
The U.S. Army Air Forces in World War II

Hitting Home

The Air Offensive
Against Japan

Daniel L. Haulman

AIR FORCE HISTORY AND MUSEUMS PROGRAM
1999

Hitting Home

The Air Offensive Against Japan

The strategic bombardment of Japan during World War II remains one of the most controversial subjects of military history because it involved the first and only use of atomic weapons in war. It also raised the question of whether strategic bombing alone can win wars, a question that dominated U.S. Air Force thinking for a generation. Without question, the strategic bombing of Japan contributed very heavily to the Japanese decision to surrender. The United States and her allies did not have to invade the home islands, an invasion that would have cost many thousands of lives on both sides.

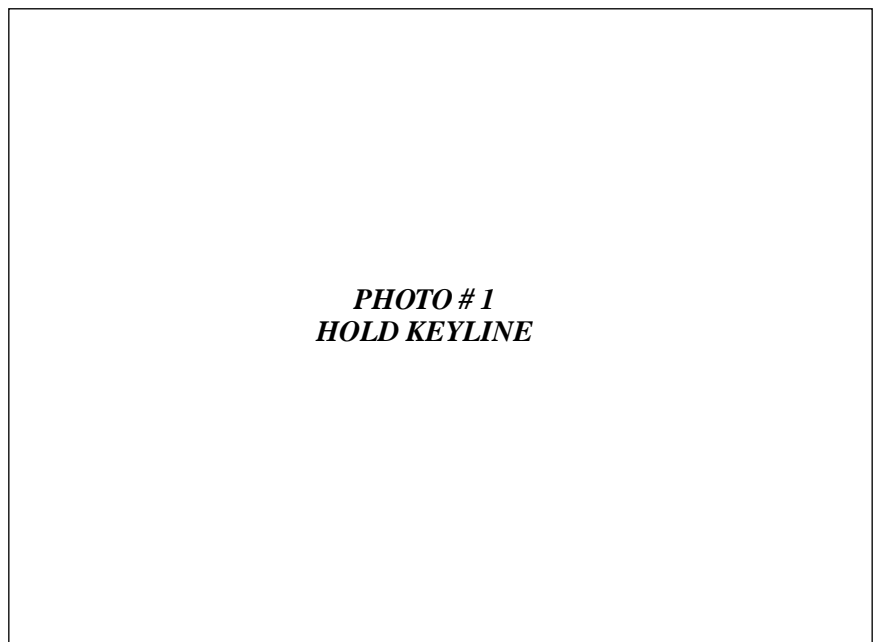
This pamphlet traces the development of the bombing of the Japanese home islands, from the modest but dramatic Doolittle raid on Tokyo in April 1942, through the effort to bomb from bases in China that were supplied by airlift over the Himalayas, to the huge 500-plane raids from the Marianas in the Pacific. The campaign changed from precision daylight bombing to night incendiary bombing of Japanese cities and ultimately to the use of atomic bombs against Hiroshima and Nagasaki. The story covers the debut of the spectacular B-29 aircraft—in many ways the most awesome weapon of World War II—and its use not only as a bomber but also as a mine-layer.

Hitting Home is the sequel to *High Road to Tokyo Bay*, a pamphlet by the same author that concentrated on Army Air Forces' tactical operations in Asia and the Pacific areas during World War II. Taken together, they provide an overview of U.S. Army Air Forces' operations, tactical and strategic, against Japan.

Thousands of miles separated the United States from ultimate victory in the Pacific during World War II. Lt. Col. James H. “Jimmy” Doolittle led the famous raid on the Japanese home islands early in the war, but spanning the vast oceans with concentrated air power proved a daunting task. American naval and ground forces had to secure bases in China and wrest far-flung islands from the tenacious grip of the Japanese. From these bases, the U.S. Army Air Forces (AAF) launched specially designed, very-long-range bombers against the home islands. The strategic bombing campaign, climaxed by the destruction of enemy cities with incendiary and atomic bombs, forced Japan to surrender and spared the United States a bloody invasion. The U.S. air offensive against Japan is the central story of the Pacific war—a drama of human courage and sacrifice and of a unique partnership among modern air, sea, and land forces.

The Pacific War Begins

After crippling the U.S. Pacific fleet in Oahu at the end of 1941, the Japanese empire expanded to its territorial zenith during the first half of 1942. A string of victories put geography on Tokyo’s side at the beginning



The Japanese bombs that fell on the U.S. naval base at Pearl Harbor, Hawaii, on December 7, 1941, took lives, destroyed airplanes, and sank battleships.

PHOTO # 2
HOLD KEYLINE

Battleships USS *Tennessee* (front) and USS *West Virginia* on fire at Pearl Harbor.

PHOTO # 3
HOLD KEYLINE

This photo of the destruction of Hanger #3 at Wheeler Field was one of the first pictures taken of the Japanese bombing of Hawaii.

of the Pacific war. Between December 1941 and mid-1942, Imperial forces took from the Americans, British, and Dutch all the important Allied bases in the western Pacific and southeastern Asia, including Guam, Wake, the Philippines, Malaya, Singapore, Burma, Hong Kong, and most of the East Indies. By mid-1942, Japanese forces controlled an empire that stretched from Alaska to India and the gates of Australia. Japan's military leaders thus considered their home islands of Honshu, Kyushu, Shikoku, and Hokkaido (where most war industries were located) immune to Allied attack. No weapon, not even the longest-range bombers then available, could reach the heart of the Japanese empire. Allied bases were simply too far away. With many of its battleships damaged or destroyed at Pearl Harbor, the U.S. Navy could do little except defend the eastern Pacific and the western coast of North America. Japan seemed invincible.

As the progression of victories continued, Japanese confidence soared and American morale languished. To reverse these trends and bring the war home to Japan as quickly as possible, President Franklin D. Roosevelt authorized a daring initiative: a surprise raid on Tokyo, the Japanese capital.

Doolittle's Raiders Strike the First Blow

Lacking bases within range of Japan, the U.S. Army and Navy collaborated on a scheme to use medium bombers launched from an aircraft carrier. On April 18, 1942, Lieutenant Colonel Doolittle led a flight of sixteen



PHOTO # 4
HOLD KEYLINE

The USS *Hornet* carried sixteen North American B-25 Mitchell medium bombers to a position 800 miles east of Tokyo. The airplanes under Doolittle's command launched from the deck of the carrier on April 18, 1942.

**Lt. Col. James H. Doolittle,
pilot (second from left),
and his crew (left to right)
Lt. Henry A. Potter,
navigator; SSgt. Fred A.
Braemer, bombardier;
Lt. Richard E. Cole, copilot;
and Lt. Henry L. Miller,
USN, engineer-gunner.**

***PHOTO # 5
HOLD KEYLINE***

***PHOTO # 6
HOLD KEYLINE***

Following the Doolittle raid on Tokyo, Brig. Gen. James Doolittle was awarded the Medal of Honor by President Franklin Roosevelt. Also pictured (left to right) are Lt. Gen. Henry H. Arnold, Mrs. Doolittle, and Gen. George C. Marshall, chief of staff.

Army Air Forces B-25s from the deck of the carrier *Hornet*. Although he had planned to take off when the carrier was 650 miles from Tokyo, Doolittle decided to start the mission from 800 miles east when enemy boats spotted the task force, threatening the element of surprise. Doolittle's raiders bombed not only Tokyo, but also Kobe, Yokohama, and Nagoya.

Surprise was achieved, but there were some complications. Hit by anti-aircraft artillery fire, one of the sixteen planes suffered minor damage. Fifteen B-25s crash-landed in China, two of them in enemy-occupied territory where the Japanese executed three crew members and imprisoned five others. The remaining plane landed near Vladivostok in the Soviet Union, and the crew was interned there for the remainder of the war. Fortunately, most of the "Tokyo Raiders" soon returned safely to Allied territory.

Although the mission inflicted little physical damage on Japanese territory, it did achieve its psychological objectives. Striking the Japanese islands boosted American morale and created heroes in the otherwise dark

early days of the war. And it shattered Japan's illusion of security. Adm. Isoroku Yamamoto, the commander of the Japanese Combined Fleet, and other Japanese military leaders responded by planning and executing a strike at Midway in June 1942 in an attempt to extend their defensive perimeter and thereby discourage future U.S. attacks on the heartland.

The Doolittle raid was not part of any systematic bombing campaign. The United States would have to wait for its surface forces to secure bases closer to the home islands for the strategic bombing effort to begin in earnest. So, starting down the long and painful path to victory, the U.S. air war against Japan shifted away from the home islands to Asia, the southwestern Pacific, and the central Pacific.

