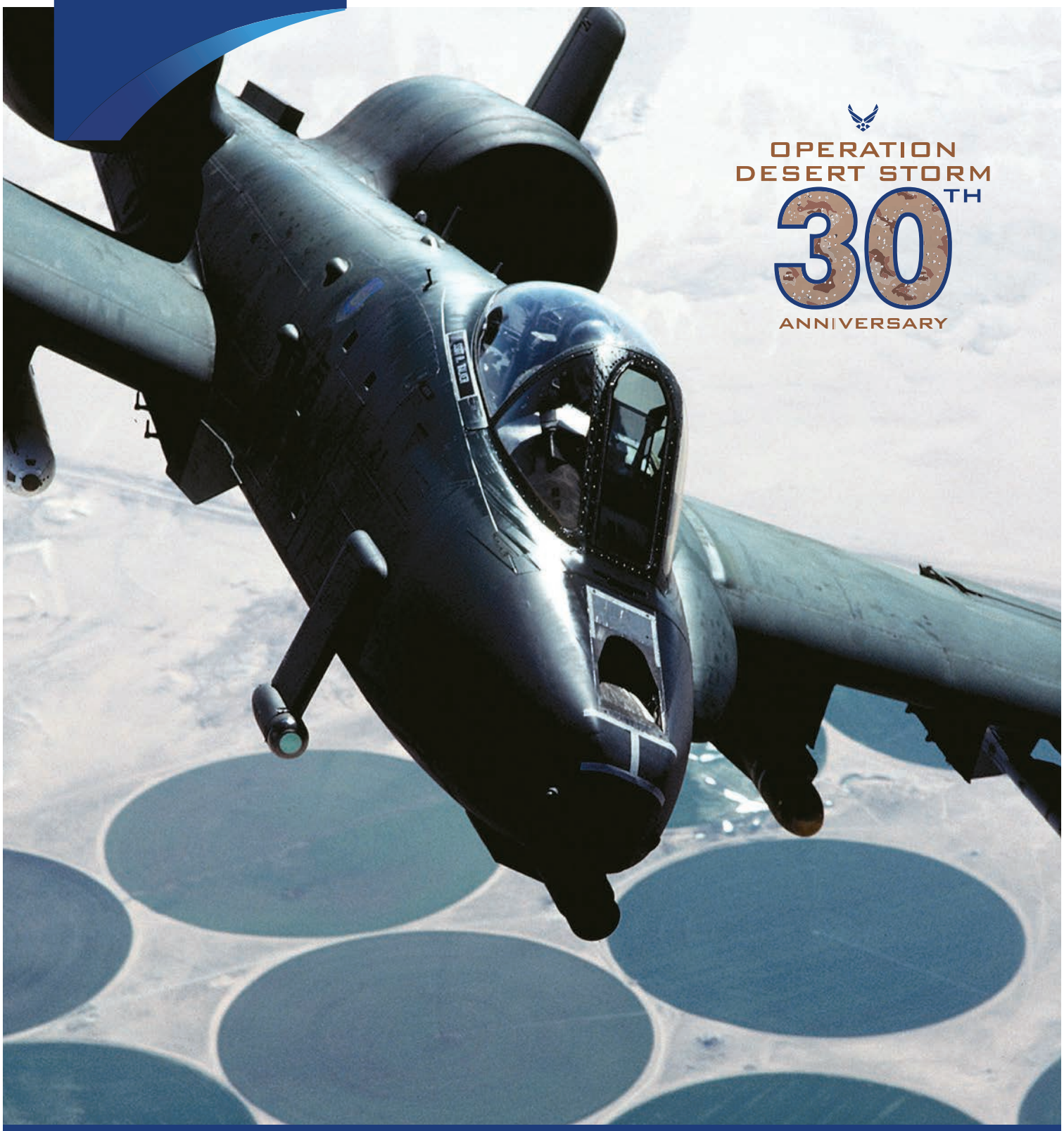
