Cessna Bobcat: user friendly, circa 1940

The old bamboo

BY RICK DURDEN

PHOTOGRAPHY BY MIKE FIZER

It wasn't fast, it wasn't glamorous, and few remember it. Yet its four-year production run helped its maker go from just another builder of little airplanes to one that defined what became the spectrum of general aviation aircraft.

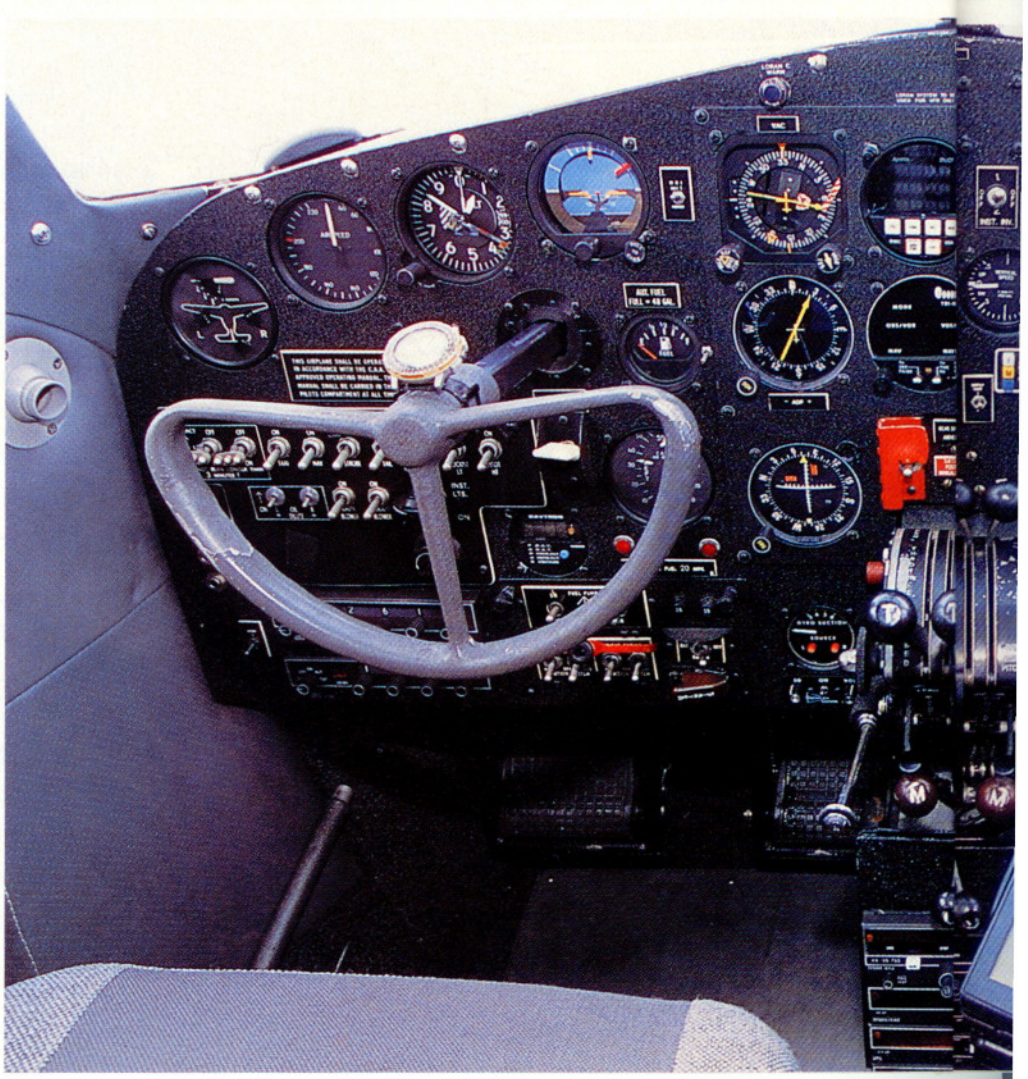
The year is 1936. The Depression is easing. Where there was despair, hope can be found. Last year Cessna, having emerged from bankruptcy in 1933, built nine C–34s. This year it will sell 32 of the incredibly efficient airplanes. Businesses are learning that it pays to move their executives in company airplanes. Cessna's brilliant young chief engineer and president, Dwane Wallace, believes there might be a market for a light twin for those businesses because he has heard the "but it only has one engine" complaints from potential customers. Lockheed twins are selling and, because there are no secrets in Wichita, Wallace knows that his competitor and former employer, Walter Beech, is designing an all-metal twin to be called the Model 18. Cessna doesn't have the financial resources of Beech, so it will approach the market by designing a smaller twin than

