

Chapter 4 - The Widowmaker [v3]

B-26 MARAUDER - Synopsis



B-26 Marauder on display at the US Air Force Museum, Dayton, Ohio, USA.

(Photo courtesy USAF Museum.)

History: Responding to the US Army Air Corps' need for a high speed medium bomber, the Martin Company submitted an unusual design; a cantilever shoulder wing monoplane carrying five (later seven) crewmen. While the plane met or exceeded all performance requirements, with a wing optimized for high speed cruising, after entering service with the U.S. Army, the aircraft got a reputation as the "Widowmaker " due to the early models' high rate of accidents during takeoff and landings. The Marauder had to be flown by exact airspeeds, particularly on final approach and when one engine was out. The 150 mph (241 km/h) speed on short final was intimidating to pilots who were used to much slower speeds, and whenever they slowed down below what the manual stated, the aircraft would stall-out and crash. The B-26 became a safer aircraft once crews were re-trained and after aerodynamics modifications (increase of wing span and incidence, to give better take off performance, and a larger fin and rudder). After aerodynamic and design changes, the aircraft distinguished itself as "the chief bombardment weapon on the Western Front" according to a United States Army Air Forces dispatch from 1946. The Marauder ended World War II with the lowest loss rate of any USAAF bomber, a remarkable feat considering the plane's undeserved nickname of "Widow-maker," among others

The B-26 carried a normal bomb load of 3,000 pounds, though another 1,000 pounds could be added when fitted with special wing hardpoints. Armament included eleven 12.7-mm machine guns in fixed, forward-firing, nose and waist mounts, and in powered dorsal- and tail-turrets. Though its service ceiling was 19,800 feet, the Marauder's primary role was close tactical ground support. As such, it was widely used in the Pacific theater and the Mediterranean by both the USAAC and the RAF, which had acquired 522 B-26's under Lend-Lease.

Some of the twenty variants of this aircraft included the **B-26A** (increased added fuel capacity, externally mounted torpedo, system revisions and heavier armament, of which 139 were built); the **B-26B** (bigger engines, armament revisions and better armor protection, a 6-foot increase in wing span, taller vertical tail and more armament, of which 1,883 were built); the **B26-F** (improved take-off performance and equipment changes, of which 300 were built); and the **JM-1** (one of several designations for US Navy models of the Marauder, used mainly for training of shipboard anti-air

crews and photo-reconnaissance.) [History by [Jeff VanDerford](#)]

Nicknames: *Widow-Maker; The Flying Coffin; B-Dash-Crash; The Flying Prostitute; The Baltimore Whore* (The last two because it had no visible means of support; "Baltimore" because the Martin Company was located there.)

Specifications (B-26G):

Engines: Two 2,000-hp Pratt & Whitney R-2800-43 Double Wasp radial piston engines.

Weight: Empty 25,300 lbs., Max Takeoff 38,200 lbs.

Wing Span: 71ft. 0in.

Length: 56ft. 1in.

Height: 20ft. 4in.

Performance:

Maximum Speed: 283mph

Ceiling: 19,800 ft.

Range: 1,100 miles

Armament:

11 12.7-mm (0.5-inch) machine guns

Up to 4,000 pounds of bombs

Number Built: 5,157

Number Still Airworthy: One, with at least one more undergoing restoration to flying condition.

Martin B-26B Marauder - Details

The B-26B was the version of the Marauder that was built in the greatest quantity. It first appeared in May of 1942.

The B-26B differed from earlier Marauder versions in having two 0.50-inch machine guns with 1500 rpg installed in a stepped-down tail position, replacing the single hand-held gun of the earlier B-26 and B-26A. The guns were operated manually by the gunner by means of a ring and bead sight. The gunner had no seat, and usually knelt to track his targets and fire his weapons. Ammunition was fed from cartridge belts held upright on a pair of roller tracks in the aft bomb bay. Each gun was equipped with 800 rounds. The new tail position increased the overall length to 58 feet 3 inches.

The B version introduced self-sealing fuel lines and a rearrangement of various internal equipment items. The engines were switched back to R-2800-5s. The large propeller spinners were deleted. The oil cooler air scoop under the engine cowling was enlarged. Torpedo racks underneath the fuselage were fitted as factory-installed equipment. Fuel supply included two 350-gallon main fuel tanks in the wings, two 121-gallon auxiliary tanks, and up to four 250-gallon bomb bay ferry tanks, for a total capacity of 1962 gallons. Normal bomb load consisted of two 2000 lb or 1600 lb bombs, eight 500-pound, sixteen 250 lb, or thirty 100-lb bombs. Maximum short-range bombload was 5200 pounds, which was seldom carried. This could be two 1600-lb bombs plus a 2000-pound torpedo on the external rack.

Provisions were made for up to seven crew members. The bombardier sat in the transparent nose cone and operated a flexible 0.50-inch machine gun with 270 rounds. The pilot and copilot sat side by side in armored seats behind an armored front bulkhead. The navigator/radio operator sat in a compartment behind the pilots. In an emergency, these four crewmen could escape through the forward bomb bay, although the pilot and copilot had escape hatches in the upper cockpit that could be opened outward. The beam gunner manned a single gun that fired through a hatch cut into the floor of the rear fuselage. A Martin 250CE dorsal power turret was mounted on the top of the fuselage behind the bomb bay. It was equipped with two guns and 400 rpm. The turret could turn through a full 360 degrees and the elevation could be as much as 70 degrees. The tail gunner operated two 0.50-inch guns. The main entrance to the fuselage was through the nose wheel well, but pilot's escape hatches were available in the roof of the canopy.

Starting in July of 1942, 207 factory-fresh B-26Bs (41-17645/17851) were sent to Martin's Omaha Modification Center for modifications to make them more combat-suitable. The nose Plexiglas was modified to carry a centerline-mounted flexible 0.50-inch machine gun. A fixed forward-firing 0.50-inch machine gun was installed in the lower right-hand side of the nose. The two 0.30-inch waist guns and the 0.30-inch tunnel gun were replaced by 0.50-inch guns. Provisions were made for two more 250-gallon ferry tanks in the rear bomb bay, increasing total fuel capacity to 1962 gallons and raising the ferry range to 2850 miles. The pair of air intakes located above the engine cowling were increased in size so that they could accommodate sand filters for operation in desert conditions when required. The windows on both side of the fuselage next to the radio operator were replaced by bulged windows to improve the downward view.

In August, the production block system was introduced with the advent of the B-26B-2. Unlike most other aircraft, the production block numbers on the B-26B Marauder were initially not in multiples of five. This model had the more powerful R-2800-41 engine, yielding 2000 hp for takeoff and 1600 hp at 13,500 feet. Maximum speed was up from 311 mph to 317 mph at 14,500 feet. However, weight was increased to 22,380 pounds empty, 34,000 pounds gross. A "whip" antenna for the new VHF radio was fitted on the underside of the fuselage. This antenna was fitted on all subsequent Marauder models.

The B-26B-3 introduced the R-2800-43 engine of similar power. This engine was retained throughout the remainder of the Marauder production run. This model also introduced as standard factory-installed equipment the enlarged air intakes mounted on top of the engine cowling so that sand filters could be fitted when required in desert conditions. These intakes were retrofitted to many earlier Marauders, so the presence of engine cowling intakes could not always be used as a reliable indicator of a B-26B-3.

The B-26B-4 which appeared in October 1942 had a longer nosewheel strut to increase the wing incidence and lift during takeoff. This gave the plane a distinct "nose-up" attitude when on the ground. Minor equipment changes such as a new starter, new navigation instruments and winterization gear were introduced. The last 141 of the 211 B-4s built had the light tunnel gun replaced by a pair of 0.50-inch machine guns, one firing through each of two side hatches on the bottom of the rear fuselage. This arrangement had previously been used on modified aircraft in the field, and was found suitable for introduction on the production line. These guns were mounted on extending arms swiveling from positions on the fuselage floor and fired rearwards and downwards. Each gun had 240 rounds of ammunition. In addition, many of the B-4s were fitted at the Martin Omaha center with four forward-firing 0.50-inch machine guns in blisters mounted on each side of the fuselage. The B-4 also introduced slotted flaps and mechanically-operated main undercarriage doors.

In order to reduce the alarming rate of Stateside training accidents, a decision was made to increase the wing area in order to lower the wing loading, reducing the takeoff and landing speeds. The new wing was first introduced on the B-26C production block at Omaha, and did not appear on the B-26B line at Baltimore until the introduction of the B-26B-10-MA production block, which first appeared in January of 1943. The wing span increased from 65 to 71 feet and area increased from 602 to 658 square feet. A taller fin and rudder was introduced to maintain stability with the larger wing, increasing overall height from 19 feet 10 inches to 21 feet 6 inches.

