

Operator's Handbook

This well-armed heavy bomber was the mainstay of US efforts to pound Germany into submission during World War II

WORDS TOM GARNER

A detailed photograph of a B-17 Flying Fortress bomber aircraft, viewed from a low angle looking up at the fuselage. The aircraft is silver with a red nose section. The cockpit canopy is prominent, showing the interior. The fuselage has several windows and a large door. The aircraft is mounted on a display stand in a museum setting with a dark, grid-patterned ceiling.

# B-17

# FLYING FORTRESS

## B-17 FLYING FORTRESS

**MANUFACTURER:** BOEING

**ROLE:** HEAVY BOMBER

**INITIAL YEAR OF SERVICE:** 1938

**WING SPAN:** 31.6 METRES (103 FEET 9 INCHES)

**LENGTH:** 22.6 METRES (74 FEET 4 INCHES)

**HEIGHT:** 5.8 METRES (19 FEET 1 INCH)

**MAXIMUM SPEED:** 462 KILOMETRES PER HOUR (287 MILES PER HOUR)

**MAXIMUM RANGE:** 3,219 KILOMETRES (2,000 MILES)

**POWERPLANT:** 4X WRIGHT R-1820-97 CYCLONE AIR-COOLED RADIAL ENGINES

**ARMAMENT:** 13X 50-CAL. MACHINE GUNS, 7,983 KILOGRAMS (17,600 POUNDS) OF BOMBS

**CREW:** 8-10

During World War II, the Boeing B-17 Flying Fortress was the American equivalent of the British Avro Lancaster. Designed as a fast, high-flying bomber that could ably defend itself, the B-17 was the mainstay of the United States Army Air Force (USAAF), particularly in Europe, where it served in very large numbers in the 15th Air Force in the Mediterranean and, most famously, for the Eighth Air Force in Europe.

The B-17's role in the European theatre has largely come to symbolise the continental air war. From 1942, Eighth Air Force launched increasingly large bombing missions to destroy Germany's ability to wage war through daylight raids. Massed formations of hundreds of B-17s flew endless sorties to destroy German industrial, transportation and communication

targets. Of the 1.5 million tons of bombs that were dropped over Europe by American aircraft, about 640,000 tons were dropped by B-17s in the attempt to rip the heart out of Germany's industrial production.

70 per cent of Berlin alone was destroyed by the efforts of Eighth Air Force and the RAF. However, flying by day in B-17s came at a terrible price. Of the 12,531 that were built, 4,754 were lost during the war, either through combat or accidents. This gave the B-17 a wartime loss rate of 37 per cent, and of the approximately 250,000 men who experienced flying in them across all theatres, 46,500 were killed or wounded. Nonetheless, the sheer number and ferocity of B-17 attacks led the US commander of Strategic Air Forces in Europe Carl Spaatz to reflect that, "...without the B-17, we might have lost the war."

*Built in 1945, this surviving B-17G is displayed in the Bomber Hall of RAF Museum London*

