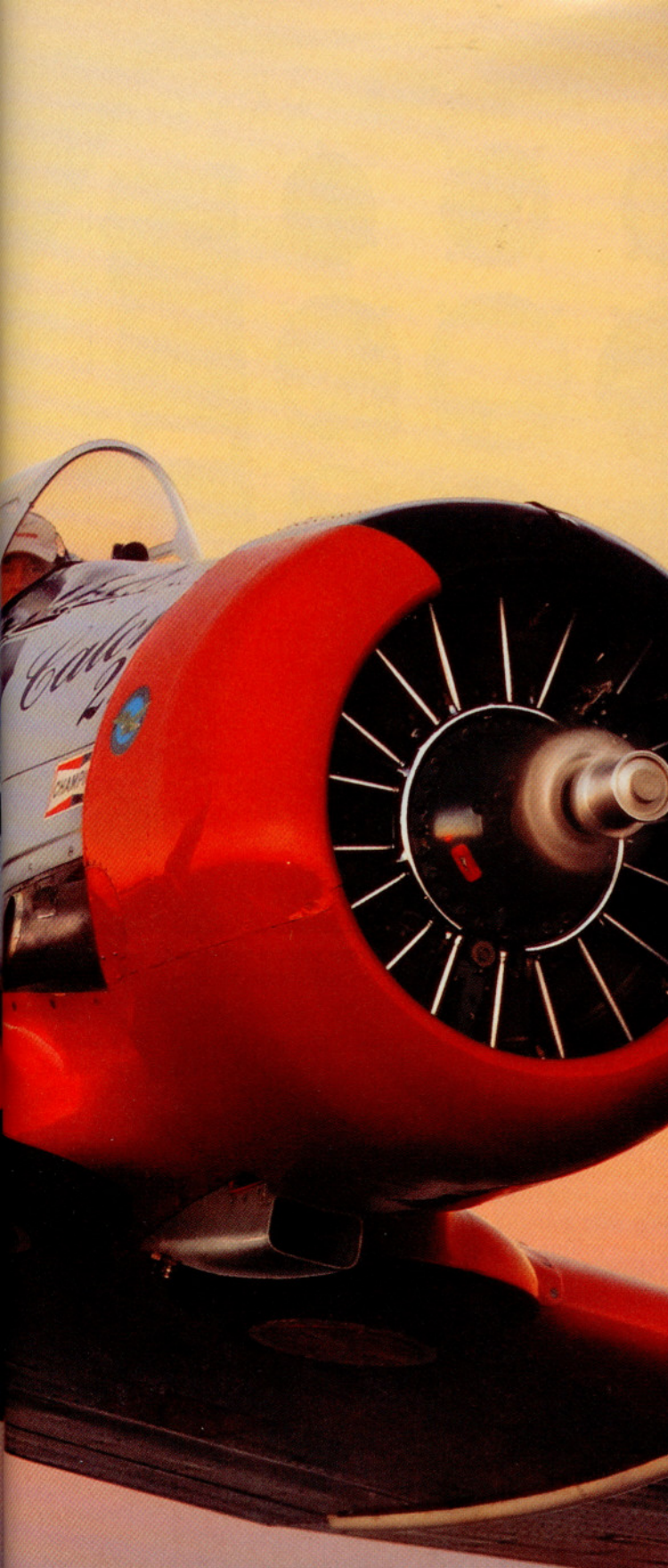


North American SNJ/AT-6/Harvard

Taming the beast

Let's fly
one of the
hot ships





Canopy, open and locked.

Prestart manifold pressure, noted. Fuel selector, reserve. Mixture, rich. Battery and generator switches, on. Use the wobble pump to pump up some fuel pressure, then prime, three strokes and leave the primer out. Prop control, full aft—low rpm, and throttle, cracked. Take a deep breath and focus, because you are going to do something you've dreamed about for years: You, trained on modern, FAA-certified, tri-cycle-gear, plain-vanilla airplanes, are finally going to see if you can fly one of the most challenging of the World War II airplanes, the high-performance advanced trainer, the North American SNJ. You've wondered if you can do it, if your skills are up to it. You're about to find out.