However, the advantages of the reduced wing loading were partially offset by an increase in gross weight to 38,200 pounds as the result of the fitting of additional armament. A total of twelve 0.50-inch machine guns were now carried. These comprised a flexible 0.50-inch nose gun with 270 rounds, a single fixed gun on the starboard side of the nose with 200 rounds, two "package" guns on each side of the fuselage below the cockpit with 200-250 rpg, two 0.50-inch guns in the rear dorsal turret, two 0.50-inch guns in the beam, and two 0.50 inch guns in the tail. Nevertheless, at a takeoff weight of 36,000 pounds, the takeoff run was reduced from 3150 to 2850 feet. However, the larger wing area resulted in a decrease in maximum speed from from 289 to 282 mph.

The B-26B-15-MA differed only in having the fixed oxygen system Type A-9 regulator deleted. Improved IFF equipment (SCR-595A) was also fitted.

On the B-26B-20-MA and later blocks, the hand-held twin tail guns were replaced by a power-operated Martin-Bell M6 turret, also with two 0.50-inch guns with 400 rpg. The guns were positioned below the gunner and afforded a wider field of fire. The blunt tail cone of this installation markedly altered the contours of the rear fuselage. The guns were operated by a remotely-controlled linkage, but gunners usually preferred to swing the guns manually. Provisions were made for two more 250-US gallon tanks in the aft bomb bay, bringing total fuel capacity to 1964 US gallons. Another noticeable external change was the use of a shorter-chord rudder.

Early models of the B-26 had two separate bomb bays, but the rear one was only used infrequently for light loads in the South Pacific. Eventually, the rear bomb bay racks were discontinued altogether, followed by the deletion of the rear bomb bay doors and actuating mechanisms as well. The space and weight factors had become too critical, and the space was more valuable as a gunner's station after two flexible 0.50-inch machine guns were installed in the waist window area and ammunition storage boxes were installed for the tail

and waist guns. Provisions for the two rear bay tanks were deleted from the B-26B-25-MA and later blocks.

An external curved armor plate was introduced on the B-26B-30-MA, along with additional armor in certain critical locations.

The carburetor alcohol de-icing system was deleted on the B-26B-35-MA.

The B-26B-40-MA introduced a torpedo-firing switch on the pilot's control column. Shark-nosed ailerons were fitted in 42-43310 onward.

B-26B-45-MA introduced a ring-and-bead sight for the package guns IFF SCR-695 was provided and the new SCR-522 VHF command radio set was added. The engine fire extinguisher was reinstated. The aft bomb bay was sealed shut from this variant onward, the extra space being used for additional ammunition. The fixed forward-firing 0.50-inch gun was deleted in the middle of the production run (from 42-95979).

The B-26B-50-MA was equipped with an emergency mechanical bomb bay closing arrangement. IFF gear was revised. Lycoming propeller blades began to be fitted from 42-95942 onward.

The B-26B-55-MA replaced the D-8 bombsight with the M-series. Changes to the Martin CE 250 dorsal turret were incorporated from 42-96079 onward. The camouflage paint was discontinued from 42-96219 onward.

The last of 1883 B-26Bs was delivered at Baltimore in February of 1944. In addition, 208 B-26Bs were converted to AT-23A target tugs for the USAAF.

Serials of Martin B-26B Marauder:

41-17544/17624 Martin B-26B Marauder
41-17625 Martin B-26B-3-MA Marauder
41-17626/17851 Martin B-26B Marauder
41-17852/17946 Martin B-26B-2-MA Marauder
41-17947/17973 Martin B-26B-3-MA Marauder
41-17974/18184 Martin B-26B-4-MA Marauder
41-18185/18334 Martin B-26B-10-MA Marauder
41-31573/31672 Martin B-26B-15-MA Marauder
41-31673/31772 Martin B-26B-20-MA Marauder
41-31773/31872 Martin B-26B-25-MA Marauder
41-31773 was 'Flak Bait' the first Allied bomber in the ETO to complete 200 sorties. Nose section is on display at NASM.
41-31873/31972 Martin B-26B-30-MA Marauder
41-31973/32072 Martin B-26B-35-MA Marauder
42-43260/43357 Martin B-26B-40-MA Marauder
42-43358/43359 Martin AT-23A
B-26B modified as unarmed target tug
42-43360/43361 Martin B-26B-40-MA Marauder
42-43362/43458 Martin AT-23A
B-26B modified as unarmed target tug
42-43459 Martin B-26B-40-MA Marauder
42-95629/95737 Martin AT-23A
B-26B modified as unarmed target tug
42-95738/95828 Martin B-26B-45-MA Marauder
42-95829/96028 Martin B-26B-50-MA Marauder

42-96029/96228 Martin B-26B-55-MA Marauder

Specification of Martin B-26B Marauder (B-10 to B-55):

Engines: Two Pratt & Whitney R-2800-43 eighteen-cylinder air-cooled radial engines with two-speed superchargers, each rated at 1920 hp for takeoff and 1490 hp at 14,300 feet. Driving Curtiss 13 foot 6 inch four-bladed propellers. Performance (at 37,000 pounds weight): Maximum speed 270 mph at sea level, 282 mph at 15,000 feet. Initial climb rate 1200 feet per minute. Service ceiling 21,700 feet. Range 1150 miles at 214 mph with 3000 lbs of bombs and 962 gallons of fuel. Ferry range 2000 miles at 195 mph with 1462 gallons or (early blocks only) 2850 miles with 1962 gallons. Take off distance to 50 feet, 3500 feet. Landing distance from 50 feet, 2900 feet. Weights: 24,000 pounds empty, 37,000 pounds combat. Fuel: The main fuel tanks are carried in the wings. Three main self-sealing tanks are installed in the wing inboard of the nacelles. Two auxiliary tanks are installed in the wings outboard of the nacelles. Long-range ferry tanks can be carried in the bomb bay. Dimensions: Wingspan 71 feet 0 inches, length 58 feet 3 inches, height 21 feet 6 inches, wing area 658 square feet. Armament: Eleven 0.50-inch Colt-Browning machine guns. One in flexible nose position, four in blister packs on sides of fuselage, two in dorsal turret, two in tail turret, two in waist positions (one on each side of the fuselage aft of the turret). The internal bomb bay had maximum accommodation for two 2000-pound bombs or four 2000-pound bombs, the latter being carried in pairs one above each other on each side of the central catwalk.

Sources:

1. Famous Bombers of the Second World War, William Green, Doubleday, 1959.
2. The Martin Marauder B-26, Victor C. Tannehill, Boomerang Publishers, 1997.
3. The Martin B-26 Marauder, J. K. Havener, TAB Aero, 1988.
4. Me & My Gal--The Stormy Combat Romance Between a WW II Bomber Pilot and His Martin B-26, Charles O'Mahony, Wings, December 1994.
5. The Martin B-26B and C Marauder, Ray Wagner, Aircraft in Profile, Doubleday, 1965.
6. Jane's American Fighting Aircraft of the 20th Century, Michael J.H. Taylor, Mallard Press.
7. American Combat Planes, Third Enlarged Edition, Ray Wagner, Doubleday, 1982.

Web Reference:

<http://home.att.net/~jbaugher2/b26.4.html>
<http://en.wikipedia.org/wiki/B-26.Marauder>

The Martin B-26 Marauder was a World War II twin-engine medium bomber built by the Glenn L. Martin Company.

The first US medium bomber used in the Pacific Theater in early 1942, it was also used in the Mediterranean Theater and in Western Europe. The plane distinguished itself as "the chief bombardment weapon on the Western Front" according to an United States Army Air Forces dispatch from 1946, and later variants maintained the lowest loss record of any combat aircraft during World War II. Its late-war loss record stands in sharp contrast to its unofficial nickname "The Widowmaker" — earned due to early models' high rate of accidents during takeoff.

A total of 5,288 were produced between February 1941 and March 1945; 522 of these were flown by the Royal Air Force and the South African Air Force.

Design and development

In March 1939, the United States Army Air Corps issued Circular Proposal 39-640, a specification for a twin-engined medium bomber. Six months later, Glenn L. Martin Company was awarded a contract for 201 planes. This design, Martin Model 179, was accepted for production before a prototype even flew. The B-26 went from paper concept to working plane in approximately two years. The lead designer was Peyton M. Magruder. Closeup view of Martin B-26C in flight.

Once the first aircraft came off the production line in November 1940, Martin conducted tests, the results of which were promising. The first B-26, with Martin test pilot William K. "Ken" Ebel at the controls, flew on 25 November 1940 and was effectively the prototype. Deliveries to the U.S. Army Air Corps began in February 1941 with the second plane, 40-1362. In March 1941, the Army Air Corps started Accelerated Service Testing of the B-26 at Patterson Field, Ohio.

The Martin electric turret was retrofitted to some of the first B-26s. Martin began testing a taller vertical stabilizer and revised tail gunner's position in 1941.