An Island-Hopping Strategy

Early in the war, American ground forces on the Asian mainland concentrated on supporting China's president, Chiang Kai-shek, and Britain's Admiral Lord Louis Mountbatten, Supreme Allied Commander, South-east Asia. After conquering Burma, Japanese troops cut the overland supply routes between India and China. The AAF began airlifting matériel over the Himalayas—the famous “Hump” air route. Here in the China-Burma-India (CBI) theater, the Allies pursued three objectives: keep China in the war, liberate Burma, and defend India. The Fourteenth Air Force supported Allied forces in China, and the Tenth Air Force aided the British in Burma and India. Preoccupied with defensive problems and lacking long-range bombers, neither air force contemplated long-range bombing missions against Japan.

Meanwhile, in New Guinea and the Dutch East Indies, Gen. Douglas MacArthur, Allied commander in the Southwest Pacific theater, led a campaign to liberate the Philippines. The Fifth and Thirteenth Air Forces dedicated themselves to flying tactical missions in support of the ground troops. Like their CBI counterparts, MacArthur's airmen had no aircraft with enough range to bring Tokyo and other Japanese cities under attack.

Of the entire Asian-Pacific region, the Central Pacific theater, commanded by Adm. Chester Nimitz, held the most promise. There, the Seventh Air Force supported an island-hopping strategy, bypassing some important enemy strongholds to reach key western Pacific islands. In American hands, these islands could eventually serve as bases for the long-range bombing campaign.

The Superfortress Takes to the Skies

Wartime planners recognized that bombing Japan required a very heavy bomber that could fly extremely long distances—a technological

***PHOTO # 7
HOLD KEYLINE***

The Boeing B-29 Superfortress could fly 3,000-mile missions, travel at speeds greater than 350 miles per hour, and cruise at over 33,000 feet. Its great range suited it for service in the war against Japan.

leap beyond the standard B-17 and B-24 heavy bomber designs. The aircraft developed for this purpose was the B-29 Superfortress. Designed between 1940 and 1942 by some of the top U.S. aeronautical engineers—Wellwood E. Beall, Edward C. Wells, George S. Schairer, and Col. Leonard “Jake” Harmon—the B-29 doubled the range and bomb load of its predecessors. Ninety-nine feet long, the Superfortress had a wing span of 141 feet and a tail 27 feet high. Four 18-cylinder, 2,200-horsepower engines and huge fuel tanks allowed it to carry ten tons of bombs and fly 3,000-mile missions. It could also exceed 350 miles per hour and cruise at over 33,000 feet. New pressurized cabins and two turbochargers for each engine increased the bomber’s high-altitude capabilities. For defense, the Superfortress boasted twelve .50-cal machine guns and a 20-mm cannon in the tail, with central gunfire control and remote turrets. A fully loaded B-29 weighed well over sixty tons, a “very heavy” bomber compared with the B-17 and B-24.

Building the Superfortress was a “three-billion-dollar gamble.” Officials rushed the new bomber into production before the prototype was even built, much less flown. Assembly lines started rolling at B-29 factories and modification facilities at Wichita, Kansas; Marietta, Georgia; Omaha, Nebraska; Cleveland, Ohio; and Renton and Seattle, Washington. By September 1942, when the XB-29 prototype first flew, the AAF had already ordered 1,664 bombers.

Converting paper into metal challenged the B-29’s engineers. The extremely complex weapon system faced a host of development problems, including engine malfunctions, jammed gears, dead power plants, and nacelle fires. Its front and rear rows of engine cylinders were too close for

efficient cooling—a serious design flaw. These difficulties struck home on February 18, 1943, when an XB-29 caught fire and crashed on a test flight. Despite all the obstacles, the engineers and aircraft builders pressed forward.

Even before the Superfortress had proven worthy for combat, President Roosevelt considered its future basing. At the end of 1943, the Joint Chiefs of Staff decided not to send the B-29 to Europe, where B-17s and B-24s were already flying strategic bombing missions against Germany. Introducing the bomber to combat in the Far East suited the AAF commander, Gen. Henry H. “Hap” Arnold, who told Army Chief of Staff Gen. George Marshall that using it elsewhere would deprive the United States of the element of surprise against Japan. At this point, even with the B-29’s phenomenal 1,600-mile combat radius, few Allied territories lay within range of the Japanese heartland. Western Pacific islands such as the Marianas were close enough, but they were still occupied by Japanese troops. Strategists considered basing Superfortresses in Siberia for attacks from the north, but the Soviet Union was not yet at war with Japan. Only one Allied territory—China—could provide bases within the B-29’s striking distance of the home islands.

The idea of basing the Superfortresses in China first surfaced at the Casablanca Conference in January 1943. While planners assessed this option, the Anglo-American Combined Chiefs of Staff, meeting in Quebec in August, authorized a central Pacific drive that included the seizure of the Marianas. Not only were the Marianas closer to Tokyo, but once in Allied hands they could be supplied and defended more easily than other sites. In September, Combined Chiefs of Staff planners concluded that B-29s in China would be plagued by logistical problems. However, President Roosevelt decided in favor of the China bases because he was impatient to bomb Japan and wished to bolster the Chinese war effort. At the Sextant Conference in Cairo at the end of the year, he promised Chiang Kai-shek that the very heavy bombers would be coming to his country. General Arnold supported that decision as a temporary expedient, but still preferred strategic missions against Japan from the Marianas, once bases there were available.

Advance AAF echelons arrived in India in December 1943 to organize the building of airfields in India and China. Thousands of Indians labored to construct four permanent bases in eastern India around Kharagpur. Meanwhile, 1,000 miles to the northeast, across the Himalayan mountains, about 350,000 Chinese workers toiled to build four staging bases in western China near Chengtu. By April 1944, eight B-29 airfields were available in Asia.

As these bases took shape, American officials fretted that the B-29s would not be ready to occupy them. The Superfortresses were rolling off the Boeing assembly lines on schedule, but the planes required extensive modifications, especially to the gun turrets, before they would be ready

for combat. Arnold was determined to get the B-29s operational as quickly as possible. Modification facilities around the country seemed unable to complete the work on time, so the government ordered B-29 modification contractors to rush personnel and equipment to four Kansas bases—Salina, Pratt, Great Bend, and Walker—for an all-out effort that came to be known as the “Battle of Kansas.” For forty-four days in March and April 1944, military and civilian engineers and mechanics fought wind and snow to ready the B-29s for overseas combat. Under the leadership of Maj. Gen. Bennett E. Meyers of the Air Technical Service Command, they rushed to prepare the first contingent of Superfortresses for deployment to India.

With production and basing under way, the AAF began to build the organizations that would employ the new strategic bomber. Training in the United States would be managed by the XX Bomber Command, established in November 1943 and assigned to the Second Air Force. But a second unique organization would be responsible for employing the Superfortress in combat. Arnold perceived that the theater commanders in Asia and the Pacific viewed aircraft merely as support for tactical surface operations and lacked a clear appreciation of the value of strategic bombing. He feared that the B-29s might be wasted on the battlefields when they would be much more useful against the Japanese home islands. To avoid this “misuse,” Brig. Gen. Haywood S. Hansell, one of Arnold’s planners, proposed to the Joint Chiefs of Staff that strategic air forces in the Pacific be consolidated under one command. The Joint Chiefs agreed and in April



PHOTO # 8
HOLD KEYLINE

**The interior of the Boeing
B-29 Superfortress, looking
into the compartment
of the remote control
gunner’s position.**

PHOTO # 9
HOLD KEYLINE

A view to the front of the B-29 Superfortress reveals the arc of windows framing the flight crew.

1944 established the Twentieth Air Force to manage the B-29s. Acting as executive agent for the Joint Chiefs, Arnold became the Twentieth's commander, and Hansell himself served as chief of staff. Centralized control of the Superfortresses from Washington marked the recognition of the B-29 as a strategic weapon that transcended theaters and services.

That same month, the first Superfortresses arrived in India, having flown across the Atlantic Ocean, North Africa, Arabia, and Iran. Accompanying them was Maj. Gen. Kenneth B. Wolfe, the new commander of the XX Bomber Command, which had been reassigned as the operational component of the Twentieth Air Force. General Wolfe had supported the B-29 project at Wright Field and had been the first commander of the 58th Bombardment Wing, one of the first wings to receive the new bomber. Wing headquarters also arrived in India during the spring of 1944. Ultimately, the 58th was the only wing to serve on the Asian mainland under the XX Bomber Command. The other original B-29 wing, the 73d, did not deploy overseas until after a base was available in the Marianas.

