col. Ray Bowers, who had studied the campaign while assigned to the Office of Air Force History, summed up the accomplishments of Rolling Thunder between the spring of 1965 and the fall of 1968 when he told an audience at the Air Force Academy, "Measured by its unsatisfactory outcome and by the . . . planes lost in North Vietnam, the controlled application of air power that was Rolling Thunder stands as a sad failure."<sup>7</sup> During the air war against the North, Air Force tactical fighters flew 166,000 sorties and the Navy's carrier aircraft 144,500. The B-52s, which strictly speaking were not a part of Rolling Thunder, saw limited action, flying just 2,330 sorties. The enemy downed 526 Air Force aircraft; 54 fell victim to surface-to-air missiles, 42 were destroyed by MiGs, and the remainder succumbed to antiaircraft fire. Of the 745 Air Force crew members shot down on missions against the North, 145 were rescued, 255 were known to have died, 222 were taken prisoner, and the fate of 123 others was unknown when the operation ended.

The air war along the trails of southern Laos complemented Rolling Thunder and the air war in South Vietnam. The objective of this third air campaign was to impede the flow of men and equipment from North into South Vietnam; in 1965 this traffic was estimated at 4,500 men and 300 tons of cargo each month. The Air Force, the Navy, and the Marine Corps all participated in this air war; the Air Force with F-100s, F-4s, F-105s, and B-57s from both South Vietnam and Thailand. The weight of the aerial effort varied with the weather, which cleared over southern Laos during a dry season that normally lasted from November through April and facilitated both road traffic and air operations. Although the campaign in this region came to be conducted year-around, initially the activity all but stopped with the onset of the monsoon rains, as the

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focus of aerial interdiction shifted to the demilitarized zone where the tempo of infiltration increased with the beginning of dry weather.

Like Rolling Thunder, the interdiction of the Ho Chi Minh Trail in southern Laos was subject to political constraints. The settlement negotiated between the communist and noncommunist factions in 1962 banned a military headquarters in Laos, and the United States used its embassy at Vientiane for that purpose, with the ambassador functioning as the military authority in the kingdom and the military attaches as his staff. Decisions as to the number of sorties, targets, and ordnance reflected the need to preserve the nominal neutrality of the Laotian prime minister, Souvanna Phouma, who did not object to the air war as long as his loyal subjects were not endangered and his government not involved to the extent that might invite North Vietnamese retaliation. The Joint Chiefs of Staff approved each of the recurring interdiction campaigns, the Seventh Air Force provided the aircraft and nominated the targets, and the ambassador vetoed any target that in his judgment might jeopardize noncombatants, captured Americans, or the appearance of neutrality on the part of Souvanna's government.

The original Barrel Roll campaign, begun in December 1964, gave way during the following April to a more extensive interdiction program called Steel Tiger. As the rains abated, infiltration increased and the number of air strikes multiplied, concentrating on the part of Steel Tiger closest to the South Vietnamese border, a region called Tiger Hound. Aircraft hit trucks, storage and bivouac areas, bridges, buildings, and antiaircraft sites. In December 1965 B-52s dropped their first bombs on the Ho Chi Minh Trail.

Although American aircraft had by the end of 1965 claimed the destruction of more than 1,000 trucks, along with structures of every sort, including bridges, few results could be verified and the number of the enemy killed could not be determined. Infiltration continued not only through Laos, but also by way of Cambodia and the demilitarized zone and by sea. As time passed, the carefully camouflaged network of roads and trails, waterways and pipelines, depots and bivouac areas steadily expanded in southern Laos, and the enemy established a logistics complex in Cambodia.

Because of the troops and cargo that traveled the infiltration and supply routes, the tempo of the fighting in South Vietnam continued to increase despite an enemy death toll that rose from an estimated 35,000 in 1965 to as many as 181,000 in 1968. Realizing the importance of the Ho Chi Minh Trail through southern Laos in sustaining the war in South Vietnam, the United States early in 1966 intensified the air campaign against this route and experimented with a number of new interdiction techniques. Until the rains arrived in May, Air Force, Navy, and Marine Corps aircraft flew more than 6,000 sorties, cratering roads and destroying 1,000 trucks, along with buildings, antiaircraft sites, and boats. World War II vintage A-26s began hunting and attacking trucks; the Combat Skyspot radar, which had proved effective in South Vietnam, began di-

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Trucks on the Ho Chi Minh Trail after a visit from an AC-130 gunship.

recting strikes in southern Laos at night and in bad weather; and AC-130 gunships equipped with special detection devices to locate and attack trucks moving by night saw their first action early in 1967. At times, South Vietnamese ground reconnaissance teams were flown by helicopter to the vicinity of the trail to locate targets and call for air strikes.

Meanwhile, the B-52s began making a greater contribution to the interdiction effort, flying some 400 sorties against portions of the trail opposite the five northernmost provinces of South Vietnam between April and June 1966. Westmoreland sought to expand still further the use of the bombers by inaugurating a systematic campaign against the mountain passes leading from North Vietnam into Laos. The ambassador, however, vetoed the proposal, doubting both the effectiveness of the bombing and his ability to sell such a program to Souvanna Phouma.

The North Vietnamese reacted to the interdiction campaign by strengthening the antiaircraft defenses and by assigning troops and laborers to repair damage and build new routes, some of which would remain undetected for months, even years, under the jungle canopy. By mid-1966, Air Force reconnaissance craft had identified about 300 antiaircraft sites bristling with guns, mostly 37-mm types; the labor force by this time totaled an estimated 38 North Vietnamese engineer battalions and 16,000 civilian laborers, many recruited locally. A North Vietnamese transportation division controlled the entire operation, which included way stations, guides and food, and communications all along the roads and rivers.

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This transportation division, in attempting to make the Ho Chi Minh Trail secure, devised many techniques for avoiding detection from the air. As much as possible, trucks moved by night; in daylight they were camouflaged with green paint, tarpaulins, and tree branches. Whenever aircraft approached, moving trucks darted onto side roads and waited for at least an hour after the intruders had disappeared before resuming the journey. Bicycles, oxcarts, boats, and human porters supplemented the trucks in carrying supplies. Troops destined for the battlefields of South Vietnam also used the Ho Chi Minh Trail, usually traveling on foot in small groups. The soldiers were warned not to discuss their travel, make any unnecessary noise while en route, or leave litter on the road—in short, to avoid any action that might reveal their schedule or betray their presence. If aircraft did appear, the individual infiltrators either froze in their tracks, threw themselves down, or moved off the trail into the rain forest. The jungle proved a valuable ally of the North Vietnamese, for they tied together the tops of trees to create an extensive trellis that hid their movements and installations from searching aircraft. Trucks and infiltrating troops crossed rivers and streams without being detected on pontoon bridges that were hidden during daylight or on underwater spans made of sandbags. Telephone lines were strung along five-foot poles that were too short to cast the telltale shadows that might alert photo interpreters to the course of the trail. This sustained effort, requiring the full-time activity of tens of thousands of soldiers who might otherwise have been fighting in South Vietnam, seemed proof that the bombing of the Ho Chi Minh Trail had disrupted the North Vietnamese war effort.

In the summer of 1966, when the seasons changed and the infiltration shifted northward to the demilitarized zone, the aircraft assigned to operations in Tiger Hound followed suit and began bombing in the Tally Ho area just north of the zone. Early in 1967, when the dry weather returned to southern Laos, the Air Force stepped up its bombing attacks, its efforts at night interdiction, and its support of ground probes of the Ho Chi Minh Trail. These operations, and the attempt to turn the roads and trails to mud by seeding the clouds to cause rain, failed to significantly reduce enemy infiltration. The Air Force attributed this failure to the need to consult the ambassador at Vientiane, which made the bombing in southern Laos, like the air war against North Vietnam, a tentative, sporadic undertaking.

In the meantime, Secretary McNamara, losing confidence in Rolling Thunder as a means of forcing the enemy to end the aggression in the South and negotiate an end to the war, began seeking a substitute for the bombing of North Vietnam less costly in lives and aircraft. He proposed, instead of intensified attacks on the heavily defended North, that air power join in a systematic effort to choke off the flow of men and equipment across the demilitarized zone and through southern Laos into South Vietnam. He ordered the establishment of what sometimes was described as “McNamara’s Wall”—a barrier of barbed wire and defensive strongpoints sealing the routes across the demilitarized zone and a

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field of electronic sensors detecting infiltration west of the zone through southern Laos. Work on the barrier along the demilitarized zone began during the second half of 1967 but was never completed; beset by shortages of transportation and materials and by poor roads, the project soon collapsed in the face of determined enemy resistance. Meanwhile, the electronic portion of the wall began to take shape. Under the guidance of the Air Force, Task Force Alpha came into being, its brain an electronic surveillance center built at Nakhon Phanom, Thailand, on the border with Laos. To monitor the movement of trucks and men along suspected segments of the Ho Chi Minh Trail, aircraft dropped acoustic and seismic sensors, along with thousands of tiny "button" bombs to help activate them. Orbiting EC-121s relayed signals from activated sensors to the center, where computers matched the information with previously stored data and controllers coordinated strikes by elements of General Momyer's Seventh Air Force.

Aircraft especially equipped for the operations of Task Force Alpha began arriving at Nakhon Phanom late in 1967. The Navy contributed a squadron of Lockheed OP-2E patrol bombers, which joined Air Force CH-3C helicopters in planting the sensor fields. Besides the helicopters, the Air Force supplied a squadron of F-4s to drop sensors in areas too heavily defended for the helicopters or the OP-2Es and eighteen A-1Es to dispense the tiny bombs that, when driven over or stepped on, emitted a noise that activated the sensors. A detachment of forward air controllers in O-1s arrived to direct both the placement of the mines and sensors and the strikes launched in response to the electronic data. Despite successful tests of the system on the trail in December, the full-scale inauguration of the program had to be postponed when the assigned aircraft were diverted in January to the defense of Khe Sanh. The marines manning the base benefited, however, from the sensors in pinpointing hostile movements and acquiring targets for air strikes or artillery.

Between December 1964 and the end of 1967, American aircraft flew 185,000 sorties of all kinds against the Ho Chi Minh Trail. Of this total, 80 percent were the work of the Air Force, which lost 107 of the 132 aircraft shot down over southern Laos during this period. As a result of the reduction and then the termination of Rolling Thunder, resources became available to transform the air campaign in southern Laos from essentially a dry-weather attempt at interdiction into a succession of sensor-assisted air campaigns, called Commando Hunt, that tried throughout the year to impede the infiltration of men and supplies.

The air war fought over northern Laos had a lower priority than operations over South Vietnam, North Vietnam, or southern Laos. Neither the communist Pathet Lao nor their opposition could recruit the forces or obtain the outside aid that would bring victory. North Vietnam used the Pathet Lao to protect the western flank of the Ho Chi Minh Trail; the United States hoped to safeguard the radar sites in Laos that directed the bombing of North Vietnam and, at the same time, tie down North Vietnamese resources that might be used to greater effect

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in South Vietnam or in southern Laos. The main antagonists, therefore, were more interested in keeping their Laotian factions in the field and fighting than in winning. Victory, after all, might require the diversion of men and materiel needed for more important operations elsewhere.

Disagreements arose over how air power could best sustain the forces loyal to the government and opposing the Pathet Lao. The American ambassador at Vientiane wanted to control the air support needed by the government forces and the irregulars recruited by General Vang Pao from the Meo tribe in the mountains of Laos. He tried repeatedly to persuade the Air Force to set aside aircraft for his exclusive use in providing close air support for the troops in northern Laos, but General Momyer resisted attempts to assign fighter-bombers to the ambassador or to the Laotian generals. Momyer's responsibilities extended from the Mekong delta to the demilitarized zone, including the roads and trails of southern Laos, and embraced every kind of air support from battlefield strikes to long-range interdiction. He was determined to retain the freedom to use his aircraft wherever and however he deemed best. Instead of continuing to maintain a few jet fighter-bombers on alert for operations in northern Laos, as his predecessor had done, Momyer preferred to allocate sorties from his overall force in response to requests from Vientiane. Although the Air Force increased the number of A-26s and A-1s assigned to Southeast Asia, types of aircraft well suited to the kind of war fought in northern Laos, the ambassador did not become his own air commander.

The fighting in northern Laos remained largely a war of proxies, with few Americans (or North Vietnamese, for that matter) serving there. The North Vietnamese provided supplies and a small core of disciplined soldiers for the Pathet Lao. An even smaller contingent of American airmen acted as forward air controllers for Vang Pao's army or operated the scattered radar sites that directed strikes in southern Laos and North Vietnam. Udorn in Thailand functioned as a pilot training center and maintenance depot for the fledgling Royal Laotian Air Force, and a C-130 flying out of Udorn functioned as an airborne command post for operations over northern Laos.

American aerial activity in northern Laos varied in intensity over the years. As an immediate consequence of the peace accord of 1962, the United States shifted its attention to South Vietnam and limited its activity in northern Laos to providing military aid, conducting the occasional show of force, and carrying out clandestine operations. These circumstances contributed to the creation of a loosely structured operating organization for which the embassy, the Central Intelligence Agency, and the military shared responsibility. Two years later, when civil war erupted despite the settlement of 1962, the United States sided with the Royal Laotian government against the communist Pathet Lao. After 1964 the fighting intensified, but by 1968 it had more or less settled into an annual pattern in which the Pathet Lao advanced onto the Plain of Jars in northern Laos during the dry season (winter), exposing its forces to air attacks that in-

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flicted casualties and hacked away at the supply and communication lines extending from North Vietnam. By the coming of the summer rains, the drive had spent itself, and the initiative passed to the government troops as the communists fell back to restock and regroup. In this annual cycle of combat, the Laotian government came to rely more and more on air power, both American and its own, and on the guerrilla army of Vang Pao.

Air Force pilots became proficient in the kind of close air support on which the Meo tribesmen depended. The first such strikes, delivered during a dry-season offensive by the Pathet Lao in 1965, demonstrated that Air Force units could work directly with the Laotian forces, whether regulars or Vang Pao's guerrillas. Laotian reliance on American air power increased during 1966, after the commander of the Laotian air arm launched an unsuccessful coup that undermined the morale and effectiveness of his organization as well as the government's confidence in its air force. The Americans had no choice but to supply the needed sorties until the Laotians could again fly them.

The reduction and later the cessation of the bombing of North Vietnam in 1968 changed all four of the air wars in Southeast Asia. The greatest change was in North Vietnam, where for more than three years American aircraft were only authorized to fly reconnaissance missions or to retaliate for some action by the enemy, usually an attack on reconnaissance craft. In South Vietnam, air power became a shield for the American disengagement and withdrawal. In Laos, the purpose of air operations remained interdiction in the southern part of the country, preventing the enemy from building up for a final onslaught as American strength in South Vietnam declined. In the north, the objective was to tie up resources that the North Vietnamese might otherwise use to turn the American withdrawal into a rout. As a result, air power no longer used against North Vietnam found ready application in South Vietnam and in the two wars being fought in Laos.

## Chapter 20

# Vietnamization and Withdrawal, 1968-1975

John Schlight

**B**y imposing a limit on American participation in the war—the effect of decisions made following the Tet offensive of early 1968—the administration of President Lyndon B. Johnson began modifying the partnership between the United States and South Vietnam. The ultimate objective remained a free and independent South Vietnam, but the United States no longer pursued that goal by means of a bombing campaign in the North and by a war of attrition in the South fought largely by American troops. Instead, the United States began to train and equip the South Vietnamese to take over the war, while at the same time engaging in negotiations with the enemy to end the fighting and acknowledge the right of South Vietnam to exist. North Vietnam proved willing enough to talk; in May 1968, after Rolling Thunder diminished in scale, the Hanoi government entered into preliminary discussions at Paris that involved the United States, South Vietnam, and, after much haggling, the political leaders of the Viet Cong. Not until January 1969, after Rolling Thunder had ended and when Richard M. Nixon, a Republican, was about to take the oath of office as President, did the preliminaries end so that the negotiators could begin addressing issues of substance. The discussions soon revealed that North Vietnam, al-

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though willing to participate, would make no major concessions that might jeopardize the ultimate conquest of the South; fight and talk became their national policy, which persisted after the death of Ho Chi Minh in September 1969.

The Nixon administration took over the basic strategy adopted by President Johnson and named it Vietnamization, a label proposed by Secretary of Defense Melvin R. Laird. The original choice, “de-Americanization,” had seemed not only less euphonious but also hurtful to South Vietnamese pride since its use acknowledged that the United States had indeed taken over the war. Ideally, as Vietnamization progressed, freshly equipped and newly trained South Vietnamese would in an orderly fashion assume full responsibility for fighting the war. The Americans in the ground forces, which contained the greatest share of draftees and suffered the most casualties, would be the first to depart as the South Vietnamese took over. In this way, the toll of Americans killed and wounded would decline sharply; and this benefit of Vietnamization would affect a large segment of the nation’s populace, the families of the draftees, thus encouraging widespread support, if not for the war itself, at least for the manner in which it was being liquidated. However, the reduction of American casualties, and the accompanying political effects of the reductions, soon took precedence over the difficult job of fitting out and training the armed forces of South Vietnam. Henry A. Kissinger, the national security adviser to President Nixon (and after August 1973, the Secretary of State), warned early in the process of Vietnamization that troop withdrawals would become “salted peanuts” for the American people, with each one whetting the public’s appetite for another. Kissinger was correct. He acknowledged years afterward that by late summer of 1969, “We were clearly on the way out of Vietnam by negotiation if possible, by unilateral withdrawal if necessary.”<sup>1</sup>

The emphasis on bringing the men home represented an attempt to placate the antiwar movement in the United States, which since 1965 had mounted several large public demonstrations against American policy in Southeast Asia. The motives of the demonstrators varied from a sincere belief that the war was morally wrong to a fear of being drafted and possibly serving in South Vietnam. By embarking on a well-publicized course of disengagement and withdrawal (and later by easing the impact of the draft preparatory to abolishing it altogether), the Nixon administration bought time for negotiation but at the same time relaxed the pressure on North Vietnam to respond. The United States clearly was leaving South Vietnam, but North Vietnam had no intention of doing so. The American withdrawals thus represented a concession by the Nixon administration to the antiwar faction rather than a reaction to concessions by the communist side in the peace negotiations. Not even a series of secret discussions between Kissinger and representatives of North Vietnam could persuade the communists to accept a program of mutual troop withdrawals.

Vietnamization in all its aspects—disengagement, withdrawal, and the strengthening of South Vietnamese forces—permeated American efforts in

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Southeast Asia, affecting all four of the wars in which the Air Force was engaged: the fighting over North Vietnam, South Vietnam, northern Laos, and southern Laos (which came to include Cambodia). From late 1968 until the spring of 1972, when a North Vietnamese invasion of the South caused a reorientation of air operations, every undertaking by the Air Force—overt or secret, authorized or unauthorized, inside South Vietnam or outside the country—was designed to facilitate in some way the withdrawal of American combat forces, their replacement by South Vietnamese, and the negotiation of an end to the war. During 1965 air power had protected the build-up of American ground forces in South Vietnam; now it formed a shield for their withdrawal.

In South Vietnam, throughout the years of Vietnamization and withdrawal, air power, ranging from strikes by fighter-bombers to the battering delivered by B-52s, helped defeat the enemy or hold him in check in a number of battles. The fighting often erupted at fire support bases or other outposts, but the most significant action of this period took place at Ap Bia mountain in the spring of 1969 during a raid on the supply depots within the A Shau Valley. An initial probe revealed that the mountain was an enemy stronghold; air power and additional troops had to be employed for its capture. The soldiers fighting there began calling the objective “Hamburger Hill,” as troops were fed into what seemed to them like the military equivalent of a meat grinder. The mountain was finally conquered at the cost of 56 Americans killed, with more than ten times that number of North Vietnamese dying in its defense, but the victors promptly withdrew. Lt. Gen. Phillip B. Davidson of the Army, at the time a staff officer with the military assistance command, declares in his book, *Vietnam at War*, that the battle “catapulted the doves into shrill flight,” but what troubled opponents of the war like Senator Edward M. Kennedy, a Democrat from Massachusetts, was not so much that 56 soldiers had died capturing an important mountaintop, but that the objective had been abandoned once it was overrun.<sup>2</sup> In Kennedy’s opinion, this latest search and destroy operation had given away what Americans had sacrificed their lives to capture, an objective that might well have to be taken again at further cost. Apparently the Nixon administration shared the senator’s concern that lives were being squandered, for the Chief Executive in the aftermath of the Hamburger Hill fighting instructed Gen. Creighton W. Abrams, who had succeeded Gen. William C. Westmoreland as Commander, U.S. Military Assistance Command, Vietnam, to limit American casualties.

Davidson argues in his volume that the battle for Ap Bia mountain and the resulting Presidential decision to hold down casualties marked another turning point in the war, since it deprived the American forces of a sense of purpose by acknowledging that this was indeed a “no-win” conflict. Beginning in 1969 and accelerating in subsequent years, morale and discipline did decline, in part because the war was being liquidated.<sup>3</sup> Put as starkly as possible, no one wanted to be the last American killed in Southeast Asia. Other factors, however, affected the armed forces during the period of Vietnamization and withdrawal. Some,

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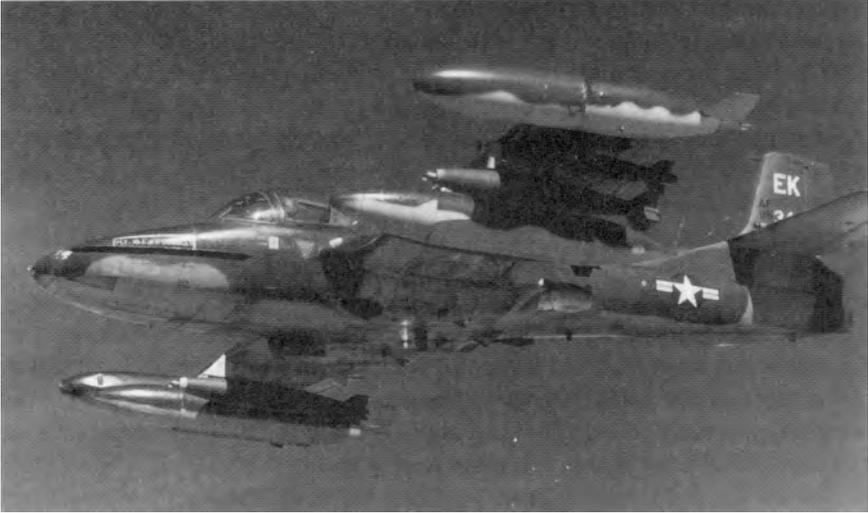
like racial strife and the abuse of alcohol and drugs, were embedded in contemporary American society; others, like opposition to the war, had shallower roots. Although the opponents of the Vietnam conflict remained a small, if articulate, minority, the American public was undeniably becoming indifferent toward the war, and servicemen felt that their sacrifices were barely acknowledged, let alone appreciated. Conditions in Southeast Asia put a unique stamp on these behavioral problems and on the growing sense of alienation. For example, members of the different races, who had cooperated in combat to survive, might be at each other's throats when not in danger from the common enemy; but racial animosity was not the only problem to surface in the rear areas. Boredom punctuated by fear of rocket or mortar attack, isolation from what was familiar and pressure from peers, and ready access to alcohol and drugs created a subculture of dependency. Drug abuse represented a problem that the services had not encountered previously; when punishment did not work, treatment programs had to be established.

During this turbulent time, the armed forces fell woefully short of their standards for disciplined behavior. Orders were disobeyed; and in the ground forces, unpopular officers and noncommissioned officers were attacked, even killed. At My Lai in 1968, scores of unarmed villagers believed to have aided the enemy were shot to death. Scandals erupted involving kickbacks and thefts at military clubs, and an Air Force transport assigned to the embassy at Saigon was used to smuggle drugs. Bad as these times were, the armed forces survived as institutions, in part because the war ended—with it the strains that had contributed to alienation and demoralization—but also because of the positive effects from efforts made to improve race relations, treat drug addiction and alcoholism, and root out crime and punish the criminals.

However much it may have contributed to the decline in morale and the breakdown of discipline, the struggle for Hamburger Hill clearly signaled the end of the massive American search and destroy operations that symbolized the war of attrition fought in South Vietnam. For the soldier or marine hacking through the undergrowth or the airman bombing North Vietnamese troops within yards of some embattled outpost, the result may well have seemed a distinction without a difference, but the fact remained that husbanding American lives now took precedence over killing the enemy. The statisticians continued their arcane work long after the resignation of Secretary of Defense Robert McNamara, who had relied so heavily on statistics. They turned from the standard yardstick of attrition, the kill-ratio of Americans to enemy soldiers, to charts and graphs depicting progress in equipping and training the expanded armed forces of the Republic of Vietnam. The war in South Vietnam became a race against time, an effort to prepare the South Vietnamese to take over the war before the American withdrawal thrust it upon them.

In terms of aircraft for the South Vietnamese Air Force, Vietnamization began (and ended, for that matter) as a matter of quantity more than quality. The num-

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A Cessna A-37 headed for a bombing mission over South Vietnam.

ber of operating squadrons doubled by 1972 from 20 to 40, but the additional aircraft were Northrop F-5s, which were not standard fighter-bombers in the U.S. Air Force; A-37s, Cessna T-37 trainers modified for use as attack aircraft; helicopters provided mainly by the Army; and old C-123 transports. Both the F-5 and the A-37 were short-range aircraft suitable mainly for operations within South Vietnam. The only Air Force gunships made available to the South Vietnamese, derived from the slow and vulnerable C-47 and C-119 transports, were useful mainly for defending outposts against infantry attack, especially at night. The modernization and expansion programs that produced the 40 squadrons excluded aerial tankers, the more modern of the gunships, F-4s, and B-52s. Even the C-130 transport was a late addition to the South Vietnamese inventory of aircraft. The usual justification for withholding aircraft was that the particular model either was not needed for self-defense or was too complicated for the South Vietnamese to fly and maintain.

The American concern that South Vietnam's air arm might be unable to absorb the most modern equipment was founded in fact, at least when Vietnamization began. The possibility that a more intensive program of training might have made a difference is arguable at best. Instruction remained geared to the equipment the South Vietnamese were receiving and encountered serious obstacles. When the Vietnamization of the air arm began in earnest in 1969, that service was an estimated two years behind the army, which had expanded in 1967. Even as their instructors tried to make up for lost time, South Vietnamese training to be pilots or mechanics rapidly had to master highly technical subjects, a truly discouraging task since few of the trainees had either the fluency in English or the technical

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background to absorb the instruction easily. Training posed the most difficult obstacle to expanding and equipping the South Vietnamese Air Force.

Whatever the problems that lay ahead, some 65,000 American troops, including slightly more than 2,500 airmen, left the country in 1969, as the actual American strength in South Vietnam declined from a peak of almost 550,000 early in the year to 484,000 by the end of December. Tactically, the proportion between air and ground reflected the fact that air power had to compensate for the diminishing size of the ground force, but other considerations were involved. The Air Force not only suffered fewer casualties than the combat arms of the Army and Marine Corps but also relied on volunteers rather than draftees, although some of those who donned its uniform had no doubt been motivated by fear of the draft and possible combat service in the infantry. The death or wounding of a comparatively few volunteers—a proportion of them pilots, who were long-term or career officers—seemed likely to have less impact on the public than more numerous casualties among draftees.

For the U.S. Air Force, Vietnamization got underway in 1969 when the air arm of South Vietnam grew from 17,500 officers and airmen and 400 aircraft to a total strength of 36,000 with 450 aircraft. The disparity in growth between manpower and aircraft resulted from the time needed to train men to service and operate the new airplanes. The process of learning took many forms. For example, the Air Force arranged for South Vietnamese and American airmen to serve side by side in the air support centers of each corps preparatory to a transfer of responsibility for the entire tactical air control system. At the same time, South Vietnamese forward air controllers and air liaison specialists assumed a greater role in directing air strikes, including those flown by American aircraft. The number of sorties by South Vietnamese forward air controllers increased during the year from 505 in January to 1,083 in December, expanding from 10 to 25 percent of the total flown. A similarly encouraging increase took place in the aggregate sorties flown by the South Vietnamese; from 55,000 in the first quarter of 1969 the number rose to 74,000 during the last three months of the year, a tribute to improving maintenance as well as to flying skill. Meanwhile, the infrastructure of bases changed to support South Vietnam's increased share of aerial operations. By October 1969 the U. S. Air Force had virtually turned over to the South Vietnamese the air base at Nha Trang, and by early the following year airmen of the two nations worked together at Da Nang, Pleiku, Bien Hoa, Binh Tuy, Soc Trang, and Tan Son Nhut.

Growth continued throughout 1970. By year's end, the South Vietnamese Air Force had thirty squadrons organized into five air divisions, ten tactical wings, five maintenance wings, and seven air base wings. The greatest increase in aircraft had come in helicopters, with transfers from the U.S. Army raising the total from 112 to 310. More important than numbers of aircraft, the South Vietnamese flew half of all the strike sorties in their nation. The greater participation by South Vietnam's air arm was necessary because more was being demanded of air power and fewer U.S. Air Force units were available to respond; during 1970, 150,000

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A flight of South Vietnamese Air Force F-5s returning from a bombing mission.

Americans departed, including more than 10,000 airmen and 11 of the 20 fighter squadrons based in the South, reducing the total American strength in the country to 334,000.

The withdrawal of American forces continued into 1971, with an additional 50,000 leaving in the spring, en route to a year-end objective of only 184,000 Americans still serving in South Vietnam. Since the need of an aerial shield for the dwindling ground force continued, so too did the expansion of the South Vietnamese Air Force. The air arm ended the year with 1,222 aircraft, including 500 helicopters, a second squadron of AC-119 gunships, and three squadrons of C-123s added to the two on hand when the year began. Although the number of fighter squadrons remained at nine throughout the year, pilots gained experience as they flew 63 percent of all strike sorties in South Vietnam and 39 percent of those in Cambodia, where the fighting had spread in 1970.

Despite the greater burden being assumed by South Vietnamese airmen, the United States persisted in its refusal to equip them with the latest aircraft, particularly for air defense and interdiction. A surge in MiG activity over Laos during late 1971 persuaded the Department of Defense to accelerate South Vietnam's acquisition of 57 F-5Es fitted out for air defense. The South Vietnamese had not received the means to interdict the Ho Chi Minh Trail because of the tacit assumption that the Commando Hunt series of attacks in southern Laos would continue, but Secretary of Defense Laird insisted in 1971 that South Vietnam's air arm be given an interdiction force that, although not the equal of

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the American operation centered at Nakhon Phanom, could to some extent disrupt the flow of men and supplies from North Vietnam. The Americans proposed that ground patrols sow modest-sized sensor fields to find targets for a five-squadron fleet of single-engine mini-gunships. Testing began in Florida of a short-takeoff-and-landing airplane, the Fairchild Peacemaker, which was to serve as the gunship. Neither the Air Force, the Military Assistance Command, nor the Pacific Command displayed much enthusiasm for the project; the addition of a multibarrel machinegun made the aircraft overweight and dangerously unstable. By the time the aircraft was ready for a combat test, the enemy had overrun the area where the gunships were to have operated, and South Vietnam never acquired the means for aerial interdiction.

The South Vietnamese, besides lacking a satisfactory weapon for aerial interdiction, did not receive the training or equipment necessary to conduct the kind of search and rescue operations that in the course of the war saved 3,883 persons from death or capture. Excluded from Vietnamization were the HH-3 and HH-53 helicopters and the HC-130P, a combination airborne command post and aerial tanker. Although all three served the Americans well, the Air Force did not transfer these aircraft to the South Vietnamese. Even so, Vietnamization interfered with the American rescue forces, which were displaced by an expanding South Vietnamese Air Force from their normal operating bases close to the likely scenes of aerial action.

Although the South Vietnamese air arm could not interdict traffic on the Ho Chi Minh Trail or rescue downed airmen, it continued to progress in other fields. By early 1972, for instance, it had assumed virtually full responsibility for the tactical air control system within the country. Officers and enlisted men trained by the Americans ran the control centers and also served as air liaison specialists with ground units. The Air Force forward air controllers turned most of the country over to their South Vietnamese counterparts and continued to operate only in the vicinity of Bien Hoa and Da Nang.

Until the spring of 1972, when North Vietnam invaded the South, the Commando Hunt series continued in dry season and wet, as the Air Force fought its war in southern Laos. Over the years, marauding aircraft, often responding to sensor signals, claimed to have damaged or destroyed a vast number of cargo-laden trucks, as many as 25,000 in a single dry season, and to have touched off tens of thousands of secondary explosions, which served as proof of successful attacks on supply caches. Yet, these claims and the impact on the enemy defied verification. Cameras and most other airborne sensors could not penetrate the jungle canopy; and with the passage of time, stronger defenses on the ground made it increasingly difficult for intelligence patrols to move into the maze of roads, trails, waterways, pipelines, supply storage areas, and troop bivouacs of the Ho Chi Minh Trail in southern Laos. Improved aerial sensors like infrared detectors, radar, and low-light-level television proved effective over the more exposed portions of the trail; and ever more devastating firepower that includ-

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ed laser-guided bombs, 40-mm cannon instead of 20-mm, and a 105-mm howitzer installed in some gunships increased the likelihood of destructive hits. Despite the greater potential for detection and destruction, comparatively few truck carcasses were seen, and the level of enemy activity in South Vietnam remained essentially constant. In an attempt to determine the effectiveness of the Commando Hunt campaigns, analysts carefully studied the patterns of sensor activation, listed as destroyed only those trucks seen to explode or burn, subtracted only that number from the estimated North Vietnamese inventory, and assigned an arbitrary weight of cargo, depending largely on the direction of travel, to each truck that air power eliminated. Unfortunately, even this analysis proved a better measure of effort than of results.

Since an aura of uncertainty surrounded the calculations of trucks and cargo destroyed, officials in the Department of Defense proposed a new target, manpower, that was judged more likely to affect the resolve of the North Vietnamese and their leadership. However, American intelligence had to locate the bivouac areas that the People's Army of North Vietnam used during the march southward before the B-52s that normally attacked truck parks and supply depots could be directed against infiltrating troops. American officials believed that the impact of aerial interdiction could be multiplied if these areas were located and the bombing proved accurate. Other communist states, these analysts reasoned, would replace trucks and their cargo, with no real cost to North Vietnam, but the killing and wounding of infiltrating soldiers would exact a direct penalty, forcing the North Vietnamese and their leaders to reconsider the wisdom of continued aggression. During the testing period for the new concept of targeting, the bivouac sites proved as hard to find as other components of the trail network; results were at best inconclusive when the aerial interdiction campaign ended.

Whether paying in lives or materiel, the North Vietnamese did not shrink from the cost of keeping the Ho Chi Minh Trail operating. Part of that price entailed the deployment of more and deadlier antiaircraft weapons, along with their crews, to protect the logistics complex. During the spring of 1972, the proliferation of antiaircraft guns, the appearance of surface-to-air missiles within Laos, and the more aggressive use of MiGs changed the nature of the air war over southern Laos. Air Force fighters had to escort missions against the trail, not only to suppress antiaircraft fire but also to deter the North Vietnamese interceptors, and gunships had to be fitted with jamming equipment to blind the radar directing the surface-to-air missiles. Despite such measures, the enemy succeeded for a time in driving the gunships, certainly the deadliest of truck killers, away from portions of the Ho Chi Minh Trail.

The main purpose of the air war in southern Laos was to disrupt the enemy's efforts to mass troops and stockpile supplies for an assault timed to catch the Americans as their withdrawal from South Vietnam neared its completion. The campaign of interdiction the Air Force conducted in southern Laos was extended secretly and on a lesser scale into Cambodia in the spring of 1969. The

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Cambodian ruler, Prince Norodom Sihanouk, in the hope of appearing neutral and thus preserving the independence of his nation, attempted to accommodate both the United States and North Vietnam. Taking advantage of Sihanouk's ambivalence, the Hanoi government established a supply line extending inland from the port of Sihanoukville to a complex of military bases and storage areas on Cambodian soil along the border with South Vietnam. When a North Vietnamese defector pinpointed the location of the headquarters in Cambodia that directed operations along the border and inside South Vietnam, General Abrams requested permission for an air attack. President Nixon approved a secret strike by B-52s, delivered on March 18, which, judging from the violent reaction when a reconnaissance patrol arrived at the scene by helicopter, may well have hit the intended target. This raid served as the precedent for a series of secret bombing attacks against the six North Vietnamese bases within Cambodia, a campaign that lasted 14 months and totaled 3,875 sorties.

In keeping with his policy of appeasing both sides, Prince Sihanouk did not object to the bombing of a region dominated by the communists and no longer under the control of his government, but he raised to the status of an embassy the Viet Cong diplomatic mission to Phnom Penh, his capital city, and made no move against the North Vietnamese supply line passing through Cambodia. A group of dissident Cambodian generals, headed by Lon Nol, took advantage of Sihanouk's absence from the country and tried to end his policy of accommodation by expelling the North Vietnamese from their bases. On March 18, 1970, the anniversary of the first of the secret strikes by B-52s, Lon Nol declared the absent leader deposed and moved against the enemy. Resources failed to match determination, however; not only was Lon Nol's army unable to defeat the North Vietnamese and their Cambodian communist allies, his aggressiveness seemed likely to prod them into a counterattack that might well overrun the entire country. Since the bases located along the South Vietnamese border, besides threatening the American policy of Vietnamization and withdrawal, sustained operations against Lon Nol, President Nixon approved an invasion of this part of Cambodia. The American "incursion," as the President preferred to call it, began on May 1 and lasted until the end of June; South Vietnamese troops then took over, but American air operations continued.<sup>4</sup>

The American attack into Cambodia had both immediate and long-term military effects. The operation resulted in the destruction of a huge quantity of food and munitions stockpiled mainly for operations in South Vietnam, including 7,000 tons of rice and weapons enough to equip 74 battalions with rifles and 25 battalions with mortars and machineguns. Estimates of the short-term impact on the enemy varied, but Kissinger concluded that the loss of food, ammunition, and weapons represented a 15-month setback for North Vietnamese plans. The cost in American lives totaled 338, with 1,525 wounded. Yet, even as it reaped these benefits for the near future, the United States assumed an abiding responsibility for the survival of the Lon Nol regime. The fate of the Khmer Republic, which

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A portion of the weapons discovered in Cambodia during the 1970 invasion.

Lon Nol proclaimed at Phnom Penh, depended in large measure on the success of the South Vietnamese in preventing the reestablishment of the destroyed bases. Unfortunately the Army of the Republic of Vietnam, in spite of American air support, proved unequal to the task. Supplied by the North Vietnamese, local communist forces advanced steadily, eventually isolating Lon Nol's capital except for airlift and the convoys, escorted by aircraft and makeshift gunboats, that forced their way up the Mekong River. The Cambodian army, hurriedly expanded, armed, and trained, never outgrew its dependence on American air power to hold the enemy at bay, and the air war in Cambodia, undertaken to complement the campaign of aerial interdiction in southern Laos, continued after the United States and the two Vietnams had agreed to a cease-fire.

In the United States, the political impact of the invasion was sudden and violent, but also subtle and long lasting. Lulled by the American withdrawals—just ten days before the attack, the President had promised that another 150,000 troops would leave South Vietnam within 12 months—the antiwar movement erupted in outrage at this extension of the war. Not only did demonstrations disrupt college campuses throughout the nation, a number of government officials, ordinarily expected to support the administration, declared their opposition and resigned or, like Secretary of the Interior Walter J. Hickel, were dismissed. During an antiwar demonstration at Kent State University, a contingent of the Ohio National Guard, which the governor had mobilized to maintain order, fired into a crowd, killing four and wounding nine.

The invasion of Cambodia and the shootings at Kent State further split an already deeply divided nation. An estimated 500,000 opponents of the war assem-

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bled in Washington, and that same day, 150,000 marched in San Francisco. The administration denounced those who demonstrated against the war, especially the students; the President's supporters rallied to his cause and, in the case of construction workers in New York City, clashed with the antiwar faction. The period of comparative harmony that followed the announcement of Vietnamization and the first troop withdrawals vanished, although temporarily. Further reductions in American forces assigned to South Vietnam and the first steps toward an all-volunteer army restored the calm, but the sudden outburst of opposition triggered by the invasion of Cambodia cast a long shadow. Throughout the remainder of the war, President Nixon remained concerned about a resurgence of antiwar sentiment and its possible effect on Congress. His worries, moreover, were grounded in fact, for the political aftermath of the invasion of Cambodia included the repeal of the Tonkin Gulf Resolution of 1964, at most a symbolic protest of the way in which the war had metastasized, and enactment of the Cooper-Church amendment and the War Powers Act.

The Cooper-Church amendment began as an immediate response to the Cambodian incursion. Senators John Sherman Cooper, a Republican from Kentucky, and Frank Church, a Democrat representing Idaho, offered an amendment to military assistance legislation prohibiting the further use of American forces in Cambodia without the express consent of Congress. The Senate adopted the rider, but the House of Representatives refused. By year's end, after months of debate, a defense appropriations act emerged containing a revised version of the amendment that ignored Cambodia, from which the American troops had withdrawn, and in effect forbade the introduction of ground forces into Thailand or Laos.

Unlike the Cooper-Church amendment, the War Powers Act from its inception addressed basic political questions rather than a transitory crisis like the invasion of Cambodia. Concern over the involvement of the nation in the Vietnam War and the expansion of that conflict, largely by executive action, caused Congress to assert greater control over the military aspects of the nation's foreign policy. In October 1973, both the Senate and the House of Representatives passed legislation that required the President to report within forty-eight hours if he should commit American troops overseas or if he "substantially" enlarged an existing commitment. The military involvement would have to be terminated after sixty days, plus an additional thirty days for withdrawing the force, unless Congress decided otherwise. After warning that such a law would impose "unconstitutional and dangerous" restrictions on Presidential authority and "seriously undermine this nation's ability to act decisively and convincingly in times of international crisis," President Nixon vetoed the legislation. Congress voted to override, however, and the War Powers Act became law.<sup>5</sup>

Less than a year after the invasion of Cambodia, South Vietnamese forces, with the encouragement of General Abrams, attacked Laos. From Khe Sanh,

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which American forces had reoccupied to serve as a supply base, the assault troops advanced toward the site of Tchepone, a village astride the Ho Chi Minh Trail that had long ago been abandoned and bombed to rubble. After reaching Tchepone and destroying the materiel stockpiled in the vicinity, the South Vietnamese planned to withdraw by way of the A Shau Valley, rooting out supply caches and disrupting the passage of men and cargo through that conduit for infiltration. The Cooper-Church amendment limited the degree of assistance that American forces could provide to air support and, as a result, the South Vietnamese divisions had to attack without their American advisers and air liaison parties.

The attack, launched on February 8, 1971, was poorly planned and badly executed. Despite precautions designed to preserve secrecy, the North Vietnamese became aware, at least in general terms, of the operation and redeployed their forces accordingly. Moreover, planners at the headquarters of the Military Assistance Command, Vietnam, overestimated the ability of low-flying helicopters to survive on their own in the face of hostile antiaircraft fire, which proved far more intense than anticipated, and had to call for help from Air Force fighter-bombers and B-52s. The contribution of the Air Force varied from flak suppression so that helicopters could disembark their troops, to strikes against North Vietnamese infantry closing in on the outposts thus established, and ultimately to attacks on tanks bearing down on the retreating South Vietnamese. Bad weather hampered close air support by the fighter-bombers, which on one occasion broke off their support of a beleaguered South Vietnamese strongpoint to participate in the attempted rescue of the crew of a downed F-4. Throughout the invasion, President Nguyen Van Thieu of South Vietnam sought to avoid the kind of casualties that might undermine his nation's support of the war, behaving much as his American counterpart had in the aftermath of Hamburger Hill. When the South Vietnamese leader judged that the losses were becoming unacceptable, he called a halt to the operation, a decision that left the invasion force scattered and vulnerable to the devastating North Vietnamese counterattack. Although a raiding party did land by helicopter near Tchepone to create an illusion of victory, the withdrawal became a rout as the enemy attacked, driving the South Vietnamese back across the border in headlong flight. The operation had attracted a North Vietnamese force of perhaps 40,000, with as many as 20,000 killed or wounded, mostly victims of air attacks, thus easing the pressure on the Americans who had not yet left South Vietnam. However, the number of South Vietnamese killed and wounded equaled from a third to a half of the North Vietnamese total, and the action only disrupted traffic on the Ho Chi Minh Trail temporarily. According to the reckoning of General Davidson, an intelligence officer for Generals Westmoreland and Abrams, after no more than a few weeks the enemy again channeled men and cargo through the area around Tchepone. This latest operation in the campaign against the enemy's supply lines in southern Laos had proved inconclusive at best.

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The Plain of Jars, Laos, and the burial urns that give the plain its name.

The air war the Air Force waged in northern Laos resembled the fighting in Cambodia, as a hard-pressed ally came to rely more and more on American air power. The combat in northern Laos flared sporadically in two areas—on the Plain of Jars and along the Ho Chi Minh Trail. On the Plain of Jars, the Meo tribesmen commanded by Vang Pao depended on aerial bombing to stop the annual dry season offensive launched by the communist forces, which over the years included an increasingly larger proportion of North Vietnamese. Once this attack had lost momentum, Vang Pao advanced, trying to take advantage of the mobility of his irregulars to isolate the strongpoints opposing him and force a withdrawal by an enemy shaken by bombing and, because of air strikes against his supply lines, desperately short of food and ammunition. To the south, nearer the border with South Vietnam, other troops loyal to the government of Prime Minister Souvanna Phouma occasionally mounted threats to the western fringes of the Ho Chi Minh Trail but were unable to interfere with the traffic it carried.

The fortunes of war fluctuated with the season. At the onset of dry weather, usually in November or December, the Pathet Lao, spearheaded by North Vietnamese soldiers, pushed boldly onto the Plain of Jars. The government at Hanoi, unwilling to ignore the real prize, South Vietnam, did not divert enough men and material to crush the Meo; and by the time the rains began falling in May or June, the communists were bloodied, exhausted, and eager to fall back to their supply bases nearer North Vietnam. Vang Pao's irregulars materialized

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around the enemy's outposts at the beginning of the rainy season when the annual retreat was about to begin. The subsequent pursuit produced varying results—in 1970 the Meo reoccupied almost the entire Plain of Jars—and continued until Vang Pao's tribesmen were utterly spent, the communists had replenished themselves, the skies had cleared, and the cycle was about to begin again. Over the years this process worked against the Meo general; since he obtained his soldiers exclusively from among his mountain people, the recruiting base was limited and subject to steady attrition, forcing him to turn increasingly to boys and old men. Reinforcements might come from elsewhere in Laos, but the royal army had thus far shown little aggressiveness in its forays toward the Ho Chi Minh Trail.

The situation seemed so bleak early in the dry season of 1968–1969 that Souvanna in June 1969 decided to make public both the presence of North Vietnamese troops in his country and the American bombing along the Ho Chi Minh Trail and in northern Laos. The Laotian premier was careful, however, to point out that American air power was the only weapon that could hold the North Vietnamese in check. In commenting on Souvanna's statement, which aroused no public controversy in the United States where the Nixon administration had just taken office, the Department of State drew a distinction between the two air wars being fought in Laos: operations against the trail were an extension of the war in South Vietnam and would continue as long as there was fighting in that country; those in the northern part of the kingdom were directed against the North Vietnamese intruders and might end in the unlikely event the Hanoi government withdrew its forces. Souvanna failed in his attempt to dramatize his nation's plight and gain international support, but the immediate military crisis abated and the annual pattern of warfare reasserted itself.

Because air power was an effective means of checking the North Vietnamese and economical in terms of the loss of American life, the Air Force undertook various measures to improve its own operations and those of the Laotians. During 1969, the Royal Laotian Air Force, recovered from the effects of the mutiny of three years earlier, received new equipment like the AC-47 gunship and underwent a housecleaning as the American air attaché at Vientiane tried to suppress smuggling. The misuse of aircraft for this purpose could not be ended, but it was made more difficult by circulating a schedule of all administrative flights among the senior officers in the hope that those who were honest would take action against the obvious abuses, such as apparently purposeless flights to areas dealing in gold or drugs, while those who were not honest would join in demanding greater control because the profits were not being divided equally. In addition, Air Force instructors began training Meos to fly T-28s in support of Vang Pao's troops, and these pilots demonstrated a willingness to run almost any risk to help their fellow tribesmen on the ground.

In general, the weapons and tactical refinements employed by the Air Force reflected the gravity of the military situation and the dependence of the ground

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A Laotian T-28.

forces on air power. The use of laser-guided bombs increased and would increase even more as the years passed. The number of forward air controllers flying in Laos grew, and some began using jets instead of O-1s. To facilitate the diversion of fighter-bombers to meet emergencies in northern Laos, the Seventh/Thirteenth Air Force distributed lists of standby targets with enough information on each so that a pilot arriving on the scene would have a clear idea of the target and its defenses. In February 1970, with a communist dry-season offensive gathering momentum, B-52s flew their first bombing mission in northern Laos, a disappointing strike that produced 130 secondary explosions but, according to a reconnaissance team that examined the target, only 20 enemy dead. In May of that year, F-4s again began standing alert at Udorn in Thailand, the revival of a practice abandoned by Gen. William W. Momyer when he commanded the Seventh Air Force. Other aircraft that saw action in northern Laos included the AC-119K and AC-130 gunships; the OV-10, a twin-turboprop aircraft designed by North American Rockwell for observation and armed reconnaissance in counterinsurgency operations; and for a time in 1972, the F-111.

Neither the arsenal of aerial weapons nor the use of Combat Skyspot and other bombing aids to improve accuracy could do more than buy time, and even this delaying action became more difficult. As the American withdrawals from South Vietnam continued, fewer sorties were available for attacks in northern Laos. The North Vietnamese, moreover, began sending MiGs against American aircraft operating in the region. The first intervention of this kind, on December 17, 1971, resulted in the downing of three F-4s, victims of surprise and the inexperience of their crews. Afterward, when the Soviet-built interceptors ap-

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A North American Rockwell OV-10 Bronco in South Vietnam, 1969.

proached, propeller-driven aircraft like the gunships or OV-10s retreated westward and F-4s jettisoned their bombs to engage the enemy. During February and March of the following year, Air Force fighter pilots shot down three MiGs.

By the time the MiGs appeared, American air power had again halted the annual communist advance, but the invasion of South Vietnam absorbed the sorties that would otherwise have supported Vang Pao's advance and harried the North Vietnamese retreat. By the spring of 1972, air support had become even more critical to the Meo general, whose army was on the verge of collapse after years of unceasing attrition. Vang Pao tried to rally his exhausted force and inspire it to further action, but the physical and emotional price exacted from the Meo over the years proved too great. The subsequent battles had to be fought mainly by an improved royal army, which performed well against the Pathet Lao and, when sufficient aircraft could be spared from higher priority operations in South Vietnam and North Vietnam, could hold its own even against the North Vietnamese. Victory remained elusive, however; like the fighting across the border in the two Vietnams, the struggle in northern Laos ended in a cease-fire.

Throughout the period of Vietnamization and withdrawal, the air war continued over North Vietnam, though on a lesser scale than the Rolling Thunder campaign, which ended in 1968. Easily the most daring operation of this period was the Son Tay raid of November 1970, an attempt to liberate some of the Americans who were prisoners of the North Vietnamese. The treatment and ultimate freedom of these captives, mostly airmen shot down over the North, had become the object of public and governmental concern within the United States. Like the North Koreans before them, the North Vietnamese sought to use their prisoners for purposes of propaganda, in the case of the Hanoi government both

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to reinforce the national sense of purpose and to gain sympathy throughout the world. They paraded captured pilots through the streets of recently bombed towns to demonstrate that the Americans, in fact, paid a price for the damage they inflicted and to channel popular emotion that might otherwise have been directed against the communist authorities, who demanded a seemingly endless sacrifice of time, wealth, labor, and life itself. Again as in Korea, torture and mistreatment produced filmed "confessions" of war crimes, usually delivered with expressions or gestures which made it clear that the statement had been made under duress.

As the number of prisoners increased, they began to communicate secretly. One of the methods of secret communication was suggested by Capt. Carlyle "Smitty" Harris, who remembered a lesson he had been taught in Air Force survival school. An instructor there had told him that by tapping on walls, Americans imprisoned during the Korean War had been able to exchange information. Harris introduced to the prisons of North Vietnam this tap code, which was based on the image of a square grid containing twenty-five letters of the alphabet (K was excluded), beginning at the upper left corner. A series of taps directed the listener down the grid to a particular row; then came a pause and other taps that led to the right and a specific letter. In this way, and through improvised sign language and carefully passed notes, the American captives overcame isolation and organized themselves, searching out the highest ranking officer in each compound so that he could take command. Anyone who did assume command could expect to be severely tortured if the prison authorities discovered his role, as they did from time to time, and those caught communicating might also be punished. Despite the risks, the constant effort to communicate and organize helped the prisoners maintain their sanity through years of captivity in what proved to be America's longest war.

At the end of that conflict, the number of captured and missing Americans totaled 3,000; of these, 23 members of the Air Force were known to have died while in confinement including Capt. Lance P. Sijan, who received the Medal of Honor for his heroism after ejecting from his aircraft. Shot down over North Vietnam on November 9, 1967, he avoided capture for six weeks. After falling into the enemy's hands, the emaciated and injured pilot escaped into the jungle while being taken to prison, only to be recaptured in a matter of hours and tortured. He endured weeks of mistreatment before dying in Hanoi's Hoa Lo prison, which the Americans held there called the "Hanoi Hilton." Sijan was the first graduate of the Air Force Academy to be awarded the Medal of Honor.

Other attempts to escape from captivity in North Vietnam were no more successful than Sijan's. It was possible to break out of confinement, but, as had been true during the Korean War, a towering American simply could not lose himself among much smaller Orientals and vanish into an essentially hostile society. Only an American rescue team from outside North Vietnam seemed to have a chance of freeing the prisoners, and during the summer of 1970 a joint task group

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Capt. Lance P. Sijan,  
posthumous recipient  
of Medal of Honor.



was formed in the United States to attempt just such a rescue. The likeliest prospects for liberation were the 55 Americans held at Son Tay, some 25 miles from Hanoi, for their prison compound nestled beside a bend in a river that facilitated identification from the air and restricted access by the troops garrisoned nearby. In command of the rescue effort was Brig. Gen. Leroy J. Manor, an Air Force veteran of some 275 fighter missions in Southeast Asia who trained air commandos at Eglin Air Force Base, Florida; Col. Arthur "Bull" Simons, an Army officer experienced in special operations, led the actual assault.

Aerial photographs of Son Tay enabled the force to construct not only a detailed tabletop model of the objective, but also a full-scale reproduction made of wood and canvas that was disassembled whenever an orbiting Soviet intelligence satellite came within range. Using an airfield where the Doolittle raiders had prepared for their 1942 attack on Japan, a force of volunteers trained to penetrate deep into North Vietnam, land one helicopter in the prison yard and two others outside the walls, free the prisoners, and fly them to safety in Thailand. On the night of November 20, when the assault force arrived at Son Tay, one helicopter deposited its troops at the wrong building and triggered a firefight with the troops quartered there. One of the other helicopters crash-landed in the compound and the other set down safely outside the walls; both disgorged their troops, who breached the wall but found no prisoners. The assault force regrouped and withdrew in the two undamaged helicopters, returning to Thailand with one man slightly wounded and another hobbled by a broken ankle. One of the F-105s protecting the raiders from surface-to-air missiles was shot down by that very type of weapon, but the two-man crew survived and was rescued. There were no losses among the one hundred or more carrier aircraft that staged a demonstration off the coast, dropping flares and feinting toward shore to divert attention from the aircraft approaching Son Tay from an inland direction.

The compound at Son Tay had been empty since July, when the North Vietnamese transferred the captives as flood waters lapped at the base of the

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prison's walls. Enemy fire and mechanical failures had frustrated low-altitude aerial reconnaissance during the intervening four months, but two important and contradictory pieces of information had surfaced. High-altitude photographs revealed signs that the prison might be occupied, but a list of prisoner-of-war compounds smuggled out of Hanoi had not included Son Tay. Unfortunately, there was no time for further low-altitude photography from drones; while visiting Hanoi, an American citizen opposed to the war had received a list of five captives who had died recently, prompting concern that the health of all the prisoners was deteriorating, making prompt action seem all the more important. The raid therefore went ahead to take advantage of a combination of good flying weather and a suitable phase of the moon, conditions that would not occur again for at least a month. Doubts about the presence of the prisoners at Ton Say remained within the organization of the Joint Chiefs of Staff; when Manor dispatched Simons and the raiding party, everyone on the operation was certain that 55 Americans lay confined in the darkness at the bend in the river.

American reaction to the raid ranged from tributes to the obvious heroism of the assault force and expressions of concern for the prisoners to condemnations of American intelligence for not realizing that the compound had been abandoned. Even the administration seemed divided. Whereas President Nixon saluted the participants as heroes and hailed the operation as a success because it reached the objective and returned without loss of life, his vice president, Spiro T. Agnew, complained of the faulty intelligence that had allowed the raid to go ahead. Dr. Kissinger, who later would characterize the operation as "an egregious failure of intelligence," suggested sarcastically that the force should have brought back something, perhaps a baby water buffalo. The person to whom he spoke apparently missed the edge to these words, assumed that an animal of this kind had been brought back, and launched a futile investigation to locate it.<sup>6</sup>

Meanwhile, the North Vietnamese reacted to the raid by consolidating in larger prisons the captives from isolated sites like Son Tay, but this worked to the long-term advantage of the prisoners by strengthening the organizational structure among them and making it easier to communicate with and to sustain one another. Among the more encouraging items of news circulating from cell to cell was the story of the small group that had penetrated the heavily defended heartland of North Vietnam and attacked the compound at Son Tay.

After Rolling Thunder ended, American officials expected that unopposed aerial reconnaissance, rather than daring raids like the descent on Son Tay, would be the usual purpose of missions over the North. Unfortunately, aerial reconnaissance proved far from routine. In November and December 1968, two Air Force RF-4Cs and an escorting F-4 were shot down over the North, along with two Navy aircraft. The missile batteries afterward fell silent, lending substance to the Nixon administration's belief that North Vietnamese negotiators at Paris had at least tacitly guaranteed the safe passage of unarmed re-

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A McDonnell Douglas RF-4 Phantom II of the 14th Tactical Reconnaissance Squadron landing at Udorn Air Base.

connaissance craft over their country. The government at Hanoi not only denied that any such agreement existed but reinforced the denial by again firing at the American jets, shooting down one in 1969 and another early the following year. In February 1970, after the second downing, the President directed that fighter-bombers escort the reconnaissance flights, as had been done during the last two months of 1968, with the accompanying F-4s authorized to retaliate instantly against any gun battery or missile site that opened fire. A duel ensued between the escorts, whose work of retaliation came to be reinforced by strikes launched especially for the purpose, and the hostile gunners, as Air Force and Navy aircraft carried out 60 so-called "protective reaction" attacks during the balance of 1970, twice that number in 1971, and 90 during the first three months of 1972. Usually the protective reaction strikes hit gun or missile batteries that had tried to down reconnaissance craft over the North, but beginning in 1971 they also were directed against those that fired on American aircraft attacking targets on the Ho Chi Minh Trail within range of weapons on North Vietnamese soil.

As 1971 drew to an end, aerial reconnaissance produced mounting evidence that North Vietnam was preparing for a major offensive. President Nixon applied the principle of protective reaction to this situation by authorizing a series of attacks on a variety of targets in southern North Vietnam. Beginning on the day after Christmas, American aircraft launched five days of strikes, totaling more than 1,000 sorties, against airfields, oil storage areas, surface-to-air missile sites, supply dumps, and truck parks associated with the buildup. Again in February, when North Vietnamese artillery began firing at South Vietnamese

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outposts across the demilitarized zone, Nixon invoked protective reaction and approved two days of strikes against those batteries.

Despite the changing definition of protective reaction, Gen. John D. Lavelle, commander of the Seventh Air Force, went too far in applying the concept. Confident that he was carrying out the implied, if not openly expressed, wishes of his superiors, Lavelle interpreted the policy of protective reaction to include attacks on potential threats to American aircraft like the airfields that MiGs might use, the radars that might control their interceptions, and not only surface-to-air missile sites but also the dumps where missiles were stored and the trucks that carried them to the launch sites. Lavelle believed not only that the North Vietnamese air defenses formed a unified threat, but also that the radar which transmitted or the guns which fired during one mission remained a danger for all subsequent sorties, even though the hostile site might remain silent on a particular day. Consequently, he directed his pilots to assume, in effect, that the radar-controlled defenses were always functioning and never to report an absence of enemy activity. Some of Lavelle's subordinates pushed this reasoning to the limit and falsely reported enemy opposition to justify the need to retaliate. Instances of false reporting caught the conscience of a young sergeant in the Air Force, Lonnie D. Franks, who thought that falsification of the record was wrong, whatever the circumstances, and wrote a letter to Senator Harold Hughes, a Democrat from Iowa, describing what was going on. Hughes turned the information over to the Air Force, the Inspector General investigated, and Gen. John D. Ryan, at the time the Air Force Chief of Staff, accepted Lavelle's immediate retirement "for personal and health reasons."<sup>7</sup> Ironically, Lavelle's successor, Gen. John W. Vogt, received a pep talk from President Nixon, who urged him to be more aggressive than the officer he was replacing.

In the autumn of 1972, the Armed Services Committees of the House and Senate conducted separate inquiries into the unauthorized bombing. The Senate committee found, in effect, that the punishment the Air Force meted out to Lavelle—retirement in the grade of lieutenant general rather than as a four-star general—was insufficient. As a result, his retired rank was reduced to major general, but this demotion did not affect his retirement pay, which was based on the highest grade that he had achieved while on active duty, that of general. In contrast, the House committee decided that the bombing missions dispatched by Lavelle had been "not only proper but essential."<sup>8</sup>

Lavelle's involvement in the unauthorized air strikes became public at a time when the prestige of the American military was declining. The My Lai massacre, in which American soldiers had mistreated and murdered unarmed South Vietnamese villagers, had been revealed and the atrocity, as well as attempts to conceal it, had been investigated. The so-called *Pentagon Papers*, a collection of official documents relating to American involvement in the conflict and a narrative of decision-making by the Kennedy and Johnson administrations, had appeared and cast doubt on the wisdom and motives of civilian officials and mili-

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tary leaders. New reports of racial strife, drug abuse, and fraud within the services came to light with sickening frequency. Yet another blow would fall in July 1973, when a former officer in the Strategic Air Command, Hal M. Knight, revealed the secret bombing of Cambodia, begun in 1969 on orders from the White House, and the system of false reporting that had thus far concealed fourteen months of B-52 strikes. No wonder that the American public lost enthusiasm for a war that seemed to corrupt even those who fought it.

The succession of protective reaction strikes that began in December 1971, including the unauthorized attacks for which General Lavelle was blamed, appeared to have served their purpose. As the winter of 1971-1972 gave way to spring, the Nixon administration was confident that its use of air power had forestalled a North Vietnamese offensive. Such was not the case, however, for on March 30, 1972, Gen. Vo Nguyen Giap, the victor at Dien Bien Phu in 1954 and North Vietnam's most prominent military leader, sent almost his entire army—initially 125,000 troops supported by tanks and artillery—knifing into South Vietnam. After striking first in northernmost South Vietnam and advancing toward Quang Tri City and Hue, the enemy attacked from the triborder region, where the territories of South Vietnam, Laos, and Cambodia converged, toward the town of Kontum and from the bases he had reestablished in Cambodia toward An Loc and ultimately Saigon.

Seen from Hanoi, the situation was never more promising; supplies were in place, Giap's soldiers were ready, the remaining American ground forces were largely support and advisory units, and the South Vietnamese had given way to panic in the last stages of their retreat from Laos a year earlier. Moreover, the United States would hold a Presidential election in November 1972, and a communist victory in the spring might have the same effect as the Tet offensive of 1968 and drive the Chief Executive from office. Indeed, the antiwar demonstrations ignited by the invasion of Cambodia in 1970 may have made Nixon appear even more vulnerable than Johnson had been. Whether the offensive represented an attempt to crush South Vietnam or merely to advance a good distance along the road to ultimate victory (and the actual objective has for years remained the subject of debate among Americans), the prospects for success seemed excellent.

The leaders at Hanoi had a distorted view, however. Although Nixon continued to worry about the antiwar movement and its possible impact on Congress, he had survived the agitation that followed the invasion of Cambodia and the shootings at Kent State University and seemed increasingly likely to win reelection. Similarly, Thieu remained in control in South Vietnam despite the manifestations of discontent that had surfaced as a consequence of the previous year's severe casualties in Laos. The Army of the Republic of Vietnam had suffered a defeat there, but it remained intact, was absorbing more American equipment and learning to use it, and when fighting on South Vietnamese soil would benefit from the presence of the American advisers on whom so many of the

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commanders had come to depend. Moreover, Giap abandoned the very tactics that had enabled the Tet offensive of 1968 to demoralize the American people and the Johnson administration. By launching a series of conventional attacks tied to roads and dependent on artillery support, the North Vietnamese general ignored the fact that his People's Army and the Viet Cong, who played almost no role in this latest offensive, were most mobile before the battle and least so after the fighting began. Giap's forces had an uncanny ability to mass men and supplies for a surprise attack, but once the battle was joined, they lacked the communications to shift forces and take advantage of unexpected changes in the tactical situation. Indeed, if the North Vietnamese could not overwhelm a stoutly defended position at the outset, they tended to attack again and again rather than probe for weaknesses elsewhere in order to bypass and neutralize the bastion. This habit immobilized them and made them especially vulnerable to air strikes.

When North Vietnam invaded, the United States tried to support the defenders with the aerial strength already in the theater, including about 300 Air Force aircraft of all types, some deploying across the Pacific in response to the enemy buildup that triggered the recent protective reaction strikes. As the Army of the Republic of Vietnam struggled to contain the offensive and the South Vietnamese Air Force quickly demonstrated that it could not cope with the emergency, Air Force flight and ground crews intensified their efforts and succeeded in launching more than 500 combat sorties per day.

For a time in early April, the defense of the northern provinces was subordinated to the attempted rescue of an Air Force officer, Lt. Col. Iceal E. Hambleton, the sole survivor of the six-man crew of an EB-66 electronic warfare aircraft shot down over the battlefield. Disregarding the perilous situation of the South Vietnamese forces, Seventh Air Force headquarters arranged to suspend artillery fire into the region where he had parachuted and diverted to the task of finding and retrieving him aircraft that otherwise would have been attacking in support of the hard-pressed South Vietnamese. Surviving on whatever berries and vegetables he was able to find (on one foraging expedition, he stabbed to death a North Vietnamese who attacked him), Hambleton followed the instructions he received on the hand-held radio that was a part of his survival equipment, avoided capture, and made his way down a stream to meet a patrol of South Vietnamese marines who brought him to safety.

The 11-day rescue effort cost the lives of nine Americans whose aircraft were shot down while searching for Hambleton or trying to pick him up and deprived a desperate South Vietnamese division of air and artillery support at a critical time. The American adviser attached to this unit warned that the division's officers resented the obvious fact that the Seventh Air Force would risk the lives of thousands of South Vietnamese soldiers to rescue one of its own officers. Nevertheless, the division survived the immediate threat, if only to collapse soon afterward, and however demoralizing the rescue may have been for the

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South Vietnamese, the concern the Air Force showed for members of its air-crews helped sustain their morale.

When the combined efforts of the American squadrons in Southeast Asia and the air and ground forces of the Republic of Vietnam could not stop the three-pronged offensive, President Nixon approved the increase of American aerial strength in Southeast Asia without reinserting ground forces. From the beginning of the invasion until the end of June, the total number of Air Force aircraft in the region increased from 1,153 to 1,426 as the equivalent of 15 squadrons deployed there, including the B-52 force that expanded from 83 aircraft to 202 and, by the time the war ended, flew almost 3,000 sorties in a single month. To sustain the B-52s and the tactical fighters, the Air Force during the spring of 1972 deployed another 110 KC-135 aerial tankers, raising the total number to 187. The Navy dispatched four additional aircraft carriers to the Gulf of Tonkin, bringing the number there to six, the largest concentration since the Vietnam War began. The Marine Corps, which had withdrawn all its air and ground forces except for a small number of advisers, sent a total of four squadrons from airfields in Japan to Da Nang and Bien Hoa. Concerned over the need to coordinate his operations with the ambassador in Laos, Vogt had earlier sought exclusive control over air operations, not only over the two Vietnams, but throughout Southeast Asia. President Nixon seemed agreeable but never sent the necessary instructions, and the old system prevailed. Since no marines were fighting on the ground in 1972, the newly arrived Marine Corps squadrons encountered no conflicting priorities in carrying out the assignments that the Air Force general gave them.

As the fighting on the ground intensified, all the American aerial might focused on saving South Vietnam. The air war in southern Laos ended and operations in Cambodia and northern Laos received only the surplus sorties from the systematic campaign that extended from battlefields like An Loc, Kontum City, and Quang Tri City to the railroads, ports, and bridges of North Vietnam. The general strategy was to bomb the offensive to a standstill by killing as many as possible of the advancing enemy soldiers, while at the same time disrupting the forward movement of the supplies and reinforcements needed to sustain the operation.

The damaged railyard in Vinh, North Vietnam, after a strike in May 1972.



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Unlike President Johnson, who preferred close personal control over individual targets, Nixon tended, with some exceptions, to authorize strikes against areas or classes of targets and leave the details to his military commanders. Blows against targets in Hanoi and Haiphong required clearance from the White House, as they had during Rolling Thunder, and the network of irrigation dikes in North Vietnam remained exempt. Occasionally, however, after a stray bomb missed an anti-aircraft site or other target and exploded near a dike, North Vietnamese propagandists charged that the United States was waging war on the civilian populace by trying to drain the rice paddies.

President Nixon approved not only attacks on the rail line leading from China, but also the mining of North Vietnamese harbors. He felt he could take this action with little or no risk of a Soviet or Chinese reaction because of the rivalry between the two communist states, which had resulted in border clashes as recently as 1969. Each of the communist countries was wary of openly aiding North Vietnam or anything else that might encourage the United States to improve its relations with the other, even though inaction might delay what both saw as the inevitable triumph of communism in Southeast Asia.

The aerial interdiction campaign against North Vietnam began April 6 with attacks in the southern part of the country and rapidly expanded. On April 16, B-52s, escorted by fighters and aircraft specializing in electronic countermeasures and suppression of surface-to-air missiles, bombed the fuel storage tanks at Haiphong, setting fires that, reflected from cloud and smoke, were visible from the bridge of an aircraft carrier 110 miles away. Shortly afterward, carrier



Haiphong Harbor during a Linebacker raid in 1972.

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aircraft joined Air Force fighter-bombers in battering a tank farm and a warehouse complex on the outskirts of Hanoi. When these attacks failed to slow the offensive, naval aircraft began mining the harbors on May 8, and two days later the administration extended the aerial interdiction campaign, formerly Freedom Train but now designated Linebacker, throughout all of North Vietnam.

President Nixon had just visited Peiping and intended to visit the Soviet Union, North Vietnam's principal supplier, later in May for a major conference. He approved this double-edged escalation, assuming correctly that General Secretary Leonid Brezhnev would not cancel their meeting at a time immediately after the Peiping visit when the United States and China were drawing closer. The President chose to lay mines and intensify the bombing to deprive the Soviet Union of any propaganda advantage that might accrue if South Vietnam collapsed during his trip to Moscow. This did not happen, for Nixon also correctly judged that air power could save the day, for the mining and other forms of interdiction, combined with aerial intervention on the battlefields of South Vietnam, brought the North Vietnamese offensive to a halt.

In terms of tactics employed and results obtained, Linebacker was a vast improvement over Rolling Thunder. During Linebacker, American aircraft attacked targets like airfields, powerplants, and radio stations that did not fall into the category of interdiction, but the main objective remained the disruption of the flow of supplies and reinforcements to the units fighting in the South. Laser-guided bombs proved effective, especially against bridges, severing the bridge at Thanh Hoa, which had survived Rolling Thunder, and the highway and railroad bridges over the Red River at Hanoi, dropped in the earlier aerial campaign, but repaired. At both places, however, the enemy again made use of alternate means of crossing the streams, usually traveling at night on ferries or movable pontoon bridges. Electronic jamming and clouds of reflecting chaff, as in Rolling Thunder, confused the radars controlling the surface-to-air missiles and the anti-aircraft guns. North Vietnamese MiGs, as they had during Rolling Thunder, gave battle throughout Linebacker but failed to gain control of the sky, in part because American radar, whether airborne, at sea, or in Thailand, detected the interceptors rising from the runways, enabling controllers to direct Air Force F-4s and Navy fighters against them.

During the war in Southeast Asia, both the pilot and the weapon systems officer received full credit for each aerial victory. Because of changes in these pairings, two backseaters, Capts. Charles B. DeBellevue and Jeffrey S. Feinstein, but only one pilot, Capt. Richard S. "Steve" Ritchie, became Air Force aces; all three of these officers made their fifth kill during Linebacker, which lasted until October 1972, when the President, encouraged by progress in the truce negotiations, restricted the bombing to southern North Vietnam.

Despite the damage inflicted in North Vietnam by Linebacker air operations, interdiction tended to be more effective closer to the battlefield. Within North Vietnam, the road net was more extensive, labor more readily available for re-

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pair and construction, and alternate routes were already well established. Nearer the advancing troops, supply lines narrowed, as though entering a funnel that ended at the front-line unit, alternate routes had to be built from scratch, and few civilians were at hand to supplement the work of the military engineers. The defenses remained dangerous, however, especially when the SA-7 heat-seeking missile, a weapon carried and fired by an individual soldier, joined crew-served guns and missiles in protecting the invasion forces.

The other goal of the air war, inflicting casualties on the advancing enemy, was pursued on all three fronts. The deadliest aerial weapons were B-52s, gunships, and fighter-bombers using laser-guided weapons, the last especially effective against artillery in the northern provinces of South Vietnam. On that front, the invaders drove the South Vietnamese from Quang Tri City on May 1; its capture the high-water mark for the North Vietnamese. The attacking North Vietnamese trapped several American advisers and senior South Vietnamese officers in the city, but four Air Force HH-53 helicopters and their escort of A-1s succeeded in snatching them from the very hands of the enemy. Despite heavy losses in the area between Quang Tri City and Hue, where the North Vietnamese had concentrated their antiaircraft defenses, Air Force fighter-bombers used laser-guided bombs to attack bridges and artillery positions, slowing the enemy's advance and reducing the severity of his artillery barrages, so that the South Vietnamese could regroup. On May 18, when amphibious tanks and infantry crossed the last river barrier before Hue and moved against the city, fighter-bombers destroyed 18 of the vehicles with laser-guided bombs and killed some 300 soldiers. The North Vietnamese drive bogged down, only to be renewed five days later, but air power again intervened, enabling the defenders to force the enemy back across the river.

Success in defending Hue inspired a counterattack, launched on June 28, to recapture Quang Tri City. Although B-52s and fighter-bombers cleared the way for the advancing South Vietnamese, President Thieu tried to avoid using aircraft against the North Vietnamese entrenched in the city itself, hoping to minimize the damage to the houses there so that displaced families could return to their own dwellings instead of becoming dependent on the government for shelter. Unfortunately, an infantry attack floundered in the streets of the town, and B-52s had to join in the sort of destructive pounding that South Vietnam's president had hoped to avoid. By mid-September, the ruins of Quang Tri City were under South Vietnamese control, and the threat to the northern provinces had ended.