Accidents

While the B-26 was a fast plane with better performance than the contemporary B-25 Mitchell, its relatively small wing area and resulting high wing loading (the highest of any aircraft used at that time) required an unprecedented landing speed (120-135 mph/193-217 km/h indicated airspeed depending on load). At least two of the earliest B-26s suffered hard landings and damage to the main landing gear, engine mounts, propellers and fuselage. The type was grounded briefly in April 1941 to investigate the landing difficulties. Two causes were found: insufficient landing speed (producing a stall) and improper weight distribution. The latter was due to the lack of a dorsal turret; the Martin power turret was not ready yet.

Some of the very earliest B-26s suffered collapses of the nose landing gear. It is said that they were caused by improper weight distribution but that is probably not the only reason. They occurred during low-speed taxiing, takeoffs and landings. Occasionally the strut unlocked.

The Pratt & Whitney R-2800 engines were reliable but the Curtiss electric pitch change mechanism in the propellers required impeccable maintenance. Human error and some failures of the mechanism occasionally placed the propeller blades in flat pitch and resulted in an overspeeding propeller, sometimes known as a "runaway prop". Due to its sound and the possibility that the propeller blades could disintegrate, this situation was particularly frightening for aircrews. More challenging was a loss of power in one engine during takeoff. These and other malfunctions, as well as human error, claimed a number of planes and the commanding officer of the 22nd Bombardment Group, Col. Mark Lewis.

The Martin B-26 suffered only two fatal accidents during its first year of flights, November 1940-November 1941: a crash shortly after takeoff near Martin's Middle River plant (cause unknown but engine malfunction strongly suggested) and the loss of a 38th Bombardment Group plane when its vertical stabilizer and rudder separated from the plane at altitude (cause unknown, but accident report discussed the possibility that a canopy hatch broke off and struck the vertical stabilizer).

The B-26 was not an airplane for novices. Unfortunately, due to the need to quickly train many pilots for the war, a number of relatively inexperienced pilots got into the cockpit and the accident rate increased accordingly. This occurred at the same time as more experienced B-26 pilots of the 22nd, 38th and 42nd Bombardment Groups were proving the merits of the

airplane.

For a time in 1942, pilots in training believed that the B-26 could not be flown on one engine. This was disproved by a number of experienced pilots, including Jimmy Doolittle.

In 1942, Senator Harry Truman was a leading member of the Senate Special Committee to Investigate the National Defense Program (the so-called Truman Committee), which was investigating defense contracting abuses. When Truman and other committee members arrived at the Avon Park Army Air Field in Florida, they were greeted by the still-burning wreckage of two crashed B-26s. Truman criticized both Glenn L. Martin and the B-26. Indeed, the regularity of crashes by pilots training at nearby MacDill Field—up to fifteen in one 30-day period—led to the only mildly exaggerated catchphrase, "One a day in Tampa Bay."

The B-26 received the nickname "Widowmaker". Other colorful nicknames included "Martin Murderer", "Flying Coffin", "B-Dash-Crash", "Flying Prostitute" (so-named because it had "no visible means of support," referring to its small wings) and "Baltimore Whore" (a reference to the city where Martin was based).

The B-26 is said to have had the lowest combat loss rate of any U.S. aircraft used during the war. Nevertheless, it remained a challenging plane to fly and continued to be unpopular with some pilots throughout its military career.

Operational history

The B-26 Marauder was used mostly in Europe but also saw action in the Mediterranean and the Pacific. In early combat the aircraft took heavy losses but was still one of the most successful medium-range bombers used by the U.S. Army Air Forces.

In September 1940, the Army Air Corps ordered 1,131 B-26s. The airplane began flying combat missions in the Southwest Pacific in the spring of 1942, but most of the B-26s subsequently assigned to operational theaters were sent to England and the Mediterranean area.

Bombing from medium altitudes of 10,000-15,000 ft (3,048-4,572 m), the Marauder had the lowest loss rate of any Allied bomber - less than ½%. By the end of World War II, it had flown more than 110,000 sorties and had dropped 150,000 tons (136,078 tonnes) of bombs, and had been used in combat by British, Free French and South African forces in addition to U.S. units. In 1945, when B-26 production was halted, 5,266 had been built.

The B-26 was phased out of US Army Air Forces service before the end of the war. Its last mission was flown in May 1945. According to an article in the April edition of AOPA Pilot on Kermit Weeks' "Fantasy of Flight", the Marauder had a tendency to "hunt" in yaw. This instability is similar to "Dutch roll". This would make for a very uncomfortable ride, especially for the tail gunner.

Variants

* B-26 - The first produced model of the B-26, ordered based upon design alone. The armament on this model consisted of two 0.3 inches (7.62 mm) and two 0.5 inches (12.7 mm) machine guns. (The last model was armed with nearly three times that number.) Approximate cost then: \$80,226.80/plane.

* B-26A - Incorporated changes made on the production line to the B-26, including upgrading the two 0.3 inches (7.62 mm) machine guns in the nose and tail to 0.5 inches (12.7 mm). A total of 52 B-26As were sent to the United Kingdom, which were used as the Marauder Mk I. Approximate cost then: \$102,659.33/aircraft (×139)

* B-26B - Model with further improvements on the B-26A. Nineteen were sent to the United Kingdom, which were used as the Marauder MK.1A. Production blocks of the 1883 planes built:

- o AT-23A or TB-26B - 208 B-26Bs converted into target tugs and gunnery trainers designated JM-1 by the Navy.

- o B-26B—Single tail gun replaced with twin gun; belly-mounted "tunnel-gun" added. (×81)

- o B-26B-1 - Improved B-26B. (×225)

- o B-26B-2 - Pratt & Whitney R-2800-41 radials. (×96)

- o B-26B-3 - Larger carburetor intakes; upgrade to R-2800-43 radials. (×28)

- o B-26B-4 - Improved B-26B-3. (×211)

- o B-26B-10 through B-26B-55 - Beginning with block 10, the wingspan was increased from 65 feet (20 m) to 71 feet (22 m), to improve handling problems during landing caused by a high wing load; flaps were added outboard of the engine nacelles for this purpose also. The vertical stabiliser height was increased from 19 feet 10 inches (6.0 m) to 21 feet 6 inches (6.6 m). The armament was increased from six to 12 0.5 inches (12.7 mm) machine guns; this was done in the forward section so that the B-26 could perform strafing missions. The tail gun was upgraded from manual to power operated. Armor was added to protect the pilot and copilot. (×1242)

- o CB-26B - 12 B-26Bs were converted into transport aircraft (all were delivered to the US Marine Corps for use in the Philippines).

* B-26C - Designation assigned to those B-26Bs built in Omaha, Nebraska instead of Baltimore, Maryland. Although nominally the B-26B-10 was the first variant to receive the longer wing, it was actually installed on B-26Cs before the B-26B-10, both being in production simultaneously. 123 B-26Cs were used by the RAF as the Marauder Mk II. Approximate cost then: \$138,551.27/plane (×1210)

- o TB-26C—Originally designated AT-23B. Trainer modification of B-26C. (×>300)

* XB-26D - Modified B-26 used to test hot air de-icing equipment, in which heat exchangers transferred heat from engine exhaust to air circulated to the leading and trailing edges of the wing and empennage surfaces. This system, while promising, was not incorporated into any production aircraft made during World War II. (×1, converted)

* B-26E - Modified B-26B constructed to test the effectiveness of moving the dorsal gun turret from the aft fuselage to just behind the cockpit. The offensive and defensive abilities of the B-26E was tested against in combat simulations against normal aircraft. Although test showed that gains were made with the new arrangement, the gain was insignificant. After a cost analysis, it was concluded that the effort needed to convert production lines to the B-26E arrangement was not worth the effort. (×1, converted)

* B-26F - Angle of incidence of wings increased by 3.5°; fixed 0.5 inches (12.7 mm) machine gun in nose removed; tail turret and associated armour improved. The first B-26F was produced in February 1944. One hundred of these were B-26F-1-MAs. Starting with 42-96231, a revised oil cooler was added, along with wing bottom panels redesigned for easier removal. A total of 200 of the 300 planes were B-26F-2s and F-6s, all of which were used by the RAF as the Marauder Mk III. The Marauder III carried the RAF serials HD402 through HD601 (ex-USAAF serials 42-96329 through 96528). The F-2 had the Bell M-6 power turret replaced by an M-6A with a flexible canvas cover over the guns. The T-1 bombsight was installed instead of the M-series sight. British bomb fusing and radio equipment were provided. (×300)

* B-26G - B-26F with standardised interior equipment. A total of 150 bombers were used by the RAF as the Marauder Mk III. (×893)

o TB-26G - B-26G converted for crew training. Most, possibly all, were delivered to the United States Navy as the JM-2. (×57)

* XB-26H - Test aircraft for tandem landing gear, to see if it could be used on the Martin XB-48. (×1, converted)

* JM-1P - A small number of JM-1s were converted into photo-reconnaissance aircraft.