**"THE B-17'S ROLE IN THE EUROPEAN THEATRE HAS LARGELY COME TO SYMBOLISE THE CONTINENTAL AIR WAR"**

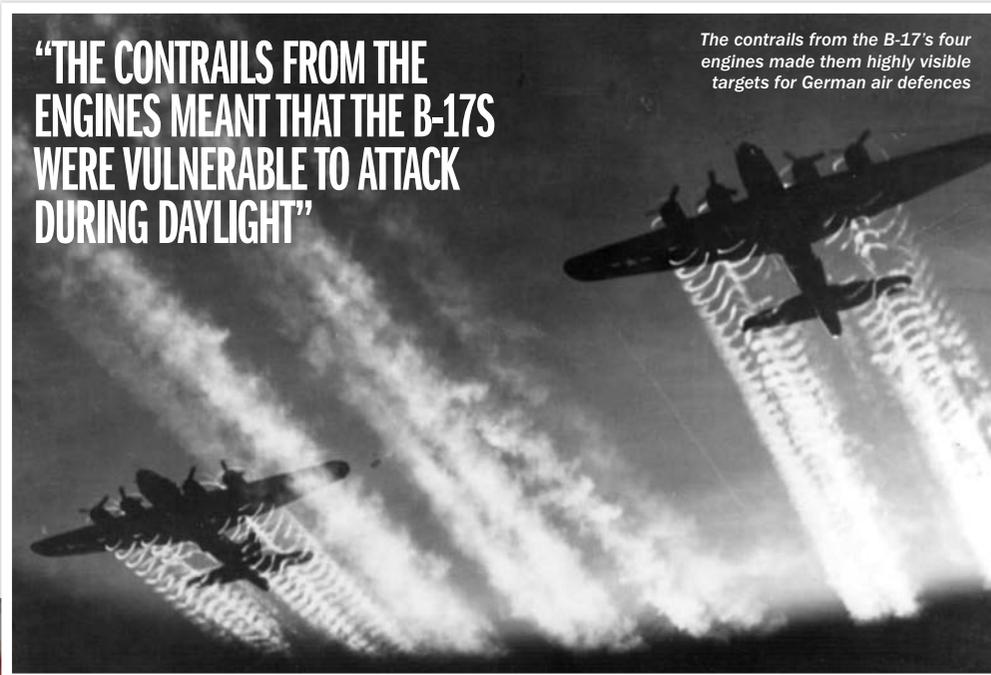


*A group of B-17 planes in formation over Germany in April 1945. B-17s flew in 'box' formations to theoretically enable them to defend themselves without fighter support*

# ENGINES

The B-17 is a four-engine bomber, equipped with large Wright Cyclone air-cooled radial engines, capable of achieving speeds of 462 kilometres per hour and a range of 3,219 kilometres. The contrails from the engines meant that the B-17s were vulnerable to attack during daylight, however their reliability meant that the bombers could return to base on just two engines, if the others were damaged during combat. Some aircraft even managed to land with the wheels up and on one engine.

*Below: Formations of over 850 US bombers would routinely fly over Europe in the daytime to destroy Germany's war effort*



**“THE CONTRAILS FROM THE ENGINES MEANT THAT THE B-17S WERE VULNERABLE TO ATTACK DURING DAYLIGHT”**

*The contrails from the B-17's four engines made them highly visible targets for German air defences*