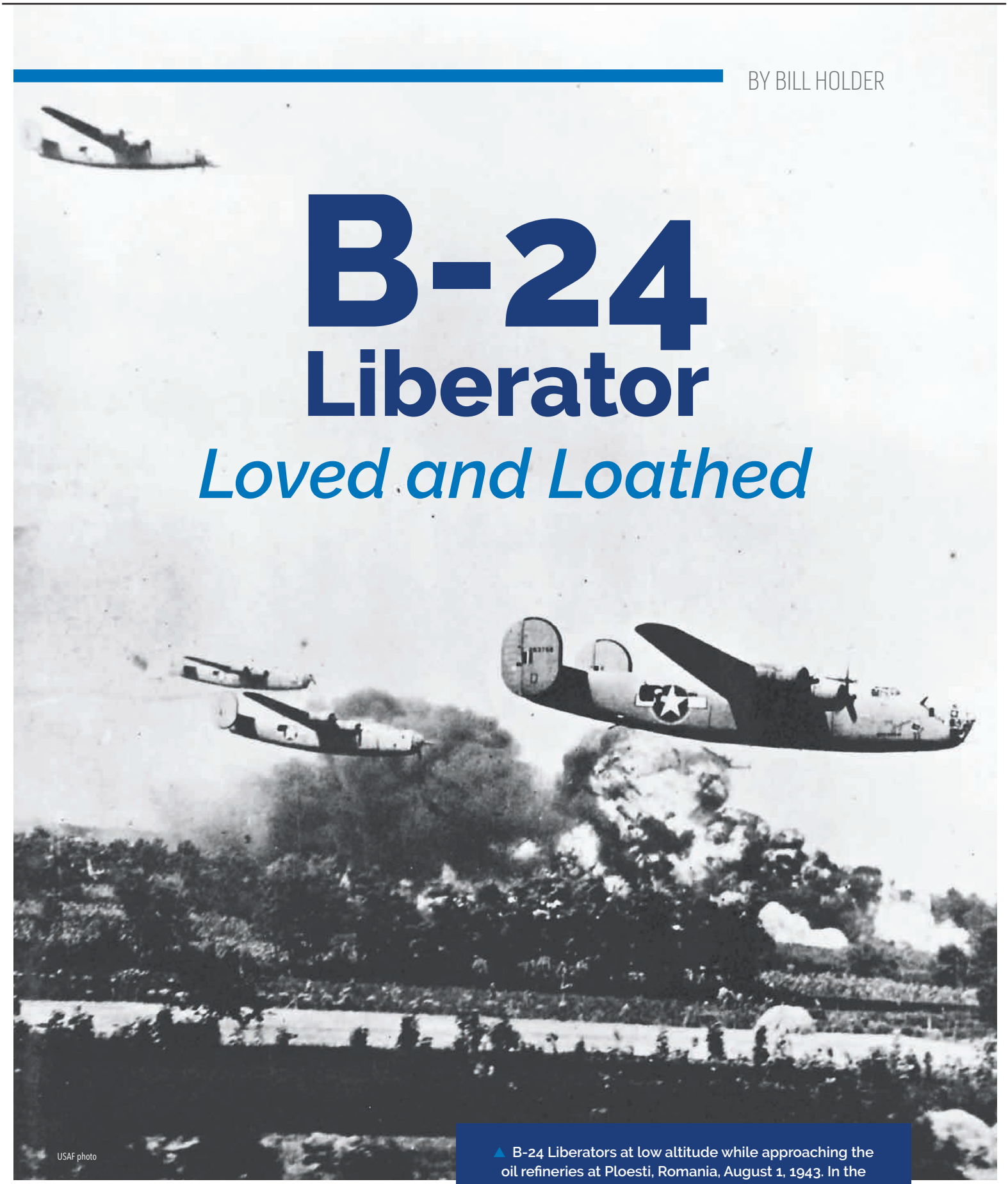
Friends Journal