In the meantime, B-52s helped blunt the other two attacks. At Kontum City in the highlands, John Paul Vann, an officer retired from the U.S. Army and now a civilian adviser to the South Vietnamese, informally assumed command of the defenses, allocating air strikes and pulling back from indefensible ground to shorten the lines and make the most efficient use of the troops available to him. As the North Vietnamese advanced on Kontum City, they encountered strong resistance at Polei Kleng and attacked by night but came under attack when an Air

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Air Force personnel attach a laser-guided bomb to an F-4 Phantom II.

Force AC-130 gunship responded to the call for help. The aircraft mounted a 105-mm howitzer, which went into action after the sensor operators located the sources of the heaviest North Vietnamese fire. The deadly aerial barrage broke up the attack, and saved Polei Kleng, if only temporarily. At Kontum City, B-52s did what the gunship had done at Polei Kleng, although fighter-bombers and South Vietnamese A-37s added their firepower and American and South Vietnamese transports delivered supplies to the troops on the ground. Early in the battle for the town, a gamble paid off when the defenders fell back so that a carefully timed deluge of high explosives from B-52s invisible in the sub-stratosphere could catch the enemy as he moved forward. The North Vietnamese succeeded, however, in cutting the roads leading into Kontum City. As long as the airfield could be used, South Vietnamese C-123s landed cargo, but when the attackers began raking the runway with direct fire, American C-130s had to supply the defenders by parachute. When the battle approached a climax, South Vietnamese A-37s joined Air Force fighter-bombers and Army helicopter gunships in destroying Soviet-built tanks, but the battering by the B-52s weakened the enemy, so that South Vietnamese forces could check his advance and by the end of May begin expelling him from the captured portions of the town.

The defense of An Loc, considered the gateway to Saigon, closely resembled the battle for Kontum City. At both places the People's Army tried stubbornly to seize a stronghold that could easily have been neutralized and bypassed, while Americans orchestrated the defenses—Vann at Kontum City and Army Maj. Gen. James F. Hollingsworth, the senior adviser to the local corps commander,

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at An Loc. Hollingsworth realized, as did Vann, that he had devastating aerial firepower at his disposal, provided the South Vietnamese could hold on long enough to force the enemy to mass and present worthwhile targets. "You hold, and I'll do the killing," the general reportedly told the South Vietnamese, and largely because of the B-52s, air power killed North Vietnamese on a scale that disheartened them and disrupted their plans.<sup>9</sup> Airlift proved critical in enabling the defenders to cling to the ruins of An Loc, since they could be supplied only by parachute. The available drop zones were small, however, and the anti-aircraft weapons were dangerous, none more so than the SA-7 heat-seeking missiles. Until radar became available in May to direct the parachute deliveries, as much as two-thirds of the cargo dropped from Air Force C-130s came down in enemy territory. At the time when the danger to An Loc was greatest, aircraft swarmed in the skies overhead; unexpected fighter-bombers arrived, causing controllers to reschedule strikes, but every bomb helped. Despite confusion and savage anti-aircraft defenses, air power prevailed. By late May the enemy offensive had stalled, and within two weeks the North Vietnamese were pulling back, ending the threat to Saigon.

Nixon's use of air power to disrupt supply lines and kill the enemy on the battlefield stopped the offensive, helped drive the enemy back a short distance, and did so without the reintroduction of the ground forces he had withdrawn from South Vietnam. In fact, the last combat troops of the U.S. Army departed in August 1972 while the South Vietnamese were counterattacking, leaving behind only 43,000 American airmen and support personnel. Yet, the very success of American aerial might caused misgivings at Saigon, where the dependence of his armed forces on the Americans troubled President Thieu. When his commanders had failed during the recent offensive, the advisers took over, bringing to bear a volume of firepower that South Vietnamese forces could not by themselves generate. Thieu realized that the American's unilateral departure would leave South Vietnam at the mercy of the North Vietnamese forces still in the country. Since the Americans would certainly leave, his only hope lay in the mutual withdrawal of all foreign troops. The South Vietnamese chief executive therefore opposed any settlement that left elements of the People's Army in place within South Vietnam.

In contrast, the United States was now willing to accept a cease-fire that gave the North Vietnamese the fruits of their recent offensive, during which they had captured or consolidated their control over large areas south of the old demilitarized zone, in the western highlands, and along the Cambodian border. After such a settlement, the enemy would occupy a position from which he could, at least detach the northern third of the nation, if not cut South Vietnam in half as had been feared when the American ground forces intervened in 1965. To offset the geographic advantage thus conferred, the United States continued to supply the Republic of Vietnam with military equipment, speeding deliveries in anticipation of a truce that would impose restrictions on future military aid.

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Consequently, the South Vietnamese Air Force expanded to an actual strength of 65 squadrons, with more than 61,000 officers and men. Except for the A-37s and C-123s, few of the 2,000-odd aircraft of 25 different types had proved effective during the offensive that just ended. Moreover, the tactical inventory still did not include heavy bombers, howitzer-equipped gunships, and high-performance fighter-bombers with the laser-guided weapons that had done so well at An Loc and elsewhere; nor were there any aircraft for long-range interdiction, rescue, or electronic countermeasures against, for example, radar-controlled surface-to-air missile complexes. Impressive as the influx of materiel was in numerical terms—South Vietnam was credited with having the fourth largest air force in the world—Thieu feared that his country could not defend itself against an established enemy and continued to insist that the North Vietnamese be forced to pull back from the territory of South Vietnam.

By the end of October 1972, with the Presidential election fast approaching in the United States, Kissinger declared that peace was at hand and a settlement in sight. His optimism proved unfounded. Thieu balked at accepting at what had come to be called a cease-fire in place, and the North Vietnamese also seemed uninterested in even so favorable a settlement. Once his hand had been strengthened by an overwhelming victory over his Democratic opponent, George McGovern, President Nixon sought to remove first one and then the other of the obstacles to peace. He obtained Thieu's reluctant assent to an in-place arrangement by offering "absolute assurance" that he intended to take "swift and severe retaliatory action" if North Vietnam should violate the terms of the agreement.<sup>10</sup> Put simply, the President gave his personal pledge that he would respond to any future invasion as he had to the offensive of 1972, an assurance that implicitly bound the government of the United States to that course of action. He then sought to remove the other roadblock, the stubborn attitude of the government in Hanoi, by ordering a resumption of the bombing of the heartland of North Vietnam.

"This is your chance to win this war," the President told Adm. Thomas H. Moorer, the Chairman of the Joint Chiefs of Staff. "And if you don't, I'll consider you responsible."<sup>11</sup> The opportunity presented to the admiral in this melodramatic fashion represented a consensus on the part of three men—the President; his adviser on national security, Dr. Kissinger; and Army Maj. Gen. Alexander M. Haig, Jr., Kissinger's principal military assistant—that B-52s should hit targets at Hanoi and Haiphong and thus force North Vietnam to accept a settlement. President Nixon thus unleashed an air campaign, called Linebacker II, that began on December 18 and ended on the 29th, with a thirty-six-hour pause for the Christmas holiday.

The B-52s again flew from Guam and Thailand, refueling as necessary from KC-135 tankers. Air Force and Navy fighter-bombers and attack aircraft struck by day, often using radar or other bombing aids because of cloud cover, and the B-52s and their escorts by night. The heavy bombers followed F-111s, which used their speed and their ability to hug the ground to attack from treetop height

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The crowded flight line at Andersen Air Force Base, Guam, 1972.

the airfields used by MiGs and, later in the operation, the most dangerous of the surface-to-air missile sites. Fighter-bombers patrolled in the event MiGs should challenge the B-52s; they carried radar-homing missiles to suppress surface-to-air missile batteries and scattered chaff to confuse hostile radar. Air Force EB-66s and Grumman EA-6s of the Navy and Marine Corps orbited nearby, broadcasting jamming signals to reinforce the effects of the chaff. Plans initially called for the B-52s to rely more on chaff than on their own jamming transmitters in penetrating the radar-controlled defenses of Hanoi and Haiphong. Approaching in a single stream of three-aircraft cells to reduce the likelihood of midair collisions, the B-52s followed a corridor of chaff to the target, dropped their bombs, turned sharply, and headed back toward their bases.

For a number of reasons, what looked good on paper did not succeed in practice. The initial corridor alerted the defenders to the direction of the attack and enabled them to launch their missiles in salvos without radar guidance, relying on proximity fuzes set for the altitude reported by MiGs shadowing the column of B-52s. In addition, the chaff tended to drift during the approach of the bomber stream, some seventy miles in length, and leave gaps in the coverage despite periodic replenishment from F-4s. Finally, the sharp turn after they released the bombs caused the jamming signal transmitted from beneath the bomber to radiate outward, more nearly parallel to the ground, instead of downward, increasing the vulnerability of the B-52s to radar-guided missiles. Taking advantage of these weaknesses, the surface-to-air missile crews downed eleven

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of the high-flying B-52s by the time operations were suspended for Christmas, six on the night of December 20-21.

The losses, which to the aircrews seemed to result from rigid adherence to flawed tactics, dealt a numbing, though not crippling, blow to morale, but a change in plans restored spirits when the attacks resumed. Besides employing only B-52s with modernized jamming equipment against the most heavily defended targets, tactics, beginning with the mission on the night of December 26, called for clouds rather than corridors of chaff, for more compact bomber streams approaching from different directions, and for the avoidance of sharp turns that neutralized jamming signals. During the final three days of the bombing, surface-to-air missiles claimed only four B-52s. The new tactics helped reduce the losses, as did attacks on the missile sites by F-4s in daylight and F-111s at night and the decreasing number of missiles fired. The North Vietnamese had fired almost all of their surface-to-air missiles; and because of the mining of the harbors, damage to the rail system, and the unwillingness of either China or the Soviet Union to risk upsetting the delicate diplomatic balance with the United States, they could not easily replenish their stocks. At this point, after more than 700 nighttime sorties by B-52s and some 650 daylight strikes by fighter-bombers and attack aircraft, the Hanoi government agreed to enter into purposeful negotiations.

For the Americans held prisoner at Hanoi, the B-52 raids seemed a sign that freedom was near. Morale soared as the guards stopped taunting their captives or threatening retaliation and scrambled for cover whenever the bombers drew



The railyard in Trung Quang, North Vietnam, after a bombing raid.

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near. Most of the other prisoners would surely have agreed with Air Force Col. Jon A. Reynolds that the B-52s had forced the enemy to negotiate, even though neither Nixon nor Kissinger, perhaps to avoid antagonizing the North Vietnamese so near the resumption of talks, claimed at the time that they had bombed the enemy to the conference table. In addition, the Linebacker II campaign served to reinforce the pledge given Thieu that in case of a future invasion American air power would come to his aid. The battering of North Vietnam also gave the South a respite in which to absorb recently arrived American military equipment and recover from the effects of the past year's invasion, but neither Linebacker II nor the talks that followed forced Hanoi to agree to withdraw its troops from South Vietnam.

The United States paid a price for the accomplishments of Linebacker II. Besides the 15 B-52s that fell victim to surface-to-air missiles, 10 other aircraft, 4 from the Air Force and the others from the Navy or Marine Corps, were shot down over the North or so badly damaged that the crews either crash landed or took to their parachutes. Of the 100 Air Force crewmen shot down, 35 were killed; 26 were rescued; and 39 parachuted, were captured, and were later released. The air war was not one-sided, however. Air Force fighters destroyed four MiGs, and tail gunners in B-52s shot down two others.

Despite headlines in American newspapers decrying the carpet bombing of a densely populated city, an interpretation based principally on the reports of a French journalist at Hanoi, later investigations revealed that, except for the destruction of part of the Bach Mai hospital by bombs intended for the airport nearby, the damage was limited almost exclusively to targets that were military in nature, like air bases and storage areas for oil and other supplies, or related to the war effort, like railyards and powerplants. Indeed, the Hanoi government stated that exactly 1,624 civilians had been killed at Hanoi and Haiphong during the entire Linebacker II campaign, a far cry from the tens of thousands killed during World War II at places like Hamburg, Dresden, and Tokyo. Several factors no doubt contributed to the comparatively modest death toll: the B-52 strikes had been carefully planned to minimize the bombs falling into residential areas, fighter-bombers used laser-guided weapons where accuracy was essential, and the North Vietnamese had built shelters and possibly evacuated a large number of noncombatants. In the United States, the wildly exaggerated stories of saturation bombing triggered no great outcry of opposition. The news may well have been believed, but the bombing, however savage, seemed to mark the end of a long and burdensome involvement in Southeast Asia. Moreover, the college campuses, which had nurtured opposition to the war, were closed for the holidays.

Occasional flights over North Vietnam, including patrols to prevent MiGs from interfering with American air operations in northern Laos, continued after Linebacker II had ended. On January 8, 1973, the crew of an F-4D—Capt. Paul D. Howman, the pilot, and 1st Lt. Lawrence W. Kullman, the weapon systems

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Somber prisoners (above) get off the bus that brought them to Hanoi's airport. Released prisoners (below) break out in cheers as their C-141 lifts off.



officer—shot down a MiG southwest of Hanoi with a radar-guided AIM-7 missile. This was the last aerial victory before the signing of the cease-fire, which went into effect on January 29. The agreement froze the current battle lines in South Vietnam, reestablished a coalition government of communists and anti-communists in Laos, permitted the withdrawal of the last American combat forces, and resulted in the release of the 591 Americans held prisoner in North Vietnam.

After the cease-fire became operative, the Military Assistance Command, Vietnam, became the much smaller Defense Attaché Office, which dispensed

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military advice to the armed forces of the republic and supervised the work of the civilians hired to perform maintenance and conduct technical training. To enforce the truce with air power, as President Nixon had promised, the Air Force established at Nakhon Phanom in Thailand a new headquarters, the United States Support Activities Group/Seventh Air Force, under General Vogt, who had relocated there from his headquarters in South Vietnam. The new command exercised operational control over the 18 Air Force fighter-bomber squadrons and one reconnaissance squadron in Thailand and over a detachment of Marine Corps attack aircraft based there. General Vogt and his staff also maintained coordination with the Navy's carrier task force in waters nearby and with the Strategic Air Command, which had 200-odd B-52s at hand in the western Pacific to resume the bombing of North Vietnam. Various factors, such as cuts in congressional funding now that the war had ended and the need on the part of the Air Force to redistribute resources that had been tied down in Southeast Asia, contributed to a decline in American strength as the months passed. When 1974 drew to a close, only 25 B-52s and 12 tactical fighter squadrons in Thailand remained to provide an immediate striking force if North Vietnam should violate the cease-fire.

American airmen continued to fight over Cambodia, where the cease-fire in Laos and the two Vietnams had no effect on the struggle between the communist Khmer Rouge and the government. President Nixon sought to use air power to hold the enemy at bay in Cambodia, but congressional and public acceptance of such a course of action was at best unenthusiastic after more than a decade of involvement in the recently concluded Vietnam War. Moreover, the past was overtaking the Chief Executive and further eroding support of the policies he advocated for Southeast Asia. In 1969, when the secret bombing of Cambodia began, a reporter had written a story that mentioned the closely held operation. Although the account passed unnoticed by other journalists and the general public, the President became obsessed with stopping leaks of classified information, and the administration illegally began tapping the telephone lines of a number of citizens, including reporters and government officials. The fear of disclosures intensified after Daniel Ellsberg, a former marine and at various times an analyst for the Rand corporation and a special assistant to the Assistant Secretary of Defense (International Security Affairs), became disillusioned with the war and turned over to the *New York Times* the classified collection of documents and explanatory text that was published as *The Pentagon Papers*. To obtain evidence against Ellsberg, who was accused of theft and espionage, operatives acting on behalf of the administration broke into the office of the psychiatrist he had consulted, an illegal act that ultimately resulted in the dropping of the charges against him. During the election campaign of 1972, another team of burglars with ties to the White House entered the headquarters of the Democratic National Committee at the Watergate office and apartment complex in Washington, D. C., in search of information that would further diminish the

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party's already slim chance of gaining the Presidency. Even as President Nixon and Dr. Kissinger were seeking funds from Congress to pursue the bombing in Cambodia, suspicion was mounting that the administration, perhaps the Chief Executive himself, had been involved in two burglaries, an attempt to conceal them, and the illegal surveillance.

In a climate of war weariness and growing mistrust of the President—a number of senators and representatives believed he had overstepped his constitutional authority—Congress asserted the power of the legislative branch and authorized continuation of the bombing only until July 15, 1973. At 11:30 local time on that day an A-7D of the 354th Tactical Fighter Wing landed at its base in Thailand after flying the last combat mission of the war over Southeast Asia. All told, the Air Force had flown 5.25 million sorties over South Vietnam, North Vietnam, northern and southern Laos, and Cambodia, losing 2,251 aircraft, 1,737 because of hostile action and 514 for operational reasons. A ratio of roughly 0.4 losses per 1,000 sorties compared favorably with a 2.0 rate in Korea and the 9.7 figure during World War II. Beginning with the deaths of Capt. Fergus C. Groves, II, Capt. Robert D. Larson, and SSgt. Milo B. Coghill in 1962, 1,738 officers and enlisted men of the Air Force were killed in action in Southeast Asia and another 766 died in accidents or from illness.

Legend has it that at the time the bombing ended in Cambodia, someone played over the radio channel used by strike aircraft a tape recording of a toilet flushing, a crude symbol of the fate many predicted for Southeast Asia. By the end of 1975, communist governments controlled South Vietnam, Cambodia, and Laos, but when this came to pass, the Nixon administration, swept into office by a huge margin in 1972, no longer existed. The secret bombing of Cambodia and the falsification of official records that preserved its secrecy surfaced in the summer of 1973, further undercutting the President. A select committee of the Senate developed evidence that linked the President to the concealment of illegal activities by members of his staff, and the House Judiciary Committee found even stronger proof while drafting articles of impeachment. (One of the articles considered but rejected by the House committee accused the Chief Executive of abusing his constitutional powers by secretly bombing Cambodia.) Rather than face the near certainty of impeachment by the House of Representatives and a trial in the Senate, the President resigned on August 8, 1974. His successor, Gerald R. Ford, a long-time Republican congressman from Michigan and minority leader of the House of Representatives, had replaced Agnew when the former Vice President, caught in a web of corruption stretching back to his days as a county official in Maryland, had resigned after pleading *nolo contendere* to a single charge of income tax evasion, thus accepting a conviction without formally acknowledging guilt.

Even as the power and prestige of the executive branch of government declined, the American public experienced an abrupt increase in the cost of living. At the root of the economic woes were restrictions by Arab oil producers on the

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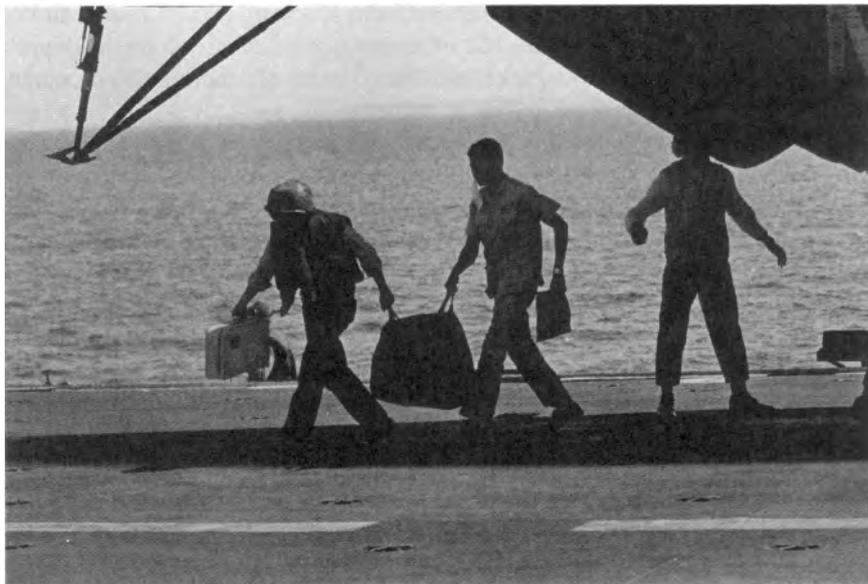
export of petroleum to the United States and the other nations that supported Israel, the victor in yet another war in the Middle East. The resulting scarcity drove up prices and made it difficult for South Vietnam to fuel the war machine that the United States had given it. Meanwhile, long lines and escalating prices at gasoline stations diverted the attention of the American public from Southeast Asia and diminished the likelihood that President Ford, in the event of another North Vietnamese invasion, could muster support to intervene even with air power.

Despite the oil shortage and the collapse of the Nixon administration, South Vietnam seemed for a while to be holding its own. Sometimes Thieu's army actually lashed out to improve the tactical position imposed on it by the cease-fire, but at other times the North Vietnamese were able to carve out gains of their own. Despite the apparent stalemate, portents for South Vietnam's future grew increasingly ominous. Stocks of fuel and ammunition could not sustain the air strikes and artillery barrages to which the South Vietnamese had become accustomed, vast amounts of equipment lay unused for lack of maintenance specialists, and the air arm, even if all its officers and men were fully proficient and all its airplanes functioned perfectly, could not survive against the kind of anti-aircraft defenses the enemy had used during the 1972 offensive. Further, North Vietnam lost no time moving that defense into the territory overrun in 1972 and converting the Ho Chi Minh Trail into an expressway for supplies and reinforcements.

In Cambodia the situation was much worse. After the bombing stopped in the summer of 1973, the United States continued to deliver weapons, perhaps in greater quantities than the government could absorb, but North Vietnam could supply the communist insurgents more easily, and the Khmer Rouge tended to make better use of what they received. Kissinger, by this time Secretary of State, hoped to negotiate an end to the fighting, but the communists saw no need to talk when they were closing in on the capital, undeterred by an occasional local setback. On April 12, 1975, nine days after an Air Force HH-53 had flown a Marine Corps command element to the embassy at Phnom Penh, Marine helicopters landed and, while a crowd of Cambodians watched passively, flew the ambassador and his staff to safety. Two Air Force helicopters then landed to pick up the marines in the command and security detachments, completing the evacuation.

Even as the Khmer Rouge tightened the vise gripping Phnom Penh, the North Vietnamese on March 10 launched an offensive that rapidly gathered momentum and overwhelmed South Vietnamese resistance. Within the Ford administration, discussion focused on military aid at a time when only armed intervention could have made a difference, although even massive bombing might have failed to ensure the survival of South Vietnam, so desperate were the circumstances. Evacuation rather than intervention became the watchword, as Air Force transports and others chartered from private firms attempted to fly out as

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Marine helicopter aboard the USS *Okinawa* with evacuees from Phnom Penh, April 12, 1975.

many people as possible. The early evacuees included hundreds of infants being cared for at orphanages in Saigon. During this “Baby Lift,” tragedy struck when the rear cargo door of a C-5A burst open in an explosive decompression of the cabin, and the transport crashed as the crew tried to land, killing 172, mostly infants, of the 300 persons on board. Despite this disaster, more than 50,000 Americans, South Vietnamese, and citizens of other nations escaped by land or sea before the advancing enemy reached the outskirts of Saigon.

As at Phnom Penh earlier, helicopters offered the final means of escape, but the evacuation from Saigon was complicated by hordes of panic-stricken South Vietnamese fighting for a place on the rescue craft. Amid confusion and open hostility from local residents, the last American fled from Saigon on April 29. Air Force and Navy fighter-bombers and Marine Corps helicopter gunships provided escort, along with AC-130s by night, as Air Force and Marine helicopters rescued more than 6,000 persons from the Defense Attaché Office and from the American Embassy. Radar at air defense sites tracked the rescue helicopters, but only once did the escort have to act; an Air Force F-4 silenced a radar with an antiradiation missile, and an accompanying fighter bombed the 57-mm battery the radar directed. The final evacuation from Saigon was successful, though only in a narrow sense, for it signified hopes destroyed and dreams betrayed, as George C. Herring writes in *America’s Longest War: The United States and Vietnam, 1950–1975*, “The spectacle of U.S. Marines using

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rifle butts to keep desperate Vietnamese from blocking escape routes and of angry ARVN [Army of the Republic of Vietnam] soldiers firing on the departing Americans provided a tragic epitaph for 25 years of American involvement in Vietnam.”<sup>12</sup>

The military involvement in Southeast Asia had not quite ended, however. On May 12, 1975, Cambodian naval forces seized the American containership *Mayaguez*, although it was in international waters, and President Ford decided to use force to recover the vessel and its crew of 39. While aircraft maintained surveillance of the ship, Pacific Air Forces ordered 16 CH-3 and HH-53 helicopters to gather in Thailand for the operation. En route, one of the HH-53s crashed, killing all 23 airmen on board. On the 13th, the surveillance aircraft observed a small fishing boat moving away from the island where the *Mayaguez* rode at anchor. Air Force A-7s promptly fired across the bow and dropped tear gas canisters in the hope of disabling the guards so that the Americans, if they were on board, could seize the craft and escape. The Americans were indeed on board, but the chemical agent affected both captives and captors; a Cambodian retained control by holding his gun against the skipper of the vessel, while the unarmed sailors from the *Mayaguez*, blinded by the gas, could not rush the guards.

Intelligence indicated that the fishing boat had taken the prisoners to Koh Tang, an island midway between the one where the captured ship was anchored and the mainland. To prevent the Cambodians from interfering as a boarding party seized the *Mayaguez*, the rescue force attacked patrol boats and shore installations along the Cambodian coast while some 230 marines landed from Air Force helicopters to capture Koh Tang and free the ship's crew. The *Mayaguez* was abandoned, but infantry armed with a variety of automatic weapons defended Koh Tang. On the morning of May 15, eight of the helicopters landed their troops, and the defenders opened fire, damaging two of the craft and shooting down three others. Meanwhile, a fishing boat carried the crew of the *Mayaguez*, released by their captors, to an American destroyer. Since no Americans were held on Koh Tang, fighter-bombers, attack aircraft, and gunships battered the island's defenders. Aerial firepower, however, could not save the 100 or more marines clinging to a part of the objective; reinforcements had to land and help hold off the enemy to permit an orderly withdrawal. By the time another 100 marines entered the fight, all but one of the nine helicopters that brought in troops during the day had been shot down or damaged.

By early afternoon, even though the marines had been unable to form a unified defensive perimeter, the withdrawal began, and it continued into evening. In a daring nighttime rescue, Capt. Donald R. Backlund could hear bullets tearing into his machine as he held it a few feet above the beach while an isolated group of marines, under cover of fire from the multibarrel gun in the helicopter, made their way up its lowered ramp. A C-130 transport appeared overhead and dropped a 15,000-pound bomb of the type used to clear landing zones for heli-

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Marines of the *Mayaguez* rescue operation on Koh Tang, May 15, 1975.

copters during the fighting in South Vietnam. The resulting blast, plus sensor-directed barrages from AC-130s and strafing by OV-10s, suppressed the hostile fire to such an extent that the three helicopters still capable of flight could carry away the last of the marines. American casualties totaled 41 killed, including the 23 members of an Air Force security detachment who died in the earlier helicopter crash, and 49 wounded. The casualties also included a copilot and a flight mechanic killed on helicopters shot down during the morning attack and six wounded helicopter crewmen. Of the 15 helicopters exposed to hostile fire, four were brought down and nine damaged.

Hailed as a demonstration that American resolve had not been undermined by the communist victories in Cambodia and South Vietnam, the rescue operation had nevertheless been marred by hurried planning and faulty intelligence that sent a hastily assembled force against a far stronger enemy. True, the *Mayaguez* was safely in the hands of its crew, but that fact had no impact on the course of subsequent events in Southeast Asia. During December 1975, the communist faction took over in Laos, and the following year saw a revolution in Thailand and the emergence of a government, as anticommunist as its predecessor, that nonetheless sought to distance itself from the United States and set a deadline for the withdrawal of the American forces based there. After the North Vietnamese conquest of the South, the communist triumph in Laos, the emergence of a hostile regime in Cambodia (which became the People's Republic of Kampuchea), and the shift of policy in Thailand, the United States could no longer maintain a

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military presence in Southeast Asia. The American perimeter in the western Pacific now extended from South Korea and Japan to the Philippines.

Within Southeast Asia, one of the announced purposes of the American involvement had come to pass, even though the main goal, the survival of a non-communist South Vietnam, had not. China did not come to dominate the region, but this outcome, however temporary it might be, resulted from the interplay of rivalries between China and the Soviet Union, between China and Soviet-supported Vietnam, and between Vietnam and the Chinese-aided Khmer Rouge in Cambodia. While these tensions persisted among the communist states, the independence of western-oriented nations like Thailand and Malaysia seemed reasonably secure.

Part VI

Regrouping After  
Vietnam,  
1975-1982



## Chapter 21

# Modernizing after Vietnam

Walton S. Moody  
Jacob Neufeld

**F**or the Air Force, the dominant theme of the decade following the Vietnam War was modernization, including the overhaul of personnel practices, the emergence of new leadership, and the acquisition of new weapons. Actually a continuous process, the renewal of the Air Force had been disrupted during the fighting in Southeast Asia and was now being resumed. In terms of aircraft and other equipment, modernization consisted of applying the latest technology to the task of carrying out the missions assigned the Air Force by national policy. In the post-Vietnam years, however, other factors were at work, among them the usual retrenchment that follows any war, the problems of managing procurement and logistics in a period of change, and the retirement of leaders with roots in the Strategic Air Command and in World War II.

The post-Vietnam retrenchment of the Air Force actually began while the fighting still raged in Southeast Asia. From the spring of 1968, when President Lyndon B. Johnson scaled down the Rolling Thunder air campaign, until the cease-fire early in 1973, the active duty strength of the Air Force declined from almost 905,000 officers and airmen to fewer than 692,000. The pace of the reductions then slowed, with the total strength dipping below 600,000 by 1976

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and continuing to a low of 555,000 in 1979, before beginning to recover during the following year, and reaching 578,000 in 1982. Compared to the active duty force, the strength of the reserve components followed an erratic pattern after 1968. Indeed, the Air Force Reserve approached 353,000 in 1971, the highest total in five years, only to decline steadily to 145,000 in 1979 before increasing at the rate of about 1,000 per year for the next three years. In contrast to the reserve, the Air National Guard showed a succession of waves, growing from 75,000 in 1968 to almost 90,000 two years later, dropping to 86,000 in 1971, rising to 95,000 in 1975, then stabilizing for three years at about 91,000 before beginning an increase that carried it beyond 100,000 in 1982.

Although the casual observer might expect the reserve components to form a mirror image of the active duty force, one expanding as the other contracted, such was not the case. The Air Force continued to call on reservists and members of the Air National Guard to supplement the men and women on active duty, and highly trained units from the reserve components might be mobilized for an extended period or merely take over a definite task, as the Air National Guard was doing with the air defense mission or the Air Force Reserve in supplying crews or transports for duties normally carried out by active duty airmen. Since the Air Force placed such reliance on the reserve components, their availability, training, and general competence became far more important than their aggregate strength.

An example of the mobilization of entire units, the ideal way to make use of a reserve, occurred during the war in Southeast Asia but as a consequence of an incident in the Far East. On January 23, 1968, the North Korean navy seized the American intelligence ship *Pueblo* as it operated just outside the territorial waters claimed by the communist state. Since the capture of the ship could well have signaled a renewal of hostilities on the Korean peninsula, the United States moved swiftly to strengthen its forces in South Korea and also began mobilizing elements of the reserve components, including squadrons of the Air National Guard. The immediate Air Force reaction to the capture of the ship was to send to South Korea 98 fighter-bombers, reconnaissance craft, and interceptors from bases elsewhere in the Far East, including a squadron of 18 F-4Cs from South Vietnam, plus 102 fighter-bombers and electronic warfare craft from the United States. By February 6, a total of 182 aircraft were in place. The recently arrived units, with their essential administrative and maintenance specialists, were joined in South Korea by base engineers, transport aircraft, and rescue helicopters.

On January 26, three days after the capture of the intelligence ship, President Johnson authorized the mobilization of the equivalent of eleven fighter-bomber or reconnaissance squadrons and three wing headquarters from the Air National Guard along with one rescue squadron and the equivalent of five airlift squadrons and two wing headquarters from the Air Force Reserve. The elements of the Air National Guard reported to the Tactical Air Command; those from the



Equipment of the 136th Tactical Fighter Wing, New York Air National Guard, is loaded into a C-141 as the unit prepares to leave for Southeast Asia. The wing's F-100s line the runway in front of the C-141.

Air Force Reserve to the Military Airlift Command. Initially, Air Force planners had addressed the possibility of including at least one tactical fighter squadron of the Air National Guard in the contingent that deployed immediately to South Korea and sending others there in the near future. This plan proved infeasible, however, for the squadrons flew an early model of the F-100 that was not the equal of the more modern North Korean and Chinese jets.

Two fighter squadrons of the Air National Guard did see service in South Korea, however, arriving there in the summer of 1968 and forming the 354th Tactical Fighter Wing. Initially assigned to provide air defense, a mission for which the F-100C proved unsuited, the wing became a training unit to teach ground forces the tactics of air support. A shortage of spare parts hampered the wing, even in the training role, throughout its overseas tour, which ended in June 1969. During the same period, the 123d Reconnaissance Technical Squadron, which went on active duty in May 1968, maintained a forward element at Osan Air Base, South Korea, to process film for American forces.

Since the elderly F-100C seemed well suited to air support operations in South Vietnam, four of the Air National Guard fighter squadrons deployed there, one to replace the squadron of F-4Cs that had departed for South Korea and the others to serve as part of the reinforcements dispatched as a consequence of the Tet Offensive of February 1968. These units joined the 35th Tactical Fighter Wing, along with the 355th Tactical Fighter Squadron of the active duty Air Force, in which eighty-five percent of the pilots had volunteered

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individually from the Air National Guard to serve in Southeast Asia. The recently called-up Air National Guard squadrons fought in South Vietnam from June 1968 until June of the following year and earned praise from the commander of the Seventh Air Force, Gen. George S. Brown, who declared that 35th Tactical Fighter Wing had “the five best F-100 squadrons in the field.” The Tet Offensive also resulted in the mobilization of about 1,000 members of the Air Force Reserve. One reserve unit, the 71st Special Operations Group, trained in Fairchild AC-119G gunships and saw combat in Southeast Asia during the first half of 1969.

In 1970, Secretary of Defense Laird popularized the term “Total Force” to describe the relationship between the active duty and reserve components. Total Force was a catch-phrase intended, in part, to assure the public that the National Guard and the reserve, even though they had been only partially mobilized for the Vietnam War, remained vital elements of the nation’s armed forces and were well worth the money invested in them. With Total Force, Secretary Laird sought to apply to the other services essentially the same concept that the Air Force had been using since 1960 to incorporate the airlift, air refueling, tactical fighter, and air defense units of the Air Force Reserve and Air National Guard into the routine operations of the active duty force. Although an old story to the Air Force, the practice of treating active duty and reserve components as a single entity became even more important as budgets declined in the aftermath of the Vietnam War. For example, the estimated operating cost of a fighter squadron of the Air National Guard was seventy percent that of its active duty counterpart. Consequently, the Air National Guard continued to participate in the air defense of the United States, and the Air Force Reserve extended its activity beyond the use of its C-124s and their crews to fly routes for the Military Airlift Command. In another Total Force program, reserve crews alternated with active duty airmen in flying the same transport, increasing the utilization of first the C-141 and then the C-5.

The Air Force Reserve and the Air National Guard attracted and held a cadre of skilled individuals and organized them into cohesive units. With roughly thirty percent of the Air Force inventory of aircraft, the reserve components consistently flew twenty percent of the total flying hours throughout the late 1970s and early 1980s. In an effort to enhance training, maintenance, and administration within the Air National Guard, the persons who performed these critically important duties full-time were brought into the federal civil service in 1969; formerly they had been employees of the various states, with differing working conditions, pay, and retirement systems. Throughout the 1970s and into the 1980s, the reserve components remained valued partners of the active duty Air Force, sharing in some missions on a routine basis and training to be mobilized in an emergency.

As it did with the reserve components, the Air Force had to make the most efficient possible use of its active duty strength. During the Vietnam conflict, the



An Air Force Reserve KC-135, part of the Total Force.

most serious personnel problems that the Air Force encountered were a shortage of pilots, racial strife, and drug abuse. Because of the danger of being drafted to fight in the jungles of Southeast Asia, wartime recruiting had not been difficult for the Air Force. However, few of the young men who entered officer training programs to escape the draft showed any interest in the Air Force as a career or in becoming pilots.

The pilot shortage proved especially intractable, largely because the uniformed leadership of the service differed with Secretary of Defense Robert S. McNamara on the basic nature of the Air Force. The Secretary of Defense saw the air arm as a military organization that happened to fly. Consequently, in mid-1965, even as the war in Southeast Asia was intensifying, he deliberately held in check the numbers entering pilot training, arguing that the Air Force had roughly three pilots for every pilot's seat and could manage its corps of aviators more efficiently by placing them only in those assignments where their skills were needed. In contrast, the senior generals saw their service as a flying organization, with the pilot its heart and soul. These leaders, almost all pilots, insisted that the apparent surplus was an illusion. The additional flyers were needed to permit rapid wartime expansion; moreover, in war or peace, a young pilot could become a senior commander or program manager only after a wide variety of experience, including nonflying assignments like attendance at professional schools or duty on joint staffs. The conflicting interpretations of what an air force actually was, and how many pilots it needed, contributed to the short-

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age, and the Vietnam War also played a part, providing a pilot with an incentive to cut short a planned career in the Air Force and exchange all the annoyances associated with military aviation—the reports and regulations, the burdensome collateral duties, and the sometimes inadequate quarters—for a high-paying job flying for a rapidly expanding airline industry. Further complicating the pilot shortage was the retirement during the 1960s of the generation of Air Force officers commissioned in the 1940s before the air arm became an independent service. Once he could no longer ignore an obvious wartime shortage, McNamara grudgingly increased the number of student pilots, and the Air Force resorted to involuntary or voluntary programs to hold onto its pilots while the current emergency lasted.

The pilot shortage recurred from time to time after the Vietnam conflict, largely because the airlines saw the Air Force as a prime source of trained pilots. Indeed, since 1965 this industry had been the single greatest temptation luring Air Force pilots away from the service. In the late 1970s, competition among the commercial carriers resulted in salary cuts and reduced benefits that made civil aviation seem less attractive. During the following decade, however, salaries and working conditions improved, large numbers of older pilots retired from the airlines, and before the 1980s ended, the Air Force tried to retain its pilots through a combination of financial incentives and changes in the policies governing assignment and evaluation of officers. To improve the esprit de corps and camaraderie, the Air Force began to issue flight crews the kind of leather jacket worn during World War II.

The Air Force believed that the other serious problems of this era—racial turmoil, the use of drugs, and the alcohol abuse—could be corrected through education or treatment. To eliminate racial strife, the service embarked on a mandatory program of education that combined lectures, discussions, and improvised drama in an attempt to isolate the sources of conflict and foster mutual understanding and acceptance. Attacking drug abuse and alcoholism required not only education about the dangers of both but also professionally run programs of rehabilitation. The efforts to deal with these three problems, innovations that the Air Force considered highly successful, came to be joined by other related programs that addressed the problems of families, women, and ethnic rather than racial minorities.

The interest in improving the lot of women reflected their increasing importance to the Air Force, as they became more numerous and served in a wider variety of specialties. Since women were now receiving assignments that required a sizable investment of time and training, their retention became a matter of concern for the Air Force. This emergence of women from stereotyped, essentially clerical jobs reflected both the needs of the Air Force and the changing attitudes of a society less willing to restrict women to certain traditional careers. Although some women continued to serve in the customary roles of nurses, medical or dental technicians, and office assistants, others gained admission to



**A Titan Ballistic Missile Analyst Technician  
of the 532d Strategic Missile Squadron.**

the Air Force Academy, completed pilot or navigator training, or became members of launch crews in strategic missile units, as the Air Force expanded the fields of activity open to women, especially officers. Horizons also expanded for enlisted women, as they became eligible for any of 230 noncombat specialties. Moreover, the total number of women in the Air Force increased from a mere 11,000 in 1968 to more than 64,000 in 1982, a record of steady growth even in those years, 1968–1979, when the aggregate strength of the active duty Air Force was declining. From a low of slightly more than one percent of the Air Force, excluding the reserve components, in the late 1960s, the proportion of women exceeded ten percent in the early 1980s.

Appearance at the highest levels of management in the Air Force symbolized the increasing importance of women in the armed services. New legislation permitted women to become general officers, and in 1971 Jeanne M. Holm became the first to hold the rank of brigadier general in the Air Force. Six years later, Antonia Handler Chayes, an educator by profession, became the first woman to serve as an assistant secretary of the Air Force, assuming responsibility for manpower, reserve affairs, and installations. In 1979, after Hans Mark became Secretary of the Air Force, she took his place as under secretary, the second-ranking civilian in the leadership of the service.

The need on the part of the Air Force to recruit women reflected the end of the Vietnam fighting and the Army's transition from dependence on the draft to an all-volunteer force. These events removed a major incentive for entering the Air Force, but the lure of technical training, the promise of a paycheck in a time of high unemployment, and veterans' benefits available to those who enlisted in

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The scoring control room of the 1982 William Tell exercise.

1976 or earlier enabled the air arm for a time to recruit all the men and women it needed. After 1976, however, the benefits no longer included loans for buying homes, and a program of matching savings made by an individual for education replaced outright grants for books and tuition. These changes, along with increasing opportunities for civilian employment, made military service seem less attractive, and in 1979, the Air Force failed to meet recruiting objectives. Experience between 1976 and 1979 indicated that recruiting was easy in bad times but difficult when jobs were plentiful. A contracting economy helped the Air Force to expand by some 12,000 from 1981 to 1982, but unemployment declined; consequently, in 1984 and 1985 Congress found it necessary to agree to a new package of educational benefits to attract recruits for the armed forces. As had been the practice since the late 1950s, a system of bonuses helped retain experienced enlisted men and women with critically needed specialties

Even as the aggregate strength of the Air Force changed, and with it the ratio of women to men, training continued, involving both the active duty and reserve components. The Strategic Air Command conducted its annual bombing, refueling, and missile competitions into the 1980s, although fuel shortages reduced the numbers vying for the flight trophies in the mid-1970s. The competition among interceptor crews and their ground controllers, nicknamed William Tell in memory of the legendary accuracy of the Swiss crossbowman whose bolt skewered an apple perched on the head of his son, resumed in 1970 after a five-year pause during the Vietnam War. William Tell came to be held every other year at Tyndall Air Force Base, Florida, the site of the exercise since 1958. After

the Aerospace Defense Command disbanded, the Tactical Air Command took over, beginning with the 1980 event. The competitors over the years have included entrants from the Royal Canadian Air Force as well as from the active duty and reserve components of the U.S. Air Force.

Preparations also continued for the day that Army troops and tactical aircraft of the Air Force might have to deploy across the ocean to reinforce the North Atlantic Treaty Organization. In a typical exercise during 1976, the Military Airlift Command flew 153 missions with its C-141s to deliver some 13,000 soldiers and 250 tons of equipment to Europe, where the force drew its tanks and trucks from previously stocked depots. In addition to undertaking frequent missions to Europe, the command used its aircraft in exercises designed to foster regional solidarity in Central America against the communist regime of Nicaragua and the insurgencies it was believed to be supporting. During the first six months of 1981, for example, C-130s delivered 500 tons of military cargo to El Salvador, where communist rebels challenged the government. Similarly, aerial deployments continued in conjunction with exercises in the United States, as during 1982, when 59 C-141s and 27 C-130s, all of the latter from the reserve components, dropped 2,000 paratroops and delivered 600 tons of cargo in the California desert to help train the Rapid Deployment Joint Task Force of the Readiness Command, a lineal descendant of the Strike Command of the 1960s.

The Military Airlift Command continued in the post-Vietnam era the humanitarian missions it had flown since its inception as the Military Air Transport Service. In 1977, Buffalo, New York, benefited from military airlift, when C-5s, C-141s, and C-130s flew 995 tons of equipment and 495 troops in 48 missions to return the city to normal after a paralyzing blizzard. Three years later, the command delivered relief supplies to Algeria and Italy after earthquakes, and its Aerospace Rescue and Recovery Service saved individuals trapped after the eruption of Mount St. Helens, a volcano in Washington, and picked up passengers from the Dutch tour ship *Prisendam*, which caught fire in the Gulf of Alaska.

The Tactical Air Command made a special effort throughout the post-Vietnam years to conduct realistic training in teaching its aircrews to defeat the hordes of Soviet fighters certain to be encountered in any air battle over Europe. The Red Flag exercises at Nellis Air Force Base, Nevada, taught fighter tactics to pilots from the command, the reserve components, and eventually other commands and friendly foreign air forces. F-4s, F-16s, and other aircraft tangled with "aggressors" flying F-5s painted to resemble Soviet fighters, while electronic equipment on the ground and on board the aircraft enabled judges to decide between victors and vanquished. Training in escape and evasion, conducted at the base since the 1950s, became an adjunct of Red Flag exercises, as did search and rescue. Eglin Air Force Base, Florida, served as the site for Blue Flag exercises that trained battle staffs under conditions of simulated combat, and the individual combat wings conducted Black Flag exercises at their own bases to

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The Northrop F-5, flying as an aggressor.

teach crew chiefs and other maintenance specialists how to wring the most sorties from their aircraft during brief periods of intense activity approximating wartime operation. The Flag exercises came to include Green Flag, described as an “electronic Red Flag,” which concentrated on the use of electronic countermeasures by tactical forces to neutralize radar-controlled anti-aircraft defenses; Copper Flag, held at Tyndall Air Force Base to improve the readiness of air defense units; Checkered Flag, consisting of practice deployments to bases overseas; and Silver Flag, which tested operations on primitive airfields. The success of the Tactical Air Command’s Flag series persuaded the Air Force Medical Service to conduct its own Red Flag exercises annually at major facilities beginning in 1979. Besides carrying out the Flag exercises, the Tactical Air Command routinely dispatched units to participate in exercises staged in Europe and the Far East.

The emphasis on training contributed to greater readiness, but even the most skilled and highly motivated pilot and crew had to have an aircraft in working order. Careful attention to supply and maintenance remained tightly linked to training exercises and aerial competitions, and one yardstick that measured the overall status of the Air Force was the percentage of its aircraft ready to perform the assigned mission. The proportion of aircraft judged fully or partially mission capable improved from about 70 percent in the mid-1970s and approached 80 percent during the 1980s.

Improved readiness coincided with a growth in appropriations for the Air Force as funding rebounded after a post-Vietnam decline; indeed, the improve-

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ment may well have depended on the availability of money for realistic training, as well as for supply and aircraft maintenance. The end of the fighting in Southeast Asia did not immediately release funds that could be used to modernize the Air Force, for retrenchment became the watchword with the return of peace. Not until Jimmy Carter became President did the annual appropriation for the Air Force exceed \$30 billion for the first time and, during his final year in office, surpass \$40 billion, although inflation eroded the actual purchasing power of the dollars made available. With the advent of President Ronald W. Reagan, Air Force appropriations increased beyond \$52 billion in fiscal 1981 and \$65 billion in fiscal 1982, in generally more stable currency.

A new generation of leaders took charge of this highly trained Air Force. Gen. John D. Ryan, the last of three successive Air Force Chiefs of Staff firmly rooted in the Strategic Air Command, replaced Gen. John P. McConnell in August 1969 and served for four years. Ryan, a former Commander in Chief of the Strategic Air Command, was replaced by Gen. George S. Brown in August 1973. A bomber pilot in World War II, Brown took part in the attack on the oil refineries at Ploesti, Rumania, in August 1943. He earned the Distinguished Flying Cross there for braving fighters and anti-aircraft fire to drop his bombs from an altitude so low that he crumpled the wingtip of his B-24 against a church steeple. Despite his wartime experience in strategic bombing, Brown did not serve in the postwar Strategic Air Command; instead, when World War II ended, he commanded air transport units flying the Pacific and was a staff officer in the headquarters of the Fifth Air Force during the Korean conflict. After the Korean fighting, he studied at the National War College, served as a military assistant to Secretary of Defense McNamara, and headed a joint agency for testing air-to-air and air-to-ground missiles. From 1968 to 1970, he commanded the Seventh Air Force in South Vietnam, taking over from Gen. William W. Momyer. After returning to the United States, General Brown assumed command of the Air Force Systems Command, his last assignment before becoming Chief of Staff.

When Brown became Chairman of the Joint Chiefs of Staff in 1974, he was succeeded as Air Force Chief of Staff by Gen. David C. Jones, who for a time had been Brown's vice commander at the headquarters of the Seventh Air Force. A flying instructor during World War II, General Jones had some experience in the Strategic Air Command, flying B-29s from Okinawa against targets in North Korea during the Korean War and afterward as an aide to Gen. Curtis E. LeMay. After leaving the Strategic Air Command, Jones attended the National War College, served on the Air Staff, and commanded a fighter wing. He commanded the U.S. Air Forces in Europe when he was chosen to become the uniformed head of the Air Force; and in spite of his assignment in South Vietnam, he was closely identified with the North Atlantic Treaty Organization, having reorganized its tactical air forces. In June 1978 General Jones succeeded General Brown as Chairman of the Joint Chiefs of Staff, and Gen. Lew Allen, Jr., became Air Force Chief of Staff.

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Air Force Chiefs of Staff Gen. George S. Brown (left), August 1973–June 1974, and Gen. David C. Jones, July 1974–June 1978.

General Allen's appointment signaled the beginning of a new era, for he was the first person to hold the office of Chief of Staff of the Air Force who had not served as an officer during World War II. In addition, he was the first Chief of Staff trained as a scientist. After graduating from the United States Military Academy in 1946, he completed pilot training and then embarked on a career mostly involved with military applications of the physical sciences. He attended the University of Illinois, where he studied nuclear physics, receiving a master's degree in 1952 and a doctorate two years later, and was assigned to a study of the effects of high-altitude nuclear detonations by the weapons laboratory at Kirtland Air Force Base, Albuquerque, New Mexico. He later joined the staff of the laboratory operated by the Atomic Energy Commission at nearby Sandia Base, called Kirtland East after Sandia merged with Kirtland in 1971. Reassigned to the Pentagon, he became a staff assistant to Harold Brown, then the Director of Defense Research and Engineering. Allen next served as a special projects officer for Eugene M. Zuckert, at the time the Secretary of the Air Force. When Brown, himself a prominent physicist, replaced Zuckert, Allen remained with the office as special projects officer for space systems. From Air Force headquarters, Allen went to the Space and Missiles Systems Organization of the Air Force Systems Command. He subsequently became a deputy to the Director of the Central Intelligence Agency and later served as the director of the National Security Agency before taking over the Air Force Systems Command, his last assignment before succeeding General Jones as Chief of Staff.

The selection of Gen. Charles A. Gabriel when Allen's term ended in July 1982 marked a return to the practice of choosing an operationally oriented officer to be Chief of Staff. A veteran of the fighting in Korea, where he flew 100

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missions and shot down two MiGs, General Gabriel spent much of his career with fighter units, but he also served as a member of the Air Staff and as a staff officer at the Supreme Headquarters, Allied Powers, Europe. In July 1970, he went to Thailand and took command of a wing of tactical aircraft. Gabriel then served as a staff officer at the headquarters of the Tactical Air Command, as a deputy commander at the American and United Nations headquarters in Korea, as a deputy chief of staff at Air Force headquarters, and as Commander in Chief, U.S. Air Forces in Europe. A graduate of the U.S. Military Academy, he earned a master's degree in engineering management from George Washington University and graduated from the Industrial College of the Armed Forces.

Finding common threads that run through the careers of these Chiefs of Staff is difficult, indeed. Of the four officers—Generals Brown, Jones, Allen, and Gabriel—who carried out the post-Vietnam modernization, three were graduates of the Military Academy; the exception, General Jones, entered the Air Force as an aviation cadet. Their educational background varied greatly, but all had either attended senior professional schools, obtained advanced degrees, or both. Three of the four had extensive operational experience; in this instance, Allen was the exception. Perhaps the only conclusion that can be drawn is that the Air Force of the 1970s was led by officers with broader educational backgrounds and more varied experience than the Chiefs of Staff of the 1960s, who had been identified so closely with the Strategic Air Command.

In selecting an officer to command the Strategic Air Command, the Air Force in the late 1960s began looking for extensive experience in a variety of assignments rather than long service in that organization. The officer who devoted his energies to meeting the demands of the Strategic Air Command for unceasing vigilance and close attention to detail tended over the years to adopt an attitude that emphasized the importance of the command in the scheme of national defense and reflected the command's operating techniques. It seemed during the 1960s that the outlook of the Strategic Air Command had permeated the entire Air Force, with veterans of that organization heading at various times the Air Force Logistics Command, the Tactical Air Command, and the Military Airlift Command, besides serving as Chief of Staff and holding key assignments on the Air Staff. Whatever the assignment, they brought with them the fruits of their experience in the Strategic Air Command; no other command exercised so pervasive an influence.

The last of the old guard to advance upward within the Strategic Air Command and become its commander in chief was Gen. Joseph J. Nazzaro, a leader of bomber units in Europe and a staff officer there during World War II. After the formation of the Strategic Air Command, he joined its headquarters. Following a tour of duty as a student and then an instructor at the Air Command and Staff School, he returned to the Strategic Air Command, progressing from commander of an air division to commander in chief of the organization, replacing General Ryan in February 1967 and serving for 17 months.

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Strategic Air Command Commanders in Chief  
Gen. Bruce K. Holloway (left), August 1968–April 1972,  
and Gen. John C. Meyer, May 1972–July 1974.

Nazzaro's replacement was a former fighter pilot, Gen. Bruce K. Holloway. A veteran of the aerial fighting in China during World War II, where he shot down thirteen Japanese aircraft, Holloway had served in the Tactical Air Command and the Strike Command, as a member of the Air Staff, and as Vice Chief of Staff of the Air Force before taking over the Strategic Air Command in August 1968. He was succeeded in May 1972 by another fighter ace, Gen. John C. Meyer.

Credited with shooting down twenty-four German aircraft during World War II and two enemy jets in the Korean conflict, General Meyer was first assigned to the Strategic Air Command in 1962, when he began a fifteen-month tour as a planner, after which he returned to the Tactical Air Command. From there he was reassigned to the Joint Chiefs of Staff, and, like his predecessor, Meyer served as Vice Chief of Staff before assuming command of the Strategic Air Command at Offutt Air Force Base, Nebraska. Although Holloway had ignored requests by naval officers assigned to a Joint Strategic Target Planning Staff for a larger voice in the nuclear targeting process, Meyer came away from his service on the Joint Staff convinced of the importance of cooperation among the services. Therefore, in the capacity of director of the Joint Strategic Target Planning Staff, Meyer expanded the role of the Navy's contingent and lessened the reliance on Air Force officers, assigned primarily as planners and intelligence specialists for the Strategic Air Command and doubled as members of the joint target planning staff, performing essentially the same duties for both.

When Meyer retired in July 1974, he was replaced by Gen. Russell E. Dougherty, a graduate of the University of Louisville law school and a staff judge advocate and a specialist in contract litigation before transferring to the Strategic

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Air Command, where he served for five years as a pilot and either staff officer or commander of tanker, bombardment, or support units. Dougherty subsequently attended the National War College, was a staff officer at Air Force headquarters and for the Joint Chiefs of Staff, and commanded the Strategic Air Command's Second Air Force. Immediately before taking over at Offutt Air Force Base, he was Chief of Staff, Supreme Headquarters, Allied Powers, Europe.

Gen. Richard H. Ellis, who succeeded Dougherty in August 1977, had a similarly varied background in the Air Force. He flew 200 bomber missions in the Pacific during World War II, left active duty after Japan surrendered, went into the Air Force Reserve, and became an attorney. Recalled to active duty during the Korean War, he embarked on a career that introduced him to tactical fighters, airlift, and staff duty. He commanded the Ninth Air Force of the Tactical Air Command in the United States and saw extensive service with the North Atlantic Treaty Organization, commanding tactical air forces in Turkey, southern Europe, and central Europe. As Commander, Allied Air Forces, Central Europe, he also commanded the U.S. Air Forces in Europe. Prior to his last assignment in Europe, he was Vice Chief of Staff of the Air Force.

Gen. Bennie L. Davis, who took over the Strategic Air Command from General Ellis in August 1981, spent a dozen years as a pilot, instructor, and staff officer in that organization. After 1966, however, his assignments broadened to include duty in tactical bombardment, with the Joint Chiefs of Staff, and with the Air Force Military Personnel Center. In addition, he completed graduate study at George Washington University and the Harvard School of Business. On the Air Staff, he became Director of Personnel Planning and Deputy Chief of Staff, Personnel, and later commanded the Air Force Recruiting Service and the Air Training Command. Once again the Air Force seemed to be making an effort to select an officer with wide experience to serve as Commander in Chief, Strategic Air Command.

The Secretaries of the Air Force came from a variety of backgrounds. Between the inauguration of President John F. Kennedy in 1961 and 1982, eight persons served as Secretary of the Air Force; the average tenure was 34 months. One secretary served as many as 56 months; another served as few as 15. Secretary Zuckert, who held the post from 1961 to 1965 under Presidents Kennedy and Johnson, was an attorney, whose experience included service as an assistant secretary of the Air Force and a member of the Atomic Energy Commission. His successor, Harold Brown, was a physicist, a teacher, and a research scientist at a number of prestigious institutions including a radiation laboratory operated by the Atomic Energy Commission. A frequent consultant to the government on problems of science and engineering, Dr. Brown had been Director of Defense Research and Engineering for Secretary of Defense McNamara and would return to the Pentagon in 1977 as President Carter's Secretary of Defense. To replace Brown as Secretary of the Air Force, President Richard M. Nixon in 1969 chose Robert C. Seamans, Jr., a trained scientist and a teacher, but as his service

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Dr. Harold Brown,  
Secretary of the Air Force,  
October 1965–February 1969.

as Deputy Director, National Aeronautics and Space Administration indicated, for most of his career an administrator or manager. Seamans was replaced as Secretary of the Air Force in 1973 by his under secretary, John L. McLucas, who had been a corporate official in various engineering firms, a deputy to the Director of Defense Research and Engineering, and at times a member of the Air Force Scientific Advisory Board and a consultant to the North Atlantic Treaty Organization. When McLucas left to head the Federal Aviation Administration in 1975, President Gerald R. Ford chose as Secretary of the Air Force an engineer turned business executive, Thomas C. Reed, who had engaged for a time in weapons research at the Livermore laboratory, served as a member of the Republican National Committee, and had been the Director of Telecommunications and Command and Control Systems for the Department of Defense. President Carter succeeded Ford in January 1977 and selected as Secretary of the Air Force a businessman, John C. Stetson, who had headed a consulting firm, a newspaper, and finally a corporation that manufactured office equipment. When Stetson resigned in 1979, Hans Mark, a physicist and teacher, moved up from the office of under secretary; Dr. Mark's previous experience in government had been as director of the Ames Research Center of the National Aeronautics and Space Administration. The election of Ronald Reagan brought Verne Orr to the office of Secretary of the Air Force in 1981. An automobile dealer who served as California's director of finances during Reagan's term as governor, Orr had no previous experience in the federal government.

The backgrounds of the individuals who occupied the office of Secretary of the Air Force during this period contributed very little to their effectiveness. Success depended less on experience than on the administration's willingness to budget funds and on their own personal relationships with authorities in the Department of Defense and the uniformed leaders of the Air Force. The Secretary of Defense exercised authority over the budget of all the services, and the Chief of Staff, assisted by the Vice Chief and the Assistant Vice Chief, head-

ed the uniformed service including the Air Staff. Obviously the civilian manager of the Air Force, like the Secretaries of the Army and the Navy, had to get along well with both the Secretary of Defense and the military leadership of his own service. Unfortunately, this relationship could be dissonant as well as harmonious, for the Secretary of the Air Force represented both the administration, whose priorities shaped the defense budget, and the service, whose urgent requirements might not always enjoy a similar status in the overall financial plan. Besides ensuring that the Air Force provided well-trained and fully equipped forces to the unified and specified commands, the Secretary had to try to obtain the budget his service desired. In carrying out these tasks, the civilian head of the Air Force had only a small group of advisers, roughly 10 percent the size of the Air Staff, and therefore relied on the larger organization for information. The uniformed leadership, the Air Staff, and the Secretary of the Air Force worked out a common position on critical issues, which the Secretary then defended to the best of his ability within the administration.

The management styles of the various Secretaries of Defense also affected the Air Force budget, and money often determined whether the Secretary of the Air Force would succeed or fail. In reaction to McNamara's centralization of authority, Secretary of Defense Melvin R. Laird, who served President Nixon, spoke of "participative management" that would enable the service secretaries to share somehow in the powers of the Secretary of Defense. Despite this endorsement of decentralization, Laird chose as his principal deputy David Packard, an executive in the aerospace industry, who considered himself the general manager of the Department of Defense, the executive agent of Secretary Laird, and was unwilling to share authority with the Secretaries of the Air Force, Army, and Navy. In the Nixon administration, the Secretary of the Air Force participated in the fiscal process, though only by reviewing a budget based on an agenda worked out by the financial managers of the services and the comptroller of the Department of Defense.

The practice of having the services respond to a budget based on their inputs but shaped by the Office of Secretary of Defense continued through the Ford and Carter years until the Reagan administration, when Caspar W. Weinberger became Secretary of Defense. Unlike his predecessors from McNamara on, he did not see himself as an arbiter, imposing independent judgment on the proposals of the services, but as their agent, pushing as vigorously as overall funding permitted for the programs they considered essential. He adopted a policy that resembled budget making in the Eisenhower years, allowing the service secretaries and his own assistants to hammer out a budget within a general ceiling. Weinberger tried for a time to have the budget makers identify sources of funds for new or enlarged programs, but each participant routinely suggested that the money come from someone else, so he ended the practice. Because the overall defense budget grew in Reagan's first two years, hard bargaining and painful choices rarely were necessary.

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Gen. Lew Allen, Jr.,  
Air Force Chief of Staff,  
July 1978–June 1982.

After the Vietnam war, one Chief of Staff, General Allen, had been a trained physicist and most of the service secretaries had some experience in science or engineering. Although the leadership of the service did not always include scientists or technocrats, the Air Force retained its interest in science and technology as the servants of air power. The Rand Corporation, an agency established to ensure technological dominance, had not worked out exactly as planned. Originally envisioned as a community of scholars, scientists, and engineers dedicated to the needs of the Air Force, the nonprofit organization had expanded to the point that it was actively seeking new clients and addressing topics, like the quality of urban life, with no relationship to the concept of air power. Moreover, many key staff members left Rand to assist Secretary of Defense McNamara, buttressing his decisions to cancel the Skybolt missile, the RS-70 aircraft, and other programs the Air Force judged highly desirable, if not essential. Consequently, the special bond between Rand and the Air Force deteriorated; the firm came to regard the service as just another customer, and the Air Force saw Rand as just one of several nonprofit think tanks that might be hired for a particular project.

Also declining in influence during the 1970s and 1980s was the Scientific Advisory Board, another means by which the Air Force (and earlier the Army Air Forces) hoped to keep up with changing technology. In the 1940s and 1950s, when Theodore von Kármán served the air arm as a principal science adviser and oversaw the functioning of the board, aerodynamics and aircraft propulsion entered the era of supersonic flight, powerful jet and rocket engines, and orbiting or ballistic vehicles that would leave and reenter the earth's atmosphere. The emphasis in those times rested on broad scientific investigation, but once the basic information had been gained, the Air Force became increasingly interested in the application of this knowledge to specific weapon systems; and the kind of work done by the scientific advisers reflected the change in the priorities of the Air Force. From the dawn of the jet age during World War II until 1959, the

Scientific Advisory Board and its predecessor, the Scientific Advisory Group, addressed specific weapon systems in only about five percent of their studies; beginning in 1960, almost a third of the studies had this narrow focus. Since the board's agenda increasingly listed specific weapon systems and their components, rather than general topics like atomic propulsion or devices for enhancing aerodynamic lift, Air Force officers experienced in the kind of system under discussion, assisted as necessary by civilian consultants, seemed better able to evaluate the subject than scientists or engineers without a comparable military background. The presence of officers therefore increased on the Scientific Advisory Board, as did the control exercised by the Air Force over the board's internal organization and the topics for investigation.

Another indication of this change was the use, beginning with General Schriever's Project Forecast in 1963 and 1964, of specially formed study groups, headed by uniformed officers, to do what the civilian scientific advisers had done in, for example, *Toward New Horizons*. The greater reliance on officers in dealing with science and advanced technology not only signaled the eclipse, at least temporarily, of the Scientific Advisory Board but also testified to the emergence within the Air Force of well-defined career fields within the scientific and technological specialties, much as General Arnold had predicted at the time of his retirement. This increasing reliance on uniformed scientists and engineers raised the possibility that future studies might reinforce accepted ideas instead of subjecting them to the kind of impartial scrutiny that outsiders might provide, leaving the possibility that the Air Force might someday reverse the decline in the board's importance.

Besides becoming increasingly involved in studies like Project Forecast, the Air Force Systems Command retained responsibility for weapon system acquisition and continued to find itself caught between the proponents of centralized procurement and those who favored decentralization. In general, the command attempted to strike a balance between extremes. For instance, Deputy Secretary Packard tried to decentralize supervision of the F-15 fighter development program by transferring oversight from the Air Staff to the Air Force Systems Command but, at the same time, established review panels and channels of reporting that kept him and the leaders of the Air Force informed of progress and problems. Moreover, the very act of decentralizing management by shifting responsibility to the Air Force Systems Command encouraged the commander of that organization to centralize authority in his headquarters rather than in the divisions directly involved with aircraft and other systems. This reaction was understandable; since the commander bore the ultimate responsibility for development and acquisition, he could not afford nasty surprises and had to know exactly what was happening.

Indeed, every level of the acquisition process shared the desire to avoid unexpected cost overruns and similar shocks. Before the 1970s ended, periodic reviews of major projects were conducted within the Air Force Systems Com-

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mand, at Air Force headquarters, and within the Office of Secretary of Defense. To be absolutely certain that a weapon would work as planned, “Fly Before Buy” became the watchword, as the Systems Command demanded competitions between prototypes, when time, cost, and technology permitted. A new attack aircraft lent itself to this process because the design was essentially straightforward, the cost of the prototypes was acceptable, and time was available for the competition. Under controlled conditions, the Fairchild A-10 won out first over the Northrop A-9 and afterward over a modified version of an aircraft, the A-7, already in service. Similarly, the General Dynamics F-16 bested a Northrop prototype and went into production. In contrast, after McDonnell Douglas defeated Boeing in a competition between prototypes of an intratheater transport, the Air Force decided it actually needed a longer range transport and engaged McDonnell Douglas to begin work on the technology that would permit such an aircraft (the C-17) to land even heavy tanks on crude airstrips.

Despite these competitions, experience soon revealed that Fly Before Buy, however attractive as a slogan, could not be applied as a principle in the 1980s as it had been fifty years earlier, when considerations of design, cost, and time permitted manufacturers to gamble their own resources in competing prototypes. Projects tended always to be urgent, expensive, and technologically sophisticated, thus, ill-suited for actual competition. Highly complex and costly aircraft and missiles had to be bought on the basis of what they should be able to do, rather than what their prototypes had done, thus complicating the job of the Air Force Systems Command. When competition between advanced prototypes from different manufacturers was not feasible, as in the case of the B-1



A Fairchild A-10 Thunderbolt II.

bomber, the project officers checked carefully into the manufacturer's projections and his actual record to date, striving throughout development and acquisition for a realistic appraisal of cost and performance.

Although the Secretary of Defense might decentralize by making the commander of the Systems Command responsible for development and acquisition projects conducted by the Air Force, the Office of Secretary of Defense continued to dominate the process, whether authority was wielded by the Secretary himself, through his deputy, or through his director or assistant for research and engineering. A project had to have the approval of the Secretary of Defense to start on the path that began with conceptualization, and continued through proof of concept, development, production, and deployment. Likewise, once the acquisition procedure began, the Secretary had to approve the termination of a project short of deployment.

When the Reagan administration took office, Deputy Secretary of Defense Frank Carlucci sought to codify the procurement process in a series of principles or "initiatives" incorporating the results of experience dating from Packard's time and beyond. Among other things, Carlucci called for greater use of multiyear funding, tried successfully with the F-16 fighter during the Carter administration to obtain orderly planning; the tailoring of management procedures to meet the needs of individual programs, as was done with ballistic missile development in the late 1950s; and a reduction in the number of programs reviewed regularly within the Office of Secretary of Defense. In general, Carlucci followed the example of Packard in making the Systems Command the focus of weapons acquisition within the Air Force.

Even as it carried out its assigned duties, the Air Force Systems Command underwent an internal reorganization designed to get its various laboratories out of basic research and into activity that contributed directly to the development and acquisition of weapons and their components. This reorganization led to the decision in 1975 to close the Rome Air Development Center in New York and transfer its electronics functions to Hanscom Air Force Base in Massachusetts, thus forming a new laboratory devoted to developing equipment for command, control, and communications. Other important organizational changes included the establishment in 1974 of the Air Force Test and Evaluation Center at Kirtland Air Force Base in response to criticism by a Presidential panel, seconded by the General Accounting Office, that the service relied too heavily on contractors to provide technical evaluations of their own products. Kirtland also became the site of the Air Force Space Technology Center, set up in 1982 as a component of the Space Division of the Systems Command. In yet another organizational change, the Air Logistics Division of the Air Force Logistics Command, which had looked after the aspects of systems acquisition related to maintenance and materiel support, would in 1984 become the Air Force Acquisition Logistics Center, a joint agency of Systems Command and the Logistics Command.

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Both the Air Force Systems Command and the Air Force Logistics Command faced different aspects of a common problem in the late 1970s and early 1980s—the soaring costs of acquiring weapon systems and then maintaining their effectiveness once they became operational. Even though the Air Force budget began to increase during the Carter years and rose even more rapidly in Reagan's first term as President, the money did not go all that far when a single B-1B bomber could cost a quarter-billion dollars and the prototype of the radar-evading B-2 perhaps twice that amount. According to Gen. Robert T. Marsh, who became head of the Systems Command in 1981, the question facing the Air Force was not whether his organization could develop the best weapons but whether the American people, expressing their will through the Congress, would continue to pay for programs that consistently exceeded the expected cost. Standard practices like the careful negotiation of an estimated price, the continuous monitoring of actual costs, the careful tailoring of requirements, and the judicious use of fixed-price contracts and contracts with incentives for containing costs had failed to eliminate a problem made even more intractable by inflated currency, comparatively limited production runs, purchases in small quantities of spare parts unique to a particular system, and the rising cost to the manufacturer of doing business. Spiraling costs affected both commands, but the chronic difficulty of controlling an inventory of more than a million items, a formidable task even in the age of the computer, complicated the Logistics Command's attempts to reduce spending. Despite the importance of inventory control, the basic mission of the command was not to provide a continuous tally of every nut and bolt but to make sure that items reached the appropriate place in suitable quantities and in ample time to keep the operating Air Force flying and fighting. Effectiveness in combat thus took precedence over efficiency in stockpiling and distribution. Gen. Henry H. Arnold, who commanded the Army Air Forces during World War II, had demonstrated the truth of this maxim when he sent the gun switches needed by a dive-bomber unit by three different routes to make sure that enough reached the destination on time.

The example of General Arnold, however, was not entirely applicable in the late 1970s and early 1980s, a time of continuous preparedness rather than actual war. Since the nation was not fighting for its survival as it had been in 1942, both Congress and the American people demanded that the Air Force Logistics Command manage wisely the money entrusted to it. Consequently the command scrutinized the performance of its contractors and continued to search for computer systems able to control the storage and shipment of spare parts and other articles of supply. An earlier network of six computers, one at each logistics center and another at the command's headquarters, initially showed promise, but proved inadequate, and had to be abandoned.

Besides looking to machines for help, the organization encouraged its officers, airmen, and civilian employees to report instances of what they considered overpricing on the part of suppliers. Among its accomplishments, this program,

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called Zero Overpricing, resulted in the purchase of computer disk packs at one-tenth of what the vendor proposed to charge, and an alert sergeant, Charles R. Kessler, raised the alarm that forced another firm to reduce dramatically the price of plastic caps to cushion the legs of the navigator's stool on a particular aircraft.

Depot maintenance, which remained a responsibility of the Logistics Command, assumed a special importance after the end of the Vietnam War. As the number of aircraft flown by the Air Force stabilized at about 10,000, the proportion with seven or more years of service rose from 50 percent to about 75 percent. The oldest of these had undergone modernizations so complete that the aircraft performed far differently than when new; for example, even the newest B-52 still in service in 1982 had been repaired and refurbished many times and carried equipment unheard of when built 20 years earlier.

Of all the tasks facing the logistics specialists, perhaps the most challenging was the prospect of a conventional war in Europe. By sharing bases already in use, tactical units arriving in the theater as reinforcements could draw upon supplies pre-positioned in Europe for such an emergency. The existing stocks would have to be replenished quickly, however, as fuel was consumed, bombs dropped, and spare parts used to keep aircraft in action. Until seagoing tankers, cargo vessels, and ammunition ships could cross the Atlantic, C-5s and C-141s would have to sustain the combat forces, even delivering fuel in transports fitted out for the purpose.

The practice of investing in aircraft but deferring the purchase of spare parts aroused special concern within the Air Force Logistics Command. The high cost of acquisition provided an incentive to buy the fighter or bomber as quickly as possible in quantities that would, to some extent, reduce unit cost. The assumption that money for spare parts would become available once the aircraft was in the inventory did not always prove true; and during the late 1970s, the command found it difficult to assemble kits of spare parts to support deployments or emergency operations. While funding for these kits was only three percent less than what the command considered the ideal amount in 1977, within three years, the gap between perfection and reality opened to eighty-five percent. However, increased appropriations in the early 1980s enabled the Air Force to address this problem.

Besides supplying American air forces throughout the world, the Air Force Logistics Command supported the military aviation of friendly nations. Before the Iranian revolution of 1979 that brought the Ayatollah Ruhollah Khomeini to power, the command had studied the logistics network supporting the air force of Shah Mohammed Reza Pahlavi and administered a contract with Lockheed Aircraft Service for its overhaul. The project had scarcely begun when the Shah fled the country and a regime hostile to the United States took over. In Saudi Arabia, the Northrop Corporation, under the general guidance of the Logistics Command, built military housing, training sites, and facilities for

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the repair of aircraft. When Saudi Arabia bought F-15s from the United States, the command arranged for the manufacturer, McDonnell Douglas, to provide support and training. During 1973, when Egypt attacked Israel and a major conflict erupted in the Middle East, the Air Force Logistics Command located and prepared for shipment items in its inventory approved for delivery to Israel's air force. In short, the support provided to the air arms of friendly nations often involved the American aircraft industry and always was designed to further the foreign policy of the United States.

Although effectiveness in war, whether on the part of the U.S. Air Force or the air forces of friendly states like Saudi Arabia or Israel, remained the overriding aim of the Air Force Logistics Command, the increasing concern for the preservation of mankind's environment affected the command's functioning. As a large-scale user of industrial solvents, fuel, and lubricants, the command found itself in the front lines of a campaign against environmental pollution. In an attempt to wage this war, the Logistics Command in 1977 began to destroy some 2.3 million gallons of herbicide left over from the Vietnam conflict. Besides being deadly to plant life, the chemical agent was suspected of causing physical deformities in the children of those who had come in prolonged contact with it. Appropriately clothed airmen carefully transferred the defoliant from drums into railroad tank cars for delivery to the ship that carried it to an uninhabited isle in the Pacific for burning.



Badly needed supplies are unloaded at Tel Aviv, Israel, October 1973.

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The Air Force Logistics Command was one of several major commands that had varied in number, title, and duties over the years but had existed in one form or another since the Air Force became an independent service in 1947, in some cases even longer. Indeed, the basic principles underlying the organization of the Air Force remained essentially unchanged, even when comparing the structures before the Vietnam conflict and after the period of modernization that followed. Perhaps the most obvious difference was the use of independent agencies, almost subcommands, to supplement the major commands.