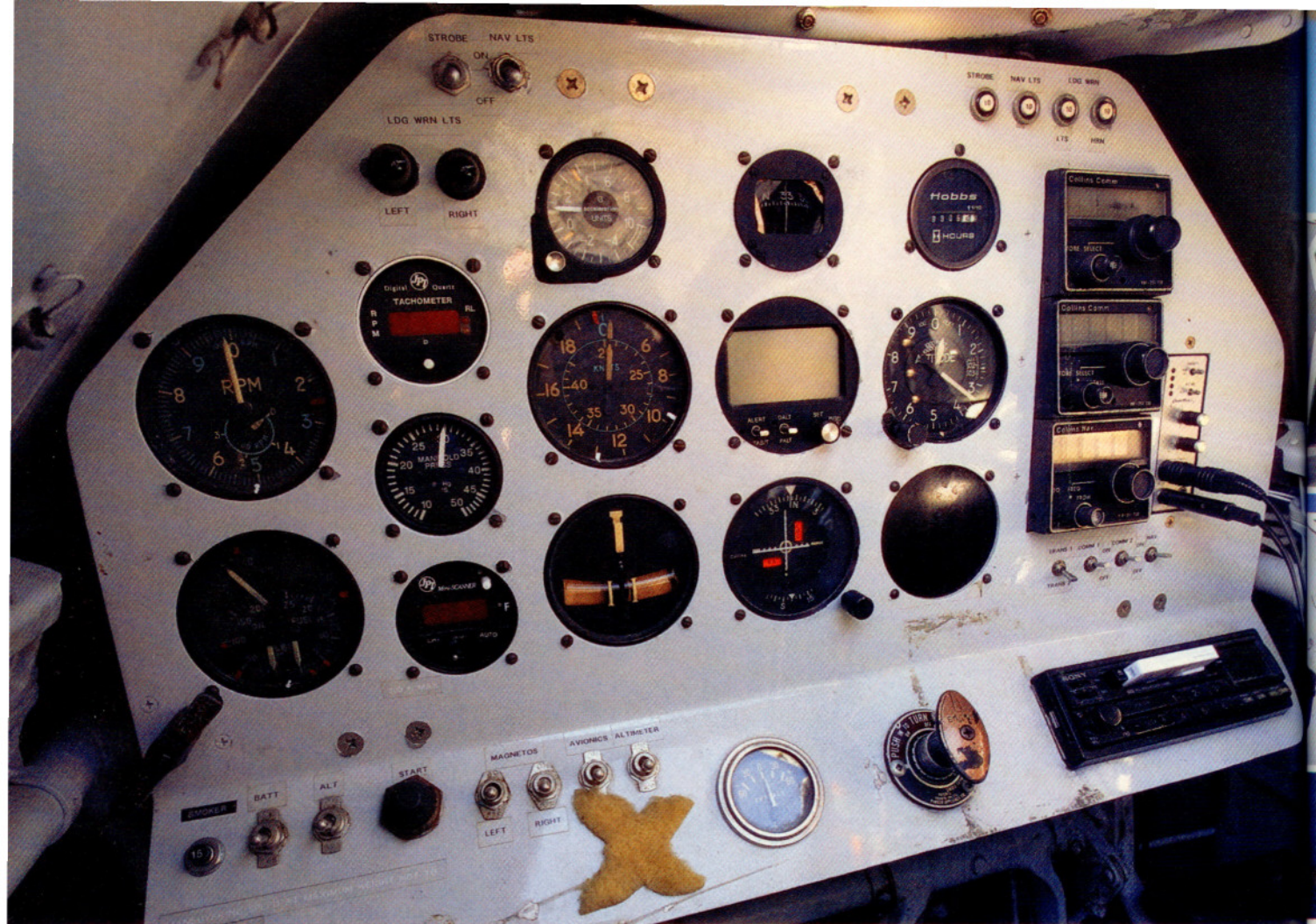
Starter, engage. Watch as the propeller slowly, almost reluctantly, begins to turn. You're starting a 600-horsepower Pratt & Whitney engine, so that starter is working to crank 1,340 cubic inches and nine pistons the size of paint cans. Count four blades and turn on the mags, while keeping the starter engaged.

