

As the US daylight-bombing offensive opened against Nazi Germany, the painful reality was that, without long-range escort fighters, the Eighth Air Force was suffering an unacceptable battering. A suitable fighter-escort existed, but only in the shadows. How it emerged "at just the saving moment" and helped assure Allied air superiority over Europe is the epochal story of the North American P-51 . . .

MUSTANG!

By Ed Rees

"It seems to me . . . that one of the great 'miracles' of the war was the fact that the full long-range fighter escort did appear over Germany at just the saving moment, in the very nick of time to keep our bomber offensive going without a break. . . ."

—From *Global Mission*
Memoirs of Gen. Henry H. (Hap) Arnold
Commanding General, US Army Air Force
World War II





LIKE giant moths, their antennas and guns bristling, 376 US bombers lifted off their runways in England into the gray dawn of a mid-August morning in 1943. Quickly coagulating into tight formations in the frigid stratosphere, they rendezvoused with their P-47 escort fighters. The mission for the day was a deep penetration of Nazi Germany—to the ball-bearing factory at Schweinfurt and an aircraft assembly plant at Regensburg. Over the ancient city of Antwerp the fighters banked sharply and headed back for England. Their tanks were low, and they could go no further. The bombers, unprotected, continued on.

Soon the enemy struck. ME-109s and FW-190s arrowed down from above in darkly symbolic javelin formations and sprayed the Flying Fortresses with 20-mm shellfire. The bombers huddled protectively closer to one another and returned the fire as best they could. The fighters buzzed them like angry gnats. Many of the bombers, bleeding gasoline from ruptured tanks or spewing fire from shattered engines, dropped

from formation. Others pressed on toward their targets and dumped their bombs. A few hours later, 316 of the bombers made it home. But sixty did not return, and 600 bunks were empty in the barracks rooms of England that night.

This was the costliest raid of the fledgling VIII Bomber Command up to that time. It was the first time the German Air Force had come up in numbers to try to stop a large formation of daylight bombers. They had not succeeded; the targets were bombed. But the toll was too high.

A short time later, on October 14, "Black Thursday," another mission to Schweinfurt was laid on. This time 291 bombers headed for the target, accompanied on the first leg by 196 escort fighters of the VIII Fighter Command. Near Aachen, 240 miles from England, the short-legged fighters had to turn back. Almost at once the Germans attacked, in wave after wave, and the high battleground was again littered with flaming

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and falling bombers. Another sixty Forts were destroyed over the continent; another 600 airmen lost.

The meaning of these two catastrophes was chillingly clear: the US did not have air superiority over Germany. Without long-range fighter escort, the daylight precision-bombing effort could not be maintained. The Eighth simply could not take the high rate of attrition.

For months, since even before June 1943 when the combined bomber offensive began, the Allied High Command had been aware of the need for long-range fighter escort. Actually such a plane existed, though in the shadows. It was a remarkable airplane, and the story behind it—as well as the story ahead of it when it finally got into combat—is one of the more thrilling episodes in the literature of flight. The airplane was the P-51 Mustang, and it was born at the moment it was needed, thereby fulfilling the first requisite of greatness. And before the final shots of the war were fired, it filled every other requisite.

In April 1940, the war in Europe had been on for eight and a half months. The Stukas and ME-109s were clouding the skies over the Low Countries and France, and the British were carefully nursing their few Spitfires and Hurricanes. The RAF, more sophisticated in aerial doctrine than most major powers, knew it needed another kind of plane—one for offensive action against Germany. The Spitfire was to be its great defensive fighter, the interceptor that would so greatly inhibit the Luftwaffe over England and win the Battle of Britain. But the fighter that RAF commanders wanted in great numbers was the American Curtiss P-40 Warhawk, an Allison-powered plane ideally suited for low-level work. The Flying Tigers used it successfully in China against the Japanese, and it proved invaluable in the Western Desert against Rommel's tanks. In order to build up a large P-40 force quickly, the British sent an Air Purchasing Commission to place an order for P-40s with a young, aggressive aircraft company named North American Aviation.

At that time North American was only six years old as a producer of aircraft. Its best-known product was the AT-6 Texan or Harvard trainer which the AAF and the RAF and, eventually, the air forces of thirty-four allied nations used extensively. Built along fighter lines, it was the training plane in which most British war pilots learned their flying. The British remembered the speed with which North American had produced it in 1938. It was built, crated, shipped through the Panama Canal and across the Atlantic, uncrated, and test-flown in 120 days from the time production was first begun.