The fewest modifications in organizational structure occurred at the top. After almost four decades, the Secretary of the Air Force, assisted by a comparatively small staff, continued to serve as civilian head of the service; he had been excluded from the operational chain of command since 1958 but retained administrative and managerial responsibility for ensuring that the men and women of the service were properly equipped, adequately trained, and appropriately deployed. The Air Force Chief of Staff, who delegated authority to a Vice Chief of Staff and an Assistant Vice Chief of Staff, remained ultimately responsible for the day-to-day activities of the organization and also served as one of the Joint Chiefs of Staff. The Air Staff, along with a small staff of specialists and a complex of boards drawn mainly from the headquarters (but at times making use of civilian experts) advised the Chief of Staff, served as his link with the major commands, and also assisted the Secretary of the Air Force. The board structure and the special staff provided the key to flexibility, changing in reaction to a seemingly endless succession of problems, each slightly different from the one it followed.

The major change in the composition of the Air Staff during this period of modernization was the transfer of the Inspector General from the special staff to head a seventh major component of the Air Staff; this move, which occurred in 1978, reflected his growing importance in safety and investigations. Otherwise, the list of deputy chiefs of staff showed little change into the 1980s, except for adjustments to titles. Logistics and Engineering replaced Systems and Logistics; Personnel became Manpower and Personnel; Research and Development was recast as Research, Development, and Acquisition; and Plans and Operations emerged temporarily as Operations, Plans, and Readiness.

In contrast, the special staff, those specialists who advised the Chief of Staff, the Vice Chief of Staff, and the Assistant Vice Chief of Staff, underwent numerous changes. The office of Chief of Operations Analysis was abolished in 1971, and an Assistant Chief of Staff, Studies and Analysis, served on the special staff from early 1967 until the summer of 1978. The Chief of Air Force Reserve replaced the Assistant Chief of Staff, Reserve Forces, early in 1968 and the Chief of the National Guard Bureau was added later that year; the Director, Air National Guard, joined the special staff in 1981. The Chief Master Sergeant of the Air Force in 1968 became an adviser on the enlisted force, with an organizational status similar to that of the Chief Scientist. In 1969, the newly ap-

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pointed Chief of Air Force History received the same status; two years later the office was elevated to full membership on the special staff, becoming the counterpart of an assistant chief of staff. The office of Secretary of the Air Staff was abolished in 1972 and that of Director of Administration in 1978, although the latter function surfaced again in 1981. From early 1975 until mid-1978, the Chief of Security Police served on the special staff, joined in September 1975 by the Assistant Chief of Staff, Communications and Computer Resources, who also remained a staff member until the summer of 1978, and an Office of Foreign Liaison existed between 1976 and 1978. Briefly, beginning in 1978, the Chief of Air Force History and the membership of the Scientific Advisory Board were shifted to the 1947th Support Group, an administrative agency for Air Force headquarters, but the science advisers returned to the special staff in January 1979 and the chief historian in 1981. The frequent changes of the staff of special advisers reflected shifting priorities in the day-to-day functioning of the Air Force, an emphasis on security at one time, or on computer sciences at another, or an acknowledgment of the importance of history. Indeed, changes on the special staff contributed to organizational stability on the Air Staff.

Whether their headquarters were located in the United States or overseas, the major commands could still be divided into general categories of operational and supporting. The overseas operational commands included the Pacific Air Forces, the Air Force component of the Pacific Command, which had been reduced in strength since the end of the Vietnam fighting and was concentrated in South Korea and Japan, with elements in Hawaii and the Philippines. Halfway around the world, the U.S. Air Forces in Europe, the Air Force component of the European Command, prepared to join the air forces of the nations of the North Atlantic Treaty Organization in defending a region extending from Norway to Turkey and encompassing some seven million square miles. The U.S. Air Force, Southern Command, which had evolved from the Caribbean Air Command, was disestablished in the mid-1970s, when the activity became an air division reporting directly to the Tactical Air Command until January 1987, afterward to that command's Twelfth Air Force.

Reflecting the tendency to substitute "aerospace" for "air" wherever appropriate, the Air Defense Command in 1968 became the Aerospace Defense Command; in 1979 the organization was abolished, for priorities had shifted from bomber defense to missile warning and space surveillance. Management of the communications net used by the Aerospace Defense Command passed to the Air Force Communications Command (so redesignated in 1979). The Strategic Air Command temporarily became the manager of the space surveillance and ballistic missile warning systems, and the Tactical Air Command took over the interceptors, radars, and control centers designed to defend against bombers.

None of the other operational commands with headquarters in the United States followed the Air Defense Command into oblivion. The Alaskan Air

Command survived and continued to participate in the early warning and air defense missions. Besides preparing units for deployment to the commands overseas, the Tactical Air Command now bore responsibility for the air defense of the United States. The bombers and missiles of the Strategic Air Command, a specified command under the Joint Chiefs of Staff, were joined by the Navy's fleet of ballistic missile submarines in providing the nation with a nuclear deterrent. The tactical airlift units that until the spring of 1975 served with the Tactical Air Command or the overseas commands were now assigned to the Military Airlift Command, which continued to operate rescue and weather services.

The newest of the Air Force commands, the Air Force Space Command, assumed control during 1982 of the Cheyenne Mountain complex in Colorado and began performing the operational functions of tracking orbiting spacecraft and providing warning of approaching ballistic missiles. The creation of the Air Force Space Command marked a watershed in the military space program. What had begun as a research and development undertaking (and therefore mainly in the province of Air Force Systems Command) was now largely operational. The task of ensuring a satisfactory relationship between Systems Command, the developer of improved space systems, and the operational users became one of the tasks of the new organization, which managed a variety of tracking, warning, and communication systems.

The major commands that supported these basically operational organizations survived largely unchanged in status, if not in internal organization. The Air Force Systems Command, the Air Force Logistics Command, the Air Force Communications Command, and the Electronic Security Command all continued as major commands, as did the Air Training Command, which in 1978, absorbed the Air University, previously a supporting agency.

With a status less than that of the major commands, the special operating agencies and direct reporting units assisted those commands; unknown in 1947, they numbered nineteen in 1982. Of the four special operating agencies that had functioned in 1965—the Air Force Academy, the Aeronautical Chart and Information Center, the Office of Aerospace Research, and the Air Force Accounting and Finance Center—only the last survived as such into the 1980s; while the Air Force Academy changed status in 1979 to a direct reporting unit. The Office of Aerospace Research, formed in 1961 to manage basic scientific research of possible interest to the Air Force, survived for fifteen years as a separate operating agency. The office issued grants and awarded contracts to civilian scientists or institutions; operated two laboratories, one specializing in electronics and the other in the more general aspects of engineering and physics; and conducted a program of space exploration using both satellites and unmanned balloons. As time passed, however, the Air Force took a less active part in basic research and abolished the separate Office of Aerospace Research, although the name and the function of administering grants and contracts survived at a lower organizational level within the Air Force Systems Command.

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Meanwhile, the Defense Mapping Agency absorbed the Aeronautical Chart and Information Center in 1972 as the process of centralization continued within the Department of Defense.

Other separate operating agencies appeared, for this kind of office could be organized or abolished to meet changing needs without affecting the basic structure of the major operational and supporting commands. During the 1970s, the service established the Air Force Inspection and Safety Center (1971); the Air Force Military Personnel Center (1971), which had operated since 1965 and in 1978 became the Air Force Manpower and Personnel Center; the Air Force Office of Special Investigations (1971), which dated under other titles from 1948; the Air Force Audit Agency (1972); the Air Force Data Automation Center (1972), which since 1967 had been the Air Force Data Systems Design Center; the Air Force Intelligence Service (1972); the Air Force Test and Evaluation Center (1974); the Air Force Management Engineering Center (1975); the Air Force Commissary Service (1976); the Air Force Engineering and Services Agency (1977), which during the following year was redesignated the Air Force Engineering Services Center; the Air Force Legal Services Center (1978); the Air Force Medical Services Center (1978); the Air Force Information and News Center (1979); and the Office of Security Police (1979). Following the disestablishment of the Continental Air Command, the Air Force Reserve in 1968 became a separate operating agency, as did the Air Force Reserve Personnel Center, which had been functioning since 1954. The Air Force used separate operating agencies as a method to deal with a range of important subjects that varied from the enforcement of contracts, through shopping services for members of the service and their dependents, to the application of computers to day-to-day activities and the automation of records-keeping.

A similar technique for attaining flexibility was the direct reporting unit, with the first appearing in 1979. The apparent distinction between these and the special operating agencies was the lower rank of the commanding officers or managers, who tended not to be general officers. One striking exception, however, was the Air Force Academy, a direct reporting unit of Air Force headquarters after 1979, even though the superintendent was usually a lieutenant general. An attempt was made to designate the Air Force Reserve, including its personnel center, as a single direct reporting unit, but both were restored to their former status as separate operating agencies. Similarly, an experiment that made the Air National Guard a direct reporting unit, despite its unique role as a state and federal force, ended in disappointment. The status of direct reporting unit also proved unsatisfactory for the Chaplain Service, the office of Surgeon General, and the office of Judge Advocate General. During the interim between abolition of the Aerospace Defense Command and establishment of the Space Command, the facility at Cheyenne Mountain functioned as a direct reporting unit called the Aerospace Defense Center. Also successful in this organizational format was the Air Force Technical Applications Center, which became a di-

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rect reporting unit in 1980. In 1949, its predecessor detected the first Soviet atomic detonation; after 1963, this center monitored the limited test-ban treaty. Established in 1972, the Albert F. Simpson Historical Research Center bore the name of the civilian who headed the Air Force History program for more than twenty years. It became one of the original direct reporting units authorized in 1979 and for years was the only one headed by a civilian, Lloyd H. Cornett, Jr.

Resources and energy previously devoted to fighting the Vietnam War eventually became available to prepare the Air Force for the future, and the results of this redirection of effort could at times be spectacular. Easily the most revolutionary developments in aircraft were the Stealth types, which in 1982 were hidden behind a veil of secrecy. Over the years, Lockheed Aircraft had worked on a fighter, and Northrop on a bomber, that employed materials and aerodynamic shapes to make the aircraft all but invisible to radar. The McDonnell Douglas C-17, another aircraft with great promise, incorporated normal materials in a less radical form. A transport smaller than the C-5, the C-17 was designed to deliver even the largest of the Army's tanks to forward airstrips in a combat zone. When the Reagan administration, during the President's first term, made additional funds available for airlift, the C-17 program was not far enough along to make immediate use of the money, so the Air Force contracted with Lockheed to reopen the C-5 production line and turn out fifty improved B models of that aircraft.

In 1970 Rockwell International, a descendant of North American Aviation, began work on the airframe of a new bomber, while General Electric developed the engines. The first of four prototypes, which carried the designation B-1A, flew in 1974, but three years later President Carter chose not to begin production, although he allowed research and development to continue. With a variable-sweep wing like that of the FB-111, the B-1A had four turbofan engines



The Lockheed C-5B in a three-tone camouflage scheme.

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The North American Rockwell B-1B Lancer  
with wings extended for cruising.

that developed three times the aggregate thrust of the two turbofans that powered the converted fighter. President Reagan in 1981 approved the production of 100 B-1Bs, a heavier version with a smaller radar cross-section, improved avionics, and engine inlets redesigned for more efficient operation at high subsonic speed and low altitude.

While work proceeded on the B-1, the Air Force modernized its fighter force. By 1982, the twin-turbine McDonnell Douglas F-15 was replacing the F-4 as the principal air superiority fighter used by the Air Force. Produced in one- and two-seat versions, the F-15's basic armament consisted of Sidewinder and Sparrow missiles and a multibarrel 20-mm cannon, although later models carried up to eight tons of bombs. The smaller, less complex General Dynamics F-16, powered by a single turbofan engine, could tangle with hostile aircraft or attack targets on the ground. The F-16 also came in single- and two-place models, flew at supersonic speed, and carried a combination of bombs and missiles along with a multibarrel cannon. Besides these new aircraft, the F-111 continued to serve the Air Force in tactical fighter and electronic warfare versions, as did a few F-5s that either functioned as trainers for foreign pilots, whose air forces used this fighter, or played the part of hostile aircraft in aerial exercises at Nellis Air Force Base, Nevada. Although almost all fighter units of the Air National Guard had reequipped with F-4s transferred from the active duty Air Force, a few still flew F-105 fighter-bombers and F-106 interceptors in 1982.

The highly maneuverable Fairchild A-10 was the only airplane developed by the Air Force exclusively to support troops on the battlefield. This twin-turbo-

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The McDonnell Douglas F-15 Eagle (above),  
and the Lockheed C-141B Starlifter (below).



fan, subsonic attack aircraft mounted a 30-mm cannon that fired a projectile designed to penetrate the armor of tanks, carried air-to-ground missiles and conventional bombs, and was being modified to deliver laser-guided weapons. When production of the A-10 ended in 1982, no similar aircraft was on the drawing board, and the ground support mission seemed likely to be taken over by a variant of the F-16. The reserve components had also begun to absorb the Navy-developed A-7, which flew ground attack missions in Southeast Asia. During much of the fighting in Southeast Asia, forward air controllers had used the O-2A, a militarized light aircraft with twin booms supporting the tail sur-

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faces and engines mounted at the front and rear of the crew compartment; by 1982, twin-turboprop OV-10s and twin-jet A-37s had replaced all but a few of the O-2As. Another veteran of the war in Southeast Asia, the gunship, also survived; the active duty Air Force had a squadron of AC-130Hs, which mounted 20-mm cannon and a 105-mm howitzer, and the Air Force Reserve a squadron of AC-130As armed with 20-mm and 40-mm cannon.

The fleet of Air Force transports—C-5s, C-141s, and C-130s—also underwent modernization, except for the C-130, which did not receive a thorough renovation. The 270 C-141As were equipped to be refueled in flight and had been fitted with an insert that extended the fuselage by 23 feet, changes that converted them to B models. The increased utilization and greater capacity of the modified C-141Bs represented the equivalent of another 90 C-141As. The prototype of the C-141B flew in 1977; rebuilding of the entire force to the B standard began in December 1979 and ended in June 1982 on schedule and within projected costs. Meanwhile, the Air Force replaced the wings on C-5As with a stronger structure to extend the useful life of the aircraft and had ordered 50 new C-5Bs with the redesigned wing, new engines and radar, and an improved navigation system.

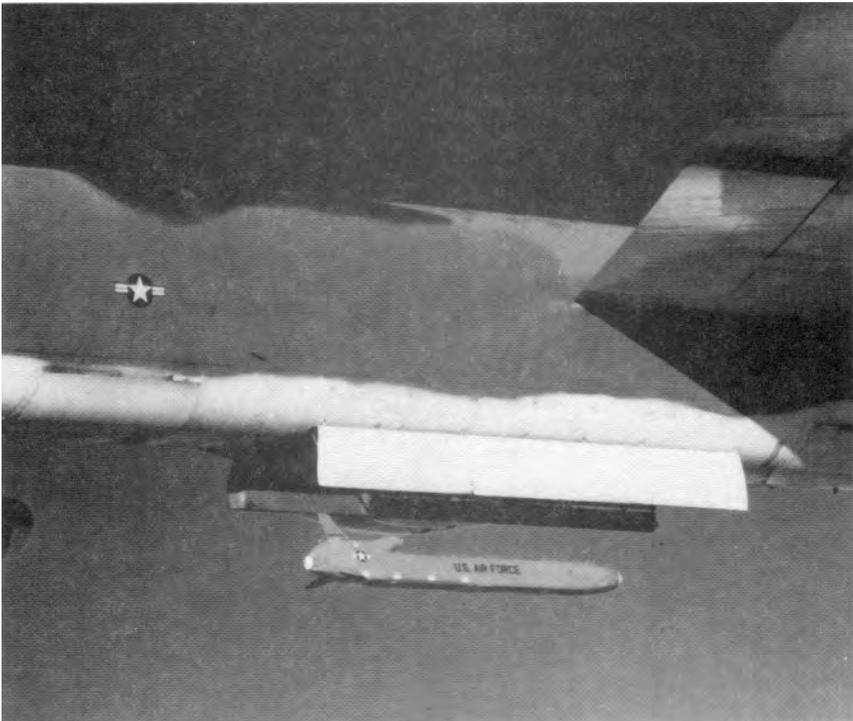
The arsenal of Air Force strategic missiles changed greatly in the years following the Vietnam War. Minuteman remained the most numerous ballistic missile, and a portion employed the multiple, independently targetable reentry vehicle, increasing the aggregate destructive power of the Minuteman force. Silos scattered around bases in Missouri, the Dakotas, Montana, and Wyoming contained two types of Minuteman: 450 Minuteman IIs, each with the F-model missile and a single nuclear warhead, and 550 Minuteman IIIs, featuring the G-model missile and capable of deploying as many as three independently targeted warheads. Under development, but about to join Minuteman, the silo-based LGM-118A (usually called the MX for “Missile Experimental” rather than by its official nickname of Peacekeeper), carried as many as ten independently targeted warheads and had a range somewhat greater than the Minuteman III.

While work went ahead on the MX, the Titan II began to be phased out of the missile force because it used a propellant that, though storable, was very volatile and a highly corrosive oxidizer that could be deadly to inhale. As long as the two remained in close proximity within the missile, an accident was possible, and the likelihood increased as the tanks and plumbing grew older. In 1978, at a silo near McConnell Air Force Base, Kansas, a cloud of escaping oxidizer killed two airmen and forced the evacuation of civilians from homes nearby. In 1980, a fuel leak at a site near Little Rock Air Force Base, Arkansas, produced an explosion that killed an airman. Reports in the press that the explosion at Little Rock had hurled a nuclear warhead clear of the silo heightened public concern about the safety of Titan II. The Strategic Air Command insisted its investigations showed the missile was safe; and the Air Force, which had purchased a new guidance system for the Titan II, was reluctant to discard the missile. However, the twen-

## Modernizing after Vietnam

tieth anniversary of the weapon's deployment was at hand; age lent an urgency to considerations of safety and reliability, and the retirement of Titan II got under way late in 1982.

A new breed of cruise missiles radically changed the post-Vietnam strategic missile force. Although these missiles remained in the atmosphere and functioned like small, pilotless airplanes, they differed markedly from the older jet-propelled Snark and the rocket-powered AGM-69 short-range attack missile. The ground-launched Snark had demonstrated neither reliability nor accuracy over its intercontinental range and had served only a short time. The short-range attack missile, carried by the B-52 and FB-111, was kept on course by inertial guidance as it leaped ahead of the bomber that had launched it, flying at supersonic speed to use its nuclear warhead to blast a hole in the enemy's air defenses. Far more technologically sophisticated, the new cruise missile could fly some 1,500 miles at high subsonic speed, relying on inertial guidance and an automated control system that enabled it to hug the very nap of the earth and presenting a small radar profile. One model, the AGM-86 air-launched cruise missile, whose spring-loaded wings extended to a span of 12 feet after the 21-foot missile fell clear of the bomber that released it, became operational with a B-52



An AGM-86 air launched cruise missile drops from a B-52 during testing.

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wing in December 1982 and was designed to be carried by the new B-1. The other Air Force version, the fixed-wing BGM-109G ground-launched cruise missile, was a mobile missile mounted on a truck.

As the appearance of new types of missiles and aircraft served to demonstrate, the Air Force had experienced a modernization following the cease-fire in Southeast Asia. The last years of the Carter administration and the first years of the Reagan Presidency signaled an upturn in spending and in manpower levels, as well as in the proportion of new missiles and aircraft acquired. The cost of running this larger and more modern Air Force also increased. Without the pressure exerted by the draft, all the services had to compete with civilian employers to attract and retain the people they needed. Like the cost of manpower, the expense of acquiring and maintaining weapons also was increasing, and the temptation persisted to defer programs of logistics to have money for the new fighter, bomber, or missile. In these circumstances, the Air Force faced a succession of difficult choices as it sought economy and efficiency without jeopardizing wartime effectiveness.

## Chapter 22

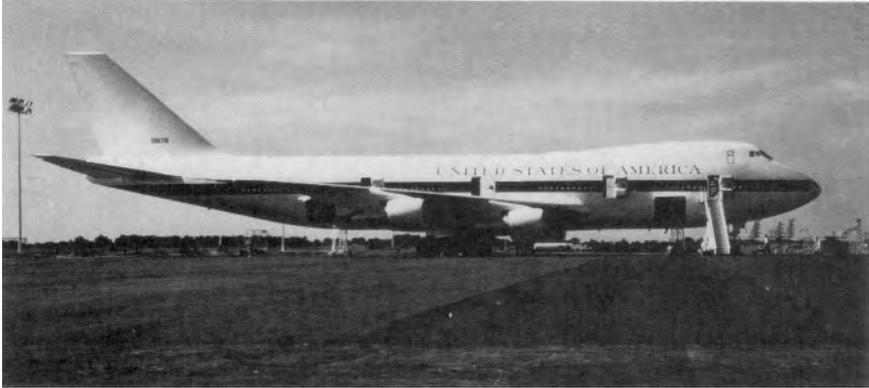
# Carrying Out National Policy

Walton S. Moody  
Jacob Neufeld

**D**uring the decade following the Vietnam conflict, nominally a period of peace despite the fighting triggered at the outset by the attempt to recover the *Mayaguez* and its crew, the Air Force interacted with three major themes. The first was national military policy as defined, after Richard M. Nixon's resignation from office, by Presidents Gerald R. Ford, Jimmy Carter, and Ronald W. Reagan. The second dealt with the use of arms control in the furtherance of national interests, a form of diplomacy that antedated the Nixon administration. The third encompassed operations, including the response to a number of crises, beginning with the Middle East War of 1973. The air operations included routine activity to help honor American commitments throughout the world and reactions with to state-supported terrorism.

By the early 1980s, nuclear deterrence had become embedded in national policy, as a succession of Presidents sought to make the deterrent more credible. In his autobiographical *White House Years*, Henry A. Kissinger, President Richard M. Nixon's most valued adviser, described how the Chief Executive sought what the two men called "strategic sufficiency," a proposed system of targeting that, in Kissinger's words, would provide "at least the theoretical ca-

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The Boeing 747 National Emergency Airborne Command Post.

pability to use forces for objectives other than the mass extermination of populations.” As part of the Nixon theory, the administration tried to develop the capacity to use a few carefully placed nuclear weapons to prevent a local conflict from becoming a worldwide conflagration. Suppose, for instance, that the Soviet Union relied on one or two nuclear detonations to demonstrate its resolve in some future confrontation. In such a case, President Nixon’s proposed strategy called for the use of only enough force to reassure a world shocked by Soviet nuclear might and, at the same time, to remind the Soviet Union that it risked prompt annihilation. What the President wanted was a broad range of nuclear options that, as he phrased it, presented an alternative to “ordering the mass destruction of enemy civilians, in the face of the certainty that it would be followed by the mass slaughter of Americans.” A series of studies sponsored by the Department of Defense produced a theory of graduated retaliation, or nuclear options, whereby the United States could respond even to nuclear aggression with conventional explosives or limited numbers of nuclear weapons. If the Soviet Union should then choose to make incremental increases in its own use of nuclear firepower, the American forces would be able to retaliate in kind at each successive stage until the aggressor backed down as a result of the mounting destruction. Like the damage-limiting concept of nuclear targeting that flourished briefly in the 1960s, the nuclear options plan held Soviet cities hostage, ultimately to be destroyed if the aggression did not stop.

The notion of a controlled deterrent that, if it had to be used, could keep the destruction at a manageable level defied logic, but remained attractive during the Ford and Carter Presidencies and into the Reagan years, since it promised the ability to tailor violence in a way that would halt aggression without bringing about the destruction of urban America. Two things were necessary for this objective to be accomplished (and here logic argued otherwise): a Soviet willingness to follow the scenario of gradual escalation, which had no precedent in that

nation's military history, and infallible communications linking American leadership to the nuclear forces and to the enemy.

Communications provided the key to the use of nuclear options, for the President had to direct his own strategic forces through a succession of responses and determine the enemy's reaction to each. President Carter improved his link to the retaliatory forces. The first Commander in Chief ever to embark in the National Emergency Airborne Command Post during a test of the system, he approved changes that, among other things, resulted in the conversion of Boeing 747s into greatly improved presidential command posts.

Even though he modernized the means of communication with the American nuclear forces, Carter showed more interest in neutralizing the Soviet leaders than in talking with them during the critical stages of an escalating conflict. His administration spoke of targeting Soviet command and control on the assumption that the American counterpart would also come under attack. Such an exchange of blows, if successful, would prevent either nation from determining the other's response to nuclear options.

During the Carter years, the search for nuclear options evolved into an announced policy of preparing for a protracted nuclear war. President Reagan followed suit, with Secretary of Defense Caspar W. Weinberger early in 1982 calling for the nation to maintain a deterrent that could "prevail and be able to force the Soviet Union to seek earlier termination of hostilities on terms favorable to the United States . . . even under conditions of prolonged war." The change reflected a growing belief that the Soviet Union was preparing to fight and win just such a conflict, even to the extent of planning to evacuate its cities and leave only the abandoned structures to be destroyed by an American retaliatory blow.

Despite the acceptance of a theory of protracted nuclear warfare by both the Carter and Reagan administrations, some planners and the general public found it difficult to accept the idea. A sudden and devastating attack, a kind of nuclear Pearl Harbor, seemed possible, but it was hard to imagine that the antagonists could endure successive attacks, theoretically limited but nonetheless killing millions, and recover each time to retaliate again and again. Except for a flurry of talk about possible post-attack assembly areas (somewhere in West Virginia for the nation's capital and its suburbs) and emergency shelters (a foxhole covered by a door taken from its hinges, with a layer of earth over the door), the federal government made no effort to provide the kind of protection for the populace that might have made a protracted nuclear war seem feasible. Moreover, further analysis indicated that the reports of the Soviet Union's ability to evacuate its citizens were greatly exaggerated. The idea of fighting a prolonged nuclear war remained an essentially theoretical concept, although it did contribute in some degree to a concern for the survivability of the nuclear deterrent.

What really dramatized the issue of survivability, however, was not so much the theory of protracted nuclear war as the so-called window of vulnerability that was widely publicized by critics of the Carter administration. The most

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vivid descriptions of this phenomenon came from Paul Nitze, who in 1950 had drafted NSC-68, the security directive that offered a prescription for the containment of communism, formed one of the pillars of President Truman's national policy, and continued to serve a similar purpose for his successors. In the late 1970s, Nitze was acting as a spokesman for the Committee on the Present Danger, which included David Packard, Deputy Secretary of Defense under President Nixon; Henry Fowler, Secretary of the Treasury for President Lyndon B. Johnson; and Eugene V. Rostow, a professor of law at Yale University and an under secretary of state in the Johnson administration. In essence, Nitze argued that the objectives of the Soviet Union had not changed in twenty-five years; the Soviet state, he declared, remained determined to dominate the world and soon would be able to achieve that goal through either nuclear blackmail or the actual launching of a surprise strike that would utterly devastate the Air Force's Minuteman and Titan II missiles, thus wiping out one component of the American triad of land-based intercontinental missiles, strategic bombers, and ballistic missiles based on submarines. Because Soviet strategic missiles were so much more powerful than their American counterparts and because Soviet technology had perfected the multiple, independently targetable reentry vehicle, Nitze and like-minded persons believed that this greater nuclear "throw weight" would enable the attacker to flood the Minuteman and Titan bases with highly accurate warheads capable of destroying the weapons in their silos. To demonstrate superiority, the Soviet aggressor might exercise the option of crippling just a part of the silo-based deterrent force, but only after evacuating his own cities to minimize the loss of life if an American President should choose to strike back with bombers, ballistic missiles launched from submarines, and the surviving land-based weapons. Nitze and his colleagues on the committee thus called attention to the possibility that, in the very near future, the Soviet Union would be able to deprive the United States of the very means, and probably the will, to retaliate against aggression. The window of vulnerability would remain open, the critics insisted, until the United States had a sufficient number of highly accurate weapons to do exactly what the Soviet missiles were believed capable of doing.

The Carter administration found this apocalyptic vision sufficiently alarming to take steps to protect the missile force. Although the President did not approve production of the B-1 bomber, which impressed him as being an ineffectual response to a threat from Soviet missiles, he tried to reduce the vulnerability of the strategic missile force by investing in cruise missiles and in a new intercontinental ballistic missile, the MX. Whereas the MX would require a fixed and protected base, the cruise missiles, compact and cheap, could be bought in large numbers and launched from aircraft, trucks, and even ships, thus complicating the efforts of Soviet planners to locate and destroy them. Although subsonic in speed, the cruise missile seemed an especially attractive weapon because the Americans believed themselves far ahead of Soviet engineers in de-

veloping the engines and the control and guidance systems that enabled the craft to fly 1,500 miles at treetop height and destroy critical targets. The MX, in effect, would serve as America's answer to the powerful Soviet missiles that seemed to threaten Minuteman and Titan II. Proponents of the MX expected the missile, with as many as ten independently targeted warheads, to slam closed the window of vulnerability, but to do so, it would have to survive a surprise attack and then retaliate with devastating accuracy. Because of advances over the years in guidance systems, placing a warhead on the designated target was less a problem than riding out an attack on the launch site, but the President and his advisers were proposing a means to minimize vulnerability.

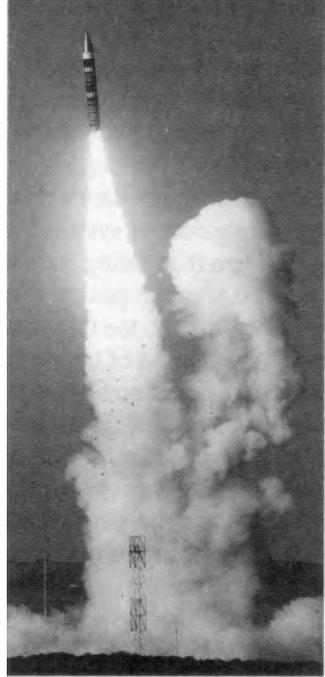
According to the Carter administration, the key to survivability would lie in a unique method of basing that both protected the weapons and permitted verification of their number as required by a 1972 arms control agreement that the United States and the Soviet Union continued to honor even after its expiration five years later. Each party to that treaty had to facilitate the other's verification of the total number of land-based intercontinental ballistic missiles, essentially by allowing the periodic examination of the silos from orbiting satellites. Balancing the requirements of the arms limitation agreement against the security of the missiles, the administration's method of basing resembling the carnival game that requires a person to guess which of three shells conceals a pea. The plan called for a fleet of trucks to shuttle 200 missiles among some 4,600 precisely surveyed launch sites in the deserts of Utah and Nevada, so that satellite observation might provide the total number of missiles, but only as deployed at that moment. If necessary, the trucks could roar to life and change the entire deployment pattern, forcing the attacker to guess which of the firing positions held the missiles. This scheme aroused determined opposition in the two states and throughout the semiarid region. Many opposed the use of a huge volume of precious water for both construction and operation, believing that the diversion of water would hamper future economic development, create shortages in the existing cities of the Southwest, and dry up irrigation projects. The proposal advanced by Carter was as good as dead when he left office, and his successor, President Reagan, confirmed that fact when he declared that, at a projected \$40 billion, the plan was too costly.

The cruise missile, like the MX, proved something of a paradox. The new ballistic missile, intended for invulnerable bases, ended up in strengthened versions of the silos earlier described as easily destroyed in a Soviet attack; the cruise missile, planned for a time as a key weapon in the arsenal of deterrence, became, at least in one of its versions, a sacrifice to arms control. By the end of the Carter years, the Air Force planned to acquire two versions of cruise missiles, one to be launched from the B-52 (and from the B-1B after President Reagan approved the production of that aircraft) and the other from trucks operating out of Air Force installations. The Navy modified recommissioned battleships of World War II vintage to accommodate another variant designed for

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The Carter Administration proposed two missiles to close the window of vulnerability: the ground-launched cruise missile (above) and the MX (later Peacekeeper) missile (right).



launching from surface ships. The ground-launched Air Force version had to be deployed overseas to reach targets deep within the Soviet Union. The nations of western Europe—the Federal Republic of Germany, the Netherlands, Belgium, Italy, and the United Kingdom—seemed the ideal location, not only for considerations of range but also because the cruise missiles would offset the Soviet intermediate-range missiles aimed at these countries.

Even though the North Atlantic Treaty Organization accepted the land-based cruise missile, and with it the Army's new Pershing II medium-range ballistic missile, the various member nations had agendas of their own. The government of the United Kingdom hoped that basing cruise missiles on the air station at Greenham Common would help persuade the United States to modernize the British fleet of ballistic missile submarines with the Trident system, the latest successor to the Polaris. Other of the treaty partners, notably the Federal Republic of Germany, preferred to bargain away the land-based cruise missiles in arms limitation talks designed to obtain a reduction in the number of Soviet missiles aimed at western Europe; these cruise missiles ultimately did become a bargaining chip.

For the United States, arms control became an accepted means of protecting the deterrent against any sudden escalation of the arms race while also easing tensions with the Soviet Union. The limited test-ban treaty of 1963 had shown that the two nations could reach an agreement on nuclear weapons if the bene-

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fits for both parties—in this case, a reduction in radioactive fallout—outweighed the disadvantage, a reliance on comparatively low-yield underground detonations in developing weapons. Within four years, President Johnson and Secretary of Defense Robert S. McNamara negotiated for further limitations, not on nuclear testing, but on strategic missiles in general and the deployment of a particular weapon, the antiballistic missile. The Soviet Union had installed a primitive ballistic missile defense near Moscow and was setting up around the perimeter of the nation a radar network that at the time seemed to have the potential for directing defensive missiles against reentry vehicles as well as against aircraft. Secretary McNamara was especially concerned that the United States might have no choice but to develop an antiballistic missile system of its own, spending perhaps \$40 billion on a weapon that, in his opinion, would reduce security by accelerating the arms race. Congressional pressure forced McNamara to endorse deployment on a reduced scale, ostensibly to protect a part of the Minuteman force against a few missiles launched from China. The Secretary of Defense believed that a major defensive system, even if it worked (which he considered unlikely), would cause both nations to fear a surprise attack from silos protected by antiballistic missiles. Both would react, McNamara predicted, by multiplying their offensive weapons even as they invested in a defense, so that each could overwhelm the other's protective radar screen with warheads and decoys too numerous to track and destroy. An American antiballistic missile program could therefore accomplish more as a bargaining chip to be traded for cuts in Soviet offensive weapons than it could as an operational system.

One method of multiplying nuclear might without an expensive investment in new missiles and new silos was the multiple, independently targetable reen-



The reentry vehicles of a Minuteman III impact near Kwajalein Atoll.

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try vehicle. The ability of one Minuteman to deliver warheads against as many as three different targets gave the United States a distinct, though fleeting, advantage. In the circumstances of the 1960s, when confidence in American technological superiority prevailed, the United States adopted a negotiating position regarding arms control that excluded the new multiple warheads from consideration and sought to impose agreed limits on different categories of weapons, including the antiballistic missile. Before discussion of the American proposal could begin, Soviet troops in August 1968 joined contingents from Poland, Hungary, the German Democratic Republic, and Bulgaria in suppressing a communist reform movement in Czechoslovakia; the Johnson administration responded by withdrawing from the talks. Although nothing came of this attempt at negotiation, the possibility had been introduced that arms control could serve to protect the deterrent force by forestalling programs that might increase its vulnerability and thus erode its credibility.

Instead of being disheartened by his predecessor's failure to obtain an agreement, President Nixon renewed the effort and succeeded. He pursued negotiations on two levels: by means of a formal conference, which in November 1969 commenced meeting alternately in Helsinki, Finland, and Vienna, Austria; and in secret sessions at Washington, which began during January 1971. Henry Kissinger, at the time Nixon's Assistant for National Security, met secretly with the Soviet ambassador to the United States, Anatoly Dobrynin. The public forum was window dressing; what mattered were the secret talks where Kissinger and Dobrynin presented the views of their governments.

The United States sought to preserve the multiple, independently targetable reentry vehicle, which had passed its tests and was being deployed, and to impose a ceiling on the more powerful Soviet ballistic missiles, which would be deadlier than Minuteman in the use of multiple warheads. To accomplish this, the United States was willing to sacrifice the antiballistic missile system, a likely bargaining chip for three reasons. First, the American scientific community could not agree whether destroying incoming nuclear warheads with radar-directed nuclear weapons launched from the ground would actually work. Second, a proposal to deploy the system around major cities had aroused opposition among the people that the weapon was supposed to protect, for an antiballistic system seemed likely to attract warheads as the enemy tried to inundate the defenses. Third, a substitute plan to concentrate on protecting the Minuteman silos seemed likely to trigger an escalation of the arms race by encouraging the Soviet Union to develop a first-strike force capable of overwhelming the defenses, a reaction that would force the United States to expand its array of missiles and extend the defensive screen to protect them.

Judging from the outcome of the talks between Kissinger and Dobrynin, the Soviet Union was especially worried that the American antiballistic missile system would prove vastly superior to the version located near Moscow. Another of Dobrynin's concerns was to protect his nation's ability to develop and deploy

large new missiles that would be fitted with multiple, independently targetable reentry vehicles; Soviet authorities were willing to accept limitations on numbers of strategic missiles to protect the new warhead technology. Prodding the Soviet Union toward an agreement was President Nixon's visit to China in February 1972 and the era of improved Sino-American relations that seemed likely to ensue. Apparently feeling compelled to reach an agreement that would remind the Chinese that his nation had not been isolated diplomatically, Leonid Brezhnev, the Soviet leader, ignored the recent American mining of harbors in North Vietnam, a Soviet client state, and in May of that year, during a time of fierce fighting in Southeast Asia, welcomed President Nixon to Moscow for a meeting that produced agreement between the two powers on strategic arms limitation and on the deployment of antiballistic missiles. In his desire for a treaty, Brezhnev chose to overlook the so-called forward-based systems, the American nuclear weapons located in Europe or on aircraft carriers within striking distance of the Soviet Union, even though his negotiators had argued for their removal.

The two nations severely limited their antiballistic missile systems by agreeing that each could deploy no more than 200 of the weapons divided between two sites, too few to protect the strategic missile silos, let alone the major cities and centers of government. Scientific research in the field of ballistic missile defense could continue because both parties were interested in exploring the possible use of ground-based lasers and other new technology for this purpose. The arms limitation agreement froze for five years the numbers of land-based intercontinental ballistics missiles, submarine-based strategic missiles, and modern missile-launching submarines at the totals on hand, although modernization or replacement was permitted. Essentially the Strategic Arms Limitation Treaty (known as the SALT treaty just as the negotiations that produced it were called the SALT talks) stabilized the retaliatory forces at 1,618 land-based and 710 submarine-launched strategic missiles for the Soviet Union, while the United States retained 1,054 Air Force Minuteman and Titan II missiles and 656 of the Navy's submarine-launched Polaris or Poseidon weapons.

President Nixon hoped to take advantage of the momentum generated by SALT and negotiate a follow-on agreement, but he became mired in the Watergate scandal that forced his resignation in 1974. After succeeding Nixon, President Ford pursued the effort to conclude what came to be called SALT II. During the talks, the Ford administration seemed intent on bringing the numbers of strategic missiles deployed by the two nations more closely into balance, whereas the Soviet negotiators seemed to be trying to eliminate Trident, the latest in submarine-launched missile systems, and the B-1 bomber. At Vladivostok in the Soviet Union, Ford and Brezhnev agreed in November 1975 to a negotiating formula that ignored individual types of missiles and sought to impose an overall limit for all such weapons, whether launched from land or from submarines. According to this concept, each nation might have 2,400 long-range

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nuclear systems, of which 1,320 might have multiple, independently targetable warheads.

The two leaders assumed that their subordinates could fashion a treaty based on this agreed approach, but difficulties arose that neither man had foreseen. One such problem stemmed from the cruise missile. Although Kissinger, who had become Secretary of State for President Nixon and retained that post in the Ford administration, looked on the weapon as a means of strengthening the American bargaining position, the Air Force and Navy did not consider it a bargaining chip at all. Instead, the two services hoped to deploy cruise missiles by the thousands, something they could not do if the pilotless aircraft were grouped with intercontinental ballistic missiles in the category of long-range nuclear systems as defined by the Vladivostok understanding. Nor was the ceiling of 2,400 such systems attractive to American military leaders if applied solely to intercontinental ballistic missiles; the United States had no intention of deploying anything like that total, so the Soviet Union would remain superior in both numbers and throw weight. Finally, Soviet engineers were testing even more powerful missiles and had developed a new supersonic bomber, the variable-sweep Tupolev Tu-26, which despite its lack of range was considered by American critics of SALT II to be a threat to the strategic balance. In these circumstances, negotiations languished until after the Presidential election of November 1976.

The new President, Jimmy Carter, revived the SALT II talks in March 1977, attempting in the process to avoid restrictions on cruise missiles in return for accepting a lower limit on intercontinental ballistic missiles. He was especially enthusiastic about the cruise missile, viewing it as a cheaper alternative to the B-1, which he had decided not to produce, although he allowed further development and testing. By this time, Nitze and his colleagues on the Committee on the Present Danger had begun describing the Soviet Union as having a civil defense program capable of protecting ninety percent of the populace, enabling the nation to fight and win a nuclear war, from which it would emerge comparatively unscathed. To defend SALT II against Nitze and the others who attacked it, President Carter seized on the MX missile, with an all but invulnerable method of basing. In the context of arms control, this weapon afforded an opportunity to build toward, though not necessarily reach, the ceiling that Ford and Brezhnev had accepted; it also served to reassure those critics who looked on the decision not to produce the B-1 as evidence of a willingness to disarm. In a further attempt to demonstrate a commitment to military strength, the Carter administration persuaded the North Atlantic Treaty Organization to accept the deployment of ground-launched cruise missiles and new intermediate-range Pershing II ballistic missiles. These weapons, it was believed, could serve as a deterrent to Soviet missiles targeted against western Europe, although, as the West Germans hoped, some future arms limitation talk might exchange American for Soviet weapons and eliminate the specific threat to the nations of the North Atlantic Treaty Organization.



A B-52 carrying six AGM-86 air launched cruise missiles under each wing.

The discussion of developing and deploying the MX and the cruise missile came at a time when relations between the United States and China were improving; the two nations agreed in 1978 to a normalization of diplomatic relations. As in the case of SALT I in 1972, the Soviet Union reacted in some degree to the possibility of being outmaneuvered diplomatically by China and participated in the revived Salt II talks. At Geneva, Switzerland, Soviet and American negotiators produced a draft agreement that tried to impose controls on both the Tu-26 bomber and the cruise missile without doing violence to the principles endorsed by Ford and Brezhnev not quite five years earlier. Each nation might have a total of 2,250 strategic missile launchers and heavy bombers; within the aggregate of 2,250, provision was made for 1,320 weapons with multiple, independently targeted warheads, a category that could include no more than 820 intercontinental ballistic missiles with the balance consisting of bombers fitted out to launch cruise missiles. (For the purpose of the agreement, bombers with air-launched cruise missiles were treated as systems having multiple, independently targeted warheads.) This particular attempt to protect the principle of deterrence by controlling the size and composition of the deterrent forces never became reality. Meddling by the Soviet Union on the troubled continent of Africa and an erroneous report of a Soviet combat battalion deployed to Cuba heightened American opposition to ratification of the treaty, which had already been challenged on the grounds that, in the absence of on-site verification, the Soviet

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Union would cheat. When the Soviet Union invaded Afghanistan in December 1979, an angry President Carter complained of a Soviet betrayal and withdrew SALT II from consideration by the Senate. Despite this setback, the principle of limiting nuclear weapons to enhance the effect of the deterrent force survived.

President Reagan, who succeeded Carter in January 1981, allowed the negotiating process to continue. At the outset of his first term, Reagan achieved no real breakthrough in arms control. Indeed, he accepted the basic strategy endorsed by Ford and Carter, and by Nixon as well, which addressed the numbers of weapons, rather than throw weights. In doing so, the new Chief Executive separated strategic missiles from intermediate-range weapons. Geneva thus became the site for discussions concerning restrictions on Intermediate-Range Nuclear Forces—the so-called INF talks—and for the Strategic Arms Reduction Talks (or START), which were the old SALT negotiations with a new name.

Even as arms control was becoming an accepted element of national policy, the Air Force carried out operations related to the other military objectives of the United States—deterrence, the containment of communism, and collective security. A major crisis, the resumption of warfare between Egypt and Syria on the one side and Israel on the other, caused the United States to send military supplies to Israel and alert the Strategic Air Command as a warning against Soviet involvement. This conflict also resulted, over the years, in a change in the military relationship between the United States and Egypt. On the Jewish holy day of Yom Kippur, the day of atonement, October 6, 1973, Egyptian and Syrian forces that had been conducting what appeared to be routine maneuvers launched a full-scale invasion. Troops from Egypt advanced eastward across the Suez Canal and onto the Sinai peninsula; those from Syria pushed westward from the mountains along the border toward the very heart of Israel. Caught by surprise, Israel hurriedly mobilized, and desperate fighting ensued, even though the architect of the attack, President Anwar el-Sadat of Egypt, had no illusion of being able to destroy the Jewish state.

Sadat, who had been serving as vice president when President Gamal Abdel Nasser died in 1970, intended to break the diplomatic stalemate that had settled over the Middle East since Israel's victory in the six-day war of 1967, dispel the image of Egyptian weakness by shattering the Israeli defenses and advancing onto the Sinai, and force the United States and the Soviet Union to impose on the region a peace settlement that was generally favorable to his nation. In contrast, Syria renewed the war, which had flared intermittently since Israel became independent in 1948, to overrun its enemy, at the very least regaining the territory lost in the 1967 fighting. Because of its proximity to Israeli settlements and its commitment to conquest, Syria posed the greater immediate danger. Egypt, more distant from Israel's heartland, sought long-term political advantage rather than a purely military victory.

The outbreak of war caught the United States at a time when its leadership was distracted by developments at home. On the fourth day of the fighting, Vice

President Spiro T. Agnew, implicated in more than a decade of petty graft and corruption, resigned his office, and as the conflict intensified in the Middle East, the first of President Nixon's aides were indicted for their involvement in the burgeoning Watergate scandal. Surprised like the government of Israel by the unprovoked onslaught, the Nixon administration assumed that the Israelis would win a quick victory that would be confirmed by diplomacy between the United States and the Soviet Union, exactly the opposite of what Sadat intended. Since the United States was so confident that Israel would prevail, no effort was made at the outset to provide more than a token amount of military supplies and equipment, enough to demonstrate the American commitment without arousing the wrath of Israel's enemies, and even this was not expected to arrive until after Egypt and Syria had been defeated.

Events did not unfold as President Nixon and his advisers had expected. While Israel mobilized, its air arm suffered severe losses, especially to Soviet-built surface-to-air missiles protecting the Egyptian armies in the Sinai. The troops and armor that had crossed the Suez Canal entrenched themselves beneath an umbrella of radar-guided anti-aircraft missiles. In attacking the Sinai bridgehead, Israeli pilots did not have the kind of electronic countermeasures that American airmen had used so successfully in Southeast Asia because the United States had not supplied Israel with this equipment. By going on the defensive, the Egyptians also compelled the Israeli Army to move its tanks much of the way across the Sinai, subjecting them to wear and possible mechanical breakdown. On the Syrian front, although its casualties were numerous, Israel fared better, containing the initial attack and on October 11 advancing across the border in the direction of Damascus, Syria's capital. Meanwhile, the Soviet Union had begun an airlift, dispatching some twenty transports to Damascus on October 10 and making the first deliveries to Egypt on the following day.

As early as the morning of October 9, Golda Meir, Prime Minister of Israel, requested emergency shipments of armaments, offering to come to the United States and personally plead her case before President Nixon. The administration responded by planning an airlift using chartered transports supplied by El Al, the airline of Israel, and American carriers. This plan collapsed because Israeli aircraft and crews were too few and the American firms refused to risk their equipment on missions not covered by insurance. As the response to the request from Mrs. Meir was being organized, Israel's ambassador to the United States, Simcha Dinitz, told American officials that his nation's armed forces were rapidly running out of ammunition. This unexpected revelation, along with the failure of the chartered airlift, made it clear that the United States would have to call on the Military Airlift Command.

On October 12, 1973, the Military Airlift Command, under Gen. Paul K. Carlton, began preparing to move supplies and ammunition to Israel. The operation got under way within two days, and the first flight unloaded at Lod airport in Israel on the night of October 14. A stream of C-141s and C-5s flew a distance

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An M-60 tank leaves the cargo bay of a Lockheed C-5 (above) at Lod Airport, Israel, October 1973. An Israeli Air Force F-4 (below) displayed with some of the munitions it can carry.



of about 6,500 nautical miles, landing to refuel only at Lajes Air Base in the Azores. Of all the American allies along the route, only Portugal, which ruled the Azores, agreed to cooperate fully with the airlift. The inability to land for fuel anywhere except at Lajes convinced the Air Force that its C-141s should be modified for mid-air refueling (as indeed they soon were). Bad weather along the route that delayed takeoffs from Lajes, and the unavoidable loss of time while re-

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fueling or making minor repairs, caused overcrowding there, but the operation continued, gathering momentum until, in General Carlton's words, the transports rolled up to the unloading ramp in Israel "like oranges out of a bushel basket."

The airlift to Israel lasted through November 14 and resulted in the delivery of 22,395 tons of cargo from 20 different locations in the United States, easily meeting an arbitrary goal of exceeding by at least 25 percent the volume of cargo that the Soviet Union was flying to Syria and Egypt. The Air Force Logistics Readiness Center in the Pentagon directed the operation, depots operated by the Air Force Logistics Command prepared the shipments from Air Force stocks, and the Military Airlift Command did the flying, launching 567 missions, all successful, as the C-5s delivered an average of 73 tons per sortie and the C-141s 28 tons. Israelis unloaded the cargo at the destination, sometimes transferring ammunition directly to trucks that immediately set out for the battlefield. The United States also provided the badly needed electronic countermeasures gear along with F-4s and Navy A-4s to replace those downed in the opening phase of the war. Ferried to Israel by American pilots, the fighters and attack aircraft refueled in transit from Air Force tankers.

A cease-fire went into effect on October 22, the product of hectic negotiations by Secretary of State Kissinger. Unfortunately, military reality tended to undercut the efforts of diplomacy. On the Sinai front, one Egyptian bridgehead east of the Suez Canal, an entire army, had been isolated by Israeli forces that had advanced westward across the canal and fanned out in Egyptian territory. Israel's generals wanted to eliminate the encirclement east of the canal, and the Egyptians hoped to extricate the men who were trapped there; consequently, skirmishing and violations of the cease-fire were all but inevitable.

The danger now surfaced that the Soviet Union would seize on any fighting in the Sinai to justify the sending of troops to enforce the peace, a course of action that Sadat seemed willing to endorse, since his encircled army might well face death or capture. Indeed, the Soviet leadership proposed that the United States join in forming a joint occupation force to maintain the cease-fire. If the United States chose to cooperate, it would become, as Secretary Kissinger later phrased it, "the tail to the Soviet kite"; the Soviet Union would emerge as the dominant force throughout the region, the apparent savior of Egypt and Syria, with American troops possibly helping to take away a victory the recent American airlift had helped to win. For the Soviet Union to return in the guise of peacemaker would reverse a decline in regional influence that had touched bottom in 1972 when Sadat had ordered Soviet troops out of Egypt, in part because he anticipated that the Brezhnev government would oppose his planned invasion of Israel.

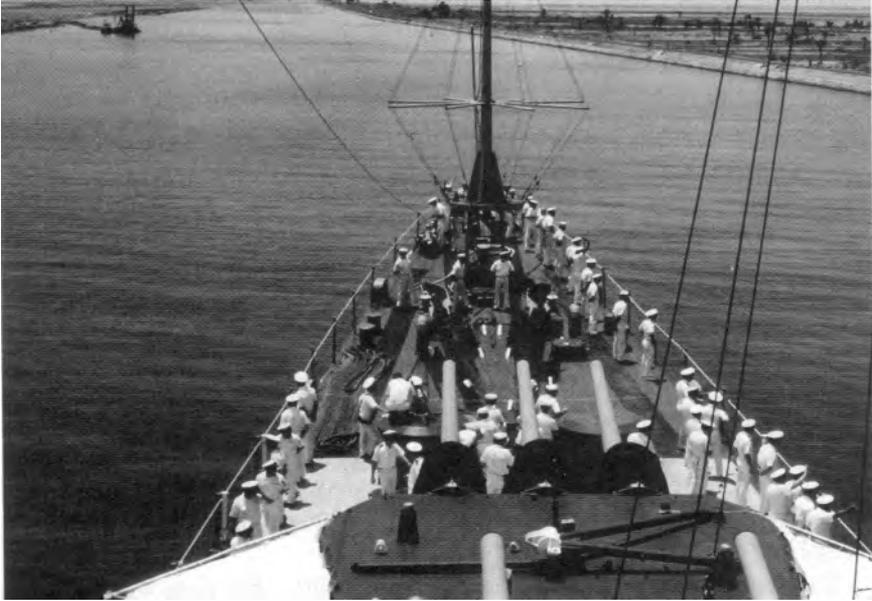
The Nixon administration concluded that, since Brezhnev could not have believed that the United States would participate in such a scheme, he must have advanced the plan as cover under which the Soviet Union could intervene unilaterally in the region. Secretary Kissinger warned Ambassador Dobrynin of the possibly dangerous consequences of a Soviet attempt to elbow its way into the

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Middle East, and to drive home the point, on October 24 American forces throughout the world, including the Strategic Air Command, increased their readiness for war. Although the alert stopped short of preparations to respond to an immediate attack, it required actions that Soviet satellites seemed certain to detect. American intelligence was also at work, reporting that eight Antonov An-22 turboprop transports, each capable of carrying 200 soldiers, were poised to fly from Hungary to Egypt. Since the heightened American alert had not accomplished its intended goal, the National Security Council approved sending a third aircraft carrier to the eastern Mediterranean, alerting the 82d Airborne Division to prepare for deployment to the Middle East, and ordering most of the B-52s still on Guam to return to bases in the United States. In its formal response to the proposal for a joint peacekeeping force, the Nixon administration emphasized the tentative nature of the Soviet plan, tacitly suggesting that since no concrete action had been taken, the Soviet Union could not be accused of backing down. Brezhnev accepted this face-saving gesture when he conceded that a peacekeeping force organized and dispatched by the United Nations might prove more satisfactory than the Soviet-American venture that he had mentioned.

By mid-January 1974, Egypt and Israel were at peace, separated by a contingent from the United Nations. Only a small number of Egyptian troops remained on the Sinai peninsula, dug in at the very limit of the effective radius of antiaircraft missile batteries located west of the canal, and armed with but a few tanks. Although this largely symbolic lodgment scarcely represented a victory over Israel, the attack that Sadat launched in October 1973 had other, more substantial effects. In the aftermath of the fighting, Egyptian and Israeli military officers and diplomats engaged in direct negotiations, helped along by frequent visits from the American Secretary of State, and fashioned a buffer zone between the canal and the mountain passes leading through the Sinai to Israel itself. Building upon this agreement, Kissinger helped guide the two nations toward a second pact, approved in 1975, under which Egypt guaranteed Israel access to the newly reopened Suez Canal in return for control of the oil wells and mountain passes of the Sinai. Israel and Egypt renounced the use of violence to settle disputes, and some 200 American technicians, using sensors not unlike those that had monitored the Ho Chi Minh Trail a few years earlier, made sure that both nations honored the pledge. In 1979, at the urging of President Carter and his Secretary of State, Cyrus R. Vance, Sadat agreed to a formal treaty of peace with an Israeli government headed by Menachem Begin; Israel thereupon pulled back from the Sinai, though not from the coastal strip that included the city of Gaza, and the two nations opened their mutual border.

Besides leading ultimately to an easing of tensions between Egypt and Israel and a community of interest between the United States and Egypt, the war of 1973 immediately converted oil into a weapon that could be used to oppose American policy toward the Middle East. At a time when the Military Airlift Command had begun delivering vital cargo and Israeli counterattacks were



The guided missile cruiser *Little Rock* begins transit of the Suez Canal in June 1975, shortly after the canal reopened.

crossing the Suez Canal and advancing toward Damascus, certain of the oil-producing nations that supported Egypt and Syria resolved to cut production until Israel relinquished its latest conquests. Their intent was to accelerate the increase in the price of oil and cause economic dislocation among the oil-importing nations that supported Israel, forcing nations like West Germany and Japan to reconsider their foreign policy. Since the United States, Israel's principal supplier of armaments, had become heavily dependent on imported oil—almost forty percent of the oil consumed domestically came from overseas, much of it from the Middle East—it too, faced the choice of pressuring Israel to surrender the occupied territory or risking the economic consequences of remaining steadfast. The Organization of Petroleum Exporting Countries, dominated by nations with ties to Egypt and Syria, imposed an embargo on shipments to nations that aided Israel. In practice, the oil weapon was used selectively, being aimed for the most part against the United States and the Netherlands, which had given strong public endorsement to the American policy of backing Israel. Of the two nations singled out as victims, the Netherlands suffered more because petroleum tended despite the boycott to become available for the lucrative American market, although at vastly inflated prices. The rapidly soaring cost of oil had a dramatic impact; for instance, a single week of price increases on the part of the Organization of Petroleum Exporting Countries raised the cost of oil for western Europe,

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Japan, and North America by \$40 billion annually. The ban on sales to supporters of Israel ended early in 1974, the oil producers were unable to maintain a united front, and the spiral reversed itself; even so, the day of truly cheap oil had ended. Whereas oil had seemed expensive at \$3 per barrel in 1970, by 1980 \$20 per barrel was considered reasonable.

The higher cost of oil had a definite impact on the Air Force, since an increasing proportion of its funds had to be spent for fuel. Flying time was managed carefully to save fuel, and other conservation efforts were undertaken, such as letting contracts for new buildings with solar heating and adding insulation to existing structures. The Air Force budget came to reflect the reality of more expensive energy, a condition with which the entire nation was learning to live.

The war in the Middle East during 1973 and the spectacular increase in oil prices to which it contributed resulted in adjustments to the collective security arrangements in the region. One relationship did not change, however. Ties with Israel remained strong, as the United States continued to provide military equipment, including the new F-16 fighter. With the passage of time, signs of strain appeared that had nothing to do with oil, but the two nations shared common interests into the 1980s.

The greatest change resulting from the 1973 conflict had to do with the status of Egypt and its relationship to the United States. Much as President Sadat had planned, the fighting led to negotiations that made Egypt the political and diplomatic equal of Israel, allowed Egypt to regain some of the territory lost in 1967, and ended the state of war that had existed with Israel since 1948. Moreover, Sadat severed his remaining bonds with the Soviet Union and by 1977 was obtaining C-130 transports and replacing Egypt's Soviet-supplied MiGs with F-4s. The peace with Israel persisted even though relations between the two nations cooled, a consequence of Israel's refusal to surrender sovereignty over the Gaza strip, taken from Egypt in 1967, and the west bank of the Jordan River, wrested that same year from the Hashemite Kingdom of Jordan.

Meanwhile, a new force, Islamic fundamentalism, was gathering strength throughout the Moslem world. In October 1981, Sadat was assassinated by soldiers who believed he had betrayed the principles of Islam in seeking to modernize the nation; however, his successor, Hosni Mubarek, an officer in the Egyptian air force, continued the same basic foreign policy. Typical of the nation's closer ties with the United States was the recurring operation called Bright Star. During the exercise held in 1982, 24 transports of the Military Airlift Command dropped 859 Egyptian and American parachute troops and 172 tons of cargo onto the desert southwest of Cairo. The aircraft carrying the American contingent and its supplies took off from the United States, remained in the air for 13 hours, and arrived over the drop zone within six seconds of the appointed time.

Exercises like Bright Star had no effect on the resurgent fundamentalism within Islam. Nowhere had the fundamentalist movement been as successful as in Iran, which Presidents Nixon and Carter tried to use as a pro-Western bastion

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to frustrate Soviet attempts to exert influence in the vicinity of the Persian Gulf. Mohammed Reza Pahlavi, the reigning Shah of Iran, had skillfully taken advantage of the escalation of oil prices in the mid-1970s and greatly increased the monetary wealth of his petroleum-producing nation. A part of that treasure he had invested in weapons produced in the United States, buying outright what other rulers, with less money at their disposal, might seek as military assistance. By 1978, the Shah's air force included 300 F-5s and 200 F-4s, with even more advanced aircraft on order, like the Navy's Grumman F-14. All of this American equipment brought with it a flood of technicians from the United States to advise on operation, maintenance, supply, and administration. On the surface, Iran seemed a modern, strong, confidently-led nation, friendly to the United States, although willing to profit at American expense on the sale of oil, and a member with Turkey and Pakistan in the Central Treaty Organization, which the Eisenhower administration had put together as a barrier to Soviet expansion into the Middle East.

In reality, the Shah's effort to modernize and strengthen Iran had created alienation as well as prosperity, disenchantment along with education; even his best intentioned and most successful policies tended to be applied arbitrarily, at times cruelly. For example, his reforms in education created a class that aspired to share in governing and increasingly resented his autocratic rule, while his attempts to improve the status of women caused profound shock among conservative Moslems. Insulated from the masses by like-minded advisers and a brutally repressive secret police, the Shah did not understand the breadth or fervor



A C-130 Hercules flies over the pyramids during a Bright Star exercise.

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of the opposition. The fundamentalist ayatollahs, or religious leaders, did not understand, however, and they channeled popular resentment into a rebellion not only against the ruler but also against all that was modern, foreign-inspired, or secular. The Shah was forced to flee in January 1979, and power passed into the hands of the Ayatollah Ruhollah Khomeini, who had been living in exile in France.

Khomeini became the driving force behind the establishment of the Islamic Republic of Iran, a government based on the strict enforcement of traditional religious and social practices. The United States maintained diplomatic relations with the new Iran, hoping to salvage something of the former partnership with the Shah but failing to gauge the new regime's hatred of the former ruler and loathing for the West. When the Carter administration, in a humanitarian gesture, allowed the cancer-stricken Shah to enter the United States for medical treatment, Iranian students on November 4, 1979, stormed the American embassy at Teheran, seized the ambassador and his staff, and vowed to hold them until the Shah was returned to Iran to stand trial.

Hope flourished for a time that the imprisonment would be brief. By the end of November, 13 of the Americans, 8 black men (including Capt. Neal Robinson, an Air Force budget specialist assigned to the embassy) and 5 white women, had been released, along with 5 captives who were not American citizens. The Ayatollah soon made it clear, however, that he was not seeking to ease the crisis; he declared that he had freed the blacks because he believed that they were victims of American racism, the women because Islam held them in high regard, and the others because his quarrel was exclusively with the United States.

The Iranians still held 53 Americans, civilians and members of the military. The group included three Air Force officers—Col. Thomas E. Schaefer, the air attaché; Lt. Col. David Roeder, his deputy; and Capt. Paul M. Needham, Jr., whose specialty was logistics—along with one black man and two white women, who were not released because the Iranians believed they were spies. The hostages suffered confinement, varying degrees of isolation, and different forms of cruelty. Colonel Schaefer, who later said that he had applied lessons taught him in an Air Force survival course, protested his treatment by staging a hunger strike that lasted five days before he was forced at gunpoint to eat a meal. Captain Needham and other of the hostages were blindfolded and subjected to a mock execution. One of those who shared Needham's ordeal, Richard Queen, a civilian, was released in July 1980 to obtain treatment of a disease that proved to be multiple sclerosis.

Queen, however, was still a prisoner in the spring of 1980 when President Carter decided to risk military action to free the hostages, even though the captors repeatedly said they would kill their prisoners in the event of a rescue attempt. Every attempt to negotiate had ended in frustration for the United States. Since diplomacy and economic pressure had failed, force seemed the only solution.

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The rescue operation included six Air Force C-130s of the 1st Special Operations Wing at Hurlburt Field, Florida, and eight modified Navy helicopters with Marine Corps helicopter pilots. On April 24, 1980, the fuel-laden C-130s made rendezvous at a site on the Iranian desert with a force of RH-53 minelaying helicopters from the aircraft carrier USS *Nimitz*. Mechanical failure forced down one helicopter, and a second turned back when its navigation equipment and some of its flight instruments failed because of sand ingested during a wind storm. (Although the helicopters were modified to extend their range, no special measures had been taken for operations over the desert.) Another of the helicopters arrived at the rendezvous after developing problems with its hydraulic system that made it unsafe for further flying. Since only five helicopters were available, one too few for the mission, the operation had to be canceled. One of the helicopters tried to move a short distance to refuel for the return flight to the *Nimitz*, but the pilot became disoriented in the cloud of sand raised by the flailing rotor blades, and his craft crashed into one of the transports, touching off an explosion that killed five members of the C-130 crew and three of the marines on board the helicopter. Since the flames seemed certain to attract the attention of Iranian security forces, the survivors immediately abandoned the airstrip on the desert and flew to safety in the remaining C-130s.

Despite this failure, the President hoped to try again; aircraft were modified and training was conducted, but the Iranians moved their captives after the attempted rescue and American intelligence could not determine the new locations. Consequently, 52 of the Americans remained prisoners for 444 days. During their confinement, the Shah left the United States after medical treatment at a hospital in New York City and at an Air Force medical facility in Texas, stayed briefly in Panama, and went to Egypt, where he died in July 1980. In September of that year, Iraq invaded Iran, an attack that worked to the advantage of the hostages. As the fighting grew more savage, the Khomeini regime realized that it could benefit by trading the captives for the unencumbered portion of the Iranian assets the United States government had impounded immediately after the embassy was seized and its staff taken hostage. Such was the basis of an agreement reached in January 1981 that resulted in the release of the Americans, who left Teheran minutes after Ronald Reagan took the oath as President, succeeding Jimmy Carter. Once the money had been obtained for the war against Iraq, the hostages, in the words of Deputy Prime Minister Behzad Nabavi, became "a fruit from which all the juice has been squeezed."

Saudi Arabia also loomed large in American Middle East policy. The kingdom was strongly anticommunist, although King Faisal, who was murdered by a deranged relative in 1975, tended to associate communism with Zionism and to regard Israel as an outpost of the Soviet Union. His opposition to Israel stopped short of open warfare, however, and Saudi Arabia played no significant role in the 1967 or 1973 conflicts. Faisal's successor, King Khalid, gave diplomatic support for Egypt's successful effort to regain the Sinai peninsula and

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kept his nation on a generally pro-Western course until he died of a heart attack after ruling for seven years. The accession to the throne of King Fahd Bin Abdul-Aziz Al Saud in 1982 did not affect the kingdom's foreign policy.

During the period of scarcity and skyrocketing prices following the Middle East war of 1973, Saudi Arabia reaped vast profits from its exports of oil. The nation's rulers invested the money in modernizing society and in acquiring new weapons. The F-15 fighter joined the kingdom's arsenal, but it became available only after lengthy congressional debate over the possibility that the aircraft might someday be used against Israel. Since Saudi Arabia was an Islamic monarchy in the throes of modernization, the expulsion of the Shah of Iran by religious fundamentalists troubled the ruling families. To prevent the Ayatollah Khomeini from exporting his revolution, Saudi Arabia became a strong supporter of Iraq in its war with the Islamic Republic of Iran.

The growing importance of the Middle East, along with Africa and southwestern Asia, caused changes in the responsibilities of the U.S. Strike Command, the joint organization designed to deploy troops and aircraft to meet emergencies throughout the world. The Strike Command remained a world-ranging "fire brigade" until late 1963, when it assumed primary responsibility for planning and conducting operations in the Middle East, sub-Saharan Africa, and southern Asia—a territory stretching from the Atlantic coast of Africa to the Bay of Bengal separating India from Burma. The Strike Command exercised this geographic responsibility for almost a decade before reverting in January 1972 to the role of a worldwide deployment force with the title of U.S. Readiness Command. Responsibility for the Middle East, Africa south of the Sahara, southern Asia, and the adjacent waters was divided among the European, Atlantic, and Pacific Commands.

After lengthy discussion, the Joint Chiefs of Staff created a task force rather than a joint command to conduct actual deployments to meet emergencies anywhere in the world. The new Rapid Deployment Joint Task Force was established in March 1980 as a subordinate element of the U.S. Readiness Command. In October 1981, however, the task force became a separate organization, no longer subordinate to the Readiness Command. Because of the American ties to Egypt and Saudi Arabia and the revolutionary threat from Iran, the Rapid Deployment Joint Task Force concentrated on Egypt, the Sudan, the Horn of Africa, the Near East (excluding Israel, Syria, and Lebanon), the Arabian Peninsula, Iran, Afghanistan, and Pakistan. While the independent task force assumed responsibility for this geographic area, the Readiness Command, as successor to the original Strike Command, provided the combat-ready air and ground units. In recognition of this division of labor, the joint task force was abolished on December 31, 1982 and replaced the following day by the U.S. Central Command, a joint organization. The headquarters remained at MacDill Air Force Base, and the principal commanders stayed the same—Army Lt. Gen. Robert C. Kingston, with Air Force Maj. Gen. Robert C. Taylor as his deputy.

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Despite the focus on the Persian Gulf and the Middle East, the nations of western Europe, rather than those extending from Egypt to Iran, loomed largest in American strategic thinking. This had been true since the 1950s, when strengthening the North Atlantic Treaty Organization rivaled in importance even the war in Korea; during the Vietnam conflict, the defense of Europe retained its priority, even though the Air Force units there furnished pilots and crewmen, along with mechanics and other technicians, to Southeast Asia. When the Shah of Iran was overthrown in 1979, almost thirteen years had passed since Charles de Gaulle announced that France was pulling out of the military structure of the North Atlantic Treaty Organization and ordered out of the country all the forces of the alliance that were based there. By de Gaulle's deadline of mid-1967, the U.S. Air Forces in Europe had complied by transferring most of its units to the United Kingdom and Germany. Although one tactical reconnaissance squadron disbanded, two others returned to the United States where, under the dual-basing concept, they stood ready to return to Europe.

The practice of dual basing, under which units located in the United States remained committed to Europe and ready to deploy in an emergency to specific, fully prepared bases, was but one means of dealing with a persisting problem, the expense of providing forces for the North Atlantic Treaty Organization. By avoiding the cost of maintaining combat units overseas on a permanent basis, with their peacetime administrative and logistic overhead, the Air Force saved money. The wings and squadrons designated for deployment had to exercise frequently, however, and the European bases they would use had to be kept ready to receive them, so that dual basing, although less costly than permanent assignment, generated expenses of its own.

The manpower ceiling provided another weapon in the struggle to save money, and the Air Force, prodded by Congress, tried to impose restrictions on the number of officers and airmen assigned to Europe, seeking always to preserve fighting strength, if necessary at the expense of headquarters and support echelons. The relationship of combat elements to support units, loosely described as the "tooth-to-tail ratio," came under continued congressional scrutiny in the aftermath of the Vietnam War, especially as it applied to the American forces in Europe. During the budget formulation process for fiscal 1975, Senator Sam Nunn, a Democrat from Georgia, successfully added an amendment to the appropriations legislation that promised a reward for sharpening the teeth while bobbing the tail. In essence, the Nunn amendment directed a reduction of 18,000 in the number of American servicemen stationed in Europe; 6,000 would depart during fiscal 1975 and the remainder by the end of June 1976. To ease the blow, however, the legislation authorized the Secretary of Defense to approve increases in combat strength equal to the reductions in the supporting establishment. The availability of replacements and accommodations in Europe would, the senator realized, bring a net reduction. Nevertheless, after meeting its quota by eliminating 4,500 manpower spaces during the two fiscal years, the U.S. Air Forces

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A General Dynamics F-111 of the 48th Tactical Fighter Wing, RAF Lakenheath, United Kingdom, in October 1977.

in Europe was able to add a wing of F-111s, a tactical control group, and a squadron of F-5Es, which functioned as aggressors in exercises modeled after Red Flag.

The Nunn amendment had another effect beneficial to the U.S. Air Forces in Europe. Since the legislation failed to draw a sharp distinction between combat and support, the command created a “combat staff” that made arrangements for wartime operations by dual-based units arriving from the United States. Despite this orientation toward combat, the staff dealt in operational support, for it ensured that supplies and engineering equipment were available at the airfields designated for use by aircraft deploying across the Atlantic. Gen. Charles A. Gabriel, who from 1980 to 1982 was Commander in Chief, U.S. Air Forces in Europe, began establishing combat staffs at his principal subordinate headquarters, the Sixteenth, Seventeenth, and Third Air Forces, a process that Gen. Charles L. Donnelly, Jr., completed after General Gabriel’s departure to become Air Force Chief of Staff.

The effort embodied in the Nunn amendment to exchange logistic tail for combat tooth staved off for a time the imposition of a numerical ceiling on the overall strength of the American forces in Europe, but such a restriction soon became a reality. Concerned that the United States was continuing to outspend its allies for the defense of western Europe, Senator Ted Stevens, a Republican from Alaska, mustered support during 1982 for legislation to freeze the allowable strength on the continent at the 1980 level. Senator Nunn, however, sponsored a successful amendment that established 1982 as the base year and thus authorized a slightly higher total. As a result, the Army faced a ceiling of 217,000, the Navy 13,800, the Marine Corps 1,100, and the Air Force 83,500. Scarcely had President Reagan approved the joint resolution that set forth these figures when

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Gen. Charles A. Gabriel,  
Air Force Chief of Staff,  
July 1982–June 1986.



the Air Force had to ask for an exception. Congress in approving the joint resolution did not take into account the scheduled deployment to Europe of the ground-launched cruise missile, the strengthening of reconnaissance forces there, a greater emphasis on electronic warfare, and other programs for which more officers and airmen would be needed. The addition of 1,400 spaces to man the cruise missile units was readily approved, but the Air Force had to meet the other needs through diverting men and women already in Europe from one program to another, postponing the filling of vacancies, and canceling the movement of units overseas.

These various efforts to save money through holding down numbers resulted in a decline in the actual strength of the U.S. Air Forces in Europe. In 1955, when the North Atlantic Treaty Organization faced a frightening prospect of invasion by Soviet forces and those of the Soviet satellites, the U.S. Air Forces in Europe reached its peak of 136,000 officers and men. Immediately afterward the size of the command began to contract, and this trend was not interrupted until the Berlin crisis of 1961 triggered a transatlantic deployment that raised the strength of the command to almost 99,000. When tensions eased, the decline resumed, accelerated by the Vietnam conflict, which competed with Europe for manpower in every specialty. The Air Force not only reduced crew-to-aircraft ratios in Europe to provide pilots and electronic warfare officers for combat in Southeast Asia, it also assigned to units fighting the war a priority on munitions loaders, mechanics, and other technicians essential for sustained operations. In 1970, U.S. Air Forces in Europe dipped below 58,000 officers and enlisted personnel, rising only to 63,000 by the end of the decade, even though the pressures of the war had disappeared.

Although the containment of costs through restrictions on manpower became a dominant consideration during the post-Vietnam years, the U.S. Air Forces in Europe also underwent reorganization to strengthen its ties to the other air forces supporting the North Atlantic Treaty Organization. The need for stronger

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bonds and closer coordination reflected tactical reality. The more numerous armies of the Warsaw Pact seemed capable in the mid-1970s of thrusting directly across the plains of northern Germany, which were defended principally by air and ground contingents from the United Kingdom and the Federal Republic of Germany. The American forces and the bulk of the troops supplied by West Germany were located to the south and formed what was considered to be the strongest element in the defenses of western Europe. Gen. David C. Jones, who from 1971 to 1974 served as Commander in Chief, U.S. Air Forces in Europe, and simultaneously commanded the Fourth Tactical Air Force of the North Atlantic Treaty Organization, tried to facilitate the shuttling of aerial strength between the southern and northern fronts by establishing a single agency to control all tactical aviation in the region. The British resisted the formal incorporation of their air forces into such an arrangement, although they accepted an alternate proposal by General Jones. His solution, the Allied Air Forces, Central Europe, functioned as an intermediate headquarters coordinating the operations of the Fourth Tactical Air Force in the north and the Second Tactical Air Force in the south. Command of the Allied Air Forces, Central Europe, became a collateral duty of the Commander in Chief, U.S. Air Forces in Europe, and the first officer to serve in that capacity was Gen. John W. Vogt, who succeeded General Jones.