Operators

France
South Africa
* South African Air Force
United Kingdom
* Royal Air Force
United States
* United States Army Air Corps
* United States Army Air Forces
* United States Marine Corps
* United States Navy
* Women Air Force Service Pilots

Survivors

* B-26B, part of the Fantasy of Flight collection in Polk City, Florida.

* B-26G (s/n 43-34581) is on display at the National Museum of the United States Air Force in Dayton, Ohio. This aircraft was flown in combat by the Free French during the final months of World War II. It was obtained from the French airline Air France training school near Paris in June 1965. It is painted as a 9th Air Force B-26B assigned to the 387th Bomb Group in 1945.

* B-26G-25-MA (s/n 44-68219) is on display at the Musée de l'Air et de l'Espace in Le Bourget, France. It was also recovered from the Air France training school.

* B-26 on display in Marietta, Georgia. Provenance unknown.

* B-26B-25-MA (s/n 41-31773) "Flak Bait." The nose section is on display at the National Air and Space Museum, Washington DC. The remainder (mid and tail fuselage sections, wings, engines, and empennage) are stored at NASM's Paul E. Garber facility in Suitland MD. This aircraft survived 207 operational missions over Europe, more than any other American aircraft during World War II and will, one day, be restored and displayed at NASM's Steven F. Udvar-Hazy Center at Dulles International Airport VA.

Specifications (B-26G)

Photo: Martin B-26G Marauder at the National Museum of the United States Air Force.

Data from Quest for Performance and Jane's Fighting Aircraft of World War II

General characteristics

- * Crew: 7: (2 pilots, bombardier, navigator/radio operator, 3 gunners)
- * Length: 58 ft 3 in (17.8 m)
- * Wingspan: 71 ft 0 in (21.65 m)
- * Height: 21 ft 6 in (6.55 m)
- * Wing area: 658 ft² (61.1 m²)
- * Empty weight: 24,000 lb (11,000 kg)
- * Loaded weight: 37,000 lb (17,000 kg)

* Powerplant: 2× Pratt & Whitney R-2800-43 radial engines, 1,900 hp (1,400 kW) each

Performance

- * Maximum speed: 287 mph (250 knots, 460 km/h) at 5,000 feet (1,500 m)
- * Cruise speed: 216 mph (188 knots, 358 km/h)
- * Landing speed: 104 mph (90 knots, 167 km/h))
- * Combat radius: 1,150 mi (999 nmi, 1,850 km)
- * Ferry range: 2,850 mi (2,480 nmi, 4,590 km)
- * Service ceiling: 21,000 ft (6,400 m)
- * Wing loading: 46.4 lb/ft² (228 kg/m²)
- * Power/mass: 0.10 hp/lb (170 W/kg)

Armament

- * Guns: 12 × .50 in (12.7 mm) Browning machine guns
- * Bombs: 4,000 pounds (1,800 kg)



Project Origins and Early Development:



U.S. Army Air Corps crest

In January of 1939, the United States Army Air Corps issued a specification (Circular Proposal 39-640) for a twin-engine medium bomber. Requests for proposals were widely circulated throughout the industry and responding companies included Martin, Douglas, Stearman, and North American. The proposal of the **Glenn L. Martin Company** of Middle River, Maryland (near Baltimore) was assigned the company designation of Model 179.



Peyton Magruder

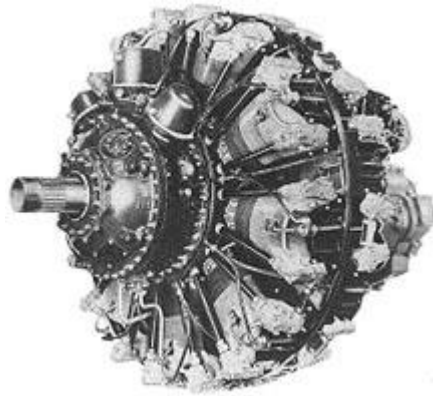
Martin assigned a 26-year-old aeronautical engineer named **Peyton M. Magruder** as Project Engineer for the Model 179. Magruder and his team decided on a low-drag fuselage profile with a circular cross section. Since the Army desired high maximum speed but had not specified maximum landing or stall speeds, the team selected a wing a span of just 65 feet with a dihedral of only 1.3 degrees.

This yielded a wing loading of over 50 pounds per square foot. The wings were unusual in possessing no fillets, and were shoulder-mounted to leave the central fuselage free for bombs and provide ground clearance for the large propellers.



Notional drawing the Martin Model 179 medium bombardment aircraft (c1939).

Early wind tunnel test models featured a twin vertical tail configuration (shown at right) that designers thought would provide better aerodynamic control. However, this was replaced by a single fin and rudder to provide the tail gunner with a better field of view.



Pratt & Whitney R-2800

The engines were to be a pair of 1850 hp. **Pratt & Whitney R-2800-5 Double Wasp** air-cooled radials, the most powerful available at the time. Two-speed mechanical superchargers were installed to maintain engine power up to medium altitudes, and ejector exhausts vented on both sides of the closely-cowled nacelles. The engines drove four-bladed Curtiss Electric propellers of 13 feet, 6 inches in diameter, and with large spinners and cuffs at the blade roots to enhance engine cooling.

The bomb bays were in an unusual tandem configuration. The forward pair of doors folded in half "accordion-style" when opened, while the aft doors opened outward in a more conventional "clamshell" fashion. Two 2000 lb. bombs could be carried in the main bomb bay, or up to 4,800 lbs. of smaller bombs if the aft bay was used as well.

Detailed design of the Model 179 was completed by June of 1939. On July 5, 1939, the Model 179 was submitted to a Wright Field Board. The Martin design was rated the highest of those submitted, and on August 10, 1939, the Army issued a contract for 201 Model 179s under the designation "B-26". This contract was finally approved on September 10. At the same time, the competing North American NA-62 was issued a contract for 184 examples under the designation B-25. Since the design had been ordered "off the drawing board", there was no "XB-26" as such.



B-26 production line, Middle River, Maryland.

The semi-monocoque aluminum alloy fuselage was fabricated in three sections and had four main longerons, transverse circular frames, and longitudinal stringers covered by aluminum skin. The mid section containing the bomb bays was built integrally along with the wing section.

The retractable tricycle landing gear was hydraulically actuated. The nose wheel pivoted 90 degrees and retracted into the nose section while the main gear folded aft into the engine nacelles. The vertical and horizontal stabilizers featured smooth, stressed-skin cantilever structures, with metal elevator surfaces and a fabric rudder surface.

The first aircraft (C/N 1226, USAAF Serial No. 40-1361) came off the production line in early November 1940, and even though it had yet to fly, orders for 139 B-26As with self-sealing tanks and armor were issued by the Army on September 16, 1940. Further orders for 719 B-26Bs on September 28, 1940 brought the total order to 1,131 aircraft.



The first B-26 Marauder

On the 25th of September 1940, Martin Test Pilot and Chief Engineer, **William K. "Ken" Ebel**, Co-pilot **Ed Fenimore**, and Flight Engineer **Al Malewski** successfully completed the aircraft's maiden flight. Thus, the bomber went from paper concept to a flying aircraft in less than two years. Since there was no prototype, the first few production aircraft were used for test purposes. The first 113 hours of flight testing went fairly well with few required modifications. However, a slight rudder overbalance necessitated reversal the rudder trim tab direction travel. Soon after, the aircraft was turned over to the Army Air Corps for operational testing.



22nd Bombardment Group crest

On February 22, 1941, the first four B-26s were accepted by the USAAF. The first operational unit was the 22nd Bombardment Group (Medium) based at Langley Field, Virginia, which had previously operated Douglas B-18s. However, several nose gear strut failures briefly delayed transition to full operational status. Although the strut was strengthened, the real problem was improper weight distribution. Due to logistical foul-ups, the first few B-26s were delivered without guns and had to be longitudinally trimmed using tools and spare parts for ballast. When the Army received the planes, they removed the ballast, thereby moving the aircrafts' center of gravity forward and increasing loads on the nose gear. Installation of the guns corrected the problem.

Early Controversy and Operational Challenges:



*"Maintain thy airspeed lest the
Earth rise up to smite thee."*

The B-26 was a fast plane with better overall performance than its contemporary, the B-25 Mitchell. However, the Marauder's small wing area and high wing loading, the highest of any allied bomber of the time, meant higher approach, touchdown and stall speeds (140 mph, 120 to 115 mph, and 130 mph with no flaps, respectively).