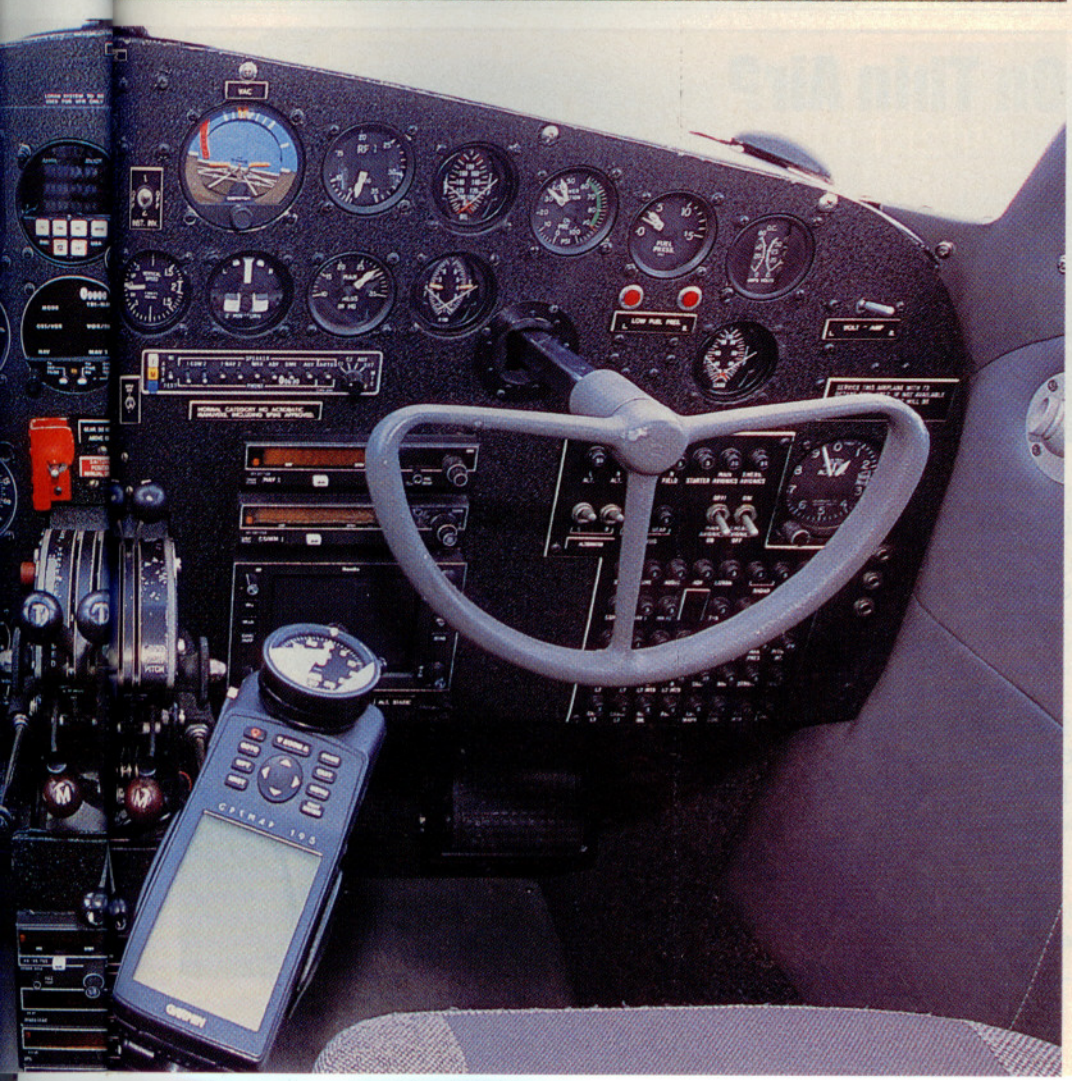
the others and building it of materials the company knows well—wood, steel tube, and fabric. The goal is to build a twin that will sell for the price of a single. Given the labor costs of building the Beech Staggerwing or Spartan Executive, the idea has merit.