The magic begins. One cylinder fires, then another, and suddenly, with a massive shudder, you and the airplane are wreathed in smoke as the big radial comes to life. Give it the final shot of prime to keep it running, and then hold 500 rpm until the oil pressure reaches at least 70 psi. Even at this low power the engine is snorting and barking out of the single, short exhaust pipe ahead and to your right, serving notice that this is not going to be a quiet experience. The oil pressure is up, so you slide the prop control all the way forward to high rpm and start taking care of all of the pretakeoff chores you can because you must wait until you have a minimum oil temperature of 40 degrees Celsius before taxiing. Radios, set. Rotating beacon, on. Rudder and elevator trim wheels on the left

Stan Musick's AT-6C was a contestant in the 1990 Reno Air Races. Its race number was 22; Musick calls the aircraft *Catch 22*.

BY RICK DURDEN

PHOTOGRAPHY BY MIKE FIZER



The instrument panel has been through at least one upgrade since World War II, but has kept some original instruments such as the full-circle tachometer (above left). The tan butterfly on the bottom of the panel was made by the owner's son Whitt, when he was four years old and has remained in place for more than 12 years. The cassette deck is not original.

side of the cockpit, set at 10 and two o'clock, respectively. You notice that human factors were not what they are today; the wheels are identical, so you impress upon your memory that the rudder trim is outboard.

Not an old geezer

Suddenly, you have nothing to do and find yourself questioning what in the world you are doing here, testing your mettle in a 60-something-year-old airplane built before aircraft design had become the science it is today. In the Navy it was the SNJ, the Army referred to it as the AT-6, and the Royal Air Force called it the Harvard; perhaps those folks were telling you something about how tough this institution of higher learning will be to fly. You are aware that it was purposely built to handle like the fighters of the era—only there are those who say that North American did its job too well, that the SNJ is more challenging to fly than its more famous sibling, the P-51 Mustang. You suddenly wonder about a comment made in

passing by Stan Musick as he briefed you before the two of you climbed into his airplane—that the Mustang is a good trainer for the SNJ.

Before you can ponder the issue further, the oil temperature passes 40 and Musick suggests you head toward the runway. A little power gets the 5,300 pounds of airplane rolling. You can't see a thing over the nose, so you taxi in a shambling weave, gingerly using the brakes to steer, because the SNJ has a free-swiveling tailwheel, virtually the only difference between it and the AT-6, which has one that is steerable.

Runup noisily brings home that there is some power up front as you hold the stick full aft and cycle the prop at 1,600 rpm. Next, you do a field barometric pressure check to confirm that the engine is developing rated power and that the propeller low pitch stop is set properly. Increase power until the manifold pressure is the same as it was prior to engine start (field barometric pressure). As the noise reaches a howling, blasting