When the British purchasing commission approached James H. "Dutch" Kindelberger, the salty president of North American, and offered him an attractive production contract for P-40s, Kindelberger turned them down. He had many reasons. First off, he was convinced his crack engineering team headed by Lee Atwood, who in 1948 was to succeed Kindelberger as president of North American, could build a better plane—and in greater numbers. Dutch had been

watching the air war in Europe closely, and, as a World War I pilot, he knew second best in air warfare meant being last. Even before the British had approached him he had Atwood design a basic fighter. "No one ever pulled a rabbit out of a hat," Kindelberger once explained, "without carefully putting one in." The Mustang was Dutch's exquisite rabbit.

Another reason Dutch wanted to build the Mustang was that it was designed for mass production—the P-40 was not. "The time to start worrying about production is before you begin product engineering," he said. The plane was designed, by a team headed by Raymond Rice and Edgar Schmued, to be made in many parts; large units were broken down into smaller components for ease of assembly and installation. The wings alone were made in six sections. Dutch brought Detroit techniques to Southern California.

The Mustang design was first shown to the British in April of 1940. They were assured in New York that North American could build the best fighter plane in the world, and within 120 days! This was convincing, and the British gave a preliminary go-ahead for further detail design. At North American's plant in Inglewood, Calif., that same day, Saturday, the structural design group began the inboard profile drawings and labored on them until Kindelberger entered the room at 10:00 a.m. Sunday. Dutch initialed his approval. A preliminary weight study was attached, and all data was airmailed to the Britishers who were impatiently waiting in New York. They liked the design, and in three days North American had an order to proceed.

Kindelberger swung NAA into its vital work with a vigor that was dazzling. Paperwork and red tape were forgotten. Interoffice memos took the place of official orders and even drawings. The instant that data could be released it was sent to the experimental shop where the full-size wooden mockup of the airplane was being made by a large crew of cabinet-makers. The wind-tunnel group carved a \$20,000 quarter-scale model of laminated mahogany to tolerances as fine as .001 of an inch—rare in those days.

The loftsmen laid out the full-scale drawings on large tables from which templates used in production were made. The purchasing department waived all regulations and sent men out on trucks to have parts made on verbal instructions from the preliminary design group.

One casting was needed in four days because a critical part had to be machined properly. Normally it would have taken three weeks, but the engineers couldn't wait. A worker was dispatched to stand by until the hot casting was peeled out of the mold, and in two days the casting was delivered.

The design group was housed in a drab room directly over Kindelberger's office, and one engineer later recalled that "the Mustang materialized out of that smoke-filled room where men knew no hours, where lights never went out, where for days all you could hear was the rattle of paper, the sharpening of pencils, and the noise of men knocking out their pipes on wastebaskets. . . ." Engineers worked an average of sixteen hours a day. "Sunday was different." one



P-51s served with tremendous effectiveness around the world in World War II. This one, equipped with rocket launchers, was with the 14th Air Force in China in July 1944.



A select few aircraft look as though they're flying even while they're still on the ground. One—and it may head the list—is certainly the P-51 Mustang.



At right, Mustangs, with their D-Day war paint for easy recognition, fly in formation over France. Eisenhower surveyed Normandy beaches from a 2-seat Mustang.

recalled, "only because the hum from the adjacent factory was missing."

To get the kind of airplane that was needed, daring and ingenious innovations had to be made. Speaking later of the engineering effort, Kindelberger said that "the situation called for the highest degree of initiative, speed, and caution—three attributes which normally do not descend together on an engineering department. . . ."

The design touchstone of the Mustang was the laminar-flow wing, a high-lift, low-drag airfoil developed by the National Advisory Committee for Aeronautics (NACA) and considered by most engineers as being too revolutionary for use in a mass-produced airplane. But the chiefs of North American's aerodynamics section believed in it so thoroughly that they promised in case of failure to produce a conventional wing within thirty days. Since wing design is the toughest of all components and usually determines the schedule for the rest of the design job, the entire project hung tenuously on the then-unproved laminar-flow concept.