BY BILL HOLDER

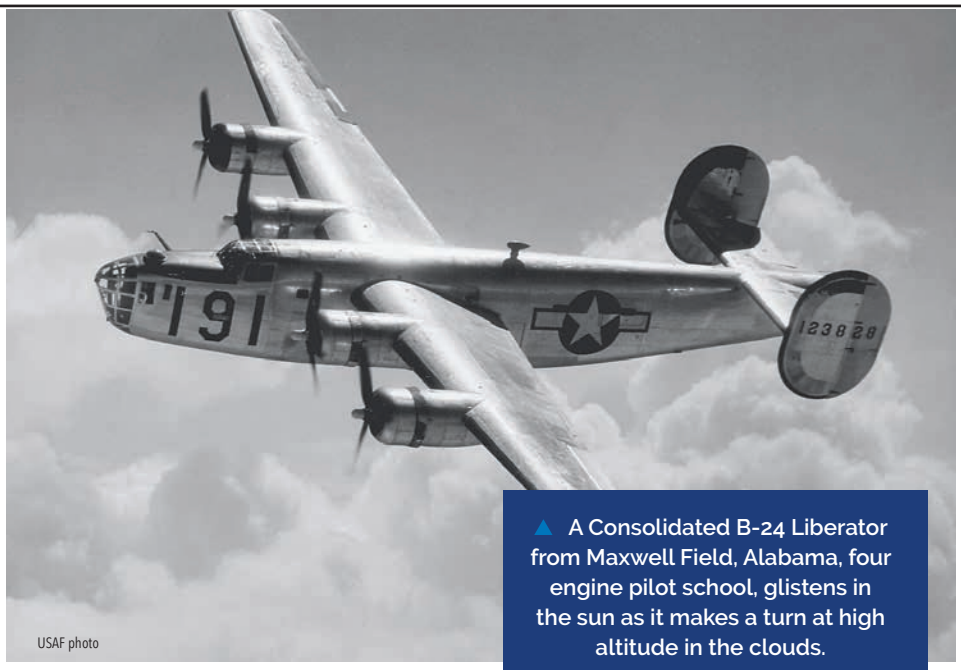
B-24 Liberator

Loved and Loathed



USAF photo

▲ B-24 Liberators at low altitude while approaching the oil refineries at Ploesti, Romania, August 1, 1943. In the foreground is B-24D Li'l Jughaid, Ninth Air Force, 98th Bombardment Group, 415th Bombardment Squadron.



▲ A Consolidated B-24 Liberator from Maxwell Field, Alabama, four engine pilot school, glistens in the sun as it makes a turn at high altitude in the clouds.

Nicknames, songs, and rhymes written about various aircraft through the years tell a lot of how those who flew them and thought about them. World War II names such as Spitfire, Thunderbolt, and Mustang are well known to many that weren't even born during their glory days.

For many, the U.S. Army Air Forces (AAF) aircraft that exemplified the victory was the majestic Boeing B-17 Flying Fortress. It received most of the accolades and was credited as a major contributor to the destruction of the Axis war machine. But there was another four-engine AAF bomber which must not be forgotten. That 'other' bomber was the Consolidated B-24 Liberator.

The Liberator's shape was far from sleek, that's for sure. And compared to the flowing lines of the B-17, the B-24 looked a bit on the squatty side. But it was a case of comparing apples to oranges as the B-17 had three wheels with the third in the tail which caused a nose-up attitude when it was sitting on Mother Earth. The B-24 by contrast, had a tricycle landing gear. The third wheel was located near the nose and made the plane sit parallel to the ground, which was considered an advantage in certain situations.

But there was another sizable design difference. The B-17 was a low-wing aircraft which enabled safer wheels-up landings as the bottom of the wings supported the aircraft better. With the high-wing Liberator, the wingtips tended to dig into the ground as it tipped, which would spin the plane around.

The Liberator unfortunately picked up some not-so-kind nicknames such as "Big-A** Bird," "Thundermug," "Agony Wagon," and "Twin-Tailed Time-Bomb." There were many rumors during the combat years when some B-24 left-seaters voiced their concerns about the durability of the old bird. However, one of the Lib's strong points was its versatility. It was modified for more different missions than any other Allied aircraft.

Negativity aside, the Liberator was produced in considerably greater numbers than its Boeing-built rival. It was also used more extensively in the Pacific conflict where B-17s were few-and-far between. The amazing stats of its European deployment were 313,000 sorties and 635,000 tons of bombs dropped.

The author had the opportunity to speak with the following Eighth Air Force Commanders about these bombers — their opinions are enlightening:

GENERAL CARL A. SPAATZ, FIRST COMMANDER OF THE EIGHTH AIR FORCE, MAY 1942 TO DECEMBER 1942

"The B-24 was provided in great numbers for the U.S. Army Air Forces in World War II, and it proved highly effective for the projects for which it was designed. Nearly half the bomb tonnage which destroyed so much of German industry and war-making capacity from 1942 to 1945 was made possible by the Liberator and its gallant crews. Those brave men were enthusiastic about the plane and this contributed materially to the high morale in all our bomber squadrons, which was a big factor in their success and the eventual victory."