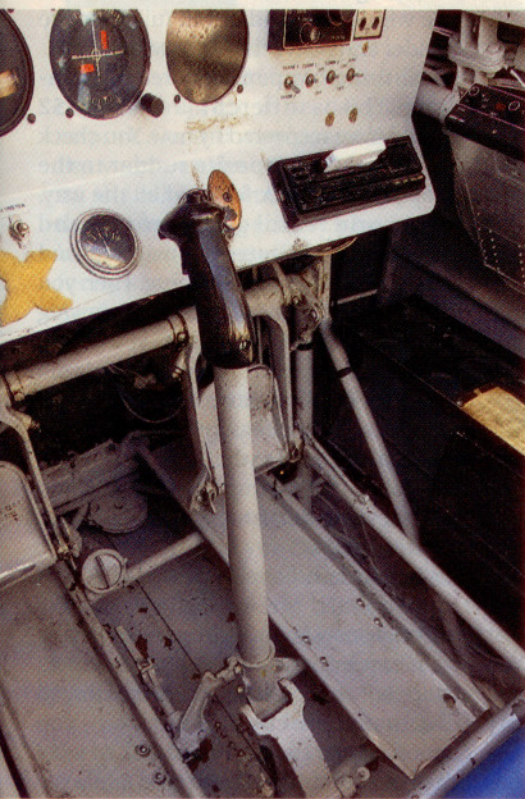
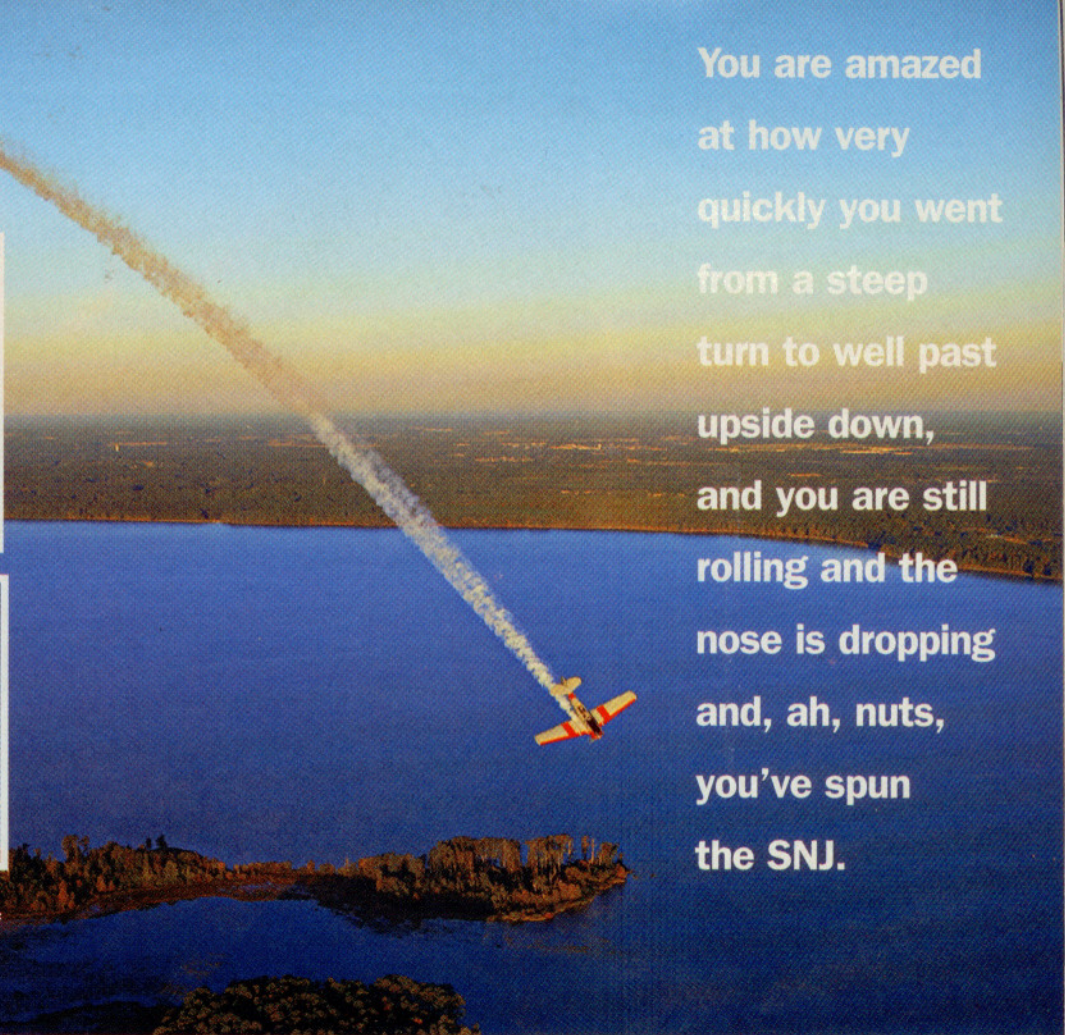
crecendo and you fight to hold the tail down amid the hurricane wind, you see that all is well because 2,200 rpm are generated; then you check the mags and restore relative calm by pulling the throttle back to idle.

You've wanted this day to happen for years and now it's finally time to see if you can fly this beast. Line up carefully, roll forward a little bit to center the tailwheel, and move the locking lever to hold it. A glance in the mirror; Musick's back there looking calm. He's done this before; he is one of the very few check airmen for fighters for the Commemorative Air Force, which means he's demonstrated not only a level of skill that inspires reverence among his peers, but also judgment about operating very high-powered, old aircraft that is deeply respected. Nevertheless, the rear seat of an SNJ is utterly blind in three-point attitude and this is your first time in one of these large displacement birds, so you know he is as alert as a long-tailed cat in a room full of rocking chairs.

