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COMMERCIAL
AIR PILOT
CHRYSLER

LEGACY OF THE

LIBERATOR



**FLYING THE
MOST-PRODUCED
BOMBER IN ITS 75TH
ANNIVERSARY YEAR**

BY JEFF SKILES

THIS DECEMBER MARKS the 75th anniversary of one of the most significant aircraft that rose from the 20th century. An airplane flown by tens of thousands of pilots that played a very large part in winning World War II, and yet it was only actively flown for six years with only two flying examples surviving the ravages of time. An airplane that holds the distinction of being the most produced multi-engine aircraft in history with more than 18,000

produced, and yet its design was obsolete almost as soon as it appeared. Its versatility led it to be used in every theater of operations during the war as a bomber, a fuel tanker, a passenger transport, and a cargo aircraft. But, it was initially viewed as so unsuitable for combat that the first examples had the armament removed and were used by the RAF ferry command as

PLOESTI

No discussion of the impact of the B-24 on the war effort is complete without a mention of Ploesti. Operation Tidal Wave, the official designation for the mission, was a strategic low-level bombing raid designed to cripple Axis oil refineries in Romania and cut off the lifeblood of Hitler's attack forces, gasoline. In August 1943 several bomb groups briefed for what would become the most famous B-24 mission of the war.

Five heavy bombardment groups of the U.S. 8th and 9th Army Air Forces departed their bases in northwestern Libya and pointed the noses of their Liberators northeast across the Mediterranean. For this long flight to Romania at least 177 B-24s took part, which was one of the largest formations of Allied bombers up until that time.

Heavily loaded with armament and carrying additional gas tanks in their bomb bays, the Liberators labored to gain altitude and clear the cloud-covered Pindus Mountains of Greece. The bomb groups cleared the terrain, but the climb strung out their formations, threatening the careful synchronization of their attack. Navigational errors by some further dispersed the bombers as they began their treetop-level approach to the target.

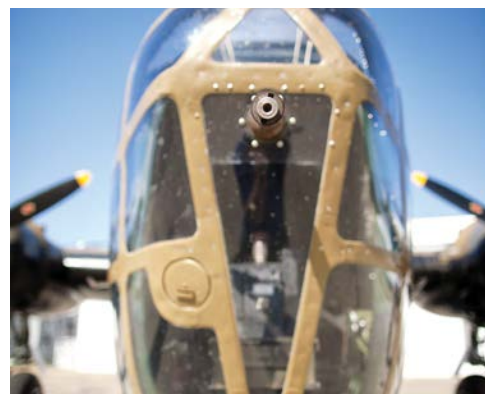
The mission planners were unaware of the significant build-up in German anti-aircraft capability to protect the critical refineries, and the B-24s were easy prey. German, Bulgarian, and Romanian fighter aircraft also shredded the American formations, rendering the aircraft unable to protect themselves because of their staggered and poorly timed approach.

There were 53 bombers shot down with a total of more than 600 airmen on board, a 30 percent loss rate. Two-thirds of the airmen shot down over the target were killed in action, while one-third survived to face imprisonment. Many of the B-24s that survived the initial bombardment were too heavily damaged to return to base. Of the 177 aircraft that departed Benghazi that day, only 88 returned, and 55 of those had significant battle damage.

Five airmen were awarded the Medal of Honor for their heroism during Operation Tidal Wave and "Black Sunday" would be remembered as the worst single mission loss in the war by the U.S. Army Air Forces.



The rear gunner has the best view in the house.



The bombardier sitting in the nose doubled as a gunner.

aerial buses. The Consolidated B-24 Liberator was a true dichotomy in the aviation world.

Like many designs, it was born of war and was singularly adapted to meet the needs of a world in conflict. However its first flight was fully two years before the United States entered into armed struggle. Designed as a replacement for the B-17 Flying Fortress, it was not a next step but a complement to the Boeing heavy bomber. But the Consolidated B-24

Liberator went on to blaze its own trail as a significant contributor in the effort to vanquish Axis forces.