Over the Hump to Matterhorn

In April 1944, the Joint Chiefs of Staff approved Operation Matterhorn, a plan for bombing Japanese strategic targets with B-29s based in

China. A committee of operations analysts who advised the Joint Chiefs of Staff and the Twentieth Air Force on targets recommended Superfortress attacks on coke ovens and steel factories in Manchuria and Kyushu. Shutting down these key industries would severely cripple the enemy's war effort. Also on the target list were important enemy harbor facilities and aircraft factories. Wolfe launched the first B-29 Superfortress combat mission on June 5, 1944, against Japanese railroad facilities at Bangkok, Thailand, about 1,000 miles away. Of the ninety-eight bombers that took off from India, seventy-seven hit their targets, dropping 368 tons of bombs. Encouraged by the results, XX Bomber Command prepared for the first raids against Japan.

Ten days later, sixty-eight Superfortresses took off at night from staging bases at Chengtu to bomb the Imperial Iron and Steel Works at Yawata on Kyushu, more than 1,500 miles away. The June 15, 1944, mission—the first raid on the Japanese home islands since the Doolittle attack of April 1942—marked the beginning of the strategic bombardment campaign against Japan. Like the Doolittle raid, it achieved little physical destruction. Only forty-seven of the sixty-eight B-29s airborne hit the target area; four aborted with mechanical problems, four crashed, six jettisoned their bombs because of mechanical difficulties, and others bombed secondary targets or targets of opportunity. Only one B-29 was lost to enemy aircraft.

The second full-scale strike did not occur until July 7, 1944. By then, Arnold, impatient with Wolfe's progress, had replaced him temporarily with Brig. Gen. LaVern G. Saunders, until Maj. Gen. Curtis E. LeMay could arrive from Europe to assume permanent command. Unfortunately, the three-week delay between the first and second missions reflected serious problems that prevented a sustained strategic bombing campaign from China against Japan. Each B-29 mission consumed tremendous quantities of fuel and bombs, which had to be shuttled from India to the China bases over the Himalayas, the world's highest mountain range. For every Superfortress combat mission, the command flew an average of six B-29 round-trip cargo missions over the Hump. Even after the Air Transport Command took over the logistical supply of the B-29 bases in China at the end of 1944, enough fuel and bombs never seemed to reach Chengtu.

Range presented another problem. Tokyo, in eastern Honshu, lay more than 2,000 miles from the Chinese staging bases, out of reach of the B-29s. Kyushu, in southwestern Japan, was the only one of the major home islands within the 1,600-mile combat radius of the Superfortress.

And the very heavy bomber still suffered mechanical problems that grounded some aircraft and forced others to turn back before dropping their bombs. Even those B-29s that reached the target area often had difficulty in hitting the objective, partly because of extensive cloud cover or high winds. Larger formations could have helped compensate for inaccurate bombing, but Saunders did not have enough B-29s to dispatch large formations. Also, the Twentieth Air Force periodically diverted the

Superfortresses from strategic targets to support theater commanders in Southeast Asia and the southwestern Pacific. For these reasons, the XX Bomber Command and the B-29s largely failed to fulfill their strategic promise.

On August 20, LeMay arrived to breathe new energy into the XX Bomber Command. The former Eighth Air Force bomber pilot and group commander had achieved remarkable success with strategic bombing operations in Europe, testing new concepts such as stagger formations, the combat box, and straight-and-level bombing runs. The youngest two-star general in the AAF had also revised tactics, tightened and expanded formations, and enhanced training for greater bombing precision. He inaugurated a lead-crew training school so that formations could learn to drop as a unit on cue from the airplane designated as the lead ship.

During his first two months at XX Bomber Command, LeMay had little more success than Wolfe or Saunders. The command continued to average only about one sortie a month per airplane against Japan's home islands. When MacArthur invaded the Philippines in October 1944, LeMay diverted his B-29s from bombing Japanese steel facilities to striking enemy aircraft factories and bases in Formosa, Kyushu, and Manchuria.

Meanwhile, LeMay gained the support of Communist leader Mao Tse-tung, who controlled parts of northern China. Willing to help against a common enemy, Mao agreed to assist downed American airmen and to locate in northern China a weather station that would provide better forecasts for the XX Bomber Command's raids on the Japanese in Manchuria and Kyushu. Hoping to gain American recognition of his own regime, Mao suggested that the Americans set up B-29 bases in northern China like those in Chiang Kai-shek's area of control in southern China. LeMay declined, however, because he found it difficult enough to supply the airfields at Chengtu.

The former European theater bomber commander continued to experiment with new technologies and tactics and soon imported to China the incendiary weapons being used by the British against Germany. In late 1944, a Japanese offensive in China probed toward the B-29 and Air Transport Command bases around Chengtu and Kunming. To slow the



***PHOTO # 10
HOLD KEYLINE***

Maj. Gen. Claire L. Chennault

enemy advance, Maj. Gen. Claire L. Chennault of the Fourteenth Air Force asked for raids on Japanese supplies at Hankow, and the Joint Chiefs directed LeMay to hit the city with firebombs. On December 18, LeMay launched the fire raid, sending eighty-four B-29s in at medium altitude with five hundred tons of incendiary bombs. The attack left Hankow burning for three days, proving the effectiveness of incendiary weapons against the predominantly wooden architecture of the Far East.

By late 1944, American bombers were raiding Japan from the recently captured Marianas, making operations from the vulnerable and logistically impractical China bases unnecessary. In January 1945, the XX Bomber Command abandoned its bases in China and concentrated 58th Bomb Wing resources in India. The transfer signaled the end of Matterhorn. During the same month, LeMay moved to the Marianas, leaving command of the XX Bomber Command in India to Brig. Gen. Roger M. Ramey. Between January and March, Ramey's B-29s assisted Mountbatten in southeastern Asia, supporting British and Indian ground forces in Burma by targeting rail and port facilities in Indochina, Thailand, and Burma. More distant targets included refineries and airfields in Singapore, Malaya, and the East Indies. The 58th, the only operational wing of the XX Bomber Command, remained in India until the end of March 1945, when it moved to the Marianas to join the XXI Bomber Command.

At the end of the war, the U.S. Strategic Bombing Survey delicately judged the B-29 operations against Japan from China to be "not decisive." Matterhorn had failed to achieve its strategic objectives, largely because of logistical problems, the bomber's mechanical difficulties, the vulnerability of Chinese staging bases, and the extreme range required to reach key Japanese cities. Although the B-29s achieved some success when diverted to support Chiang Kai-shek's forces in China, MacArthur's offensives in the Philippines, and Mountbatten's efforts in Burma, they generally accomplished little more than the B-17s and B-24s assigned to the Fourteenth, Fifth, Thirteenth, and Tenth Air Forces.

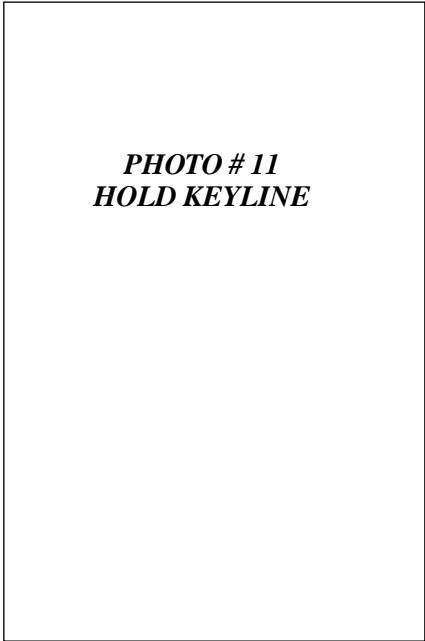
Chennault considered the Twentieth Air Force a liability and thought that its supplies of fuel and bombs could have been more profitably used by his Fourteenth Air Force. The XX Bomber Command consumed almost 15 percent of the Hump airlift tonnage per month during Matterhorn. Lt. Gen. Albert C. Wedemeyer, who replaced Lt. Gen. Joseph W. Stilwell as American senior commander in the China theater, agreed with Chennault. The two were happy to see the B-29s leave China and India.