There were times when Kindelberger and Atwood thought they had failed. The first wind-tunnel test of the quarter-scale model wing in the California Institute of Technology tunnel showed that although the drag was the lowest on record—fifty percent less—the stalling characteristics were bad. The airfoil was quickly but carefully modified, and a new model was built in a week. Again, the silk tufts glued to the wing surfaces did not act satisfactorily. But now the engineers suspected that the model was too large for the tunnel; the walls were affecting the airflow at the wingtips. The wing was loaded into an airliner—its first flight was *inside* a plane—and flown to a larger wind tunnel at the University of Washington in Seat-

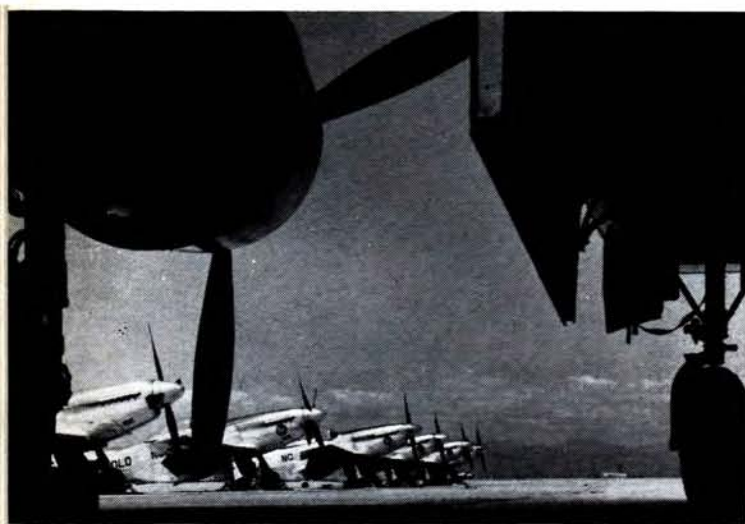
tle. There it passed all tests with flying colors. The laminar design, wherein the greatest thickness of the wing was moved well back and was followed by a teardrop-shaped trailing edge, gave tremendously improved lift and also the structural strength to withstand the "shock waves" which the plane would later experience in its high-speed combat maneuvers, maneuvers that tore ME-109s and FW-190s apart.

To reduce the frontal area as much as possible, North American chose the same liquid-cooled in-line Allison engine that powered the P-40. This presented the problem of a large drag-producing radiator scoop conventionally placed at the nose of the ship. Atwood placed it under the fuselage and aft of the pilot. But early flight tests showed the engine was not being cooled adequately. Further wind-tunnel tests showed that the disturbed boundary layers of air beneath the wing and fuselage prevented a "clean" flow through the radiator. The entrance lip of the scoop was lowered one inch. The turbulent air was thus bypassed and perfect air circulation was attained. The fuselage, the smallest cross-sectional area ever to be placed behind an Allison engine, offered low drag but demanded high-density packing of the equipment—radios, compasses, hydraulic systems, and the like—that had to go into it. "It's like stuffing the insides of a bomber into a fighter," one engineer lamented.

The first Mustang, minus an engine and with landing gear borrowed from an AT-6, was rolled out of Building No. 1 and into the bright California sunlight just 117 days from the placement of the order. Designated NA-73, it got its first taste of air on October 26, 1940, in a test flight that was eminently successful.

A year later, in November 1941, the first Mustang arrived in Liverpool in crates: the merchantman carry-

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After the war, P-51s served with Air National Guard units. Here, seen from under the wing of a B-26, were some of the Mustangs assigned to Colorado ANG's 86th Fighter Wing.



This quartet from the wartime 361st Fighter Group's 375th Squadron made a deadly hunting pack in European skies.



Always a beautiful sight for wartime bomber crews was one of the "Little Friends," the P-51s out on escort missions.

ing it had been bombed en route but the airplane was undamaged. But it could not be flown until British anti-aircraft batteries and RAF fighter squadrons could be briefed—the plane looked too much like an ME-109 and might have been shot down.

On the P-51's first demonstration flight, an American test pilot put it through a 500-mph dive and several low-level speed runs. RAF officials at first refused to believe the performance data, and the flight had to be rerun. It was not long before they admitted that it outperformed their beloved Spitfire, but more meaningful British recognition of the plane's greatness came later when a London pub named a drink after it.