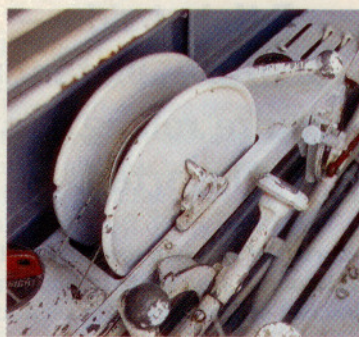
You are amazed at how very quickly you went from a steep turn to well past upside down, and you are still rolling and the nose is dropping and, ah, nuts, you've spun the SNJ.



Initial reciprocation is announced by a generous dose of noise and lavish puffs of smoke (top). The modest baggage compartment behind the rear seat can hold 100 pounds of essentials (above).



The austere monochromatic paint-schemed cockpit is open to the belly of the airplane with trays for the pilot's feet (above left). The left side of the cockpit is a busy place with rudder and elevator trim wheels, wobble pump handle, carb heat knob, gear handle, and flap lever (top right). The hydraulic power control lever activates the hydraulic system for about two minutes (above right).



Roaring into the air

Smoothly, steadily, ease the throttle forward to, oh, man, 36 inches of manifold pressure. Before you get the lever even halfway there the SNJ has started to let you know it understands the concept of acceleration. There are 600 horses up there, only two people back here, and the noise is making your teeth hurt. The airplane wants to dart left, so get on the right rudder, not that much, and boy, oh, boy, are these controls sensitive, and keep your eyes out of the cockpit and keep it going straight. Glance in for a moment and there's 60 knots so a little bit of back pressure, rats, not that much, and, holy smokes, are these controls light and we're climbing and there's 80 knots so get the gear up. You reach for the oval hydraulic power control lever near your left hip, and then push it down. The hydraulic pump is always running; the handle activates the system for two minutes to allow the gear or flaps to operate. Now grab the gear handle, an oddly curved bit of metal, move it forward a bit, out of the detent, and then all the way up. The two gear-down

lights wink out and you feel the airplane accelerate a bit as the wheels chunk into the wells.

Power back to 30 inches and 2,000 rpm for the climb and trim for 100 knots. The SNJ is nearly twice the weight of the general aviation airplanes you've been flying, but you are rapidly discovering that its controls are by far the lightest of anything you've ever flown. You seem to just think about something and the airplane snaps out a quick "Aye, aye!" and complies.

You climb high, at least 9,000 feet above the ground because you want to get to know this airplane and you've heard some stories about it having a very untrainerlike characteristic—it isn't forgiving of mistakes. Looking out at the degree of sweep of the wing leading edges, you consider that if you don't keep the ball centered when you stall, the resulting yaw means one of those wings is going to have a lot more lift than the other and the airplane might just roll off with vigor. You'll soon find that you're right.

Set 21 inches of manifold pressure and 1,800 rpm, which generates "low cruise," about 140 KTAS while burning 25 gph. Published usable fuel is 100 gallons in left, right, and reserve tanks (no two of which are the same size); however, you also remember that the manual says full usable fuel is available only if the tail is lifted to level attitude during fueling, so realistic usable fuel is about 96 gallons. That seems a healthy number until you consider that should you decide to do aerobatics or just stay in the pattern for touch and goes, you must plan on burning more like 45 to 50 gph.

Level flight is a one-fingertip affair. It takes some getting used to before you relax that grip on the stick and begin to absorb the light, responsive feel of this thoroughbred. The SNJ only looks round and stubby; it flies lean and quick. It seems a serious error to have saddled this delightfully agile machine with such a stodgy title as "trainer," even if it is "advanced." Musick has you try some turns. Almost immediately you find you can't help but roll in and out rapidly; it takes almost no effort and the fast roll rate is exciting. Steep turns take some work initially because it's so easy to overcontrol; you can load



Suddenly, it's an E-ticket ride—*Shazat!*—instantly you're rolling past inverted.

up a lot of Gs with very little effort, which causes the big airframe to rapidly scrub off speed. It's not set and forget, as are most airplanes you are used to; here you're flying every moment.