What would emerge in 1939 as the T–50 was a chubby, pug-nosed twin powered by 225-horsepower Jacobs radial engines, with a graceful, one-piece wing crafted of laminated spruce, a tail of the same material, and a steel tube fuselage around a five-seat cabin. The main gear retracted, something Cessna had only done in a few, purpose-built racers. Just as T-tails were the trendy design of the 1970s, Cessna initially followed the 1930s fad of twin rudders along with Lockheed, Beech, and North American. During ground vibration testing of the prototype, a potential for flutter was revealed, so the twin-tail design was dropped.

On March 26, 1939, Dwane Wallace made the first flight of the T–50. While having the company president make the initial flight of a complex new airplane could potentially be disastrous, money was tight and Wallace's practice of sometimes making payroll with winnings from racing a company Airmaster meant his skills as a pilot were never questioned. Changes were few in the nine-month certification process: The Jacobs engines were nudged up a bit to give 245 hp for one minute for takeoff, and then continue on at 225 hp as before.

Timing for the T–50 was perfect. Pan American Airlines promptly ordered 11 for use in supporting its far-flung empire and the Civil Aeronautics Administration (CAA), apparently impressed during certification, ordered 13 to inspect navigational aids, throwing Cessna into pleased confusion. Nobody had ever ordered that many of anything. Cessna approached the Army about buying a few, thinking it might like airplanes made of "non-strategic materials" as the military rearmed and aluminum was difficult to obtain. In July 1940, the Army ordered 33 advanced trainers, to be dubbed the AT–8 and have Lycoming engines, the only T–50s to leave the factory with other than Jacobs' power. Two months later things were almost too good: the Canadians came to town and ordered 180 T–50s. Suddenly, a manufacturer that had averaged 31 airplanes per year was awash in orders. Cessna contracted madly to radically expand its plant, making airplanes even as buildings were erected around them.





Fuel selector valves are located between the front seats. Gear and flap switches are located behind the control wheel.

Over four years, Cessna would build some 5,399 T–50s, most for the armed services. They would be called *Cranes* in Canada, AT–8s, AT–17s, and UC–78s for the U.S. Army and JRC–1s in the nomenclature of the Navy. Early on, Cessna ran a contest for its employees to name the T–50. Perhaps thinking of the snarl of the Jacobs engines on take-off, the winning appellation was *Bob-cat.* However, who knows what causes nicknames to adhere? The Hughes Hercules, made of birch, was contemptuously referred to at a congressional hearing as *The Spruce Goose.* The name stuck. The Cessna Bobcat, actually made of spruce, came to be known to all as *The Bamboo Bomber.*

Shortages of metal meant many military Bobcats left the factory with fixed-pitch, wooden propellers. Eventually all were converted to constant speed metal props, yet even those could not be feathered. Military manuals asserted that with one engine out, a Bomber with wooden props could maintain a 1,000-foot density altitude. It could maintain a 5,000-foot density altitude with constant speed props attached and the dragging prop pulled back to high pitch. The veracity of those statements was the source of much discussion among those who flew the airplanes regularly.