The Liberator served in yeoman duty all over the world, but it pales in historical reputation to the rugged, battle-tested B-17. The beautiful lines of the B-17 led Hollywood to use clips of the Boeing in almost every movie about bombers over Europe. The cinematic appearances of the slab-sided B-24 are largely limited to the story of the *Lady Be Good*, an unfortunate



Diamond Lil is painted to represent the first Liberators off the assembly line.

aircraft and crew that disappeared over Africa after overflying their base in darkness.

The B-24 was produced in larger numbers than any other U.S. military aircraft—ever. But it was retired from active service almost immediately upon the conclusion of World War II, and its surviving examples were scrapped or simply left to rot. It had a reputation for lightweight construction that rendered it susceptible to battle damage, and it had an alarming propensity for catching on fire, but untold thousands of airmen flew and fought in the Liberator and returned to home and hearth after the war.

MODEL 32

The B-24 began life as the Model 32 by the Consolidated Aircraft Corporation and ironically grew out of a U.S. Army Air Corps request that Consolidated consider building the Boeing B-17 on license. The use of the manufacturing capability of companies who would otherwise be competitors was often necessary to produce the quantities of aircraft required for the

war effort. Consolidated instead proposed a new design, a high-wing heavy bomber using a low-drag wing designed by one of its own engineers. The wing design would famously be known as the Davis wing.

To facilitate the new design the Army Air Corps issued a specification asking for a bomber that could fly farther, faster, and higher than the B-17. The specification was created with the Consolidated Model 32 in mind, and in March 1939, without much competitive pressure, Gen. Henry “Hap” Arnold approved a contract for a prototype, and the Model 32 moved forward to production.

The aircraft would look very unlike its predecessors. It would be a high-wing, twin-tail design similar to other Consolidated aircraft like the Commodore, Coronado, and Corregidor flying boats. It would be powered by four Pratt & Whitney R-1830 Twin Wasp engines. Its bomb doors would roll up into the fuselage like a tambour door, and it possessed a then unusual feature for a military design—a nose wheel.

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The result was a somewhat ungainly boxy-looking aircraft that would nevertheless be redesigned in later models into a capable bomber that would darken the skies over Europe.

DIAMOND LIL

Diamond Lil started life early in the long production run of the B-24. The first B-24s to roll off the assembly line were destined to fill orders from several countries. The United States bought 36, the French 120, and Britain ordered 164. *Diamond Lil* was the 25th aircraft off the assembly line and was initially destined for Britain. It unfortunately suffered a landing incident on its delivery flight and was returned to Consolidated for repair.

Deleted from the initial order, *Diamond Lil* was rebuilt into a passenger



The power quadrant bristles with levers.



The cockpit is small and conventionally laid out.



The crew assembles for a flight briefing.

transport and became the prototype for the C-87, a transport version of the B-24 designed to provide heavy cargo and personnel lift capability with longer range and higher speed than a C-47. The aircraft stayed on as a personnel transport and a test bed for Consolidated until after the war when it was sold to Continental Can Company where it was operated as an executive transport.

After 10 years of operation it was again sold to Petroleos Mexicanos where it flew

until 1967 when the Commemorative Air Force acquired the aircraft for its collection.

Today the CAF still flies *Diamond Lil*, saluting our veterans and providing ride flights around the country as one of only two surviving Liberators in flying condition and as a B-24A model, the oldest in existence.

FLIGHT CHECK

Walking around the B-24 makes you realize how large the aircraft is, much bigger

than it appears from a distance, crouched on the ramp. The wings and engines are way up in the air and so are the pilots in the cockpit. The bridge girder landing gear has massive single tires, and the short-coupled nose gear looks odd in proportion to the rest of the aircraft.

The crew compartments are split by a centrally located bomb bay with the officers, pilots, bombardier, and navigator in the front and the enlisted men in the back in a large rear gunner's compartment. The

B-24 VERSUS B-17

Volumes have been written comparing the various attributes of the Liberator and the Flying Fortress. Why are people so determined to crown a victor in this almost 70-year-old competition? Perhaps because in the end both aircraft were so similar. They both were four-engine bombers used primarily in the European theater. They both boasted 1,200-hp supercharged engines and maximum weights around 65,000 pounds. And, they both carried about the same bomb load, putting it on target with the infamous Norden bombsight.