Modernization proceeded along with reorganization. The Federal Republic of Germany, the Netherlands, Belgium, Norway, and Denmark decided to replace their aging F-104s; all but Germany deciding in 1975 to supplant the F-104s with some 300 F-16s, thus compensating to some degree for the American investment in the defense of Europe. New aircraft also were arriving for the squadrons of the U.S. Air Forces in Europe—F-111s, F-15s, A-10s, F-16s, and E-3 airborne early warning and control aircraft, modified Boeing 707-320 commercial transports that could do more effectively what the EC-121s had done during the fighting in Southeast Asia.

Funding, manpower, organization, and modernization were not the only recurring challenges that faced the U.S. Air Forces in Europe. The protection of the command's aircraft (and those of the partners in the North Atlantic Treaty Organization) remained the subject of close attention over the years. Beginning in the mid-1950s, varying numbers of fighter-bombers stood ready to take off on fifteen-minute notice, becoming airborne before enemy aircraft could attack their bases. As an additional means of protection, the Air Force experimented into the early 1960s with a zero-length launcher, essentially a rocket that could propel a fully loaded aircraft at flying speed from a ramp built on the bed of a trailer. Ingenious though it was, the zero-length launcher was vulnerable—as Air Force Maj. Gen. Gabriel P. Disosway said, “even a .30 caliber bullet fired from an adjacent hill can effectively deny a mission”—unless protected by a shelter, but the addition of a blast-proof shell drove up the cost. Moreover, reliance on tactical nuclear weapons declined; whereas comparatively few hard-

ened zero-length launchers could inexpensively accommodate a compact nuclear strike force, the expense of scattering hundreds of conventionally armed fighter-bombers at individual sites throughout western Europe, and maintaining the necessary logistic and security networks, was truly prohibitive. Emphasis therefore shifted to improving the survivability of aircraft at conventional airfields, whether main bases or alternate sites, by means of dispersal, camouflage, and shelters. Training in the decontamination of aircraft and facilities after a chemical attack became a key element in planning for wartime operations.

Even as the air forces of the North Atlantic Treaty Organization were reorganizing, modernizing, and taking steps to protect their aircraft, the alliance experienced new strains. In 1974, relations between two members, Greece and Turkey, exploded over Cyprus, an island in the Mediterranean due south of Turkey. A majority of the inhabitants of the former British colony were Greek Christians, but a sizable minority were Turkish Moslems. The government of Cyprus sought to accommodate both factions by dividing public offices, and even membership in the armed forces, proportionally between them. When Cypriots favoring union with Greece rebelled to accomplish their goal, Turkish troops invaded on July 20 to preempt anticipated landings by Greek forces. After overrunning some forty percent of the island in a campaign lasting four weeks, Turkey announced a cease-fire. The captured territory was subsequently organized as a separate state; negotiations for the reincorporation of the Turkish enclave into a biregional confederation of Cyprus dragged on into the 1980s.

Because Turkey had used equipment supplied by the United States to invade Cyprus, Congress in 1975 suspended the sale of arms; Turkey retaliated by taking over the American bases on its territory, except for Incirlik, which was restricted to use by the North Atlantic Treaty Organization. The restoration of military assistance in 1978 revived normal relations between the United States and Turkey.

The military junta that ruled Greece during the unsuccessful uprising in Cyprus resigned shortly after the Turkish invasion; the "rule of the colonels" thus ended, and constitutional government was restored. The new government, however, removed its military forces from the North Atlantic Treaty Organization, as France had done during the previous decade, but did not shut down the American bases. The continued use of Hellenikon Air Base at Athens and other installations remained a thorny subject as a socialist government, basically opposed to the American military presence, came to power early in the 1980s.

The United States remained committed to the principle of collective security and to the North Atlantic Treaty Organization, but the attitudes of its European partners were changing. There seemed to be less willingness than before to allow the United States the exclusive and unrestricted use of bases on the territory of these allies. Moreover, popular sentiment was favoring a greater reliance on arms control, rather than on armaments, for national and regional security. This feeling seemed especially strong in the Federal Republic of Germany, where so

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many American-controlled nuclear weapons were located and where frequent military flights and maneuvers proved intrusive and at times destructive.

Despite the emphasis on Europe, the growing interest in the Middle East, and the withdrawal from Southeast Asia, the Air Force continued to support national policy in the Orient and in the Americas. For example, when North Korea for a third time since the Korean War directly challenged American policy in the Far East, the Air Force joined in the response. Twice the challenge had been directed at intelligence-gathering operations outside North Korean territorial waters—the crew of the USS *Pueblo* had been captured in January 1968 and imprisoned for eleven months before being released and the entire crew of a Navy EC-121 were killed in April 1969 when North Korean fighters shot down the aircraft some ninety miles off the coast. President Johnson responded to the *Pueblo* crisis with a small-scale mobilization of the reserves and a rapid deployment of aerial strength to South Korea, a response that his eventual successor, Richard M. Nixon, criticized as being too weak. Faced with the loss of thirty-one American lives in the aircraft downing, President Nixon hoped initially to react with military force (and one of the options available was the use of B-52s from Okinawa for strikes in North Korea), but circumstances dictated caution. Retaliation by air might have led to fighting on the ground, embroiling the United States in a second war in Asia, even as it was laying the groundwork for eventual disengagement from Vietnam. Consequently, Nixon responded to the second incident much as Johnson had to the first, reinforcing naval strength in the area and providing fighter escort for future aerial reconnaissance missions.

The third incident occurred on August 18, 1976, when a work detail of American and South Korean soldiers in the demilitarized zone near Panmunjom attempted to prune a tree that interfered with the view of United Nations observers. A group of North Koreans beat to death the two American officers who were in charge. The Ford administration reacted by demanding an apology and taking action to demonstrate that it expected the demand to be met. Air Force reinforcements arrived within two days, as Pacific Air Forces sent a squadron of F-4s from Okinawa and the Tactical Air Command a squadron of F-111s from Mountain Home Air Force Base, Idaho. To dramatize American resolve, B-52s began flying in the region, while naval air and surface forces converged on the peninsula. On August 21, another work detail felled the tree, while armed South Korean and American troops stood by. Apparently in response to the show of determination, Kim Il Sung, the leader of the Democratic People's Republic of Korea, expressed regret over the murders.

As demonstrated by the seizure of the American embassy at Teheran and the members of its staff, a new kind of enemy was testing the ingenuity and determination of American political and military leaders. This latest threat was the terrorist, an agent of some group or nation, who used violence, including murder and kidnapping, against essentially innocent victims to influence policy or

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avenge some perceived injustice. The victims of terrorism might be members of the military who were not engaged in actual hostilities against their attackers or civilians like the most of the Americans taken captive at the embassy in Iran. All that the terrorists seemed to have in common was a deeply felt commitment to a cause that manifested itself in a willingness to inflict pain, to kill, and to die in doing so.

Often the terrorist sought to attain his objective by seizing hostages, who might be killed unless a government took a particular action, and air power seemed able to play a role in rescuing these unfortunate victims. The most striking example of the use of the airplane for this purpose occurred in July 1976, after hijackers, initially disguised as ordinary passengers, boarded a French airliner at Athens, drew their weapons after takeoff, and forced the crew to refuel in Libya and fly the aircraft, originally bound from Tel Aviv to Paris, to Entebbe airport near Kampala, Uganda. Under the benign gaze of Idi Amin, the Ugandan dictator, the terrorists sought to bargain the lives of the Jewish passengers for the release of 53 Palestinians or Palestinian-sympathizers convicted of terrorism and imprisoned in Israel, West Germany, Kenya, Switzerland, and France. After a week of fruitless negotiation and careful planning, a team of Israeli commandos flew to Uganda in four American-built C-130s, landed at night on the darkened runways at Entebbe, killed perhaps 40 Ugandan soldiers who tried to interfere and all seven of the terrorists, and rescued 103 persons. The daring raid cost the lives of one soldier and two of the hostages. The commandos did not know that another of the hostages, an elderly woman, had been taken to a hospital; left behind when the raiding party withdrew, she was later killed.

The spectacular attack on Entebbe, more than any other single event in the struggle against the growing threat of terrorism, fired the imagination of military planners who believed that terrorists had to be fought and defeated. The American reaction included the organization of Special Forces Operational Detachment Delta, called the Delta Force, designed to be flown anywhere in the world to do what the Israeli commandos had done in Uganda. Although inspired at least in part by the Israeli success, the Army modeled its counterterrorist arm after the British Special Air Service, even to the profusion of flowers that decorated the grounds of a neatly-kept headquarters. The imitation of the British example resulted from the training a number of the members of the original cadre of the Delta Force received from the Special Air Service in the tactics of unconventional warfare.

The first mission undertaken by the new Delta Force, as the initial complement finished its training, was participating in the joint operation to rescue the hostages held in the Iranian capital. Whereas the Israeli commandos had been able to land in darkness on paved runways at Entebbe, overpower the terrorists and the Ugandans who sheltered them, and take off immediately with the freed hostages, the descent on Teheran required refueling in the desert, hiding the helicopters on the outskirts of the city, infiltrating amid a populace of some six

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million to rescue the hostages, and making rendezvous with the helicopters to escape. Yet, it was mechanical failure among the helicopters, rather than the complexity of the plan, that doomed the rescue effort.

Even as the Air Force learned to deal with terrorism, renewed itself, modernized after the Vietnam conflict, and continued to refine its tactics and develop the latest technology and management practices, it carried out its assigned missions in protecting the United States and furthering national policy. The new technology included fighters and bombers all but invisible to radar, cruise missiles, and an intercontinental ballistic missile more powerful than Minuteman. Improvements in management dealt as much with the efficient employment of individuals as with the acquisition and logistic support of weapon systems. In using to the fullest the skills of its men and women, the Air Force sought to complement training with a variety of morale and welfare programs designed to reduce the uncertainties that affected performance and, at the same time, attempted to remove the artificial obstacles based on race, ethnic background, or sex. Among the highest ranking of Air Force officers, a pattern of career management was emerging, in part a response to congressional action, that required professional military training at advanced schools and service in joint organizations. Operationally, the Air Force maintained the land-based deterrent, conducted combat operations in varied and far-flung places, flew humanitarian missions, and conducted training, including those exercises intended to demonstrate an American commitment to an ally or an alliance.

In brief, the Air Force of the late 1970s and early 1980s, in terms of training, administration, and operations, did essentially what it had been doing since 1947, helping to preserve and advance the interests of the United States efficiently and effectively. The organization, however, was carrying out its missions with improved equipment, a thoroughly professional active duty force backed by increasingly skilled reserve components, and an organizational structure and leadership closely attuned to a wide range of military activity. The unique challenge of recent years was the threat of terrorism, but the role of air power in deterring outrages like the murderous attacks on innocent tourists at airports or on board commercial airliners had not yet been defined.

Part VII

The  
Post-Cold War Era,  
1975-1982



## Chapter 23

# Peace is not Always Peaceful

William T. Y'Blood

**A**lthough the eighties and nineties saw the supposed Soviet monolith crumble and disintegrate, leaving the United States as the dominant world power, the need for a U.S. military force did not disappear. Indeed, it appeared that with the easing of tensions between East and West and the improbability of a major confrontation occurring, the number of brush fire conflicts rose dramatically. Some of these conflicts were instigated by leaders dismissed by the media as “two-bit hooligans” and the like. Yet many of these individuals had the wherewithal to obtain more than just two-bits of advanced, and quite deadly, military equipment. They also had the strong desire to use this equipment. Invariably, it was the United States that was called upon to handle these situations, either by itself or as the leader of an international coalition.

Such conflicts ranged from single raids, such as one on Libya, to all out wars like the Persian Gulf War. Despite the different scenarios, different tactics, and different situations, each illustrated the Air Force’s capabilities and readiness for almost any contingency. However, the first of these conflicts to enmesh the United States, the Grenada campaign in October 1983, although successful, received mixed reviews from both the media and the services following its conclusion.

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Grenada is the southernmost of the Windward Islands, which are part of an arc of islands known as the Lesser Antilles that extend from the Virgin Islands south toward Trinidad, thence west along the coast of Venezuela to Curacao. This larger group of islands, together with the Greater Antilles and the Bahamas, form the West Indies. Larger than many Caribbean islands and with a mountainous and heavily wooded interior, Grenada was still a relatively small military objective. Only 21 miles long and no more than 12 miles at its widest point (approximately 119 square miles), Grenada had a population of about 90,000 in 1983. Under British rule since 1803, the island finally achieved independence in 1974, although a governor general continued to represent Queen Elizabeth II as the formal head of state. Unfortunately, Grenada's independence was characterized by corruption and political instability.

Grenada's first prime minister, Sir Eric Gairy, had been a thorn in the British government's side for years before he became prime minister. Corrupt, ruthless, and given to squandering his country's money, Gairy continued these traits after becoming the leader of his tiny nation. He also became quite interested in various psychic phenomena, including UFOs. And in a way, it was UFOs that brought him down.

In March 1979, Gairy travelled to New York to ask the United Nations for a full debate on UFOs. His political opponents, who had chafed under Gairy's autocratic rule, seized this moment to launch an almost bloodless (one person was killed) coup d'etat. Most Grenadians greeted Gairy's overthrow with joy because they believed the new leadership would deliver them from the corruption and brutality of the previous government. Disastrously, they just traded one malevolent regime for another that was far worse.

The new leader of Grenada was Maurice Bishop, a Marxist-Leninist who soon sought a closer alliance with Cuba and the Soviet Union. Although Cuba shipped arms to Grenada immediately following the 1979 coup, not until early 1982 did Cuba and Grenada begin to collaborate militarily. A Cuban military mission was organized, followed in October by the opening of a Soviet embassy in Grenada's capital, St. George. Cuba and the Soviet Union were not the only countries Grenada looked to for military equipment and technical assistance. Agreements were also signed with Czechoslovakia, Vietnam, North Korea, Libya, and East Germany.<sup>1</sup>

In addition to the military equipment it received (far more than Grenada's small army could use, yet still more was requested), Bishop's government wished to complete an international airport at Point Salines on Grenada's southwestern tip. The Point Salines construction was announced publicly as being an effort to stimulate tourism to the island. The size of the project, however, and the effort Cuban workers were exerting on the construction, caused concern on neighboring islands and in the United States. To the United States, the Point Salines construction was just a cover for the projection of communist power into the eastern Caribbean and thence elsewhere. Indeed, documents captured dur-

ing the operation known as Urgent Fury showed that the airport would have been used by Cuba as a staging area for its troops who were involved in an undeclared war against guerrillas in Angola. Also, the Soviets, with their big Tu-95 Bear long-range aircraft, could have used Point Salines as a primary base for western hemisphere reconnaissance missions.

Bishop's government also began several other projects on the island, projects that could only be termed military construction. Although the United States worried about Grenada's leftward shift and its increasing militarism, there was little the U.S. could do about the situation lest it be castigated as a bully or an aggressor. In spite of their concern about Grenada, many Caribbean countries seemed complacent about what was transpiring on Grenada. This complacency was shattered on October 19, 1983.

The new People's Revolutionary Government was not even a year old when opposition to Bishop's regime surfaced. This opposition was put down ruthlessly, but disenchantment with Bishop's rule continued to simmer. Bishop's eventual downfall, however, did not come from outside his government, but from within.

Attempts to turn Grenada into a Marxist state turned into one failure after another. By 1983, the country was in deep economic trouble. Bishop, seeing no other alternative, began seeking help from western countries. This was seen as a betrayal by those in the Central Committee (the actual governing body of the party), especially Deputy Prime Minister Bernard Coard, who wanted to take a harder line and make Grenada even more Marxist.

In late September 1983, while Bishop was away on an official visit to eastern Europe, Coard initiated his plan to wrest control from the prime minister. Talks with, and occasional threats to, members of the Committee resulted in most siding with Coard in the decision to replace Bishop. Coard also received the support of the small Grenadian military, the People's Revolutionary Armed Forces, of which the army was the most significant portion.

During volatile meetings of the Central Committee on October 12–13, Bishop's fate was sealed. The prime minister was placed under house arrest, and Coard assumed Bishop's position. Coard's time in office was brief, because the Grenadian people angrily refused to acknowledge him as prime minister, and then came the invasion. Although he remained the newly declared prime minister, Coard retired quickly from public view due to the open antagonism of the Grenadians. If Coard's wish was to keep a low profile, others proved willing to play more public roles. One of these was Gen. Hudson Austin, formerly a corporal in Gairy's army but now the Minister of Defense as well as the interior minister. His fervid militancy eventually helped (or pushed) Coard and others to take the final step, the brutal murder of Bishop and some of his supporters, that ultimately doomed Coard's Government.

On October 19, Bishop was freed by his supporters, but this proved to be a short reprieve. Attempting to regain the initiative, Bishop and some of his clos-

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est followers moved to Fort Rupert, the army's headquarters. Hundreds of people gathered outside the fort in hopes of hearing Bishop, who was still immensely popular with the Grenadians, speak. Thus for a brief period it appeared that Bishop might survive the coup, but this was not to be.

Realizing that they would be finished if they gave Bishop time to marshal support, the Central Committee (in a hastily-organized meeting) decided that Bishop and his closest supporters must be killed. A small force of soldiers on armored personnel carriers moved to Fort Rupert and launched an assault on the building, killing and wounding over 100 civilians before capturing Bishop and several of his main supporters.

The victors wasted no time in executing Bishop and seven of his followers. Their bodies were then burned and buried. But if Coard and Austin thought their troubles were over following Bishop's death, their real problems had only just begun. Because most Grenadians had seen Bishop as their true leader, the newly-organized Revolutionary Military Council swiftly established martial law, a measure that only intensified the people's hatred. Further problems soon surfaced.

Grenada was a member of the Organization of Eastern Caribbean States with Dominica, St. Vincent, St. Lucia, Montserrat, St. Kitts-Nevis, and Antigua. The other member nations were shocked and appalled at what was transpiring on Grenada. Meeting on October 21, the leaders of these countries voted for military intervention to restore order. However, they had no viable military forces themselves, and they realized that such forces would have to come from elsewhere. They sought help from the United States and the Caribbean Community, a larger organization that also included the Bahamas, Barbados, Belize, Guyana, Jamaica, and Trinidad and Tobago. Delegations of this organization met the following day, October 22, with the majority supporting some form of intervention. However, attempts to settle the situation peacefully were rebuffed by Grenada, as were similar attempts by British and U.S. envoys on the 22d and 23d. The situation was rapidly becoming increasingly unstable.

In the meantime, the United States had not been standing still. On the 19th, the Joint Chiefs of Staff issued a warning order about Grenada, and planning commenced. Given the task of doing the bulk of this work was the Atlantic Command, a unified command headquartered at Norfolk, Virginia. Most of this initial planning, however, addressed the evacuation of civilians from Grenada. It soon became apparent that much more than an evacuation operation would be involved.

On the 20th, as the situation worsened, a battle group built around the carrier *Independence* and a Marine amphibious unit, both en route to Lebanon, was directed to head south toward Grenada and await further orders. Further directions from the Joint Chiefs gave the planners three strategic objectives: secure the safety of the medical students and other American citizens, restore a legitimate democratic government, and eliminate the Cuban presence on Grenada.<sup>2</sup> They were given less than a week to accomplish these objectives.

On October 21, President Reagan signed a draft National Security Decision Directive regarding a possible invasion of Grenada. The following day, the Joint Chiefs of Staff issued an execute order for the operation. Grenada, though, was not the only problem occupying the U.S. government's time. On October 23, 241 U.S. marines were killed in Lebanon when a bomb-laden truck was driven into the building serving as their quarters. However, as the President received more information about Grenada, he became very concerned about the safety of the approximately 1,000 U.S. citizens on the island, most students and faculty at a medical school. Grenada's government did not seem to be able to guarantee their safety, and a strong possibility existed that the students could be used as hostages. The Lebanon problem would have to wait; Grenada was the more urgent situation. Later on the 23d, after meeting with his senior advisors, Reagan signed the "smooth copy" of the directive and directed that D-day be October 25. Urgent Fury was under way.

That same day, the Eastern Caribbean organization formally requested assistance from Jamaica, Barbados, and the United States under Article 8 of the organization's Treaty of Association. This article called for "the collective defense and preservation of peace and security against external aggression by requesting assistance from friendly countries."<sup>3</sup>

Vice Adm. Joseph Metcalf III was designated the commander of Joint Task Force 120, the overall organization charged with carrying out Urgent Fury. Metcalf's deputy was a little-known Army officer, Maj. Gen. H. Norman Schwarzkopf, who had been brought in at the last minute from his command of the 24th Infantry Division (Mech) to provide advice on army matters. (Seven years later, his name would become much more familiar to the American public.) Metcalf's command was divided into four task forces totalling approximately 20,000 personnel: Task Force 121 had the elements of the 82d Airborne Division, Task Force 123 the special operations units (SEALs and Rangers), Task Force 124 the marines of the amphibious unit and the *Independence* battle group, and Task Force 126 the Air Force units.

Metcalf's troops, however, suffered from spotty intelligence. Until the recent events brought the island more notoriety, Grenada had not been an important target to U.S. intelligence agencies. Although order of battle information regarding the Cubans on the island was generally very good, that on the Grenadian forces was not as reliable. The Americans were also unsure of just how the Grenadians would react to an invasion. Also, in spite of reconnaissance efforts by SR-71s, U-2Rs, RF-4Cs, and RC-135s, the attackers had poor knowledge of the placement of enemy positions and, although they believed they knew where the students were gathered, had even less knowledge of the students' actual locations.

On Grenada, the Cubans had 701 men under the command of Col. Pedro Tortolo, who arrived on the island just 17 hours before the invasion. The Cubans were not civilian construction personnel; they were military engineers who knew how to use heavy weapons. The Americans seriously underestimated the

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number of individuals in Grenada's army and its backup, the People's Revolutionary Militia. It was believed the army had about 1,200 troops and that the militia could field from 2,000 to 5,000 personnel. Actually, the army had 2,179 well-armed troops, and the militia consisted of approximately 7,000 men and women. The intelligence organizations also stated that several communist nations had men and women (later established as numbering 179) on the island in various capacities, but that they would most likely not take part in combat.

The invaders were warned that the Grenadians and Cubans had antiaircraft guns (ground-bound versions of the famed Soviet ZSU-23 self-propelled guns), heavy machine guns, and mortars. They were also equipped with a few armored personnel carriers, antitank guns, 130-mm artillery pieces, and rocket launchers. These warnings may not have had the sobering effect needed because the briefers apparently thought the defenders would not put up a fight.

In his memoirs, General Schwarzkopf recalls listening incredulously to meetings in which the briefers told their audiences that the Grenadians would not fight or were so poorly trained that they could cause little harm. Although not voicing his concerns, Schwarzkopf kept worrying, "What if they do fight?"<sup>4</sup> Unfortunately, they did.

Among the first air units engaged in Urgent Fury were E-3A AWACS aircraft of the 552d Air Warning and Control Division (the unit had just upgraded from wing status), which deployed from Tinker Air Force Base, Oklahoma, to Puerto Rico on the evening of the 23d. These aircraft were to focus on Cuba and monitor any movement of its forces toward Grenada. Assisting in this task were F-15Cs of the 33d Tactical Fighter Wing, which had moved from Eglin Air Force Base, Florida, to join the 552d in Puerto Rico. The fighters would provide a distant combat air patrol for the invasion force, again in case Cuba made threatening moves southward. As it turned out, the Cuban government, other



Boeing E-3 Airborne Warning and Control Systems aircraft.

than issuing bombastic warnings over the radio, remained quiescent during the operation.<sup>5</sup>

Urgent Fury actually started late on October 24, when Navy SEAL teams began reconnoitering the beaches and areas behind the beaches or headed inland to undertake specific missions, such as ensuring the safety of the island's governor general. The main assault did not begin until approximately 5:20 the next morning, when marines arrived during a rainstorm via helicopter to surprise the defenders of the Pearls airfield, a 5,200-foot strip on the east side of the island. The defenders fired a few wild shots, then scattered for safety. Among the prisoners captured by the marines, who suffered no casualties in the action, were a dozen Cubans, crewmen for Colonel Tortolo's Soviet Antonov An-26 Curl transport. That plane and another Soviet-made transport were taken unscathed. Other marines swiftly took the town of Grenville, just south of Pearls, and the entire area was soon under U.S. control.

While the marines had a relatively easy time at Pearls, the Army Rangers attacking the Point Salines airfield suffered many anxious moments, some starting even before they took off on their mission. The planning for the marines' part in the operation, as was planning for everyone else in Urgent Fury, had been tightly compressed, and the initial plans did not survive a series of changing circumstances. First, the Rangers had to perform their mission without their normal complement, because extra men were needed to support other special operations. Then, instead of operating completely at night, the attack was rescheduled for 5:00, minutes before first light. Finally, the Rangers had little information on what defenses awaited them. These problems were encountered prior to taking off for Grenada. More problems surfaced en route to the island, problems that completely changed the concept of the assault.

The Rangers were transported in three waves, the first two departing from Hunter Army Air Field, at Savannah, Georgia, near Fort Stewart, and the third flying out of Pope Air Force Base, North Carolina, next to the 82d Airborne Division's home of Fort Bragg. Leading the first wave were three MC-130E Combat Talon I's of the 1st Special Operations Wing. These aircraft carried terrain-following radar and other sophisticated instrumentation and were primarily used in support of special operations. Four regular C-130s (known as "slicks" because they did not have all the antennas associated with MC- and EC-130s) made up the rest of the first wave. The second wave consisted of two MC-130Es and three C-130s; the last wave had four C-130s. All of the slicks came from the 317th Tactical Airlift Wing. Their flight to the target would take about eight hours.

These transports were not the only Military Airlift Command aircraft involved in the early stages of the operation. Three C-5s of the 436th Military Airlift Wing delivered the commander of airlift forces and his staff, plus nine knocked-down Army helicopters, to Grantley Adams International Airport on Barbados shortly after midnight on the 25th. Only 45 minutes from Grenada,

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the airport served as a forward operating base and the airlift command post during the operation. For the following week, Grantley Adams was a beehive of activity, with air operations continuing around the clock and aircraft from huge C-5s down to helicopters packing the ramps and taxiways. The helicopters that were brought in were to have been used by the special operations forces during the initial assaults, but their reassembly took so long that when they finally arrived over Grenada, Pearls had been captured, the Rangers were fighting for Point Salines, and the defenders were ready for further attacks.

Meanwhile, as the C-130s lumbered southeastward over the Caribbean toward Grenada, an AC-130H Spectre gunship from the 16th Special Operations Squadron arrived over Point Salines at 3:30 in the morning to make a final reconnaissance of the field. What the gunship's crew discovered, as they peered through night-vision goggles and looked at the images flickering on the screen of the plane's low-light television array, was not encouraging. The runway was blocked by construction equipment and other obstacles. Also, numerous gun positions were spotted overlooking the airfield. Landing the C-130s under these conditions was impossible. The pilot reported the situation to Task Force 123's commander, who was aloft in one of the three airborne command and control EC-130Es from the 7th Airborne Command and Control Squadron used during the operation.

As its designation indicates, this aircraft enabled the commander to keep abreast of what his units were doing and to issue orders as needed. Controllers aboard the EC-130s also coordinated the close air support missions of the AC-130s and Navy aircraft, and operated as airspace managers over Grenada. (Another interesting version of the C-130 participating in Urgent Fury was a single EC-130E operated by the Pennsylvania Air National Guard's 193d Electronic Combat Group. This version was presumably used on electronic surveillance missions.)

The task force commander radioed the rapidly approaching C-130s of a change in plans. Instead of airlanding the Rangers, they now would airdrop them. For the next few minutes chaos erupted in the transports as the soldiers donned parachutes and rigged for jumping. Further confusion ensued minutes later as the first planes began the run toward the airfield. Although a faint streak of light began to edge the eastern horizon, it was still dark, and rain showers were passing fitfully over Point Salines when the crew of the lead MC-130 discovered their inertial navigation system was working erratically. Not wishing to drop the Rangers into a very narrow landing zone under these conditions, the crew relinquished the lead to the second aircraft. But this aircraft also suffered equipment failures, and the lead passed to the third MC-130.

All of these switches took place in a few minutes as the C-130s thundered in toward the airfield. There was one final decision to be made. Although intelligence sources had spotted some defenses overlooking the airfield, the orbiting AC-130 had sighted more. Even through the night-vision goggles, it was apparent that most of these defenses were sited so as to fire on aircraft above 1,000 feet.

Aboard the lead MC-130, the Ranger commander huddled with Maj. Gen. William J. Mall, Jr., the Twenty-Third Air Force and mission commander, and Col. Hugh Hunter, the 1st Special Operations Wing's leader. They quickly decided to make the drop from 500 feet, low for a combat parachute drop but not an unusual tactic. As the lead plane roared over Point Salines, a searchlight stabbed through the darkness and locked onto the aircraft. Intense ground fire filled the sky, most of it well above the MC-130 but some on target, ripping holes into the transport. The first "sticks" of Rangers and a combat control team from the 317th tumbled out of the plane to land square on the runway. As soon as they had jumped, the pilot reefed his MC-130 into such a tight diving turn that General Mall was pinned against the side of the cockpit.

The heavy fire caused Mall to order the following aircraft to peel off and orbit outside gun range. His second order was to Maj. Michael J. Couvillon in the AC-130 circling overhead. The order was simple—get the guns! This was a task Couvillon and his crew jumped to enthusiastically. Soon, the distinctive ripping sound of the hundreds of shells leaving the barrels of the Spectre's twin 20-mm Vulcan cannons, interspersed with the heavier whump-whump-whump of its 40-mm cannon, reverberated over Point Salines. Most of the defenders, if not dead or wounded, retreated swiftly for denser cover.

As the enemy fire slackened, General Mall ordered the jump resumed. By about 6:20, the last Rangers had left their planes and were beginning to clear the area around the airfield. Shortly before 8:00, with the sun now well up, the last wave of C-130s, carrying the Ranger's jeeps and other heavy equipment, began landing on the partially open runway. Assisted by Couvillon's aircraft, the Rangers drove the defenders away from the airfield, capturing more than 200 Cubans in the process.

More important, they reached the medical school campus known as True Blue and rescued some 138 students. The attackers now realized that more students were located at the Grand Anse campus, south of St. George, the capital. (However, they remained unaware of more than 200 U.S. citizens located on the Lance aux Epines peninsula until the 28th, when they finally discovered them, just about 2,000 meters across Prickly Bay from the True Blue campus.) Getting to the students at Grand Anse would be difficult because it was in that direction that the Cubans and Grenadians were setting up new defenses. Luckily, telephone lines had not been cut and the Rangers were able to contact the students at Grand Anse. Throughout the next couple of days of fighting, this connection remained open, providing the American troops valuable information about the area around the campus.

Lightly armed, the Rangers needed more support if they were to reach Grand Anse. Part of their support was furnished by the three AC-130s on watch over the island 24 hours a day. (Six AC-130s were eventually used in the operation.) Usually two of the gunships remained on station, while the third returned to Barbados to replenish its supplies. They did not suffer from a lack of targets,

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This C-130 unloading on the runway at Point Salines , Grenada, has its engines running for a quicker departure.

which they destroyed or neutralized. At one point, a trio of armored personnel carriers attempted to punch through the Rangers' thin lines. They did not make it far. A hail of fire from the Rangers and four shells from an AC-130's 105-mm howitzer left all three smoldering ruins.

By 2:00 in the afternoon, enough of the Point Salines runway had been cleared to allow bigger aircraft to land. Parking, however, presented a problem at the field throughout the operation because its surface remained unfinished and piles of supplies and equipment were stacked about it. Eight C-141s of the 62d Military Airlift Wing, followed by four more Starlifters of the 63d wing, brought in the first elements of the 82d Airborne Division. The timing of this infusion of fresh, more heavily-armed troops was fortuitous because the personnel carriers' attack occurred while the planes were unloading.

The tight parking at Point Salines resulted in most of the succeeding C-141 flights landing at Barbados, where their troops were transferred to C-130s for movement to Grenada. (It should be noted that the ability of U.S. forces to use the Grantley Adams airport was a major factor in Urgent Fury's success.) Most of the C-5 missions during the operation also flew from Grantley Adams.

By the end of October 25, U.S. forces held both of Grenada's airfields and significant areas of real estate surrounding them. Late that day, the marines also landed at Grand Mal Bay, north of St. George's. But Urgent Fury had not gone the way the briefers had earlier hoped. Instead, the Grenadians and their Cuban allies chose to fight; they had given their attackers a bloody nose, particularly in the fighting around Point Salines and during a SEAL attempt to rescue the governor general, which only resulted in both the team and its putative evacuee



Members of the 82d Airborne Division wait to board a C-141 transport at Pope Air Force Base, North Carolina.

being trapped. Still, the situation was not in doubt. Cuba was not coming to the aid of its people on Grenada, and other Eastern Bloc countries were merely bystanders to the unfolding action.

The next day, the first of the medical students from the True Blue campus were evacuated from the island to Charleston, North Carolina, via a Starlifter from the 315th wing. By the time Urgent Fury was completed, the C-141s and C-5s had evacuated 688 American students, Catholic priests and nuns, missionaries, foreign nationals, and some Grenadians to the United States.

Meanwhile, as the C-141s brought in more troops, the attacks resumed toward Grand Anse and St. George. The defenders found themselves being squeezed between the marines to the north and the paratroopers to the south. Most of the Grenadian civilians, despising their new leadership as well as the army, welcomed the U.S. troops enthusiastically. While the marines pushed steadily south, a Ranger force flew by Marine helicopter from Point Salines to Grand Anse. There, some 224 students were plucked from the midst of Grenadian troops, loaded aboard the “choppers,” and flown back to the airfield. An AC-130, Navy aircraft, and a destroyer kept the defenders busy while the students were spirited away.

The 82d Airborne Division troopers had a tougher fight south of Grand Anse as they encountered the strongest defenses on the island. Nonetheless, they continued to advance cautiously north and east through heavy underbrush to push

## History of the United States Air Force



Students board a C-141 at Point Salines, Grenada.

the Grenadians, braced by some Cubans, back from one of their main positions, the Calliste barracks. By the end of the 27th, the battle for Grenada was essentially over, but neither the Americans nor the Grenadians realized that just yet.

Further assaults on the remaining enemy positions were launched the next day. Calivigny barracks, the last major Grenadian camp and supposedly the center of Cuban activities on the island, was the primary target. Before the Rangers and the 82d's troopers attacked, the camp was pounded by AC-130s, Navy planes, and a destroyer. As it turned out, Calivigny was lightly held, but the attackers suffered casualties nonetheless. Three of the helicopters used in the attack were destroyed or damaged during their landings, inflicting a number of casualties on the soldiers. Nevertheless, the attack carried through, and the barracks were secured in about an hour.

The next few days were spent mopping up. As almost an afterthought, the students at Lance aux Epines were finally discovered and returned to the United States. (Actually, several students and faculty members were not discovered until after the battle; they remained on Grenada the entire time.) Then, both Bernard Coard and Hudson Austin were ferreted from their hiding places to await trial for their part in the death of Maurice Bishop and their consequent usurpation of governmental power. On November 2, the operation was officially closed. It had not been the walkover that some had believed. Eighteen Americans were killed, another died of his wounds, and 106 were wounded. On

the enemy's side, 24 Cubans were killed, as were 21 members of Grenada's army, 396 of the defenders (of which some may have been civilians) were wounded, and 673 were captured. Some 24 civilians are known to have been killed during the action.

Urgent Fury was a successful operation, but how successful remains controversial. Despite overwhelming numbers, it took U.S. forces several days to beat down the opposition. Because of the tight time frame for planning, the execution of the various phases of Urgent Fury was too often mishandled or poorly coordinated. Most seriously, poor intelligence led to poor decisions. (Although the safety of the medical students was the rationale behind Urgent Fury, the intelligence agencies completely missed the locations of most of them.) One critic later stated, "We won in Grenada in spite of ourselves."<sup>6</sup>

However, the operations of the Air Force units participating in Urgent Fury were almost uniformly good. Some confusion cropped up in the initial loading phase and during the Point Salines drop, but the Air Force crews got the soldiers to the target in good order and dropped them where they were supposed to land. Then, they kept the supplies and reinforcements coming in on schedule. Of inestimable value were the AC-130 gunships. Their tremendous firepower provided the ground forces excellent support at all times.

Perhaps the greatest contribution of Urgent Fury was a "wake-up call" to the military that more training, better intelligence, and improved coordination of joint assets were required for future conflicts. As Just Cause and Desert Storm proved later, these lessons were well heeded.

Although individuals and groups have used terrorism throughout the ages as a means to achieve certain goals, the last 25 years of this century have seen individual countries institutionalizing it more and more as state policy. One of the leading practitioners of state-supported terrorism is Muammar Qadhafi, the charismatic and extremely anti-American Libyan leader.

The mid-eighties saw Qadhafi's anti-American rhetoric turn sharply into deeds. In October 1985, the cruise ship *Achille Lauro* was hijacked by terrorists and a wheelchair-bound American tourist, murdered. Then, just two months later, on December 27, two bands of terrorists (armed with AK-47s and grenades) launched bloody assaults on the Rome and Vienna airports. When these events were over, the attackers had been killed or captured, but 19 civilians were dead and over 100 more had been wounded. Although other countries were implicated in these massacres, U.S. intelligence agencies uncovered evidence showing Libya had been the prime fomenter of these actions.<sup>7</sup>

Still, a "smoking gun" was not found to tie Libya positively to these assaults, and the U.S. moved slowly as it gathered proof to present an open-and-shut case, not just as a legal matter but for public scrutiny as well. Planning also began on a series of military options for use against Libya. These ranged from B-52 strikes to the use of Tomahawk missiles against selected targets. In essence, a countdown to a confrontation with the Libyan strongman had begun.

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In late January and mid-February 1986, two U.S. Navy carrier battle groups took part in a pair of exercises in the Gulf of Sidra, the waters abutting Libya's shores. Such activities were nothing new; the Navy had been exercising in the Mediterranean since the end of World War II. But Qadhafi had increasingly become enraged at the presence of American warships near his country, and in the early eighties, he proclaimed that a line running along the 32°30' north latitude (well out in international waters) was now Libya's northern boundary. Melodramatically, he called it the "Line of Death." These two exercises did not cross the Line of Death, but they certainly stirred up the Libyan Arab Air Force. A number of encounters with Libyan fighters ensued, but the MiG-25 Foxbat and MiG-23 Flogger pilots usually retreated when the F-14s and F-18s drew near. These confrontations had a salubrious effect on the Navy pilots when they realized their adversaries were not very good.

A third exercise, Attain Document III/Prairie Fire, was authorized by President Reagan on March 14, 1986. This exercise would cross the Line of Death. Attain Document III involved standard exercise procedures, but Prairie Fire placed the Navy ships, organized as Task Force 60, on a wartime footing and permitted defensive and offensive actions as necessary. On March 24, the task force (now with three carriers) crossed 32°30' to begin the Gulf of Sidra exercise.

The Libyans responded quickly, firing several of their big SA-5 surface-to-air missiles, followed by SA-2s, at the Navy aircraft. All missed, and the missile site whence they had come was soon taken out by AGM-88A antiradiation missiles. Small, fast-moving attack craft of the Libyan Navy also put in an appearance, but several of these were sunk or damaged and, other than being nuisances, had no effect on the operations. Surprisingly, Qadhafi's aircraft failed to appear during any of this action. Task Force 60 remained south of the Line of Death for two more days, and then headed north on the 27th. Two days later the exercise ended.

The Navy had dealt Qadhafi a severe blow, but not realizing the precariousness of his position, Qadhafi reacted in typical style—unleashing his terrorists on unsuspecting and innocent parties. On April 2, just three days after Attainment Document III ended, a bomb ripped open a TWA airliner coming in to land at Athens. Four people died. Authorities could not link Libya directly to this attack (Syria appeared the more likely culprit), but Qadhafi was quick to openly praise the terrorists.

If Qadhafi could not be linked to the TWA bombing, the next attack led directly to him. Early on April 5, a bomb tore apart a Berlin discotheque, killing a U.S. soldier and his girl friend, while wounding another 79 Americans and 150 Germans. Intelligence analysts had been aware that some terrorist act was to take place in Berlin, but they had been unable to pinpoint the location until it was too late for warnings.

The analysts had been monitoring messages between Libya and its East Berlin Libyan People's Bureau, a supposedly innocent information office. One message to Qadhafi mentioned that something would happen soon to make him

happy. Following the bombing, the bureau radioed Libya, "An event occurred. You will be pleased with the result."<sup>8</sup> At last, the link had been forged tying Qadhafi to terrorist groups.

Following a meeting with his advisors on the 9th, Reagan authorized the operation known as El Dorado Canyon. The President specified the destruction of major elements of Libya's terrorist infrastructure as the operation's strategic objective, with the bombing of various terrorist facilities and the destruction and suppression of Libyan air defenses, including the air defense radar network, as the operational objectives.<sup>9</sup>

Planning for El Dorado Canyon was delegated to the United States European Command, an element of the North Atlantic Treaty Organization. Its commander, Gen. Bernard W. Rogers, further designated Vice Adm. Frank B. Kelso, the Sixth Fleet commander, to lead the operation. Time was of the essence; Reagan wanted action taken before Libya and its terrorist surrogates caused more mischief.

Actually, planning for such an endeavor had been under way since just after the Rome and Vienna massacres; the European Command and the Sixth Fleet just revised and refined their original plans. One major alteration, however, caused considerable concern to the Air Force units scheduled to take part in El Dorado Canyon. Several facilities known to be used for the training of terrorists made the target list. They included the Aziziyah barracks (the center of terrorist activities in Libya) and the Murat Sidi Bilal camp (a Palestine Liberation Organization school), both in Tripoli, and the Jamahiriyah barracks in Benghazi. Also selected for destruction were Libyan air force facilities and aircraft at the Tripoli and Benghazi (or Benini) airfields. Finally, to blast a path for the raiders to fly through, segments of the Tripoli and Benghazi air defense sectors were to be taken out. None of these targets would be easy. Built-up civilian areas surrounded all of the targets, and the Libyans were liberally equipped with Soviet-made SA-2, SA-3, SA-5, SA-6, and SA-8 missiles, as well as French-designed Crotale missiles.

A process of elimination decided what units to use against the Libyans. The use of Navy SEAL or Army Green Beret units was considered and discarded as being too difficult to accomplish within the time allotted for the operation. Tomahawks were ruled too valuable a resource to be used on targets that could be hit by other means. Battleships, even if they had been available, would be vulnerable to enemy air attacks. That left air strikes as the only option.

Admiral Kelso naturally looked first at the aircraft gathered on his three carriers. Eventually he used 21 A-6E and 6 F/A-18 attackers plus assorted support aircraft. To ensure the destruction of the selected sites, he needed aircraft capable of high-speed, low-altitude attack with pinpoint accuracy. He found them at RAF Lakenheath, England, in the guise of the F-111F. (Although designated a fighter, the F-111F was really a strike, or bomber, aircraft.) The Aardvark (or just "Vark" as the plane was known to its crews) was fitted with a Pave Tack tar-

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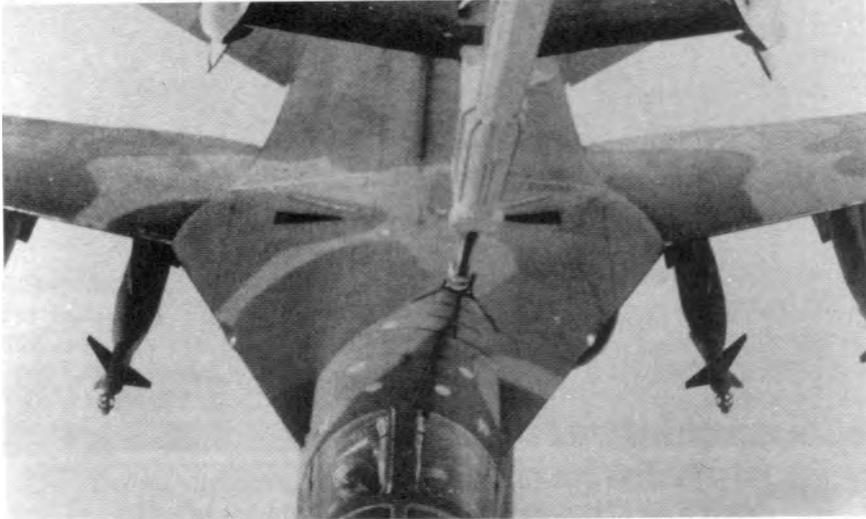


A 48th Tactical Fighter Wing F-111F receives its “last chance” inspection prior to takeoff for Operation El Dorado Canyon, April 14, 1986.

geting pod which contained forward-looking infrared radar and laser designating/range finding systems interfaced with the plane’s avionics. As would be shown in El Dorado Canyon, but even more so later during Desert Storm, the combination of airframe, targeting pod, and precision guided munitions proved to be a remarkably accurate and deadly combination.

The Lakenheath-based 48th Tactical Fighter Wing was given the job of carrying out the Air Force portion of the operation. Following the Rome and Vienna airport massacres, the wing was ordered to prepare for a strike on Libyan facilities. The operation would be known as Prime Pump.<sup>10</sup> When the tense situation arising from these attacks eased, Prime Pump planning stopped. However, the 48th, in conjunction with the European Command and the Sixth Fleet, continued preparing various contingency plans in case a Libyan attack was authorized. Also, Air Force and Navy officers were exchanged to work with their opposites on the plans. Up until just two days before its planes took off for Libya, the wing assumed that a force of six F-111Fs would be used. Virtually at the last moment for planning purposes, the 48th was directed to use 18 aircraft on the raid. This created great concern for the wing which now had to scramble to identify which targets the extra planes would hit, readjust the timing and flow of the aircraft across the target, and reconsider the weapons loading for the F-111s.

When the dust settled, nine F-111Fs (each carrying four 2,000-pound MK 84 Paveway II laser-guided bombs) were scheduled to attack the Aziziyah barracks, three more similarly armed Aardvarks would hit the Murat Sidi Bilal camp, and



A McDonnell Douglas KC-10 Extender provides fuel for an F-111F on its way to Libya.

six aircraft (each with 12 Snakeye retarded delivery MK 82 500-pound bombs) would bomb the Tripoli airfields. Navy aircraft would take care of the Benghazi targets. The raiders would follow in close succession one after another at low level and would make only one run over the targets. Admiral Kelso also directed that each target be positively identified before bombs were dropped.

The F-111Fs were not the only Air Force aircraft used in the operation. Five EF-111A Raven (colloquially known as Sparkvarks) electronic countermeasures aircraft from the 20th Tactical Fighter Wing's 42d Electronic Combat Squadron provided jamming support. However, perhaps the most crucial elements to the success of the F-111 attacks were the tankers. Although Prime Minister Margaret Thatcher authorized the use of British bases for the launch of the attacks, other national leaders were not so accommodating. Neither France nor Spain would allow overflight of their territories, forcing the 48th's aircraft to fly an almost 3,000-mile circuitous route over the Atlantic, through the Strait of Gibraltar, and across the Mediterranean to Libya.

Both France and Spain, as well as Portugal, noted the air refuelings and the passage of the attack force, but they made no public comments about these activities. The Italian government was not so obliging. Its radar operators notified Malta, which in turn alerted the Libyans, about half an hour before the Americans struck. This notification did not help the defenders much, however.<sup>11</sup>

Assigned the task of air refueling the F-111s was the European Tanker Task Force, a loosely knit organization composed of tankers deployed on temporary duty to the United Kingdom and Spain. Its usual assignment was support of Air

## History of the United States Air Force



F-111Fs of the 48th Tactical Fighter Wing prepare for takeoff from RAF Lakenheath on the afternoon of April 14, 1986.

Force and North Atlantic Treaty Organization operations in Europe. However, the tankers serving with the task force were not sufficient to carry out both El Dorado Canyon and their normal duties. Therefore, more KC-10s and KC-135s flew in between April 10 and 14, some arriving just hours before the F-111s took off for Libya. Eventually, tankers from 15 different wings, groups, and squadrons participated in the operation.

Late in the afternoon of the 14th, the first of 28 tankers took off, followed a short time later by the F- and EF-111s from Lakenheath and Upper Heyford. El Dorado Canyon was under way. After four air refuelings and a flight of approximately six and a half hours, the Aardvarks streaked in toward their targets. The clocks in Libya were ticking toward 2:00 a.m. on the 15th. Because of their proximity to Libya, the Navy aircraft had launched much later, but they would arrive over the target in concert with their Air Force compatriots.

Not all of the 18 F-111s made it to the target. Three of the planes scheduled to hit the Aziziyah barracks suffered various electronic problems. Because the rules of engagement for the operation specified that all equipment had to be working so that collateral damage could be avoided or, at the least, minimized, these aircraft had to abort the mission. Then, the crew of one of the planes bound for the Tripoli airport became disoriented following an air refueling. After they recovered their bearings, they were behind schedule for the closely timed attack, as well as off-course, and they had to abort also.

What happened to the last F-111F is still subject to conjecture. The plane of Captains Fernando Ribas-Dominicci (promoted posthumously to major) and Paul Lorence disappeared. Some publications quote Navy sources as saying its pilots saw an Aardvark inadvertently fly into the water. Others have stated that

the plane was shot down by a surface-to-air missile, which is more likely, considering that the plane was the eighth in a stream of nine aircraft (giving the Libyans time to line up the last raiders), and that missile batteries had indeed locked on briefly to aircraft just ahead of Ribas-Dominicci and Lorence.

Minutes before 2:00 a.m., EF-111As and their counterparts, Navy EA-6Bs, began jamming the Libyan radars. Those radars that tried to filter out this interference found themselves targets of AGM-88 and AGM-45 antiradiation missiles that quickly shut down the sites. At 2:00 a.m., the Air Force and Navy planes hit their targets simultaneously. While the Navy planes headed south from the sea, the 48th's aircraft circled Tripoli to hit their marks from the opposite, and unexpected, direction. Both groups roared in at 100 feet altitude.

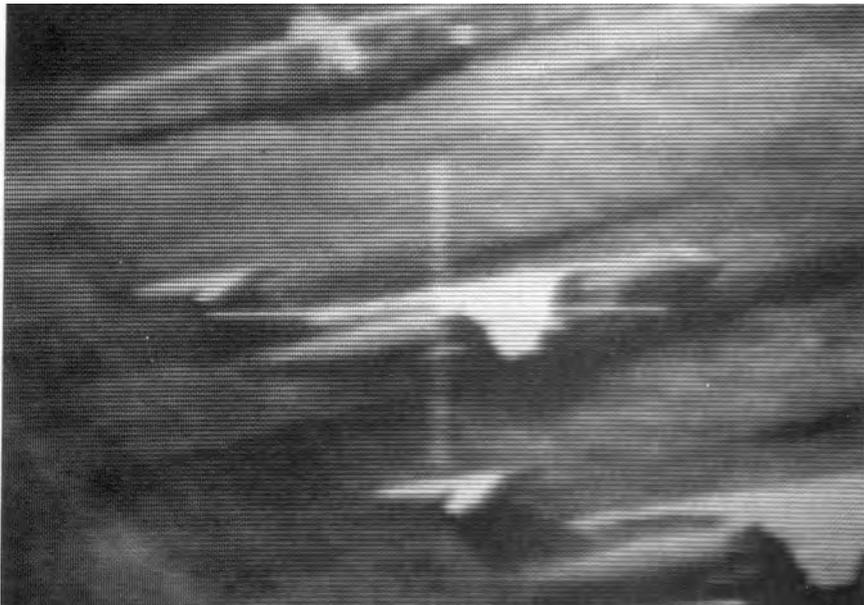
A colorful fireworks show greeted the attackers. Explosions from unguided missiles and antiaircraft shells dappled the black skies with great fiery bursts, while lines of tracers wove a deadly embroidery around the flashes. This display did not deter the fliers as they raced towards their targets. At the Aziziyah barracks, three of the Aardvarks placed their laser-guided bombs squarely on target, blasting several buildings housing administrative facilities and buildings sheltering the terrorists. Another F-111F crew could not identify their aiming point and, following the rules of engagement for the operation, did not drop their weapons. A fifth plane used a wrong aiming point, and three of its 2,000-pound bombs landed near the French Embassy.

Three of the four F-111s (one had aborted) scheduled for the Murat Sidi Bilal camp laid their bombs precisely. Numerous casualties were inflicted, training buildings were destroyed, and other installations were damaged in this highly successful attack.

The last five aircraft took aim at the Tripoli airfield. In less than five minutes, the planes carpeted the field's ramps and taxiways with 60 of the 500-pound Snakeeyes. The bombs ripped into several Soviet Ilyushin Il-76 Candid transports, destroying two and damaging three. Other aircraft were also damaged, and the ramp and taxiways were cratered in this effective assault.

Eleven minutes after the attack began, the F-111Fs were streaking out over the ocean headed for home. Meanwhile, the Navy aircraft, having demolished many of their targets at the Jamahiriyah barracks, and having pounded the Benghazi airfield to good effect, were heading back to their carriers. The entire attack had taken but 19 minutes; yet even after the American planes were long gone, confusion reigned in Tripoli and Benghazi. Antiaircraft guns and missile batteries continued to fire against nonexistent targets for hours afterward. Then, the following night, the Libyan defenders (jittery and trigger-happy) again let loose a barrage of shells and missiles at invisible aircraft. In a final paroxysm of impotent anger, the Libyans fired a pair of Scud missiles at a U.S. Coast Guard long-range navigation station on the island of Lampedusa, located about halfway between Tunisia and Malta and about 170 miles from Libya. The missiles landed noisily well out to sea from the tiny island.

## History of the United States Air Force



Libyan Il-76 Candid transports on the ramp at the Tripoli airport as seen through an F-111F's Pave Tack targeting system.

The attackers left behind them two ships sunk, one probably sunk and another damaged, six aircraft destroyed and several others damaged, several air defense network stations knocked out, many military and terrorist facilities destroyed and damaged, and one dictator with a severe case of nerves. The Libyans claimed that 37 people were killed and 93 injured in the raid. All but one were supposedly civilians, a suspiciously high number.<sup>12</sup> Also suspicious were Libyan reports that one of the dead was Qadhafi's adopted infant daughter. Later information indicated that the child was "adopted" after her death.

El Dorado Canyon was a bittersweet success; bitter in that one F-111F and its crew had been lost, but sweet in that the operation jolted Qadhafi and his terrorist companions severely. His monumental arrogance and self-confidence were shaken to the core, and for months afterward he preferred to keep a low profile. His terrorist underlings and their supporters likewise decided that any retaliation would not be worth the drubbing they were sure to receive. It took many months before the terrorists resurfaced.

The operation was also bittersweet because not all of the F-111F's bombing and navigation systems worked properly, leaving gaps in the coverage of the targets. Too many aircraft aborted for one reason or another, and too many bombs landed away from their targets. Nonetheless, the men of the 48th had reason to be proud of their role in El Dorado Canyon, but the true capabilities of the wing



In traditional aviator fashion, Air Force Chief of Staff Gen. Charles A. Gabriel “flies” the mission again with one of the returning pilots.

and its aircraft lay ahead—almost five years in the future—when they would demonstrate just what precision bombing was all about.

In December 1989, the United States again focused its attention on the Caribbean and Central America regions. Six years after *Urgent Fury* restored a democratic government to Grenada, a second military intervention by the U.S. brought down another dictatorship and led to the establishment of a new government. Under the code name *Just Cause*, Panama was invaded, and its strongman ruler, Gen. Manuel Antonio Noriega, ousted from office.<sup>13</sup>

Unlike *Urgent Fury*, which was a quickly planned and executed operation, *Just Cause* had been planned for some time and executed with deliberation. The seeds of *Just Cause* had been sown years earlier. In 1968, Omar Torrijos-Herrera, then a colonel in the Panamanian National Guard—the *Guardia Nacional*—led a coup that overthrew the elected government. From then until his death in 1981, Torrijos was the unquestioned ruler of Panama. Backed by the power of the military, Torrijos was brutal and ruthless, and made no pretense of being a democratic leader.

One of his trusted lieutenants was a Capt. Manuel Antonio Noriega, head of Panamanian military intelligence and one of the most feared men in his country. After Torrijos’ death, a power struggle ensued among some of his proteges, with Noriega eventually gaining the upper hand. As head of military intelligence, Noriega had in the late 1960s already forged an alliance, particularly with the *Central Intelligence Agency*, that served him (if not the U.S.) well. As commander of the *Guardia Nacional*, he also had the power to do almost anything

## History of the United States Air Force

he wanted, nor did he shrink from using his power. Despite the veneer of a democratically elected government, real power lay in Noriega's hands. Noriega continued the policies of Torrijos, but with additional brutality.

A major instrument of this brutality was the military. One of his first acts (after promoting himself to general) on gaining control of the military was to combine the Guardia Nacional with the tiny Panamanian navy and air force components. Noriega renamed this force the Panama Defense Force, believing this new appellation gave the military a more substantial and positive image. What was not positive about this control was that it enabled him to rule the country in even more draconian ways.

Although U.S. intelligence agencies (initially concerned more with happenings in Nicaragua and El Salvador) continued to see Noriega as useful because of the information he could supply, their support of him began to fade. It finally became apparent that he was involved heavily in drug-running enterprises and was dealing with the Columbian drug cartels. Also, much of the information he supplied was really second-rate. Finally, it appeared that he was getting substantial aid from communist countries, in particular, Cuba.

Under Noriega, Panama's relations with the United States deteriorated. Harsh criticism in the United States of Noriega's brutal repression of political dissent, including a U.S. Senate resolution on June 26, 1987, calling for the Panamanian people to oust him, caused the U.S. government to reassess its support of Noriega. This criticism did not seem to bother the Panamanian strongman who used it to blame the United States for interfering in Panama's affairs. Four days after the Senate's action, Noriega ordered an attack by his supporters on the U.S. embassy in Panama City, causing the United States to stop military and economic aid to Panama. This termination of aid was not the least of Noriega's problems in his relations with the United States. In early 1988, two federal grand juries returned indictments charging Noriega with drug trafficking.

Nevertheless, in mid-1987, perhaps feeling a bit cocky that he had pulled the American Eagle's tail feathers, Noriega escalated a campaign of harassment against U.S. servicemen. This campaign was also probably intended to deflect reports that he had instigated the murder of a prominent critic of his regime. The harassment soon took on a life of its own and eventually played a major role in the decision to attack Panama. Noriega also intensified his actions against opponents of his regime. First, he had an attempted coup ruthlessly put down. Then, when the May 1989 election did not come out in favor of his selected candidates, he had the election annulled. Topping off this egregious exercise of arrogance, Noriega had his opponents beaten by members of the so-called Dignity battalions ("Digbats," or as American soldiers later termed them, "Dingbats"), basically groups of young thugs loyal to Noriega. These beatings took place in full view of the television and print media covering the elections.

Because of the seriousness of the situation and the possibility that Noriega might unleash the Digbats against U.S. citizens and their property, President

## Peace is not Always Peaceful

Bush authorized additional forces for the Southern Command, the unified headquarters for Latin America, whose primary mission was the defense of the Panama Canal. Under the code name Nimrod Dancer, nearly 1,900 Army and Marine troops flew in from the United States to take positions near each end of the canal. At the same time, the President ordered several thousand U.S. civilians, servicemen, and their families who were living offbase either to move back onto the bases or be evacuated as a precautionary measure.

Further insertions of combat troops, under the guise of movement exercises, took place throughout the remainder of the year. As these troops moved in, the command began holding larger maneuvers which, in part, were intended to draw a response from defense force units. These exercises were known as Purple Storms or Sand Fleas, the latter named after an irritating little pest common to the region. Also participating in these exercises were OA-37s of the 24th Tactical Air Support Squadron, 24th Composite Wing, based at Howard Air Base in the Canal Zone. These little planes flew over Panamanian installations to see what reaction the flights would engender. The reaction to these maneuvers provided intelligence that was put to good use during Just Cause. The exercises also gave the soldiers, marines, and airmen excellent training for what was to come.

In the meantime, the international outcry resulting from the election did not seem to bother Noriega. If anything, these activities raised Noriega's self-esteem to a new high. He was not above doing whatever was required to ensure that he remained Panama's ruler, for example, continuing to harass his opponents and violently disrupt demonstrations against his rule. Another way of ensuring his power was to create an anti-American attitude in the country. Americans were castigated as interlopers meddling in Panama's affairs, and, as the most visible U.S. presence in Panama, members of the military and their families were targeted for increased attention: military school buses were stopped and ticketed for not having Panamanian license plates; individual soldiers, sailors, and airmen were arrested and held in jail (usually just for a few hours) on any pretext; Panamanian forces interfered with field exercises by Southern Command units, primarily the Panama-based 193d Infantry Brigade. In one notorious incident on the night of April 12, 1988, members of the Panama Defense Force and, very likely, of a Cuban special operations unit attacked U.S. marines guarding a tank farm near Howard. Several of the attackers were killed or wounded during the ensuing firefight. Tensions rose with every incident.

By late 1989, the United States government had reached its limit of tolerance regarding Noriega's actions. Planning for various military contingencies in Panama became more sharply defined. Another failed and bloody coup on October 3 brought a heightened sense of urgency to this planning. But the coup also allowed American intelligence agencies to study firsthand how Noriega and his defense force, particularly the elite Battalion 2000, reacted and moved to

## History of the United States Air Force

quell the rebellion. This information proved useful a few months later. Also of great interest to the Americans was the fact that a number of high-ranking defense force officers were involved in the coup.

Perhaps seeking to shore up his increasingly shaky position, following the coup Noriega had his rubber-stamp legislature declare that a “state of war” existed between Panama and the United States. When U.S. officials apparently remained somewhat passive about the coup and the supposed state of war, some of the more hawkish senators and congressmen saw their government’s failure to respond to the situation as a failure of nerve. Little did they realize that activities were already in motion to depose Noriega.

For many years, the Southern Command’s contingency plans were based on outside threats to the Panama Canal. Operations against a threat from inside Panama were seldom considered. Noriega’s ascendancy to power turned this thinking around. Just Cause was the end product of a series of plans that were initiated in early 1988, following Noriega’s indictments on drug charges.

Elaborate Maze was the first in these series of plans. Basically a noncombatant evacuation operation plan, it was soon discarded because it did not consider a full range of contingencies. Replacing Elaborate Maze was Prayer Book, which consisted of a set of four different plans covering various options. One of these was named Klondike Key, which involved a noncombatant removal. A second was Krystal Ball, later named Blind Logic. A rather hazy plan, it involved civil-affairs activities following the end of hostilities. Neither plan was completely fleshed out as to how they would be conducted, and the commands that would carry them out were not enthusiastic about the plans. As it was, neither plan was used during Just Cause.

The other two parts of Prayer Book—Blue Spoon and Elder Statesman (later, Post Time)—did play significant roles in the actual operation. Post Time involved the buildup of U.S. forces inside Panama, while Blue Spoon was the combat portion of the Prayer Book plans. In their original forms, the two plans visualized the deployment to Panama of approximately five brigades and a corps headquarters over a period of up to three weeks. Most of these troops would come from the 7th Infantry Division (Light), one of the Army’s relatively new organizations which were lightly armed but capable of deploying rapidly.

The Joint Chiefs of Staff, however, were concerned about the length of time it would take to move the troops to Panama and what headquarters would command the actual operations. Overseeing the entire operation would be the Southern Command’s new commander, Lt. Gen. Maxwell R. Thurman, who took over on September 30, 1989. In turn, Thurman delegated the actual planning to a subordinate unit. Previously, the command’s Army component, U.S. Army South, had been pencilled-in as the warfighting headquarters, but it had a small staff and was not really a warfighting headquarters. Instead, Thurman gave the task to Lt. Gen. Carl Stiner’s XVIII Airborne Corps, stationed at Fort Bragg. The corps headquarters was designated Joint Task Force South.

Stiner and his staff threw out the earlier plans calling for a lengthy buildup of troops. Now there would be a simultaneous, massive onslaught against defense force installations. Although approximately 13,000 U.S. personnel were already in Panama (many had been brought in for Nimrod Dancer and for other exercises intended to bolster the 193d Brigade), more were needed. By the time the operation ended, close to double this number of troops had taken part. Of these other units, the 82d Airborne Division and the 75th Ranger Regiment, both important components of Urgent Fury, would again play key roles.

As planned, Just Cause was a complex undertaking, the largest U.S. military operation since the Vietnam War. (At the last minute, the operation's name was changed from Blue Spoon because some felt it was a silly name for a major battle, and they feared they would be hard-pressed to describe their part in it to their children without cringing.)<sup>14</sup> Stiner's group had four major components—Army, Navy, Air Force, and Joint Special Operations—that were subdivided further into several task forces. Because most of the fighting would involve ground action, the ground units were split into the Atlantic, Semper Fi, Bayonet, and Pacific Task Forces.

Primarily built around two brigades of the 7th Infantry Division, Atlantic was directed to attack positions around the Caribbean end of the Canal. Marines of Semper Fi would secure the area around Howard Air Base, as well as the important Bridge of the Americas that spanned the Canal. Bayonet consisted mainly of the 193d Infantry Brigade and had the task of securing numerous positions in and around Panama City, with the defense force's headquarters, *La Comandancia*, an especially important target. Pacific, composed of two 82d Airborne Division brigades, would airdrop and airland after special operations forces (organized as Task Force Red) seized the fields at Torrijos International Airport and Tocumen Military Airfield, which were co-located a few miles east of Panama City. These two fields, along with Howard, would be vital gateways for the arrival of reinforcements, which would then fan out over the countryside via helicopters and ground vehicles. The actual assaults on the airfields, as well as one on the important defense force facility at Rio Hato, about 100 miles west of Panama City, would be led by the Rangers.

A unique feature of Just Cause was that American forces were already in place in large numbers prior to the invasion. In a way, Just Cause was an invasion from the "inside out," hardly the usual pattern. Although the forces the United States had maintained in Panama for many years had begun to decrease in number, and were to decrease even more by December 1999, when control of the Panama Canal was turned over to the Panamanians, there were still a number of important military installations under U.S. supervision. A few of the installations from which attacks could be launched against Noriega's forces included Howard Air Base, the main U.S. airfield in the Canal Zone; Quarry Heights, the Southern Command's headquarters; Fort Clayton, the home of the U.S. Army, South; Fort Davis, with a battalion of special forces troops in resi-

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dence; and Fort Sherman, which housed the U.S. Jungle Operations Training Center.

Air Force involvement in Just Cause was principally in a support role, but its involvement was not limited to just that. A sizeable fleet of C-130s, C-141s, and C-5s was gathered, initially to airdrop or airland the attackers and then to bring in reinforcements and supplies. Other aircraft, however, were used for close support of the ground troops. AC-130A/Hs would be especially useful for covering fire, while OA-37s of the 24th Tactical Air Support Squadron and A-7Ds of the Ohio Air National Guard's 180th Tactical Fighter Group (on normal rotational duty to Panama from Toledo) would be on call if needed. One other aircraft type, the recently unveiled F-117A, would play a controversial role in the operation in support of the Ranger's attack at Rio Hato.

In mid-November, most of the remaining military dependents in Panama were directed to leave the country as soon as possible. Given the rising tensions in Panama (exacerbated by the failed coup), some had already left, but far too many still remained. As the dependents were leaving, C-5s were arriving, bringing in under cover of darkness helicopters and Sheridan tanks, which were quickly moved into hiding. The Joint Chiefs had approved the plan for Just Cause, and the final buildup was in motion. In the final month preceding the invasion, Sand Flea and Purple Storm received renewed emphasis as the units trained against their actual targets in Just Cause. These activities took on even greater importance when defense force guards stopped four American servicemen in their private car on December 16. When the four attempted to drive away, the guards opened fire, mortally wounding Marine lieutenant Robert Paz and wounding two others in the car. Just a few hours later, a Navy lieutenant and his wife were stopped by more defense force soldiers. They were held for several hours, beaten severely, and threatened with death before being released. It was the last straw. Noriega was about to find out just what constituted a "state of war."

When the reports of these incidents reached Washington, a flurry of meetings ensued. General Colin Powell, the new Chairman of the Joint Chiefs of Staff (he had held the position less than three months), met with Secretary of Defense Dick Cheney and then with the service chiefs. All agreed that a point had been reached where no options remained except for military action. Powell then headed for the White House to brief President Bush. Among the others attendees at this meeting were Vice President Dan Quayle, Secretary of State James Baker, and National Security Advisor Brent Scowcroft. After again sifting through all possible options and listening to everyone present give their views, Bush gave the order—"Let's do it."<sup>15</sup>

D-Day was set for Wednesday, December 20, and H-hour for 1:00 a.m. This allowed 48 hours for the deployment phase, which ended on 1:00 a.m. on the 18th. On the 18th, General Stiner and his staff flew from Fort Bragg to Panama, where he assumed command of Joint Task Force-South's forward headquarters at Fort Clayton. General Thurman was already at Quarry Heights overseeing the

Southern Command's operations. He had been in Washington briefing Cheney when word came about Lt. Paz's death, and he quickly returned to Panama on the 17th. As Thurman and Stiner made their final preparations, 12 C-5s, 17 C-141s, and a single C-130 arrived at Howard with the last loads of equipment and troops to augment the units already in place.

The planners hoped, as had Urgent Fury planners, that the operation would be completed swiftly. Just Cause had more planning time than Urgent Fury, but it was a more massive undertaking, with strong forces attacking simultaneously. Like Urgent Fury, this operation did not run according to plan; even the weather conspired against it.

On the 18th, Military Airlift Command aircraft began gathering at several airfields in the southeastern United States. A last-minute change that reduced the amount of time for loading the 82d Airborne Division caused planes from airlift wings all over the country to descend on Pope Air Force Base almost simultaneously, instead of in an orderly manner. By the next afternoon, 45 C-141s crowded Pope's ramps and taxiways, exceeding by 12 the number of aircraft that planners had believed Pope could handle. Of these 45 planes, 20 were to haul 2,176 troopers of the division for the assault on the Torrijos/Tocumen airfields; the others would carry the 82d's heavy equipment. When space finally permitted them to land, six more Starlifters loaded the remainder of the division's heavy equipment. The heavy lift C-141s then moved to Charleston Air Force Base, South Carolina, whence they would stage to Panama.

Early on the 18th, weather forecasters warned officials that a severe ice storm would hit Pope that afternoon. Hearing this, the men and women assigned to load the big planes jumped to the task with renewed urgency. Remarkably, they were assisted by many Army and Air Force retirees, as well as Reservists, living in the area. These individuals had heard that something was "up" at Pope and Fort Bragg, and they volunteered to help in any way they could. This was an offer that could not be refused, and many of these volunteers put in long hours helping load the Starlifters. These efforts enabled all 31 C-141s to depart Pope for Charleston by 10:30 a.m. on the 19th.

The storm arrived on schedule, and the quickly forming ice created serious problems at all the fields. At Pope, ice one-half inch thick coated the aircraft. Located in a supposedly mild climate, the fields did not have adequate deicing fluid or equipment. Extra deicing trucks and thousands of gallons of fluid were flown from other bases so that delays in dispatching the aircraft would be minimal. The next few hours were miserable for ground crews, paratroopers, and the Rangers.

Despite the compressed loading times and the terrible weather, most of the transports took off close to their scheduled departure times. First off were four 317th planes from Hunter Field at Savannah, Georgia, that carried members of the 75th Ranger Regiment, who would make the first jumps at Torrijos/Tocumen. These four aircraft were Special Operations Low Level II C-130s, with the air-

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crews wearing night-vision goggles that would enable them to land on blacked-out fields or accomplish other night operations. A few minutes later, the first C-130s going to Rio Hato took off from Fort Benning's Lawson Field carrying more Rangers.

The deicing delays caused the launches of the C-141s to change considerably: 12 Starlifters going to Torrijos/Tocumen, 7 carrying Rangers and 5 with equipment, left Hunter more than two hours before the other planes, even though they had been scheduled to leave after the aircraft at Pope. Next to depart were the 31 C-141s positioned at Charleston Air Force Base. Bringing up the rear were the transports from Pope carrying the 82d's troopers. Because of the time it took to deice them, instead of a single formation of 20 aircraft, the C-141s departed in formations of 8, 2, 3, and 7 aircraft. As soon as each group was deiced, it was dispatched. The first group was nearly an hour and 45 minutes late in departing, but it made up much of this time en route.

Actually, even with the late departures of the aircraft, Just Cause kicked off earlier because it had become apparent that the Panamanians (through breakdowns in security) were aware of the impending invasion, were going to a wartime footing, and were even starting to fire on the U.S. installations. A contributing factor may have been a report by CBS news anchor Dan Rather, who interrupted his network's normal programming to announce that many aircraft were taking off from Fort Bragg and that they may or may not be heading for Panama. It was not an auspicious beginning.

The first of the units belonged mainly to the various special operations units trying to capture the elusive Noriega and those assaulting key Panamanian installations. (Noriega proved to be very cagey and was not apprehended until



A C-130 flies over a typical Panamanian coastal area during Just Cause.

January 3.) Supporting the initial assaults were AC-130H Spectres from the 16th Special Operations Squadron, backed up by a pair of AC-130A gunships from the 919th Special Operations Group, an Air Force Reserves unit. The latter aircraft were in Panama for training and were to have returned to Florida on the 19th, but the rapidly unfolding events kept them at Howard.

Two AC-130Hs were assigned to the force assaulting *La Comandancia*. Located only 600 yards south of the headquarters of the Southern Command, this walled compound was the Panama Defense Force's command center, and as such, was one of the most important objectives of the operation. When the Army unit assigned to take the compound began advancing toward it, the unit came under heavy fire from Panamanian soldiers ensconced in buildings leading to *La Comandancia*. Using both their 40-mm and 105-mm guns, the AC-130s soon had the headquarters building ablaze, driving most of the defenders from the windows where they had been taking pot shots at the U.S. troops. The defenders also set fire to the slums abutting the compound, and the blazes raced through the area, sending dense clouds of smoke skyward, which hindered both the airmen and the infantrymen.

So much smoke and flame blanketed the area around *La Comandancia* that the gunship's crew circling overhead had trouble picking up targets through their low-light sensors. In fact, they may have been responsible for wounding several attackers and destroying their M-113 armored personnel carriers. However, with so much gunfire erupting from every direction, the soldiers could not establish the exact origin of the firing. The defenders fought tenaciously, and it took until the afternoon of the 20th to finally reduce *La Comandancia*.

In the meantime, other gunships were also busy assisting other portions of the assaults. At Fort Amador, where soldiers from both countries often golfed together, the golf course became the battleground. Here, though, resistance was minimal as many of the defenders, already aware of the impending attack, melted away into the civilian populace. After pumping a few shells into some targets around the fort, the AC-130s were sent to other areas.

The Spectres saw more action at the Pacora River Bridge, located east of the airfields on the highway leading to Battalion 2000's base at Fort Cimarron. Even before the soldiers who were to set up a blocking position reached the bridge, they came under fire. As they filed from hangars to board their helicopters at Albrook Air Station for the flight to the bridge, they were shot at by defense force members who lined the fences of the base. Only a couple of men were hit in the exchange of gunfire and the attackers were swiftly driven off, but this gave the Americans an impetus to get on with their mission. When they finally reached the bridge and began establishing positions, they spotted a convoy approaching from Fort Cimarron. For a time, it appeared the Panamanians might break through the thinly held U.S. lines. Some of the helicopters landed in full view of the approaching convoy, which was just starting over the bridge, headlights on.