As a multiengine trainer, the AT–17 proved excellent. It was appropriately forgiving; transitioning young plow jockeys from the furrows to the combat skies of Europe and the Pacific. It demanded airspeed discipline and insisted on appropriate control manipulation to obtain what performance could be had. Its minimum controllable speed with one engine out (V_{MC}) behavior was about right; it wasn't so violent as to eat a student's lunch, but was vigorous enough to require the student's undivided attention and prepare him for the demands of heavier and faster iron, as did its lousy single-engine performance.

As a transport, more than half of the UC–78s went overseas where they were usually assigned as a squadron "hack" to run errands, ferry personnel, or be used by fighter and bomber pilots who wanted to go somewhere on leave. For kids used to flying a heavy bomber or 400-mph fighter, a sedate wooden airplane got no respect. It thus acquired the less-than-sterling nickname of *Useless-78.*

The main landing gear retracts via a bicycle chain and worm gear arrangement (left). There's seating for three across on the rear bench (opposite).

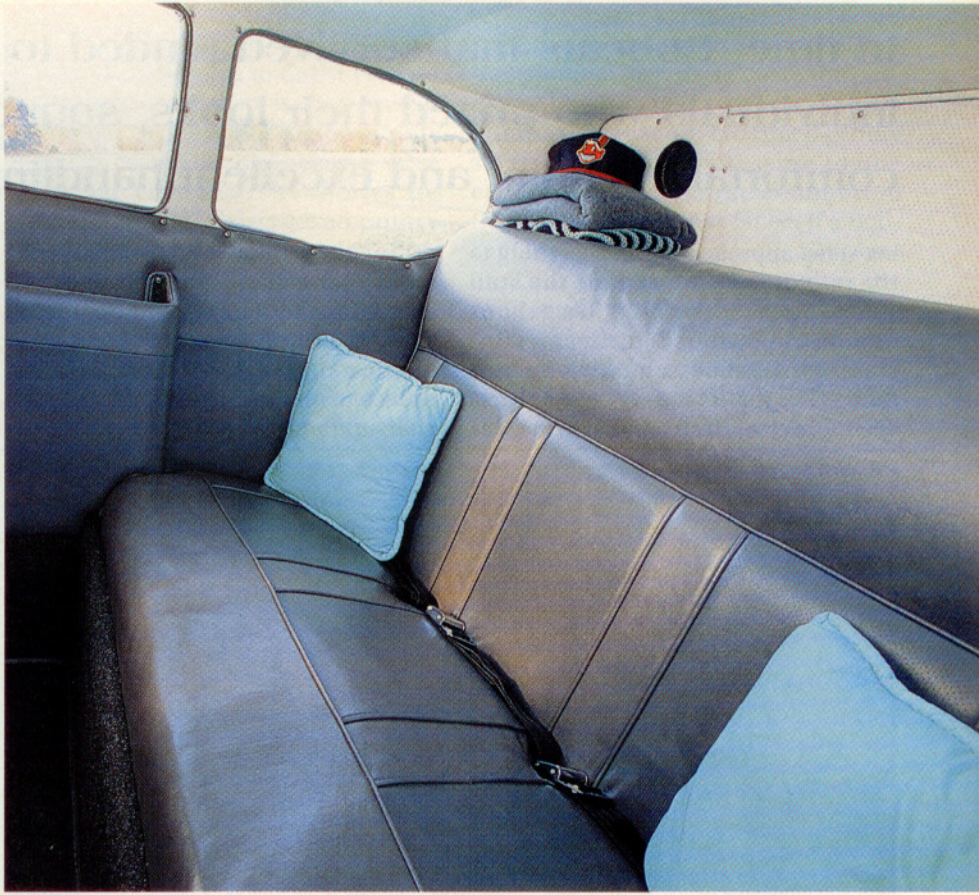
Aware that Bobcats would flood the surplus market after the war, Cessna shut down the assembly line upon completion of its military contracts. Most of the scores of skilled woodworkers were laid off even though, for a while, Cessna manufactured a line of wooden furniture (now pursued by airplane collectors seeking to one up each other).