Yet, despite those objections, Matterhorn did benefit the Allied effort. Using the China bases bolstered Chinese morale and, more important, it allowed the strategic bombing of Japan to begin *six* months before bases were available in the Marianas. The Matterhorn raids against the Japanese home islands also demonstrated the B-29's effectiveness against Japanese fighters and antiaircraft artillery. Operations from the Marianas would

profit from the streamlined organization and improved tactics developed on the Asian mainland.

The Capture and Use of the Marianas

With the capture of the Marianas, U.S. forces gained a defensible, easily supplied set of airfields capable of sustaining hundreds of Superfortresses



Two of the most important islands in the Marianas group: Saipan in the foreground and Tinian in the background. The overall distance covered by the photograph is approximately 26 miles.

Following U.S. capture of the Marianas, members of an engineer aviation batallion constructed airstrips on the islands of Saipan, Tinian, and Guam.

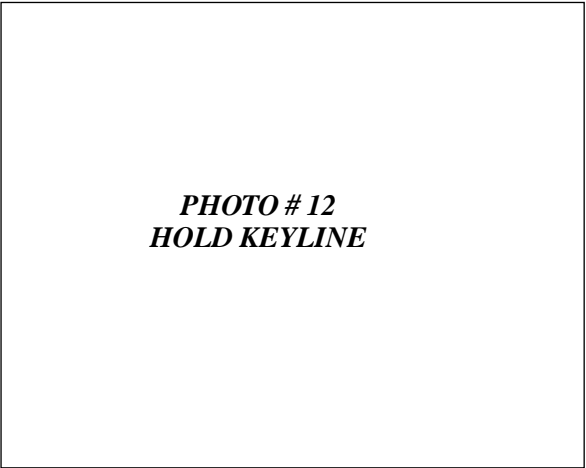


PHOTO # 13
HOLD KEYLINE

B-29s fly in formation during a familiarization flight over the Marianas in 1944.

at one time. Of the major Japanese home islands, only Hokkaido lay beyond Superfortress range from Saipan.

Admiral Nimitz coordinated the sea, land, and air forces that secured the southern Marianas during the summer of 1944. Saipan fell at great cost in a brutal campaign during June and July. Nimitz captured Tinian in July and Guam in August. The U.S. conquest of the southern Marianas shook Japanese political and military rulers, who correctly reasoned that the Americans would bomb Japan from the captured islands. In July 1944, a retired general, Kuniaki Koiso, replaced Gen. Hideki Tojo as premier, primarily because of the successful American invasion. Although more moderate than Tojo, Koiso refused to consider surrender. He realized Japan's vulnerability to air attack from the Marianas, but was far from concluding that the war was lost.

As the Japanese adjusted to the loss of Saipan, Tinian, and Guam, the United States prepared for B-29 operations based in the Marianas. Nimitz coordinated his activities with those of the AAF through Lt. Gen. Millard Harmon, who became commander of the AAF, Pacific Ocean Areas, on August 1, 1944. The former head of army forces in the South Pacific wore two hats: exercising operational control of all land-based planes in the Pacific theater, Harmon reported directly to Nimitz; and, as deputy commander of the Twentieth Air Force, he reported to Arnold in Washington.

Arnold reserved operational control of the Superfortresses in the Marianas for the XXI Bomber Command under Hansell, former chief of staff of the Twentieth Air Force. On October 12, Hansell landed at Isley Field on Saipan in the first B-29 to reach the Marianas, and soon the 73d Bombardment Wing arrived with its complement of Superfortresses. Before the month ended, Hansell launched the first shakedown flight: fourteen B-29s

PHOTO # 14
HOLD KEYLINE

Japanese air strikes at Saipan in late 1944 destroyed B-29s and fuel at the XXI Bomber Command headquarters. In the photos above and to the right, firefighters work to contain the blazes and spare aircraft.

PHOTO # 15
HOLD KEYLINE

struck the submarine pens on Dublon Island, several hundred miles southeastward in the Caroline Islands.

Hansell's strategic targets were handpicked by the Joint Chiefs of Staff. First priority went to aircraft factories because that industry, like the steel facilities targeted during Matterhorn, was considered particularly vulnerable, and the bombing would affect the enemy's performance against MacArthur's offensive in the Philippines. Other targets included port facilities in the major cities of the Japanese empire.

Hansell prepared carefully for his first strategic missions. On November 1, the *Tokyo Rose* flew a photographic mission over the Japanese capital, marking the first appearance of an American aircraft in the skies over Tokyo since the Doolittle raid more than two-and-a-half years earlier. Later that month, reconnaissance versions of the B-29 flew seventeen more sorties. On November 24, more than six weeks after he had arrived on Saipan, Hansell finally unleashed San Antonio I, the first Superfortress attack on

PHOTO # 16
HOLD KEYLINE

Pictured from left to right, Maj. Gen. Curtis E. LeMay, Brig. Gen. Haywood Hansell, and Brig. Gen. Roger M. Ramey.

Japan from the Marianas. One hundred eleven B-29s, 90 percent of the Superfortresses on Saipan, set off for Tokyo, led by Brig. Gen. Emmett O'Donnell, Jr., 73d Bombardment Wing commander, in *Dauntless Dotty*.

The mission had only symbolic success. Many of the bombers ran short of fuel and turned back; others failed to bomb because of mechanical difficulties. Eight Superfortresses were damaged by the enemy, and one was lost in combat. At high altitude, the remaining bombers encountered strong jet stream tailwinds that pushed them over the targets at a speed of 445 miles per hour. Only 35 of the 111 B-29s managed to bomb the primary target, the Musashino aircraft factory. A mere 48 bombs hit the factory area, damaging 1.0 percent of the building and 2.4 percent of its machinery.

Three days later, Hansell launched San Antonio II. Eighty-one Superfortresses bombed aircraft factories and docks in Tokyo, using radar because of cloud cover, but they did little damage. However, the news was not all bad: the raid showed that airmen could sustain a bombing campaign from the Marianas and that most Japanese interceptors and anti-aircraft artillery were still ineffective.

Not until January 1945 did Hansell demonstrate the potential of precision bombing tactics with B-29s against Japan. On January 19, his Superfortresses practically shut down the Akashi works of the Kawasaki Aircraft Industries Company near Kobe, which in 1944 had supplied 17 percent of Japan's airframes and 12 percent of its airplane engines. The raid cut the plant's production by 90 percent. Unfortunately for Hansell, the destructiveness of the January 19 raid was not confirmed until much later.

PHOTO # 17
HOLD KEYLINE

Iwo Jima, situated halfway between Saipan and Japan, was a tiny fortress of only eight square miles. From the cross-like airfield directly in the center of the island, the Japanese sent aircraft to raid B-29 bases and attack U.S. bombers en route to or from Japan.

Hansell—A Vulnerable Commander

Even with the new bases in the Marianas, the XXI Bomber Command's B-29s had little success against Japan during late 1944 and early 1945. The Superfortresses continued to suffer mechanical problems. (Hansell's own airplane had to abort during San Antonio I.) The extreme range placed still more demands on the aircraft. Formation flying and the 3,000-mile round-trip to Japan consumed enormous quantities of fuel. The very long distances precluded land-based escort, so the B-29s flew at altitudes of up to 35,000 feet, beyond the reach of most Japanese interceptors. The climb consumed even more fuel. At extremely high altitudes, jet stream winds around Japan blew the bombers and bombs off course. Tailwinds pushed the Superfortresses so fast over their targets that there was no time to drop the bombs accurately. Headwinds slowed the bombers, increasing their vulnerability to antiaircraft defenses or fighters and eating up fuel. Clouds often obscured targets, and tropical storms were common.

During the first weeks on Saipan, Hansell also lacked enough aircraft to mount effective strategic missions. Larger formations could compensate in part for lack of precision, covering more area with bombs and increasing

A crew member looks out through the damage inflicted on a Seventh Air Force Liberator by a Japanese antiaircraft shell after the B-24 had dropped its bomb load over Iwo Jima.

***PHOTO # 18
HOLD KEYLINE***

the chances of hitting a target. By mid-January 1945, two full B-29 wings were based in the Marianas.

Iwo Jima, a small island between Japan and the Marianas, was a continual sore point for the United States. From there, enemy aircraft often raided the Superfortress bases or attacked the formations heading to or from Japan. Sacrificing guns and bullets for speed and altitude, the desperate Japanese fighters sometimes rammed the giant bombers. Enemy radar on Iwo Jima also warned the Japanese home islands of impending Superfortress raids.