GENERAL JAMES DOOLITTLE, COMMANDER OF THE EIGHTH AIR FORCE, JANUARY 1944 TO SEPTEMBER 1945

"The B-24 was an excellent airplane. It was fast, could carry a heavy load of bombs, had long range and carried powerful firepower for protection against enemy fighters. Our combat losses particularly from flak were higher with the B-24 than with the B-17. The reason for this was that the high-speed Davis wing reduced the plane's ceiling and thus caused it to fly in more intense and accurate flak. Toward the end of the war in ☛

▲ Waves of Consolidated B-24 liberators of the 15th AAF fly over the target area, the Concordia Vega Oil refinery, Ploești, Romania, unmindful of bursting flak, after dropping their bomb loads on the oil cracking plant, on 31 May '44

USAF photo

Europe all of the B-24 units were being replaced or re-equipped with B-17s. This provided more B-24s for the Pacific Theater where they comported themselves very well indeed."

USAF photo

GENERAL CURTIS LEMAY, COMMANDER, THIRD DIVISION, EIGHTH AIR FORCE, SEPTEMBER 1943 TO AUGUST 1944

"When I commanded the Third Division of the Eighth Air Force, I had seven groups of B-17s and the same number of B-24s. You would have to know that I wasn't an admirer of the B-24. The early versions of the B-24 were very good planes and could out-perform the B-17s. But with the addition of self-sealing tanks and the front turret, its performance advantage was eliminated.

"In combat, the Liberators just couldn't take the battle damage as [well as] the B-17 and it just wasn't as good a bombing tool as the B-17 and couldn't get bombs on the target as well. I finally got one B-24 group bombing as well as the B-17s in combat, but it took a lot of time. We also tended to send the B-17s on the tougher missions."

USAF photo

GENERAL IRA EAKER, COMMANDER OF THE EIGHTH AIR FORCE, DECEMBER 1942 TO JANUARY 1944

"There were three outstanding heavy bombers deployed in World War II; the B-17, the B-24, and the RAF Halifax. Between them, they carried the destructive loads which wrecked Hitler's industry, destroyed the Luftwaffe and enabled the success of the Allied invasion on D-Day, 1944. During my time with the Eighth Air Force, we operated more than a thousand Fortresses and Liberators. I always considered it one of the fortuitous circumstances of the war that combat crews had a distinct preference for their planes, whether it be the Liberator or Flying

Fortress. Fortress crews thought that their aircraft was sturdier, through design and construction, and that it could sustain more battle damage and survive. But Liberator crews contended that their plane could fly a little higher and faster, consequently suffering less damage."

It should be noted that these legendary commanders had varying opinions of the bombers with appreciation for each. It is hard to compare these bombers; the missions varied from command to command. Also, the performance of different models varied with the addition of armament, bomb loads, etc. It is definitely a case of comparing apples and oranges.

BIRTH OF THE B-24

The development of various bombers during the pre-World War II era brought a number of new designs. In 1931, the all-metal monoplane Boeing YB-9's performance was impressive for the time at 188 miles per hour at six thousand feet. But technology was quickly growing bringing forth the Martin B-10 two years later. Pushing the B-9 aside, it had a 200 mile per hour top speed at 21,000 feet. It served as the mainstay of the Army Air Corps during the 1930s.

Next came the contribution of the B-18 Bolo from Douglas Aircraft. Its advanced design was capable of about 216 miles per hour. Next came the first four-engine bomber entry, the giant Boeing XB-15, but the engine technology wasn't up to the lifting job it would have to do. The requirements were then modified and would eventually lead to the XB-17.

Then there occurred a strange situation that could well have prevented the B-24 ever being built. It happened in 1938 when the Consolidated Aircraft Company was asked by the AAF to inspect the B-17 with the idea of producing the Boeing plane at Consolidated's San Diego plant. Consolidated executives objected to their production of the B-17. In response they proposed that they produce a "new and better" aircraft. It was a pretty gutsy call to make because Consolidated could have ended up not having any bomber production for the AAF at all.