Surplus Bobcats sold cheaply, some just for the engines, some because the price was less than the value of the gasoline in the tanks. Others went to shoestring air charter operators. Exposure to the elements and poor maintenance meant death for many Bombers. Scores rotted away at tiedowns. Keeping one flying was simply more expensive than caring for the metal airplanes that could be purchased almost as cheaply. In time, Bobcats that survived tended to be in the hands of individuals who prized their looks, sound, short-field ability, comfortable cabin, and excellent handling. As a result, there are fewer than 100 Bobcats still snarling today. Trying to estimate the value of an "average" Bobcat is a challenge. In excellent shape, modified with 300-hp Jacobs' and top of the line radios, a Bobcat might sell for six figures, however, after a few years of

neglect outside, another Bamboo Bomber may well have a negative value.

One superb example of the species is owned by Jim Kramer who hangars his Bomber at the picture-perfect airport in Empire, Michigan. He purchased it in 1968 and, for a while, used it for an on-demand charter operation on Long Island. In the late 1980s he completely rebuilt it, and has used the aircraft as a personal traveling machine all over the country, freely admitting that he is able to keep it going because he went out and obtained his A&P certificate. No matter where he goes, few people know what the airplane is, but its immaculate appearance and unfamiliar lines draw attention.

Preflighting a Bobcat requires effort. The fuel filler caps are found on the inboard sides of the engine nacelles and are reached by climbing up the wing walks on either side of the cabin. The fuel tanks hold 60 gallons each, nearly all of which is usable, and, depending on the version of the airplane, there may be a 30-gallon auxiliary tank under the back seat. While on the wing, one can't help but notice that the straight flaps seem to take up much of it. They extend some 45 degrees, allow-



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ing steep approaches but, according to the manual, do not reduce the stall speed. The engines hold five gallons of oil, with owners figuring on consumption of about a quart every two hours. The main landing gear retracts via a bicycle chain and worm gear arrangement powered by an electric motor. Movement is vertical, much like a DC-3, so the maximum operating speed is a surprisingly high 150 mph. A portion of the tires protrude when retracted, minimizing damage during a gear-up landing.

Getting aboard means a large step onto the wing and then a short walk to a generously sized thick door that looks as if it came from a Bentley. A triangular portion of the door extends well into the roof making entry and exit dignified, rather than a squat-and-creep affair. Once inside the large, airy cabin the feeling is that your backyard gazebo has somehow boarded a magic carpet. One of the large windows just forward of each pilot seat can be swung open

Saving a small airport

When Jim Kramer bought his summer home near Empire, Michigan, he found that the local airport was hardly a source of community pride. Despite the fact it was close to the shores of Lake Michigan, in a beautiful setting, and convenient to scores of vacation homes and resorts, most of the hangars were in terrible shape, it was overgrown by weeds, and the taxpayers frankly didn't see that it was worth the cost to keep it open. The "close it down" voices were being heard. Luckily, the township had just accepted some government money to resurface the paved runway, meaning it had to be kept open, at least in the short run.

Kramer found that the local pilots wanted to improve things, so they organized and took it upon themselves to act. They started mowing the grass runway and movement areas themselves, much to the astonishment of the township. The pilots, fully aware of the tight budgets all small communities face, then approached the township about tearing down the hangars that had become eyesores and allowing the pilots to lease parcels of land to build good quality, attractive hangars of their own. Kramer did so immediately, as did his friend Dan Lautner, who added an office with sleeping loft to his, making it a home away from home. Eventually, four private hangars would be constructed on land leased from the township.

and can remain that way in flight (keep in mind that the airflow is outward as more than one chart has suddenly departed through those windows). The rear bench seat holds three and seems only barely within hailing distance of the two front seats. With a gross weight of 5,700 pounds for most Bobcats, 780 pounds can be carried in the cabin when the wing tanks are full.

