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BOEING B-52H STRATOFORTRESS

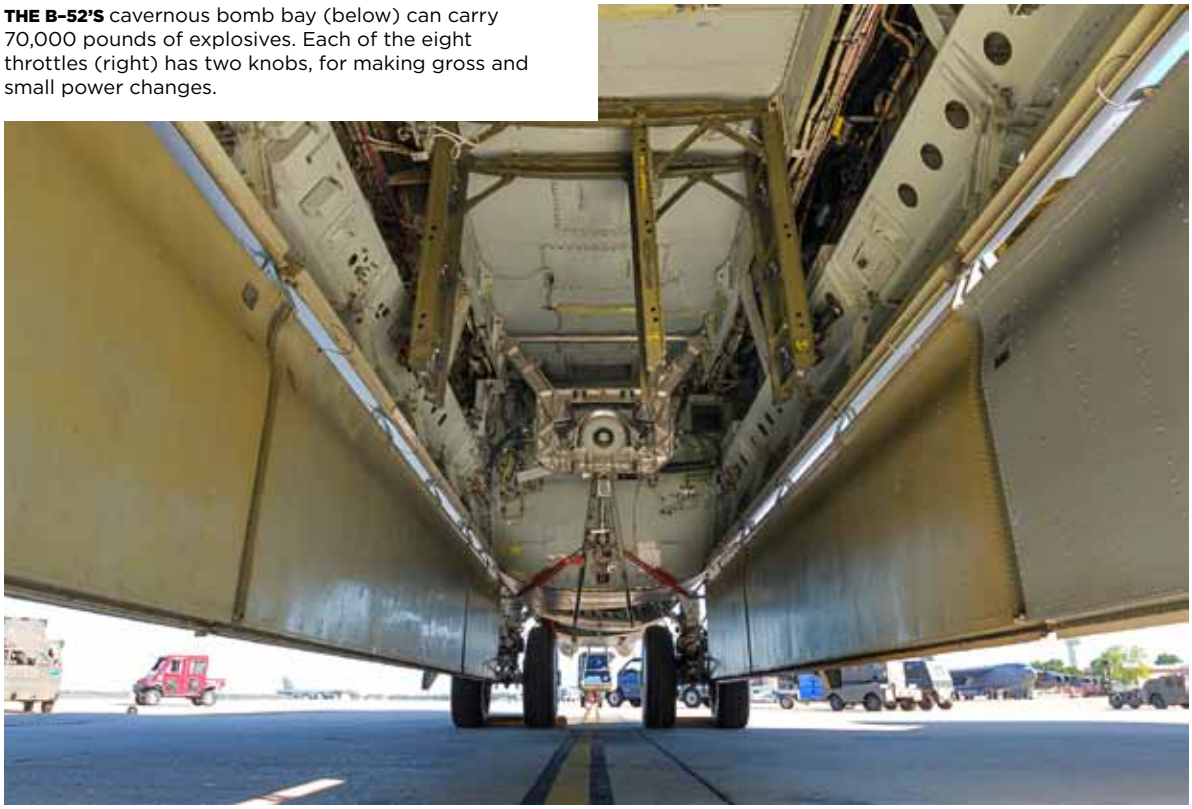
Broad shoulders

The Stratofortress continues to serve

WHEN THE PRESIDENT OF THE UNITED STATES needs to wield a "big stick" and deliver harsh punishment, he has available the Boeing B–52H Stratofortress, an intercontinental nuclear bomber that also can carry 70,000 pounds of conventional bombs. No one thought when this legendary airplane first flew in 1952—a coincidental date—that this weapon of war would have such longevity.

BY BARRY SCHIFF
PHOTOGRAPHY BY MIKE FIZER

THE B-52'S cavernous bomb bay (below) can carry 70,000 pounds of explosives. Each of the eight throttles (right) has two knobs, for making gross and small power changes.



Commanding the maiden flight was Alvin "Tex" Johnston, the test pilot who dumbfounded spectators a year later by barrel-rolling the prototype Boeing 707 over the Gold Cup Hydroplane Races in Seattle.

America's B–52s are operated by the Global Strike Command, an evolution of the Strategic Air Command. My invitation to fly one came from the 20th Bomb Squadron of the 2nd Bomb Wing at Barksdale Air Force Base, Louisiana. Never in my wildest dreams did I think that I would ever have an opportunity to fly a B–52, but some dreams do come true, even wild ones.

My first full day at Barksdale included short courses in physiology, parachuting, and the use of emergency equipment. And then there was the obligatory physical exam. The next morning I met my instructor, Maj. Corey "Finch" Hancock, and our other crewmembers. Hancock would be riding shotgun for Capt. Cody Bias, who was making his first flight as aircraft commander. The purpose of our flight, designated "Skull 25," was to simulate weapons delivery and practice aerial refueling.

There is nothing attractive about this airplane. Form truly follows function, and this war machine looks as lethal as it is. The B–52 is nicknamed BUFF, an acronym for "big, ugly, fat fellow."