However, things worked out for the company when their heavy bomber design was accepted and a prototype was contracted for. The contract for the XB-24 was signed in March 1939. The new design would end up complementing the B-17, but it was certainly a different beast. Granted, it had a low-drag wing and unique flap configuration, but the Liberator's body had more the look of a transport than a strategic bomber.

LIBERATOR PROBLEMS

Early in its career, the B-24 picked up a bad reputation when a series of crashes were blamed on the failure of the tail structure. It was determined that a vibration was created when the front gear touched the runaway. The remedy was to strengthen the rear fuselage, which solved the problem. Another unique problem was a flutter which was caused by control cables installed too close together.

There was another dangerous phenomenon involving air flow problems that occurred when certain cowl flap settings were used. Several pilots at the time spoke specifically about the panels over the wing that hid the life rafts — they said the panels would actually come open in flight, ripping them away in the airstream and taking the life rafts right along with them.

Cliff Glassmeyer, a B-24 pilot with the Sixth Air Force, recalled some of the modifications that were made to aid in ditching in the sea. He recalled, "We were provided wooden 4x4s to insert while in flight to beef up the bomb-bay section to lessen the possibility of the plane folding up when we hit the water. They actually provided additional structure members. But I was certainly glad that I didn't ☛

▼ Consolidated XB-24 in flight.

USAF photo

▲ B-24s on the world's largest double aircraft assembly line in Consolidated-Vultee's Fort Worth plant. In foreground are "Liberator" bombers modified for special American uses. To the rear of this front line are C-87 "Liberator Express Transports" in various assembly stages. The second line is composed entirely of B-24 "Liberator" bombers in final assembly stages.

have to test the effectiveness of that interesting technique."

Then there was an innovative technique when it was necessary to slow down a Lib landing when returning from a mission with brake problems. The technique involved attaching two crew parachutes to the waist gunner mounts and then deploying them when the wheels touched the runway!

FLYING THE LIBERATOR

The Liberator's advantage came from its ability to fly faster and carry more payload. But the B-17 could fly higher, which subjected it to less anti-aircraft fire.

For an aircraft as large as the B-24, pilots remembered that it had the characteristic of a smooth take-off. But once at altitude, the Liberator pilot had to be pretty strong. In one situation, a diminutive five-foot-three B-24 pilot was transferred to B-17s. After the change, he noted, "The B-17 seemed like a Piper Cub compared to the B-24!"

One of the real exciting moments in a B-24 mission occurred when all the bombs were dropped together and Lib almost immediately gained altitude. But when the bombs were dropped one at a time, there was little change in the aircraft.

A number of former crew members recalled that when the bomb bay doors were opened there was a freezing gale that flew through the plane. Also, most B-24s had the smell of gasoline fumes about them. To address the dangerous situation of explosive fumes building up, aircraft commanders often cracked the bomb bay doors to blow out the fumes.

The advanced Davis wing's efficiency was dependent upon a significant amount of speed which had to be monitored constantly. When slow-speed maneuvers were performed without benefit of flaps, the results often were very marginal. And to operate at maximum efficiency, the wing had to be totally clean. Any battle damage to the leading edge immediately produced handling problems.

When an engine was lost, it was a much better situation that it be an inboard engine. In that situation, it was easier to trim up the plane to counter the imbalance of power. The loss of an outboard engine during take-off often caused a serious accident.

But the worst inflight problem was when two engines were silenced. And worst of all if that happened on the same wing. A massive effort was required in the cockpit with the pilot cranking in full trim plus use of the rudder and ailerons to maintain directional control. The "book" said that a B-24 couldn't fly in that condition, but there were some shot-up Liberators in that woeful condition that made it back.

In a world of conventional bombers, the B-24 would have to be classified as being slightly unconventional. A Lib pilot recalled, "She was a little different and to get her to fly like she should, you had to do what she wanted." Putting it bluntly, it took a fair pilot to fly a B-17 well, while it took an excellent pilot to fly the B-24 well.

OTHER AIR FORCES

Probably the most famous user of the B-24 was the Eighth Air Force based in Great Britain, but there were other Air Forces and locations that made significant use of the Liberator.