Startup reminds one that going about flying an old pelican requires some serious study of the systems before the attempt. Just directing fuel to the engines is a unique experience. Three selector valves are found on the floor between the front seats. One determines the fuel tank—singular—to be used. No matter what, both engines draw from the same fuel tank, so position the tank selector to the left or right wing tank for takeoff. Then use the engine selector valve to direct the fuel to both engines. If there is a need to cut off the fuel to one of the engines, this is the valve used. The third selector valve is labeled "crossfeed." Its choices are "on" and "off." Unlike contemporary twins where crossfeed is used to allow an engine on one side of the airplane to feed from a fuel tank on the opposite side, the Bobcat crossfeed is to allow one of the engine driven fuel pumps to supply fuel pressure for both engines should the other engine's pump go on holiday. Crossfeed is selected for takeoff as a creative way of providing a backup fuel pump on a system where the only other backup is a manual wobble pump. After takeoff, crossfeed is only selected if the fuel pressure to one engine drops under the assumption that engine's pump has failed. If a Bobcat is modified with electrically powered aux pumps for each engine, the need to use crossfeed vanishes.

The gear and flap switches are just that, switches. To make matters more challenging, the small toggles are beside each other on the panel behind the

Dan Lautner and Jim Kramer

The pilots then worked with the township to build two hangars that the township could lease, also helping to defray the costs of maintaining the airport. Pilots who had seasonal homes in the area and who had parked their airplanes elsewhere, found that the cleaned up airport was suddenly attractive. They began using the revitalized tiedown area.

More than a few tiedown users sent $300 to $500 checks to the township, along with thank you notes, when they headed south at the end of the season, bringing joy to the hearts of township officials and direct recognition of how an airport adds value to a community.

Kramer and Lautner and the other local pilots continue to work to keep Empire Airport in perfect condition. Recently they got a vote of confidence from the township. It bought them a lawnmower. ***—RD***

pilot's control wheel. Wise Bobcat owners have fashioned protective guards for their landing gear switch and generally do not touch anything after landing until absolutely certain they are raising the flaps rather than lowering the airplane. Even the mixture controls must be given some thought. They are on the throttle quadrant, but they move vertically, with down being rich.

The electrical system seems simple at first glance. Depending on the contract that specified the airplane, a Bamboo Bomber may have either a 12- or

This is an excellent short-field airplane; at gross it can be up and over an obstacle in well under 2,000 feet.

24-volt system. Fortunately, Cessna put a generator on each engine; so losing an engine didn't mean having to depend on the battery. The quirk is that the aircraft electrical system also fires one set of spark plugs on each engine, instead of having both excited by magnetos. Thus, loss of both generators means loss of one set of plugs if the battery goes flat.

Startup is unconventional. The prop levers are full aft, in the low rpm position, where they were at shutdown. The selector for the one manual primer is moved to squirt the results of its machinations to the appropriate engine. Fuel pressure is obtained by levering the wobble pump several strokes if no one has installed electric aux pumps on the airplane. If unmodified, the Jacobs' ignition system only retards the spark on the battery-fired plugs, so the engine is cranked with just that set of plugs activated, while the pilot stands ready to flip on the magneto set when the engine lights.

After confirming the prop levers are aft, pushing the mixture controls down, selecting the desired tank for fuel and aiming it at both engines, pumping up fuel pressure, priming appropriately, activating the starter while on the battery mag, checking the lineup of the stars, and glaring at the appropriate engine, one is usually rewarded with the utterly perfect sight, sound, and smell of a radial coming to life. As the cylinders decide, independently, to internally combust, puffs of oil smoke emerge with increasing frequency from the exhaust, until the engine eventually breaks into the relaxed lope unique to radials and the area is bathed with the gentle aroma of warm oil. Once each engine is running and oil pressure passes the 50 psi mark, the prop controls are moved all the way forward to high rpm.