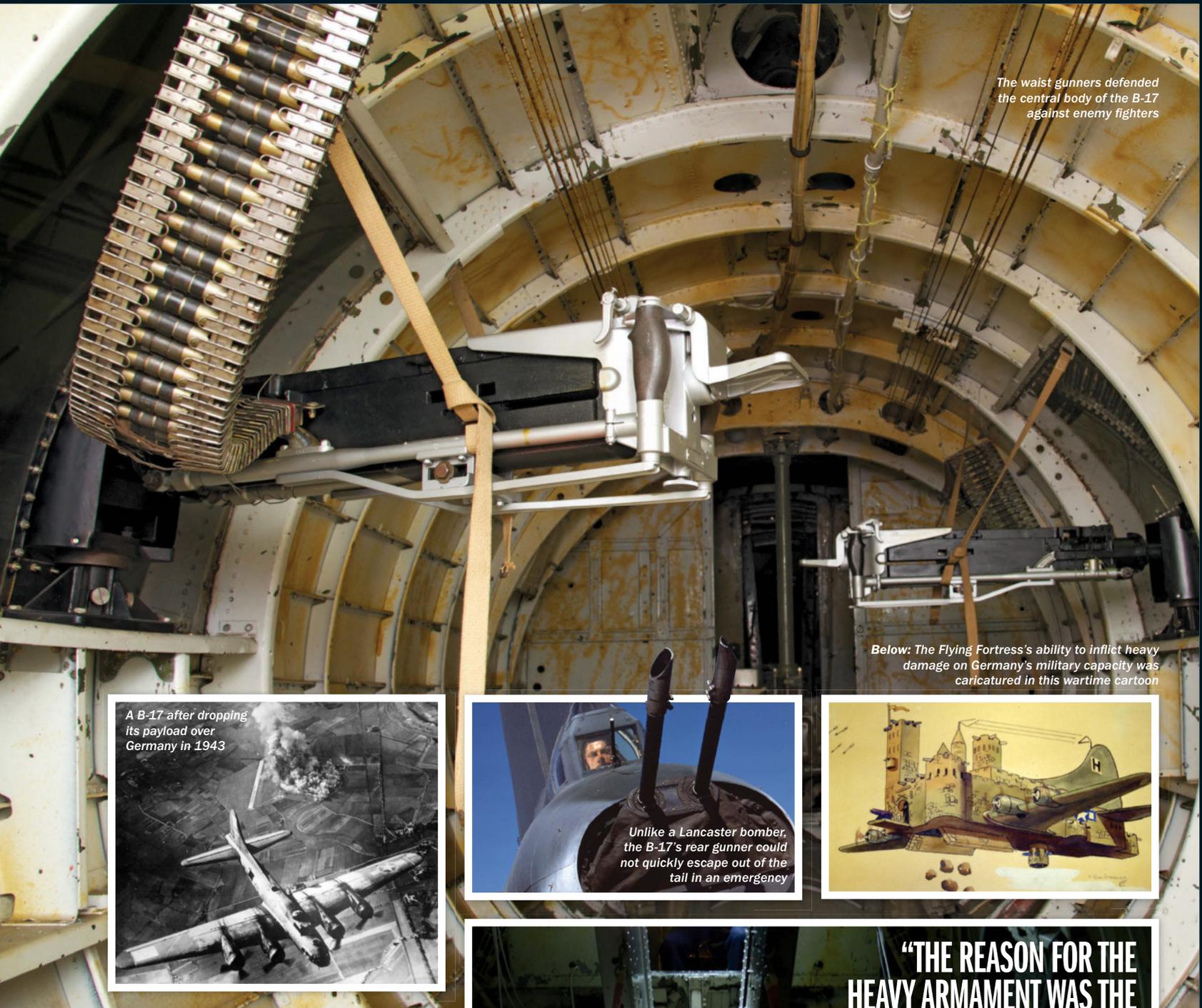


*The B-17 could theoretically fly and land on one or two engines if the others were damaged in combat*



**Left: B-17s were equipped with reliable Wright R-1820 Cyclone radial air-cooled engines. First produced in 1931, these engines remained in production until the 1950s**

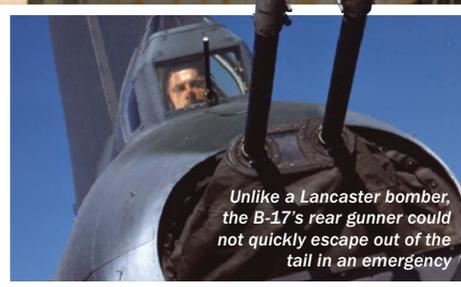
The waist gunners defended the central body of the B-17 against enemy fighters



Below: The Flying Fortress's ability to inflict heavy damage on Germany's military capacity was caricatured in this wartime cartoon



A B-17 after dropping its payload over Germany in 1943



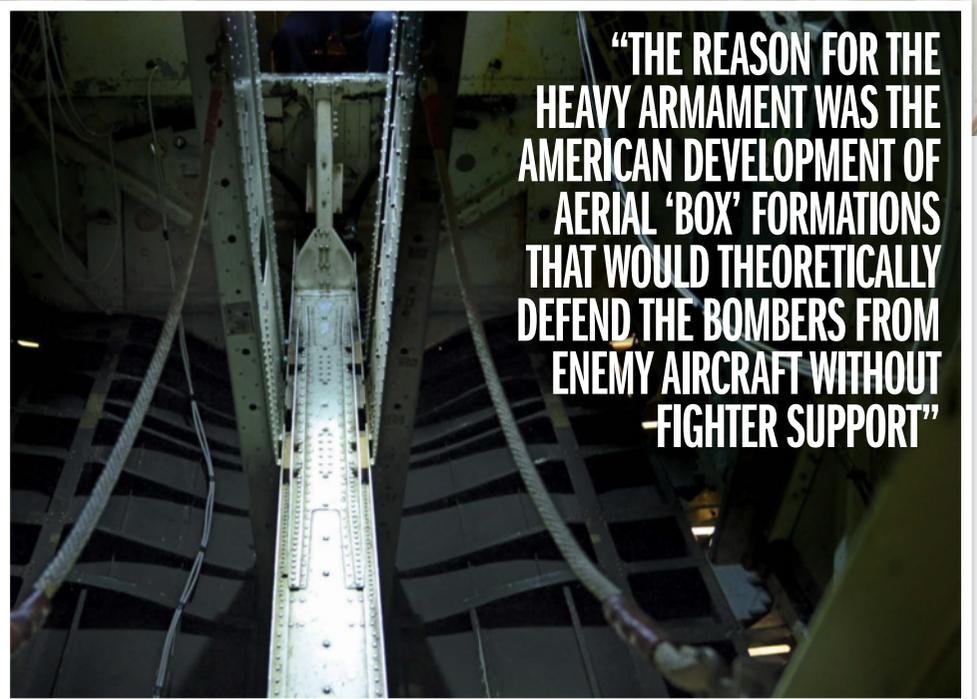
Unlike a Lancaster bomber, the B-17's rear gunner could not quickly escape out of the tail in an emergency