With the war heating up across the planet, the demand for new aircrewman was extremely pressing. Most experienced pilots were already overseas, seasoned instructors were in short supply, and it was not practical to give new pilots much flight time during initial training. They rapidly went from low performance aircraft (such as the Beechcraft AT-9) directly into "hot ships" like the B-26.

The Marauder's high performance and revolutionary features made this a huge leap for most, and the high approach speed and unforgiving single engine operation were more than some "green" pilots could handle. Experienced mechanics were also in short supply, which may have contributed to the high incidence of engine failures early in the bomber's career.

Due to its rotund fuselage, the Marauder's engines were placed fairly far outboard. Loss of power on one side therefore caused substantial asymmetrical thrust that could induce rapid yaw and roll rates if minimum controllable airspeed (V_{MC}) was not achieved (or maintained). Although this was to be expected of an aircraft with this power and configuration, these characteristics initially led to a high number of accidents, particularly on takeoff.



Undignified ending for a Marauder

The crash rate inevitably spawned a number of cynical nicknames such as "Widowmaker", "Martin Murderer", "The Flying Coffin", "B-Dash-Crash", "The Flying Prostitute" (because its small wings provided "no visible means of

support"), and *"The Baltimore Whore"* (because the Martin Company was located there).

By the autumn of 1943, the situation resulted in the appointment of a blue ribbon Commission of Inquiry was led by then-Senator Harry Truman. When he and other commission members arrived at the Avon Park Bombing Range, they were greeted by the still-burning wreckage of two crashed Marauders. Indeed, the regularity of crashes by pilots training at MacDill Field — up to fifteen in one thirty day period — led to the only mildly exaggerated catchphrase, *"One a day in Tampa Bay."* The Board soon ordered the entire B-26 fleet to be grounded pending further inquiry.

Nevertheless, despite its high stall and landing speeds (which remained essentially unchanged despite numerous modifications made to reduce them), the Marauder had no really "vicious" flying characteristics, and its single-engine performance was actually fairly good for the day.

Although the B-26 was for a time considered so dangerous that aircrews tried to avoid getting assigned to Marauder-equipped units and civilian ferry crews actually refused to fly them, it turned out that the bomber was actually very safe in the hands of a properly trained crew. It certainly demanded a higher standard of training than the B-25 Mitchell, but once mastered, the B-26 offered a level of operational immunity to its crews unmatched by any other aircraft in its class.

Design Changes Lead to the Lowest Loss Rate of Any WWII Combat Aircraft:



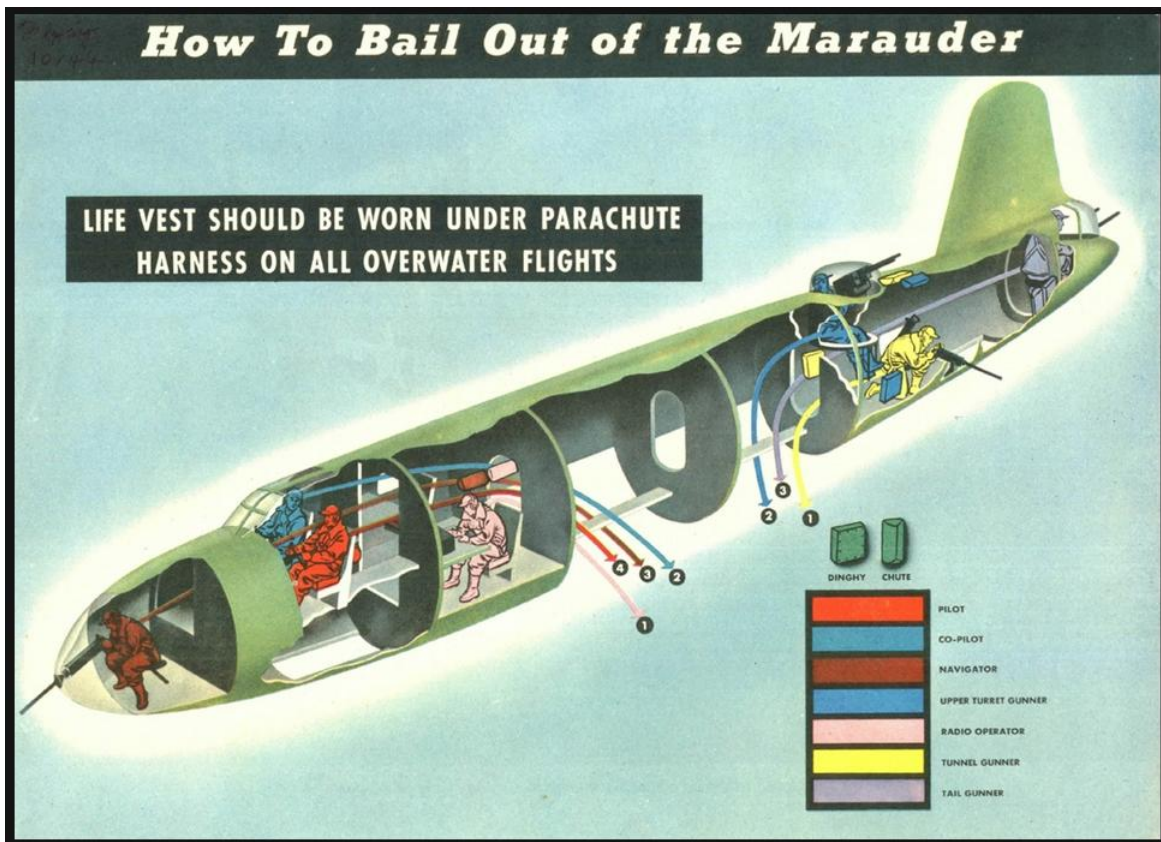
The lowest combat loss rate of all WWII aircraft.

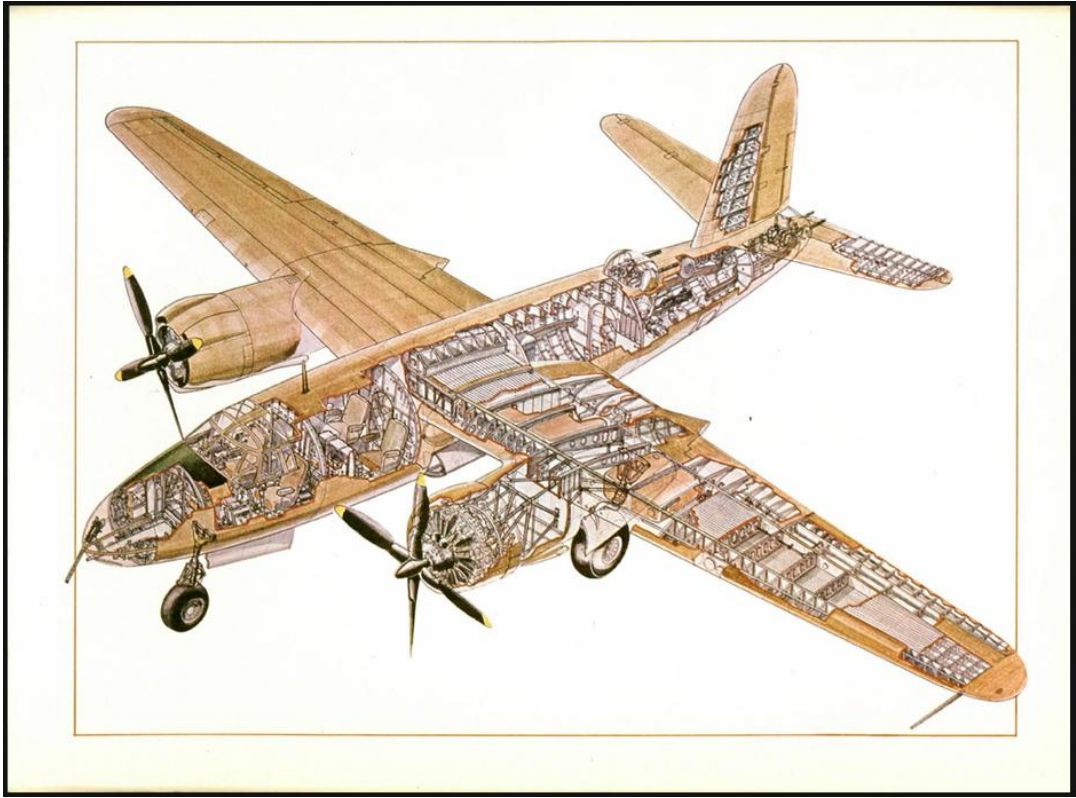
Consequently, a variety of design changes were implemented and the resulting B-26B had an additional 6 feet (1.8 m) of wingspan and other changes. These modifications slightly reduced landing and stall speeds and ultimately yielded the lowest attrition rate of any combat aircraft of WWII. Nevertheless, it remained a challenging plane to fly and somewhat controversial throughout its service life.