The Mustang was a pilot's airplane. Control and balance were such that when a pilot operated the stick he was not conscious of moving the control column. "You don't fly this airplane," said one pilot, "you wear it." Armed with two .50-caliber MG 53-2 Browning machine guns mounted below the engine, plus a single .50-caliber MG-53 and two .30-caliber MG 40 guns in each wing, its striking power was formidable. In October 1942, on its first flight to Germany—the first flight any single-engine fighter based in the UK had made to the Reich—a Mustang hit a military camp on the Dutch border, strafed a factory and gas tanks at Lathen, Germany, shot up barges and lock gates along the Dortmund-Ems Canal, and, on the way back, set fire to a 500-ton ship on the Zuider Zee and exploded another vessel. Earlier, in the commando raid on Dieppe in August 1942, the Mustang supported ground troops, flew reconnaissance, and provided a key segment of the 1,000-fighter aerial umbrella that kept the Luftwaffe from making a shambles of the orderly evacuation.

Even before the P-51's first flight on October 26, 1940, the British, impressed by the startling progress

of Kindelberger's team, placed an order for 320 Mustangs. The US government approved this with the proviso that two of the aircraft be turned over to the Army Air Corps for test and evaluation. Accordingly, the fifth and tenth ships to roll off the North American assembly line were sent to Wright Field and designated XP-51. The plane performed exceptionally well, but not as a high-altitude airplane.

"Below 22,000 feet," an official report said, "the P-51 . . . has the best all-around fighting qualities of any fighter." Its top speed of 386 mph was reached at 15,500 feet and its service ceiling was 33,800 feet (compared with 450 mph at 24,000 feet and a 43,300-foot ceiling for the "D," built in mid-1944), but it outmaneuvered anything in the air. It was an excellent low-level ground-support aircraft. But USAAF fighter policy at the time was hinged to the P-47 and the P-38, and the two P-51 prototypes did not quickly change that policy.

In the autumn of 1942, the US military attaché in London, Maj. Tommy Hitchcock, reported to Washington that the Mustang was one of the best, "if not *the* best," fighter airframes developed to that date. A world-renowned polo player before the war, Hitchcock was also a pilot and he had flown the Mustang. He suggested—and American Ambassador to the Court of St. James John Winant endorsed the suggestion—that the Mustang be crossbred with the powerful Rolls-Royce Merlin 61 engine. This would give it a high-altitude capability. Hitchcock's opinion was soundly seconded by such aviation authorities as Eddie Rickenbacker and RAF Air Marshal Sir Trafford Leigh-Mallory.

But the Army Air Forces dragged its heels. Somehow it regarded the Mustang as a "foreign" airplane, designed to British specifications for British use. The

Mustang's spectacular performance at Wright Field and in the skies over Europe, however, inexorably won over even the most dogged skeptics. After the war General Hap Arnold said that on only one occasion did he overrule an Air Materiel Command recommendation on aircraft procurement. The decision came after he toured the North American production line and had a talk with Gen. Carl A. Spaatz, who was then organizing the Eighth Air Force. "That's the plane I want," said Spaatz. "If that's what you really want," said Arnold, "you'll get it." Testifying before the House Armed Services Committee later, Arnold said: "I was never sorry for that decision."

The Packard-built Rolls-Royce Merlin engine, which converted the P-51A to the P-51B, proved a spectacular improvement and gave the Mustang the high-altitude capability that put it in a class by itself. Flight tests in September 1942 showed that it climbed to 20,000 feet in 5.9 minutes compared with 9.1 minutes for the P-51A and that it had an over-all speed increase of twenty-six percent. Even before the flight tests were completed, General Arnold reported to President Roosevelt that 2,200 Merlin-powered Mustangs had been ordered by the AAF. By the summer of 1943 they were in full-scale production at Inglewood and a new North American plant at Dallas. It was this airplane that in 1944 the Senate War Investigating Committee, headed by Harry Truman, called "the most aerodynamically perfect pursuit plane in existence."

In December 1943, the P-51B joined the Eighth Air Force inventory in the UK. Overnight the bomber escort radius jumped from 320 to 650 miles. When the dual 108-gallon external tanks were added to the P-51 a few months later, the escort radius fanned out to 750-850 miles. The new plane was not only a dependable escort, it was a tough fighter as well. It could turn on a dime at high speed, it could climb like a bullet, and best of all it had shrugged off the label of a low-level performer. A report of the AAF Tactical Employment Trials, dated February 12, 1944, said, "There is a considerable difference in the over-all handling and performance of the P-51A and the P-51B. The latter is far superior, particularly at high altitudes."