With aircraft boasting such similar statistics, little things rise to the surface to illustrate the differences between them. The B-24 was faster and more efficient with its thin high-aspect ratio laminar-flow wing, but the B-17 could fly higher with its thicker, albeit higher-drag airfoil. The B-24 was a hydraulic aircraft, where the B-17 followed Boeing's penchant for electrically operated gear and flaps. The B-24 could carry slightly more weight in the bomb bay, but the B-17 had a reputation for ruggedness that brought many a crew back home from the unfriendly skies of Germany.

Certainly the B-17 has more to offer from an aesthetic point of view with its big round tail and curvaceous fuselage. Rarely has Hollywood cast the Liberator as a supporting actor. The film *Twelve O'Clock High*, ironically written by a former B-24 group commander, might not have been quite so compelling with the boxy Liberator. B-17 pilots like to joke that the B-24 is just the box the B-17 came in.

The Liberator will always boast of the manufacturing prize with more than 18,000 B-24s produced as compared to the B-17's still impressive 12,000 airframes. Nearly half of all B-24s were built by Ford at Willow Run near Detroit. At peak production Ford was rolling out a new B-24 every 63 minutes. I have had the opportunity to fly both aircraft, and while they share very heavy control inputs, the B-17 is an honest and harmonious flying aircraft; the B-24 flies like it looks.

The truth of the matter is that both served our country, helped crush Axis manufacturing might, and got crews home more times than not. Maybe in the final analysis, that's all that needs to be said about these two fine aircraft.



Crew members pull the props through before start.



The B-24 was armed with 10 .50-caliber Browning machine guns.



Diamond Lil's twin tails are a common design feature on Consolidated aircraft.

waist gunners fire from staggered side positions. The tail gunner sits in a sling much like a child's swing set in the very tip of the tail, and on some models a retractable ball turret could be extended in the air for protection.

A central walkway connects through the bomb bay and brings you to the forward control area. The cockpit is fairly conventionally laid out for an airplane of its era, and your eyeballs are level with the shoulder-mounted wings.

Engine start is accomplished jointly between the pilots, and it takes awhile to get all four Pratt & Whitney engines turning. With them all shaking and belching smoke we wait, warming the oil before taxi.

THE B-24 MAY BE ONE OF THE MOST VERSATILE AND SIGNIFICANT AIRPLANES OF THE LAST CENTURY, AND YET TODAY ITS SHORT SIX YEARS OF ACTIVE DUTY ARE SOMEWHAT LOST TO HISTORY.

For new pilots, taxi can be the most challenging part of the flight. Like other bombers of the era, the B-24 has a nose wheel but doesn't have nosewheel steering. Lateral direction is controlled by brakes and by differential engine power. It sounds easy, but the B-24 has an extremely short wheel base, and taxiing can be a chore. Differential engine application is harder than it sounds, and even a little brake tends to oversteer the nose wheel. A neophyte lurches down the taxiway oversteering from side to side. The proper technique is to ride both brakes and just curl your toes in the direction you want to move the nose. Easy to say...

At the end of the runway, the throttles are run up for the laborious checking of all four engines prior to takeoff. Once satisfied with the mechanical integrity of the four Pratt & Whitney engines loping on the wings, we lurch onto the runway and try to get the nose wheel aligned with the stripe.

While holding the brakes we set field barometric pressure (30 inches) on the manifold gauges. The Liberator surges against the binders. We release the brakes and walk all four throttles forward while

the bomber begins to trundle down the runway. The nonflying pilot stabilizes the power at 45 inches of manifold pressure, and speed picks up rapidly. Just lighten the nose wheel and the B-24 will leave the grounds at about 100 knots. Nose it over to accelerate, jam on the brakes to stop the big tires from rotating, and call for gear up while trying to remember not to turn. You must be in level flight when raising the wheels or the awkward

looking outwardly retracting gear can actually damage the aircraft's structure with gyroscopic forces. Only when the gear is safely in the wells should a turn be initiated.