B-26 crews first began flying combat missions in the South Pacific in the spring of 1942, but the majority were sent to England and the Mediterranean. The 22nd Army Air Force Bomb Group was originally based in northern Australia but often operated from Port Moresby, New Guinea. On 9 June 1942, Lt. Cmdr. Lyndon B. Johnson flew on a bombing mission to Lae, New Guinea, but his aircraft developed engine trouble and returned to base.

Like the B-25, the B-26 was originally designed for medium-altitude bombing, but the demands of combat eventually brought them down to treetop level. Later versions of the B-26 were equipped with a side-mounted battery of forward-firing machine guns for strafing ground targets. Intensive low-level bombing and strafing at Utah Beach by the Marauders before and during the "D-Day" Normandy invasion contributed to a reduction in casualties among the American assault force.

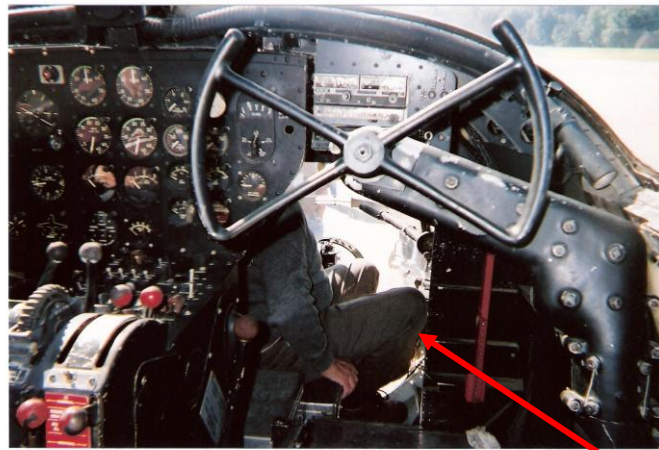
The B-26 was phased out of Army Air Force service shortly before the end of the war. The last Marauder mission of WWII was flown in May 1945. It continued to see duty in a variety of civilian roles for many years. Today, this superb machine lives on as a highly-prized museum item and in a handful of flyable variants.





This the radio operator's station in a B-26 Marauder bomber. This particular exhibit, as seen in the National Air and Space Museum in Washington DC, has been re-created in a fuselage section of an aircraft called "Flack Bait" (Photo by Jerry Proc)

Flack Bait served with the 449th Bombardment Squadron, 322nd Bombardment Group, Eighth and Ninth Air Forces. It flew from bases in England and, after D-Day (on which it flew two missions), from bases in France and Belgium. In 21 months, Flak Bait acquired more than 1,000 holes, had its hydraulic system shot out twice and its electrical system once, returned twice on one engine, and came back once with an engine on fire. By war's end, it had flown 202 bombing missions, more than any other American bomber over Europe. (Photo by Jerry Proc).



As bombardier, this is where George would sit. There was no exit other than back through this companionway past the co-pilots seat and back to the bomb bay doors. Pretty challenging with a parachute on if your plane is going down.



Cabin interior colours of B-26 Marauder remain something of an enigma. About the only source for the information contained herein is the examination of the nose of B-26B-25-MA Flak Bait which is on display in original condition at the National Air and Space Museum, Washington , DC. In the above photo, the view of the forward ring of the fuselage to which the clear perspex nose is attached indicates at least that (a) the cabin interior of this B-26 was painted and (b) the colour was not black.

Martin seems to have not used Zinc Chromate primer very often. Most interior parts were left in bare metal or painted in clear lacquer. Only a few components like steel parts and rudders were painted in Zinc Chromate Yellow.

Production standards of the B-26 have not yet been sufficiently researched. The National Air and Space Museum has the forward fuselage of the famous B-26B-25-MA Flak Bait, which is the basis of the following colour information. In the cockpit, everything above the lower canopy edge was painted flat black paint, as was the floor, armour plating, and crew seats. Fuselage sides in crew areas were padded with drab-coloured insulation material.

Interior of the fuselage including the bulkhead aft of the cabin seats was unpainted aluminium with black floors and walkways.

The wheel wells were finished in Aluminium lacquer, with selected fixtures in Zinc Chromate Yellow. Photos exist of camouflaged B-26s that show Neutral Grey on the undercarriage legs and inner surfaces of gear doors.

Aircraft Background:

The Marauder, a medium-range bomber, posted the lowest loss rate, about 1%, of USAAF combat planes during World War II. The B-26 was used most effectively for bombing raids on railroad depots, bridges, and airfields, and it developed an excellent reputation as a dam buster.

Our Aircraft's History:

MAPS B-26, the 99th Marauder built, crash landed in British Columbia, Canada, on January 16, 1942, five weeks and five days after Pearl Harbor was bombed. Efforts are being made by several members of the MAPS Air Museum to restore it to flying condition. A book about the crash landing, including a personal account by co-pilot Lt. Howard Smiley, is available in the MAPS gift shop. *Out of the Wilderness: Restoring a Relic* was written by Lee B. Morrison of New Philadelphia, Ohio.



1995



2000

As is too often the case, when a part of an airframe is damaged or missing, often there is no option but to recreate, from scratch, the missing parts. In this example, we're looking at internal ribs for the B-26 Marauder's ailerons. These parts were either missing, or damaged beyond repair, so the restoration team had no choice but to recreate the parts from scratch.



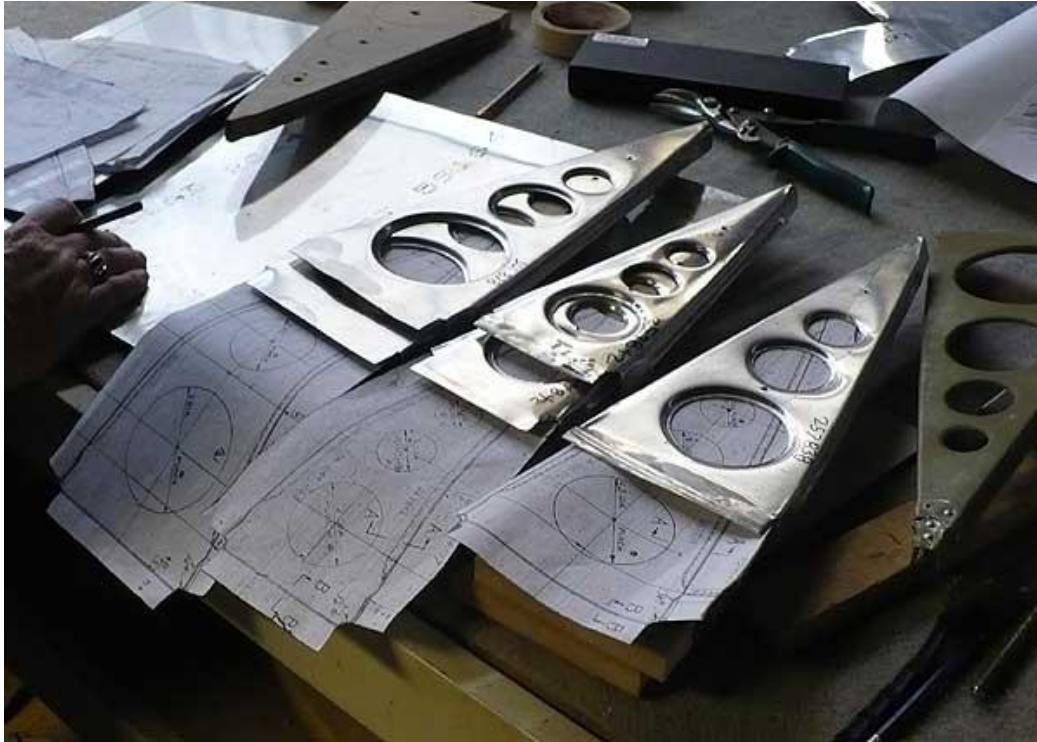
First, full size templates printed ...



... wooden forms cut & shaped...



... wooden hammers bend to shape, and ...