It is the only airplane ever produced with eight turbine engines. They hang in pairs from four pylons, two engines per nacelle. There are so many engines that you need to count them during preflight. When the airplane was designed, available turbojet engines were not particularly powerful and eight were needed to do the job. Four modern engines could easily power the airplane today, but the re-engineering is considered cost-prohibitive. The last model built, the B–52H, has eight turbofan engines, each developing 17,000 pounds of thrust.

Unless you're prepared for it, the sight of seriously wrinkled skin on the sides of the forward fuselage can be alarming, but this is not the result of abuse. The wrinkling is due mostly to wing bending and largely disappears as the wings arch upward during flight. Such aeroelasticity enables each wing tip to move through a 32-foot arc, 16 feet up and 16 feet down—an interesting sight in heavy turbulence.

The B–52 is a broad-shouldered, high-wing airplane, but the wings droop so much when on the ground that the tips almost touch the tarmac. Standing near a wing tip, you can see along the wing's entire upper surface. Landing gear, called outriggers, supports the wing tips and prevents them from scraping the ground. The main quadricycle landing gear is similar to bicycle landing gear, except that there are four landing-gear trucks instead of two.

Because of wing droop and the outriggers, you cannot make a conventional crosswind landing in a B–52. Instead of touching down in a wing-low slip, the airplane must be landed while crabbing into the wind with wings level. This is not a problem, though, because the airplane has crosswind landing gear.

The B–52's Fowler flaps have only two positions, full up and full down. The same flap setting is used for takeoff and landing. An advantage of this is that flaps need not be reset during a missed approach or touch-and-go landing.

You enter the B–52 by climbing a short ladder through a belly hatch into the lower cabin. This is where the bombardier and navigator are stationed; they sit in downward-firing ejection seats. Climb another ladder to reach the upper cabin and cockpit. In addition to the pilots, this is where the electronic warfare officer is stationed. Those on the upper deck sit in upward-firing ejection seats. I was an extraneous crewmember and did not have an ejection seat, which was OK by me. My bailout instructions were to dive headfirst through one of the holes remaining after someone on the lower deck had ejected, pull my D-ring when clear, and enjoy the view.

During much of my eight-hour flight I sat in the instructor's seat aft of and between the pilots' seats. One would expect such a large airplane to be roomy, but not so. Little space is provided for creature comfort. The cockpit is so cramped that you have to disconnect the control column and push it fully forward (on the ground or in the air) to have enough room to crawl into a pilot's seat.

Only the pilots have windows. Other crewmembers have no view or sense of the outside world—which, I was told, can lead to airsickness. Helmets should be worn when moving about the cabin (especially

THE 1950S-ERA cockpit (below) is little changed from when it was designed. The crab-angle selection knob (far right) on the center pedestal is used to select the desired crab angle of the crosswind landing gear.

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in turbulence) to prevent head injury and have ready access to communications and oxygen outlets. It's not the most pleasant place to be during missions that can last more than 24 hours, but there is a small cooking oven and good music is piped over the intercom.

Start-up involves first starting engine number four using a start cart. Bleed air from this engine is then used to start number five. Both of these engines are then accelerated to 82-percent rpm, and their combined bleed air simultaneously "gang starts" the remaining six engines. The entire process takes six minutes. At idle, all engines burn a total of 8,800 pph. The airplane has four generators and 10—*count 'em, 10*—hydraulic systems.

The crosswind landing gear is checked during taxi by rotating the crab-angle-selection knob to turn all four main landing gear trucks left and then right (up to a maximum of 20 degrees each way). Taxiing sideways in a crab is really weird. The airplane points toward the side of the taxiway but tracks the centerline. The rudder pedals are used to conventionally steer the forward main landing gear.

When departing with a crosswind, you lumber onto the runway in a crab. If the crosswind is strong enough, you wind up looking out a side window during the takeoff roll. It is tempting to return the nose to the runway centerline, but if you do, the airplane will go for the weeds. You make the entire takeoff roll headed toward the upwind side of the runway, and you lift off that way.

An adjustable block on the throttle quadrant is set before takeoff to prevent the throttles from being advanced too far forward. This prevents nose-up pitching that can result from excessive power and limited nose-down elevator authority during the takeoff roll. As the airplane accelerates along the runway, timing begins at 70 knots. If it takes too long to reach S_1, the decision speed, takeoff is aborted. Rotation begins five to 10 knots before S_2, the liftoff speed.

The wings have an unusually large, 8-degree angle of incidence. This enables the fuselage to be horizontal during bomb release at altitude. As a result, little rotation is required for liftoff. The airplane unsticks at a 5- to 7-degree nose-high attitude and climbs out in an unusually flat attitude.

When flying an airplane with eight engines, there obviously is an increased possibility of engine failure. BUFF drivers,


HELP
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MAIN
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Pre-ejection Procedures
Beacon lanyard
Extra crew should don life preservers, parachutes, and attach ML-4
WARNING
REMOVE NVG & PLZT (P-CP) AT THE
INDICATION OF A SERIOUS AIRC
EMERGENCY


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AN AIR FORCE survival instructor (at left) teaches how to use a parachute and how to steer on the way down (below left), The portable transceiver (far left) is for search-and-rescue operations.