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The defenders quickly unleashed a hail of gunfire, rockets, and grenades at the Battalion 2000 convoy. In the darkness, it was difficult to tell if their efforts were having any effect, so the infantry commander called in an AC-130 to finish the job. The gunship raked the convoy with 40-mm and 105-mm shells, stopping it cold. Nonetheless, some of the surviving Panamanians kept advancing, but their movements were detected by the gunship, which radioed the ground troops about the threat. With this information, the U.S. soldiers quickly took care of what was left. Then, yet another small convoy inched out from Panama City toward the bridge. The tremendous firepower of a second AC-130 brought the convoy to a screeching halt, and with no other threats appearing, the U.S. soldiers at the Pacora River Bridge soon had the area around it secure.

Meanwhile, in the largest nighttime airdrop since Normandy, almost simultaneous airborne assaults took place at Torrijos/Tocumen and Rio Hato. East of Panama City, the Rangers led the way at the two airfields, followed by the 82d's troopers. Just two hours away from the drop zone, the Rangers and airborne troops had received disturbing word that the Panamanians knew of the impending invasion, meaning that the drop zone most likely would be "hot." Just as disturbing was the news that a Brazilian airliner, with perhaps 376 passengers, had been late in arriving at Torrijos and was just now unloading. This meant that a lot of civilians (and potential hostages) would be right in the middle of the action.

Unknown to the Rangers, a distinguished visitor was at that moment making himself comfortable with a prostitute in the Ceremi Recreation Center at Tocumen. General Manuel Antonio Noriega's revelries abruptly halted when an AC-130 and a pair of AH-6 attack helicopters began beating up the field with gunfire. Several Panamanian soldiers fell under this fire, and some defensive positions, including one holding a ZPU-4 anti-aircraft gun, were destroyed.

Scrambling out of bed, Noriega watched, wide-eyed and shaking with fear, as American soldiers dropped from the sky all over Tocumen. His aides hustled him into a car and drove off into the darkness. At one point, the car's headlights revealed Rangers, faces daubed with camouflage paint, running toward the Recreation Center. Noriega's driver barreled around a corner, cut across a bumpy field, and onto a road back to Panama City. Unknowingly, the Americans had missed the Panamanian dictator by a hairsbreadth. Noriega's last days of freedom, however, afforded him little rest.

At 1:03 a.m. Eastern Standard Time, the 12 Starlifters from Hunter began dropping the Rangers from 500 feet over the fields. (Although 800 feet was the normal minimum altitude for personnel drops, the Army requested the lower altitude to minimize the time the paratroopers would be in the air.) A few minutes later, the four C-130s arrived with their loads of Rangers. About an hour after the initial drops, the first of the 28 C-141s staging through Charleston began dropping their loads of heavy equipment, including Sheridan tanks. Finally, between 2:11 and 5:15 a.m., the four waves of C-141s that had been delayed for deicing disgorged their loads of paratroopers.

For the Rangers and paratroopers swooping down onto the two fields, the drop zone was indeed “hot.” Tracers burned through the darkness in all directions; explosions of grenades and of ammunition “cooking off” after being set afire by the Spectre and the Army helicopters punctuated the din of aircraft roaring overhead, of commands being shouted, of guns chattering. But slowly, inexorably, the Americans ground down the opposition.

Probably the most tense moments occurred in the terminal, where most of the passengers debarking from the late-arriving Brazilian airliner were still gathered. Several passengers, including some U.S. citizens, were grabbed as hostages by Panama Defense Force soldiers. After several hours of negotiations, the Panamanians realized they had no options and surrendered. However, the nearly 400 passengers had to remain in the terminal until the battle was over.

By noon of the 20th, the situation had stabilized, and the troopers began expanding the perimeter around Torrijos/Tocumen. Many civilians began emerging from their houses to welcome the U.S. soldiers. When the area around the fields was secured, the runways were cleared of debris so that reinforcements could be landed instead of airdropped. Shortly after 3:00 in the afternoon, the first C-141 touched down with infantrymen of the 7th Infantry Division. The two fields now served as vital entry points into Panama, and, with the use of helicopters airlifted in and those already in place, allowed for the staging of further attacks on enemy positions throughout the country.

The assault on Torrijos/Tocumen was highly successful, with only one Ranger killed and five wounded; 19 more soldiers were injured during the jump. Thirteen Panamanian soldiers were killed and 54 taken prisoner. How many defenders were wounded is unknown. A major weapons cache was seized, along with 12 helicopters and 13 fixed-wing aircraft.

A small controversy arose later about the accuracy of the air drops. The drop zone was narrow, only 600 yards wide compared with peacetime drop zones measuring 800 yards. Too, the airlifters were directed not to drop on the runway, effectively cutting the width of the zone in half. Consequently, some of the heavy equipment, including six of eight Sheridans, went into a marshy area bordering the fields. A few paratroopers who jumped after the red “no-go” lights came on in the planes also landed in the marshes, but, overall, the delivery of the troops and equipment went very well.

Meanwhile, one minute after the first Rangers jumped from their C-141s at Torrijos/Tocumen, more Rangers leaped from their planes over Rio Hato. Thirteen C-130s from the 317th and 314th wings carried 837 Rangers, while an additional two transports lifted their heavy equipment. (The 317th’s planes were equipped with the Adverse Weather Aerial Delivery System for airdrops in all types of weather.) Two Special Operations Low Level II C-130s brought up the rear, carrying equipment to be airlanded, and to evacuate wounded, if necessary. The plans called for the transports to release their loads onto the field just minutes after H-hour, with two F-117s dropping two GBU-27 laser-guided bombs

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near the barracks housing the defenders. An AC-130 and Army AH-6 and AH-64 Apache helicopters were to provide close support to the Rangers.

The F-117s part in the plan had been controversial from the beginning, and became even more controversial afterwards. When briefed that they would be used at Rio Hato, Secretary of Defense Cheney was dubious, asking, "Why the hell do you want to use the F-117? The last time I checked there was no serious air defense threat?"<sup>16</sup> Told that the plane's accurate night-bombing capability was a valuable asset, Cheney finally assented.

Originally, six F-117s were assigned to the operation: two to attack Rio Hato; two for other targets; and two as spares. Only the two at Rio Hato played any role. The Army troops scheduled to take Rio Hato had wanted the F-117s to lay their "eggs" directly on the barracks, which were close to the drop zone. (Indeed, the Air Force crews conducting the Rio Hato airdrop were briefed that the barracks were to be the targets.) This request was denied because of a fear by higher officials that too much collateral damage might be inflicted. Instead, the pilots were directed to drop about 50 yards from the barracks so as to stun and disorganize the defenders. At the last moment, this distance was increased to 250 yards, in the middle of a grassy area with few identifying features other than some tall shrubs.

When the F-117s arrived over Rio Hato, clouds hung low over the field, and the pilots had difficulty determining just where to precisely guide their bombs. The 2,000-pound bombs landed several hundred yards from the barracks, too far away to have a stunning effect on the defenders. Actually, the bombs would not have been that effective in any case, because most of the Panamanians, aware of the imminent invasion, had already streamed out of the barracks to their defensive positions. (Some critics of the F-117 program, not knowing what had been planned for Rio Hato, attempted to seize on the supposed "failure" of this attack as proof that the aircraft was just an expensive white elephant. It took the Gulf War to silence these individuals, though few ever admitted they were wrong in the first place.)<sup>17</sup>

As soon as the GBU-27s exploded, the Army helicopters and the AC-130 began working over the airfield. Several Soviet-made ZPU-4 antiaircraft guns, as well as small arms, opened up, but not for long. The overpowering weaponry of the Spectre and the Apaches took out most of the antiaircraft guns immediately. A couple of guns that were initially missed began firing at the C-130s, which had arrived to drop the Rangers. Thirteen of the fifteen transports were holed by this fire, but shells from the AC-130's 105-mm howitzer soon took care of the remaining ZPU-4s. The drop zone itself proved almost as dangerous as the antiaircraft fire. Numerous barbed wire fences, concrete walls, power lines, and the hard surface of the runway inflicted 26 injuries on the Rangers.

The battle for Rio Hato was short but vicious. Many of the defenders ran when the parachutes blossomed over their heads, but some stayed to fight. Close-range fighting took place in and around the barracks area and other build-



The crew of a 55th Special Operations Squadron MH-60 helicopter keeps a wary lookout while operating in Panama's back country during Just Cause.

ings scattered about the airfield. By sunrise, however, the Americans had seized all of their objectives. Those Panamanians who chose to fight lost 34 killed, an undetermined number of wounded, and 362 captured. Ranger losses were heavier than at Torrijos/Tocumen: Rio Hato saw 4 dead and 18 wounded during the battle, along with the 26 injured during the drop.

By the end of December 20, the invasion of Panama was essentially over. Although fighting continued for several days afterward as U.S. troops fanned out all over Panama to take key installations and persuade the defenders to surrender, these actions were usually brief and marked by few casualties. Most of the defenders preferred to surrender, especially after watching AC-130s supporting these forays put on accurate displays of their frightening firepower.

One of the biggest problems facing the Americans during the remaining days of December and into January was the breakdown of law and order in the country. This had not been seriously considered, and few military police had been sent to Panama. Only with the use of combat troops as police was this situation finally controlled.

Before Just Cause could be considered officially concluded, one more matter remained—the capture of Noriega. He had barely escaped from Tocumen on the first day of the operation, and from that time on, he had been constantly on the run. Then, on the afternoon of Christmas Eve, he showed up at the Nunciature, the Vatican embassy in Panama City. No longer outfitted in a perfectly tailored military uniform, he wore a gray T-shirt and ill-fitting Bermuda shorts.

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Noriega's stay in the embassy lasted 10 days. When informed that Noriega had surfaced, General Thurman ringed the embassy with troops. In a somewhat misguided attempt at psychological warfare, the soldiers began playing raucous rock music over loudspeakers surrounding the embassy. This had no effect on Noriega but it irritated the Vatican ambassador and many others, and the assault by decibels ended swiftly.

Noriega had nowhere to go, and the Vatican would not shelter him forever. On January 3, after requesting that he be allowed to wear his Panama Defense Force uniform, Noriega walked from the Nunciature and into the custody of the Americans. No longer a strutting, swaggering bully, he looked a stunned, pathetic figure. He was flown on an Army UH-60 helicopter to Howard Air Base, where Drug Enforcement Administration agents took him into custody. After exchanging his freshly pressed uniform for plain coveralls, Noriega was hustled aboard a waiting MC-130E of the 8th Special Operations Squadron for the flight to Homestead Air Force Base, Florida. From Homestead, Noriega was taken to the Miami federal courthouse, where he was booked and then jailed. Although the operation did not end officially until January 31, Just Cause was over.

What was the cost of Just Cause? For the size of the operation, American losses were not much more than those suffered in Urgent Fury. Twenty-three soldiers died during the fighting, compared with 19 for Grenada. Three times as many men (324) were wounded in Panama as were injured in the earlier operation. The defenders, however, experienced much greater losses—at least 314 killed, 124 wounded, and approximately 5,800 captured or detained. Unfortunately, civilian casualties were high, many the result of the Panamanians setting fire to the slums surrounding *La Comandancia* and firing recklessly at anyone or anything. Some



Drug Enforcement Agency agents with Manuel Noriega on an 8th Special Operations Squadron MC-130E for the flight to the United States.

human rights organizations later claimed that thousands of Panamanians had been killed and wounded, but even Panamanian authorities did not believe such inflated figures. Estimated civilian casualties were 202 killed and perhaps 1,508 wounded.

For the Air Force, Just Cause once again established the service's essential role in the modern U.S. military. Although most of the attention focused on airlift operations, other combat elements provided excellent support to the ground troops. Much of this combat work was undertaken spectacularly by the Special Operations gunships. Their work, however, was upstaged (at least in the media) by the initial combat appearance of the formerly super-secret F-117. Other combat types participating in Just Cause included the Ohio Air National Guard's A-7Ds and the 24th Tactical Air Support Squadron's OA-37s. These two units, both based at Howard, flew a number of sorties in support of the ground forces.

Strategic Air Command KC-135s and KC-10s from 23 squadrons showed again that without tankers, no major operation could take place. As the tanker crews loved to keep reminding their bomber and fighter pilot friends, "Nobody kicks ass without tanker gas." In the period between December 20 and January 4, when it concluded its participation in Just Cause, the tankers pumped 12,069,500 pounds of fuel to other aircraft.

Tactical Air Command's planes, other than the F-117s, OA-37s, and A-7Ds (the latter, though National Guard aircraft, were controlled operationally by the command), were less evident in Just Cause because their involvement was generally discrete, but they were there. Similar to their use in Urgent Fury, some of the command's F-15s flew combat air patrol missions in case Cuba tried to interfere, but these sorties were quickly halted when it became evident that Cuba's reaction was purely defensive. More directly engaged were a pair of EC-130H Compass Call aircraft, two EF-111As, and another pair of EC-130Es. These aircraft were employed in electronic warfare against Panama's communications and for psychological warfare purposes. Finally, two EC-130Es provided airborne command post platforms.

The Military Airlift Command shouldered the load in Just Cause. Aircraft and personnel from every active duty, Reserve, and National Guard flying unit in the command participated in the operation. Support included C-5A/Bs, C-141Bs, C-130B/E/Hs, C-9s, and C-21s on transport missions, and AC-130A/Hs, MC-130E/Hs, MH-53H/Js, and MH-60Gs in special operations roles. Additionally, personnel from airlift control squadrons, aerial port squadrons, the Air Force Weather Service, and aeromedical evacuation units performed vital support functions both in the United States and in Panama. From December 20, 1989, to February 14, 1990, when the last deployed forces returned to the United States, transports (not including commercial aircraft) flew 763 missions, carrying 37,065 passengers and 20,329 tons of cargo. During all of Just Cause, the command's special operations force flew 796 missions.

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Just Cause was not the perfect operation, nor was it the hardest. It occurred under uniquely favorable conditions: in a country where U.S. military forces had been stationed for years and were able to train for their D-Day assignments under the noses of the soon-to-be defenders, in a country whose people strongly favored the overthrow of their leader, and against a weak military force.

Nonetheless, some things did not go as expected; but perhaps the unexpected should be expected—few plans survive the first shots of battle. Poor security measures gave the Panama Defense Force warning of the impending attack, bad weather delayed the airborne assault, Noriega escaped the initial attempts to capture him, friendly fire caused “blue on blue” casualties, and some Rangers and paratroopers and their equipment did not land exactly as intended. Overall, though, these are minor quibbles. Just Cause was professionally and efficiently executed. If the American public still had lingering questions about their military’s malaise (the so-called Vietnam Syndrome) or about the capabilities of their forces, Just Cause clearly laid these to rest.

Although its contributions were crucial to the operation’s success, the Air Force was still considered a supporting player. However, just a little over a half year later, the service took the lead dramatically against another despot. Perhaps the Cold War *had* ended and the threat of a major East-West conflict *had* receded, but with tyrants like Noriega creating mischief and misery, it was obvious that peace is not always peaceful.

## Chapter 24

# From the Deserts to the Mountains

William T. Y'Blood

**T**he services were still digesting the lessons of Just Cause when another tremor of political upheaval shook the world. Unlike the low-magnitude oscillation that the crisis in Panama registered on political Richter scales, this was a violent fluctuation that threatened to disrupt global petroleum supplies and to endanger the independence of many countries in the Middle East. Iraq invaded, then conquered neighboring Kuwait with its oil fields in short order. Suddenly alarmed U.S. intelligence agencies believed that Saddam Hussein was bent on dominating the rest of the Arabian Peninsula, home of much of the world's oil reserves.<sup>1</sup>

Though Kuwait supported Iraq during its war with Iran, antagonism between the two countries had long simmered. By fiat of Great Britain, which received its authority from the League of Nations, Iraq was born in 1922 from the ashes of the defeated Ottoman Empire, which until then had controlled much of the Middle East. Iraq's boundaries, drawn with little regard for ethnic or geographic realities, did not embrace an ocean port, while Kuwait's did. Also once part of the Ottoman Empire, Kuwait did not gain independence from Great Britain until 1961.

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From its beginnings as a sovereign state, Iraq claimed that Kuwait was just one of its provinces. This claim fell on deaf ears, but when the British withdrew from Kuwait in 1961, Iraq tried to seize its neighbor. A display of force by returning British troops dissuaded the Iraqis from further action. Undeterred, Iraq struck again in 1973, seizing part of northeastern Kuwait. When the Arab League, formed in 1945 to provide a united front for Arabic nations and to foster common goals, demanded Iraq's withdrawal, it did, but not before receiving an \$85 million "loan" from Kuwait. From then until the spring of 1990, relations between the two countries appeared calm if somewhat strained. Yet always lurking just under the surface was Iraq's hatred for Kuwait and its need for a Persian Gulf port.

Fifty-three years old in 1990, Saddam Hussein came to power in Iraq through what has been described as "gun-barrel politics." Cold, calculating, xenophobic, and utterly ruthless, in 1979 he forced out the current president and installed himself in that office. Through murder and terror, Saddam reinforced his position over the years. Distrustful of the United States, and believing that the West plotted to destroy him, he nonetheless welcomed American assistance during his war with Iran.

Since the end of World War II, the relationship between the United States and Iraq has been convoluted. Until the socialist Ba'ath Party (of which Saddam Hussein was a member) gained firm control in 1968, the United States regarded Iraq, along with Iran, as major bulwarks against Soviet incursions into the region. When Ba'ath radicalism made Iraq an increasingly unreliable ally, the United States began to turn more often to Iran. In 1967, during the six-day War, Iraq severed diplomatic relations with the United States. These were not restored until 1984.

The Iranian revolution, followed by the 1981–1988 Iraq-Iran War, caused an abrupt shift in American policy. By 1982 the United States considered Iraq a buffer against both Iran and the Soviet Union, overlooking Iraq's well-documented human rights abuses, its deep hostility toward Israel, and its record of support for terrorism. The U.S. soon granted Iraq agriculture credit guarantees, making Iraq the largest foreign buyer of American rice and one of the largest buyers of several other grains.

In October 1989, President George Bush signed National Security Directive 26, designating the Persian Gulf area vital to U.S. national security. This directive committed the United States to the defense of its "vital interests in the region" and to the use of military force, if necessary, "against the Soviet Union or any other regional power with interests inimical to our own."<sup>2</sup>

The first high-level meeting between the Bush administration and Iraqi officials, not a particularly pleasant encounter, came on October 6, 1989. Iraq's foreign minister, Tariq Aziz, accused the United States of trying to destabilize and punish Iraq. At the same time, Aziz also asked for new credit guarantees to purchase food from the United States. Shortly after this meeting, the U.S. provided

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some \$500 million in credits, and on January 17, 1990, over congressional opposition, Bush signed an order expanding trade with Iraq. From that point, however, relations between the two countries deteriorated rapidly.

On February 24, 1990, Saddam shocked not only an Arab Cooperation Council (Iraq, Jordan, Yemen, and Egypt) meeting, but also the United States when he railed against a possible American dominance in the Persian Gulf region, as the Soviet Union (the “key champion of the Arabs,” in his words) pulled back from the area.<sup>3</sup>

Despite White House efforts to smooth over the situation, Saddam grew more bellicose and threatening. Iraq executed an Iranian-born British journalist on trumped-up espionage charges; plans to build in Iraq a huge, long-range artillery piece were revealed after the assassination of its inventor, a naturalized American; and several western governments discovered the shipment to Iraq of banned material that could be used in missile and nuclear weapons construction. Saddam denounced these incidents as part of a U.S.-backed Israeli conspiracy against him.

Throughout the spring of 1990, which one State Department official characterized as “the spring of bad behavior,” Saddam’s bellicosity increased. In late May, Iraq began to threaten Kuwait. The Iraqi dictator claimed that his neighbor was engaged in “economic warfare” against Iraq and demanded billions of dollars in compensation. In the dictator’s eyes, Kuwait had thrown Iraq’s economy into a tailspin by keeping the price of oil low through overproduction. Some observers believed that Iraq’s worsening economy (ravaged by the war with Iran and low oil revenues, and now \$80 billion in debt), which Saddam refused to stabilize, caused the fiery rhetoric. As one diplomat observed presciently, “To get out of bankruptcy, you rob a bank.”<sup>4</sup>

Iraq’s attack on Kuwait actually began on July 16 with a political offensive. That day, Foreign Minister Aziz wrote secretly to the Arab League that both Kuwait and the United Arab Emirates were aggressors in that they were holding down world oil prices by exceeding the Organization of Petroleum Exporting Countries oil production quotas. In particular, Aziz accused Kuwait of stealing Iraq’s oil by slant drilling into the Rumaila oil field that the two countries shared. Aziz’s secret letter was followed the next day by a public speech by Saddam. In this speech, Saddam charged Kuwait and an unnamed country (obviously the United Arab Emirates) of stabbing Iraq in the back. The United States was not exempted from his tirade. It was castigated as an instigator of a plot to “undermine Arab interests and security.”<sup>5</sup>

Three days after Aziz sent his letter to the Arab League, Iraqi troops began moving to the Kuwait border. Middle East experts split on the significance of these movements. Some considered it a prelude to invasion; others thought it a bluff to pressure Kuwait into acceding to Iraq’s demands. Still, Kuwait took the precaution of placing its armed forces on alert. Whatever the Iraqi movements suggested, Iraq obviously enjoyed a tremendous military advantage over Kuwait.

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Estimates of Iraq's military strength at the outset of the invasion of Kuwait vary widely. According to the Department of Defense's April 1992 report to Congress, *Conduct of the Persian Gulf War*, Iraqi ground forces were split among three major organizations: the Republican Guard, the regular army, and the Popular Army. The Republican Guard was considered the most capable force with the best equipment. Consisting of eight divisions and several brigades, the Guard contained almost 20 percent of Iraq's ground forces. Guard units were armor-heavy, with Soviet-made T-72 main battle tanks, and a variety of modern armored personnel carriers and artillery, both towed and self-propelled.

More than 50 divisions and additional brigades made up the regular army. Most of its divisions were infantry, but it did have several armored and mechanized divisions, primarily equipped with older Soviet and Chinese equipment. The Popular Army, consisting of Ba'ath Party members, numbered about 250,000 men. These personnel, generally of low caliber, were restricted to rear area duties.

Iraq's ground forces were equipped with more than 5,000 main battle tanks, 5,000 armored infantry vehicles, and 3,000 artillery pieces of 100-mm or larger. Battle-tested during the war with Iran, the ground forces were believed to possess a formidable fighting prowess. Desert Storm showed the hollowness of Iraq's military reputation.

The Iraqi air force, composed of approximately 40,000 men, had a somewhat lesser reputation than the ground forces did. Numerically the sixth largest air force in the world, it possessed more than 700 combat aircraft ranging from modern MiG-29s and Su-25s; through MiG-23s, MiG-25s, and French F.1 Mirages; to elderly MiG-19s and Tu-16s. These aircraft could operate from 24 primary air bases, with 30 additional dispersal fields. Facilities on these fields were extensive, with multiple taxiways and multiple runways, and numerous hardened shelters believed able to withstand nuclear blasts. Unfortunately for the Iraqi air force, these proved vulnerable to penetrating precision-guided munitions. Although these 700 aircraft made the Iraqi air force the largest in the Middle East, the quality of its pilots was suspect. International aviation experts believed the French-trained pilots flying the F.1 were the best of the batch, but even these fliers were poorly-skilled in the art of air combat.

Iraq's extensive air defense network consisted of radars, hardened and buried command and control facilities, surface-to-air missiles, interceptors, and prodigious amounts of antiaircraft artillery. It has been estimated that Iraq had 3,679 command guidance missiles (plus an additional 7,400 shoulder-fired or mobile missiles), 972 antiaircraft artillery sites, 2,404 guns, and 6,100 self-propelled guns. This network was patterned upon standard Soviet practice of a intertwined, redundant, and "layered" air defense system. Baghdad's defenses, with 552 missiles, 380 antiaircraft artillery sites, and 1,267 guns, were so concentrated that it was thicker than the most heavily defended Warsaw Pact target of the Cold War, and seven times as dense as Hanoi's before Linebacker II during the Vietnam

## From the Deserts to the Mountains

War.<sup>6</sup> The network, however, depended almost wholly on centralized control, a vulnerability to be exploited.

Since Iraq only had about 36 miles of coastline, it had a miniscule navy. Some 5,000 men served on 60 vessels of all types. Only five of these ships were as large as a frigate. Because of its small size, the Iraqi navy played a minor role in the Gulf War.

The Iraqi military also had several weapons that posed serious threats to neighboring countries and to the Coalition force eventually arrayed against it. The best known was the Soviet-designed Scud missile. At the time of the Kuwait invasion, Iraq owned three versions of the Scud: the standard Scud-B had a range of 300 kilometers; an Iraqi-modified version, the Al-Husayn, had a range of 600 kilometers; and another indigenous version, the Al-Hijarah, could reach targets 750 kilometers distant. All were capable of carrying high explosive or unitary and binary nerve agent and biological warheads. Poorly constructed with very large circular error probable radii of more than 2,000 meters, the Scuds were really terror weapons incapable of accurate targeting. Yet the knowledge that these missiles could carry biological and chemical warfare agents (which Iraq had developed and used) profoundly influenced Coalition actions during the war.

Iraq clearly outgunned Kuwait. The Kuwaiti army had only about 20,000 men, plus another 7,000 in the National Guard. Its armor forces consisted of approximately 250 tanks, with only 165 of these considered first-line. The Kuwaiti air force had less than 60 aircraft, divided about equally between A-4s and Mirage F.1CK/BKs. A tiny navy, even smaller than Iraq's, completed Kuwait's military. The other countries on the Arabian Peninsula were in no better shape. Although mostly equipped with modern aircraft (particularly Saudi Arabia with F-15s and E-3s), these countries did not have enough planes to act as much more than a delaying force, and their ground forces were tiny. The largest military units belonged to Saudi Arabia, but again, these units would have been overwhelmed by the sheer number of Iraqi troops.

A force was available that would prove more than a match for the battle-tested Iraqi military. Officially designated the United States Central Command, its area of responsibility was Southwest Asia, encompassing Iraq, Kuwait, Saudi Arabia, Bahrain, Qatar, the United Arab Emirates, Oman, Yemen, Iran, Afghanistan, Pakistan, Jordan, Egypt, Sudan, Djibouti, Ethiopia, Somalia, and Kenya. It was responsible for contingency planning, for threat assessments, for joint exercises, for the administration of a security assistance program, and for operational command of U.S. forces located in the gulf. The command normally was a planning staff, involved primarily with exercises and security assistance matters; but in contingency situations, it had the muscle provided by components of the Army, Air Force, Navy, Marine Corps, and Special Operations. Central Command's commander in 1990 was Gen. H. Norman Schwarzkopf.

The Air Force portion of Central Command's structure was CENTAF, led by Lt. Gen. Charles A. "Chuck" Horner, who also commanded the Ninth Air Force

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Gen. H. Norman Schwarzkopf (left), Commander, U.S. Central Command, and Lt. Gen. Charles A. Horner, Commander, Ninth Air Force and Central Command Air Forces.

headquartered at Shaw Air Force Base, South Carolina. Air power was an essential, indeed critical, factor in any of the command's operations, and as the most mobile component, Air Force units could arrive on the scene first to gain air superiority, interdict enemy supply lines, and provide close air support. Success in these operations would ensure that ground forces and their equipment and supplies arrived safely. Under "normal" contingency operation, CENTAF could provide seven (plus  $3\frac{1}{3}$  more as replacements for losses) tactical fighter wings, two strategic bomber squadrons, one electronic combat group, one tactical reconnaissance group, one airborne warning and control wing, and a varying number of tactical airlift squadrons. To enhance an operation's capability, the Strategic Projection Force (created in 1980) of B-52s, KC-135s, KC-10s, and various reconnaissance and electronic warfare aircraft could also play an important role.

As Iraqi forces massed along, and then burst across, the Kuwaiti border, Central Command was conducting a command post exercise at Eglin Air Force Base, Florida, and Fort Bragg, North Carolina. This exercise, named Internal Look, was designed to test various aspects of a new draft operations plan, 1002-90, "Defense of the Arabian Peninsula," which visualized Iraq launching an attack into Saudi Arabia with six heavy divisions.

Internal Look's fortuitous timing proved a boon in subsequent planning for Desert Shield/Desert Storm. The exercise demonstrated the need for a revised troop list, more armor, and more mobile forces. It confirmed CENTAF's concept of air defense for the Arabian Peninsula. Furthermore, given the role air power would play in the war, it exercised the joint air tasking order used for air operations coordination. In essence, 1002-90 became the skeleton on which Desert Shield defensive planning was fleshed out.

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The international community swiftly denounced the invasion. On August 2, the United Nations Security Council issued Resolution 660, condemning the invasion and demanding Iraq's withdrawal. It was adopted by a vote of 14–0–1, with Yemen abstaining. This was just the first in a series of resolutions during the summer and fall of 1990 that concerned the situation in the Persian Gulf. Other resolutions adopted by the Security Council addressed trade and financial embargo issues.

When Iraq remained intransigent about Kuwait, the Security Council (in its November 29, 1990, Resolution 678) authorized United Nations members to use "all means necessary" to enforce the previous resolutions. They gave Iraq until January 15, 1991, to leave Kuwait. By a vote of 12–2–1 (Cuba and Yemen against, China abstaining), the members of the Security Council overwhelmingly adopted Resolution 678.<sup>7</sup>

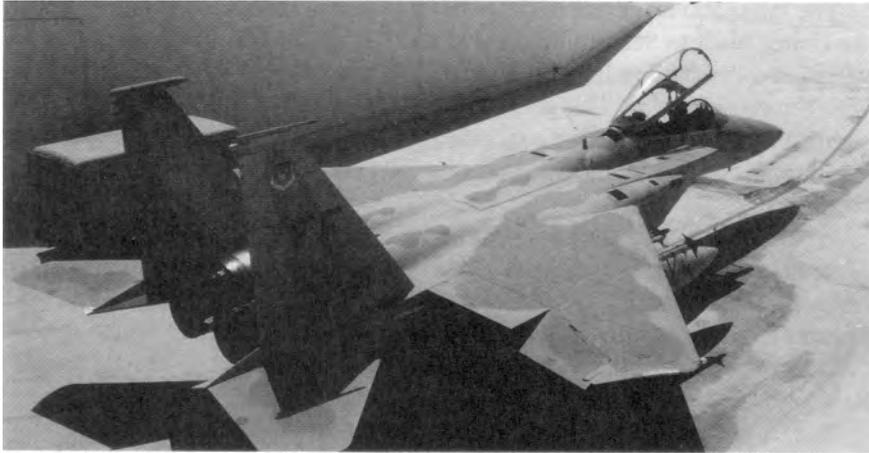
The United States also reacted immediately to the Iraqi invasion. Within hours of the assault, the President directed two Navy carrier battle groups into the region. A pair of KC–135s, supporting United Arab Emirates' fighters since July 23 in response to Saddam's July 17 tirade, were ordered to remain in position. Such activity accelerated even more as U.S. officials considered the serious possibility of an Iraqi attack on Saudi Arabia.

On August 4, Generals Schwarzkopf and Horner briefed the President and his senior advisors on the military options in response to the invasion. At the conclusion of this meeting, Bush decided to send U.S. troops to Saudi Arabia. King Fahd ibn Abd al-Aziz, however, had not yet agreed to an American presence in his country. To secure an agreement, President Bush dispatched Schwarzkopf, Horner, and Secretary of Defense Cheney to brief the monarch on the situation. Following a meeting on the sixth, the king consented to the deployment of U.S. forces to Saudi Arabia. Other Arabian Peninsula countries swiftly followed suit. Leaving General Horner in Saudi Arabia to act as Central Command, Forward, General Schwarzkopf returned to the United States to oversee the initial movements.

Thus what eventually became known as the Persian Gulf War (or just Gulf War) got under way. The deployment portion of the war, known as Desert Shield, consisted of two phases. Desert Shield's first phase lasted from August 7 to November 8, 1990, and essentially involved the establishment of a defensive posture. Its second phase came after the President announced on November 8 that he would increase the number of American troops on the Arabian Peninsula, and may be likened to a defensive-offensive stage. The final phase of the war was the offensive called Desert Storm.

On August 6, the Joint Chiefs of Staff directed the deployment of combat troops to the Persian Gulf region. Among the first units to deploy, and one of the first to arrive, was the 1st Tactical Fighter Wing from Langley Air Force Base, Virginia. The wing had been alerted for such a move since the invasion, so it did not take long to launch its F–15C fighters. Following a flight of 14 hours, with 7

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An F-15C of the 1st Tactical Fighter Wing sits alert at Dhahran.

air refuelings, the aircraft arrived at Dhahran on August 8. Within a few hours of their arrival, the first planes were sitting alert, and combat air patrols were instituted the next day. The first barrier to further Iraqi aggression was in place. Actually, the F-15s were not the first Air Force aircraft to arrive in Saudi Arabia. Several E-3 AWACS aircraft and some KC-10s carrying the Strategic Forces Advisor and his contingent arrived shortly before the Eagles.

What would become one of the most remarkable achievements in U.S. military annals was under way. Soldiers of the 82d Airborne and 101st Airborne (Air Assault) Divisions were rapidly airlifted to the area, as were personnel of the 7th Marine Expeditionary Brigade. Supplies of all types came by airlift. Indeed, airlift was the critical factor in Desert Shield's success. Although sealift carried the bulk (approximately 85 percent) of the heavy equipment during Desert Shield/Desert Storm, airlift hauled 99 percent of the personnel. The swift deployment of troops via aircraft enabled a significant combat force to be on the ground in time to forestall further Iraqi incursions southward.

Military Airlift Command's capabilities were stretched to the limit by Central Command's continual requests for additional personnel and by its fluctuating priority requirements. These requests became so great that two weeks into Desert Shield, fully 94 percent of the command's C-5s (118 of 126) and 74 percent of its C-141s (195 of 265) were occupied in moving supplies and troops across an "aluminum bridge" from the U.S. to the Arabian Peninsula. To augment its own active-duty capacity, the command relied upon its Air Reserve Component units, and within a short period of time, had to call up six Reserve and one Air National Guard C-5 squadrons, ten Reserve and one Guard C-141 squadrons, and five C-130 squadrons from each component. Still, more airlift capacity was required for this unprecedented airlift.



A C-5 taxis in at its desert base following its arrival from the United States.

Although U.S. airlines had already volunteered some of their aircraft for service with the command, Desert Shield's accelerated pace dictated that more commercial airplanes were needed to sustain the flow of supplies. On August 17, Gen. Hansford T. Johnson, dual-hatted as the commander of both the Military Airlift Command and the U.S. Transportation Command, announced the activation of Stage I of the Civil Reserve Air Fleet. This was the first time in its 38-year history that the civil reserve fleet had been activated. Stage I provided 17 passenger and 21 cargo long-range international aircraft and crews. When Desert Storm began, Stage II was implemented, adding another 76 passenger and 40 cargo aircraft to the airlift.

Yet this enormous effort by military airlifters and the civil fleet was not enough. Strategic Air Command's KC-10s and KC-135s were utilized in both airlift and air refueling roles, moving in excess of 4,800 tons of cargo and over 14,200 passengers in support of their command's operations alone. Additionally, KC-10s carried more than 1,600 tons of cargo and 2,500 passengers while operating in a dual-role capacity. Finally, 20 KC-10s were used as dedicated airlifters to transport over 25,000 tons of cargo and 4,900 personnel.

During Desert Shield's early stages, from 50 to 65 strategic airlift missions flew daily into the theater. This number fell to 44 in mid-September, increased sharply by the end of the month to approximately 100, and then tapered to 36 missions a day in early October. With President Bush's November 8 order for an increase in U.S. forces to the area, the number of missions swelled once more. December and January mission rates for the C-141s were nearly three times their normal figures of approximately 500 missions per month; C-5 rates were comparable. By mid-December 1990, an average of 65 Military Airlift Command

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Military Airlift Command's C-141 fleet saw extensive service in the Gulf War.

and civil planes delivered 8,000 troops to 16 different airfields daily; on average, one landed every 22 minutes. And the pace quickened in Desert Storm. At its peak, the airlift had 127 aircraft operating per day, averaging one landing every 11 minutes.

Even at this pace, two weeks were often required for supplies deemed critical to the accomplishment of the mission to reach Saudi Arabia. To alleviate this situation, the command launched an overnight service called Desert Express. Beginning October 30, dedicated C-141s flew high-priority supplies from Charles-

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### Strategic Airlift Operations

<u>Operation</u>	<u>Number of Missions</u>	<u>Tonnage</u>	<u>Distance (miles)</u>	<u>Duration (days)</u>
Berlin	277,000	2,300,000	300	463
Vietnam War (peak)*	8,750	42,200	7,500	30
1973 Yom Kippur War	560	21,190	6,450	33
Just Cause	775	20,675	2,250	26
Gulf War	15,402	544,000	7,000	206

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\* May 1973

Sources: *Conduct of the Persian Gulf War: Final Report to Congress* (Washington: April 1992), p 413; James P. Coyne, *Airpower in the Gulf* (Washington: 1992), p 139; William T. Y'Blood, *The Eagle and the Scorpion: The USAF and the Desert Shield First-Phase Deployment, 7 August-8 November 1990* (Washington: Air Force History, 1992), p 138. This latter document is classified, but the information cited is unclassified.

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## From the Deserts to the Mountains



A pair of C-130Hs pass over their base at Al Kharj, Saudi Arabia.  
In the distance are F-15s, F-16s, and more C-130s.

ton Air Force Base, South Carolina, twice daily. (Charleston had been chosen because it was already active in the airlift and many commercial cargo carriers also used the field, thereby lessening delays caused by transshipping cargo.) Desert Express became so successful that it spawned a second service, European Desert Express, which operated out of Rhein-Main, Germany. Together, these two airlifts delivered nearly 2,500 tons of urgently needed supplies.

A brief historical comparison of some strategic airlift operations shows the magnitude of the efforts during Desert Shield and Desert Storm.<sup>8</sup> Another indicator of the extent of Desert Shield's and Desert Storm's airlift activity is found in a comparison of the million ton-miles of cargo flown per day during the Berlin Airlift and Desert Shield. In the earlier operation, only 1.7 million ton-miles were flown per day; in Desert Shield, this figure soared to 17!<sup>9</sup>

The importance and extent of airlift activity was not confined to the strategic mission. C-130 tactical airlifters, gathered from active duty, Reserve, and Guard units, were heavily involved from the outset. On August 9, 16 Hercules of the 317th Tactical Airlift Wing's 40th squadron left Pope Air Force Base, North Carolina, for Masirah, Oman. These planes were the first of 144 Air Force C-130s (about 33 percent of the fleet) that operated throughout the area during the war. (Five Republic of Korea C-130s also served with the Air Force transports during Desert Storm's final days.)

As with other aircraft, C-130s rotated in and out of the theater regularly, which meant the number of aircraft on any given day fluctuated. Also, several Reserve tactical airlift units deployed only temporarily, and were replaced subsequently by other Reserve units. The primary bases for these aircraft during the

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war were Masirah and Thumrait in Oman; Bateen, Al Ain, and Sharjah in the United Arab Emirates; and Al Kharj in Saudi Arabia.

Almost immediately upon arrival, the C-130s were hard at work moving munitions and other supplies from prepositioned stockpiles to the beddown locations of the arriving units. As the number of Hercules in the theater increased, so did their workload. CENTAF soon established a joint intratheater airlift operation, known as Camel Star. Its primary mission was to move personnel, mail, and time-sensitive materiel between bases. A second operation, Camel Express, ran on a regular schedule delivering cargo. Camel Express flights were arranged to match the arrival of strategic airlift missions at the two principal aerial ports of debarkation, Dhahran and Riyadh. In Desert Shield, C-130s carried 142,000 tons of cargo and 134,000 passengers.

As hectic as the pace of operations was for the C-130 force in Desert Shield, it became more frenetic in Desert Storm. Daily, the transports flew shuttle missions between the staging areas and forward logistics bases. Often, they used narrow roads because no airfields existed. In over 21,000 hours of flying, the C-130s delivered 159,000 tons of cargo, approximately 600,000 gallons of fuel, and 184,000 personnel. Although receiving little public credit, the tactical airlifters were vital to the success of the ground offensives into Kuwait and Iraq.

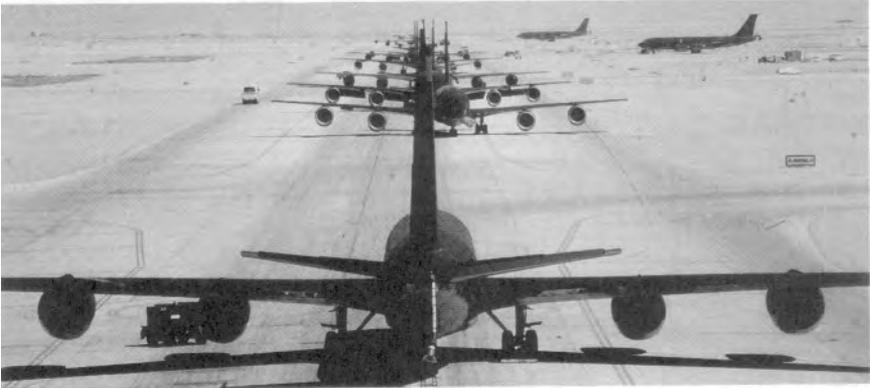
Following the outset of the air war and the consequent blinding of Iraq's command, control, and communications network, General Schwarzkopf placed in motion what he later described as the "Hail Mary Pass," the end-around maneuver that trapped many Iraqis. To freeze the enemy in their positions, Schwarzkopf initially kept his two major units, the XVIII Airborne Corps and the VII Corps, in place. With the enemy completely blinded to any Coalition maneuvers, the general then directed the XVIII Corps to move westward in preparation for the encirclement of the Iraqis. C-130s transported almost the entire XVIII Corps from the Dhahran/Ad-Dammam area to the jump-off positions near Rafha, more than 400 miles to the west. Originally, CENTAF planned to use 72 aircraft, with one aircraft landing at Rafha every 10 minutes, 24 hours a day for 14 days. Actually, in the first 13 days the Hercules averaged one landing every seven minutes. They delivered more than 9,000 tons of equipment and 14,000 troops to Rafha in this extraordinary airlift.

With the troops in position, the airlifters turned to building up the logistics bases built behind the front lines. They also moved the 2d Marine Division from the eastern flank of the 1st Marine Division to its western flank, whence an attack was launched toward Kuwait's "bend in the elbow." C-130s were also used for two major and numerous minor airdrops. The first major airdrop supplied ammunition to the VII Corps when bad weather caused its trucks to bog down in the mud. The other major mission involved dropping 100 tons of food and water to the 101st Airborne Division, which had outrun its supplies. Over 90 percent of the airdrops, though, were of food and water, most intended to feed the large number of Iraqi prisoners.

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Finally, some 36 C-130s served in an air evacuation role premised on the expectation of 3,000 casualties per day. Fortunately, the war ended quickly, and the C-130s evacuated only 2,023 patients (just a few more than they had evacuated in Desert Shield). The end of the war did not mean the halt of the tactical airlifter's job. The C-130s moved troops from outlying positions back to the aerial ports of embarkation for further transport back to the United States. One of their last big airlifts was the movement of 6,000 refugees from Safwan, Iraq, to relocation camps in Saudi Arabia. From beginning to end, the C-130 operations proved to be vital factors in Desert Shield's and Desert Storm's success.

Just as critical as airlift to Desert Shield/Storm's success, though, was air refueling. An almost reflexive response concerning air refueling is that it is a "force multiplier," but without doubt, that response is true. Without air refueling, the Desert Shield buildup would have taken longer than would have been militarily sound and the air war could not have sustained the ferocious pace that it did.



A line of KC-135Rs on the runway (above). The tanker in the foreground has a drogue for aircraft equipped with refueling probes rather than receptacles for booms. A KC-135E from the 160th Air Refueling Group, Ohio Air National Guard (below), returns to base following a refueling mission.



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At the peak of the Gulf War, the Air Force committed some 81 percent of its KC-10 fleet and 44 percent of its KC-135 fleet to the support of U.S. and Coalition forces. A total of 46 KC-10s and 262 KC-135s operating from 21 bases in 10 countries provided this support. The tankers and crews came from 20 active duty, 13 Air National Guard KC-135E, 3 Reserve KC-135E, and 3 KC-10 associate units.

Although Great Britain, France, Canada, Saudi Arabia, and the U.S. Navy and Marine Corps had tankers, and used them, the Air Force performed the bulk of the air refueling. The following table shows the extent of this employment.<sup>10</sup>

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### Gulf War Air Refueling

<u>Aircraft</u>	Desert Shield		Total	Offloads
	<u>Events/Sorties</u>	<u>Hours</u>	<u>Rcvr ARs</u>	<u>(lbs of fuel)</u>
KC-10	4,117	23,262	4,253	87,340,800
KC-135A/R/Q	10,128	37,095	23,312	263,379,200
KC-135E	3,040	14,476	5,545	90,297,600
Total	17,285	74,833	33,110 *	441,017,600

<u>Aircraft</u>	Desert Storm		Total	Offloads
	<u>Events/Sorties</u>	<u>Hours</u>	<u>Rcvr ARs</u>	<u>(lbs of fuel)</u>
KC-10	3,278	16,717	10,915	283,616,000
KC-135A/R/Q	9,897	34,635	27,390	353,030,000
KC-135E	3,690	14,886	13,391	164,090,000
Total	16,865	66,238	51,696	800,736,000

\*Corrected.

Source: Eliot Cohen, et al, *Gulf War Air Power Survey*, Vol. III, *Logistics and Support*, "Logistics," pp 180-81. (Washington, 1993).

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At Desert Shield's outset, an "air bridge" (the Atlantic Bridge) was established to support the deployment and also provide logistic support for the Strategic Air Command. It became the primary deployment route for all U.S. aircraft requiring air refueling. Tankers utilized bases in the Azores, England, Spain, France (the first time Air Force aircraft had been based there since 1966), Turkey, Greece, and Egypt. The Eighth Air Force operated the Atlantic Bridge, using

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KC-135As extensively so as to free the more effective KC-135Rs for use in the gulf. A second air bridge, the Pacific Bridge, was also established to support tanker, bomber, and airlift aircraft headed for Diego Garcia. Hickam Air Force Base, Hawaii; Andersen Air Force Base, Guam; and Diego Garcia served as Pacific Bridge operating locations.

Both the KC-135A and KC-135Q performed marginally in hot weather and needed water injection for takeoff, which requires more ground equipment and reduces fuel capacity, limiting the aircrafts' effectiveness. Also, because of their noisy and pollution-creating engines, the A and Q models could not use certain airfields. The R model, however, with more powerful and cleaner burning engines, could operate from fields throughout the Arabian Peninsula. One KC-135R could be used for missions that would have required two A or Q models. Thus, the KC-135R became the model most heavily relied on for gulf missions.

When Desert Shield became Desert Storm early on January 17, 1991, the tankers already had been busy fueling the attackers. For the remainder of the war, they maintained a hectic pace of operations. During Desert Shield, KC-135s averaged 66 sorties flown and 175 aircraft refueled per day. The war saw these numbers soar to 215 sorties flown and 839 aircraft refueled per day, because almost every strike and direct combat support mission required air refueling. Combat sorties by U.S. and Coalition force aircraft averaged 1,650 per day. With so many flights, it is no wonder that air space became a critical limiting factor affecting air refueling during the war. A relatively small amount of air space and large "packages" of aircraft operating together combined to create a great deal of congestion. This led to 37 reported near midair collisions. Fortunately, only one collision actually occurred, and both planes were able to return to their bases.

Desert Storm was the denouement of air campaign planning that began back in August 1990 and which had little connection to Central Command's 1002-90 plan. In response to General Schwarzkopf's request for a conceptual offensive air



A 19th Bomb Wing KC-135R refuels a trio of F-4G Wild Weasels.

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plan, the Air Staff's deputy director of plans for warfighting concepts, Col. John Warden, and his planning group (known as Checkmate) developed such a concept. They named it Instant Thunder, an allusion to contrast it with the Vietnam War's graduated Rolling Thunder campaign. Essentially, the Air Staff planners saw Instant Thunder as a blueprint for a "stand-alone" war-winning strategy. It was designed to attack Iraq's centers of gravity by destroying 84 strategic targets in less than a week. Schwarzkopf approved the plan as a retaliatory option and forwarded it to Horner.

When General Horner received the Instant Thunder plan, he rejected its "air-power alone" thesis. However, he kept the substance of the plan and established a Special Planning Group to refine it. This group became known as "The Black Hole." (Although there are many theories for this appellation, one wag insisted it was because resources, personnel, and intelligence seemed to be swallowed up by the group and never seemed to reappear, something akin to the phenomenon known as a black hole that occurs within a collapsed star.)<sup>11</sup>

The name Instant Thunder disappeared, but CENTAF's "Offensive Campaign, Phase I," retained the basic concepts. Meanwhile, Schwarzkopf incorporated it into his theater campaign. On August 25, 1990, the Central Command commander briefed General Powell on his proposed four-phase offensive campaign:

Phase I: Strategic air campaign against Iraq;

Phase II: Air campaign against Iraqi air defenses in Kuwait;

Phase III: Attrition of Iraqi ground combat power to neutralize Iraq's deployed ground forces and isolate the Kuwait battlefield;

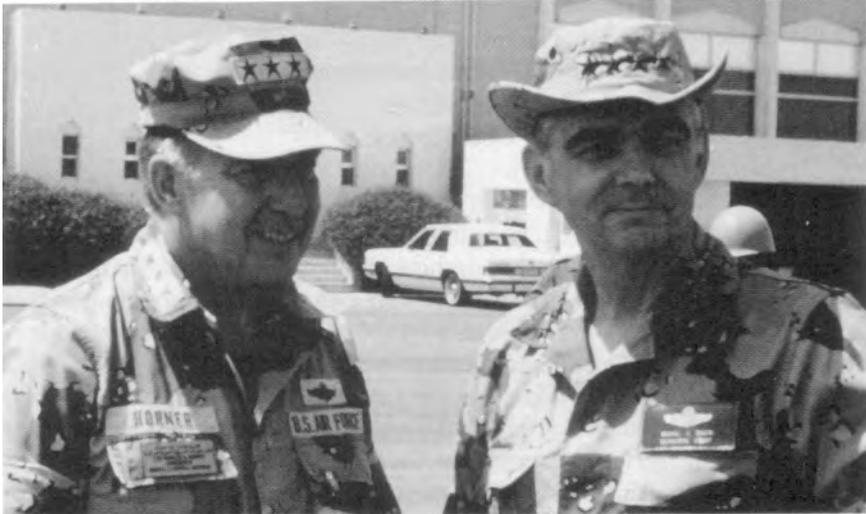
Phase IV: Ground attack to eject Iraqi forces from Kuwait.

Of these four phases, air power alone would perform the first two; air and ground power would accomplish the last. A feasibility study suggested that Phase I would last six days, Phase II two days, and Phase III six days. Some overlap of all phases was considered during the initial planning, but when more Coalition aircraft became available in January, the planners decided to combine the first three phases into simultaneous attacks on all targets in these phases.

To run the air show, Schwarzkopf assigned the job of Joint Force Air Component Commander to the CENTAF commander. This concept actually dated back to World War II, but Desert Storm was the first major regional conflict in which it was established formally. As Joint Force Air Component Commander, Horner was responsible for planning the air campaign and coordinating, allocating, and tasking more than 2,700 Coalition aircraft from 14 countries and service components. To make sure everyone understood Horner's role, Schwarzkopf stated, "If you aren't part of the air campaign under Horner, you don't fly."<sup>12</sup>

Horner integrated the air operations into a unified and focused campaign using the master attack plan and the air tasking order process. The master attack plan detailed the daily intent for the air campaign, while the air tasking order was

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Lt. Gen. Horner (left) greets Gen. Michael J. Dugan, Air Force Chief of Staff, arriving in Riyadh for an inspection trip.

the daily schedule used by the aircrews to execute the attack plan. The attack plan and the tasking order were strikingly different in size. For the first day's attacks, the master attack plan was only 21 pages long; the air tasking order, on the other hand, was the size of a large city's telephone book and could take as long as two hours to transmit to all units. Although very effective during the preplanned strategic air campaign phase, the air tasking order proved somewhat inflexible when operations became more fluid and the emphasis shifted to more mobile targets in and near Kuwait. To regain the necessary flexibility and responsiveness, new plans were developed using kill boxes, strip-alert aircraft, and uncommitted air tasking order sorties.

Being the Air Component Commander was daunting, not only because of the numbers of aircraft that were employed, but also because some units, particularly the Navy and Marines, were not overly enthusiastic about the idea of an Air Force officer controlling their forces. It took some hard selling, some compromising, some patience on Horner's part to satisfy (at least through the war) all parties about the efficacy of the system and the air tasking order process. But Horner knew his job, worked well with both the other Central Command component and Coalition commanders, and performed admirably.

Just hours before Desert Storm raged across Iraq, General Schwarzkopf issued Central Command Operations Order 91-001. In it, he restated the Coalition's key military objectives:

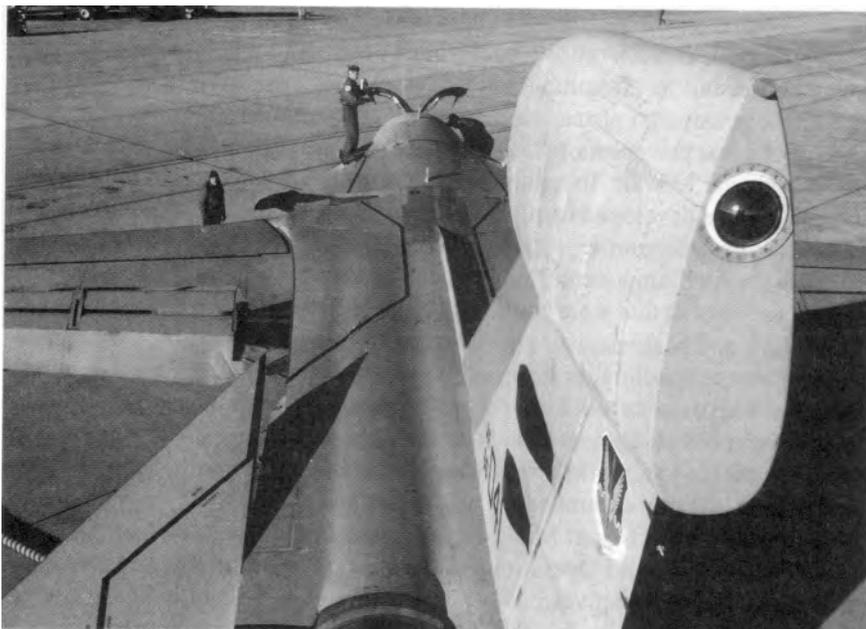
1. Attack Iraqi political-military leadership and command and control facilities;

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2. Gain and maintain air superiority;
3. Sever Iraqi supply lines;
4. Destroy nuclear, biological, and chemical production, storage, and delivery capabilities;
5. Destroy Republican Guard forces;
6. Liberate Kuwait City.

Desert Storm opened on the 17th with a bang, or rather, with several bangs. South of the Iraqi border, Coalition aircraft queued up behind some 160 tankers to get their last gulps of fuel before dashing into Iraq to begin the destruction of Saddam Hussein's military infrastructure. Hugging the desert floor thousands of feet below the tankers and receivers, a trio of MH-53J Pave Low helicopters from the 20th Special Operations Squadron led nine Army AH-64 Apache gunships across the border toward some Iraqi early-warning radar sites. The Air Force helicopters led the way because the AH-64s did not have the navigational capabilities of the MH-53s. Unerringly, the Pave Low helicopters homed in on the targets, then, veering off, left the destruction of the radars to the Apaches. It was over quickly. H-hour, 3:00 a.m., local, was then less than 21 minutes away.

With the radar sites destroyed, 19 F-15Es darted through the gap in the radar coverage to bomb fixed Scud missile launcher sites in western Iraq. Also coming through the gap were three EF-111As assigned to provide electronic countermeasures for a group of 37th Tactical Fighter Wing F-117s attacking the heart of



EF-111s provided invaluable electronic countermeasures support.

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An F-117A at its base in Saudi Arabia.

Iraq, Baghdad itself. (This mission was the only time in the war that the F-117s asked for or received direct electronic warfare support.)

Nine minutes before H-Hour, an F-117 planted two GBU-27 2,000-pound Paveway III laser-guided bombs on the Nukhayb Sector Air Defense Center southwest of Baghdad. Iraq's air defense command and control system began disintegrating. At first, as some early warning radars and then an air defense center were blown out of existence, the Iraqis reacted blindly to the threat. F-117 pilots were treated to a jaw-dropping display of Baghdad's air defenses as the sky over the city suddenly blossomed into a gigantic fireworks show. Tracers from light and heavy antiaircraft guns stitched a delicate filigree across the black skies, while missiles fired without guidance blazed heavier streaks of flames upward. But the defenders were firing at shadows, at ghosts, for no American planes had yet crossed the city.

Minutes later, however, F-117s did appear over the city. In quick succession, their laser-guided bombs sliced into the so-called "AT&T building" (center for 60 percent of Iraq's military land-line communications capacity); the Abu Guryahb Presidential Palace (one of Saddam's numerous residences and the Iraqi General Staff's wartime headquarters); and the important Salman Pak Intercept Operations Center southeast of the city. In Riyadh, General Horner and his staff watched a newscast on the CNN television network. Two of its newsmen were reporting from Baghdad by phone about the antiaircraft fire over the city. In the middle of a sentence, the line went dead. The AT&T building had been taken out. A great cheer reverberated throughout Horner's headquarters.

As the thunder of explosions still resounded throughout the city, new blasts signaled the appearance of BGM-109C Tomahawk land attack missiles. Fired 90

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minutes earlier from Navy vessels in the Persian Gulf and the Red Sea, these cruise missiles struck additional targets, including Ba'ath Party headquarters and Baghdad's six electrical power plants. Within minutes, Baghdad had completely lost commercial power, on which Iraq's air defense system relied. Although secondary systems kicked in, these were inefficient and subject to continual breakdowns. For all intents, in these first minutes of the war Saddam began losing control of his military.

Iraq continued to reel under the weight of the massive air assault. Two large attack groups, one from Navy carriers in the Red Sea and one an Air Force package driving north from Saudi Arabia directly for Baghdad, speckled the screens of Iraq's remaining radars like a bad case of measles. Operating without central control, individual radar sites came on-line to "paint" what appeared to be a huge number of attackers. Jamming by electronic warfare aircraft prompted the operators to keep their radars on for long periods in an attempt to "burn through" this interference. It was a disastrous mistake, for many of these aircraft were not bombers but pilotless decoys mimicking attackers. Hidden among the decoys were the real threats bent on destroying the radars—aircraft whose mission was suppression of enemy air defenses.

The depth and breadth of the enemy radar system was evident early when the lead F-4G Wild Weasel flight countered more than 15 radar sites and several different types of missiles. But soon the Iraqi radar operators could only watch in dismay and fear as AGM-88 HARM (high-speed antiradiation missiles), designed to home in on missile and antiaircraft artillery radars, functioned as planned. One observer later dubbed the destruction of the Iraqi radars on the opening day of the war, "HARM Heaven."<sup>13</sup> The smashing of the radars and the air defense centers ripped out the heart of Iraq's air defense system. Few of the remaining radars dared to turn on for any length of time because their activation meant certain death. Before the week was out, Iraqi radar emissions had dropped 95 percent. Iraq's air defenses were blind.

A few hours after the F-117 bombs and Tomahawk missiles signaled to Baghdad the opening of the war, areas near the capital reverberated again to the sounds of explosions. These were not a reprise of F-117 or Tomahawk attacks; they were calling cards delivered by some of the oldest combat aircraft in the Air Force's inventory. Shortly after 6:00 a.m. Central Standard Time on the 16th (more than 11 hours before H-Hour), seven B-52Gs from the 2d Bomb Wing roared off the runway at Barksdale Air Force Base, Louisiana, to begin the longest combat mission in air warfare history. They carried a heretofore secret cruise missile variant, the AGM-86C, armed with a conventional warhead. More than 17 hours later, at 8:30 in the morning, local time, these seven planes released their missiles toward targets north of Baghdad. After releasing the missiles, the bombers returned nonstop to Barksdale.

Although the eight targets attacked by these B-52s were struck later in the war by other planes, somewhat obscuring the results of this raid, intelligence sources

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rated the attacks as effective. Perhaps just as important, however, this raid (which took more than 35 hours to fly over 14,000 miles and encompassed four air refuelings) forcefully demonstrated the Air Force's worldwide capabilities, encapsulated in the phrase, "Global Reach-Global Power." One other long-range mission was flown from the United States. Ten B-52Gs of the 379th Bomb Wing flew from Wurtsmith Air Force Base, Michigan, dropped their weapons on Republican Guard targets in southeastern Iraq, and then recovered to a base in the area, becoming part of the 1708th Bomb Wing (Provisional).

While the attack from Barksdale was the most dramatic of all the B-52 missions during the war, it constituted merely a tiny fraction of the big bomber's activities in Desert Storm. Sixty-eight B-52Gs (known colloquially to their crews as "BUFFs"), flying from far-flung bases at RAF Fairford, England; Moron, Spain; Diego Garcia, in the Indian Ocean; and from other locations participated in combat missions. Yet these few planes, comprising only 3 percent of the Coalition's total combat aircraft, delivered 30 percent of the total air munitions tonnage. The B-52Gs flew more than 1,600 sorties and delivered more than 72,000 individual munitions weighing more than 27,000 tons. Eighty-five percent of the munitions delivered were either 750-pound M117 or 500-pound MK 82 general-purpose bombs. Other weapons dropped included several varieties of cluster bombs and the British-designed 1,000-pound general-purpose bomb



A flight of F-4G Wild Weasels patrols the skies seeking enemy radar emissions.

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known as the UK-1000. Only one B-52 was lost during the war, not to Iraqi fire, but in an operational accident. Eight others suffered varying degrees of damage from missile and anti-aircraft artillery hits or from other causes.

The missions flown in Desert Storm blurred the traditional distinction between “strategic” and “tactical” aircraft. The B-52s flew approximately 85 percent of their sorties against Iraqi ground forces or ground support targets; the remainder were against strategic targets. Thus, in an ironic twist, a “strategic” bomber (the B-52G) flew mostly against ground support targets in Kuwait, whereas “tactical” fighter-bombers (F-117As, F-111Fs, and F-15Es) attacked strategic targets. This *volte-face* was primarily the result of new technology exemplified by precision-guided munitions and highly sophisticated cockpit and systems avionics.

Even though the distinction between the two types of aircraft became nebulous, the power and destructiveness of the B-52 remained unchanged. A single B-52 could carry 51 of the 750-pound M117s. A load of these munitions dropped on the defenders was sure to get their attention. On the first day of the war, the bombers battered several Iraqi forward operating airfields in low-level attacks. Later that evening, they returned, again at low level, to begin pounding Republican Guard units.

By the third day, when it was evident the Iraqi air force was neutralized but missiles remained a threat, the B-52s shifted to high-altitude operations, out of the lethal envelopes of most missiles. The high-altitude attacks on Iraqi ground forces proved highly demoralizing to the enemy. Every 3 hours, 24 hours a day, a 3-plane formation struck the Iraqis. Often unaware these B-52s were overhead, the ground troops were terrified when bomb after bomb began chewing up real estate all around them. Enemy units miles from the impact point of these bombings could feel the ground shake and see clouds of debris soaring into the sky.

These bombings did not necessarily kill many of the enemy, but they contributed to the high desertion rate that sapped enemy strength. Prisoners of war almost universally described the B-52 as the weapon they feared the most. When he was interrogated by U.S. troops after the war, an Iraqi commander asserted that he surrendered because of the B-52s. His interrogator expressed surprise. “But your position was *never* attacked by B-52s.” “That is true,” the Iraqi shot back, “but I saw one that *had* been attacked.”<sup>14</sup>

Preparing the battlefield proved to be the B-52s’ forte during the war, but they also attacked other targets. A small number of B-52s were used to deter Scud launches, flying all night over suspected launch areas, dropping a couple of bombs every 15 minutes or so. Strategic targets were not ignored. One such target was the huge Taji logistics center north of Baghdad. This immense facility was too large for efficient use of precision-guided munitions, so the B-52s were utilized to transform it into heaps of rubble. Between February 10 and 27, the bombers flew 68 sorties and dropped approximately 3,000 bombs on the complex, seriously damaging it.

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A line of B-52Gs wait for their next Desert Storm mission.

Finally, in mid-February, the bombers flew breaching missions against enemy defenses along the Kuwait/Saudi Arabia border. For three days the planes sowed MK 82s and M117s profusely, destroying barriers, berms, and other obstacles, creating breaches for corridors the Coalition troops used when they surged into Kuwait.

As the B-52s devastated enemy units on the ground, Coalition aircraft swept the Iraqi air force from the sky. Despite media reports portraying the Iraqi air force as a group to be reckoned with, Coalition intelligence painted a far different picture. Many Iraqi aircraft were modern, but most pilots were poorly trained and very rigid in their tactics. Iraqi fliers had not performed well in the Iran-Iraq War and were not considered particularly aggressive. Still, equipped with MiG-29s, Su-25s, and F.1s, they could be dangerous.

General Horner planned to gain air superiority quickly so that the Coalition's full air power strength would be turned against the entire Iraqi infrastructure, including its ground forces in Kuwait. But how quickly not only air superiority, but air supremacy as well, were obtained came as a mild surprise to the CENTAF commander and his staff. In the two weeks leading up to Desert Storm, Iraqi aircraft had been averaging approximately 55 "shooter," and another 40 support, sorties per day. On the first night of the war, "shooter" sorties dropped to about 25, while support sorties soared to around 90. Although "shooter" sorties rose to almost 60 (the largest number of the war) on the 18th, they were never very effective.

Coalition fliers quickly realized the first night that the defenses to worry about were missiles and antiaircraft fire. Iraqi pilots, accustomed to the rigid control of a Soviet-style air defense system, were left confused and bewildered when the hail of bombs and missiles reduced most of the air defense system to rubble.

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Lacking initiative, imagination, and, often, good flying skills, enemy fliers fell prey not only to their highly trained adversaries but sometimes to themselves as well. Forty-one Iraqi aircraft fell to the missiles and guns of their adversaries. Hundreds more were destroyed on the ground as they tried to hide from the aerial onslaught.

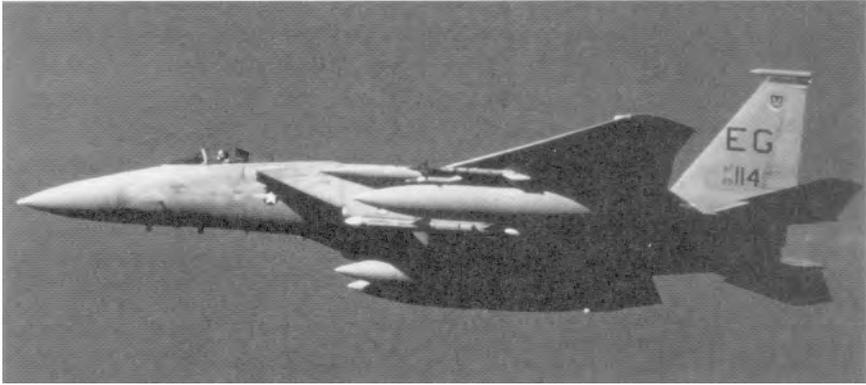
The first air-to-air kill of the war went to Capt. John K. Kelk, of the 33d Tactical Fighter Wing's 58th Tactical Fighter Squadron "Gorillas," who bagged a MiG-29, the first of 16 kills for the Tabuk-based F-15C wing. The 36th Tactical Fighter Wing, which flew F-15Cs out of Al Kharj and Incirlik, also scored 16 victories.<sup>15</sup> Other units credited with victories include the 1st Tactical Fighter Wing (one Mirage F.1), the 32d Tactical Fighter Group, assigned to the 36th wing at Incirlik, (one MiG-23), the 926th Tactical Fighter Group (one helicopter), and the 10th Tactical Fighter Wing (one Mi-8). Two Navy squadrons, VFA-81 (two MiG-21s) and VF-1 (one Mi-8), received credit for downing Iraqi aircraft, as did the No. 13 Squadron of the Royal Saudi Air Force (two F.1s).

Two pilots from the 36th's 53d squadron tied for leading scorer for the Coalition. Lt. Robert W. Hehemann notched three victories, including a Pilatus PC-9 he forced into the ground on March 22. Capt. Thomas N. Dietz bagged two MiG-21s and an Su-25. Most of the F-15C kills were accomplished with AIM-7 or AIM-9 missiles. The two A-10s scored their victories using their 30-mm guns. Several instances were reported of enemy aircraft flying into the ground while maneuvering. At least one incident is known of an Iraqi pilot shooting down his own wingman.

An F-15E crew notched an unusual kill, for which they did not receive credit. On February 14, the fliers were on Scud patrol when the AWACS notified them that several enemy helicopters were airborne nearby. Popping out of heavy clouds, the Strike Eagle pilot and weapons' system officer sighted the helicopters on the ground or about to land. Picking out one, the pilot locked onto the target with his radar and prepared for an AIM-9 attack. Because it looked as if the helicopter was on the ground, the weapons' system officer dropped a GBU-10 laser-guided bomb. About that moment the helicopter began to accelerate and move forward. The Strike Eagle pilot uncaged his AIM-9 and was about to fire when the 2,000-pound GBU-10 struck the helicopter. There was a flash, and then some smoke. When the smoke cleared, all that remained of the helicopter were tiny bits of metal fluttering to the ground.

By the end of Desert Storm's first day, the Coalition effectively had achieved air superiority. For its part, the Iraqi air force became a will-o'-the-wisp quickly fading from sight. Many Allied airmen were surprised that the Iraqis, defending their homeland, were not putting up much of a fight, but this was a precept the Iraqi air force had followed in the war with Iran. Iraqi doctrine pictured the air force as a strategic reserve to be used at the most propitious moment. Too, Saddam Hussein was never very comfortable with his air force, believing it to be a bit too radical and independent-minded for his own peace of mind, not to say

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This 33d Tactical Fighter Wing F-15C was credited with two aerial victory credits (top). The A-10 (above) is from the 926th Tactical Fighter Group, an Air Force Reserve unit. One of the A-10 pilots was credited with downing a helicopter. F-15Es of the 4th Tactical Fighter Wing (right) rest between missions at Al Kharj.

his own security. Thus he always kept a tight rein on air force operations. In any event, the Iraqi air force hunkered down in its shelters, content to wait out the storm—a disastrous mistake.

Faced with little aerial opposition, Schwarzkopf and Horner declared air supremacy on January 27. Coalition leaders, however, believing the Iraqi air force still remained a strong force, feared it could be lying low ready to spring a trap. Although Coalition aircraft spent much time trying to neutralize enemy airfields (RAF GR.1Mk1 Tornados employing JP233 mines at very low altitudes were particularly active in this role), General Horner wanted to ensure that enemy

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Precision guided munitions destroyed this shelter (top left). These four hardened shelters at Al Jaber airfield in Kuwait sustained heavy damage from precision guided munitions (top right). An American soldier inspects damage to an Iraqi shelter caused by precision guided munitions (right). This hardened shelter at Tallil Air Base, Iraq, was not hard enough to protect the Su-25 hiding inside from precision guided munitions (below).



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planes did not suddenly reappear. Rather than concentrating on the runways, Horner directed his air units to begin attacking the shelters that harbored enemy planes.

This was not easy, for in addition to being in the middle of missile-infested areas, most of the shelters had been hardened. (A more correct term, perhaps, for most of the Iraqi shelters is “hardened aircraft bunker,” but shelter will be used here to describe these structures.) The strongest of these were the so-called Yugos, extremely strong structures designed and built by Yugoslavian contractors. Although before the war these were considered difficult to destroy, the accuracy and power of precision-guided munitions demonstrated that they, too, were vulnerable.

The shelter-busting campaign began on January 22. Leading the way in these strikes were F-111Fs, F-117As, and F-15Es, all with very accurate targeting systems. Particularly adept at this task were the F-111Fs of the 48th Tactical Fighter Wing. Fitted with the Pave Tack targeting pod which could acquire, track, and designate targets for an assortment of precision-guided munitions, the Aardvarks were deadly shelter-busters. The F-111Fs could carry a variety of weapons, but a typical load for this mission consisted of four 2,000-pound hard-target-penetrating GBU-24A/Bs.

The Iraqis offered virtually no aerial opposition to these attacks. For several days, Iraqi planes remained concealed in their “bombproof” shelters or parked next to schools, hospitals, or important archeological sites. Aircraft near populated areas remained untouched, but those in the shelters became twisted, useless hunks of metal as GBU-10s and GBU-24s drilled through the shelter roofs to create havoc inside. The ferocity of these strikes is illustrated by an attack by 20 F-111Fs on one airfield. In one seven-minute period, these planes delivered 80 guided munitions onto their targets—one weapon impact every five seconds. By the end of the war, Coalition aircraft had destroyed 375 of Iraq’s 594 hardened aircraft shelters, with F-111Fs credited with 245 of those.



An F-111F of the 48th Tactical Fighter Wing takes off on another mission.

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Destruction of these shelters became a bomb-damage assessment nightmare and a bone of contention between fliers and intelligence personnel. Entry holes were often very small and did not totally reveal the destruction inside. Thus, the assessors—even when reconnaissance photos showed blast doors blown apart and thrown yards away, and charred earth and wreckage radiating out in front of a shelter—refused to rate the shelter as destroyed, but as perhaps merely suffering some damage. Only after the war did inspections prove the actual destructiveness of the shelter-busting campaign.

It was during the shelter-busting campaign that an F-111F hit the “mother of all targets” (to paraphrase Saddam Hussein). Twenty Aardvarks were scheduled to bomb Tallil Air Base, in southeast Iraq near Nasiriyah. The first plane hit an ammunition dump which erupted with such fury that the remaining planes, faced with smoke and debris boiling 30,000 feet into the air, could not attack. It has been reported that this blast was the largest nonnuclear, man-made explosion ever detected by satellites.

Whether their shelters were damaged or destroyed, Iraqi fliers saw only a bleak future unless they could escape. Already on January 21, the Iraqis had sent 25 large aircraft to safety in Iran, their putative enemy. Then, on the 26th, a major portion of the Iraqi air force began fleeing to Iran. Two days later, nearly 80 planes were in Iran; by February 10, this number had swelled to approximately 120. Some of the fleeing aircraft, perhaps already low on fuel on takeoff, or because of inexperienced pilots, crashed before reaching the dubious safety of Iran. Others ran into a hastily-formed barrier patrol along the Iranian border. F-15s shot down several MiG-23s desperately seeking sanctuary. These shootdowns halted the aerial hegira temporarily, but when CENTAF reduced the number of aircraft on barrier patrol, the stampede began anew. Eventually, some 148 aircraft, including 24 F.1s, 24 Su-24s, and 40 Su-22s, were parked on Iranian airfields. None returned to Iraqi hands.

At the beginning of the Gulf War, the Iraqi air force was rated the sixth-largest air force in the world. How good its pilots were was a matter of opinion. By the end of the war, however, only one interpretation could be made: the Iraqi air force was now neither large nor good.