...finally, holes are cut (to lighten *and strengthen* the part) ♦ Photo ♦ James Kohan



NEW! working on attaching the new ribs back on the B-26 aileron ♦ Photo ♦ Rick Willamon



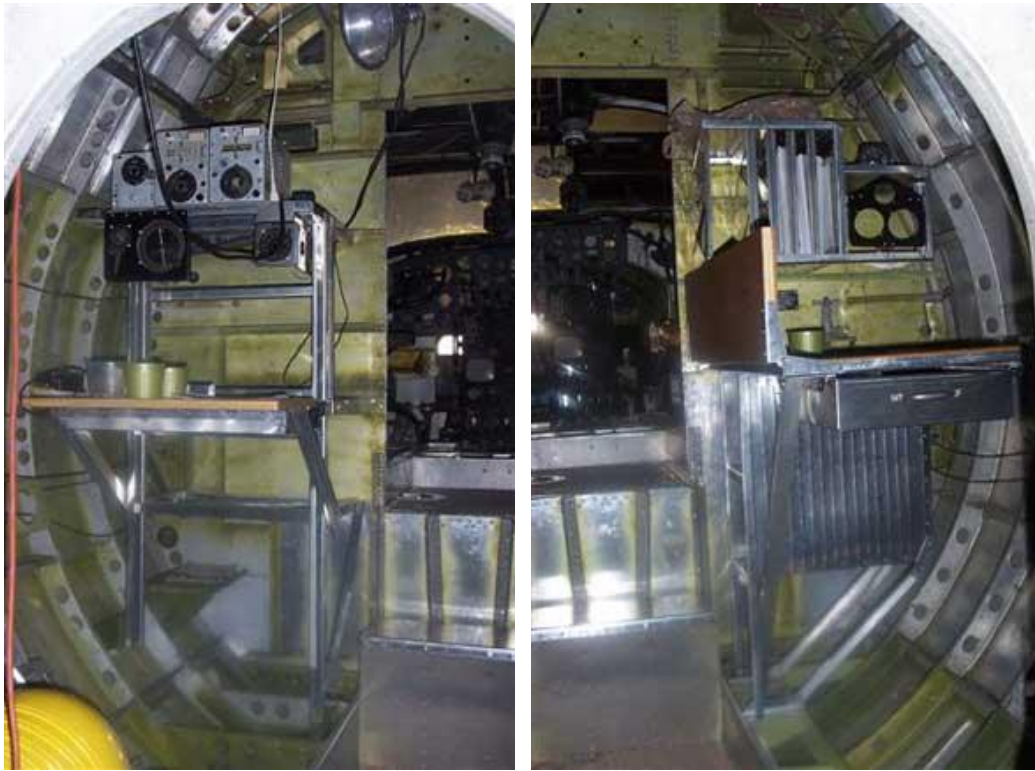
B-26 aileron ribs starting to go back on the aileron ♦ Photo ♦ Rick Willamon



Restoration work on the B-26 co-pilot's seat. The co-pilots seat ran on rails, to allow the Bombardier to gain access to the nose compartment. The last photo on this page shows (at left) the still-in-progress seat in place in the aircraft. ♦ Photos ♦ James Ko ♦ Photos ♦ James Kohan



Engine mount back on the port (left) B-26 wing ♦ Photos ♦ Photos ♦ James Kohan



Left - Radio rack. Right - Navigators table ♦ Photos ♦ Kent Kleinkenecht



New ribs to go under the rebuilt stabilizer end ♦ photo 0000" size="1">"1"> ♦ James Kohan



MAPS Member Don working on new stabilizer end ♦ photo r />



MAPS Member Don working on new stabilizer end ♦ photo ♦ Steve Satchell



MAPS Member Kent patching one of the B-26's clamshell bomb bay doors ♦ photo ♦ James Kohan



MAPS Member Kent patching one of the B-26's clamshell bomb bay doors ♦ photo ♦ Steve Satchell



MAPS Member Jim painting one of the B-26 engine mounts ♦ photo ♦ James Kohan



MAPS Member Bud working on one of the B-26 firewall units ♦ photo ♦ Steve Satchell



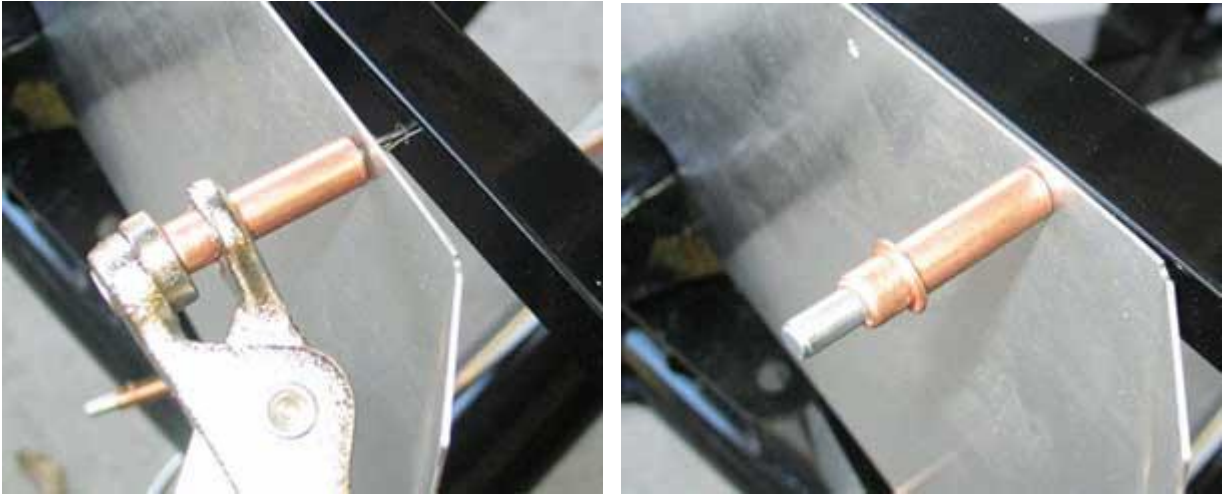
B-26 engine nacelle as of 01 October 2006 ♦ photo ♦ John Ashley



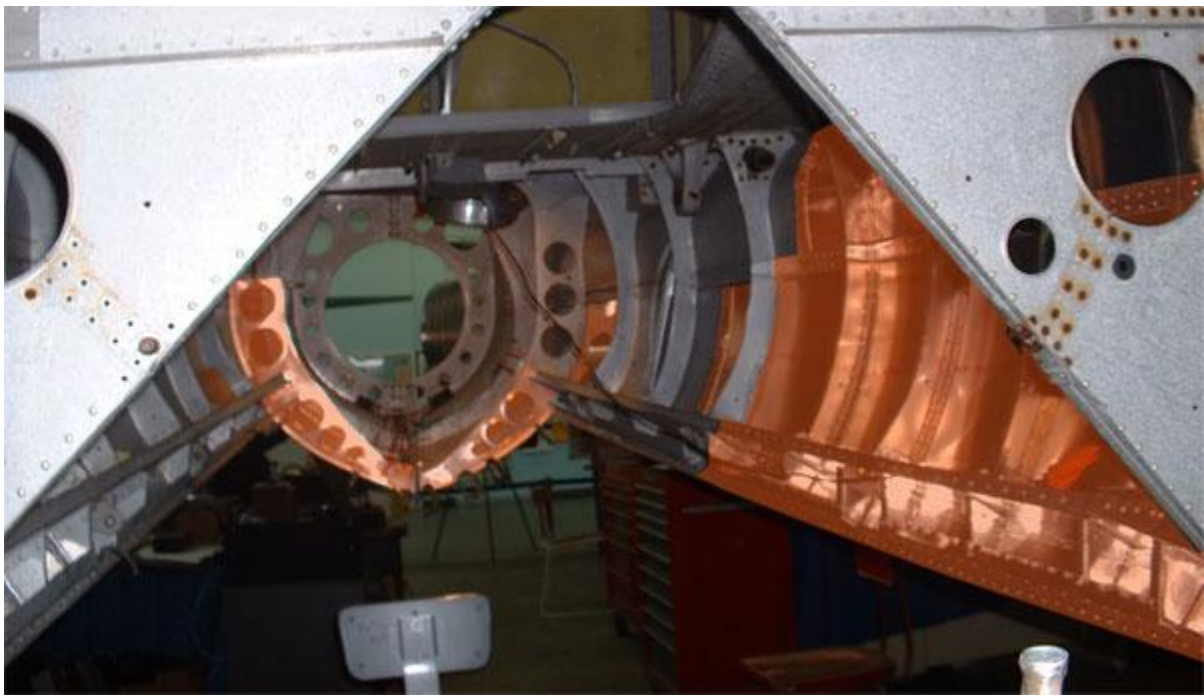
B-26 engine nacelle - Cleco's are holding the pieces together until riveting ♦ photo ♦ Gary Haught



What is a Cleco? A Cleco is a spring-loaded fastener used to temporarily hold two pieces of sheetmetal together until they can be permanently joined together, usually by riveting or bolting. Mostly used in the aircraft building process, they also appear in racing when building up the race car exterior.



Using a pair of Cleco pliers to install a Cleco temporary fastener



B-26 engine nacelle interior - colored sections are completely new sheetmetal work ♦ photo ♦ Gary Haugt



B-26 engine nacelle exterior - ALL DONE! Most of the cleco's are gone ♦ photo ♦ Gary Haught



Nose compartment of the B-26. Note cockpit layout and limited access ♦ photo ♦ Gary Haught

SPECIFICATIONS:

Span: 65 ft

Length: 56 ft

Height: 19 ft 10 in

Weight: 21,735 lbs empty, 32,000 lbs max

Armament: 6,000 lbs of bombs, up to six .50 cal. machine guns.