Taxiing reveals the Bobcat's one less-than-pleasant aspect; it's not easy, even for experienced tailwheel pilots. For reasons lost in the mists of time, the tailwheel is not steerable, it either free swivels or is locked straight ahead. The original expander tube brakes were perfectly adequate initially, but, in time, became maintenance headaches. Most owners have installed Cleveland brakes, finding that there is one very effective mod, an STC from the Twin Bonanza. The reality of modern operation of a Bobcat on the ground is that steering involves careful use of the brakes, with only minor forays into differential power and an overall grim determination to instantly correct even the smallest deviation from the desired track. As one experienced Bobcat pilot put it, "if you can get it to the runway, you can fly it."

Before-takeoff checks take a few moments as all systems are reviewed and switches and selectors positioned. Elevator and rudder trim are set using handles projecting from a surprisingly ornate metal box located on the ceiling between the pilots and which also contains the tailwheel-locking lever.

For takeoff, open the throttles slowly, using differential power and rudder as needed, while holding the yoke all the way aft to pin the tailwheel. After the bobbing, weaving exercise of taxiing to the runway, the takeoff run is easily controllable by a pilot willing to be assertive. For a beamy old beast, acceleration is unexpectedly rapid. The tail is raised before the airplane has gone a-half dozen lengths. A Bamboo Bomber is an excellent short-field airplane; at gross it can be up and over an obstacle in well under 2,000 feet. Ninety mph turns out to be an all-purpose number; it is the safe operating speed in case an engine goes south, best rate of climb speed, and the speed to fly on final. Climbing at 100 to 110 mph gives more than 700 fpm and provides enviable visibility in all directions. At altitude the nose is lowered to a point well below the horizon and cruise power set while the

Bobcat takes its time reaching its modest cruise speed of about 150 mph. When one takes a gazebo aloft, not only can the sights be seen easily, they remain in view for a while. Total fuel burn is about 23 gph. Owners such as Jim Kramer, who have modified their Bombers with 300-hp Jacobs engines, report a fuel burn of about 30 gph at a cruise of 160 mph.

The ride is best described as buoyant; the moderate wing loading means it sails with turbulence rather than taking hard shots. The controls are firm, extremely well harmonized, and nicely responsive to input. It's no wonder that pilots continue to maintain these wooden airplanes; they are roomy, comfortable traveling machines that handle delightfully. Maneuvering a Bamboo Bomber through steep turns, slow flight, stalls, and single-engine work helps one understand why the U.S. played a major role in winning World War II: It developed user friendly airplanes.

Approaching the runway, the flaps can come out at a maximum of 108 mph. Final is flown at the ubiquitous 90 mph, slowing to 80 over the numbers. Landing is generally a tail-low affair, although full stall, three pointers are perfectly acceptable. Astonishingly short landings can be made by flaring only slightly, then spiking the airplane onto its main gear and applying hard braking in level attitude. While that would seem an invitation to nosing over, the airflow against the top of the fuselage helps prevent the nose from dropping too far, and the pilot can play the elevators to keep the airplane's weight on the main wheels for maximum braking.

Shutdown involves running the engines up to 1,300 rpm, pulling the prop levers aft to high pitch to get as much oil as possible out of the prop domes and then idling for about two minutes at 600 rpm for oil scavenging. Once the mixtures are raised to idle cutoff and the twin Jakes clatter to a stop there is a tendency to sit for a while listening to the sounds of the engines as they cool and being thankful for those people who make the effort to keep wooden airplanes alive. AOPA

i Links to additional information about classic aircraft may be found on AOPA Online (www.aopa.org/pilot/links.shtml).

Rick Durden, AOPA 684126, *is an aviation attorney who holds an airline transport pilot certificate and enjoys flying antique and classic aircraft.*