The aerial onslaught on Iraq also came from the north. A potent organization named Joint Task Force Proven Force formed the second jaw of the nutcracker splitting Iraq's shell. Based at Incirlik Air Base, Turkey, the task force's primary organization was the 7440th Composite Wing (Provisional). This unit included F-15Cs, F-16Cs, F-111Es, F-4E/Gs, RF-4Cs, EF-111As, EC-130Hs, E-3Bs, and KC-135s. In addition, B-52s flying from RAF Fairford, United Kingdom, and Moron Air Base, Spain, supported the task force. Many of the aircraft flying from Incirlik did not arrive at the base until the day before the war began, after the Turkish parliament approved the use of Incirlik for offensive operations.

The U.S. European Command held operational control of the aircraft assigned to Proven Force, but General Schwarzkopf, through General Horner, kept tacti-

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cal control. CENTAF did not include the task force in its daily air tasking orders but did supply its targets. Because of its relative isolation from the rest of the Coalition's air power, the task force operated, for the most part, autonomously. Most of its targets lay above the 35th parallel, while CENTAF aircraft operated below that line. At CENTAF's request, beginning February 15 and continuing until February 27, the 7440th struck below the 35th parallel. The focus of these strikes was the Taji military complex, just 15 miles north of downtown Baghdad. This vast complex included machine shops and warehouses, ammunition depots, and repair facilities for every type of weapon. Despite the success of these strikes, throughout the war the wing was somewhat limited in its effectiveness because, although its aircraft did carry antiradiation missiles and Mavericks, they did not have the capability to carry guided bombs. (A few F-4Es which did have this capability joined late in the war, but only flew a couple of missions.)

Between January 16 and February 28, Proven Force aircraft flew 4,785 sorties. During the same period, the Coalition air forces in the south flew 118,661 sorties. Naturally, because Kuwait and central and southern Iraq were the centers of activity, there were far more aircraft in the south than in the north—nearly 2,700 to about 120—thus more sorties, but the Incirlik-based aircraft did their part to keep the Iraqi leadership and military off balance and with no place to hide.

Meanwhile, Iraq began using a terror weapon that would occupy more and more of General Horner's resources. On the afternoon of January 17, Iraq launched two Scud missiles at Israel. The Scud was a notoriously inaccurate weapon and these two missiles plunged harmlessly into the sea. Nonetheless, as



An F-16C Wild Weasel of the 52d Tactical Fighter Wing taxis to the runway at Incirlik, Turkey, for another mission over northern Iraq.

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The remains of a Scud missile found northwest of Riyadh in Saudi Arabia.

a terror weapon, the Scud packed a major psychological punch. Later firings also caused serious damage and casualties and created fear in the civilian populations under its fire. That Iraq would use these weapons was not a surprise and considerable effort had been expended by CENTAF planners during Desert Shield on how to combat the Scuds. A big worry of the planners was that missile attacks on their country would goad the Israelis into retaliatory attacks. Such retaliation might well under the fragile alliance of Arab states supporting the war against Iraq.

The following day, January 18, seven more Scuds fell on Israel and Saudi Arabia, this time causing casualties. Another Scud attack on Tel Aviv occurred on the 19th. Israel prepared to respond to these attacks, but an intense campaign by the U.S. government to prevent the Israelis from counterattacking bore fruit. Patriot missile batteries were shipped to Israel for ballistic missile defense, and additional Coalition aircraft were directed to go Scud hunting.

What became known as “The Great Scud Hunt” began auspiciously. A launch site was detected and 4th Tactical Fighter Wing F-15Es were sent against it. These planes, loaded with CBU-89s and CBU-87s, pounded the site and the pilots reported many secondary explosions. This raid apparently caught the Iraqi’s attention because Iraq did not fire on Israel again for three and one-half days, and it was more than five days before another mass launch was attempted.

Finding and destroying the mobile Scud launchers and their support infrastructure proved maddening. Scud crews quickly showed that they were fast on their feet. Within a few minutes after a launch, their mobile transporter-erector-

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launchers could be miles from the firing site. If a plane saw the Scud fired, the launcher might be destroyed. If not, it escaped.

Because of the extreme importance placed on keeping Israel from retaliating and the deadly possibility that these missiles could be used for the delivery of chemical warfare agents, the campaign against the Scuds developed a life of its own. Daytime anti-Scud patrols were A-10s and F-16s, while F-15Es equipped with low-light infrared low-altitude navigation and targeting pods and F-16s and A-6s with forward-looking infrared equipment kept watch at night for the elusive missiles. B-52s droned over the launch areas both day and night. More aircraft were diverted from CENTAF's main strategic air effort to Scud manufacturing, assembly, storage, and fixed launch sites. Eventually, the anti-Scud effort absorbed 22 percent (2,767 sorties) of the strategic air campaign's total sorties. These 2,767 sorties were equal to those flown against all of the rest of Iraq's conventional military support facilities.

In spite of some successes, especially when special operations forces operating on the ground could physically locate the launchers and their loads, the Great Scud Hunt did not destroy a significant number of them. In fact, many of the reported Scud kills may have been high quality Scud decoys manufactured in East Germany. Prior to the war, intelligence agencies believed that Iraq had less than 30 fixed launchers, perhaps 22 launchers, and a number of locally constructed mobile-erector-launchers. The latter was basically jury-rigged launch rails attached to flatbed trucks. Postwar analysis indicated that while almost all of the fixed launchers were destroyed (Iraq did not fire any Scuds from the fixed sites anyway), Iraq still had at least 36 transporter-erector-launchers in service.

Nevertheless, if the Great Scud Hunt turned more into a Snipe Hunt and took more time and effort than CENTAF had planned, it did blunt Iraq's use of the terror weapon and the psychological impact effect imparted. Iraq fired 88 Scuds during the war, 42 at Israel and 46 at the Persian Gulf nations. More than half of these firings occurred in the first two weeks of the war, and before the anti-Scud effort really took hold. Unfortunately, on February 25, one of the last Scuds fired caused the greatest number of U.S. casualties during the war. Unengaged by Patriot missiles, the Scud flashed out of the sky over Dhahran to smash into a building housing members of an Army Reserve unit. When the fire and smoke subsided and the debris could be cleared, 28 soldiers lay dead and another 98 were wounded. It was a frightful reminder of what greater tragedies the Coalition could have expected if the counter-Scud effort had not been executed.

The labor expended against the Scuds slowed the progress of the air campaign during the first week, but bad weather, the worst in 14 years, also became a factor. Cloudy and rainy conditions hindered air operations throughout much of the war; about half of all sorties into Iraq were affected by weather. Because of the stringent rules of engagement that mandated positive target identification to prevent collateral damage, numerous sorties were canceled or diverted to secondary

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This pipeline terminal near Kuwait City was set afire by Iraqi troops.

targets when the weather interfered. Particularly constrained were the laser-guided bombs, which required relatively clear weather.

Meanwhile, as the anti-Scud and shelter-busting efforts continued, Coalition aircraft continued to attack many other targets. (It should be noted that each segment of the air attacks, i.e., airfields, shelters, Scuds, bridges, etc., had little relation to the air campaign's phases, which ran concurrently.) One special attack took place early on January 27, Two days after Iraq had deliberately released millions of gallons of Kuwaiti oil into the Persian Gulf at the Al Ahmadi refinery. The poisonous slick resulting from this act extended for miles. If the oil was not shut off, an ecological disaster of monumental proportions loomed. After consulting with petroleum experts and other individuals, CENTAF worked out a two-pronged plan to stem the flow.

One prong would set fire to the oil fouling the water at the Sea Island Terminal supertanker loading dock ten miles offshore. (This slick, indeed, was set afire, but during an unplanned running gun battle between Navy vessels and an Iraqi patrol boat.) The second prong would be an aerial attack on two fuel manifolds, located about five miles inland, that controlled the pressure to the main pipeline. The F-111Fs of the 48th Tactical Fighter Wing, with their very accurate Pavé Tack equipment, were given the job.

Five F-111s initially composed the attack force. One aborted shortly after takeoff, but the remainder pressed on. It was planned that two aircraft would each release a 2,000-pound GBU-15(V)-2/B imaging infrared precision-guided munition. The other two aircraft, well off to one side and out of anti-aircraft artillery range, would then guide the bombs to their targets. That was the plan; it did not work quite that way.

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Just seconds after the first GBU was away, the aircraft controlling it reported that the data link to the bomb had been lost. The weapons system officer in the second guidance aircraft quickly gained control of it, but the link between his plane and the weapon was shaky also. Still, he guided the GBU-15 right into the selected manifold. A minute later, amid a hail of flak, the second F-111 made its run. The same weapons system officer controlled this bomb also and guided it to the target. Although some observers credited the Kuwaiti underground with actually turning off the manifold valves, it is evident that this strike was a major factor in the sudden reduction in the flow of oil into the gulf. This attack was an excellent display of the remarkable accuracy of precision-guided munitions and the excellent training and abilities of the F-111 crews.

In spite of the pounding they were receiving at the hands of the Coalition's air forces, the Iraqis tried to fight back, though not in the air. On the night of January 29, two days after General Horner declared air supremacy, the Iraqis launched a ground attack across the Kuwaiti border toward the small town of Ras Al Khafji. This village, seven miles south of the border, held no strategic importance and precious little tactical significance. Why Saddam Hussein decided to make Khafji the scene of the first ground action of the war is still debated. Many analysts believe Saddam, realizing that the air campaign was defeating his forces and that a Coalition ground campaign would not take place for some time, felt that he must force the issue. The Iraqi leader believed that the American public would not stand for much bloodshed, and if he could inflict casualties on the U.S. troops, he believed public opinion would force an end to the conflict. In addition, if his troops could capture any Americans, he could use them for propaganda purposes. Finally, he saw this as an opportunity to give his Arab enemies a thrashing.<sup>16</sup>

His plan misfired badly. Even before the actual assault on Khafji began, intelligence agencies were aware that something was afoot. A week prior to the attack, on the night of the 22d, an E-8 surveillance and targeting aircraft noted an enemy convoy moving toward the border. (Though still undergoing testing, both of the existing prototype E-8s were utilized to outstanding effect in the war.) Two A-10s and an AC-130 were vectored in on the target. These aircraft had a field day with the convoy. After the trio finished pummeling them, 58 of the 71 vehicles in the convoy had been destroyed.

Five separate battalion-sized armored and mechanized infantry attacks were thrown against Khafji and Al Wafrah, about 35 miles to the west, on the evening of the 29th. United States Marines patrolling the border at Al Wafrah drove the attackers off with heavy losses. Initially, the Iraqis were successful at Khafji against what was merely a light screening force. The town was captured and the few defenders were pushed back, but the attackers had little time to enjoy the victory. Unbeknownst to the Iraqis, a few marines were trapped in the town, where they were able to spot for air strikes and artillery barrages. Early on the 31st, Saudi and Qatari forces, assisted by the marines, counterattacked and drove the Iraqis back across the border with heavy losses.

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A 15,000-pound BLU-82 bomb is prepared for loading into an MC-130E.

The Battle for Khafji had not been just a ground action. Throughout this confrontation, Coalition aircraft waited overhead, ready to pounce on the enemy. As the enemy retreated back into Kuwait, they were pounded mercilessly. Without air support of their own, the Iraqis became easy prey. Soaring smoke plumes dotted the desert floor, marking the graves of some 300 enemy vehicles. Sadly, the losses were not one-sided. An A-10's wayward Maverick missile struck a light armored vehicle, and seven marines died in this friendly fire incident. On the 31st, as dawn broke, Iraqi soldiers spotted an AC-130H gunship overhead. Because of the approaching daylight, the gunship had been directed to return to base. A mass of targets lay beneath its guns at that time, and the crew was reluctant to leave with their job unfinished. Suddenly, a shoulder-fired missile struck the gunship. It crashed into the gulf just offshore from Khafji. All 14 crewmen died, the worst single loss of the air campaign.

Khafji was just another episode in the air war. Although both Scuds and airfields received a great deal of attention by Coalition aircraft, the Iraqi army and its logistical lifeline had been under attack from the first day. B-52s dropped tons of "iron" bombs in and behind the front lines in Kuwait. On the first two days of the war, 214 F-16s, 8 F-15Es, 31 B-52s, and 36 F/A-18s pounded the Republican Guards. This pressure never lessened. Even the venerable Hercules, in its guise as the MC-130E Combat Talon, got into the bombing act. A 15,000-pound general-purpose bomb designated the BLU-82 was loaded onto a pallet in the plane's cargo bay. When over the target, the crew just pushed the pallet out the

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plane's rear cargo door. This gigantic weapon was detonated just above ground level by a three-foot fuze extender, producing an overpressure of 1,000 pounds per square inch. When it exploded, the tremendous noise it generated, along with a violent convulsion of the earth, could be heard and felt miles away. Eleven BLU-82s were dropped on nine different enemy positions during the war. Although planned to be used as a minefield breaching weapon, its effectiveness in this role was not determined. Nonetheless, it became a potent psychological weapon.

To isolate the battlefield and strangle the Iraqi supply lines, Coalition aircraft went after the railroad and highway bridges that crossed the Tigris and Euphrates Rivers between Baghdad and Basra. Although the Iraqis had stockpiled large amounts of supplies in southeast Iraq, they were still dependent for logistic support on the lines of communication that crossed the bridges. Under attack from the first day, the bridges received closer attention after the first week. Historically, bridges are difficult targets to destroy. New technology removed much of this difficulty, and seven to ten bridges a week fell victim to various guided bombs, Mavericks, and standoff land-attack missiles. Forty-five percent of the bomb tonnage employed in bridge attacks were precision-guided munitions; almost all of the damage to bridges was inflicted by the guided munitions.

The attacks had the added benefit of creating traffic backups, thus presenting attractive targets in themselves. Too, because much of Iraq's communications cables were routed alongside or underneath the bridges, the bombings ruptured the communications network, creating even more chaos in the military's command and control structure. By war's end, the assault had brought down 41 major bridges, including all 9 railroad bridges, and 31 pontoon bridges that the Iraqis had hastily thrown across the rivers. Although the Iraqis had already stockpiled much equipment and supplies in Kuwait, the combination of de-



Unable to cross this destroyed bridge, Iraqi vehicles proved easy targets.

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stroyed bridges and the unwillingness of truck drivers to drive under the constant observation of Coalition aircraft resulted in the Iraqis losing the capability for offensive operations. As food and other supplies became scarce, so did many defenders, who fled in search of safer areas. By mid-February, intelligence agencies estimated that the Iraqi forces in Kuwait could barely subsist in place, let alone fight.

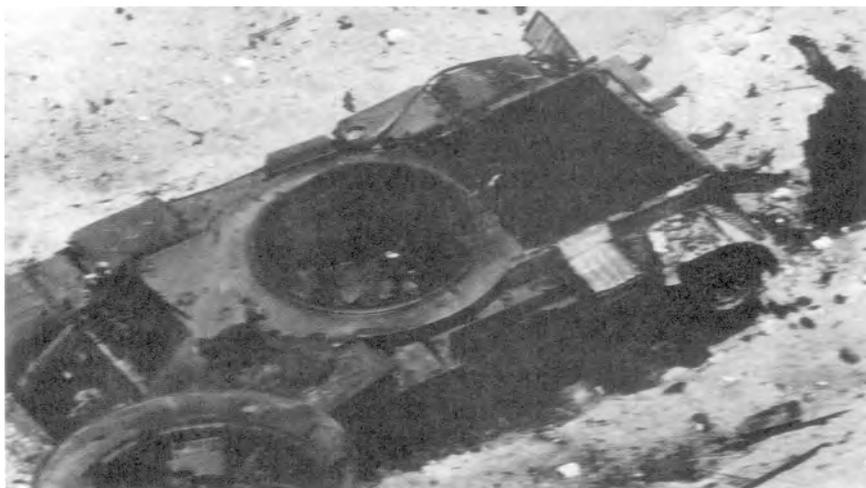
It was not just the aerial onslaught on the bridges and the communication lines that placed the Iraqis in such a perilous state. Since the beginning of the war, Coalition aircraft roamed the battlefield seeking artillery pieces, armored vehicles, command posts, command and control facilities, and supply dumps. The number of aircraft prowling over what was a very constricted area concerned the CENTAF planners well before Desert Storm began. To ensure that fratricide or midair collisions did not occur, and that all strikes would be employed in the most efficient way, the planners devised a kill box system. These boxes, 30 miles on a side and subdivided into four quadrants, provided a means to deconflict aircraft operating over the area. They also simplified the task of locating targets, which could be maddening.

While the enemy concealed some positions (like tanks dug into the sand up to their turrets and protected with sandbags and berms), reconnaissance planes spotted others before the war, providing juicy targets for the fliers. Iraqi armor, whether dug in and immobile or gathered in huge laagers and ready to move at a moments notice, were priority targets. In late January, F-111F crews discovered that the forward-looking infrared equipment of their Pave Tack pods could take full advantage of an interesting signature of the enemy tanks.

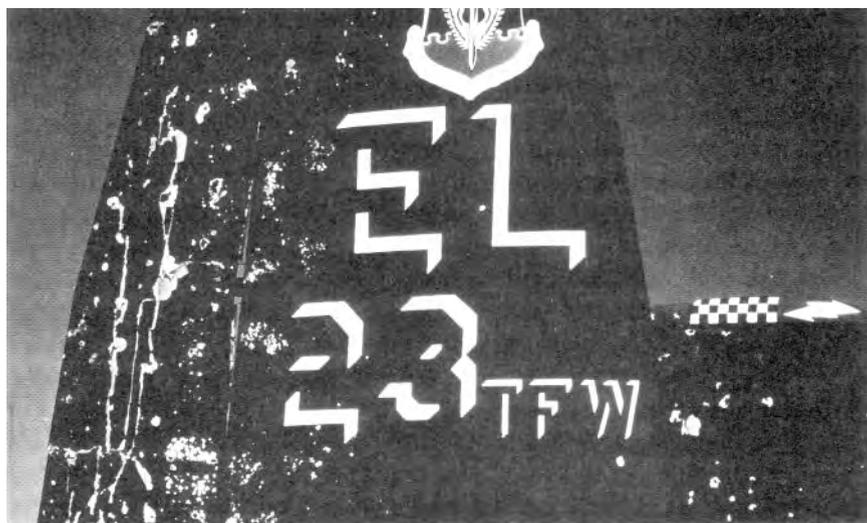
The crews noted that in the evening, because their metallic surfaces cooled slower than the surrounding sand, dug-in tanks and other armored vehicles could be detected by the Aardvark's Pave Tack equipment. Inside the aircraft, on the Pave Tack screens, the armor stood out like the proverbial sore thumb. On February 5, F-111Fs tested the validity of their observations. Eight GBU-12 500-pound laser-guided bombs were dropped on an enemy armored force, and four tanks and an artillery piece were claimed destroyed. Realizing that this anti-armor capability gave his forces an added dimension in attacking General Schwarzkopf's favorite target set, General Horner ordered the F-111Fs out of the strategic campaign and into the "tank-plinking" business. This term dismayed many Army officers, including General Schwarzkopf, who were vocal in their dislike of it. This only ensured that tank plinking enjoyed even more popularity in Air Force circles.

More than 140 GBU-12s showered dug-in Republican Guard armor and artillery positions on the night of February 6/7. After a one-day return to other targets, the Aardvarks resumed tank plinking on the night of the 8th. From then until the beginning of the ground war on the 24th, the F-111Fs spent most of their time attacking ground forces, particularly armored units. Although bomb damage evaluators often had a difficult time in assessing just which weapon caused

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This tank was “plinked” (above). Yet “tank plinking” could be dangerous. The 23d Tactical Fighter Wing’s “Boss Bird” (below) was peppered by Iraqi gunfire during such a mission.



the destruction of specific targets, they did credit the F-111Fs with the destruction of more than 1,000 tanks and armored vehicles.

The F-111Fs were not the only aircraft unleashed on Iraqi armored forces. F-15Es with low-level infrared navigation and targeting pods and A-6Es soon joined this battle. (A-10s had already been going after tanks.) With its sophisticated targeting system, the Strike Eagle proved to be an excellent tank buster. On

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at least one occasion, two infrared-equipped F-15Es, each toting eight GBU-12s, were credited with destroying one tank per bomb. Much less sophisticated than the F-15E, the A-10 Warthog (its official name was Thunderbolt II, but its pilots preferred the earthier appellation) also put on a dazzling display of antiarmor proficiency, albeit using a rather unusual method of targeting.

Normally a close air support/attack aircraft, the A-10 was used extensively in night antiarmor operations. Two squadrons, the 355th and the 74th, were chosen for this task. Except for a few daylight missions on the first two days of the war, the A-10s of the 355th flew exclusively at night. After two weeks of day operations, the 74th also switched to night flying. It did not take long for the "Hog drivers" to discover that the imaging infrared seekers of their AGM-65D Maverick missiles could be used as a poor man's forward-looking infrared equipment. Using this seeker, the pilots could search (in a narrow visual range) for the telltale heat signature of an armored vehicle. The pilots likened this search procedure as looking through a soda straw. Most of the 4,801 Mavericks fired by the A-10s were directed at armored vehicles.

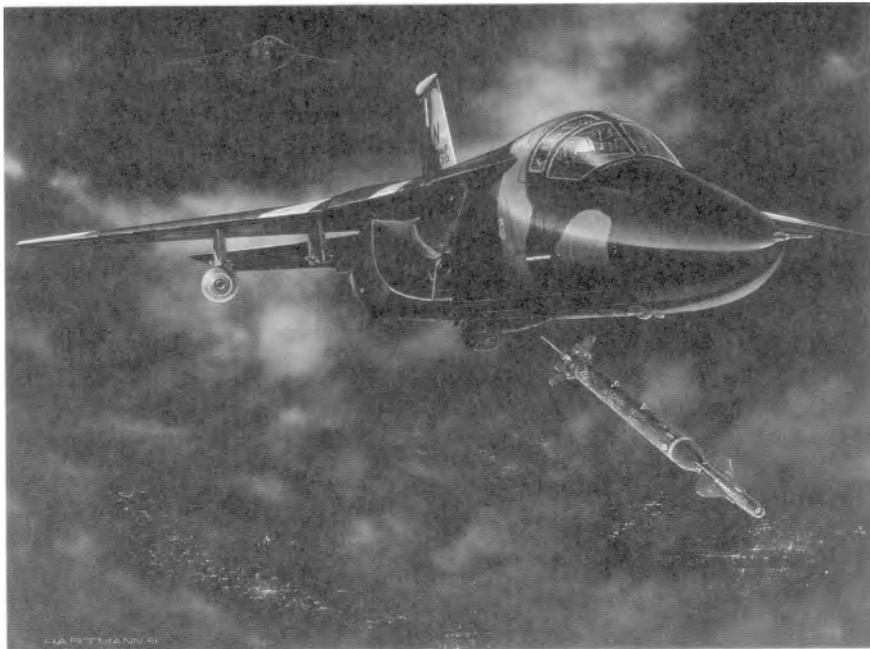
The tank-plinking effort had a profound effect on Iraqi tankmen. One captured officer commented that during the war with Iran, his tank was his friend because it sheltered him not only from enemy fire, but also the cold. Now, his tank was his enemy. Not even the blackness of night protected the vehicles as, one after another, they were blown up by the F-111s, F-15Es, and A-10s. The officer learned to stay as far away as possible from a tank.

Notwithstanding the inordinate amount of effort expended on Scuds, the air campaign progressed well until the 13th, when a target in Baghdad was struck that slowed the momentum of the campaign. Earlier in the month, U.S. intelligence agencies received information that the Al Firdos District bunker in Baghdad had been activated as a communications and, perhaps, an intelligence facility. Previously, this bunker was believed to be a probable civilian bomb shelter and had not been targeted. However, barbed wire fences surrounded the structure, prominently placed markers forbade its use by the general public, and military vehicles were seen parked next to it. All of these signs pointed to the use of the bunker as a military installation. After this information became known, two F-117s were assigned to bomb it.

Early on the 13th, the F-117s dropped two GBU-27 penetrating laser-guided bombs on the bunker. The first bomb jammed the bunker's heavy doors; the second sliced through many feet of concrete to explode on the structure's upper floor. Hundreds of people, most identified as civilians, died in the rubble. Iraq's propaganda machinery began grinding out tales of American barbarism, and many other countries decried the bombing. In the United States, President Bush and General Powell, fearing that more instances of civilian casualties would undermine support for the war, ordered an immediate halt to all bombing of Baghdad targets.

Baghdad, at least its inner sections, remained untouched from February 15 to 22. During that time, strategic targets farther afield were pursued, and the Iraqi

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This painting entitled “The Grand Finale” shows the release of a GBU-28 against Command Leadership Bunker No. 2.

army’s suffering in Kuwait continued unabated under constant air attack. The F-117s returned to Baghdad late on the 22d. Except for the night of February 25/26, when weather halted their operations, the F-117s struck many targets in Baghdad. Buildings housing various Iraqi security organizations received special attention, as did Ba’ath Party headquarters. Several of Saddam’s favorite residences in Baghdad and in his home town of Tikrit were also bombed.

On the 27th, in the last hours of the war, a pair of F-111Fs dropped, literally, a hot new weapon on an enemy target. Iraq possessed several command bunkers that were extremely tough and hard to destroy with the available weapons. Something better was needed. Air Force scientists and engineers developed, constructed, tested, and deployed a new laser-guided bomb in the astonishingly short time of 17 days. This bomb, designated the GBU-28, weighed 4,637 pounds and was machined from the barrels of surplus Army 8-inch howitzers. A molten tritonal mixture poured into four completed bombs provided the explosive punch. Two of these weapons were tested in Nevada, and the other two were shipped to the gulf, where they were wheeled directly from the transport to waiting F-111s, their casings still warm to the touch. Because of its weight, only one GBU-28 could be carried on an Aardvark’s wing, with a 2,000-pound MK 84 laser-guided bomb carried on the other wing for balance.

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Command Leadership Bunker No. 2 at Al-Taji was the chosen target for the GBU-28's debut. Possibly a favorite haunt of Saddam's, this bunker had been attacked before with hardly a scratch to its surfaces. This new weapon, which received the nickname "Deep Throat," did more than scratch the bunker. Although the first bomb missed, the second pierced many feet of concrete and dirt to explode well inside. Clouds of debris and smoke gushed from the bunker's entrances, signaling, at last, the destruction of this long-battered structure. It was a fitting end to the strategic air campaign.

Meanwhile, three days earlier, on the 24th, the ground campaign had begun. At the request of the ground commanders, much of the bombing effort had been against the frontline troops and those immediately behind the lines. Continual bombing and shelling shattered many of these frontline elements. With their morale broken and many soldiers deserting prior to the ground war, most of these units crumbled quickly when the land assault began.

Unable to see what their opponents were doing because Coalition aircraft had chased the Iraqi air force from the sky, the Iraqi army was ripe for a sucker punch, and it got one. Schwarzkopf called it a "Hail Mary" play (although in football parlance it really was not that). First he fixed the enemy to his immediate front, ready to stop the quarterback draw up the middle, but then he shifted his power backs (the XVIII Airborne Corps and the VII Corps) far to the left via a C-130 airlift for an end around. The play worked beautifully.

As his troops fronting Kuwait City rolled over the enemy ahead of them, the two corps to the west began their move into empty desert. Against little opposition, it was just a matter of hours before they were threatening the enemy rear. While French elements and the 82d Airborne Division formed a blocking position to counter any enemy attack from the west, other units of these two corps drove north and then wheeled right to drive toward Basra. By the end of the second day, elements of the 101st Airborne Division had reached the south bank of the Euphrates River, and were astride Highway 8, one of the main supply routes into Kuwait.

On day two the offensive gained momentum. Often the ground troops encountered more problems from the mud created by rainy weather than from any hostile fire. The bad weather also affected the air units, but when there was enough visibility to operate, the planes were overhead, occasionally swooping down to pick off another tank, another artillery piece, a fleeing car here and there. Air Force planes flew 3,000 sorties over the battlefield on February 27 alone.

As antiaircraft artillery and missile sites disappeared under the ground blitzkrieg, the Warthogs became especially effective. Two Hog drivers from the 76th Tactical Fighter Squadron, Capt. Eric Salomonson and 1st Lt. John Marks, had a field day on the 25th. In three missions over the battlefield, the pair used Mavericks and the A-10's powerful 30-mm gun to destroy a confirmed 23 tanks and damage 10 others! In several other instances, A-10s caused enemy soldiers to surrender just by flying over their positions. Already demoralized by the con-

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The “Highway of Death.”

stant attention they had received from the air, the enemy were more than ready to give up. Because of the speed of the ground offensive (it received the catchy, but totally inaccurate, nickname, “The 100-Hour War”), most of these sorties (61 percent) were for interdiction rather than close air support.

Some of the most vivid photos of the war showed hundreds of vehicles smashed and burning on a road out of Kuwait City. The media soon gave this road the melodramatic name “Highway of Death.” On the night of the 25th, one of the E-8 aircraft was directed to watch closely this stretch of highway. Coalition intelligence had received word that the Iraqis were preparing to pull out of Kuwait City. Sure enough, small yellow crosses, each representing an enemy vehicle, began to dot the plane’s radar screen. The crosses began to overlap so that soon a solid line showed the route that panicky Iraqi soldiers were using.

CENTAF quickly organized an attack force. F-15Es from the 4th Tactical Fighter Wing (Provisional) with infrared navigation and targeting equipment led the way. In the darkness, they first hit the fleeing Iraqis near Mutla Ridge, forming a chokepoint which blocked further movement north. Next they turned their attention to the tail end of the column as it came out of Kuwait City, bottling up the mass of vehicles between the two points. When daylight came, more Air Force and Navy planes flew up and down the line of retreat, ravaging the vehicles caught in the congestion. Photos of the highway show terrible destruction. Some observers far removed from the scene were repulsed by these images, believing the attacks to have been unnecessary overkill. Actually, the Highway of Death was more a graveyard of vehicles. Many Iraqis, realizing what would happen if they stayed with their transport, bolted and faded into the desert. Fewer than 300 Iraqi dead were found later in the debris. However, more than 1,400 ve-

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hicles were destroyed. Few of these were tanks; only 14 were counted in the mass of wreckage.

If fleeing enemy troops made it past Mutla Ridge, they faced another choke-point at the causeway across al Hammar lake and its marshlands northwest of Basra. Here, Coalition aircraft, primarily F-111s, destroyed a further 600 vehicles on the 26th and 27th. As at Mutla Ridge, however, few were tanks or other armored vehicles. Several days later, the causeway became the site of one of the largest armored actions of the war.

Meanwhile, the attackers pressed forward in overwhelming force. On the afternoon of the 26th, the 2d Armored Cavalry Regiment ran head-on into a brigade of the Republican Guard's Tawakalna Division. Fighting in a driving sandstorm, the American M1A1 tanks and Bradley Fighting Vehicles crushed the enemy brigade in less than six minutes. During this short span, the Tawakalna was destroyed as a coherent fighting force. The following day, Tallil and Jalibah airfields fell to the 24th Infantry Division.

Coalition forces also Kuwait City on the 27th. Although some marines had entered the capital the day before, General Schwarzkopf reminded them that the liberation of the city would be the task of the Arab forces in the Coalition. The marines had to be content with the recapture of Al Jabar Air Base and of the Kuwait International Airport.

By now the ground war had degenerated into a rush for the border by both sides. Occasionally, some of the enemy would attempt to make a stand, but most were intent only on escaping. At Medina Ridge, on the 27th, the 1st Armored Division ran into one unit which tried to stop the advancing Americans. This attempt by the Medina Armored Division, a Republican Guard outfit, failed miserably. In what some called the biggest tank battle since the Battle of Kursk in 1943, the 1st Armored Division pulverized its overmatched foe. In just a few hours, the division destroyed more than 300 Iraqi armored vehicles for the loss of just one man killed.

Seeing how well the ground campaign was unfolding, President Bush concluded that it was time to end the bloodletting. The overwhelming power of the coalition had forced the invaders from Kuwait. American, British, and French units were well within Iraq. Most of the enemy were fleeing deeper into their country. The first press reports of the destruction on the Highway of Death were filtering in, and Bush did not want it to appear as though the Coalition was piling on an already prostrate foe. Further combat would also mean further Coalition casualties. Following considerable discussion with his senior advisors, which included General Powell, and with General Schwarzkopf, the President decided to end the conflict at 8 a.m., Saudi time, on the 28th. Implementing a cease-fire at that time would bestow a satisfying symmetry of 100 hours to the ground war.

Although Iraq agreed to the cease-fire and to talks for its implementation, heavy fighting still broke out sporadically over the next couple of days. The

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largest encounter occurred on March 2, when the 24th Infantry Division, continuing to move eastward, came upon the Hammurabi Division. Until this moment, except for air attacks, the elusive Republican Guard unit had escaped almost untouched. Now, elements of the division were discovered stalled and strung out along the road leading to the battered Hawr al Hammar causeway.

The Americans, ordered not to fire unless fired upon, just watched as the Iraqi division inched toward the causeway. However, seeing American tanks lined up to their west, a few skittish Iraqis began to fire. It was a terrible mistake. For the next few hours, M1A1s, Bradleys, Apache gunships, and division artillery tore the enemy column to pieces. When the carnage was over, more than 185 armored vehicles, 400 trucks, and 34 artillery pieces lay as melted, twisted clumps of wreckage. Hundreds of prisoners joined the thousands already held by the Coalition. Ironically, one of the biggest battles of the war, albeit one-sided, took place after the war had supposedly ended.

As soon as the cease-fire was announced, Schwarzkopf sought a spot to hold the negotiations. A prime requisite was that it be held in Iraq. Looking at a map, his eyes fell upon the town of Safwan, five miles above the Kuwait border. Two major highways ran through it and an airfield lay adjacent. According to his information, the 1st Infantry Division had captured the town. The general told reporters that Safwan would be the site of the negotiations. Unfortunately, it had not been captured. The 1st Division had inserted only a few helicopters there, which found just a few stragglers. When Schwarzkopf found out the town was not in American control, he flew into a rage and ordered the corps commander to take the town immediately. When the division's lead units finally arrived in Safwan, however, they found much more than stragglers. Five Iraqi battalions were dug in and ready to fight, but after several hours of intense talks, the Iraqis pulled out for Basra. Schwarzkopf had his cease-fire site.

On the morning of March 3, General Schwarzkopf, accompanied by Lt. Gen. Khalid bin Sultan, the Saudi officer commanding the Joint Forces (i.e., the Arab ground forces), and other Coalition officers, strode into the tent erected at the airfield to house the negotiations. Facing the allied contingent were Lt. Gen. Sala Abud Mahmoud, commander of the III Corps, Lt. Gen. Sultan Hashim Ahmad, chief of staff of the Ministry of Defense, and a small staff. Their meeting did not last long, about one hour; and when the proceedings were over—the war had ended. The Gulf War officially concluded on April 11, after Iraq accepted United Nations Resolution 687, which detailed further cease-fire terms and war reparations.

Since the war, some of the concessions and statements made by the Central Command commander, who had neither political nor air advisors during the negotiations, have come under great scrutiny and much second-guessing. Probably the most unsettling of the concessions was the one giving the Iraqis clearance to use helicopters, even armed craft, throughout Iraq. It evidently did not occur to General Schwarzkopf—surrounded by, and familiar with, sophisticated and very

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Gen. Schwarzkopf (far left) and Lt. Gen. Khalid bin Sultan (second from left) set out the terms of the ceasefire to the Iraqi contingent.

advanced military technology—that Iraqi helicopters could be used with devastating effectiveness against people who did not have this technology to defend themselves.

Nevertheless, the Gulf War was over and the victors could now begin to study the “lessons learned” of the conflict. Immediately after the war, there were many who claimed that air power alone had won the war, and that had the air campaign been allowed to continue in its “proper” role, the ground campaign would not have been needed. Just as many scoffed at this and believed that the ground forces—with a little help from the air—were the true victors. The truth lies somewhere in between.

Unlike previous wars, air power *was* the dominating factor in this war and the Air Force *was* the dominating service. From the first to the final day of the war, U.S. and Coalition aircraft roamed Iraq and Kuwait, crippling Iraq’s ability to wage war, rendering its air force impotent, isolating the battlefield. When F-117s struck the heart of Baghdad on the first night and paralyzed Saddam’s command and control infrastructure, Iraq was staring defeat in the face. When air supremacy was declared just days later, the Coalition’s victory was guaranteed.

A few statistics gathered from the *Gulf War Air Power Survey* reveal the depth and breadth of air power’s—particularly the Air Force’s—contributions to the Coalition’s success in the war. During Desert Storm’s 44 days, the Coalition air forces flew almost as many sorties (118,661) as during Desert Shield’s 163 days (147,375). Air Force aircraft flew 60 percent of the Desert Storm sorties, while the Navy flew 15 percent (18,303) and the Marines flew 9 percent (10,683). In

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The Iraqis were amazed at how far Coalition forces had advanced into Iraq.

return for this effort, the Coalition air forces lost 24 aircraft, including 7 Air Force, during Desert Shield and only 38 aircraft, including 14 Air Force, in combat during Desert Storm. These low losses in the war give a remarkable loss rate of but 0.4 aircraft per 1,000 sorties.

Regrettably, materiel losses often result in personnel losses and the Gulf War was no exception. Thirty-four Air Force personnel died during Desert Shield and Desert Storm. Also, eight Air Force fliers were captured and made prisoners during the conflict. All returned into U.S. hands following the cease-fire. Although most had been subjected to intense interrogation and brutality, they soon recovered from their ordeal.

Just as they debated which service was the dominating service, the victors also argued which of them had destroyed the most targets in number, as well as the most in value. The *Gulf War Air Power Survey* put these disagreements into perspective when it stated:

All the squabbling about numbers of tanks and artillery pieces destroyed that occurred during the war, and which even two years later remain[ed] as bones of contention, however, miss[es] the point. It was not the number of tanks or artillery pieces destroyed, or the number of Iraqi soldiers killed that mattered. It was the effectiveness of the air campaign in breaking apart the organizational structure and cohesion of enemy military forces and in reaching the *mind* [emphasis in original] of the Iraqi soldier that counted.<sup>17</sup>

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The Gulf War was remarkable for the speed, range, flexibility, lethality, and precision of modern airpower, attributes that constitute the Air Force's concept of Global Reach-Global Power. Luckily, the war was fought at the right time—before planned cuts in the entire U.S. defense structure really began to affect the services; in the right place—a region with a well-conceived in-place airfield infrastructure, and with an ample supply of prepositioned equipment, and in terrain that enhanced the effectiveness of the Air Force's weapons; and, finally, against the right enemy—one which, although strong militarily, was ill-served by its leadership. Planners of the next war cannot assume the same favorable circumstances. Finally, notwithstanding the impressive performance of various weapon systems, ultimate success was really measured by the outstanding performance of those in the Air Force serving worldwide.

Even as the Desert Storm warriors returned home and the victory parades were held, Saddam Hussein began exacting his revenge on the people of his own country. Believing his Coalition foes were ready to return home and would ignore any internal actions of his, within days of the Safwan meeting Saddam turned his attention to the Kurds and other minority groups within Iraq. A savage civil war broke out with Iraq's helicopters dropping napalm and chemical warfare agents upon the insurgents. Saddam's instincts were right in this instance, for the United States and its allies refused to become bogged down in another war. However, the plight of Kurdish refugees in northern Iraq and southeastern Turkey, starving and ravaged by disease, convinced President Bush to authorize on April 5, 1991, a relief effort. Dubbed Provide Comfort, it was hoped the operation would ease the Kurds' situation by providing humanitarian aid and by moving an estimated 350,000 refugees to safe havens in Iraq. By 1996, this estimate had soared to 1.2 million refugees, not all Kurds.

The movement of these refugees to the safe havens was particularly nettlesome because it involved securing a large portion of northern Iraq, in essence, a second invasion of that country. Additionally, under the terms of the cease-fire agreement, Iraq could not employ fixed-wing aircraft. To enforce this, a no-fly zone was established on April 6 that covered all of Iraq north of the 36 N latitude. What Saddam's reaction would be to these restrictions and to the establishment of the safe havens was unknown; therefore, the Provide Comfort units were heavily armed.

Most of the Air Force aircraft assigned to Provide Comfort came under control of the 7440th Composite Wing (Provisional) at Incirlik. As its designation indicates, the wing controlled a variety of aircraft types from fighters to special operations helicopters to transports. Incirlik also served as headquarters for the operation. Provide Comfort started on April 7, as Air Force Hercules left Incirlik to airdrop food, tents, and other supplies to the Kurds. These were soon joined by transports from Britain, France, and Italy. Many other countries participated in Provide Comfort, but the primary members in this operation were the United States, the United Kingdom, France, and Turkey.

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A C-130, on a mission as part of Provide Comfort, leaps off an airstrip built out of a section of road.

Fully armed A-10s prowled ahead of the transports, looking for any sign of ground opposition. Circling over the transports were F-15Cs and F-16Cs, ready to swoop down upon any enemy aircraft foolish enough to intervene. Controlling these planes and observing the scene were E-3B/C AWACS aircraft, while KC-135s, deployed to Incirlik, provided refueling support. By the end of April, a forward airstrip at Sirsenk had opened, and the need for airdrops ceased. Most of the U.S. transports returned to their bases, their task taken up by fixed-wing aircraft and helicopters from other countries. Provide Comfort settled into years of routine, with air and ground units and personnel rotating to Incirlik and villages in northern Iraq on a 90-120 day basis. Supplies continued to be airlifted in for distribution out to the countryside. Meanwhile, ever watchful eyes scanned the skies for intruders and the ground for terrorists. Iraq, even in the safe havens, remained a dangerous place.

Paralleling the troubles in northern Iraq was a Shiite rebellion in southern Iraq, and Air Force planes based in Saudi Arabia monitored developments there. A reconnaissance force was based at Riyadh, but most of the Air Force assets were concentrated at Dhahran. There, the 4404th Composite Wing (Provisional) was established to handle aircraft and personnel drawn from all Air Force commands. Heavy in fighters, the wing also contained EF-111As, F-4Gs, C-130s, and other types deployed on a rotational basis. British and French aircraft also stationed at Dhahran provided additional punch as needed.

For a year following the war, Iraqi fighters and bombers remained quiescent, but provoked by Iranian aircraft which began crossing into Iraq, they shed their

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dormancy and again took to the air. Initially, the Iraqi pilots were not particularly aggressive; if they did enter the northern no-fly zone, they quickly retreated when U.S. fighters exhibited an interest in them. In southern Iraq, however, up to 30 sorties a day were flown by Iraqi combat aircraft; some were used against Shiite rebels near Basra. A new no-fly zone was established extending south of 32° north latitude to control these activities. The operation was known as Southern Watch and became effective on August 27, 1992. At first, it appeared the Iraqis would comply with the no-fly zone restrictions as they moved back their fixed-wing aircraft into the unrestricted zone between the 32d and 36th latitudes.

Late in December 1992, however, the Iraqis began to show renewed aggressiveness. On the 27th, several Iraqi fighters attempted to intercept some F-15Es. This encounter was inconclusive, but the next one a few hours later drew blood. As F-16C/Ds of the 33d Fighter Squadron patrolled the no-fly zone, a pair of MiG-25s streaked south across the 32d parallel. One of these planes fired an air-to-air missile at the F-16s, but missed. Their supposed quarry turned from hunted to hunter as the squadron commander, Lt. Col. Gary North, flying solo in a two-seat F-16D, fired an AIM-120A air-to-air missile and blasted one of the MiGs out of the sky. This was the first kill for both the F-16 in Air Force service and for the AIM-120A.

During the first two weeks of January 1993, the Iraqis became more audacious and made more incursions into the no-fly zones. F-15s chased off a MiG-25 attempting to intercept a U-2. Iraqi soldiers entered Kuwait at gunpoint to remove missiles from captured stores. Finally, missile batteries were moved back into the no-fly zone, an especially threatening gesture to the planes enforcing the restrictions. Warned that these actions could produce serious repercussions, Saddam chose to strike an even more defiant pose.

To make sure the Iraqi leader understood the consequences of his actions, on the evening of January 13, more than 100 American, British, and French aircraft struck various missile sites and other targets between the cities of Kut and Basra. Among the attackers were F-117s, F-15Cs and F-15Es, and F-16s, plus electronic warfare, AWACS, and other aircraft types. The Iraqis retaliated with anti-aircraft artillery fire and a few missile launches, but they could not bring down any attackers. However, poor weather, more than the defensive fire, contributed to a rather lackluster bombing performance this day.

Should Saddam need further reminders that he was to comply with the terms of the cease-fire and the United Nations directives, allied forces continued to hit Iraqi targets for the next several days. Southern Watch planes again struck missile sites on the 17th, and an F-16C of the 23d FS bagged a MiG-29 with an AIM-120 in the northern no-fly zone. On the same day, U.S. Navy vessels fired a gaggle of Tomahawks at the Zaafaraniyah nuclear fabrication facility southwest of Baghdad. Most hit the target, causing great damage, but one strayed off course to hit the Al Rashid Hotel, home of most of the media during the war.

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The pressure was maintained the following day, January 18, when the Southern Watch planes in their first daylight strikes went after command and control facilities at Najaf, Samamwak, and Tallil. Provide Comfort planes simultaneously pounded anti-aircraft artillery positions in their zone, while two F-4Gs launched AGM-88s at a radar site near Mosul when its radars illuminated them. A few enemy planes put in appearances, but apparently only for show, because most fled before U.S. fighters could close. One F-15C did engage a MiG-25 with an AIM-120 and an AIM-7, but the missiles apparently missed.

Further action occurred on the 19th when anti-aircraft batteries fired on an F-16, and Iraqi radars near Mosul again tried to lock on to other aircraft. Perhaps realizing that they were not winning these skirmishes, on January 20, the Iraqi leadership announced a cease-fire. In a public statement, they described this cease-fire as a gesture of peace for the inauguration of Bill Clinton as President of the United States. This demonstration of peaceful intent did not correspond with their continued efforts during 1993 to illuminate or fire at the aircraft patrolling the no-fly zones. Invariably, these actions drew a response, usually the launch of anti-radiation missiles or the dropping of cluster bombs.

One U.S. response to Iraq's provocations stood out in 1993. When former President Bush visited Kuwait in April, a sinister plot to assassinate him was uncovered. Iraq's complicity in this plot was plainly evident. To remind Iraq that this behavior would not be tolerated, President Clinton ordered a Tomahawk strike on the headquarters of the Iraqi secret police. Twenty-three were launched on the evening of June 26, 1993, causing severe damage to the secret police building.

Throughout the rest of 1993 and into the summer of 1994, a thin veneer of peace gilded the Persian Gulf. Sadly, one of the few instances of combat involving Air Force planes in the region during 1994 turned out to be self-inflicted, a case of friendly fire. On April 15, while under the direction of an AWACS aircraft, a pair of F-15Cs mistakenly identified two U.S. Army helicopters as Iraqi aircraft and shot them down. All 26 people aboard the helicopters died. Official investigations indicated that poor command and control procedures on the part of the AWACS crew and poor aircraft identification by the F-15 pilots were major causes of this tragic incident. Additionally, it was found the rules of engagement procedures were ill-defined, and the operations plan in use at that time was two and one-half years old. Several individuals involved in this incident, both in the air and on the ground, received varying degrees of punishment. To prevent such an incident from recurring, the rules of engagement were updated and a new operations plan was prepared.

For much of the year, Iraq remained relatively quiet militarily, but it continued to frustrate United Nations attempts to inspect its military facilities, including those producing chemical and biological warfare agents, and its nuclear production sites. Occasionally, Saddam or his foreign minister erupted in paroxysms of braggadocio to rail against Iraq's enemies. Then, in late summer, Saddam

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KC-135s and C-141s crowd the ramp at a base supporting Vigilant Warrior.

again threatened Kuwait, which he still considered to be just one of Iraq's provinces. In the first week of October, two Republican Guard divisions moved close to the Kuwait border. It appeared that a rerun of the Gulf War was imminent. As in August 1990, however, the United States reacted quickly, sending several air units and 12,000 ground troops to Saudi Arabia in Operation Vigilant Warrior. Unlike the 1990 deployments, this time a strong aviation presence was already in place at Dhahran, Riyadh, and other places in the region.

Vigilant Warrior saw C-17s performing their first operational deployment. In mid-October, two of the big transports delivered some 80 tons of equipment and supplies for the U.S. forces. This operation was also notable for the appearance over Kuwait on November 1 of a pair of 28th Bomb Wing B-1Bs and another duo of B-52Hs from the 5th Bomb Wing. On that date, more than 100 American, British, and Kuwaiti aircraft participated in a large-scale exercise held over Kuwait and the southern no-fly zone. In conjunction with this show of force, the B-1s and B-52s flew directly from their home bases to drop MK 82 500-pound bombs on a Kuwaiti bombing range only a few miles south of the Iraqi border. This undoubtedly got Iraq's attention.

Faced with an increasing number of unfriendly troops and knowing the capabilities of the air forces arrayed against it, Iraq pulled the Republican Guards back from the border, but the Iraq-Kuwait border remained an unstable and troubled location as Iraq continued to rebuild its shattered military and continued to threaten Kuwait. United States forces, particularly Air Force elements, remained in Saudi Arabia and Kuwait ready to thwart any Iraqi foray southward.

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Although Southwest Asia continued to exert a strong influence on U.S. military activities well into the nineties, other areas of the world also saw the Air Force engaged heavily in both combat and humanitarian actions. Of these two forms of actions, humanitarian efforts began to engage the American military with increasing frequency. Two areas that occupied the Air Force, first with humanitarian aid, and then in combat, were Somalia and the former Yugoslavia.

For years Somalia had been a country wracked by famine and disease, governmental breakdown and civil war. Despite the efforts of international aid agencies, the turmoil in Somalia worsened as various warlords clashed and thousands of civilians perished. Finally, United Nations Secretary-General Boutros Boutros-Ghali recognized that his organization had to intervene before thousands more died. Only the United States had the resources to provide the leadership, as well as most of the aid to Somalia, and the secretary-general appealed to President Bush for help. On August 14, 1992, the president authorized a relief effort named Operation Provide Relief. Because Somalia fell within its area of responsibility, Central Command was directed to conduct the operation. In its first major operation since its June 1, 1992, reorganization, the Air Mobility Command provided the majority of the initial forces and equipment.<sup>18</sup>

Personnel arrived at Moi International Airport in Mombasa, Kenya, on August 17 to establish a base from which supplies would be flown to refugee camps inside Kenya and to selected airheads in Somalia. Eight C-130s and four C-141s quickly followed. The first humanitarian missions were flown on the 21st by a pair of 314th Airlift Wing C-130s to a refugee camp at Wajir, Kenya, near the Somalia border. (Very active during the Gulf War, the 314th once again found itself a workhorse outfit for the airlift.) Although the big Starlifters flew some missions to Wajir and brought supplies from the United States direct to Mombasa, their operations ended on September 3, and all relief flights were taken up by the C-130s. By the 20th, a full complement of 14 Hercules was in place for the relief airlift. Additionally, RAF C-130s and *Luftwaffe* C.160 Transalls were assigned to Provide Relief.

On August 28, the C-130s flew their first missions into Somalia, using a 5,700-foot rutted dirt airfield at Belet Uen near an outlying relief camp. Along with several other strips, the C-130s also used a former Somali air force strip at Baidoa, which was paved, but virtually derelict, with only half of its 10,000 feet length usable. In addition to treacherous landing surfaces, the crews had to deal with roving gangs of bandits, who holed several transports as they unloaded supplies. Because of these dangers, the C-130s flew only during the day and kept their engines running while unloading. Nonetheless, in 1,598 missions flown between August 21 and December 31, the C-130s carried 13,404 tons of relief supplies into Somalia.

Violence throughout the country, particularly in the capital and main port of Mogadishu, hampered the relief efforts, which finally compelled the United

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Nations to bring in a Pakistani peacekeeping force to protect the supplies. In an airlift dubbed Impressive Lift, C-5s and C-141s flew almost 1,000 personnel and more than 1,100 tons of equipment from Pakistan to Mogadishu, but this small force proved unable to protect the supply routes from Mogadishu to the hinterlands from the unwanted attention of vying Somali warlords and their clans. When a relief ship unloading supplies in Mogadishu harbor was shelled, the United Nations suspended further relief shipments until the activities of the clans could be controlled. Hundreds of Somalis were still dying each day, and Boutros-Ghali once again appealed to the United States for help before Somalia became one vast charnel house.

On November 26, the president ordered the commitment of up to 40,000 troops to support the Somalia relief efforts. A week later, on December 3, the United Nations Security Council passed Resolution 794, which stated in part, “[the United Nations] welcomes the offer by a member state [the United States] concerning the establishment of an operation to create . . . a secure environment.”<sup>19</sup> The force employed was not a United Nations force, but was endorsed by the Security Council and consisted primarily of U.S. troops. Other major Allied units came from France, Italy, Belgium, Canada, Australia, and Pakistan, plus smaller contingents from more than 20 other countries.

Gen. Joseph P. Hoar, Commander in Chief, U.S. Central Command, designated Lt. Gen. Robert Johnston, USMC, as commander of Joint Task Force Somalia, which later became known as the United Task Force. Johnston’s organization included elements from the First Marine Expeditionary Force, the 10th Mountain Division, and Air Force and Navy units. This new operation received the name Restore Hope. In the meantime, Provide Relief humanitarian airlift missions continued in conjunction with the new operation.

Restore Hope began December 9 with the arrival at Mogadishu of the first marines, along with the 1701st Mobility Support Squadron from McGuire Air Force Base, New Jersey, to control airlift operations. For the Air Mobility Command, Restore Hope was a complex “surge” operation, involving not just airlift aircraft but numerous tankers as well. It quickly became an impressive example of “Global Reach-Global Power.” This integration of airlift and tanker assets utilizing an Atlantic refueling bridge similar to that used during the Gulf War lessened wear and tear on the airlifters by avoiding the need for extra landings. The aircraft involved employed several fields as staging bases for this airlift, including Cairo West, Egypt; Djibouti; Jeddah New and Taif, Saudi Arabia; Addis Ababa, Ethiopia; Baledogle and Kismayu, Somalia; and even Aden, Yemen. (Although the last field was used sparingly, just obtaining permission to use it, given that Yemen was an ardent Iraqi supporter during the Gulf War, was considered a diplomatic breakthrough.) Most of these fields were relegated to secondary status when Mogadishu emerged as the primary aerial port of debarkation.

Mogadishu airport remained the center of air operations throughout Restore Hope, but it often became congested as aircraft from many countries, as well as

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troops, sought space for their activities on and around the field. On its busiest day, January 24, the field saw 450 fixed-wing and helicopter movements. Its peak day for intertheater cargo airlift, however, was December 22, when 923 tons of cargo were delivered, and its peak day for passenger delivery was December 31, when 1,470 troops arrived.

Following a brief period appraising the situation, the marines pushed inland to open roads for the relief convoys and to secure the dilapidated airfields at Baidoa and Baledogle, the latter with a 6,000-foot strip. Farther south, on December 20, Belgian paratroopers assisted U.S. forces in securing Kismayu, Somalia's second-largest city and port. Kismayu also had the longest runway (11,000 feet) in Somalia. After these fields were secured, C-5s and C-141s brought in elements of the 10th Mountain Division and more marines to beef up the American presence in the country. On December 16, 1992, Restore Hope's first phase, the securing of both the Mogadishu airport and harbor and the Baidoa region, was declared concluded. By the end of the year, Air Mobility Command airlifters had flown 395 strategic airlift missions, and carried approximately 13,000 personnel and more than 12,500 tons of cargo for Provide Hope.

Two weeks later, on December 31, phase two of the operation, the deployment of the United Task Force into Baidoa and the expansion of security operations throughout central Somalia, was completed. Restore Hope's next phase, the extension of security operations into southern Somalia, was also accomplished rapidly. By mid-January, the desperate situation in the country had stabilized sufficiently so that General Johnston was able to turn over the operation to the United Nations peacekeeping force.

Air Mobility Command's efforts switched from deployment to redeployment as the C-5s and C-141s returned the U.S. troops to their home bases. Restore Hope was officially declared completed on May 4, 1993. For the 147 days of Restore Hope, air transports flew 977 deployment missions with almost 33,000 individuals and more than 32,000 tons of supplies. They also flew 181 redeployment missions carrying over 15,000 passengers and 8,000 tons of cargo.

Although a small U.S. presence, about 4,000 personnel, remained in Somalia to support the second United Nations operation, the primary forces in the country were international, consisting of soldiers from Pakistan, Belgium, Australia, France, Canada, Italy, Botswana, and Morocco. Restore Hope had been a successful operation, with well-defined goals, and it appeared to high officials that the peacekeeping force would be just as successful at curbing the wars between the clans and stopping the famine. Sadly, its goals were murky, and success was not achieved.

After most of the troops had departed for the United States, the Somali clan chiefs, led by Mohammed Farah Aideed in Mogadishu, returned to their internecine ways. The small United Nations contingents proved unwilling or unable to halt the swelling violence. On June 5, 1993, the violence escalated when

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Aideed's men ambushed Pakistani troops (along with some U.S. peacekeepers) in Mogadishu, and killed 24 Pakistani soldiers. What had begun back in August 1992 as a relatively simple humanitarian relief effort now degenerated into a drawn-out, costly, and deadly military action.

American forces, consisting primarily of special operations units, returned to Somalia with the hope of helping to quell the violence, but this hope was quickly shattered. On June 11, 1993, three AC-130Hs of the 16th Special Operations Squadron participated in air attacks. The three planes used their 105-mm howitzers and 40-mm guns to destroy a radio station used by Aideed for propaganda broadcasts, as well as a nearby compound that housed vehicles. Five days later, the gunships were back in action, this time pummeling Aideed's headquarters and several weapons caches. These attacks, though very precise and destructive, did not induce Aideed to halt his assaults on the United Nations relief convoys and peacekeepers.

Then, on October 3 and 4, a major firefight broke out in downtown Mogadishu between Aideed's followers and a U.S. joint-service team named Task Force Ranger inserted into the center of the city to capture a number of militia leaders thought to be responsible for the attacks. In addition to Army Rangers and Delta Force personnel, Air Force combat controllers and pararescuemen from the Pope-based 24th Special Tactics Squadron participated in this intense fight.

Army UH-60 Black Hawk helicopters flew in the task force. The area chosen for the assault, although near Aideed's headquarters, was a warren of narrow streets, alleys, and closely packed buildings, some several stories high. Here would be close-in fighting at its most brutal. As soon as the helicopters began hovering to discharge their troops down ropes, they came under intense fire. One of the Black Hawks was shot down, and combat controller Staff Sergeant Jeffrey W. Bray was directed to go to the crash site. Before he reached the scene, two pararescuemen, Master Sergeant Scott C. Fales and Technical Sergeant Timothy A. Wilkinson, roped down from their grenade-damaged chopper to arrive at the crash and begin treating the wounded.

For the next 18 hours, these three men were heavily involved in the action. Bray first set up a casualty collection point, and then began directing the fire of the circling gunships against advancing militia troops. He remained at this task throughout the night, sometimes calling in the gunship's fire to within a few feet of the American positions. Both Fales and Wilkinson were wounded during the fight, but their wounds did not prevent them from performing their duties. Several times Wilkinson darted through streams of gunfire to aid the wounded. Under frequent grenade attacks, Fales often had to shield his patients with his own body.

Around 7:00 the next morning, a relief force fought its way through to the embattled troops and the fighting sputtered out. It had been an extremely costly action—18 Americans killed and 84 wounded and more than 1,000 Somalis dead or wounded. For their actions during the battle, Bray and Fales received Silver

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SSgt. Jeffrey W. Bray (left), MSgt. Scott C. Fales (center), and TSgt. Timothy A. Wilkinson (right), recipients of medals for their actions during the Restore Hope operation in Somalia.

Stars, and Wilkinson, the Air Force Cross. Wilkinson became the first Air Force enlisted man to receive that medal since the *Mayaguez* incident in 1975. Several other members of the 24th squadron also received medals for their deeds in this clash.

While the Provide Relief humanitarian operations had been an outstanding success, the succeeding operations had sunk in a quagmire of conflicting objectives, vague directives, and a growing Somali animosity toward the United Nations force (including the Americans). Thus the October battle, combined with the apparent inability of the United Nations to form a coherent Somalia policy, caused the Clinton administration to reconsider the U.S. role in that tragically divided country. Not wishing to become even more entangled in an increasingly dangerous and complicated situation, the president decided to remove the troops. Although they had been controlled by their own, not United Nations, commanders, the U.S. forces still had to operate within the strictures of nebulous and vac-

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illating United Nations directives. Too, their role as peacekeepers was quite different than what they had been trained for. By March 25, 1994, the last U.S. service members had withdrawn from Somalia, and less than a thousand Americans, mainly civilian aid workers and diplomatic personnel, remained in the strife-riven country. With the departure of U.S. combat troops, the warfare between rival clans escalated and chaos again enveloped Somalia. Unable to effect any resolution to the conflict, one year later the United Nations ordered the remaining peacekeeping forces withdrawn.

Sadly, before the last Air Force units left the region, they suffered a major loss. On March 14, 1994, during a training mission off the coast of Kenya, a shell exploded in the 105-mm howitzer of a 16th squadron AC-130. The explosion started fires in two of the plane's engines, and the Hercules had to be ditched. Unfortunately, during the ditching the gunship's fuselage broke in half, and 8 of its crew of 14 were lost. They were the last casualties of what had begun in 1992 as just a humanitarian mission.

Distressingly, what starts as a relatively small-scale humanitarian effort too often balloons into something much more widespread and deadly. Such was the case in the former Yugoslavia. With the collapse of the Soviet Union and the withdrawal of its troops from eastern Europe (the Warsaw Pact was formally dissolved on June 30, 1991), many of its former client states sought more democratic forms of government. In most instances this was accomplished peacefully. Not so in Yugoslavia.<sup>20</sup>

Although a communist country, Yugoslavia had steered an independent course under the autocratic leadership of Josip Broz—Marshal Tito. After his death in 1980, the country continued Tito's policies. But the iron hand that had kept this ethnically diverse population under control no longer wielded power. Then, when the Soviet troops withdrew from eastern Europe, the grip finally broke. Ethnic animosities extending back centuries had simmered under the guise of national unity now burst forth unrestrained. Consequently, just a few months after the Gulf War, another world "hot spot" ignited.

On June 25, 1991, the provinces of Slovenia and Croatia declared their independence from Yugoslavia. Civil war erupted as the primarily Serb Yugoslavian government attempted to reassert its control over the breakaway republics. Fighting centered initially in eastern Croatia, and the Croats lost about one-third of their land, primarily in the Krajina and Slavonia regions, to the Serbs. That December, two regions, Krajina proper and western Slavonia, united to form the Republic of Serb Krajina. They were joined by three more former Croatian regions in April 1992.

The European Community recognized Slovenia and Croatia as independent states in January 1992. On March 1, 1992, Bosnia-Herzegovina declared its independence and was recognized by both the European Community and the United States on April 7. Because another of its provinces, Macedonia, had also broken away from the country, the Yugoslavian government in Belgrade, for all

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intents, now represented only Serbia and Montenegro. This did not mean that Belgrade intended to let these new states, recognized or not, survive.

Shortly after Bosnia-Herzegovina declared its independence, Serbian forces shifted their attacks from Croatia to Bosnia. By mid-July 1992, the Serbs controlled almost two-thirds of the country. Bosnia was an ethnically diverse country—44 percent Muslim, 31 percent Serb, 17 percent Croat—and this diversity with its centuries-old hatreds produced fighting of the utmost savagery. The euphemism “ethnic cleansing” (forcibly removing one ethnic group for the benefit of another), was articulated by various factions to justify their actions, which brought back dark memories of World War Two and the atrocities of the Nazis. Sarajevo, Bosnia’s capital and home to Muslims, Serbs, and Croats since the fifteenth century, became the focal point of the fighting. Thousands of civilians died and thousands more were displaced. Just who was fighting whom required a scorecard: Muslim fought Serb, Serb fought Croat, Croat fought Muslim, and all fought each other at one time or another as various groups used the war to settle age-old vendettas.

As conditions worsened in Bosnia, U.S. and European leaders searched for ways to halt the bloodshed and suffering. The urgent need for some sort of solution to the chaos in Bosnia led the United Nations to form a peacekeeping force, designated the United Nations Protection Force, for the region and to mount a humanitarian relief effort. None of the warring factions wanted “interlopers” in their midst, but they grudgingly acquiesced to the presence of some 23,000 United Nations personnel in Bosnia to establish safe areas and to guard relief convoy routes. For these troops it was a thankless, dangerous task.

When the United Nations had difficulty handling the crisis, NATO was drawn into it. Unlike the Gulf War, where the command and control apparatus was American dominated and fairly straightforward, two parallel, and competing, organizations—the United Nations and NATO—with different chains of command were involved in military activities.

In late June 1992, United Nations troops reopened the Sarajevo airport which had been closed for three months because of the fighting. After it reopened, a relief airlift named Operation Provide Promise started on July 3, 1992. For the next three and one-half years, until January 4, 1996, this airlift helped sustain the citizens of Sarajevo. Running three times as long as the Berlin Airlift, Provide Promise became the longest humanitarian airlift in history. Air Force airlifters, primarily C-130s, provided much of the airlift capacity, though aircraft from 20 other nations also participated. Flying 12,895 sorties, these planes delivered almost 180,000 tons—versus 2.3 million tons for the Berlin Airlift—of food, medicine, and other supplies to Sarajevo and other spots in Bosnia.

Leading the way in this effort was the United States Air Forces in Europe’s 435th Airlift Wing, whose main component was the 37th Airlift Squadron. On the first day of the operation, three C-130s carried 80,000 military ready-to-eat meals (called MREs—Meals, Ready-to-Eat) for Sarajevo’s hungry citizens.

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A United Nations official greets a C-130 crew during Provide Promise.

Provide Promise expanded on February 28, 1993, when airdrop missions to isolated areas started. Even when Rhein-Main was transferred back to German control in the fall of 1994 to become a “contingency” base, and operations moved to Ramstein, the 37th kept up its hectic pace. During the winter of 1993/1994, the squadron was flying 3 airland and 12 airdrop missions daily, but such a pace could not be sustained indefinitely. In addition to its Provide Promise missions, the squadron had to conduct normal theater airlift operations, a full-time job in itself. To assist the 37th, a provisional squadron, the 38th Airlift Squadron (P), composed of active duty, Reserve, and National Guard C-130 units on rotational deployments, was activated on January 4, 1994. When a heavy weapons exclusion zone was established around Sarajevo in February, land routes opened and the need for extra C-130s diminished. The provisional squadron was disbanded in June.

Further assistance for the hard-working Hercules crews came in the form of C-141s. From May 8 to July 21, 1994, five Starlifters of the 437th flew missions to Sarajevo. Because of their greater cargo capacity, these aircraft delivered almost three times the supplies that had been previously delivered daily. However, fighting erupted again around the airport, and several planes, including a C-141, were damaged. Until it was deemed safe to operate, the airlift was suspended. When operations resumed on August 16, the C-141s did not participate, but returned to Charleston because of the threat of more attacks.

Unfortunately, closing of the Sarajevo airport and the cancellation of many missions was not an uncommon event. The warring parties often fired on the transports as they landed at Sarajevo or airdropped supplies farther afield. A mis-

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sile brought down an Italian transport in September 1992, and several cargo planes also received minor damage from small arms fire and/or shrapnel from artillery fire. C-130 crews routinely wore body armor and survival vests and carried side arms. Sheets of Kevlar armor were often laid on cockpit floors or jury-rigged around vital sections of the interiors of both C-130s and C-141s. Most of the aircraft were fitted with missile countermeasures systems, and all crewmembers kept a keen lookout for missile launches. Bosnia was definitely a dangerous place.

In response to the threat of missiles and other anti-aircraft weapons, and the continued use of military aircraft by the warring factions, the United Nations, prodded by the U.S., passed Resolution 781 on October 9, 1992. This resolution banned all military flights over Bosnia. Additionally, NATO E-3A/Ds were authorized to monitor flights from tracks over the Adriatic Sea and Hungary.

Serbian forces took advantage of the situation to extend their offensives in eastern and southwestern Bosnia. On March 14, 1993, Bosnian Serb AN-2 biplanes bombed villages near the besieged Muslim town of Srebrenica. A little more than two weeks later, on the 31st, the United Nations Security Council passed three resolutions: one (Resolution 819) designated the cities of Bihac, Gorazde, Sarajevo, Srebrenica, Tuzla, and Zepa as safe areas in Bosnia; a second demanded the cessation of hostilities against these safe areas; and a third (Resolution 816) authorized the use of force against aircraft violating the ban on military flights over Bosnia. The provisions of Resolution 819 were expanded on May 6 by Resolution 824. Bosnian Serb forces took no notice of either resolution and continued to attack the Muslim enclaves. The need to resort to force was underscored on April 4 when Serb helicopters were active near Maglaj in north-central Bosnia. This was the last straw. The United Nations asked NATO to enforce a no-fly zone over Bosnia, an operation subsequently dubbed Deny Flight.

Overall responsibility for Deny Flight was vested in the Commander in Chief, Allied Forces Southern Europe, initially Adm. Jeremy M. Boorda, USN, then his successor, Adm. Leighton W. Smith, USN. He delegated control of the operation to the Commander, Allied Air Forces Southern Europe, initially Lt. Gen. Joseph W. Ashy, USAF, later Lt. Gen. Michael E. Ryan, USAF. Day-to-day control was in turn delegated to Italian Lt. Gen. Antonio Rossetti, the Fifth Allied Tactical Air Force commander. On April 9, 1993, to oversee air operations, General Rossetti established a combined air operations center at Vicenza, Italy, whose director, initially Maj. Gen. James E. Chambers, USAF, and later, Maj. Gen. Hal M. Hornburg, USAF, was responsible for planning and directing air operations over Bosnia.

The United States provided the bulk of the forces (F-15Cs, F-16Cs, F-14As, F/A-18Cs, and support aircraft) for Deny Flight. These came primarily from Air Force units in Europe and Navy carriers in the Mediterranean and Adriatic, with additional units deploying from the United States. British F.Mk 3 Tornados,

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Video maps displayed on the wall of the Aviano operations room show flight activity over Bosnia.

French Mirage 2000Cs and F.1CRs, Dutch F-16As, and Turkish F-16C/Ds were also employed. Aviano, in northern Italy, was the primary operational base, though several other bases, mainly in Italy, were also utilized. On July 1, 1995, the 7490th Wing (Provisional) was activated at Aviano to provide closer control over all the Deny Flight air units based there.

Deny Flight air operations started on April 12, 1993, when NATO fighters began flying fully armed around-the-clock combat air patrols. British and U.S. tankers kept the thirsty aircraft fueled for their missions. At the same time, various reconnaissance assets maintained photographic and electronic surveillance of Bosnia. These operations did not stop the warring factions from violating the ban; such breaches soared into the hundreds. Most involved helicopters, which usually landed when NATO fighters began closing in. The United Nations Security Council issued another resolution, No. 836, on June 10, 1993, which in part authorized the use of air power to support the United Nations Protection Force. NATO began providing such support in late July, when attack aircraft such as U.S. A-10s, AC-130s, and F/A-18s and British and French Jaguars arrived to augment the fighters already flying the Deny Flight combat air patrols. These planes provided top cover when French and Swedish United Nations troops were engaged later in battles with some of the factions. Although Yugoslavian (Serbian) aircraft regularly shadowed NATO fighters, no confrontations ensued, and until early 1994, Deny Flight missions were generally peaceful. This changed in February 1994.

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A 36th Tactical Fighter Wing F-15C lands at Aviano following a Deny Flight mission. Inactivated in 1994, the wing was reactivated that year as the 31st Fighter Wing.

On February 5, Serbs shelled a marketplace in Sarajevo, killing 68 and wounding more than 200 civilians. The brutality of this attack drew worldwide condemnation. At the urging of the United Nations, NATO ministers issued an ultimatum to the Bosnian Serbs that their heavy weapons had to be withdrawn at least 12 miles from Sarajevo or they would be attacked by air. At the same time, the United Nations commander in Bosnia negotiated a cease-fire, including removing weapons, for Sarajevo. It is unknown which of these actions or other diplomatic endeavors had the most effect, but after much obstinacy on the part the Serbs, the weapons were removed and peace returned to Sarajevo—for a time. Fighting continued fitfully in and around the city for the rest of the year.

Just three weeks after the mortar attack, on February 28, the Deny Flight missions took a serious turn when six Bosnian Serb Super Galeb light attack aircraft struck Muslim facilities near Bugojino and Novi Travnik. A pair of F-16Cs of the 526th Fighter Squadron intercepted four of the intruders, initiating what was the first combat action of NATO forces in 45 years. After the raiders ignored warnings to leave the area, the flight leader, Capt. Robert L. Wright, picked off three of the quartet in quick succession; two with AIM-9s and the last with an AIM-120. Another pair of F-16s arrived in time to bag a fourth Galeb. The surviving aircraft quickly scuttled from the area.

Almost three weeks later, on the 18th, Muslim and Bosnian-Croat forces agreed to a cease-fire monitored by United Nations troops. Among the particulars of the agreement was a new Constitution and a clear definition of the responsibilities of all parties. One group, the Bosnian Serbs, was not party to this agreement. At that time occupying nearly two-thirds of Bosnia, they saw no need to participate and continued to fight. On March 12, a pair of AC-130Hs almost joined in against the Serbs when they came upon some Serb tanks firing at

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Three F-16Cs from the 31st Fighter Wing head for Bosnia.

French United Nations troops in Bihac. By the time a request to attack had gone up the chain of command (and reluctantly authorized by the United Nations officials), the tanks had broken off their bombardment and withdrawn.

Then, on April 10, a Serb tank shelled Gorazde, one of the supposed Muslim safe areas, and the commander of the United Nations protection forces called for air strikes on the tank. This time permission to attack was given less reluctantly, and a pair of F-16Cs of the 512th Fighter Squadron responded. Bad weather prevented an attack on the tank; instead, the planes were directed to hit a Serb artillery command post a few miles southwest of Gorazde. Several MK 82s were dropped on the position, and artillery firing halted shortly thereafter. This was another historic moment for NATO; the first time in the alliance's history that its aircraft had struck a ground target.

The next day, Marine F/A-18s were also called in to bomb tanks and artillery positions which were shelling the town. The dangerous nature of low-altitude strikes and the effectiveness of man-portable missiles was demonstrated when a missile brought down a British Sea Harrier during this fighting. The pilot ejected and suffered only minor wounds. While U.S. planes circled overhead, he made his way to Muslim lines and eventually back to his unit. Serb tanks rolled into Gorazde on the 17th. Though they withdrew that evening from the town, Gorazde was now effectively under Serb control. Following a NATO warning that their positions around Gorazde would be pounded by aircraft unless they pulled back at least 12 miles from the town, the Serbs took the hint and retired. Still, though not in the town, they had gained effective control of the region.

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Throughout the summer of 1994 the Bosnian cauldron continued to boil. Clashes between opposing forces occurred regularly, but NATO air units took little part in these actions. There were several exceptions. On August 5, a Serb raiding party seized a tank and other vehicles from a United Nations-guarded collection point near Sarajevo and fired at a French helicopter observing them. Two A-10s and a pair of French Mirages were called in to deal with the raiders, but the closeness of the tank to a civilian area prevented them from attacking. An alternate target of what was identified as a World War Two-vintage U.S. M-18 light tank was destroyed. Threats of heavier air strikes prompted the Serbs to return their ill-gotten gains.

Then, on September 22, a Bosnian Serb tank entered the heavy weapons exclusion zone around Sarajevo and fired at a vehicle carrying French peacekeepers. A pair of RAF Jaguars and an Air Force A-10 were called in and made quick work of the tank. Affronted by this act, the Serbs then threatened to shoot down relief aircraft flying into Sarajevo. A few days later the airport was closed and did not reopen until December 17. Sarajevo was the site of yet another incident in November. Both sides began pummeling each other with artillery. Several dry runs at low altitude by F-15s and F/A-18s finally quieted the gunners.