Wing Area: 602 sq ft

Engines: 2 Pratt & Whitney R-2800-5 radial engines of 1,850 hp each.

Crew: Seven

PERFORMANCE

Maximum speed: 315 mph at 15,000 ft

Cruising speed: 265 mph

Range: 2,200 miles

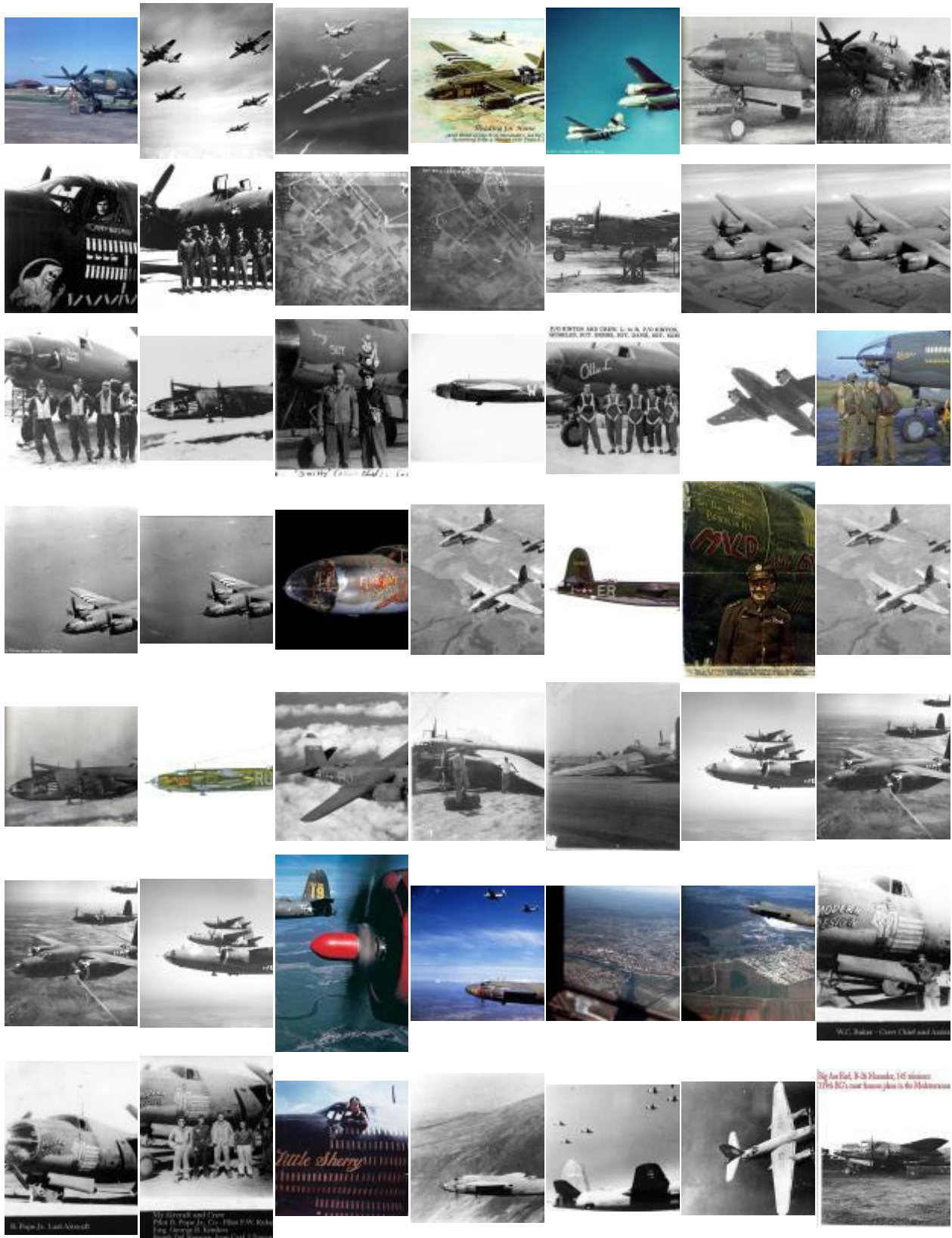
Service Ceiling: 25,000 ft.

Rate of Climb: 1,200 fpm





Friday, April 10, 1942 - Revised English
View of the B-24 Liberator bomber (44-2411) on the ground. The bomber was painted in the colors of the United States Army Air Corps. The tail section is visible. The tail section is painted in the colors of the United States Army Air Corps. © 2012-2013

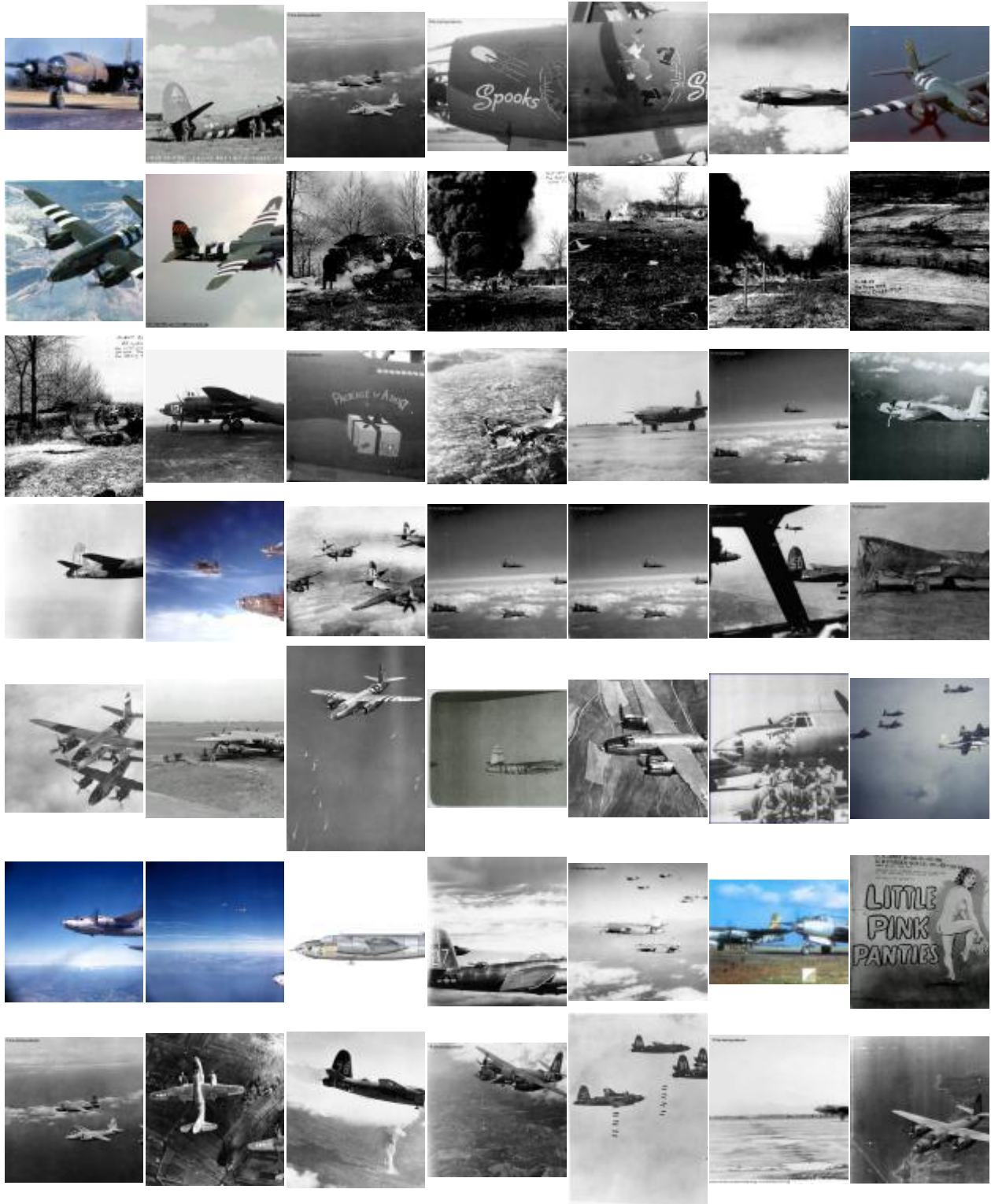


B. Page Jr. - Last Aircraft

My Aircraft and Crew
 Pilot: P. Page Jr. Co. - 1stst PW Bde
 Eng. George H. London
 Tech. Sgt. William Earl Huff 4th Bde

Little Sherry

Big Air Force B-29 Superfortress 1stst Bde
 17th AF (CG) over Sumatra, Java in the Netherlands









Made Entirely in the USA