THE FIFTH AIR FORCE

Formed in 1942, this Air Force was stationed in Australia. Its 90th Bomb Group was highly effective and by the end of 1943 had destroyed 320 enemy aircraft and 100,000 tons of enemy shipping in only 13 months. The 90th's B-24s were highly visible with a "Jolly Roger" on the outside of each vertical tail.

THE SIXTH AIR FORCE

This Air Force consisted of the 6th and 9th Bombardment Groups which contained both B-24s and B-17s. The mission was to protect the Panama Canal and the western approaches to the American west coast. The missions were extremely long.

THE SEVENTH AIR FORCE

Hawaii was the location of this organization. Its first mission was to hit Wake Island, with later missions including Tarawa in the Gilbert Islands and Nauru just west of the the Gilbert Islands, supporting the invasion of the Marshall Islands.

THE TENTH AIR FORCE

This Air Force supported the South Pacific theater. Its four squadrons of Liberators began strikes on Mandalay. They also flew a 2,700 mile mission against Bangkok which seriously damaged an oil facility.

THE ELEVENTH AIR FORCE

The Eleventh Air Force was located in Alaska with much of its attention directed toward protecting the Aleutian Islands. There were many reconnaissance missions.

THE THIRTEENTH AIR FORCE

The initial mission of this Air Force was to support troops on Guadalcanal. The B-24s were based in the Solomon Islands and helped cut the Japanese southern lifeline.

THE FOURTEENTH AIR FORCE

The Liberators of the Fourteenth were based in Kunming, China. Their missions ranged far to the east and south from India to disable Japanese communications.

THE FIFTEENTH AIR FORCE

Once these Liberators could stage from the southern tip of Italy, they became a huge threat to the German war machine. There were over 700 Liberators allocated along with 200 B-17s. During 1944, it was the fastest-growing Air Force in the USAAF.

Author Bill Holder is a retired aerospace engineer, who worked at Boeing and at Wright-Patterson AFB. He is the author of approximately 20 aviation books as well as dozens of aviation articles. He lives two miles from the National Museum of the U.S. Air Force™, in Riverside, Ohio.

Consolidated B-24D Liberator in the World War II Gallery at the National Museum of the United States Air Force.

YOU MAKE A DIFFERENCE

HELP US HONOR OUR HEROES AND INSPIRE THE NEXT GENERATION

The Air Force Museum Foundation is supported by Friends like you

Annual Individual Levels

YOU MAKE A GIFT	WE SAY THANK YOU
ACE **$1,000**	**• Access to a Foundation Concierge to help plan your visit** • Invitation to Annual Donor Appreciation Reception • Early invitations to Special Events • Invitation to Friends-only Events • Discounts on shopping, dining, shows, and rides • Quarterly *Friends Journal* and Annual Collectible Calendar • First to know about exciting new exhibits and events at the Museum
EAGLE **$500**	**• Invitation to Annual Donor Appreciation Reception** • Early invitations to Special Events • Invitation to Friends-only Events • Discounts on shopping, dining, shows, and rides • Quarterly *Friends Journal* and Annual Collectible Calendar • First to know about exciting new exhibits and events at the Museum
FALCON **$250**	**• Early invitations to Special Events** • Invitation to Friends-only Events • Discounts on shopping, dining, shows, and rides • Quarterly *Friends Journal* and Annual Collectible Calendar • First to know about exciting new exhibits and events at the Museum
FLIGHT LEAD **$100**	**• Invitation to Friends-only Events** • Discounts on shopping, dining, shows, and rides • Quarterly *Friends Journal* and Annual Collectible Calendar • First to know about exciting new exhibits and events at the Museum
WINGMAN **$50**	**• Discounts on shopping, dining, shows, and rides** • Quarterly *Friends Journal* and Annual Collectible Calendar • First to know about exciting new exhibits and events at the Museum
AVIATOR $30	• Quarterly *Friends Journal* and Annual Collectible Calendar • First to know about exciting new exhibits and events at the Museum *Please note, discounts apply for Friends at the Wingman ($50) level or higher.*

AIR FORCE MUSEUM FOUNDATION

To become a *Friend* or renew your support visit us online at afmuseum.com/friends or call 937.258.1225.

Discounts at the Air Force Museum Store, Valkyrie and Refueling Cafés and Air Force Museum Attractions are currently 10%. The benefits listed above are subject to change at the sole discretion of the Air Force Museum Foundation, Inc.