The B-24's controls are heavy as are all large aircraft of its day and not particularly well balanced. The elevator is light enough, but the ailerons and rudder are very heavy. Rolling into and out of a turn requires planning and muscle.



Diamond Lil is powered by four Pratt & Whitney R-1830 Twin Wasp engines.



Paul Maupin on the bomb bay catwalk.

In the air the B-24 feels as if you're herding livestock as its great bulbous nose is steered around the sky. During the war the Liberator was known to be a handful to fly in formation and could be fatiguing on long flights. The interminable missions must have been exhausting with the control forces necessary and the weariness of combat.

We set up for landing with a high bomber pattern to give plenty of time to maneuver and for the wheels to come out

and lock before turning base. There's something not right about an outward retracting main gear when viewed from just about any angle.

Coming around on final the turn must be led considerably. You need to get the ship lined up with the runway stripe the first time. You don't want to find yourself having to maneuver down low. Easing the throttles off over the numbers produces a satisfying landing as the big wing slowly pays off. Miserly application of the brakes brings the Liberator to a crawl, and the taxi dance begins anew.

the Japanese closed the Burma Road, and the C-109 tanker version supplied B-29s operating from China with precious gasoline to take the war directly to Japanese home islands.

The B-24 may be one of the most versatile and significant airplanes of the last century, and yet today its short six years of active duty are somewhat lost to history. But the legacy of the Liberator doesn't rest in the sound of its engines or the sight of hundreds of heavy bombers in box formation thundering overhead. It lies in the faces of the men it brought back home from conflict, the battles it fought in the sky to preserve our freedom, and the faded photographs of those who made the ultimate sacrifice for their country. The Liberator had one purpose and it served it well, a fitting epitaph for any aerial warrior. *EAA*

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CONSOLIDATED AIRCRAFT

Consolidated Aircraft has the distinction of being one of the most prolific, yet at the same time, least known aircraft manufacturers of the 20th century. Founded by Reuben Fleet, the company raced from building single-engine biplanes in the late 1920s to large flying boats and four-engine bombers in a frenetic 15 years of growth prior to World War II.

Best known for the PBY Catalina flying boat and B-24 Liberator, the company also produced designs ranging from the PT-11, a very Stearman-like primary trainer, to the B-32 Dominator heavy bomber designed and built as an alternative to the Boeing B-29 Superfortress. Like the B-29 the B-32 was powered by the new Wright 3360 engines, was pressurized, and had remote control gun turrets. Delays in testing and the success of the B-29 in the field led to only 118 examples of the B-32 being manufactured, but it had the distinction of being the last aircraft to be engaged in combat during World War II. Other notable aircraft built by Consolidated for the war effort were the TBY Sea Wolf torpedo bomber and the PB2Y Coronado four-engine patrol bomber.

In 1943 Consolidated merged with Vultee to produce Consolidated-Vultee, later shortened to Convair. The company went on to design and produce a successful line of medium-sized civilian airliners as well as significant military aircraft such as the F-102 Delta Dagger, the F-106 Delta Dart, the B-58 Hustler supersonic bomber, and the gargantuan B-36 Peacemaker strategic bomber.

In the 1960s the company shifted focus by shutting down the assembly line of its Convair 880 and 990 four-engine passenger liners and transitioning to producing subassemblies for other manufacturers such as Boeing, Douglas, and Lockheed. It also moved into aerospace where Convair's Atlas Centaur rockets launched more than 100 communication satellites.

Lost in a series of mergers among military contractors, the remnants of Consolidated aircraft and its 73-year history was completely dissolved by McDonnell Douglas in 1996.

LEGACY

The B-24 served proudly as the Swiss Army knife of a war-torn globe. Legions of Liberators conducted strategic daylight bombing over Europe from their bases in England and North Africa. Many more were used as patrol bombers searching for U-boats on both sides of the Atlantic. The C-87 transport version flew cargo over the Hump to resupply Chiang Kai-shek after



The tailgunner sits in a sling.