Hansell's own resistance to his superiors' demands for area incendiary bombing also contributed to his fall. Fire raids dated back to July 1943 when the Royal Air Force had ignited a firestorm in Hamburg. After the successful December 1944 fire raid by the India-based XX Bomber Command against Hankow, China, Twentieth Air Force Chief of Staff Brig. Gen. Lauris Norstad directed Hansell to launch similar fire raids against Japan from the Marianas. Hansell, who had devoted much of his life to selective targeting and precision bombing doctrine, reluctantly sent an incendiary raid against Nagoya on January 3, 1945. The raid failed to achieve the level of destruction Arnold and Norstad desired. By mid-January, Arnold was exasperated by Hansell's caution, delays, and lack of results. Before the successful Akashi raid, Arnold had already decided to replace Hansell with LeMay.

Hansell's dismissal obscured his achievement in pioneering the XXI Bomber Command's strategic campaign against Japan from the Marianas. Stressing precision daylight raids over night bombing with radar, Hansell improved bombing accuracy after a determined struggle. He increased the percentage of bombers reaching their targets and returning to their home

bases. At the time of his dismissal, his 73d Bombardment Wing in Saipan had been joined by the 313th on Tinian, and the 314th was on the way to Guam. Hansell oversaw the stationing of these new wings. Most important, he set in motion the repeated bombing of industries in Tokyo and other Japanese cities that were beyond the reach of the B-29 bases in Asia. In fact, his performance with the XXI Bomber Command in the Marianas compared favorably with that of the XX Bomber Command in the China-Burma-India theater. But Arnold, determined to knock Japan out of the war prior to an Allied invasion, expected a significantly better performance from the Marianas.

Building Up the Force

LeMay arrived in the Marianas with a reputation as a troubleshooter for B-29 operations in Asia and quickly built on Hansell's carefully prepared foundation. Driven to improve the XXI Bomber Command's ability to destroy Japanese targets while decreasing the number of planes that failed to bomb the target or to return from a mission, LeMay stressed crew training, especially for lead crews.

As more B-29s arrived in the Marianas, LeMay was able to increase the average number of aircraft in each formation from seventy-five to more than one hundred. He reasoned that if huge formations dropped their loads at the same time, a large contiguous area that included the target would be destroyed. He also persuaded the AAF to assign escort fighters to the Twentieth Air Force to reduce further the chances that the big bombers would be lost.

LeMay soon amassed the resources to create his large bomber formations. The XXI Bomber Command ultimately set up one wing on each of five airfields that navy and army engineers constructed in the Marianas: one on Saipan, two on Tinian, and two on Guam. By the end of January 1945, the 73d, 313th, and 314th Bombardment Wings were established on Saipan, Tinian, and Guam, respectively. At the end of March, the 58th Bombardment Wing moved from India to Tinian, and during April the 315th Wing arrived on Guam.

LeMay also benefited from the maturation of the B-29 as a weapon system. As assemblyline workers gained experience, Superfortress factories increased the quality and quantity of their production, and more of the very heavy bombers were available for Pacific duty. Throughout 1945, B-29s in the Marianas suffered fewer mechanical problems because maintenance crews discovered and corrected defects more quickly.

Fortunately for LeMay, U.S. Marines conquered Iwo Jima between February 19 and March 26, 1945. By taking the island, U.S. forces deprived the Japanese not only of an air base from which to raid the Marianas and the AAF bomber formations, but also of a radar site from which

***PHOTO # 19
HOLD KEYLINE***

to warn the home islands of impending raids. Iwo Jima soon became a staging base, a fighter-escort base, and an air rescue station. The VII Fighter Command found a home there at the end of March. More important, the United States gained an emergency landing field for the B-29s. By the end of the war, 2,400 Superfortresses had made emergency landings on Iwo Jima, proving the worth of the small island that 4,600 Americans had sacrificed their lives to capture.

The Home Islands Ablaze

Gen. Curtis E. LeMay

Despite the changes, LeMay was still dissatisfied with the XXI Bomber Command's performance. During his first six weeks in the Marianas, B-29s dropped more than 5,000 tons of bombs during sixteen missions, but only one raid caused much damage. From altitudes of 25,000 to 30,000 feet above targets obscured by cloud ceilings averaging 6,000 feet, LeMay's airmen placed less than 6 percent of bombs within 1,000 feet of their targets. The damage was hardly worth the raid's expense in resources and lives. LeMay was getting no better results than had Hansell.

***PHOTO # 20
HOLD KEYLINE***

Boeing B-29s take off on a night mission against Japan from an airstrip on Saipan.

PHOTO # 21
HOLD KEYLINE

Seen through the windows of another Superfortress, incendiary bombs drop from two B-29s. Each firebomb delivered the destructive force of ten gallons of flaming gasoline against predominantly wooden Japanese buildings.

Anxious to demonstrate the effectiveness of the B-29, LeMay decided to supplement precision, high-altitude, daylight bombing with low-altitude, night incendiary bombing of Japanese cities. He had good reasons for the transition. Arnold and Norstad insisted that he use incendiary bombs. They had encouraged LeMay's fire raid on Hankow, China, in December 1944 and had pressured Hansell to use fire raids as well. LeMay admitted: "The turkey was around my neck. . . ."

Operations in Europe had demonstrated the effectiveness of incendiary raids. In February, British and U.S. bombers devastated the German city of Dresden, causing firestorms like those in Hamburg. LeMay and other AAF leaders speculated that the fire raids would destroy the enemy's will to resist as well as his ability to do so. LeMay also reasoned that Japan's predominantly wood-and-paper structures were more vulnerable to fire than was the masonry construction of German cities.

Incendiary weapons were then becoming available in quantity. Chemists at Dupont and Standard Oil, with support from the National Research Defense Council, had perfected napalm and other formulas, making the new bombs more lethal than ever. The U.S. Navy, in firm control of the water routes to the southern Marianas, could deliver the large quantities of firebombs that the XXI Bomber Command would need for incendiary raids.

However, LeMay believed that greater accuracy would not necessarily cripple Japanese production. Much of the enemy's war industry was in small factories scattered across the cities rather than in large plants. Unlike Europe, Japan had few strategic bottlenecks vulnerable to precision bombing.

Lower-altitude strikes, from about 5,000 feet, would save fuel and engines by eliminating the need for the B-29s to climb so high during the long flight from the Marianas. Coming in beneath the high-velocity jet stream, bombers would not have to fight powerful headwinds, and bombardiers would not have to worry about tailwinds driving the bombers too quickly over the targets. The fuel savings would allow each bomber to carry more bombs, and flying below the average height of the cloud cover would make the targets more visible, even at night. LeMay preferred night raids, which would reduce the effectiveness of Japanese anti-aircraft artillery and fighters and make low-altitude missions practical. Without the threat of enemy night fighters, the XXI Bomber Command could strip the B-29s of most of their guns and load more bombs instead.

Putting these theories to the test, LeMay directed a massive B-29 raid on the Japanese capital on February 25, 1945—a rehearsal for future incendiary raids. Striking a city four times as densely populated as the average American city, 172 B-29s from three wings left twenty-eight million square feet of urban real estate in smoldering embers. The Tokyo raid proved the vulnerability of enemy cities to firebombing, although it did not produce the tremendously destructive firestorms of later B-29 attacks.

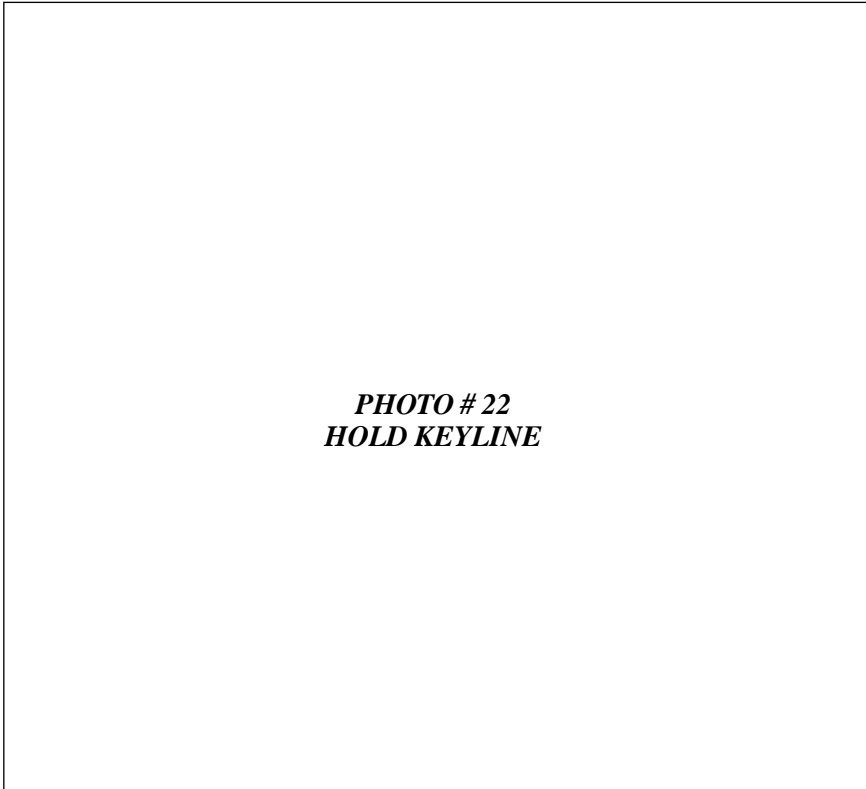
In March 1945, XXI Bomber Command employed the new incendiary tactics in five massive fire raids against some of the largest Japanese cities, including Tokyo, Nagoya, Osaka, and Kobe. During the Tokyo raid on the night of March 9/10, 279 B-29s flew in at altitudes of 4,900 to 9,200 feet. Three streams of bombers from three wings dropped almost 2,000 tons of firebombs while pathfinder aircraft illuminated the heart of the city.