Responding to a Bosnian and Krajina Serb offensive near Bihac in September, Bosnian government forces struck back near the town in late October and November. These attacks were successful initially, but the Bosnian Serb army, with the help of allies in other Serb provinces, hit back in an attempt to erase the Bihac enclave. The fighting alarmed the United Nations, which had continually sought diplomatic solutions to the ever-changing and ever-murky factional situation in the country. Matters came to a head between November 9 and 19, when Republic of Serb Krajina aircraft assisted the Bosnian Serbs in raids on Bihac. These attacks damaged many military targets and killed or wounded numerous civilians. For many months, despite numerous provocative acts by all sides, but especially the Bosnian Serbs, the United Nations had continually sought diplomatic solutions to the Bosnian situation. Now faced with the possibility that the conflict could escalate completely out of control, the United Nations asked NATO for air strikes.

The Serb Krajina planes had come from Udbina, 35 miles southwest of Bihac. This airfield, however, lay in what was nominally Croatian airspace, and the rules of engagement forbade NATO aircraft from entering that space. Nevertheless, the United Nations authorized an extension into Croatian airspace, and the Croatian government, which also fought the Serbs, swiftly approved the move.

In NATO's first major action since its creation but its seventh air engagement since the war in Bosnia began in 1992, nearly 40 aircraft struck Udbina on the afternoon of November 21. The strike force included RAF and French Jaguars, French Mirage 2000s, Dutch and U.S. F-16s, F-15Es, Marine F/A-18s, and an EF-111A. An EC-130E coordinated the strike, AWACS aircraft kept watch, and several helicopters stood by if needed for search and rescue. Before the main

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force attacked, several F-15Es and F/A-18s destroyed missile sites and a radar van. The attackers then planted laser-guided bombs, cluster bombs, and iron bombs squarely on the runway and support facilities. At the United Nations request, none of the Krajina aircraft were attacked. Although airfield repairs were completed by mid-December, the undamaged aircraft did little flying for some time.

The following day, a Serb missile site near Bihac fired unsuccessfully at a pair of reconnaissance aircraft scouting the area. The Serbs also threatened to retaliate against the 25,000 peacekeepers in Bosnia. On the 23d, NATO mounted a major reconnaissance effort. Eight photo-reconnaissance aircraft swept across the region looking for missile sites. They were accompanied by a strong air defense suppression force of F-15Es, F/A-18Ds, and French Jaguars, along with some EA-6Bs, all armed with antiradiation missiles. When several missile sites illuminated some of the reconnaissance aircraft, the sites were quickly destroyed or severely damaged. In spite of the dangers imposed upon the NATO aircraft by the Serbian air defenses, the United Nations refused NATO permission to hit these defenses before attacking other targets or dropping supplies into Bihac. Therefore, NATO declined to place its aircraft into peril.

In the meantime, Serbian forces took several hundred peacekeepers hostage in retaliation for these strikes and continued attacking Bihac. The commander of the United Nations force warned the Serbs that NATO planes would strike without warning if their troops did not pull back from the safe area.

In mid-December 1994, former U.S. President Jimmy Carter brokered a cease-fire for the war-torn and war-weary region. An uneasy peace fell over Bosnia for more than four months. The peace shattered on May 1, 1995, when a resurgent Croatian army crossed the cease-fire lines to retake western Slavonia, which had fallen to rebel Serbs in 1991. The Serbs then bombarded several Croatian towns, including Zagreb, the Croatian capital. When the Bosnian government, perhaps sensing the Serb hold on Bosnia was weakening, rejected an extension of the cease-fire, the Serbs began shelling Sarajevo and Tuzla. Once again, they also seized several hundred United Nations peacekeepers as hostages.

Despite the loss of territory in Slavonia, the Serbs were far from defeated, but launched a new offensive. During the next three months they overran two United Nations safe areas, first Srebrenica, then Zepa. United Nations troops withdrew from a third safe area, Gorazde, in mid-August, leaving the protection of that area to air power alone. The inability to hold these safe areas was a major factor in the creation and development of the air campaign plan known as Deliberate Force.

During the early months of 1995, NATO air units remained relatively inactive with the exception of reconnaissance and combat air patrol missions. On May 25-26, NATO planes did bomb an ammunition depot near Serb headquarters in Pale after the Serbs rebuffed the ultimatum to return all heavy weapons that had been removed from United Nations collection points. This led again to what had

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now become an almost obligatory response on the part of the Serbs; the seizing of hostages. Most of those taken were released in a couple of weeks.

Just one week after the bombings, on June 2, an Air Force F-16 from the 31st Fighter Wing's 555th Fighter Squadron was shot down by a Bosnian Serb SA-6 missile. After ejecting from his aircraft, the pilot, Capt. Scott F. O'Grady, evaded capture for six days. Bosnian Serb forces, wanting desperately to capture an American flier, launched an intensive search and, at times, were within a few feet of where O'Grady was hiding. A rescue force, consisting primarily of Marine Corps personnel, with Air Force A-10s providing support, helicoptered in during daylight on the 8th and executing a daring rescue, plucked the flier from under the noses of his would-be captors. Several missiles fired at them missed, and the group returned safely.

As chaotic as the situation in Bosnia had been for many months, it worsened during the summer. Any pretense at United Nations control in Sarajevo (the focus of its activities) vanished in mid-June when the United Nations force ended any effort to police the Bosnian Serb artillery ringing the city. It was increasingly evident that with few true combat troops on the ground and with indecisive leadership and vacillating instructions from senior officials, the United Nations was incapable of protecting its own forces, let alone monitoring a cease-fire. Only NATO's air units could inflict enough pain to bring the discord under control.

Yet even NATO was tethered by United Nations officials who permitted only small efforts in support of United Nations troops when Srebrenica fell in mid-July 1995. NATO leaders, having chafed for some time about what they considered the misuse (not to say "nonuse") of its air power, began to pressure the United Nations to use the best weapon available to demonstrate to the Serbs their precarious position. In late July, United States, British, and French political and military leaders met in London to discuss Bosnia and, in particular, the remaining enclave in eastern Bosnia, Gorazde. These leaders resolved that any Serbian attack on Gorazde would result in an immediate and significant response from NATO air units. They extended this guarantee to the Sarajevo, Bihac, and Tuzla areas on August 1. The Bosnian Serb commander was informed of the implications of an attack on Gorazde. He paid scant attention to the warnings.

Weary of having their air units hobbled by inflexible United Nations policies, NATO officials were also tired of having their peacekeepers killed or wounded, taken hostage, or harassed. A British/French Rapid Reaction Force, armed with heavy artillery, was dispatched to Sarajevo and soon went into action in response to the Serb shelling of the city. Under pressure from the NATO ministers, United Nations Secretary-General Boutros Boutros-Ghali agreed to give French Lt. Gen. Bernard Janvier, a veteran of the Foreign Legion and the commander of United Nations forces in the former Yugoslavia, authority to approve air strikes. Admiral Smith, Allied Forces Southern Europe commander, already had the NATO authority for these strikes. With such authorization, planning for an air

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campaign, under way since December, entered its final stages. On August 3, Admiral Smith and General Ryan, Commander, Allied Air Forces Southern Europe, briefed the plan—named Deliberate Force—to the NATO Secretary General, Willy Claes, and the Supreme Allied Commander Europe, Gen. George Joulwan, USA. One week later, Smith and Janvier signed a memorandum of understanding concerning air operations to protect United Nations safe areas.

The act that finally set Deliberate Force in motion was the shelling of Sarajevo on the morning of August 28, 1995. Five mortar rounds fell on the Mrkale market, the site of the infamous February 1994 attack. Four of the rounds did little damage; the fifth killed 38 civilians and wounded 85 others. Upon notification of this outrage, Admiral Smith recommended that Deliberate Force begin. When the attack occurred, General Janvier was on leave, so Admiral Smith consulted with Lt. Gen. Rupert Smith, UK, the commander of the United Nations forces in Bosnia and Janvier's second-in-command. More inclined to action than Janvier, the British Smith agreed with the American Smith that action was required and approved the air campaign. Janvier concurred with his subordinate's decision after he rushed back to Zagreb to reassume command.

Under the rubric Dead Eye, some 26 air defense targets and 68 separate aiming points had already been identified. A second target list was composed of about 450 Bosnian Serb positions, ranging from an airfield to buildings housing command posts. However, United Nations officials, ever cautious, agreed on only one-third of these. Too, General Janvier did not wish to see Deliberate Force burst upon the Serbian forces in one massive onslaught. Rather, he thought that a measured ratcheting up of the campaign would produce better results. To the Americans this brought back bad memories of Vietnam and its policy of a graduated response. On the evening of the 29th, Smith and Janvier met to decide on the target list. The positions on the Dead Eye list received priority, and an additional 25 targets were selected to be hit. Atop Mount Igman outside of Sarajevo, the Rapid Reaction Force artillery would take under fire other Serbian positions. H-Hour was set for 2:00 a.m. on the 30th.

Shortly after the meeting, NATO aircraft began taking off from their bases in Italy or from the carriers in the Adriatic Sea. The first wave of attackers, designated Dead Eye Southeast, consisted of approximately 43 planes, including the now-necessary air defense suppression force and other electronic warfare aircraft. Their targets were located in eastern Bosnia.

Beginning at 2:12, this force worked over 16 air defense sites, including command and control facilities, missile and antiaircraft artillery, and radar positions. Before this strike exited the target area, another force, labeled Strike Package Alpha, roared in to pound Serb positions around Sarajevo. For ten minutes this package of ten strike aircraft and eight air defense suppression aircraft hit four targets. A key target was a command and control bunker 12 miles southeast of the capital. An F-15E destroyed this underground facility with a 2,000-pound GBU-10 laser-guided bomb.

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Fourteen attackers accompanied by four air defense suppression aircraft made up Strike package Bravo. During their 20-minute action, these planes hit four more targets, including ammunition dumps and missile sites in the Sarajevo area. (Most targets were located around the capital, but sites near Mostar and Tuzla were also bombed.) As this group finished its jobs, two reconnaissance planes, protected by four air defense suppression aircraft, swept over the target areas to take the first bomb damage assessment photos. Three more strike packages, Charlie, Delta, and Echo, completed the day's activities. Ammunition dumps and storage areas were the focus of these attacks. Meanwhile, large numbers of air defense suppression aircraft (one group involved 18 planes) prowled the skies. The accuracy of the main attacks and the presence of the suppression aircraft generally kept the Serb missile sites quiescent. Some man-portable missiles were fired, however, and one of these downed a French Mirage 2000N. Its crew was captured and not released until December 12. In addition to the strike packages, A-10s and other aircraft provided close air support. On several occasions, forward air controllers called A-10s to attack artillery and mortar positions and bunkers.

The ferocity of Deliberate Force shocked the Serbian president, Slobodan Milosevic. Before the last echoes of the explosions died away on the evening of the 30th, Milosevic had contacted General Janvier to seek a halt to the bombings. At Milosevic's request, Janvier sent Ratko Mladic, the Bosnian Serb commander, an offer to meet, along with conditions for halting the air strikes. He also asked for a countrywide cease-fire.

Janvier's letter, with its call for a cease-fire, was not well received by either NATO or the United Nations. Senior officials in both organizations believed the general had overstepped his authority. They were worried that it might prove impossible to get all three warring factions in Bosnia to agree to such a request. Nonetheless, a bombing halt was ordered, and it went into effect early on September 1. Reconnaissance, enemy air defense suppression, and other missions continued to be flown.

The following day General Janvier endured a stormy 14-hour meeting with Mladic. The Serb was evasive, obstinate, and insulting, but by the end of the meeting Janvier had a letter from Mladic pledging to remove his heavy weapons from the "exclusion zone" surrounding Sarajevo and to lift the siege of the city. In turn, the general offered a 96-hour bombing moratorium. All of this sounded highly promising, but a close reading of the letter revealed so many conditions that it was worthless. Still, Janvier and, initially, Admiral Smith believed the letter was worth exploiting.

General Joulwan, the Supreme Allied Commander Europe, and Willy Claes, the NATO Secretary-General, disagreed vehemently. "I can't buy it," Joulwan chided Admiral Smith. "We'd be snatching defeat from the jaws of victory."<sup>21</sup>

NATO and the United Nations rejected Mladic's letter and issued an ultimatum of their own: halt the assaults on Sarajevo and other Bosnian safe areas, pull

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An unusual pairing of aircraft. An F-16C of the Aviano-based 31st Fighter Wing flies over the Adriatic Sea with a former East German, now *Luftwaffe*, MiG-29. No MiG-29s were used over Bosnia.

the Serb artillery away from the city, and guarantee freedom of movement to the peacekeepers. Mladic replied with another inflammatory missile. It appeared, however, that despite the bluster, the Serbs were withdrawing. Early euphoria gave way to anger when it became obvious that these movements were illusory. Deliberate Force was on again.

The first attacks began shortly after 1:00 p.m. local time on September 5. In a four-hour period, nearly 70 aircraft, accompanied by about 50 air defense suppression aircraft, battered storage and repair depots, ammunition dumps, and command and control facilities. Towering thunderstorms temporarily halted the action, but when these moved out of the area, another 20 fighter-bombers (along with air defense suppression support) returned to plaster more storage sites. Most of the attackers (F-15Es, F-16s, F/A-18Ds, Mirage 2000s, and GR-7 Harriers) dropped various laser-guided bombs ranging from 500-pound GBU-12s to 2,000-pound GBU-10 deep penetrating laser-guided bombs. Overseeing the battle arena were NATO AWACS aircraft and EC-130E airborne command post planes.

The following day, lines of communications received priority attention. Bad weather again interfered, which limited the action, but precision—guided muni-

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tions once more showed their accuracy, especially against bridges. For the next week, until the 14th, NATO aircraft maintained the pressure. With the return of good weather, the 7th saw the most sorties flown (nearly 250) of the campaign.

Several "firsts" marked the actions on September 9 and 10. Navy F/A-18Ds began using AGM-84 standoff land attack missiles against air defense targets. These missiles, first used in the Gulf War, could be launched up to 60 miles from a target, outside its defenses, proved very accurate. Perhaps making more of a splash, at least with the media and politicians, was the use of Tomahawk cruise missiles against the Serb air defense complex near Banja Luka in northwest Bosnia. The 13 missiles fired were considered to have performed very well. Their use, though, prompted French and Italian diplomats to worry that the conflict could escalate. When assured that suppressing air defense targets would not produce escalation, both governments supported this effort. Finally, F-15Es began using GBU-15s. Generally, this 2,000-pound weapon, which used either electro-optical or imaging infrared seeker heads, was to be used sparingly against well-defended, high-value targets, just the type of target represented by the Banja Luka complex.

The Bosnian Serbs reacted to the attacks on their command and control and air defense facilities with a new tactic of their own. Serb gunners began filling the air around their position with large flak barrages, similar to the "box barrage" tactics used by the Germans in World War II. Allied pilots also reported that such barrages were seen miles distant from where the planes were operating. The pilots believed these to be missile-lined traps ready to be sprung on unwary fliers attempting to take out the anti-aircraft artillery guns.

Numerous sorties pounded a rapidly shrinking number of approved targets on the 12th, but considerably fewer aircraft were aloft the next day when bad weather settled over the region once again. As Deliberate Force progressed, other events took place that would bring the operation to a close and, at the same time, lead to a tenuous peace for the war-racked region.

On the ground, a Croat-Muslim offensive in western Bosnia drove back Serb forces and eventually reduced the Serbian hold of Bosnian territory from three-quarters to less than one-half. In Geneva, Bosnian Muslim, Croat, and Serb foreign ministers met for the first time in two years to discuss a cease-fire. Mladic, the Bosnian Serb military leader, seeing his air defense and logistics infrastructure reduced to rubble and the mobility of his forces strangled by overwhelming air power, decided it was time to sue for peace.

Following tough negotiations, Mladic committed his forces to removing their heavy weapons from around Sarajevo. He was directed to do this within six days, with significant progress in this removal to be shown within 72 hours. On the morning of the 14th, a 72-hour bombing moratorium began. This pause was extended for another 72 hours on September 17, after the Serbs actually began to remove their weapons. Three days later NATO and the United Nations agreed that resumption of the air strikes was unnecessary. Deliberate Force was over.

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The air campaign had involved more than 200 aircraft. These planes flew 3,500 sorties, of which a bit less than one-fifth (750) were strike sorties. These aircraft delivered more than 600 precision weapons against 55 preselected targets, for which some 344 aiming points had been chosen. The Air Force, the operation's major contributor of equipment, flew the most sorties, approximately 60 percent of the total, with British and French aircraft splitting about equally another 30 percent of the sorties. Air power had played a vital role in bringing all sides to the peace table, but a cease-fire continued to be a tantalizing but elusive goal.

Several times in October, NATO aircraft had to respond to hostile actions taken by the Serbs. In one incident, a pair of Air Force F-16s bombed a Bosnian Serb command bunker after Serbian forces shelled Tuzla, killing a United Nations soldier, and fired rockets at Muslim civilians. Slowly and painfully, however, the peace process edged forward. All sides at last agreed to a cease-fire which went into effect one minute past midnight on October 12. Although sporadic firing continued throughout Bosnia, the cease-fire held.

The next step was to institute a formal peace agreement. At the firm urging of the United States, negotiators from the warring factions met at Wright-Patterson Air Force Base, Ohio, in November to discuss a Bosnian peace agreement. After days of intense, occasionally acrimonious talks, the presidents of Bosnia, Croatia, and Serbia initialled an agreement on November 21, 1995. This agreement became known as the Dayton Accord. The formal signing of this agreement took place in Paris on December 14.

Under the terms of the agreement, the United Nations turned over control of operations in Bosnia and Croatia to NATO. (NATO officially assumed military command on December 20.) To implement the terms, a multinational organization was formed, with sectors under U.S., British, and French control established in Bosnia. Headquarters for the U.S. sector was near Tuzla, in northeast Bosnia. Interestingly, after an agreement with NATO had been reached, some 1,500 Russian troops also served with the Americans. The operation, which was scheduled to last just one year, until December 1996, was named Joint Endeavor. Overall command of the operation was held by General Joulwan, but Admiral Smith served as the on-scene commander. General Ryan led the air units; Lt. Gen. Sir Michael Walker, UK, acted as the ground forces commander.

A 19-page annex to the agreement called for the deployment of a NATO-led force to implement the military aspects of the agreement. One portion of the annex, which became known as the "silver bullet" paragraph, authorized these troops, including NATO aircraft, to use force to respond to even perceived threats, a provision that had not been included in earlier peacekeeping operations. To the airmen, this authorization and the change from United Nations to full NATO control was welcome. Previously, the fliers had been restricted in their operations, reacting to incidents or waiting for often hesitant United Nations approval for action. Now they could respond more quickly to developing events.

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A C-130 brings needed supplies into Bosnia.

The first NATO troops, including two American enlisted men, arrived in Bosnia on December 4. Two days later, the first U.S. plane, a C-130 from Ramstein, landed at Tuzla. Tuzla was not the best field from which to conduct air operations. It was hemmed in on three sides by mountains and, initially, had only a nondirectional radio beacon for navigation aid. Its 8,100-foot main runway ran east-west, so takeoffs to the east (and landings from that direction) brought aircraft very close to the border of Serbia and known collections of missile sites. Limited ramp space constricted the number of transports that could use the field at any one time.

Following several days of fog and rain which closed the field, C-130s brought in TACAN and precision-approach radar equipment, and the field was at last up and running. A provisional group, the 4100th Air Base Group (P), was soon activated to coordinate and control the increasingly heavy activity at Tuzla. Although C-130s were the main participants in the Tuzla airlift, the three primary Air Force airlifters (C-17s, C-141s, and C-5s) were also employed. These aircraft (12 C-17s, 9 C-141s, and 2 C-5s) operated as a composite unit, unofficially known as the "Charlie Squadron," from Rhein-Main.

Except for one supply flight to Sarajevo on December 8, C-17s did not join Bosnian airlift operations until the 17th, when one of the big airlifters brought in a load of Army equipment. Thereafter, because of their huge load-carrying capacity and their ability to operate in restricted landing areas, the C-17s saw extensive use. The first C-141 mission, a 62d Airlift Wing aircraft from McChord Air Force Base, Washington, arrived at Tuzla on Christmas Eve. The crew of this plane was from the 16th Airlift Squadron stationed at Charleston Air Force Base, a Starlifter unit tasked with a special operations mission. The squadron was well-

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trained in low-level navigation and in the use of night vision goggles, but neither were needed at Tuzla. Too large for use at Tuzla, the huge C-5s flew in and out of Taszar, Hungary, which was near a major railhead where troops and equipment moved into Bosnia by rail.

The C-17 soon proved to be a godsend to the Army. Attempts to bridge the Sava River, which forms Bosnia's northern border with Croatia, were thwarted by poor weather that turned the river into a swollen torrent. Bridge sections, engineering equipment, and tents were washed away by the flood. The Sava crossing was important because it was the primary route to bring in heavy armor and other vehicles from their staging area at Taszar. Other modes of transportation were either unreliable or could not be used at all, so three C-17s were used to airlift 25 pontoon bridge sections, already loaded on flatbed trailers, to Hungary. The trailers were driven off the planes and directly to the river, where their loads were used to complete the bridge. On February 9, the deployment phase was declared completed and the airlifters flew their last missions of this phase. The last C-17 into Tuzla on the 9th carried General Fogleman, the Air Force Chief of Staff, who had come to observe the operations at the field.

From Urgent Fury in 1983 to Joint Endeavor in 1996, the United States Air Force had been a vital participant in major operations and in countless other smaller undertakings. Indeed, in Desert Storm and Deliberate Force, the Air Force had an integral part. Despite a rapidly shrinking inventory of aircraft and a steadily diminishing number of personnel, the Air Force in the last years of the twentieth century remained the foremost aerospace power in the world. New aircraft such as the F-15E, the F-22, the B-2, the C-17; other new weapons systems; and new and imaginative thinking by its leaders ensured that the United States Air Force would remain dominant into the twenty-first century as well.

## Chapter 25

# Metamorphosis: The Air Force Approaches the Next Century

William T. Y'Blood

**T**he last two decades of the twentieth century saw the Air Force, as well as the other services, undergo a striking organizational metamorphosis as changes in the world political order—distinguished primarily by the collapse of the Soviet Union and the consequent end of the Cold War—and changes in worldwide economic conditions caused the United States to drastically rethink the size and roles of its military forces.<sup>1</sup>

With the organizational changes came equipment changes enabling the Air Force to retain its qualitative edge over any other air force. This new equipment included some remarkable aircraft which incorporated advanced technology and enhanced performance. Unfortunately, such advances came with a heavy price, and a parsimonious Congress was loath to provide as much funds as the Air Force believed were necessary to sustain an adequate force.

Despite the turmoil associated with such substantive changes, the Air Force continued to maintain a strong combat-ready force capable of moving almost anywhere in the world. In 1990, this capability was reflected in the newly minted Air Force phrase—“Global Reach-Global Power.” This phrase manifested the unique characteristics of the Air Force: speed, range, flexibility, precision, and

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lethality. In a June 1990 White Paper titled “The Air Force and U.S. National Security: Global Reach-Global Power,” the service discussed several objectives of national security, their associated forces, and the Air Force contributions to national security.

As listed in the White Paper, the objectives included:

**Sustaining deterrence.** The Air Force remained committed to the triad concept of manned bombers, ground-launched intercontinental ballistic missiles, and sea-launched ballistic missiles that had been a cornerstone of U.S. defense strategy since the 1960s. The service also believed that the “most stabilizing element of the triad” was the manned bomber force, which was being modernized with the addition of new bombers.<sup>2</sup>

**Providing a versatile combat force.** Here the Air Force, through its ability to concentrate forces rapidly over great distances—what it called speed, range, and flexibility—believed it could play an increasingly important role.

**Supplying rapid global mobility.** For any contingency scenario, the Air Force’s fleet of airlifters and tankers would be critical. Though sealift would be the primary force for long-term operations, airlift would be the only method of deploying troops rapidly throughout the world. With the United States reducing its overseas military forces, this airlift capability was becoming increasingly important. This capability was dramatically underscored in Desert Shield in 1990, and again in Operation Vigilant Warrior in October 1994, both discussed in the preceding chapter. Air Force tankers would provide a force multiplier for all the services.

**Controlling the high ground.** Space was the “high ground,” and as the principal provider of space systems for the Defense Department, the Air Force believed it was uniquely qualified to remain that provider. The service saw its space systems as consisting not only of reconnaissance and communications satellites, but also of weather, navigation, and surveillance satellites. In addition, the Air Force saw command and control as part of the high ground. Its airborne command posts, such as the EC-130 (ABCCC), the E-3 AWACS, and the future E-8 aircraft, were key elements, which in conjunction with the space systems, would enable a battle commander to make the critical decisions during rapidly changing situations.

**Building U.S. influence.** This could be accomplished in many ways, including security assistance through the sale of weapons and logistics systems, the training of other countries’ military forces, humanitarian aid via airlift, and nonlethal deterrence by the deployment of surveillance aircraft, such as AWACS, RC-135s, and U-2s.<sup>3</sup>

## The Air Force Approaches the Next Century

A refined version of this concept, "Global Presence," appeared in 1994. This title symbolized what the Air Force leadership, and many others, saw as the Air Force's strength in this era of shrinking size and shrinking funds. Along with the term "warfighting," presence was a component of "power projection," or the "means to influence actors or affect situations or events in America's national interest."<sup>4</sup> Essentially, this was considered to be "virtual" presence as contrasted to "physical" presence. However, it did not preclude a physical presence, although Navy and Marine critics of the White Paper were quick to see it as a threat to their long-time roles in overseas deployments. To the Air Force, however, presence meant the "posturing of military capability, including nonbelligerent applications, and/or the leveraging of information to deter or compel an actor or affect a situation."<sup>5</sup> The ability to quickly project a "presence" anywhere in the world was the cornerstone of Air Force planning and policy into the next century. Such a presence could take a number of forms, such as an actual combat scenario where aircraft would drop bombs and shoot down aircraft; a humanitarian scenario where Air Force transports provided life-saving support; a scenario where aircraft and other reconnaissance sources were stationed over a potential hot spot, in essence showing that country that the United States was there watching; or the inherent global presence of space systems.

This global capability as stated in "Global Reach-Global Power" and "Global Presence" was tested several times during the waning years of the century when the Air Force was called on to move its units and engage in combat (to varying degrees) in areas that had become the new flashpoints of regional instability: places such as Grenada, Libya, Panama, Somalia, Bosnia, and, especially, the Persian Gulf.

A couple of examples demonstrate the Air Force's "Global Reach." In August 1994, two B-52Hs left Barksdale Air Force Base, Louisiana, on an around-the-world bombing mission. Following a 17-hour flight, the planes dropped 13.5 tons of bombs on a Kuwaiti target range, then returned to Barksdale via the Philippines. The mission took 47 hours and 5 air refuelings. This mission was followed in June 1995 by a 25,000-mile, 36-hour, around-the-world, nonstop flight by a pair of B-1Bs from Dyess Air Force Base, Texas. While setting three world speed records, the two planes also dropped training munitions on ranges in Italy, Japan, and Utah.

Throughout the last 20 years of the century, the Air Force, like any well-run organization, military or civilian, continually planned for the future. It did this in the form of studies, numerous planning documents, and other papers (such as "Global Reach-Global Power") detailing what the service required for it to remain a viable force in the coming years. From the mass of material gathered came various plans and strategies to be utilized in order "to keep one step ahead." These plans and strategies were issued in several forms.

For the acquisition of new aircraft, one of the first of these plans was an Airlift Master Plan initiated in 1982. The plan, a result of a 1981 Department of Defense

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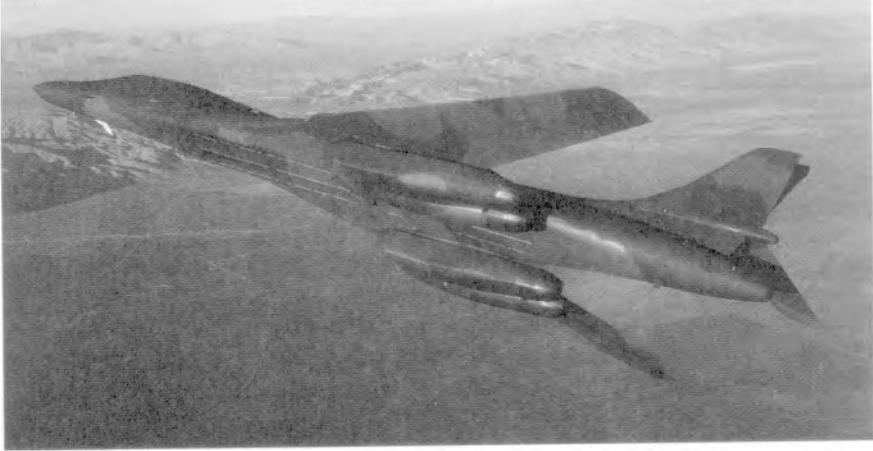
study of strategic mobility, was intended to close the gap between U.S. strategic airlift capabilities and requirements. Its centerpiece was the C-17, with 210 to be acquired by 1998. It also recommended the retirement of approximately 180 C-130s and 54 C-141Bs between 1991 and 1998. The remaining C-141s would be transferred to the Air Force Reserve. The Air Force felt the useful life of these aircraft could not be extended beyond 2015, even by extensively modifying them. The study concluded that the Military Airlift Command had to be capable of moving cargo at a rate of 66 million ton-miles per day over intercontinental distances. However, at the time of the study, the command fulfilled less than half of that requirement. Despite the addition of 50 newly built C-5Bs, stretching C-141s, modifying KC-10s to a convertible cargo configuration, and building up the Civil Reserve Air Fleet, by 1989 the strategic airlift capability would still be only 49 million ton-miles per day.

The Airlift Master Plan was updated in 1995 by an Integrated Airlift Acquisition Strategy. The information required to support this strategy was to be presented to the Defense Acquisition Board during its November 1995 meeting. A reassessment of the United States' strategic mobility requirements resulted in a reduction in the cargo figure from 66 in 1982 to 49-52 in 1995. However, the rapidly approaching end to the C-141's service life meant that even the lower figures could not be met without obtaining either more C-17s or a combination of C-17s and Non-Developmental Airlift Aircraft. Although the C-17 was the most capable military airlifter, the Air Force also realized that the most cost-effective acquisition could be a mix of C-17s and a civilian airlifter of whatever type the board chose. It all hinged on the important November 1995 meeting.

A second acquisition plan which the Air Force presented to Congress in 1984 was the "Tactical Fighter Roadmap." In it the service outlined what it saw as its fighter needs through 1993 and the buildup to a 40-fighter wing equivalent structure. At that time, the Air Force visualized a force of at least 392 F-15Es (four wings of 72 or more aircraft), with the Es and F-16C/Ds carrying the new infrared navigation and targeting system and advanced medium-range missiles. Commenting on the 1984 Roadmap, Air Force Chief of Staff Charles A. Gabriel stated, "[It] addresses our force requirements in terms of quantity and quality. It prescribes a procurement strategy that will increase the current force of 36 tactical fighter wings to 40 wings while sustaining the force at an acceptable age."<sup>6</sup>

The fiscal year 1984 Defense Authorization Bill provided for purchasing 36 F-15s per year. Three years later, as F-15Es began to be produced, the Air Force strove for a 392 F-15E force, planning on an annual procurement of 48 aircraft a year through 1994. Because of fiscal constraints, this number had to be reduced to 42 aircraft per year. Then in the 1990 and 1991 budgets, the Air Force absorbed cuts of \$2.76 billion and \$3.6 billion respectively by extending programs rather than canceling them. Procurement of additional F-15Es, however, was a casualty of these cuts. Production of the fighter was to be terminated after 1991, and only about 200 would be built.

## The Air Force Approaches the Next Century



The B-1B bomber.

Another study was the “Bomber Roadmap” issued in June 1992. It outlined what the Air Force saw as an operational concept and structure for its future bomber forces. The study was the result of changes brought about by the various nuclear arms reduction initiatives and the breakup of the Soviet Union, which caused the Air Force to greatly reduce planning for global nuclear wars. Instead of the nuclear mission as the primary role of the bomber, its proposed role shifted sharply to a more conventional mission.

The Bomber Roadmap assumed that by fiscal year 2001 the bomber force, with enhanced capabilities, would be able to destroy all of the more than 1,250 target elements, i.e., aimpoints or building corners, of a hypothetical list of 238 high-priority targets. These target sets were based on Gulf War experience. At the same time, the bombers would be able to swing between two conflicts as spelled out in the new strategy of fighting and winning two nearly simultaneous major regional conflicts. (See page 553.)

For planning purposes, the 1992 roadmap assumed a total bomber force of 95 B-52Hs, 96 B-1Bs, and 20 B-2As. However, requirements for training, depot maintenance, and testing meant that only 80 B-52s, 80 B-1s, and 16 B-2s would actually be available to the commanders at any one time.

Air Force planners estimated that by the end of the century, overall spending on the bomber force would decrease by 63 percent, from about \$5.76 billion in fiscal year 1992 to \$2.126 billion in 1999. Even with such steep decreases in funding, technological advances would result in much greater capabilities for the bomber force. The largest share of this funding (a bit over 52 percent) would go into support costs, such as spares and war reserves. The B-1, as the primary player in the bomber force, would receive most of the funding for support and enhancement costs.

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In 1995, the Bomber Roadmap was updated in an Air Force White Paper. The number of aircraft in the total bomber force changed slightly to 181 bombers (66 B-52Hs, 95 B-1Bs, and 20 B-2As) that would be available to meet future challenges. The Air Force also estimated that at least 122 bombers, all with enhanced conventional capabilities, would be able to execute the two-conflict strategy.

Several new aircraft became part of the global capability exemplified in "Global Reach-Global Power" and "Global Presence." The F-117A and the B-2 emerged from the so-called "black world" where highly classified projects were developed, the B-1B was the end product of an earlier canceled program, the F-22, was designed to replace the F-15 and to operate well into the twenty-first century, and the C-17 became operational as the Air Force's primary airlifter. Some of these aircraft traveled very rocky roads from their initial design stages through to their test and production stages, and even later, after they had entered service. All encountered technical and budgetary problems, not to say, philosophical differences over their effectiveness, which created further difficulties with a Congress searching for ways to save money in the U.S. budget. Expensive military programs offered tempting targets to the congressional ax-wielders.

Following his election in 1980, Ronald Reagan's campaign oratory regarding the need to strengthen U.S. defenses quickly turned into deeds. In March 1981, Caspar W. Weinberger, the new Secretary of Defense, told Congress that the United States had to redress the strategic balance that, in the new administration's view, had become seriously disarrayed in favor of the Soviets. To accomplish this, the U.S. ballistic missile force had to be increased and strengthened by completing the MX missile and by developing further types. A new manned bomber also needed to be acquired. The new bomber was the B-1B, but development of a second bomber (then called the Advanced Technology Bomber, later the B-2) was also proposed.

The simultaneous development of these two bombers did not please some in Congress. The costs of these highly sophisticated programs created great concern, but these critics also wondered that if the B-2 was as great as was being touted, and since its initial delivery time would be about the same as the first B-1Bs, why was the first bomber needed. Secretary Weinberger pointed out that the development of the B-2 entailed some risk. If shortcomings were discovered in the technology, more B-1Bs could be procured from an active assembly line. Conversely, if the B-2 proved successful and if the B-1B itself encountered problems, fewer than 100 B-1s could then be bought.

Senior Air Force officials also pointed out that acquisition of both bombers was the most prudent approach to revitalizing the manned bomber force. With the B-52 rapidly approaching the end of its operational life, the addition of the B-1B, able to penetrate Soviet defenses well into the 1990s, would let the Air Force shift the B-52s to the less demanding standoff cruise missile role. Then, as the Soviets reacted to the B-1 threat, the B-2 would come on line, enabling the

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B-52s to be retired and the B-1Bs to take over both the conventional and “shoot-penetrate” roles.

The Rockwell B-1B Lancer’s immediate predecessor, the B-1A, had already felt the cost-cutters axes in 1977. After only four prototypes had been built, the B-1A program was cancelled. Among the reasons the Carter administration gave for this decision were the soaring costs of the B-1A program; that modified B-52s could carry air-launched cruise missiles and thus be cheaper and more effective than the B-1A; and that a new technology, “Stealth,” which held great promise in aircraft applications, was just beginning to appear. Nevertheless, although B-1A production was halted, research and development was allowed to continue, a step which left open the possibility that the bomber might yet be saved.

With the B-1A’s cancellation, the Air Force began a new Bomber Penetration Evaluation study, using the four B-1As as research vehicles. At this time, both the Department of Defense and Congress considered obtaining a stretched version of the FB-111A (which itself had been planned only as a interim type until the B-1A became operational) as a substitute for the B-1A. The Carter administration planned to modify 67 FB-111As to a “stretched” FB-111H configuration as well as to build 98 new aircraft.<sup>7</sup> Although some senior Strategic Air Command officers, particularly the commander, Gen. Richard H. Ellis, now favored the modified FB-111, many in the Air Staff did not. This stretch proposal was discarded shortly afterward for several reasons. One was that the aircraft so created would not make an efficient penetration bomber. A second was that the FB-111H would not effect major cost savings over a B-1. Probably the main reason the FB-111H did not receive production approval was that when Reagan entered office in 1981, he strongly supported the B-1.

In October 1981, the B-1B was officially selected as the best choice for a multirole bomber. The aircraft maximized both range and payload, had the ability to perform the missions of conventional bomber, cruise missile launch platform, and had a nuclear weapons delivery system in both tactical and strategic roles. In response to congressional skepticism, Reagan certified that a 1986 initial operational capability was achievable and that the acquisition of 100 B-1Bs was feasible within a \$20.5 billion (in 1981 dollars) budget estimate. However, this amount would be achievable only if Congress appropriated the money in the amount and according to the schedule advanced by the administration. The acquisition program came on line below the certified cost ceiling; however, the fiscal year 1986 budget reduced B-1B funding about \$1 billion below that ceiling. The Air Force viewed this cut as risky and subject to future requests for supplemental funding. Additionally, in the President’s 1986 budget, slightly less than \$6.6 billion was requested for production of a final 48 aircraft, initial spares, and continued test and evaluation.

Besides the Reagan administration’s strong support, the new B-1B enjoyed some of the benefits of research into the newly introduced technology of low-

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observables, more commonly referred to as “Stealth.” Actually, the theory that led to the development of Stealth technology is far from new. In the mid-1880s, the Scottish physicist James Clerk Maxwell developed mathematical formulas for the refraction of light waves or energy waves off geometric shapes, and Arnold Johannes expanded on Maxwell’s work at the turn of the century. Not until 1962, however, when Soviet physicist Pyotr Ufimtsev published his scientific paper “Methods of Edge Waves in Physical Theory of Diffraction,” did the possibility of reducing an aircraft’s radar and infrared signature become feasible.

Although the Soviets heaped honors upon Ufimtsev for his breakthrough work, they proceeded to ignore it. Not so the Air Force. When Ufimtsev’s paper, and several others, including a book, in which he expanded upon his initial theory, reached the attention of United States intelligence experts in 1971, they became quite interested in his theory. They soon passed this information on to aerospace firms participating in a 1974–1975 Defense Advanced Research Projects Agency project on aircraft signature reduction.

Both the F-117 and the B-2 were greatly influenced by Ufimtsev’s theory, but the B-1B also enjoyed some of the fruits of Stealth technology. Although the B-1A had a smaller radar cross section than the B-52, the redesigned B-1B had even less, approximately 1/69th of the older bomber. The smaller signature, along with virtually smokeless engines, a blended wing/body, variable-geometry wings, high speed at low altitudes, and an automatic terrain-following system, theoretically meant that the B-1B could penetrate heavily defended areas with greater ease than the aging B-52Gs and Hs. Thus, the B-1B’s design is that of a nuclear weapons-carrying penetrator.

Officially named Lancer, although its crews preferred the appellation “Bone” (for B-One), the first of the new bombers arrived at Offutt Air Force Base, Nebraska, in July 1985, followed by assignment to wings at Ellsworth, Dyess, Grand Forks, and McConnell Air Force Bases. Controversy also arrived with the aircraft. Even though the bomber was designed as a high-speed, low-altitude penetrator, critics complained the aircraft was too slow at high altitudes; they completely missed the B-1’s design rationale. Even before delivery of the final B-1B, the aircraft’s countermeasures suite was causing headaches for both the builders and the Air Force. This very complex system—some 108 separate components operating as one unit—did not work properly. Fixes for deficiencies were identified and the system was to be modified to correct the problems, as well as enhance it for the conventional role during the Conventional Mission Upgrade Program in the late 1990s.

Delivery of the B-1B was completed in April 1988, with six squadrons receiving 74 aircraft and a 25-plane reserve. This was later changed to a total of 90 aircraft in the squadrons and 7 in storage, and further altered to a proposed force of between 70 and 84 aircraft by the year 2000. Meanwhile, with the threat of nuclear war receding due to the end of the Cold War, the Air Force increas-

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ingly considered using the B-1B in the conventional role. To enhance the aircraft for this role, the upgrade program also initiated a series of upgrades for the B-1B. A portion of these modifications consisted of certifying the bomber to deliver cluster bomb munitions. Although Congress looked askance at a conventional B-1B, Air Force officials continued to plan for the bomber to use a full range of ordnance, including the Joint Direct Attack Munition and the Joint Standoff Weapon, plus newer avionics.

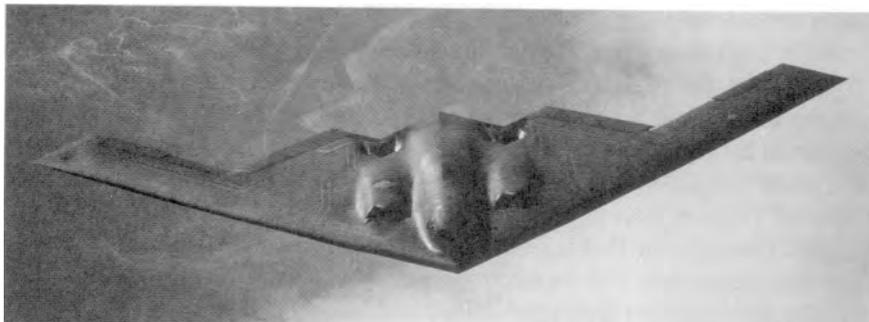
Unfortunately, the B-1 suffered considerable bad publicity, not only with the problems associated with its electronics suite, but also with crashes of three of the aircraft<sup>8</sup> and other highly publicized instances of fuel leaks (quickly solved) and groundings of some of the B-1Bs due to cracks in portions of the airframe and the landing gear. A lack of spare parts also contributed to a low mission-capability rate for the B-1B. Because of the continuing concerns about the B-1's ability to perform its mission, Congress, in 1994, directed that an operational readiness assessment be held. Results from this assessment would then determine if the bomber could achieve a 75 percent mission capable rate for a six-month period, given 100 percent of its required parts, supplies, and manning. From June 1, 1994, to November 30, 1994, the Ellsworth-based 28th Bomb Wing conducted the assessment and attained an almost 85 percent mission capable rate, thus fully validating the B-1B's mission capabilities.

Probably the most striking and most technologically advanced aircraft sought by the Air Force was the Northrop B-2, later named the Spirit. This unique flying wing design combined stealth characteristics with advanced avionics, but it was an extremely expensive aircraft to obtain. As of 1989, the B-2's estimated total program cost was \$66 billion in 1989 dollars. The primary reason for this extraordinary cost was the plane's revolutionary technology. Almost one-third of the total program cost was in research and development. In 1988, the Air Force estimated that actual B-2 flyaway costs (in 1989 dollars) would be \$274 million. This contrasted with \$228 million for the B-1B and \$150 million for the Boeing 747. Actually, the B-2 program consumed a smaller portion of the defense budget over its procurement period (1.3 percent) than either the B-52 (1.4 percent) or the B-1B (1.6 percent).

The first B-2A flew in July 1989. A month earlier, the Air Force was still planning to procure 132 of the flying wings by mid-1996. By now, tensions between East and West had subsided considerably and the need for that many bombers came under great scrutiny in Congress. Also, increased pressure by a Congress shocked at the cost of the B-2 program resulted in a 1991 budget specifying only 75 B-2s. This number was sliced even more drastically in 1993 to a final buy of only 20 of the bombers.

However, in the 1995 budget, released in February 1994, \$793 million was made available for further research, testing, and equipment for the bomber. Four months later, in June, the Senate Armed Services Committee approved an option to buy more B-2s, and it allocated an additional \$150 million to keep the pro-

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The Northrop B-2 Spirit.

duction line open. Then, in the summer of 1995, the number of B-2s to be acquired again became a point of contention in Congress. Republicans, with a majority in the House, tentatively agreed to increase defense funding for a buy of possibly 20 additional B-2s.

Sixteen B-2As were to be assigned to the 509th Bomb Wing at Whiteman Air Force Base, Missouri; eight to each of the 509th's two squadrons. The wing received its first aircraft on December 17, 1993. Initial operational capability for the first squadron was scheduled for 1997, and full operational capability for the second squadron was set for the early 2000s. Originally designed to replace the B-1B in the nuclear bomber penetration role, with global nuclear warfare much less likely following the Soviet Union's demise, the B-2A's mission was modified to include carrying conventional precision-guided munitions. The 20 aircraft were to be produced in three construction blocks. Block 10 planes would carry up to 16 B83 nuclear weapons or MK 84 2,000-pound general purpose bombs. Block 20 aircraft could also carry up to 20 B61 nuclear weapons, various cluster bomb configurations, and would have a limited precision-guided munitions capability. The last two aircraft would be Block 30 models, with full precision munition capability and the ability to carry other conventional bombs and mines. This block would also have avionics improvements. By 2000, all B-2s would be modified to the Block 30 configuration.

Because of the very small numbers of aircraft bought, where the loss of even one could create serious operational problems, some critics of the program saw the B-2 as never being used in a conventional role, but harbored instead for a final nuclear cataclysm. Gen. John M. Loh, the Air Combat Command leader, was enthusiastic, however, about the plane's positive aspects. He believed that just the 20 aircraft would give him enough flexibility to fight two wars simultaneously, a strategy adopted in the Department of Defense's 1993 "Bottom-Up Review."

On November 10, 1988, the Pentagon finally admitted the existence of the F-117A, more than ten years after the first scaled-down versions—known as

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The remarkable F-117A.

Have Blue—flew and more than seven years after the F-117's first flight. Until 1988, this remarkably different-looking aircraft operated in that black world which few hope to enter and where special access to virtually any item regarding the aircraft was a zealously guarded secret. Unlike the smooth design of the later B-2, the F-117 was all angles, or facets, carefully plotted to scatter radar energy away from the aircraft. With this energy dissipated unevenly, a radar site would be unable to "paint" the aircraft on its radar screens, and the plane would become, for all intents, invisible or "stealthy."

Although carrying the "F" for fighter designation, the F-117A was not a fighter but a bomber. With only subsonic performance, it had no gun or missile armament and carried only a small number (often just two) of laser-guided bombs. It did have a superior bombing-navigation system that enabled it to perform with astonishing effect in the Gulf War. The final F-117A, the 59th built, was delivered to the 37th Tactical Fighter Wing on July 12, 1990. At a time when defense critics were looking for every supposed fault in military programs so as to bludgeon the services about perceived inefficiencies and wasted resources, the F-117 was a remarkable example of how efficient the military acquisition and development process could be. This last F-117 was delivered two months ahead of schedule and under budget.

In 1984, the Air Force issued a Request for Information to several aircraft companies concerning a new Advanced Tactical Fighter. After considering the responses to this request, the Air Force set certain goals the fighter must obtain. Among the more important were requirements to fly supersonically without afterburning (supercruise), have a greater range than the F-15, have high maneuverability using vectored or reverse thrust engine nozzles (although Northrop's design forewent this feature), be able to operate from short airfields, and be as stealthy as possible.

A Request for Proposal for demonstration and validation aircraft was issued in September 1985, along with changes and ongoing engine contracts with Pratt

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The Lockheed YF-22, the Air Force's fighter for the next century.

and Whitney and General Electric. Seven manufacturers responded. Lockheed and Northrop submitted winning proposals for the tests. Because of the likely extensive development costs, not to say the design of new technology airframes and avionics, both companies decided to join forces with other manufacturers for full-scale development of the winning designs. Thus Lockheed teamed with Boeing and General Dynamics for the YF-22 and Northrop and McDonnell Douglas teamed on the YF-23.<sup>9</sup>

The first of the two candidates to fly was the Northrop-McDonnell Douglas team's YF-23A. It flew in August 1990, followed a month later by the YF-22A. After a series of tests and an intensive source selection process, the Air Force chose the YF-22A as its next-generation fighter, and the Pratt and Whitney F119 engine to power it. It would be the last fighter to be obtained by the Air Force in the twentieth century. Although originally envisioned as an air superiority fighter and a replacement for the F-15C, and designed to engage enemy fighters beyond visual range, the Air Force soon reconfigured the aircraft to have a limited air-to-ground capability as well. In addition to its air-to-air armament of an internal 20-mm gun, AIM-9 or AIM-120 missiles, the F-22 was now projected to carry joint attack munitions and other advanced air-to-ground weapons. Initially, the Air Force planned to buy 750 of these planes to replace its F-15A/C/D fleet, but its plans were revised after a reassessment of force sizing requirements and financial considerations in the post-Cold War era. Following a 1990 review of major aircraft acquisitions, a buy of 648 aircraft was anticipated; this number was further reduced in 1994 to 442 aircraft as a result of congressional budget cuts.

The C-17 Globemaster III actually originated in 1979 when the Department of Defense directed the development of a new strategic transport, the CX. Although the Douglas Aircraft Division of McDonnell Douglas won the CX

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Air Mobility Command's C-17.

competition, the program was shelved in 1982 because other less-costly or more readily available possibilities drew more favor. Among these possibilities was the purchase of more C-5s or an already available commercial cargo aircraft. Indeed, 50 more C-5Bs were obtained, as were 44 KC-10A dual-role tanker/transports. Nonetheless, Douglas was directed to continue design work on the CX, which soon received the designation C-17. Then, in 1985, full-scale development of the transport was approved. The C-17 became a congressionally directed Defense Enterprise Program as designated by the Office of the Secretary of Defense. On December 18, 1988, the Defense Acquisition Board approved a low-rate initial production schedule. General Gabriel saw the C-17 as the “key to our future force projection capability.”<sup>10</sup> The plane did have tremendous capabilities; it could haul outsize loads such as tanks and helicopters; carry up to 102 troops or a maximum payload of 172,200 pounds; and operate in and out of short, unprepared airstrips. Unfortunately, numerous problems plagued the development of the C-17.

As the first prototype took shape, both the manufacturer and the Air Force discovered the aircraft was well over its planned weight, leading to reductions in the plane's prescribed range and payload. Other problems included fuel leaks, computer software “glitches” in its flight systems, concern about the aircraft's airworthiness (the wings of one of the static test articles failed at loads well below the manufacturer's specifications), and cost overruns. Exacerbating the final problem was Secretary of Defense Richard Cheney's 1990 decision to slice the planned acquisition of 210 aircraft to 120, which made each aircraft cost more.

Following an intensive review by the Defense Acquisition Board, on December 15, 1993, the Secretary of Defense placed the C-17 program on “probation” for two years, with acquisition of the C-17 limited to only 40 aircraft. A

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The spacious interior of the C-17.

November 1995 board meeting ended the transport's probationary period and resulted in the decision to reinstate a production run of 120 aircraft. While the fate of the C-17 was being debated in the Pentagon and in Congress, the 437th Airlift Wing received its first C-17 in June 1993; 12 were on hand in early 1995. On January 17, 1995, the Air Mobility Command declared the 437th's first squadron as operational. Even before then, in October 1994 when Iraq again appeared to be threatening Kuwait, a pair of the wing's C-17s performed their first contingency deployment during Operation Vigilant Warrior.

A decision on the acquisition of C-17s was needed urgently because of three factors. First, the C-141 fleet was rapidly wearing out. Because of the high amount of flying time incurred during the Gulf War, structural fatigue had become a major problem for the C-141 fleet. In fact, in January 1994, the entire C-141 fleet was temporarily grounded as a result of fatigue problems. Although extensive repair efforts kept the C-141s in the air, these were only stopgap measures, and replacement of the planes could be delayed only slightly. At the end of 1994, the Air Force announced that its active-duty C-141s would be phased out by 2003. The drawdown of the Starlifter fleet would continue as Reserve and Air National Guard aircraft were also withdrawn from service, and by 2006, all C-141s would be retired. Second, the Army's newest equipment (the M-1 tank, AH-64 Apache helicopter, Patriot missile launcher, etc.) did not fit into the C-141. Third, the withdrawal of U.S. military forces from overseas meant that a large permanent forward presence was a thing of the past. Thus, the only means to respond rapidly and flexibly to threatening situations overseas was airlift, where the C-17 would provide significant capability.

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The Slingsby T-3A Firefly training aircraft.

Another aircraft that would have a much greater effect on operations than the small number of aircraft procured would indicate was the E-8A Air Force/Army Joint Surveillance and Target Attack Radar System. Initially developed for ground surveillance, targeting, and battle management missions, it was later scheduled to operate also in the bomb-damage assessment role. Development of the type started in 1985, and evaluation tests of the E-8A and its 25-foot-long ventral phased-array multimode radar took place in Europe in February and September 1990. These evaluations received high marks from all the participants. Although only two prototypes, ex-airline 707-320 airframes, were available when the Gulf War began, the success of their European evaluations led to their being rushed to Saudi Arabia where they performed brilliantly. The Air Force planned to acquire at least 20 E-8s, modified from used 707s, with delivery beginning in 1996 and an initial operational capability in 1997.

Manned aircraft were not the only types engendering Air Force interest in the nineties. Indicative of the growing importance the service now placed on unmanned aerial vehicles was the July 1995 activation of the Air Force's first unmanned aerial vehicle squadron. Designated the 11th Reconnaissance Squadron, the unit was assigned to the 57th Wing at Nellis Air Force Base, Nevada. The squadron was equipped with Predator unmanned aircraft manufactured by General Atomics Aeronautical Systems. This lightweight craft carried both electro-optical and infrared sensors and could fly 24-hour missions up to 500 miles from its base.

Further aircraft buys that would provide the Air Force more economic and efficient utilization of resources into the twenty-first century involved trainers. Two new trainers entered Air Force service in the 1990s. One was the Slingsby T-3A Firefly. This British-designed, propeller-driven aircraft replaced the aging Cessna T-41, and was used by two squadrons. One of these, the 557th Flying

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The Beech T-1A Jayhawk trainer.

Training Squadron at the Air Force Academy, used the aircraft to screen potential pilots in the Academy's cadet wing. The second squadron, the 3d Flying Training Squadron based at Hondo Field, Texas, (near Randolph Air Force Base), performed similar duties for Officer Training School and Reserve Officer Training Corps candidates. The first aircraft, of a proposed buy of 113, entered service in early 1994, and deliveries were completed in January 1996.

The second new trainer was the Beech T-1A Jayhawk, a twin-engine military version of a business aircraft. One hundred-thirty of a projected buy of 180 aircraft had been delivered by January 1, 1996. This aircraft fulfilled the requirement of a newly revised curriculum, called Specialized Undergraduate Pilot Training. It was a dual-track program, in that all students initially flew the T-37, then entered one of two tracks. Students selected for fighter and bomber assignments would go on to fly the T-38. Students scheduled to fly large aircraft, such as the KC-10 and KC-135, C-17 or C-5, would go directly to the T-1A. This latter track was named the Tanker-Transport Trainer System. It began at Reese Air Force Base, Texas, in 1992 and expanded to four more training bases in 1995 and 1996. The T-1 program was a full-system approach to training, including not only aircraft, but a ground system, known as the Ground Based Training System, of flight simulators, procedures trainers, courseware, technical data, and other ground training.

By the 1990s, both of the Air Force's and Navy's primary trainers, the T-37 and T-34, were decidedly "long in the tooth." An extensive review of training requirements for both services began in 1989 with the Trainer Aircraft Masterplan. This was followed in 1991 by the issuance of detailed operational characteristics of a proposed Joint Primary Aircraft Training System. Although it was primarily an aircraft acquisition program, it was also a full-system training approach like

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that used with the T-1. Most important, however, was that the Joint Primary Aircraft Training System was a truly "joint" program.

In 1993, the Secretary of Defense directed the Secretaries of the Air Force and Navy to consolidate primary fixed-wing training for all the services and to transition to a common primary trainer. Within a couple of months, both service secretaries forwarded to the Secretary of Defense a joint training plan. The plan called for the consolidation of Air Force and Navy flight training programs. Potential pilot candidates would be screened initially by their respective services (Air Force, Navy, Marine Corps, and Coast Guard) before entering the Joint Primary Training program. Two prototype primary training squadrons (one T-37 squadron at Reese and one T-34 squadron at NAS Pensacola, Florida) were established. Reflecting the joint nature of the program, the executive officer of the Pensacola squadron was an Air Force lieutenant colonel, while the operations officer for the Reese squadron was a Navy commander. As the remaining primary training squadrons transitioned to the joint training, they would also become joint squadrons. When the students completed the Joint Primary Training stage, they would advance to a four-track, follow-on training regime. Students would attend an Air Force bomber/fighter track, a Navy fighter/attack/E-2 or C-2 aircraft track, a joint airlift/tanker/maritime track using T-1A jets or T-44 twin-engine turboprops, or a helicopter track.

The Air Force was designated the lead service for this program. A Request for Proposal was issued on May 18, 1994, listing the necessary requirements for the trainer and also encouraging the use of commercial standards and best industry standards as much as possible. Seven contractors responded to the request with turboprop, turbojet, or turbofan designs. Most were basically "missionized" versions of commercial aircraft. Interestingly, although all the manufacturers had to be American, all but one of the proposals were based on foreign designs.

On June 22, 1995, the Raytheon Aircraft Company's Mk II turboprop (a derivative of the Swiss-designed Pilatus PC-9) was named the winner. Contract award was scheduled initially for later that year, but two of the losing competitors filed formal protests, eventually rejected, about the awarding of the contract. It was intended that the Air Force acquire 372 aircraft, with introduction into service by the turn of the century. The Navy would buy 339 aircraft and place them in use beginning in 2003. The Secretary of Defense designated this program as one of his five acquisition pilot programs. As such, it was intended to incorporate a streamlined acquisition approach and to encourage commercial practices. Only time would tell if this approach in the new era of "jointness" would prove successful.

Aircraft were not the only weapons systems the Air Force sought. Reflecting the findings of the President's Commission on Strategic Forces (the Scowcroft Commission) that were made public in April 1983, the Air Force embarked on an intercontinental ballistic missile modernization program. The Commission specifically recommended the development of a new, small ballistic missile; the

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The pieces flying from this LGM-118A Peacekeeper missile are “friction pads” designed to provide a snug fit for the missile inside Minuteman silos.

deployment of 100 LGM-118A (also known as the Peacekeeper or MX) missiles in existing Minuteman III silos near Francis E. Warren Air Force Base, Wyoming; the development of new mobile and hardening technologies; and the improvement of C<sup>3</sup> facilities for the U.S. strategic forces.

Peacekeeper was a 195,000-lb., 4-stage missile carrying up to ten independently targetable warheads. It was in full-scale development in 1985, first deliveries took place in 1987, and it was declared fully operational in December 1988. Congress approved in 1986 the deployment of only 50 of the missiles, and all 50 had been deployed in the Minuteman silos by June 1989, displacing LGM-30G Minuteman III missiles. The procurement and deployment of further missiles was subject, however, to congressional approval of a more survivable basing mode. Serious consideration was given the concept of basing pairs of these missiles on trains, which could move from place to place, thus presenting an enemy with the unenviable task of trying to find the missiles. The concept was known as Rail Garrison, and once it was well under way, the Air Force planned to begin production and deployment of a small intercontinental ballistic missile. However, on September 27, 1991, following a failed coup against the govern-

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ment of Boris Yeltsin and the knowledge that these Russian “hardliners” would be unable to reconstruct the fractured Soviet Union, President Bush cancelled this program, along with the small intercontinental ballistic missile mobile basing option, and the short-range attack missile. Additionally, during his 1992 State of the Union address, President Bush announced the cancellation of the entire Peacekeeper program.

The small missile, later designated the MGM-134 and nicknamed the Midgetman, was a lightweight (approximately 37,000 pounds) missile carrying a single warhead. The three-stage missile’s first flight test took place in May 1989 and was generally successful. Just the month before, President Bush directed the establishment of a two-missile program that included redeploying the 50 Peacekeepers from their ex-Minuteman silos to the Rail Garrison mode. The second portion of Bush’s program was the development and deployment of a road-mobile small ballistic missile, which was projected to be operational in fiscal year 1997. Bush’s request for the Midgetman was at odds with the Department of Defense’s views because Defense requested that Midgetman be terminated as a result of high costs. A small amount of developmental funding was requested, but no more than that. In any event, along with the Peacemaker, Bush also terminated the small missile program in January 1992.

Other missiles of interest to the Air Force included the advanced cruise missile and the advanced medium-range air-to-air missile. The nuclear warhead advanced cruise missile later became the AGM-129A. This missile was intended as a replacement for the AGM-86B cruise missile, which equipped B-52G/H units. Delivery of this long-range (approximately 1,900 miles) missile began in June 1990, and the final missiles reached the operational units in August 1993. Though the Air Force intended originally to obtain 1,461 AGM-129s, this number was sliced to approximately 640 in January 1992, and only 461 were acquired.

The AIM-120A advanced medium-range missile was designed as a replacement for the AIM-7 Sparrow, and had been under development since 1981. Production started in 1987 and the first AIM-120As were delivered to an operational unit in 1988. An improved version, the AIM-120B, was also produced. The original program requested 24,500 missiles, subsequently reduced in fiscal year 1992 to 15,450. Because of the changing threat environment resulting from the end of the Cold War, the number of missiles was further reduced to 8,450 AIM-120s for the Air Force and about 3,585 for the Navy.

Among other weapons systems the Air Force desired was the Joint Direct Attack Munition, which mated an inertial guidance system—continuously updated by the Global Positioning System—to existing MK 83 and BLU-110 1,000-lb. or MK 84 and BLU-109 2,000-lb. weapons. This relatively low-cost weapon was designed for use in adverse weather conditions. The attack munition was scheduled to be begin production in 1997, with first deliveries by 1999. It would be compatible with most of the Air Force’s combat aircraft, and the first units were scheduled for use by the B-2.

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An F-16 of the 421st Fighter Squadron fires an AIM-120A AMRAAM missile.

Also under development was the AGM-154A Joint Standoff Weapon, a folding-wing, unpowered glider vehicle, which integrated a sensor-fuzed weapon, the BLU-108 submunition, with the munition. Also fairly low cost, this weapon provided an aircraft with the standoff capability to destroy tanks in a single pass. The Navy was the executive agent for this program. A design review of this weapon took place in early 1995, and production of the Navy and Marine Corps version was to begin in 1997. Delivery of the Air Force version, carrying six sensor-fuzed submunitions, each with four antiarmor warheads, was expected to begin in 2000. A follow-on version containing a unitary 500-lb. warhead was scheduled to enter service in 2001.

Another significant weapons system the Air Force requested was the AGM-137 triservice standoff attack missile (TSSAM). Authorized in 1985, this subsonic stealthy missile was to have a range of 180 miles. Some 4,525 missiles were to be procured, with an initial operational capability of 2000, but, saddled with development problems, cost overruns, and numerous failed tests, the program was finally cancelled in December 1994. Soon afterward, the Air Force began studying possible replacements for the cancelled missile. Informally named “son-of-TSSAM,” the joint air-to-surface standoff missile became the designated replacement, and is scheduled to begin production in 2000.

Besides acquiring aircraft and missiles, the Air Force was hard at work in a philosophical arena. The services were directed by Congress and the administration to expend more effort toward working with, rather than against, each other. A number of initiatives were undertaken to accomplish “jointness.” One, a memorandum of agreement between the Air Force and the Navy, was signed on September 10, 1982. This agreement was depicted as a “major step forward in improving maritime operations and enhancing ongoing Navy/Air Force joint efforts.”<sup>11</sup> Among the specific provisions of this agreement were increased integration of Navy and Air Force forces in tactical training exercises, including Joint

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Chiefs of Staff exercises, and increased cooperation and/or interservice use of facilities, schools, weapons, etc. This memorandum eventually led to tests of the AGM-84A Harpoon antiship missile with the B-52. These tests were successful and one B-52G squadron on each coast was trained and equipped to execute Harpoon missions. As the Gs retired, the missiles were transferred to B-52Hs.

Even more important joint efforts were to come. In 1983, the Army and the Air Force signed a memorandum of understanding on joint Army/Air Force efforts for the enhancement of the Joint Employment of the Air Land Battle Doctrine. This was followed on May 22, 1984, with the signing of the so-called 31 Initiatives memorandum. General Gabriel, one of the prime forces behind this initiative, later commented, "Both services are committed to increased cooperation—working, planning, and training together to ensure the most affordable and effective combined combat capability."<sup>12</sup>

However, although both Gabriel and Gen. John Wickham, the Army chief of staff, exerted great effort to see that the 31 Initiatives succeeded, enough resistance from various interests inside both the Army and Air Force ensured that after the two chiefs retired, the 31 Initiatives died a quiet, and to some, a deserving death.

In the summer of 1983, the Defense Department's central arbitrating body, the Defense Resources Board, ordered the phase-out of B-52Gs from the nuclear attack force. Ninety B-52Gs had been designated as cruise missile carriers, each plane carrying up to 12 missiles. Although the Air Force had been willing earlier to phase out these aircraft, it was only because 200 MX missiles were to have been deployed in their place. Now, with only a possible 100 missiles, the Air Force was not too eager to part with the G models. Instead, the Air Force argued that these aircraft should be retained until a "significant" number of B-2s became operational. The Air Force was facing the possibility of having a force of only 100 B-1Bs and approximately 125 B-2s to carry out its nuclear mission. However, the board saw an immediate savings of several hundred million dollars if the Gs were not modified as missile carriers but were disposed of. Its decision, however, had no effect on the transfer of another 61 B-52Gs to Strategic Air Command's Strategic Projection Force and their use in a conventional role. B-52G/Hs began to be converted in 1987 to carry AGM-86Bs.

In 1985, Air Force plans called for these B-52Gs to leave the inventory in the early 1990s and their missiles to be transferred to the B-1Bs. By 1989, 96 B-52Hs (84 operational and 12 in storage) had been modified to carry the AGM-86B. The Hs would be retained until almost the turn of the century to perform the stand-off mission using both AGM-86Bs and AGM-129As. With the retirement of the Gs, the 47 B-52Hs in the active inventory were further modified starting in 1993 to enhance their conventional capability. Then, on the recommendations from the 1993-1994 Nuclear Posture Review, the Air Force began to restructure its B-52 force to a total of 66 B-52Hs that would be used to support the nuclear mission. In addition to conventional operations, ten B-52Hs

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would carry the Israeli-designed AGM-142 Have Nap, later named Raptor, standoff missile, 19 would carry the Harpoon, and all of the B-52s would be capable of carrying the subsequently-cancelled AGM-137 stand-off missile (in 1998), and joint attack munition (in 2001). All remaining active Hs were also to receive GPS avionics and other navigation and communications upgrades.

The Air Force's drawdown began in 1986. At its peak, the Air Force maintained 211 wings—166 active/45 Air Reserve Component. By 1995, it was to be down to 128 wings—83 active/45 Air Reserve Component. Between fiscal years 1986 and 1995, the Air Force retired about half of its bomber and active fighter force. As the drawdown was underway, the Total Force policy became more important. Between 1973 and 1985, the Guard and the Reserves increased manpower authorizations by 35 percent, while the active force size decreased by 12 percent. For fiscal year 1986, the Air Reserve Component was planned to grow by another 5,800 positions. In January 1984, the first F-16 to be accepted by the Air Force Reserve was delivered to the 419th Tactical Fighter Wing at Hill Air Force Base, Utah. Then, on April 16, 1984, the Air Force notified Congress that it would begin transferring strategic airlift assets to the Guard and Reserves. An essential part of the Total Force concept, these assets began to be transferred in 1985. By 1987 the plan was well under way. One C-5 squadron each was formed in the Guard and Reserves during this period. One C-141B squadron each would follow in 1986. Initially, 44 C-5s and 16 C-141s would be transferred under the 1986-90 Five-Year Defense Plan. This was subsequently changed to 40 C-5s and 80 C-141s, plus an additional 24 C-17s to the Air National Guard.

Another serious problem faced the active Air Force, and especially the Military Airlift Command, from the late 1970s through the early 1990s—pilot retention. Primarily caused by competition for pilots from the airline industry, it was exacerbated by several other factors: congressional threats to the current military retirement system and benefits; a widening pay comparability gap between military and civilian pay; high out-of-pocket expenses for moves when changing assignments; and the possible loss of various tax deductions to service members. Attempting to retain pilots, the Air Force instituted an Aviation Career Incentive Pay program. Then, the 1989 Defense Authorization Act required both the Air Force and Navy to develop a bonus proposal for pilot retention. On January 1, 1989, the two services implemented a bonus plan, known as Aviator Continuation Pay. Helicopter pilots also received approval for such bonuses, with the first payments starting in 1996. Ironically, in the mid-1990s, as the services shrank in size, the Air Force found itself with too many pilots and had to resort to “banking” or placing pilots in various ground jobs until they could be called up for flight duty. Various measures were initiated to “empty the bank,” and the Air Force expected this to take place in fiscal year 1996, three years earlier than originally planned.

The 1985 Defense Authorization Act prescribed statutory tenure for key procurement managers in all of the services. The act was intended to improve

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program stability and to fix accountability for cost growth in programs. It also required guarantees on many weapon systems. To satisfy the provisions of the act, the Air Force initiated a number of acquisition program management improvements to control costs, improve readiness, and enhance competition at the prime and subcontracting levels. Second sources were developed for such programs as the AIM-7M/9M, AIM-120, and Maverick missiles; combined effects munitions; and the Alternate Fighter Engine which eventually played a significant role in F-16 production. Also, by breaking out components from the prime contractors for competition, the Air Force saved overhead and handling costs. Components in these areas included such items as wheels and brakes, inertial navigation systems, radars and radomes. Finally, with the issuance of its Reliability and Maintainability 2000 Action Plan on February 1, 1985, the Air Force took the lead in the Defense Department in demanding from its contractors improved reliability and maintainability of both new and fielded weapons systems. This increased emphasis, as it became a co-equal with cost, schedule, and performance, paid off handsomely for the Air Force in subsequent years.

Readiness and sustainability were also high priority concerns for the Air Force in the eighties and nineties. These issues were not glamorous, like F-15s and B-1s, but without them the F-15s and B-1s would be useless pieces of metal. The Air Force defined ready forces as those able to engage the enemy effectively on the first day of fighting. Sustainable forces were those which had to fight during and beyond the initial period of combat. Each force was a part of the whole of the Air Force's combat capability. Both readiness and sustainability showed increases from 1980 to 1985. However, one area of concern was munitions. Although large stockpiles existed, much of this armament consisted of "dumb" weapons. More effective "smart" weapons were coming into the inventory in 1985, but at a slower rate than had been planned.

Another concern for the Air Force was the impact of what were called "Operations Other Than War." Such operations were officially added to the duties of the services in early 1995. A new National Military Strategy contained two primary objectives—promote stability and thwart aggression. Under these objectives were three tasks—peacetime military operations, deterrence and conflict prevention, and warfighting. These activities included humanitarian airlift, contingency deployments, drug interdiction, and the like. The Air Force noted in one report that, although its end strength had been reduced 34 percent since 1986, deployments (many of these not war operations) had increased fourfold. Personnel were being sent on temporary assignments more often and for longer periods. Such assignments hampered training, contributed a great deal of stress on the airmen and their families, and was becoming more and more a financial burden on the already funding-impacted Air Force.

The big increases in defense funding that distinguished the Reagan administration's first term slammed to a halt in 1985. Congress, looking at a \$200 bil-

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lion deficit and hearing horror stories (some true, most false) of fraud, waste, and mismanagement in Defense, slashed the administration's 1986 defense budget from \$322 billion to \$297.4 billion. It was the first decline in military spending of the Reagan Presidency.

Of even more serious concern to all the services over the long term was Congress's adoption of the Gramm-Rudman-Hollings Bill in December 1985. This bill was an attempt to eliminate the federal deficit by 1991. If the President and Congress could not agree on target levels to reduce the deficit, automatic cuts would kick in to meet these targets. Shouldering half of these cuts was the Defense budget. Also, in 1987 and after, these reductions would "cut across the board" in all defense programs, severely restricting attempts to shape a coherent defense policy.

Although a federal court in February 1986 found portions of the law unconstitutional, it delayed putting its ruling in effect until the Supreme Court heard an appeal. Thus, a congressionally mandated \$5.8 billion cut in 1986 defense spending was allowed to go forward, with more on the way. For the Air Force, specific reductions caused by the law included four fewer F-15s; Maverick procurement cut by 360 missiles; and day-to-day operations and maintenance funding slashed by \$965 million. Unfortunately, these first cuts fell disproportionately on research programs and operations and maintenance, areas that could least afford them. In July 1986, the Supreme Court agreed with the lower court that the act was unconstitutional. Still, this did not stop the cuts from occurring.

Gramm-Rudman-Hollings was not the least of the Defense Department's worries. Congress eyed even more cuts in defense spending, and defense reform gained new impetus in 1985. On July 15, 1985, President Reagan signed Executive Order 12526 establishing the President's Blue Ribbon Commission on Defense Management (the Packard Commission, after its chairman, David Packard). The Commission included a number of individuals who later held high government positions, including Frank C. Carlucci and William J. Perry, both later Secretaries of Defense; retired Air Force Lt. Gen. Brent Scowcroft, President Bush's National Security Advisor; and R. James Woolsey, later the Director of the CIA.

President Reagan directed the Commission to conduct a defense management study of the budget process; the procurement system; legislative oversight; and the organizational and operational arrangements, both formal and informal, among the Office of the Secretary of Defense, the organization of the Joint Chiefs of Staff, the Unified and Specified Command systems, the military departments, and Congress.

The Packard Commission's report was preceded by a call by Senate Armed Services Committee Chairman Barry Goldwater and Senator Sam Nunn for sweeping changes in Defense. These changes were enacted on October 1, 1986, when President Reagan signed the Department of Defense Reorganization Act of 1986, more popularly known as the Goldwater-Nichols Act, into law. Goldwater-

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Nichols was the most significant restructuring of the Department of Defense since 1958, when the department was overhauled.

The act was actually a much-revised version of one sponsored by Representative Bill Nichols (D-AL) in 1983. At that time, Nichols, Chairman of the House Armed Services Committee's Investigative Subcommittee, introduced legislation known as the "Joint Chiefs of Staff Reorganization Act of 1983." This major piece of legislation was intended to strengthen the role of the Chairman. It also attempted to make Joint Staff service a more attractive option for ambitious individuals in the military. Air Force General Robert T. Herres, who served as the first Vice Chairman, said the Goldwater-Nichols Act could be "focused sharply into one sentence: Increase the clout of the CINCs and the Chairman."<sup>13</sup>

Nichols' legislation placed the Chairman directly in the chain of command that had previously extended from the President to the Secretary of Defense down to the unified and specified commanders. It also extended tours for Joint Staff officers and removed a limit on the number of officers allowed to serve on the Joint Staff. Additionally, it gave the Chairman the power to supervise the commanders of combatant commands and to act as their spokesman (under the Secretary's direction) on operational requirements. It also gave the Chairman the "power to not only set the agenda for Joint Chiefs of Staff meetings and monitor their debates but the power to determine when issues under consideration would be decided."<sup>14</sup>

The entire Joint Staff, approximately 1,600 strong, was now accountable to the Chairman alone, not to the Joint Chiefs as a whole. A vice chairman position was created in order to help the Chairman handle his many new responsibilities. Additionally, the act directed a 15-percent reduction in Air Force headquarters staff and a 10-percent reduction in numbered air force and major command staffs by October 1, 1988. Numerous Air Staff functions were also moved to the Office of the Secretary of the Air Force. One of the most dramatic changes prescribed by this law, which had been sought earlier by Representative Nichols, was the provision (Title IV) for 1,000 critical joint assignments to be filled by Joint Specialty Officers. Joint Duty Assignments required average tour lengths of 3 and 1/2 years for colonels and below, and 3 years for general officers. These tour-length requirements proved troublesome to the Air Force, as did other provisions, and much effort was needed to iron out these problem areas.