## ARMAMENT

Designed as a heavy bomber, the B-17 could carry a maximum load of 13,000 pounds of bombs, but on an average mission it carried around 4,000 pounds to balance with the fuel capacity. The explosives varied from iron bombs, dumb bombs and incendiaries. The B-17 was defended by 13 .50-calibre machine guns in various positions, including chin and upper turrets and a rear gunner. The reason for the heavy armament was the American development of aerial 'box' formations that would theoretically defend the bombers from enemy aircraft without fighter support. In reality, that was not practical, and US fighter support became an increasing feature of bomber missions.

*Right: To access the flight deck from the main fuselage, crew members had to squeeze through the bomb bay on a narrow walkway*



**"THE REASON FOR THE HEAVY ARMAMENT WAS THE AMERICAN DEVELOPMENT OF AERIAL 'BOX' FORMATIONS THAT WOULD THEORETICALLY DEFEND THE BOMBERS FROM ENEMY AIRCRAFT WITHOUT FIGHTER SUPPORT"**

*The ball turret was a monstrous little chamber from which escape was virtually impossible*

**“THE MOST DANGEROUS ROLE IN THE B-17 WAS MANNING THE BALL TURRET”**



## **BALL TURRET**

The most dangerous role in the B-17 was manning the ball turret. Located on the underside of the fuselage, the turret was fitted with two .50 calibre machine guns and could rotate 360 degrees around and 180 degrees to aim the guns. Enemy aircraft flying below would often target the turret, meaning nobody volunteered to man it. The gunner tended to be the smallest crewmember and he would sit in a foetal position on a canvas strap and place his feet on heel placements. There were handles to operate and revolve the turret, but this nightmarish box was so small that the gunner couldn't wear a parachute.

**Right:** *The cramped interior was exposed to enemy fighter gunfire and there was no room for a parachute*





## FLIGHT DECK

The flight deck of the B-17 had a high position, but it was thinly armoured with only an aluminium skin protecting it, although some of the seats would have been armour-plated. The seats were arranged in an almost armchair position and there were thick pads for the rudder pedals in an attempt to make the aircraft more comfortable. The cockpit is located between the engines and during combat this already noisy atmosphere would have been deafening. In a common design feature for the time, the B-17 had an astrodome and small chamber in front of the cockpit, which housed the navigator and bombardier.



Above: The cockpit had an excellent viewing platform with a thin aluminium skin

The vulnerability of the flight deck is amply demonstrated by this B-17 that was heavily damaged after a raid on Cologne in 1944



The astrodome was located forward of the cockpit



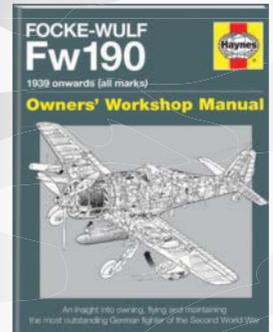
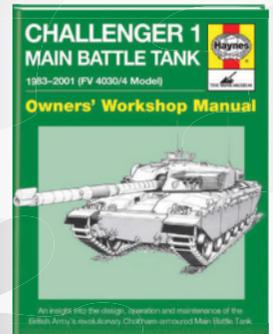
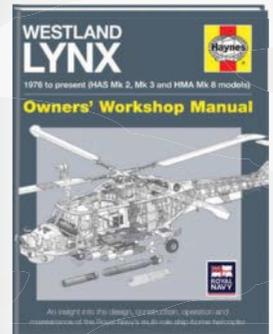
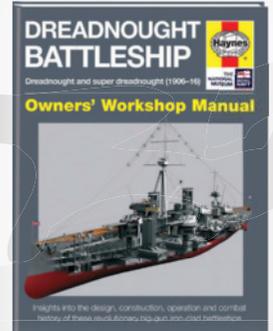
A B-17G after taking a direct flak hit over Kranenburg, Germany. Only the pilot of the aircraft survived

**ROYAL AIR FORCE** museum

The pictured B-17G is exhibited in the RAF Museum, London. For more, visit [www.rafmuseum.org.uk](http://www.rafmuseum.org.uk)



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