In thirty minutes, the fires were out of control. Even if the Japanese had had more and better fire-fighting equipment, they would have been hard-pressed to combat the raging firestorms that boiled water in canals and melted the glass of store windows. Flames leaped waterways and firebreaks and raced through a three-by-five-mile area. Updrafts even shook the bombers flying above the fires. The raiders could see the glow in the sky 150 miles away. This time the incendiaries burned out sixteen square miles of Tokyo, killing more than 83,000 people, injuring more than 40,000, and leaving up to one million homeless. No other single air raid in history had killed so many people. More than 267,000 buildings, as much as one-fourth of the city, burned down. The proper combination of factors, including weather, quantities of bombers, types of bombs, and formation patterns resulted in the annihilation of 18 percent of Tokyo's industrial area and 63 percent of its commercial area. In contrast, the XXI Bomber

Command lost only fourteen B-29s on the mission and forty-two other airplanes suffered damage.

The Twentieth Air Force raided Nagoya the night of March 11/12, 1945, with 285 B-29s; Osaka before dawn on March 14 with 274 B-29s; Kobe just after midnight on March 17 with 307 B-29s; and Nagoya again the night of March 18/19 with 290 B-29s. The five raids in ten days incinerated more than thirty-one square miles of densely populated urban area in four of Japan's largest cities. Later in March, LeMay also directed the firebombing of Tachiarai, Oita, and Omura. By the end of the month, the XXI Bomber Command was running out of incendiary bombs.

The low-level night fire raids fulfilled the airmen's expectations. Bomb loads on each airplane doubled. LeMay increased the number of missions per month, saved large amounts of fuel per mission, and lost fewer bombers. More aircraft bombed the new primary targets because those targets were so much larger: area bombing did not require much



Whole sections of the industrial city of Hamamatsu, Japan, were destroyed in B-29 bombing raids in the spring and summer of 1945. The few business blocks that remain standing are only hollow building shells.

PHOTO # 23
HOLD KEYLINE

Delivered by B-29s of the 500th Bomb Group, a shower of firebombs pours on Japanese installations at Yokohama on May 29, 1945.

accuracy. Although analysts could not accurately gauge the destruction of Japanese industrial and military targets hidden in the cities, they could see in reconnaissance photographs how much area was destroyed. LeMay was succeeding where Hansell had failed. The March fire raids convinced the bomber commander that air power alone could force a Japanese surrender.

During April 1945, the XXI Bomber Command shifted its attention from major enemy cities to airfields on Kyushu. From there, suicidal Japanese kamikazes launched deadly ramming attacks against the U.S. fleet during the invasion of Okinawa (Operation Iceberg). Okinawa in the Ryukyu Islands was to be the home of new B-29 bases for the strategic bombardment of Japan. Between April 8 and May 11, 75 percent of XXI Bomber Command missions supported Iceberg. Regrettably, these airfield raids were not very effective because the enemy forces hid their fighters and quickly rebuilt the strips.

By mid-May, LeMay was happy to return his attention to the Japanese cities and their industries. He embarked on an "Empire Plan," which allowed weather conditions to determine if the bombing raids would be precision or area strikes. The B-29s flew precision daylight missions in good weather and night incendiary raids when targets were obscured by clouds. Thus, LeMay retained the relevant portions of U.S. strategic bombing doctrine.

Incendiary bombing continued to produce the most destructive results. In May and June 1945, the XXI Bomber Command firebombed Japan's six largest industrial cities, eliminating them as profitable targets.

Seven of these raids involved formations exceeding 500 B-29s. On the night of May 23/24, no less than 520 B-29s—the largest number of Superfortresses sent against any Japanese city—struck Tokyo again. Two nights later, 464 B-29s returned to the Japanese capital with over 3,000 tons of firebombs. Almost seventeen square miles burned, and the Imperial Palace caught fire. Casualties, however, were lower than in the March raid because of evacuations to the countryside. Fifty-eight medium-sized cities and towns suffered next. A firestorm generated by B-29s at Toyama destroyed 99 percent of the city.

Throughout the onslaught, Japanese air defenses remained largely ineffective. U.S. B-29s could operate freely at lower altitudes because anti-aircraft fire was feeble at night and the enemy lacked a first-rate night fighter. Even so, enemy fighters downed twenty-six Superfortresses during the last fire raid on Tokyo the night of May 25/26, 1945, the highest single-day loss of B-29s in the war. A few days later, 454 B-29s struck Yokohama, this time escorted by more than one hundred P-51s from the VII Fighter Command on Iwo Jima. By the summer of 1945, LeMay was so confident his bombers could get through the Japanese fighter and anti-aircraft defenses that he began warning enemy cities that might be attacked through leaflet drops and radio broadcasts. Of course, he did not immediately strike every city warned, but the tactic did prove psychologically damaging and saved some lives.

The XXI Bomber Command devoted 75 percent of its sorties and tonnage to urban area incendiary attacks. Just as advocates had predicted, the fire raids destroyed many strategic targets that precision bombing had failed to hit: an estimated twenty-three major aircraft factories; six major arsenals; and a host of steel, petroleum, and gas plants. The Twentieth Air Force launched almost 7,000 B-29 sorties or flights on seventeen incendiary raids, dropping a total of 41,500 tons of firebombs. Only about 136 B-29s were lost to all causes during the incendiary campaign—a mission loss rate of less than 2 percent.

Specialized Missions Take Their Toll

The XXI Bomber Command devoted the rest of its sorties and tonnage to specialized missions performed by the 313th and 315th Bombardment Wings. On June 26, 1945, the 315th began a campaign against Japanese oil facilities. Over the next few weeks, it destroyed or heavily damaged Japan's ten largest petroleum and synthetic oil plants, including much storage capacity. Although the B-29s bombed at night so that they could carry more bombs and fewer guns, they achieved a reasonable degree of precision with the help of improved radar (APQ-7). By early August, the 315th bombers had eliminated most of the enemy's refining capability. Despite this success, some questioned the rationale for the attacks because the

Allied naval blockade had already severely restricted the delivery of crude oil supplies to the refineries.

For its part, the 313th Bombardment Wing on Tinian assumed another specialized mission—the aerial mining of Japanese waters to supplement the submarine blockade. Dubbed Operation Starvation, the mining was not an orthodox strategic air mission. LeMay supported Starvation, nevertheless, to demonstrate the versatility of air power. The 313th began systematic mining in late March 1945. Each B-29 carried 12,000 pounds of half-ton and one-ton mines. By mid-August, the bombardment wing had dropped more than 12,000 mines, most in the Shimonoseki Strait between Honshu and Kyushu, through which 80 percent of Japanese merchant shipping passed. The B-29s also mined Nakaumi Lagoon and the waters around Sakai, Yonago, Hamada, Wonsan, and other enemy ports. In less than five months, the 313th Bombardment Wing conducted 1,528 mine-laying sorties, losing only nine airplanes to enemy action. After April, the enormously successful B-29 campaign accounted for more Japanese merchant marine losses than did U.S. submarines. Superfortress-laid mines sank half of the tonnage the Japanese merchant marine lost during the war. The enemy lost 9 percent of her ships to the Twentieth Air Force.