These two laws forced the Air Force to abandon its goal of a 40-wing equivalent air force, "an article of faith" to many Air Force officials, and plans in 1987 envisioned just 37 wing equivalents. This was an enormous reduction (some saw it as a "big compromise") from the 70 fighter wing equivalent force originally sought by the Air Force. In 1987, the Air Force consisted of a total active force of 871,365 personnel plus a further 195,010 Air Reserve Component personnel, and some 4,885 combat aircraft.

For the Air Force, the Chief of Staff, Gen. Larry D. Welch, was responsible for overseeing the implementation of the changes imposed by the two laws. General

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Air Force Chiefs of Staff Gen. Larry D. Welch (left), July 1986–June 1990, and Gen. Michael J. Dugan, July–September 1990.

Welch, who replaced General Gabriel as Air Force Chief of Staff on July 1, 1986, first served in the Kansas National Guard before enlisting in the Air Force. He then became an instructor pilot and a fighter pilot, flying combat missions over North and South Vietnam and Laos in F-4Cs. After attending several service schools and moving up in rank and responsibilities, Welch became the Ninth Air Force commander. As its leader, he was also the Air Force component commander of the Rapid Deployment Joint Task Force, Central Command's predecessor. Welch then served in the Pentagon in various capacities, including Air Force Vice Chief of Staff. Prior to assuming the position of Chief of Staff, Welch was Commander in Chief, Strategic Air Command.

Although considered somewhat reserved by some, Welch had a sharp intellect that proved of great value to the Air Force as it dealt with many concerns during the last half of the eighties. When General Welch retired on July 1, 1990, his replacement was Gen. Michael J. Dugan. Dugan was almost the exact opposite of the somber Welch—gregarious, free-speaking, and more approachable by those in the ranks. Like Gabriel and Welch, General Dugan had been a fighter pilot and had served in Vietnam, although he flew A-1s in that conflict. After serving in the Pentagon, he became a fighter wing and air division commander. In April 1989, Dugan assumed command of United States Air Forces in Europe. Dugan's tenure as chief of staff was distressingly short, only two and one-half months. His candor to reporters in Saudi Arabia regarding Air Force plans for Desert Storm led Secretary of Defense Cheney to relieve Dugan of his duties. He retired in January 1991.

Replacing General Dugan was Gen. Merrill A. McPeak, another of the group of fighter pilots that had supplanted the more bomber-oriented chiefs of the sixties and seventies. McPeak had flown with the Air Force Air Demonstration

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Air Force Chiefs of Staff Gen. Merrill A. McPeak (left), October 1990–October 1994, and Gen. Ronald R. Fogleman, October 1994–.

Squadron, the Thunderbirds, as a solo pilot. Like the three men before him, McPeak served a tour in Vietnam. Although he held a variety of positions over the years, General McPeak remained a “fighter jock” and was still current in the F-15. Before becoming Chief of Staff, he had commanded the Pacific Air Forces.

McPeak was placed in the unenviable position of having to oversee the massive downsizing and restructuring of the Air Force. Nevertheless, he performed this task with distinction. However, other issues he initiated during his term did not gain the same accolades. His introduction of a new uniform replete with various accouterments was not well received. In fact, McPeak’s successor, Gen. Ronald R. Fogleman, although retaining the basic uniform, did away with the trimmings, to the delight of most members of the Air Force. McPeak’s hands-on disposition for determining what unit insignias would survive during the downsizing and what each insignia must look like also drew howls of pain from both retirees and active personnel who were loath to see their unit’s emblem and history disappear.

General Fogleman, like the four chiefs before him, served in Vietnam. As a fighter pilot in that war, Fogleman was shot down and wounded. He became the first Air Force Academy graduate to hold the office of Chief of Staff and had the distinction of being the first Chief of Staff to have been an instructor at the Academy, where he taught history. Fogleman had a varied career before moving to the top job in the Air Force. Along with service in Vietnam, he had been an instructor pilot, an F-15 demonstration pilot in Europe, served in various capacities in the Pentagon, commanded a wing and a division, then moved up to lead the Seventh Air Force in Korea. Prior to becoming Chief of Staff, Fogleman commanded Air Mobility Command.

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Secretaries of the Air Force Russell A. Rourke (left), December 1985–April 1986, and Edward C. Aldridge, Jr. , April 1986–December 1988.

Just as the Chiefs of Staff changed over the years, so did the Secretaries of the Air Force. Russell A. Rourke succeeded Verne Orr as secretary in December 1985, but he served only five months. Replacing Rourke was Edward C. Aldridge, Jr. Aldridge had been active, both in and out of government, as an analyst and adviser on such matters as arms control, strategic planning, and space programs. An aeronautical engineer, Aldridge was undergoing astronaut training for a space shuttle mission when he was chosen to be the new Secretary of the Air Force.

Coming in with the new Bush administration in 1989 was Dr. Donald B. Rice. A former Army officer, Rice worked in various government positions during the late 1960s and early 1970s. From 1972 until becoming Secretary of the Air Force, Rice was president and chief executive officer of the RAND Corporation. It was during his tenure that the Gulf War was fought and the tremendous downsizing and reorganization of the Air Force occurred.

In August 1993, Dr. Sheila E. Widnall became the first woman to become the Secretary of one of the services, bringing impressive credentials to the office. Like Aldridge, she was an aeronautical engineer and internationally known for her work in fluid dynamics. Before becoming Secretary, Dr. Widnall was an associate provost at the Massachusetts Institute of Technology.

These Chiefs of Staff and Secretaries were “on watch” as the Goldwater-Nichols Act affected the services. One impact of the act was the establishment of several new unified commands. One, the United States Transportation Command, was activated on October 1, 1987, under the command of Gen. Duane H. Cassidy, the Military Airlift Command commander, and it became fully operational one year later. In addition to the Military Airlift Command, it included the

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Secretaries of the Air Force Donald B. Rice (left), May 1989–January 1993, and Sheila E. Widnall, August 1993–.

Navy's Military Sealift Command and the Army's Military Traffic Management Command. Initially, the services were all unenthusiastic about formation of this command, naturally sensing that its establishment would diminish their own organization's clout and independence.

Improving the United States' military transportation systems had long been debated, often contentiously. In 1977, the Joint Chiefs believed the military transportation system was working just fine. Then came Nifty Nugget in 1978. This exercise was designed to simulate a full-scale mobilization and deployment of troops to Europe. A spectacular disaster, it was abandoned only one week into its scheduled three-week period. Severe problems in airlift and sealift capacities, along with breakdowns in communications and coordination, led to a rethinking of military transportation.

The Joint Deployment Agency, established in 1979, was an initial stab at solving the problem. Its purpose was to integrate the plans and resources of the three service transportation commands into a single "management entity," the Joint Deployment System, which, by coordinating the movement and schedules of the three transportation organizations, supported time-sensitive planning and execution and complemented peacetime deliberate planning. Good plan; bad execution. The Joint Deployment Agency/Joint Deployment System could coordinate but not command the organizations it oversaw. It lacked clout because its commander held only two-star rank, whereas the organizations it was supposed to coordinate were headed by higher ranking officers. It just did not work, and in the Grenada operation, it did not even participate.

The chiefs had favored consolidating the Army's and Navy's transportation commands in 1981, but both the Army and Navy successfully fought the idea. Congress, also, did not like the idea of the consolidation, and it mandated against

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such an action in 1983. The problems encountered in Grenada finally led to the repeal of this action with the implementation of Goldwater-Nichols.

The Transportation Command took over the Joint Deployment System. The disparity in communications equipment, computers, procedures, etc., of the three services had greatly limited effectiveness. It was hoped that the new transportation command would be able to break through this incompatibility.

During the last 20 years of the century, various arms reduction talks and treaties helped play vital roles in easing tensions between East and West, if not enormously impacting the size and structure of both sides' military forces. Although the Carter administration broke off the SALT II discussions in 1979 after the Soviet Union invaded Afghanistan, in 1982 President Reagan was willing to negotiate new arms treaties. In the spring of that year, Reagan proposed new talks to reduce, rather than limit, the total number of nuclear missiles on each side. Following a favorable response from Soviet leader Leonid I. Brezhnev, a new round of arms control negotiations, called the Strategic Arms Reduction Talks or START, commenced on June 29, 1982, in Geneva.

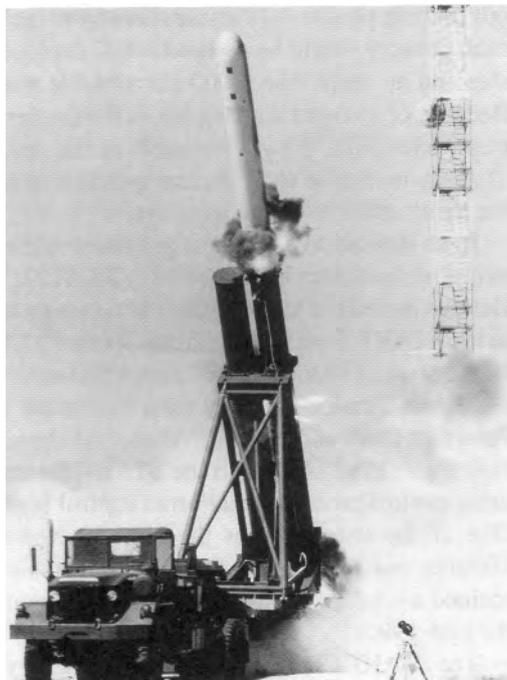
The high hopes of these initial talks were shattered in late 1983 when the Soviets broke off negotiations in protest to the deployment to Europe of intermediate-range ballistic missiles. These missiles had also been the subject of a series of off-and-on negotiations since 1981. Closely related to other arms limitations discussions, the Intermediate Nuclear Force talks stumbled along as each side jockeyed for advantageous positions on all types of arms limits. At the Reykjavik Summit, some common ground was found on which to build a treaty. Further meetings were held in 1987 to "lock in" acceptable language for a treaty, and on December 8, 1987, Reagan and General Secretary Mikhail S. Gorbachev signed this historic treaty to eliminate intermediate-range nuclear weapons based in Europe. The treaty was ratified and a compliance plan published on June 1, 1988.

Deployment of these missiles (the Army's Pershing II and the Air Force's BGM-109G Tomahawk) began in late 1983 at RAF Greenham Common. Other sites included RAF Molesworth; Comiso, Italy; Wüschiem Air Base, West Germany; and Florennes, Belgium. The first 16 missiles became operational at Greenham Common on January 1, 1984; by November 1987, some 322 BGM-109Gs, from a planned 464 (plus 95 transporter-erector-launcher vehicles), were in place. Following the treaty signing, the withdrawal and destruction of the missiles began. Final pull-out was scheduled to occur within three years, and this timetable was adhered to closely. The last BGM-109Gs were removed from Comiso on March 26, 1990, and on May 6, 1991, the last Pershing II was destroyed, completing the terms of the treaty. Some 288 Pershing IIs and 443 BGM-109Gs had been destroyed since June 1988.

In a March 23, 1983, speech, President Reagan launched the Strategic Defense Initiative, a U.S. program that played a considerable role in the START debates. This major initiative, renamed Ballistic Missile Defense and dubbed by

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Test launch of a BGM-109  
cruise missile from its  
mobile transporter.



detractors as “Star Wars,” was a call for a strategic reassessment of both the policies and technologies that had guided and formed U.S. and Allied nuclear defense since the end of World War II. It became a volatile issue with vocal and strident outbursts both pro and con on the issue. The affordability, the feasibility, the actual need for such a project provoked a firestorm of debate, with the Air Force inevitably drawn in.

The break in START negotiations lasted until 1985. Then, on October 11–12, 1986, Reagan and Gorbachev met at Reykjavik, Iceland, in what was intended to be a preliminary summit meeting to establish the ground rules for a formal summit meeting in the United States. When Gorbachev suggested discussing arms control and Reagan agreed, this “preliminary summit” turned into a full-fledged summit. Reykjavik saw both sides reach a tentative agreement on the reduction of all strategic nuclear forces by 50 percent within the first five years of the ten-year treaty period. Because of differences over strategic defense and the earlier Anti-Ballistic Missile Treaty, no final agreement was reached at Reykjavik.

At Reykjavik, the penetrating bomber, primarily the B-1B and the B-2, was seen by both sides as a “stabilizing,” non-first-strike weapon. Each bomber counted as a single weapon regardless of the number of short-range missiles or gravity bombs carried. Bush and Gorbachev signed the START Treaty in Moscow on July 31, 1991. The agreement imposed equal aggregate ceilings on the strategic offensive arsenals of both countries. Reductions would be carried

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out in three phases over seven years from the treaties initiation. After that time, each country would be allowed 1,600 deployed strategic nuclear delivery vehicles and no more than 6,000 accountable warheads (among other provisions). Because of its rapid disintegration, the former Soviet Union did not confirm the treaty. However, the governments of the new Commonwealth of Independent States, which held such nuclear weapons, signalled that they intended to ratify the treaty and live within its terms.

In an indication of the new political realities emerging from the shattered remains of the Soviet Union, on May 23, 1992, Russia, Ukraine, Kazakhstan, and Belarus joined the United States in signing a new protocol, the Lisbon Protocol, to the START Treaty. Kazakhstan ratified START in July 1992, followed by the U.S. Senate in October. The Belarus Parliament ratified the treaty on February 4, 1993, but Ukraine dawdled until November 1993 before signing. Meanwhile, President Bush and Premier Yeltsin had already signed the START II Treaty on January 3, 1993. Although the START Treaty was a major step forward in the arms control process, other arms control features proved tougher to negotiate. One of the toughest was the Nuclear Non-proliferation Treaty, which both Ukraine and Kazakhstan found unacceptable. Full accord on arms control remained a source of concern to all parties involved in the START process during the mid-1990s.

The START I Treaty was not superseded by START II, but continued in force along with the later treaty, except as modified. A major change in START II was that it counted each bomber with a nuclear role as having the number of warheads it was actually capable of carrying. This accelerated the retirement of AGM-69 short range attack missiles and B-52Gs with cruise missiles, caused a portion of the cruise missile force to be placed into storage, and reduced the number of advanced cruise missiles to 460. Following ratification of the treaty, all Minuteman IIIs were to be modified to a single warhead and various components replaced so as to extend their service life through 2020. Starting in 2000 and ending in 2003, the Peacekeeper would be retired.

By June 1992, the 450 LGM-30F Minuteman IIs had stood down from alert status and the Air Force planned to retire all of these missiles between fiscal years 1992 and 1997. Destruction of the Minuteman II silos was projected to be complete by early 1998. All B-52Gs at the Aerospace Maintenance and Regeneration Center were to be eliminated, the B-52H was to be retained in the standoff cruise missile role, the B-1B shifted to the conventional mission, and the B-2 brought on line.

Another treaty of importance was the Conventional Armed Forces in Europe Treaty. Negotiations on this treaty opened in Vienna on March 9, 1989, with the 17 NATO nations and the 6 Warsaw Pact countries participating. The agreed objectives of these negotiations were to establish a secure and stable balance of conventional forces at lower levels; to eliminate disparities prejudicial to stability and security; and to eliminate the capability for launching surprise attacks and

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initiating large-scale offensive action. This treaty was signed in November 1990, just as events in the Middle East were becoming hotter, and it entered into force in November 1992.

By June 1988, the Air Force fighter inventory had increased by 39 F-15s and 165 F-16s, but two tactical fighter wings were scheduled for deactivation including one in Spain, a result of the impending closure of the base housing the wing. Crotona, Italy, formerly a cruise missile site, was approved by the Italian government, and it was thought the Spanish-based 401st Fighter Wing might move there rather than deactivating. Instead, after some delay, primarily caused by the Gulf War, the 401st (later redesignated the 31st Fighter Wing) moved to Aviano in 1994.

On October 24, 1988, Public Law 100-526, the Base Closure and Realignment Act, was passed by Congress. Just two months later, on December 29, 1988, the Secretary of Defense's Commission on Base Realignment and Closure issued its first "hit list." This list included recommendations to close five Air Force bases, one National Guard facility, eight Army facilities, and two naval stations and to reorganize 45 other bases. The first Air Force facilities scheduled for closure were George, Norton, Chanut, Mather, and Pease Air Force Bases, and the Bennett Air National Guard facility in Colorado. Most of the aircraft at these bases would transfer to other bases, although some, particularly the B-52Gs at Mather Air Force Base, California, would be retired. Succeeding panels recommended many more base closings until the final Commission report in June 1995.

Final action on these recommendations did not occur without a fight, however. City and state governments, and, especially, congressmen eager to show their constituents how much they were working for them, pressured the Commission and the services to find some other base to close. These contentions occasionally became bitter and some closings were cancelled, but most closures came to be accepted, albeit reluctantly.

With the fall of the Berlin Wall in 1989 and the collapse of the Soviet Union signifying the end of the Cold War, the United States began rethinking its defense strategy and the posture of its military forces. Instead of just making a smaller version of its Cold War military, the U.S. took a fresh look at its defense requirements. Thus the Defense Secretary proposed a 25 percent cut, spread out over several years, in the armed services. Such cuts would reduce the Air Force 25 percent by 1995, down from 36 fighter wings to 26.5, including eliminating 9 active wings and one reserve fighter wing.

A new defense strategy with a focus on a regional consideration emerged in 1990, along with the Base Force to implement it. This strategy consisted of strategic nuclear deterrence and strategic defense, forward presence, crisis response, and reconstitution. The strategy recognized that the threat from Soviet forces and an attack in Central Europe capable of escalating into a global war had all but evaporated. In the Soviet's place, however, were other nondemocratic

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powers that “might attempt to achieve hegemony in regions” critical to U.S. interests. Such threats could occur with little or no warning.

The Base Force, which Gen. Colin Powell, Chairman of the Joint Chiefs of Staff, called his recommended minimum force, was a “framework” within which the United States could size its forces “in an era of uncertainty.” It was distinguished by four components of a total force: Strategic Forces; Atlantic Forces; Pacific Forces; and Contingency Forces. The names of the Atlantic and Pacific Forces designated their areas of commitments. Strategic Forces, designed primarily to protect against nuclear threats, consisted of the triad of submarines, bombers, and intercontinental ballistic missiles plus Global Protection Against Limited Strikes. This latter portion of the Strategic Forces was a refocusing of the Strategic Defense Initiative to provide limited defense on a global scale, including the United States, its forward deployed forces, and its allies.

During the last two decades of the twentieth century, as the Air Force expanded and then contracted, a number of new commands were established and others were abolished. Among the first of the new organizations were the Air Force Space Command, which was activated on September 1, 1982, and the U.S. Space Command, established in September 1985. (In 1986, the Air Force command became a major component command of U.S. Space Command.) The latter organization integrated all U.S. military space assets into the unified command structure, exercised direct operational control of most U.S. military space systems, planned for their joint wartime use, and was the focal point for identifying military space requirements. From the outset, it was headed by an Air Force general.

The creation of these two commands and their Air Force leadership affirmed the influence and capabilities of the Air Force in space. The Air Force had established itself as the leader in military space matters for some years prior to 1985, and its leadership continued as the twentieth century drew to a close. The Air Force had the infrastructure, the overwhelming majority (93 percent in fiscal year 1995) of the personnel for military space activities, and the budget commitment (\$5.3 billion from a total obligation authority of \$6.3 billion for the same period) required to provide space-based support for America’s global military operations.

The first space doctrine separate from that embodied in Air Force Manual 1-1, *United States Air Force Basic Doctrine*, was issued in 1982. Titled Air Force Manual 1-6, *Aerospace Doctrine: Military Space Doctrine*, the manual visualized warfighting missions, including space strike and denial missions. Four years later, however, another Air Force document was stating, “Space continues to be a place, not a mission for the United States Air Force.”<sup>15</sup> The Air Force was involved in the ballistic missile, missile warning, and satellite surveillance missions, but it also expended great effort into spacecraft launches and research and development. Then, as space occupied more of the “high ground” essential to successful military operations, Air Force Space Command began to shift from

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space exploration and research to a much greater involvement in the warfighting role.

This shift was illustrated in a new space doctrine which appeared in late 1993. *Air Force Operational Doctrine: Space Operations* (Air Force Doctrine Directive 4) continued to focus on providing combat units the space resources necessary to make them more efficient and on providing space resources for surveillance and other information functions. At the same time, it proposed warfighting missions other than support, including space-based ballistic missile defense, space strike, and other combat missions. By early 1996, as technologies improved and space became an even more important area of military operations, the command emerged from what some had characterized as an “egghead” scientific community with little association to combat activities to become an integral part of all military operations.

In addition to U.S. Space Command, two more unified commands emerged in the 1980s. On 1 January 1983, the United States Central Command was activated at MacDill Air Force Base, Florida, as a unified command, replacing the Rapid Deployment Joint Task Force. The Air Force’s component of this unified command was composed of portions of the Shaw-based Ninth Air Force. Also in 1983, the Air Force’s Special Operations units, particularly the 1st Special Operations Wing, moved from the Tactical Air Command to the Military Airlift Command. The other new unified command, the United States Special Operations Command, was activated in 1986. Its components included Air Force Special Operations Forces; the Army Special Forces and Rangers; and the three services’ special warfare schools.

The most sweeping changes in the Air Force’s organizational structure since it was established in 1947 occurred between 1990 and 1995, as the Air Force underwent a monumental restructuring, the result, primarily, of the Secretary of Defense’s July 1989 Defense Management Report to the President. This was an all-encompassing review of the defense acquisition system and the Department’s management practices. For the Air Force, the report had major consequences; Air Force Logistics Command and Air Force Systems Command were restructured in 1991, and then merged into Air Force Materiel Command on July 1, 1992. Air Logistics Centers were realigned to product and service orientations. Air Force Communications Command was disestablished as a command and redesignated a Field Operating Agency. An Air Force Special Operations Command was established on May 22, 1990, with its aircraft and personnel obtained from the Military Airlift Command’s Twenty-Third Air Force, which was then inactivated.

The Air Force also began streamlining its organizational structure from the top down—some field elements with policy responsibilities moved to headquarters, while some operational and administrative functions moved to the field; Field Operating Agencies were redesignated from Separate Operating Agencies and Direct Reporting Units to more accurately reflect their operational/implementation missions; Air Force Intelligence Command was activated at Kelly Air

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Force Base, Texas. (In October 1993, this command became the Air Intelligence Agency, a Field Operating Agency of Headquarters, Air Force.) All of these actions resulted in the elimination of manpower positions and the savings of millions of dollars.

Almost immediately after the Gulf War, the Air Force began contracting in size at a more rapid pace than it had before. On June 1, 1991, just a few months after the end of the war, the service disestablished the Alaskan Air Command and transferred its assets to the Pacific Air Forces. All surviving FB-111s began to be converted to F-111Gs and transferred from the Strategic Air Command to the Tactical Air Command. Ten tactical fighter wings were scheduled to be lost by fiscal year 1995, and manpower was to be reduced from 788,137 in 1990 to 590,112 in 1995. Furthermore, a new wing structure was created.

These new wings were composite wings. This was not a new concept; it had been implemented in the 1920s and 1930s and again during World War II by the Air Commandos, but General McPeak became quite interested in composite wings. His interest was spurred by the success of several provisional units during the Gulf War, particularly the Proven Force composite unit stationed in Turkey.

Although the first composite wing was the 4th Wing at Seymour Johnson Air Force Base, North Carolina, it was really just a test of the concept. Consisting of KC-10s from the 68th Air Refueling Wing and F-15Es of the 4th Tactical Fighter Wing (both already stationed at Seymour Johnson), the wing was officially redesignated the 4th Wing on April 22, 1991. (In 1994, the KC-10s were transferred to Air Mobility Command, leaving the 4th with only F-15Es.) The first true composite wing was the 366th Wing, a rapid-reaction, power-projection unit based at Mountain Home Air Force Base, Idaho, with a force of F-15C/Es, F-16s, B-52s, and tankers. The B-52s and KC-135s were actually stationed at Castle Air Force Base, California, but both came under the 366th's control. Eventually, the tankers moved to Mountain Home, but the B-52s were replaced by a B-1B squadron based at Ellsworth Air Force Base, South Dakota. A battle-field support wing, the 23d Wing, with F-16s, A/OA-10s, and C-130s, was based at Pope Air Force Base, North Carolina. A third composite wing, the 347th Wing with F-16s, A/OA-10s, and C-130s, was formed at Moody Air Force Base, Georgia, in mid-1994. These composite wings gave the Air Force rapidly deployable and employable wings able to meet a wide array of contingencies.

Along with the establishment of the composite wings came a change in nomenclature for many existing organizations. Mission designators, such as "tactical" and "strategic," were dropped from wing titles. The "wing" designation now applied to those wings with multiple weapon systems. A wing with only a single weapon system was named for that system, i.e., bomb wing for a wing equipped with bombers. Also, in the Air Force Reserve, the term "Associate" for airlift, air refueling, and aeromedical airlift units augmenting the active-duty organizations was dropped. The elimination of this term, however, had no effect on the ongoing activities or responsibilities of these reserve units.

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The most significant changes, and for some, the most wrenching, were the disestablishment of Strategic Air Command, Military Airlift Command, and Tactical Air Command on June 1, 1992. Two newly created major commands took their place: Air Combat Command, headquartered at Langley Air Force Base, Virginia, and Air Mobility Command, at Scott Air Force Base, Illinois. Air Combat Command now was responsible for the strategic bomber, the CONUS-based fighter and attack aircraft, and the reconnaissance forces. Most of Strategic Air Command's tanker fleet went to Air Mobility Command.

Air Combat Command controlled four numbered air forces—the First, Eighth, Ninth, and Twelfth. Initially, the command was also responsible for the Second and Twentieth Air Forces. However, when the Air Education and Training Command was formed, the Second was assigned to that new command. It was also believed that the Twentieth Air Force, which held responsibility for intercontinental ballistic missile assets, more properly belonged under Space Command's aegis, and it was transferred to that command.

The First Air Force, headquartered at Tyndall Air Force Base, Florida, oversaw the air defense forces and provided the U.S. component for the North American Aerospace Defense Command. Smallest of Air Combat Command's air forces, the First's flying assets were Air National Guard F-16 and F-15 dedicated air defense aircraft controlled originally through four, and later three, Air Defense Sectors. Also, on October 1, 1995, the Northeast Air Defense Sector was transferred to Air National Guard control, leaving the air force with only two sectors to oversee.

Long associated with strategic bombing during its days in the Strategic Air Command, the Eighth Air Force at Barksdale, retained control of the manned bomber force (B-1B, B-2A, B-52H, and F/EF-111) after its transfer to Air Combat Command. If needed, it would also supply the air component for the unified U.S. Strategic Command. Though primarily a bomber command, the Eighth also had some C-130 units assigned, as well as a few T-37s and T-38s, which were used to provide extra flying time for bomber crews. Lastly, and somewhat surprisingly, the air force gained control of a rescue squadron equipped with HH-60G helicopters and an F-15C/D fighter squadron based at Keflavik, Iceland. The Eighth's control of the fighter squadron did not last long. Because of the reduced threat to the region, the fighter squadron was deactivated in early 1995, and the helicopter unit was redesignated a group.

Units of the Ninth Air Force, based at Shaw Air Force Base, South Carolina, saw extensive duty during the Gulf War as the air component of the Central Command. Following the reorganization, the Ninth remained primarily a "tactical" air force. The Ninth controlled six flying wings and one air base wing that had no assigned aircraft in the eastern half of the United States. Most of its aircraft were F-15s, F-16s, and A/OA-10s. Like its sister air force, the Eighth, the Ninth Air Force also had C-130 units which had been gained from Air Mobility Command on October 1, 1993.

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Probably the most diversified of Air Combat Command's air forces was the Twelfth Air Force at Davis-Monthan Air Force Base, Arizona. It was responsible for the command's bases primarily in the western United States, and it also provided the air component for the U.S. Southern Command. Of the Twelfth's nine wings, the largest was the 366th Wing, the so-called "super wing," with F-15C/D/Es, F-16C/Ds, KC-135Rs, and B-1Bs. Additional aircraft types the Twelfth oversaw included U-2s, F-117s, various models of EC-135s and RC-135s, EC-130s, A/OA-10s, E-3 AWACS aircraft, and HH-60Gs. The Twelfth also supervised training programs for the *Luftwaffe* with F-4Es and for Taiwan with T-38s.

Air Mobility Command consisted initially of three numbered air forces. The Fifteenth Air Force, at March Air Force Base, California, contained all of the command's air refueling assets; the Twenty-First Air Force, at McGuire Air Force Base, New Jersey, controlled all East Coast airlifters; and the Twenty-Second Air Force, stationed at Travis Air Force Base, California, was in charge of West Coast airlift assets. However, on July 1, 1993, the Twenty-Second was inactivated, and Fifteenth Air Force headquarters moved to Travis to assume the Twenty-Second's assets. The major reason for this move was that active-duty operations at March were scheduled to be shut down by 1995. Additionally, the command activated two air mobility wings in the fall of 1994. These units, the 60th Air Mobility Wing at Travis and the 305th Air Mobility Wing at McGuire were multipurpose organizations consisting of KC-10s, C-5s, and C-141s.

Another new command, Air Education and Training Command, formerly Air Training Command, was established on July 1, 1993. On the date of its establishment, two numbered air forces came under its purview. The Nineteenth Air Force, at Randolph, was responsible for flight and crew training from the primary through to the combat crew training unit stage. Actually, less than half of Air Combat Command's crew training was transferred to the command, and much of the crew training in the other commands was also retained by them. The Second Air Force, which moved from Beale Air Force Base, California, to Keesler Air Force Base, Mississippi, assumed the responsibility for technical training.

Concurrent with the nomenclature shifts came further changes at the base and wing levels. In the past, a base commander (often junior to a wing commander) ran all things pertaining to the operations of a base, while a wing commander was concerned only with the activities of his wing. In essence, the wing was just a tenant on the base. Under the reorganization, a policy of "one wing/one base" was established where the wing commander (now often elevated to brigadier general from the usual rank of colonel) managed and administered all operations on a base.

In a historic event for the Air Force, the Barksdale-based 46th Flying Training Squadron became the first Air Reserve Component unit to be equipped with heavy bombers. Part of the 917th Wing, the squadron began converting from A-10s to B-52Hs in December 1993 and was redesignated the 93d Bomb

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A pair of E-8s, like this one undergoing testing, performed yeoman service during Desert Storm.

Squadron. (An aircraft from this squadron flew the first Reserve “Global Power” mission on July 18, 1995.) Although it had once been intended that the Air National Guard also acquire a B-52 unit (to be based at Fairchild Air Force Base, Washington), this plan was discarded. Instead, an Air National Guard unit, the 184th Fighter Group at McConnell Air Force Base, Kansas, acquired even newer bombers when it traded in its F-16s for the B-1B in 1994, in the process changing its designation to the 184th BG. Another Guard unit, the F-15A/B-equipped 116th Fighter Wing at Dobbins Air Reserve Base, Georgia, was also slated to convert to the B-1B and relocate to Robins Air Force Base, Georgia.

Not even mentioned in the Air Force’s 1990 White Paper on “Global Reach-Global Power” nor in its 1992 update, by 1993 the term “information warfare” signaled a new era in warfare when the Department of Defense established a policy on information warfare. That same year, the Air Force established the Air Force Information Warfare Center at Kelly. The center focused on subjects such as the direct support of operations and campaign planning and also in the acquisition and testing of information warfare technology. Advances in information-based technologies, including satellites, new aircraft such as the E-8 Joint STARS and updated versions of the E-3 AWACS, and more sophisticated and powerful computers allowed the Air Force to monitor and assess most global conditions rapidly and efficiently, a process the service called “situational awareness.” This awareness resulted in a wide range of possibilities, from a force multiplier in traditional warfare to what some termed “cyberwar.” For example, in the first instance, information warfare could be used to precisely locate and destroy targets, effectively producing “more bang for the buck.” In the second, the opposition’s command and control structure could be exploited, corrupted, or destroyed through its information, information functions, and telecommunications linkage.

In its 1995 White Paper on Global Presence, the Air Force viewed situational awareness as being able to give “America the ability to anticipate crises and prepare appropriate responses to them.”<sup>16</sup> Thus, as the Air Force relied more and

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more on computers for operational and administrative management, the need to develop situational awareness through the offensive and defensive capabilities of its information systems grew increasingly important. A unique organization, the 609th Information Warfare Squadron, was established at Shaw in late 1995 to evaluate the requirements for electronic information warfare techniques against an adversary and to ascertain defenses against an enemy onslaught on U.S. computer systems.

Also indicative of the immense changes occurring in the waning years of the twentieth century were several other items of note. One was the cessation on July 28, 1990, of the 24-hour "Looking Glass" airborne alert missions performed for over 29 years by Strategic Air Command EC-135Cs. Two other events were perhaps more astonishing. In the harsh climate of the Cold War, both would have been considered inconceivable; with the collapse of the Soviet Union, the inconceivable became the imaginable. The first of these was in response to requests from officials of the Commonwealth of Independent States, the former Soviet Union. Their economy was floundering and they urgently needed food and medical supplies. A short-term airlift under the rubric Operation Provide Hope began on February 10, 1992, to provide this aid. The Twenty-First Air Force provided command and control for the operation, while the Twenty-Second Air Force furnished the C-5s and C-141s. Logistical support was handled by the 435th Airlift Wing at Rhein-Main.

During the two weeks of the operation, 65 missions were flown from bases in Germany and Turkey to some 24 locations, including Moscow and St. Petersburg in Russia and cities in ten other Commonwealth states. (One of these cities, Chita, lay almost at the border of China and Mongolia, an immense distance.) These 65 flights delivered approximately 2,400 tons of supplies, which were gratefully accepted by the recipients, but they were only the beginning. The success of the airlift engendered a second phase which began April 15, 1992, and ended July 24, 1992. More than 19,000 tons of food and medical supplies were delivered to 33 locations during this second effort. Most of this tonnage was carried by rail or sealift, but 182 tons were airlifted to their destinations. Although Provide Hope was still ongoing in early 1996, most of the supplies were transported overland, and Air Mobility Command participation in the operation had steadily dwindled since May 1993, with only occasional missions being flown. As of the end of 1995, aircraft had flown 316 missions and carried 7,872 tons of humanitarian cargo to these states.

A second, hitherto unheard-of event was the visit on March 4-8, 1992, of two B-52Gs and one KC-10 from the 2d Wing to the previously "enemy" field at Ryazan-Dyagilevo, a Russian bomber training base near Moscow. The Russians reciprocated the visit by sending two Tu-95 Bears and two An-124 Condors to Barksdale between May 9-15. This visit coincided with the Strategic Air Command's last bombing and navigation competition, Proud Shield. The Russian aircraft were displayed during the competition's awards ceremonies.

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The visit to Russia was one of the last “hurrahs” for the B-52G. In May 1994, the last B-52G in the Air Force, from the 93d Bomb Wing, was retired to the storage facility at Davis-Monthan.

In early 1993, Secretary of Defense Les Aspin ordered a new look at the military in an era of reduced budgets and reduced tensions. Called the “Bottom-Up Review,” it was a collaborative effort of the Defense Secretary and all military and other Defense components intended to define the “strategy, force structure, modernization programs, industrial base, and infrastructure” needed for the post-Cold War period. Expressed succinctly, the services would have to do more with less. The review studied four force structure options based on strategies ranging from winning one major regional conflict to winning two nearly simultaneous major regional conflicts, plus conducting smaller operations. The option chosen was one in which the United States would fight and win the two nearly simultaneous conflicts. Although these conflicts could occur anywhere in the world, the review focused on the Persian Gulf and Korean areas.

The review also evaluated force structures needed for smaller-scale conflicts, usually as part of peacekeeping operations; overseas presence; and deterrence of attacks with weapons of mass destruction. It was desired that the force structure emerging from the review would exhibit the best mix and balance of capabilities in a time of dwindling resources for the military and shifting priorities. For the Air Force, this strategy required 20 fighter wing equivalents (13 active and 7 reserve) and up to 184 bombers. Additionally, a strategic nuclear force of 500 Minuteman IIIs and a mix of nuclear-capable B-2s and B-52s were required. Most of the reductions called for in the review came from Reserve units and by drawing down even more steeply the Air Force units still in Europe.

Projected force reductions from fiscal years 1990 to 1995 included decreasing Air Force fighter wing equivalents from 36 (24 active) to 26.5 (15.25 active), and the number of heavy bombers from 268 to 181. The Defense Department also announced in January 1992 that the number of overseas bases and sites to be returned to host nations totaled 441 and that another 51 were to be reduced or placed in standby status, approximately 30 percent of the United States’ overseas bases. The review produced estimates showing the fighter force, by the end of fiscal year 1995, would be approximately half the size of the 1988 force (down to about 2,000 aircraft). The bomber force would show a similar shrinkage, containing only 107 combat-ready bombers (7 B-2s, 60 B-1Bs, 40 B-52Hs) out of an inventory of 182 bombers—a far cry from the 422 bombers possessed in 1988.

The review predicted a 34 percent decline in Air Force personnel from a high of 871,477 active military personnel and civilians in 1986 to about 590,000 by 1995. This downsizing did not lessen any organization’s responsibilities or involvement. The Air Force continued to enforce two United Nations no-fly zones in Iraq, flying by the start of 1994 more than twice the number of missions flown during the Gulf War; while in Bosnia, F-16s downed four aircraft attacking targets in a prohibited zone.

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Another indication that “jointness” had become the driving force behind Defense Department policy and strategy was the Joint Advanced Strike Technology program, a result of the Bottom-Up Review. Previously, all of the services had individual requirements beginning in 2010 to replace several combat aircraft as they reached the ends of their useful service life. As a result of the review, these plans changed, and the program became the Defense Department’s focal point for defining an affordable next generation weapons system to replace its older aircraft. Not just an American program, Britain was involved as a full codevelopment partner, and discussions with the French and German governments also ensued. Three airframe design teams (Boeing, Lockheed, and McDonnell Douglas/Northrop Grumman) began working on demonstrators, which were scheduled for flight tests in 1998–1999.

The last years of the twentieth century saw the United States Air Force at the top of its form. Despite a shrinking size but confronted with more tasks, the Air Force was more than capable of handling its share of crises. And there seemed to be another crisis springing up every few months. The “Evil Empire,” as President Reagan had described the Soviet Union, had broken apart, but more than enough hot spots persisted around the world to keep the United States and its military services quite busy.

# Conclusion

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The twentieth century has been, first and foremost, the century of flight, when humanity at last achieved the ability to use the third dimension and the technology of flight for the betterment of society and national defense. This remarkable technological and social transformation first began with the Wright brothers' pioneering flight of December 17, 1903, a flight that covered a mere 120 feet—barely half the wingspan of a C-5B Galaxy. Since that chill and blustery morning, Air Force people have circled the globe nonstop and landed on the moon. In six wars and other conflicts, they have fought for freedom in foreign skies, both for the United States and for the country's allies. Today, they undertake routine operations worldwide, thanks to the synergistic linkage of various high technologies that enable a remarkable exploitation of the air and space environment. The revolutionary advances in flight since the beginning of the twentieth century have profoundly influenced military affairs of the United States; indeed, the United States Air Force is now the only truly global air force in the world.

Over the centuries, both armies and navies sought height to control surrounding surface areas: armies sought to control the high ground, and navies built ships with large masts and lookout positions to watch for enemy fleets and opposing ships. During the medieval period, experiments hoisted observers aloft in kites, and the advent of the balloon in 1783 increased the ability to seek height in both land and naval warfare and thereby secure awareness. Victory, however, still had to come through short-range power projection—the projection of the slowly moving ship or infantry force, capable of influencing events within a range of a few thousands of yards.<sup>1</sup>

In the years since 1907, military aviation in the United States evolved from an auxiliary of the Army into the independent United States Air Force. The organization that began with one captain and two enlisted men peaked in 1944 at a strength in excess of two million, dipped below 400,000 in the years immediately after World War II, expanded for the Korean and Vietnam Wars and the most intense periods of the Cold War rivalry, and finally stabilized at more than 500,000. The obscure office tucked away in Signal Corps headquarters de-

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veloped into a carefully organized institution with a Secretary of the Air Force, a Chief of Staff, appropriate staff support, and major commands and operating agencies organized according to function.

Over the years, a single thread unified these many changes—a commitment to the development, acquisition, and use of the airplane as a weapon of war. The fragile, fabric-covered craft, useful mainly for daytime scouting and courier duty, gave way over the years to sleek aircraft built with exotic metals and composite materials, aircraft that are capable of using a deadly variety of weapons despite cloud cover or darkness. Piston engines grew increasingly complex until supplemented and then largely supplanted by the simpler and easier to maintain turbine. The day rapidly passed when just one mechanic could learn to fix anything that might go wrong with an airplane, and the quaint idea that a skilled horseman could readily learn to fly also disappeared, replaced by systematic programs of screening and training designed to produce pilots with an absolute mastery of the latest aircraft.

Training proved simple at the outset: the Wright brothers taught a few officers to fly their invention in just a few weeks. As more numerous and more complex aircraft entered service, formal schools became necessary, and the vast expansion for World War I required mass production of pilots, observers, and mechanics. A network of schools took shape to train pilots and technicians, meeting peacetime needs and expanding in time of war or emergency. For advanced training in aircraft engineering, the air arm began sending officers to civilian institutions like the Massachusetts Institute of Technology, a practice that continued after the service established an engineering course of its own.

As the air arm grew in size and importance, officers had to be able to do more than fly skillfully and understand the basic principles of aircraft design. Over time, a system of professional military education evolved, with schools designed to teach everything from routine administration to the wartime employment of military aviation. Perhaps the most celebrated of these was the Air Corps Tactical School, which during the 1930s produced a coherent doctrine of strategic air warfare—accurate, long-range, daylight bombardment that could destroy the enemy's war-making potential—and in whose classrooms many of the aerial leaders of World War II taught and studied. After becoming independent in 1947, the Air Force grouped the different professional schools under the Air University and established a service academy to educate a cadre of career officers.

As the various programs of instruction demonstrated, military aviators faced the challenge of acquiring the most advanced aircraft, training with them in peacetime, and using them to the deadliest effect in the event of war. To convert the triumph of the Wright brothers into the practical weapon, airmen demanded improved performance and wrested a military advantage from the advances made by the nation's aviation pioneers. The changes have been spectacular. The Wright Flyer carried a pilot and one passenger, but the Lockheed

C-5B of the 1980s, with a crew of five, could deliver more than 300 troops with their equipment. Maximum speeds, once measured in miles per hour, have come to be expressed in relation to the speed of sound. The rifle that 2d Lt. "Jakie" Fickle fired from a rickety airplane proved to be the precursor of machineguns, multibarrel cannon, and air-to-air rockets. Riley Scott's telescopic bombsight blazed a trail for the gyroscopically stabilized models of the 1940s and those that employed radar. The bombs hand-tossed by an observer perched on the lower wing of a Wright biplane foreshadowed laser-guided munitions and nuclear weapons. Some innovations the air arm pioneered, like the pressurized cabin, have helped revolutionize commercial aviation, but such benefits were incidental to developing the airplane as a weapon of war.

As technology marched forward, organizational structure kept pace. The Air Force and its predecessors established agencies, beginning with the Engineering Division at McCook Field, Ohio, to conduct or encourage research and development. Similarly, increased cost and complexity demanded that closer attention be paid to contracting and other aspects of weapons procurement. The Wright Flyer, purchased on the basis of a contract of a few pages, carried a price tag of \$30,000, including a bonus for exceeding performance requirements; in contrast, a single aircraft of the 1990s represented an investment of hundreds of millions of dollars and required many volumes of detailed specifications and careful oversight by procurement specialists.

The greater the technological sophistication of military airplanes and their equipment, the heavier became the logistic burden. Hap Arnold and another lieutenant photographed the parts of an early Wright airplane for the guidance of mechanics, but to do the same with even a World War II fighter would have proved too formidable a task for any pair of pilots. Nor could someone take out a pocketknife and whittle smooth the damaged surface of a turbine blade, as Maj. Theodore C. Macauley did in 1919 to a wooden propeller damaged by a storm. The maintenance and repair of aircraft came to require much the same skill and equipment needed to build them. The eventual result was a series of depots where a work force, mainly of trained civilians, performed major overhauls. A similar network stocked, shipped, and distributed the supplies needed to maintain and employ the aerial weapon.

The efforts to develop and maintain aircraft, and to train and supply those who operated them, focused on the military uses of aircraft. Despite its vulnerability to weather and enemy fire, the tethered balloon at times provided a useful means of observation; an airplane, able to fly for some distance under its own power, had to do that and more. Even before the Wright brothers had flown, visionaries like Alexander Graham Bell predicted that aircraft would someday be able to sink heavily armored battleships. The flimsy Wright biplane that soared aloft in December 1903 clearly could not fulfill this prophecy, but in 1921, Bell's dream became reality, though admittedly under artificial conditions, when Army bombers sank old battleships anchored as targets.

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Bell was not unique in his enthusiasm for the aerial weapon. Few inventions have fired the imagination like the airplane, and in most instances even the wildest of expectations were eventually realized. Before World War I, the British novelist H. G. Wells wrote of air raids on major cities, and by the time the conflict ended, German airplanes and dirigibles had attacked London and bombers of the new Royal Air Force were raiding cities in Germany. Although the wartime bombing proved indecisive, as it had in the fiction by Wells, it seemed to portend truly devastating attacks with high explosive and poison gas when suitable munitions and aircraft became available.

Moreover, aircraft were improving rapidly in range, speed, and carrying capacity. The Army's Barling bomber, though woefully underpowered, set altitude and endurance records in 1924 while carrying loads of three or four tons. That same year, an Army transport flew nonstop across the United States, and two of the four aircraft that set out to fly around the world completed all the legs of the 175-day journey. No wonder, then, that airmen like Billy Mitchell in the United States or Giulio Douhet in Italy trusted technology to convert the wood-and-cloth aircraft of the day into fighting machines that could range beyond the trenches and defeat the enemy by destroying his morale and military industry.

The gruesome battles of World War I, which killed or wounded an estimated 37.5 million servicemen, made the airplane seem all the more attractive as a weapon of war. In a future conflict, vast armies of conscripts need not burrow like moles to find protection in the earth, emerging only to surge forward against deadly machinegun and artillery fire. Aircraft would prevent a repetition of the slaughter that took place between 1914 and 1918 by carrying the war to the enemy's cities, leveling the factories that sustained his armed forces and sowing panic among the urban masses. No nation could long endure once aerial bombing had crippled its industry and destroyed the will of its ordinary citizens to resist. Air power could thus win a war cheaply, quickly, and without the assistance of ground or naval forces. Cruel though the bombing of civilians might seem, its advocates considered it merciful compared to the dead and maimed soldiers, drowned sailors, starved civilians, and exhausted national treasuries resulting from the trench warfare and naval blockades of World War I.

The American people, although their wartime casualties were light compared to the other combatants, came away disillusioned from World War I and lapsed into isolationism, seeking to avoid future involvement in Europe's quarrels. Mitchell might speak about strategic air warfare, loosely defined as the decisive use of military aviation against the enemy's heartland, and its ability to deliver a bolt from the blue that would shatter a hostile power, but the populace put its trust in isolation behind ocean barriers. Consequently, the proponents of air power chose to present the bomber as a defensive weapon able to destroy an invasion fleet bound for the coast of the United States, as Mitchell tried to demonstrate by sinking the old battleships.

Whatever its defensive value, Mitchell and his followers believed the bomber to be a decisive weapon, capable of destroying any hostile nation, even a country that could hold out against a naval or land campaign. For this reason, the advocates of air power believed that the United States should have an independent air force, the equal of the Army and Navy. Although the Army air arm increased in organizational stature and potential military importance, several factors delayed its independence. The Army realized the importance of aviation to land warfare and was concerned that an independent air service would pursue the vision of strategic attacks on the enemy's war industries and ignore the tasks vital to the ground forces, such as observation, attacks on battlefield strong points, and protection from hostile aircraft. The leadership of the War Department did not close its eyes to the possibilities of strategic bombing; indeed, it funded a number of long-range aircraft, but it insisted that military aviation meet the needs of the ground forces before embracing the new and untested concept. Moreover, although technology improved rapidly, a genuine strategic bomber did not appear until the advent in 1935 of the experimental model of the Boeing B-17 Flying Fortress, which flew faster than most pursuits and seemed to have the firepower to fight its way to distant industrial targets and the bomb capacity to destroy them.

In the 1930s, the American aviation industry, in its struggle to recover from the effects of the Great Depression, pursued both civil and military business. Fortunately, the same advances in technology—cantilever construction, load-bearing stressed metal skin, streamlining, wing flaps, and retractable landing gear—proved useful for aircraft in both arenas. A kind of technological cross fertilization occurred. For example, Boeing's single-engine Monomail transport inspired the twin-engine, open-cockpit Y1B-9 bomber, which taught lessons that were applied to the basic Model 247 transport with two engines and an enclosed cabin and cockpit. Boeing, after using wing flaps to reduce the landing speed of its P-26 pursuit, adapted them to Model 247D, the most successful commercial aircraft of that series. Similarly, the Boeing 314 seaplane owed a debt to the XB-15, a bomber prototype, and another transport, Model 307, borrowed from the B-17.

The introduction in 1934 of the P-26, the Army's first low-wing, all-metal, monoplane pursuit, demonstrated that the Army was making progress in this type of aircraft as well as in bombers. Even with wing flaps, the P-26 represented a bridge between the old technology and the new. It retained the open cockpit, which fighter pilots preferred over the confining and often uncomfortable plexiglas-enclosed greenhouse; an externally braced wing; and a fixed, though streamlined, landing gear. As the 1930s progressed, fighter designs improved. Enclosed cockpits, retractable landing gear, cantilever construction, and the new liquid-cooled Allison engine, all of which permitted greater streamlining, gave new pursuits like the twin-engine P-38 and the single-engine P-39 and P-40 an advantage in speed over even the fastest of bombers.

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In the meantime, Germany, Japan, and Italy drew closer together, as the Rome-Berlin Axis, on which the fate of Europe was said to revolve, came to include Tokyo. Under Adolf Hitler, Germany rearmed and embarked on a policy of territorial aggrandizement, including the invasion of Poland in 1939 that triggered World War II, the conquest of France in 1940, and the invasion of the Soviet Union in the summer of 1941. Benito Mussolini, Italy's dictator, led his nation into the war alongside Germany in 1940. Japan, dominated by the military, became bogged down in its attempt to subdue China and on December 7, 1941, attacked the U.S. Navy base at Pearl Harbor, gambling that such a blow could cripple U.S. naval power long enough for the Japanese military to seize from the British Commonwealth and Dutch empire the natural resources needed to dominate the western Pacific. The other Axis partners, Germany and Italy, promptly joined Japan as cobelligerents.

The B-17 and other long-range bombers—the Consolidated B-24 Liberator, which appeared shortly before the United States went to war, and the Boeing B-29 Superfortress, which made its first flight in September 1942—inspired a group of Army Air Forces planners to draft, in the summer of 1941, a concept for defeating Germany by aerial bombardment. Their plan reflected a basic strategy of defeating Hitler first, if the United States should go to war against the three Axis powers. The airmen believed that American bombers could fight their way deep into Germany and, using the extremely accurate Norden bomb-sight, destroy 154 industrial or transportation facilities that would, in effect, knock Germany out of the war. Although the target list underwent expansion in 1942, the belief persisted that accurate bombing could deliver rapier-like thrusts to the vitals of the wartime German economy.

As it turned out, strategic bombing bludgeoned German war industries to death, rather than killing them swiftly and cleanly. The bombing proved far less accurate than expected, for the bombardier using the Norden sight could not see through the prevailing cloud cover over northern Europe and achieve the precision attained in the sunlit skies of the American Southwest. Radar enabled the bombers to attack in cloudy weather, but pinpoint targets often disappeared in the cluttered images of large urban areas, and accuracy suffered accordingly. Moreover, the air offensive gathered momentum slowly. Aircraft had to be built and flown to England, crews trained and deployed, and a succession of missions flown as the flyers perfected their skills. American bombs did not begin falling on Germany until January 1943, and during the long-range strikes later in the year, unescorted bomber formations suffered dismaying losses. Not until a new escort fighter, the North American P-51 Mustang, arrived to wrest control of the daytime skies from the German *Luftwaffe*, could the strategic bombing campaign begin the systematic destruction of vital industries like oil production and transportation.

Air power characterized the Pacific War, from the assault on Pearl Harbor to the atomic bombing of Hiroshima and Nagasaki that brought the war to an

end. The common images of the Pacific air war were duels between carrier-based aircraft, long-range fire bomb raids on Japan, and finally, the devastation of the two atomic bombs; but it involved far more than this. Aerial resupply over the infamous Himalayan “Hump” played a key role in keeping China in the war, an air operation made possible by turning America’s great commercial aircraft and airline industry to the needs of war. Much of the war centered on seizing bases from which to project air power against Japan. Indeed, the entire strategic bombing campaign reflected the strong personal desire of President Franklin Roosevelt who, as early as 1940, outraged by Japanese aggression against China, expressed the opinion that Japan should suffer under bombing attacks.

Because of the vast distances in the Pacific, the sustained strategic bombing of Japan had to await the production of a suitable aircraft, the B-29, and the development of bases within range of the enemy’s industrial centers. An attempt, begun in June 1944, to mount attacks from airfields in China could not be supported logistically, but that same month, amphibious forces landed in the Mariana Islands, from which the final battering of Japan began in November. Two atomic bombs delivered by B-29s destroyed Hiroshima and Nagasaki in August 1945 and provided the final blows that forced an already devastated Japan to surrender without the necessity of an invasion.

When strategic air attacks began against Japan, some in the Japanese military leadership realized the war was lost. Premier Kantaro Suzuki remarked, “It seemed to me unavoidable that in the long run Japan would be almost destroyed by air attack so that merely on the basis of the B-29s alone I was convinced that Japan should sue for peace. On top of the B-29 raids came the atomic bomb . . . which was just one additional reason for giving in. . . . I myself, on the basis of the B-29 raids, felt that the cause was hopeless.”<sup>2</sup>

The demonstrated effectiveness of all forms of air power in World War II convinced even the most skeptical of observers that the Army’s air element deserved independence. General Eisenhower, returning triumphantly from Europe, emphasized that “no sane man” could any longer contest this thinking. A unified defense establishment and formation of an independent Air Force were necessary for national security in the nuclear age. The establishment of the United States Air Force in September 1947 culminated a long journey that went back prior to World War I.

One month later, as if in celebration of the Air Force’s independence, Captain Charles E. “Chuck” Yeager and the Bell XS-1—an Air Force pilot in an Air Force experimental airplane—first exceeded the speed of sound. If the Air Force was perceived as a creature of the atomic era born at Trinity, Hiroshima, and Nagasaki, it was likewise perceived as a creature of the supersonic revolution as well. Supersonic speed and atomic weaponry would become two inextricable thematic links in the history of the United States Air Force, but they served as limiting prisms through which to view the service and its importance

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to national defense affairs. There was far more to the Air Force than merely speed and atomic and nuclear warfare, and the self-limitations of perceiving the service in such a narrow way would come back to haunt the Air Force, first in Korea, then in the Vietnam, and later in 1989 and early 1990.

Within a year of independence, the Air Force had the lead role in the country's first serious confrontation with the Soviet Union: the Berlin airlift. As in many later crises, the speed and responsiveness of air power thwarted a hostile state. Berlin remained free because Air Force aircrews, supported by the efforts of other American and Allied airmen, met the challenge of resupplying a city from the air. The airmen displayed the same determination to reach Berlin that they had in the Second World War, this time to put food on German tables and coal in German stoves rather than to place bombs on Nazi industrial and leadership targets; again, the price paid was in blood, in aircraft and lives lost, but not to flak and fighters, but to poor flying conditions on cold and foggy nights.

The fury of the atomic bomb seemed to vindicate the belief that air power could win wars by striking a single decisive blow. Only briefly, however, did the United States exercise a monopoly over this weapon; the Soviet Union tested its own bomb in 1949, and by the mid-1950s, both nations had developed hydrogen bombs. To some, the United States and the Soviet Union resembled two scorpions in a bottle, each capable of killing the other, but only in the certain knowledge that both would die.

The very destructiveness of nuclear weapons, demonstrated at Hiroshima and Nagasaki and in subsequent tests, inhibited their use. Even a surprise attack, a nuclear Pearl Harbor, seemed a sobering gamble, given the devastation that a few surviving weapons could inflict on an urban society. The United States and the Soviet Union (and to a lesser extent China, France, and Great Britain) acquired the weapons that at last enabled air power to hurl a bolt from the blue, but for fear of retaliation no nation dared to do so. Nuclear warheads, whether fitted to bombs or ballistic missiles, became a force for stability, a deterrent to all-out war.

For a time, some Air Force leaders like Gen. Nathan F. Twining, the Chief of Staff from 1953 to 1957, suggested that the threat of nuclear retaliation could deter every kind of warfare, while others, like Gen. Otto P. Weyland, who headed the Tactical Air Command from 1954 to 1959, sought to apply the principle of nuclear deterrence to limited warfare. Logical though their reasoning may have seemed, wars and crises continued, for the same certainty of mutual destruction that deterred an all-out attack also argued against the use of such weapons except when national survival was clearly at stake. One of the most important developments in the field of nuclear weapons has been the centralization in the Department of Defense of civilian control over their potential use. The technological revolution since World War II enabled the civilian leadership to control, through a complex system of safeguards, the use of nuclear weapons.

Despite the tighter controls, successive political administrations determined that the strategic nuclear deterrent must remain, as defense analyst Bernard Brodie stressed, “the constant monitor.”

Korea forced its own challenges, particularly the rediscovery of lessons in the Second World War about the value of tactical air power. The North Korean invasion in June 1950, and the subsequent blunting and turning back of the Chinese Communist intervention in November 1950, were countered by the application of massive air power. Even in this era before precision munitions, air power successfully substituted for the lack of strong in-place ground combat forces, while the rapid achievement of air superiority over Korea meant that United Nations forces on the ground could go about their work largely without fear of enemy air attacks. After Korea, the rapid deployment of air-refueled aircraft over global distances gave air power a flexibility and value previously unknown.

A sometimes inappropriate fascination for technology and a dangerous fixation on nuclear war led to the Air Force increasingly turning away from the realities of likely conflict and crisis as the 1950s passed into the 1960s. As a result, the demands and shock of a new war in Southeast Asia quickly revealed dangerous shortfalls in strategic thinking, leadership, tactics, and development of appropriate weapons. The service discovered that it had to come to grips with the realities of the missile age, particularly the dangers posed by integrated air defense networks built around radar-controlled fighters, surface-to-air missiles, and antiaircraft artillery, but had neglected the possibilities of smaller conflicts.

The Air Force had to acquire three separate Navy-developed aircraft to meet its needs in the skies over Vietnam—the Douglas A-1 Skyraider counterinsurgency airplane, the Ling-Temco-Vought A-7 Corsair II light attack aircraft, and most notably, the powerful and remarkable McDonnell F-4 Phantom II multirole fighter, which became the backbone of the Air Force of the 1960s and 1970s. Rules of engagement proved critical, and all too often air power was used to send messages, not to achieve a desired military effect. The “never again” mindset generated in the officer and enlisted force that served in Vietnam proved an important catalyst for the vital changes in military doctrine, policy, leadership, and training that took place in the 1970s and 1980s and set the stage for the successful conclusion of the Cold War and Desert Storm.

The costly and painful experience of Vietnam air combat has, to a degree, caused some very real accomplishments of that war to be overlooked. Two key campaigns—the use of air power to defeat the North Vietnamese spring invasion of 1972 and the use of air power to force North Vietnam to seek a serious peace at the end of the year (the Linebacker II strikes)—highlighted the value of American air power, particularly that of the United States Air Force, in stemming aggression and imposing conditions for a just peace. Unfortunately, in the years after Linebacker II, national resolve to support the government of South Vietnam flagged, so that what had been accomplished in the air and on the land

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in Vietnam was left to wither in the face of renewed Communist aggression, leading to the collapse of the Saigon government in 1975.

The war in southeast Asia constituted a watershed for the Air Force in many ways. In the conflicts and crises of the 1950s, and most of the 1960s, the service relied on a core cadre of experienced veterans. The MiG-killers of Korea were often fighter pilots seasoned by combat in World War II. The Strategic Air Command built its nuclear deterrent on a trained force that had flown against Berlin and Tokyo. By the time of Vietnam, that core had become the service's senior leadership. After Vietnam, the leadership of the service would largely pass from that generation to the Vietnam generation. In Desert Storm, for all services, the senior leadership were individuals seasoned by Vietnam, for whom World War II was either a childhood memory or the stuff of history books. Out of Vietnam came an appreciation within all services, but particularly within the Air Force, for radical improvements in training, organization, and equipment. Truly, the successes of the 1980s and of Desert Storm were built on the hard-learned lessons of Southeast Asia.

The Vietnam War demonstrated the importance of being able to operate strike aircraft in high-threat areas. As a result, the United States Air Force took the lead in several key ways to meet this challenge. First, it emphasized hard and realistic training and tactics—the Red Flag exercises and others like them—to give both aircrews and ground support personnel experience in war-like operations and tempo. Second, the Air Force emphasized explicit technological developments to negate an enemy's effectiveness. Some of these, such as enhanced electronic warfare systems, built on existing concepts and capabilities. Others, such as increased emphasis on precision weaponry, were relatively new, already tested and proven in Southeast Asia. Still others were markedly nontraditional, such as an advanced air superiority fighter aircraft with a thrust-to-weight ratio in excess of 1 and enhanced energy maneuverability characteristics (the McDonnell Douglas F-15) and an aircraft relying on a totally electronic flight control system (the General Dynamics, subsequently Lockheed-Martin, F-16 Fighting Falcon).

One truly radical departure was the whole field of low observable aircraft that resulted from the development of advanced computer technology, which modeled the way radar waves hit and reflect from an aircraft and furnished the basis for electronic flight controls that could keep an otherwise unstable aircraft in trim. Amid great secrecy, the Air Force produced the first radar-evading stealth strike aircraft, the Lockheed F-117, placing it in operational service in 1983. As the all-metal monoplane had revolutionized aviation in the 1930s, and the turbojet and sweptwing that of a later generation, the stealth revolution accomplished the same, but at an even greater level of dominance. From 1983 to the present, no equivalent rival system has appeared—an event unprecedented by the standards of twentieth century military technology where such developments as the submarine, dreadnought, tanks, radar, jet fighters, atomic bombs, and interconti-

mental missiles were equaled by other countries within, at worst, a few short years.

Hand-in-hand with training and technology came an increased appreciation for the lessons of air warfare and what air power brings to a fight, as well as clear recognition that air power works best when it is unconstrained by self-imposed limitations or inappropriate rules of engagement. In particular, a Vietnam-seasoned group of thinking warriors—individuals such as General Charles Boyd, Colonel John Warden III, and their acolytes—reinvigorated air power thought and doctrine in ways unknown since the last great exponent of air warfare thought, Great Britain's Lord Tedder, had presented his seminal Lees Knowles lectures at Cambridge after the Second World War.<sup>3</sup>

The 1980s were a time when all the military services of the United States developed an interest in returning to their first principles. Creative thinkers rediscovered the enduring value of the great military theorists of the past, notably Carl von Clausewitz. Warden, however, went beyond this neo-Clausewitzian approach, emphasizing the punishing clash of surface forces, to develop what might properly be seen as a “post-Clausewitzian” viewpoint reflecting the uniqueness of warfare in the third dimension, with its ability to strike swiftly, decisively, and in simultaneous fashion across an enemy's entire spectrum of operations and targets. Warden's landmark study reinvigorated the air power debate, and a growing and unsettling awareness within the Air Force that thought and doctrine lagged behind technology reflected a lack of focus on basic principles. “Strategic” had become synonymous with “nuclear,” and “tactical” had become synonymous with “air support.” The revolutionary capabilities of combined strategic and tactical attack—subsequently made manifest in Desert Storm—were unappreciated by many who had grown up under a rigid “SAC-TAC” culture.

In 1990, concerned over this debate, Secretary of the Air Force Donald B. Rice launched a study on the use and value of air power. The study examined the five innate “virtues” of air power—speed, range, flexibility, precision, and lethality. Out of these strengths flowed five objective capabilities of American air power: to sustain nuclear deterrence, provide versatile combat forces, supply rapid global mobility, ensure control of the high ground, and build U.S. international influence. Further review and discussion resulted in Rice issuing a milestone strategic planning framework, *Global Reach-Global Power*.<sup>4</sup>

Released in June 1990, this document triggered an intense debate over the merits of air power. Then, in August 1990, came the onset of the Gulf crisis. Within days, the responsiveness of air power to the Gulf region had thwarted any hopes Saddam Hussein might have had of furthering his aggression into Saudi Arabia. Next, the building of an air campaign plan incorporating bold and innovative thinking gave the theater commander in chief, General H. Norman Schwarzkopf, an option to destroy Iraq's offensive potential well in advance of any ground conflict. The subsequent war validated Rice's notions about the

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dominance of air power, for it was the air weapon that clearly was the key to victory—in the Gulf, particularly, a victory with minimal losses.

Before the war, Hussein had argued that victory would go to Iraq because the United States would rely on its air force, and that air power “has never been the decisive factor in the history of wars.” He was, in many ways, the test case for modern air power in the precision weapon era; after the war, understandably, President George Bush succinctly stated, “Gulf lesson one is the value of air power.”<sup>5</sup>

Critics who had argued the value of air forces only in terms of supporting land armies found their logic undone by the stealth fighters and conventional aircraft that struck out of the dark skies of Iraq to incapacitate Saddam Hussein’s military machine and imprison his force in place. Indeed, the entire ground operation was more a huge prisoner round-up than a combat assault; there was no ground engagement at any level that could be considered comparable to El Alamein, Stalingrad, or Gettysburg. Saddam had been undone by theater-wide air strikes that had destroyed his ability to wage war.

The Gulf War represents an important milestone in the use of military power, though little consensus existed among defense experts if it was the product of a revolution in military affairs, a revolution itself, or a catalyst of a revolution to come. What it did show—as did the subsequent air embargo and, effectively, the air occupation of Iraq—was that decision-makers and political leaders, with the maturity of air and space power, had far greater flexibility and options in their own range of actions. Further, this flexibility of options ranged from actual combat activity through humanitarian relief, presence, and missions of national resolve.

Nowhere has the interplay of technology, doctrine, and a changing world environment been more significant than in the Air Force’s support of global humanitarian relief. Immediately after the Gulf War, the Air Force used the capabilities that supported the Desert Shield buildup and the Desert Storm combat effort to undertake the rapid supply of critically needed foodstuffs to the former Soviet Union. This effort, Operation Provide Hope, exploited the inherent theater-wide airlift capabilities of modern Air Force transports to overcome deficiencies in the Russian transportation infrastructure that limited shipments sent to Russian ports. Provide Hope and Operation Provide Promise into Bosnia-Herzegovina thus became important post-Cold War precedents for the many kinds of humanitarian relief activities undertaken by the United States.

Airlifters of Air Mobility Command today fly worldwide to support humanitarian relief operations. In 1993, Air Mobility Command aircrews operated in 96 percent of the world’s countries, 186 out of 193 nations. Overall, since 1947, the United States Air Force has participated in nearly 600 humanitarian relief operations. Some, such as the famous Berlin Airlift, are well-known; others—responses to plagues, floods, fires, typhoons, hurricanes, volcanoes, and earthquakes—are far less so, but may involve an even greater need for speed and

responsiveness. Nearly 100 such emergencies have occurred since 1987. With the collapse of a reasonably stable bipolar world environment and its replacement by a fragmented multipolar one, the need for the Air Force to be responsive to humanitarian crises has assumed even greater urgency. Fortunately, the linkage of modern support systems, such as aerial refueling and space-based assets, to advanced airlifters like the C-17 Globemaster III, coupled with streamlined management and organizational practices embodied within the recently established Air Mobility Command, will allow the Air Force to meet the challenge of global humanitarian airlift and military operations other than war with an efficiency previously unknown.

In the conflict in the former Yugoslavia, the United Nations initially showed little comprehension of the true value of air power, and as a result, prior to August 1995, it was not employed effectively. Indeed, the United Nations commanders showed a distressing tendency to think of it merely as a means of sending signals and indications of resolve. "To many of us airmen," Air Force Chief of Staff General Fogleman subsequently recalled, "it was very reminiscent of what we had seen in Vietnam."<sup>6</sup>

The lack of success with half-hearted air power application caused a rethinking of United Nations strategy. The resulting air campaign undertaken by NATO in Bosnia was a model of how air power should be employed. Precise attacks shattered Bosnian Serb air defense and allowed other precision attacks against military targets. Chastened, the Serbs came to the peace table in Dayton, Ohio. Eleven days of air attacks involving 3,515 sorties by 293 airplanes from eight nations had brought the first hopes for a lasting peace to a region in turmoil since the end of the Cold War.<sup>7</sup>

Commenting in retrospect, Ambassador Richard Holbrooke, the Assistant Secretary of State, emphasized: "One of the great things that people should have learned from this is that there are times when air power—not backed up by ground troops—can make a difference. That's something that our European allies didn't all agree with; Americans were in doubt on it; [but] it made a difference."<sup>8</sup>

In contrast to the Air Force of the 1970s and mid-1980s, the Air Force of the 1990s is smaller, more tightly organized, and more flexible. It has a clearer perception of its capabilities. It is largely based in the continental United States, for one of the hallmarks of the 1990s has been the rapid withdrawal of military forces from abroad and a decrease in the dependency on foreign basing of American forces.

Across the Air Force, decisionmaking and accountability have been shifted to the lowest possible levels, with headquarters developing and offering guidance to field organizations that are free to pursue the execution of that policy as they can best accomplish it. Above all, the Air Force has undergone an organizational reinvention stressing a return to basic principles, commonsense structure, clear lines of authority and responsibility, wide-spread empowerment of

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military and civilian workers at every level, and an overall desire to give power to the operators—those charged with ensuring that the Air Force meets the challenges of a complex, multipolar world.

One of the hallmarks of the new Air Force is the extraordinary change in organizational structure that has taken place. Hallowed commands that existed unchanged for decades—the Strategic Air Command, Tactical Air Command, and the Military Airlift Command, among others—have given way to more streamlined, dynamic, and focused successors. Indeed, the number of major commands has decreased from 13 to 8, as they were reorganized to reflect a better understanding of both the purposes of military force and power projection and a more quality-focused organizational culture. An entire command echelon of 19 air divisions has been eliminated, removing a superfluous link in the chain of command. This restructuring has also affected the realignment of subordinate and smaller organizations as well, eliminating some and enfolded or reorganizing their functions within new administrative organizations termed field operating agencies. The number of flying squadrons has meanwhile declined, from 240 to 205. Thus, the Air Force of the 1990s looks very different from the Air Force of a decade ago. However, if smaller and reorganized, it is more capable of fulfilling America's national security needs than at any previous time in its history, a tribute to the service restructuring itself. In an address before the Air Force Association's 1996 Air Warfare symposium arguing that the capabilities of modern air power and the Air Force have revolutionized what historian Russell Weigley has called "the American Way of War," Chief of Staff General Ronald R. Fogleman stated:

The Air Force was the first service to recognize that the post-Cold War era called for a new look at how military force would and could be applied. This was reflected in our strategic vision of Global Reach-Global Power that was published in 1990. We used this vision to restructure the Air Force so that we could provide the nation an economy of force capability to execute the National Military Strategy—primarily through the application of asymmetric force. This was a vision that was built on the basis of the new National Security Strategy articulated by President Bush in the summer of 1990. In short, the end of the Cold War freed up assets previously immersed in the nuclear deterrent mission—bombers, tankers, post-SIOP reconnaissance aircraft, and satellites, allowing the Air Force to be responsive on a conventional, day-to-day basis to the needs of the theater commanders.<sup>9</sup>

The reinvention of the Air Force has enabled the United States Air Force to preserve its combat edge, technological superiority, and freedom of action even as it has had to reduce its size and resources. The linkages of Air Force capabil-

ities redefined military power. The linkage of speed, range, and space-based C<sup>4</sup>I generate time, decision, and information dominance over an opponent, what some analysts are terming “cyberwar.” The linkage of precision intelligence with precision navigation and precision weapons generates a focused lethality that is, ironically, now the most humane form of warfare, short of using non-lethal weaponry. As attacks in Iraq and Bosnia generally showed, targets can be struck precisely even in urban areas, with little of the “collateral damage” that plagued earlier applications of air power. The linkage of various Air Force space-based assets with intelligence, weather, and communications that furnish global awareness has now become the linchpin of modern American military operations. The combination of all these capabilities and linkages, wielded by a service committed to ongoing reinvention enables the Air Force to project power, influence operations, and provide presence anywhere, anytime.

In 1996, recognizing that *Global Reach—Global Power* had fulfilled its purpose as a transitional strategic planning framework, the United States Air Force undertook a comprehensive series of long-range planning studies at the behest of the Secretary of the Air Force and the Chief of Staff. Study teams at the Air University, the Scientific Advisory Board, the Rand Corporation, and at the Air Staff examined issues ranging from pursuit of new and innovative technologies to the changing nature of the strategic and international environment. Out of this tremendous intellectual ferment came a vision for the twenty-first century Air Force, called *Global Engagement*, which was announced by Secretary Sheila E. Widnall and Gen. Ronald R. Fogleman at the opening of an exhibit on the fiftieth anniversary of the Air Force at the Smithsonian Institution’s National Air and Space Museum on November 21, 1996.<sup>10</sup>

*Global Engagement* flowed naturally from the National Security Strategy of the United States, and was grounded in a vision of future conflict promulgated by the Chairman of the Joint Chiefs of Staff, General John Shalikashvili, that strongly emphasized joint warfare. The new Air Force vision reflected a core belief that in the twenty-first century, the strategic instrument of choice would be air and space power. To meet such a challenge would require more than ever before the integration of key elements of air and space power to secure, attain, or prosecute air and space superiority, global attack, rapid global mobility, precision engagement, information superiority, and agile combat support. These core competencies would ensure that the service could continue to meet its primary mission: to defend the United States through control and exploitation of air and space.

The basis for the many achievements of air power in peace and war has been the development of a spirit of mature professionalism. Over the years, the aerial weapon grew more complex, deadlier, and more demanding, as did the uses of air power, whether in fighting a war or deterring a nuclear catastrophe. The evolution of aircraft and the changing nature of warfare imposed greater demands on the skill, judgement, and initiative of the people of the Air Force.

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Although the leather jacket survived as the symbol of an adventurous era, the individual who wore it in the 1990s was better trained, more broadly educated, and more widely experienced than the typical flyer of a bygone time, when biplanes cost a few thousand dollars and flew mainly by day, when nuclear weapons were a topic for science fiction, and when war seemed a remote possibility. While the Air Force will undoubtedly exhibit the same change and evolutionary patterns that have occurred since the creation of the first military aircraft five years after Kitty Hawk, one characteristic will not: the need for perceptive, dedicated, skilled, and courageous men and women to carry on, extending the proud legacy of the past into the future.

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