"The P-51B has good performance at all altitudes, but above 20,000 feet the performance improves rapidly, and its best fighting altitude is between 25,000 and 35,000 feet. The aircraft maintains a speed of 400 mph or better from about 11,000 feet to 40,000 feet. At 40,000 feet the aircraft indicates 210 mph in level flight, and can still be maneuvered, as it is not hanging on its propeller. The rate of climb is outstanding. Above 20,000 feet the over-all fighting qualities of the P-51B-1 aircraft are superior to those of all the other types used in the trials."

In its first fifty-five days of combat the P-51B shot down 13.1 enemy aircraft per 100 sorties as contrasted with 4.3 for the P-38 Lightning and 2.7 for the P-47 Thunderbolt.

The dribble of new planes swelled into a flood, and by May 1944 there were seven P-51 groups in the VIII Fighter Command, then headed by Maj. Gen. William E. Kepner. Of these, one group, the 4th, was

destined to distinguish itself as the outstanding Mustang unit anywhere.

The 4th Fighter Group, composed of the 334th, 335th, and 336th Squadrons and headed by Col. Donald J. Blakeslee, was stationed at Debden, forty miles north of London. The pilots got their P-51s on February 28, 1944. They had the planes ready for operational flying the next day. Some of the pilots took off with less than an hour's checkout in the new plane. Four days later, on March 4, they escorted a force of B-17s and B-24s to Berlin. It was the first time single-engine fighters had made the 1,100-mile trip.

The following day the P-51B group escorted some Liberators almost to Spain. And the day after that they were again over Berlin, gunning down seventeen enemy planes which tried to interdict the bombers. They rested a day, then went back again into action.

When Colonel Blakeslee, RAF-trained, first flew in Spitfires in the early days of the war, he did well to stay up for an hour and a half. With the Mustangs he led his men on seven-hour missions.

The extreme range of the P-51 led to a dual mission effort. Some Mustang groups, after seeing their bombers safely en route home over the North Sea, returned to the fray without landing and made additional sweeps over the Hamburg area, destroying shipping, locomotives, troop concentrations — "anything that moves," as one mission directive read.

In their very first month of operation the P-51 pilots with Blakeslee's 4th Fighter Group accounted for 156 German planes, a new one-month record for any US fighter group. For that hectic period the group won a Distinguished Unit Citation.

In April '44 the record for monthly kills was again broken by the 4th with a score of 207. Generals Eisenhower, Doolittle, Spaatz, and Kepner came to the base to look at the plane that was helping change the course of the war. Two months later Eisenhower flew over the Normandy beachhead to survey battle progress in a specially modified two-place Mustang piloted by Maj. Gen. E. R. "Pete" Quesada.

The VIII Fighter Command, after its initial experience with the Mustang, said in a report on tactics and techniques, "The P-51 has met with tremendous success by being able to accompany the bombers over their deepest and final penetration where formerly they had little if any escort."

"When did you know that the Luftwaffe was losing control of the air?" General Spaatz asked Goering after the war.

"When the American long-range fighters were able to escort the bombers as far as Hanover," Goering replied, "it was not long before they got to Berlin." Goering said he could not believe his eyes when he saw them over his capital.

Goering then observed: "The reason for the failure of the Luftwaffe against the Allied Air Forces was the success of the American Air Forces in putting out a long-range escort fighter airplane which enabled the bombers to penetrate deep into Reich territory and still have a constant and strong fighter cover. Without
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this escort the air offensive would never have succeeded."

Early in 1944, the systematic destruction of Goering's Luftwaffe began. The all-out offensive was carried on by all Allied fighter groups, but nowhere with more striking results than those of the 4th. In one mission in April the 336th Squadron claimed twenty-six enemy aircraft destroyed and sixteen damaged—the greatest score ever claimed by one squadron in the United States Army Air Forces for a single mission. Blakeslee's P-51 pilots were the first in VIII Fighter Command to reach 400, 500, 600, and then 700 enemy aircraft destroyed. The 4th ended the war with a total of more than a thousand—both ground and air.