By August, the Twentieth Air Force had conducted 380 combat missions against Japan. Superfortresses released 147,000 tons of bombs, 91 percent of all bombs dropped on Japan's home islands. B-29 attacks destroyed half of the enemy's aircraft plant capacity and probably cost the Japanese 7,000 combat planes in lost production. In the process, the Twentieth lost 512 B-29s and 576 aircrew members. By August, more than 2,000 crew members were missing in action, but in the last month of the war, when the Twentieth Air Force had over 1,000 B-29s in the Pacific, only four Superfortresses were lost.

The Twentieth Air Force did not have a monopoly on the bombing of Japan. After the Allies drove enemy forces from the Aleutian Islands of Alaska, the Eleventh Air Force established bases there. Using B-24 Liberators, the Eleventh bombed Japanese installations in the Kurile Islands northeast of Hokkaido as early as November 1943. After the fall of Okinawa to U.S. forces in April 1945, the Far East Air Forces (comprising the Fifth, Seventh, and Thirteenth Air Forces) established bases in the Ryukyu Islands, southwest of the home islands, from which to bomb Kyushu in preparation for the invasion of Japan. Okinawa was near enough to Japan for the Far East Air Forces to use B-24s and other warplanes smaller than the B-29.

The Question of Japanese Surrender

Following the March fire raids and the U.S. invasion of Okinawa in early April, the Japanese government finally showed signs of movement

PHOTO # 25
HOLD KEYLINE

PHOTO # 26
HOLD KEYLINE

Among the specialized missions carried out by personnel in the Marianas Islands was aerial mining of Japanese waters to support the submarine blockade. In the photos above, crews prepare the mines and load them aboard their delivery Superfortresses.

toward peace. When the Soviet Union renounced its neutrality pact with Japan on April 5, suggesting that it would join the United States against Japan after Germany was defeated, General Koiso became convinced that

he had failed the emperor and resigned as premier. Kantaro Suzuki, a former admiral in the Imperial Navy, took Koiso's place. Suzuki set up a small inner war council of six, including himself, the foreign minister, the navy minister, the war minister, and the two military chiefs of staff. Of these, the first three leaned toward peace.

The death of President Roosevelt as a result of a stroke on April 12 and the surrender of Germany on May 7 had some effect on the Imperial government. Japanese officials representing the peace party approached the Soviets to seek continued Russian neutrality and to see if the Soviet Union might serve as a mediator with the Allies. The Soviets refused. They were preparing to invade Japanese-held territory in Asia and knew that the new U.S. president, Harry S Truman, pursued the same policy as his predecessor in seeking an unconditional Japanese surrender.

By July 1945, Japan was reeling from the effects of the U.S. naval blockade and air offensive. Food shortages were so severe that the government urged people to collect acorns. Incendiary attacks from the air had destroyed 2.5 million houses, leaving millions of people homeless. Aware of Japan's distress, both Arnold and LeMay believed that the enemy might surrender without an invasion. General Marshall did not share their opinion. He believed the Japanese would continue to resist the pressure of air and sea power. Marshall told Truman that bombing and blockade alone had not defeated Germany and likely would not defeat Japan either. At President Truman's direction, the Joint Chiefs of Staff continued to prepare for the invasion of Japan.

***PHOTO # 27
HOLD KEYLINE***

Almost all of Toyama was in flames following night incendiary attacks on August 1, 1945. Toyama was an industrial city where textiles, ball bearings, machine tools, aircraft parts, and special alloy steels were produced.

Invasion plans required about five million Allied troops, most of them from the United States. In the first stage, Operation Olympic, Allied forces would invade Kyushu in November 1945. In the second stage, Operation Coronet, scheduled for March 1946, the invasion troops would assault Honshu. U.S. planners had no illusions about the costs of the invasions. The Japanese had gathered more than 8,000 airplanes to use as kamikazes against the invasion fleet. About two million Japanese troops, supported by twenty-eight million armed civilians, awaited the invaders. If the U.S. casualty rate for the invasion of Kyushu matched the 35 percent casualty rate experienced on Okinawa, 268,000 Americans might be killed or wounded during Operation Olympic alone. Experts estimated that the entire invasion of Japan, including the assault on Honshu, would kill or wound a million Americans, and many more Japanese. An alternative to the invasion might save lives, and that alternative was waiting in the wings.

The Manhattan Project

Since the late 1930s, scientists had been exploring the military applications of atomic energy. German scientists split the atom in a laboratory experiment as early as 1938. The next year, Albert Einstein, a leading physicist who had emigrated from Germany to the United States to flee the Nazis, warned President Roosevelt that a new atomic weapon might be possible. Alarmed by the outbreak of war in Europe, Roosevelt authorized an American effort to develop the first atomic bomb before the Germans did. Code-named the Manhattan Project, it was placed under the leadership of Col. Leslie R. Groves of the U.S. Army Corps of Engineers.

Scientists predicted that fission fuel could be derived from uranium 235, an isotope of uranium, and from plutonium, a uranium by-product that could be produced from atomic reactors. Before long, the Manhattan Project constructed several facilities for production of an atomic bomb. Among them were Oak Ridge, Tennessee, where huge equipment separated uranium 235 from uranium 238 ore; Hanford, Washington, where reactors produced plutonium; and Los Alamos, New Mexico, where the bomb itself was designed.

The Twentieth Air Force's fleet of B-29s offered the obvious delivery vehicles because they were capable of dropping the new weapons where they would have the greatest effect. In December 1944, long before the first bomb was ready for testing, the Army Air Forces activated the 509th Composite Group, with specially designed B-29s, under Col. Paul W. Tibbets, Jr. After training at Wendover Field, Utah, the group moved to North Field, Tinian, in May 1945. Most of the 509th's members did not know about the atomic bomb until the first mission, having been told only to prepare for the delivery of special devices over selected Japanese targets.

At Los Alamos, American physicist J. Robert Oppenheimer led a team of scientists designing the first atomic weapon. In two years, his team invented two kinds of atomic bombs: “Little Boy,” a uranium 235 bomb that used a gun detonator; and “Fat Man,” a plutonium bomb that used an implosion detonator. Both bombs operated on the same principle—force enough nuclear material in a small enough space to achieve a critical mass that would produce an atomic chain reaction. The resulting explosion would dwarf any that humankind had ever achieved.

Only when Truman succeeded to the presidency in April 1945 did he learn the details of the Manhattan Project. Despite the surrender of Germany in May, Truman directed that the Manhattan Project proceed, and by mid-July the first atomic bomb was ready for testing. Engineers put one of the plutonium Fat Man bombs on a one-hundred-foot steel tower at a site called Trinity at the Alamogordo Bombing Range, about 200 miles south of Los Alamos. On July 16, 1945, the bomb exploded with a blast equivalent to 17,000 tons of TNT.



***PHOTO # 28
HOLD KEYLINE***

U.S. physicist J. Robert Oppenheimer, left, and Col. Leslie R. Groves, U.S. Army Corps of Engineers, were principal players in the Manhattan Project.

Potsdam

News of the successful Alamogordo test reached Truman when he was at the Potsdam Conference in Germany with Britain's Winston Churchill and the Soviet Union's Joseph Stalin. Some of the Manhattan Project scientists suggested that the atomic bomb could end the war without an invasion of Japan. General Arnold did not think the new weapon was necessary if the blockade and incendiary bombing continued. As the AAF commander put it, "Atomic bomb or no atomic bomb, the Japanese were already on the verge of collapse." Nonetheless, Truman came to believe that he had a choice between the invasion and use of the atomic bomb.

Churchill contributed to this view. After learning of the successful American test, Churchill speculated that the new weapon, so different from any that had ever been developed, might give the Japanese a face-saving



*PHOTO # 29
HOLD KEYLINE*

Members of the 509th Composite Group, based at North Field, Tinian, in the Marianas: standing, left to right, Lt. Col. John Porter, maintenance officer; Capt. Theodore J. (Dutch) Van Kirk, navigator; Maj. Thomas W. Ferebee, bombardier; Col. Paul W. Tibbets, group commanding officer and pilot; Capt. Robert A. Lewis, copilot; and Lt. Jacob Beser, radar countermeasure officer; front row, left to right, Sgt. Joseph S. Stiborik, radar operator; SSgt. George R. Caron, tail gunner; Pfc. Richard H. Nelson, radio operator; Sgt. Robert H. Shumard, assistant engineer; and SSgt. Wyatt E. Duzenbury, flight engineer.

excuse to surrender. Thus, the British and the Americans might not need the promised Soviet entry into the war, which would expand Stalin's influence in the Far East. President Truman informed the Soviet dictator about the new bomb without giving him any details.