WANT A CLOSE-UP LOOK AT A B-52?
EAA has announced that for the first time ever a B-52 will be on display at AirVenture, July 20 through 26 in Oshkosh, Wisconsin. The B-52H is from the U.S. Air Force Reserve's 93rd Bomb Squadron of the 207th Bomb Wing at Barksdale Air Force Base in Louisiana. It will be hard to miss on the ramp.

however, do not get too excited about the failure of one engine. Losing one of eight is similar to losing 25 percent of one engine's power on a twin—it's not very traumatic.

Climb speed for the first 1,000 feet is 180 knots. The flaps are then retracted, which takes forever—a full minute. Cabin pressurization does not begin until reaching 8,000 feet. With 7.45 psi of differential pressure, cabin altitude at FL400 is 10,000 feet and at FL550 is 13,500 feet.

Each thrust lever has two knobs. The smaller, lower knobs allow you to grab all eight throttles with one fist and make gross power changes of all engines at the same time. The larger knobs are for adjusting individual engines with your fingertips. Engines four and five, the two inboard engines, have the tallest throttle knobs. Small adjustments of only these engines are like using a vernier and make it easier to establish and maintain a precise airspeed.

When it was my turn to fly, I quickly discovered that the flight controls are not boosted. They're heavy and reminiscent of a Boeing 707—not surprising, given the bloodline of these aircraft. Unlike earlier models, the B–52H does not have ailerons; spoilers are used for roll control. An odd characteristic of rolling into and out of turns is the need to simultaneously push slightly forward on the control wheel to prevent nose-up pitching. This is because spoiler activation on a B–52 shifts the center of lift forward.

The center instrument panel is dominated by 32 vintage analog engine instruments, eight columns of four that all look similar. Eight oil-pressure gauges are in a horizontal row above the windshield. The cockpit is old and worn, from another era, almost a relic. The airplane lacks many of the safety features taken for granted on large modern jets, such as engine fire extinguishers, fuel dumping, and thrust reversers—but it does have brakes and a drag chute.

The flight instruments are not presented in a standard matrix of six. This devastates the scan of someone accustomed to a "six pack." Adding to my confusion was that some instruments have unfamiliar displays. Also, the instrument layouts for the aircraft commander and the co-pilot are reversed, and specific instruments are not where you expect them to be. All of this takes getting used to.

Each pilot's panel has an electro-optical viewing system, a large green display that utilizes high-resolution optical and infrared cameras to provide a remarkable view of the outside world (in all ground and flight conditions).

The KC–135 tanker appeared several miles ahead of us on AR302, a refueling route over Louisiana. The idea is to rendezvous 3 nm behind and 1,000 feet below the tanker while indicating 310 knots. You then begin a gentle climb to get in position with the tanker at a matched airspeed of 275 knots.

Maj. Hancock wisely did not offer me an opportunity to try this, but I did accept the challenge from another instructor, Capt. Ryan Russell, in a B–52 simulator. It's more difficult than it looks. A factor I had not considered is that the tanker gets lighter as the bomber gets heavier. The pilots of both aircraft need to make opposite power and pitch changes.

I also got to shoot the "dreaded seven-engine approach," a facetious reference to the relative ease with which the airplane is handled following failure of only one engine. Descent from cruise altitude begins only 40 nm from the airport with engines idling and landing gear extended. The spoilers are partially deployed during the landing approach so that when the spoilers on the low wing rise farther during turn entry, the spoilers on the high wing retract somewhat. This increases the difference in lift between the two wings and improves roll rate and control. It is similar to why two ailerons are more effective when entering a turn in a conventional airplane than just one would be.

The tower-reported wind is used to set the crab angle of the main landing gear for landing, with extreme care not to crab the wheels in the wrong direction.

The approach is flown flaps down and with respect to the best flare speed (and with side cockpit windows open, if desired). The downwind leg is flown at best flare speed (BFS) +30 knots and final approach at BFS+10. Unlike other large turbofan airplanes, normal procedure is to retard the throttles to idle well prior to the runway threshold (so as to glide across the threshold at best flare speed and touch down 10 to 15 knots less than that).

During a BUFF pilot's first few crosswind landings in a B–52, he learns to resist the urge to kick the aircraft out of the crab and align it with the runway before touchdown (as we normally would do). He must discipline himself to touch down in a wings-level crab. Once he becomes accustomed to this, he'll probably want all airplanes to be equipped with crosswind gear. The B–52 can be landed comfortably with a direct crosswind well in excess of 40 knots.

The last of 742 Stratofortresses rolled off the Wichita assembly line in 1962. There currently are 58 on active duty plus 18 in reserve. The Air Force plans to continue rewriting history with the B–52H until beyond 2040. Some BUFF drivers yet to be born will be flying an airplane in service that had been flown by their great-grandfathers. No other military airplane has such a legacy—or likely ever will again. **AOPA**

The author expresses his gratitude to Lt. Gen. Donald Aldridge, Maj. Corey Hancock, Capt. Cody Bias, Capt. Ryan Russell, Capt. George Shanks, and the men and women of the 20th Bomb Squadron for so graciously sharing their time and expertise.

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