On June 21, 1944, sixty-five Mustangs attached to the group flew for seven hours and fifteen minutes on the first of the historic shuttle raids from England to Russia. They joined over Poland with three bomber combat wings and fought their way to Piryatin air-drome in Russia. They returned by way of Italy, destroying fifteen enemy aircraft during the mission, with the loss of only one plane.

The plane also flew its way into the hearts of the men whose lives depended on it. 1st Lt. Leonard Warner spoke of the toughness of the P-51 when he stated in his official report on return from a Berlin mission on October 6, 1944: "I tacked on to an ME-109 that slipped through the bombers and hit for the deck. The last time I looked at my meter I was clocking 600 mph and still gaining. The wingtips and the rudder of the ME came flying back at me. I didn't have to fire. The ME went in, still shedding its controls."

From another combat report: "A patrol of eight P-51s sighted twenty ME-109s south of Dreux at 11,000 feet. Orbiting in elements of two, the squadron climbed to 14,000 feet and attacked from above. At the same instant sixty ME-109s joined the combat, emerging from a cloud to the north. In the next fifteen minutes, the Mustangs, outnumbered ten to one, were busily embattled from 11,000 feet to the deck. The enemy was aggressive and apparently experienced, but they tried to turn with our aircraft. When it was all over, the squadron pilots had destroyed eleven and damaged two enemy aircraft against the loss of two planes."

The Mustangs fought with distinction in every theater of World War II. In the early months of 1944, Mustangs began operating in Burma in support of airborne troops attacking Japanese lines of communications 200 miles behind the Assam-Burma front. P-51Bs were also introduced into the Fifteenth Air Force in Italy, and, on May 5, 1944, RAF Mustangs operating from eastern Italy smashed the great Pescara Dam by bombing. Not one Mustang was lost on that operation, which was a remarkable feat for single-engine fighters. It was in this same theater that two A-36s, the dive-bomber version of the Mustang, attacked and sank a 50,000-ton Italian transport of the *Conte Di Savoia* class, the world's sixth largest liner, at anchor off a quay at Bagnara in southwestern Italy.

But it was in VIII Fighter Command that the P-51

came into its own: by the end of 1944 fourteen of the fifteen fighter groups in the Eighth Air Force had converted to Mustangs. The fifteenth, of course, was the celebrated 56th Fighter Group, whose P-47 "Jugs" wrote their own special history in the skies over Europe and produced such Thunderbolt aces as Gabreski, Zemke, Schilling, and Bob Johnson.

In Blakeslee's P-51 group the top aces were Capt. Don S. Gentile and Capt. John T. Godfrey, who between them racked up a total of sixty-six victories in the air and on the ground.

As the war neared its end, the last of the nine Mustang models appeared. This was the P-51H, powered by a 2,000-hp Packard/Rolls-Royce engine. It was ten percent stronger than the "D" and 700 pounds lighter. It was the fastest—490 mph—most maneuverable, highest, and fastest-climbing and the longest-ranged (2,000 miles) Mustang. On April 7, 1945, operating from newly captured Iwo Jima, the P-51 was the first land-based fighter plane to attack Tokyo.

The "H" was taken out of mothballs during the Korean War when ground-support aircraft were urgently needed. It held its own until relieved by another North American airplane, the F-86 Sabrejet, and then was retired permanently.

A total of 15,757 Mustangs of all models, including the A-36 dive bomber, F-6 photo version, and P-52 Twin Mustang, were built, according to North American records. Those which reached combat flew 213,873 missions and in the European Theater alone destroyed 4,950 enemy aircraft in the air and 4,131 on the ground.

But the full measure of the Mustang cannot be taken in figures. That it was superior to enemy fighters and knocked them out of the skies in great numbers was not the most significant contribution the airplane made to the successful Allied war effort. Rather, it was the fact that it made daylight precision bombing possible, and it was daylight precision bombing that brought victory in a thousand days over a foe whose boast was that his empire would last a thousand years.

The Mustang earned a warm place in the memories of the thousands of crewmen of Flying Fortresses and Liberator bombers, men who knew them by their radio call of "Little Friends." It was those Little Friends who faithfully flew their good shepherd missions, sweeping the skies of enemy fighters before them and, wing-to-wing, guiding crippled bombers with their helpless crews safely back to base.—END

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