At the same time that Truman and Churchill were considering the implications of the new weapon, Stalin was preparing to declare war on Japan and invade Manchuria. The three leaders called on Japan to surrender unconditionally or face "utter devastation." While still at Potsdam, Truman approved an order to the Joint Chiefs of Staff authorizing an atomic raid on a Japanese city sometime after August 3, 1945. By then Japan would have had time to respond to the Potsdam decisions. The Japanese government continued to resist unconditional surrender as a matter of honor. Perhaps fearing a military coup if he agreed to surrender, and hoping for a negotiated settlement, Premier Suzuki replied ambiguously to the Potsdam ultimatum. Truman interpreted Suzuki's answer as a rejection.

Unleashing the Atomic Weapon

In preparation for the attack, the Joint Chiefs of Staff reorganized the strategic air organizations in the Pacific. Gen. Carl A. Spaatz, commander of the United States Strategic Air Forces in Europe, became leader of the



*PHOTO # 30
HOLD KEYLINE*

A "Little Boy" nuclear weapon, the kind detonated over Hiroshima, Japan, was 28 inches in diameter and 120 inches long. The bomb weighed 9,000 pounds and had a yield equivalent to approximately 20,000 tons of high explosives.

***PHOTO # 31
HOLD KEYLINE***

A “Fat Man” nuclear weapon, the kind detonated over Nagasaki, Japan, was 60 inches in diameter and 128 inches long. The bomb weighed 10,000 pounds and in testing it yielded a blast equivalent to 17,000 tons of TNT.

United States Strategic Air Forces in the Pacific, the command that would exercise jurisdiction not only over the Twentieth Air Force but also over the Eighth, which was moving to Okinawa. LeMay, commander of the Twentieth Air Force for a brief time after its headquarters moved from Washington to Guam, would be Spaatz’s chief of staff. Command of the Twentieth Air Force went to Lt. Gen. Nathan F. Twining, and the Eighth to Lt. Gen. James H. Doolittle. General Arnold, as AAF commander, retained authority over Spaatz, LeMay, Twining, and Doolittle.

At the end of July 1945, about the same time that Spaatz arrived on Guam, ships and aircraft delivered the components of two atomic bombs to Tibbets on Tinian. From a target list of four cities that had been spared some of the conventional raids so that analysts could measure the effects of atomic bombs, LeMay selected Hiroshima for the first atomic attack because it was headquarters of the Japanese Second Army and contained important war matériel factories. He also believed, erroneously, that the city had no Allied prisoner of war camps.

On August 6, 1945, Tibbets flew the *Enola Gay* 1,500 miles from Tinian to bomb Hiroshima with the first atomic bomb ever used in combat. The mission followed its plan almost exactly. While approaching the Aioi Bridge aiming point in central Hiroshima, Tibbets dropped his deadly cargo. Forty-three seconds later, it exploded about 1,890 feet over the bridge,

PHOTO # 32
HOLD KEYLINE

A view of the atomic fireball fifteen seconds after detonation at the Trinity test site at Alamogordo Bombing Range in New Mexico.

PHOTO # 33
HOLD KEYLINE

Pictured above is Trinity ground zero, the site of a 100-foot steel tower that held a plutonium Fat Man bomb in a test explosion carried out on July 16, 1945. Trinity is located 200 miles south of Los Alamos, New Mexico.

***PHOTO # 34
HOLD KEYLINE***

Col. Paul W. Tibbets, center, and members of the 509th Composite Group stand in front of the B-29 Superfortress “Enola Gay.”

as planned. The blast created fires that burned out 4.7 square miles of the city’s center. The explosion and fires killed between 70,000 and 80,000 people and left a like number wounded. Hundreds of people later perished from the effects of the radiation, and 80 percent of the buildings of Hiroshima were destroyed.

President Truman immediately announced to the world the first atomic bomb attack on Japan. He threatened more such attacks if the enemy continued to resist unconditional surrender. Meanwhile, U.S. B-29s dropped leaflets over Japan with the same message, and Japanese scientists visiting the ruined city confirmed that a radically new weapon had been used.

On August 9, just three days after the Hiroshima attack, Maj. Charles W.

***PHOTO # 37
HOLD KEYLINE***

Maj. Charles W. Sweeney

PHOTO # 35
HOLD KEYLINE

The Aioi Bridge in central Hiroshima was Tibbets's aiming point.

PHOTO # 36
HOLD KEYLINE

A view of Hiroshima after the bombing.

Sweeney in the B-29 *Bockscar* dropped a second atomic bomb on Nagasaki. The hillier terrain resulted in fewer casualties: about 40,000 dead and 60,000 injured. Still, there was massive destruction. If only one bomb could destroy a city, Japan did indeed face the utter devastation promised at Potsdam.

The Surrender

On the day of the Nagasaki raid, the Soviet Union declared war on Japan. Almost immediately, about 1.6 million Soviet troops, many battle-hardened from the war in Eastern Europe, sliced deeply into Manchuria. Now the scales were overwhelmingly tipped against the Japanese empire.

Even following both of the atomic attacks and the Soviet declaration of war, the Imperial cabinet remained deadlocked over accepting Potsdam's call for unconditional surrender. On August 14, eight days after the Hiroshima raid and only five days after the Nagasaki attack, Japan's Emperor Hirohito himself broke the cabinet's deadlock and accepted the Allied terms. The next day, Hirohito addressed the Japanese people directly for the first time to announce his decision.

Although many factors contributed to the ultimate victory, there can be little doubt that the prospect of further nuclear bombardment swayed Hirohito. When the emperor announced the surrender, he referred to a "new and most cruel bomb." But, according to Prince Fumimaro Konoye, "the thing that brought about the determination to make peace was the prolonged bombing by the B-29s." Premier Suzuki said it this way:

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.

Forty-five American C-47 transports landed at Atsugi Air Base in Tokyo on August 28, 1945, to begin the American occupation of Japan.



PHOTO # 38
HOLD KEYLINE

An atomic bomb cloud forms over Nagasaki on August 9, 1945.

PHOTO # 39
HOLD KEYLINE

One month after the atomic bomb blast in Nagasaki, ground zero is rubble and remnants of a few buildings.

That airplanes rather than amphibious landing craft should be the first Allied vehicles to touch Honshu symbolized the relative importance of air power in avoiding the scheduled invasion and securing the ultimate victory.

SUGGESTED READINGS

- Arnold, Henry H. *Global Mission*. New York: Harper, 1949.
- Berger, Carl. *B-29: The Superfortress*. New York: Ballantine, 1970.
- Butow, Robert J. C. *Japan's Decision to Surrender*. Stanford, Calif.: Stanford University Press, 1954.
- Craven, Wesley Frank, and James L. Cate, eds. *The Army Air Forces in World War II*. Vol. V, *The Pacific: Matterhorn to Nagasaki*. Chicago: University of Chicago Press, 1953.
- Glines, Carroll V. *Doolittle's Tokyo Raiders*. Princeton, N.J.: Van Nostrand, 1964.
- Hansell, Haywood S., Jr. *The Strategic Air War Against Germany and Japan: A Memoir*. Washington, D.C.: Office of Air Force History, 1986.

- LeMay, Curtis E., and MacKinlay Kantor. *Mission with LeMay: My Story*. Garden City, N.Y.: Doubleday, 1965.
- LeMay, Curtis E., and Bill Yenne, *Superfortress: The Story of the B-29 and American Air Power*. New York: McGraw-Hill, 1988.
- Morison, Samuel Eliot. *The Two-Ocean War: A Short History of the United States Navy in the Second World War*. Boston: Little, Brown, 1963.
- Sherry, Michael S. *The Rise of American Air Power; The Creation of Armageddon*. New Haven, Conn.: Yale University Press, 1987.
- Spector, Ronald H. *Eagle Against the Sun*. New York: Free Press, 1985.
- Thomas, Gordon, and Max Morgan Witts. *Enola Gay*. New York: Stein and Day, 1977.
- Tibbets, Paul W., Jr. *The Tibbets Story*. New York: Stein and Day, 1978.
- Wheeler, Keith. *The Fall of Japan*. Chicago: Time-Life, 1983.
- Wolfe, Kenneth B. "The Men of the B-29s." *Air Force* 27 (September 1944): 4-8, 44.
- Wolk, Herman S. "The B-29, the A-Bomb, and the Japanese Surrender." *Air Force* 58 (February 1975): 55-61.