Air games

Stalls are next. Musick has told you in no uncertain terms that the ailerons are to be kept centered during stall recovery. Any use of aileron during stall recovery may well be most unpleasantly counterproductive as you experience aileron reversal. Cautiously you ease the power back and approach your first stall. You wait for the prestall buffet that the book told you about. *What!* Without any warning that you could discern, the nose pitches down abruptly and the SNJ rolls hard left. You sit there, foolishly unmoving for a moment, then shove the stick forward while keeping the ailerons cen-

tered and using the rudder to stop the roll. To your amazement, almost instantaneously the SNJ is flying again. It's as if you flicked a light switch: click, stalled, click, flying. You try another, and yet several more stalls. You still cannot detect any prestall buffet; the stall is astonishingly abrupt, but so is recovery. It is utterly black and white. The behavior is the same with the gear and flaps extended.

Musick steps up the pace and encourages you to explore the upper-left corner of the performance envelope, that is, high-G, or accelerated, stalls. At idle power you roll into a 60-degree bank and pull firmly. Suddenly, it's an E-ticket ride—*Shazat!*—instantly you're rolling past inverted. You are amazed at how very quickly you went from a steep turn to well past upside down, and you are still rolling and the nose is dropping and, ah, nuts, you've spun the SNJ. How embarrassing. The rate of rotation is impressive; Musick is in the backseat chortling over

the intercom, and you finally quit gee-whizzing over the whirling pictures in the windshield and put in full opposite rudder and heave the stick well forward.

Nothing happens. You're still spinning. This is different; a Cessna 152 would have recovered by now. You check that you have opposite rudder to the stop and the stick forward all the way. The world is still going around and around; the altimeter is unwinding and Musick is back there, laughing. Then you notice that the rate of rotation is slowing and the nose is dropping. OK, you're now in a dive, so center the rudder and pull out. Gently. With those incredibly light controls you can easily load up the Gs and stall again. As you climb back up to altitude, Musick reminds you that it can take several turns to stop a developed spin in an SNJ.

You try another accelerated stall. This time the SNJ breaks and rolls rapidly through level flight. Full opposite rudder and stick forward, and the roll has stopped, and it's flying. You're starting to feel that you're catching on now as you smoothly fly the airplane back to level flight. Suddenly, accelerated stalls are like eating potato chips; you keep doing them, at various power settings, and have more fun than you've had in weeks.



Stan Musick (left) performs in his AT-6C in airshows across the country. Built in 1942, the aircraft is based at the Booneville, Arkansas, airport.

Sweat equity

The floor-mounted fuel gauges make it clear that it's time to head back for the airport. On the way, you stretch and flex your toes, desiring to be a virtuoso on the all-important rudder pedals during landing because you want to keep this massive airplane going perfectly straight during rollout. North American built some 23,000 SNJs/AT-6s/Harvards, with production costs eventually getting down below \$13,000 per unit. There are fewer than 500 still flying today, and you have no desire to reduce that number because of ineptitude and thus find out that a nice one is worth well into six figures.

On downwind you target slowing to 100 KIAS while Musick encourages you to stay very close to the runway so that you are able to hit it if the engine quits. Drop the gear once you are under 125 knots, and check the green lights, the two pointers by your left knee, and the mechanical indicators on each wing root to confirm the gear is down and locked. Abeam the runway threshold, make a further power reduction and start turning for the runway. At Mu-

sick's suggestion you go ahead and drop all the flaps and start slowing to 90 on base, anticipating 80 on final. Once on final, you slide the prop and mixture controls all the way forward and work to line up with the centerline, with absolutely no drift. Every nerve alert, you close the throttle and start to flare, aiming for a three-point touchdown, with the stick all the way aft. You find yourself overcontrolling because of the very light pitch forces and your reaction as the nose comes up and blocks the view forward. Your tension builds as the wind noise diminishes and you become aware of the subdued lobe of the idling Pratt.

Finally, touchdown, on all three wheels, and almost immediately the SNJ fakes right and darts left. You are ready with instant doses of rudder, taming the animal, holding the locked tailwheel firmly against the ground, sweating, straining to sense any swerve, any departure from where you are determined to go. This is not an easy airplane to land. After what seems a sweaty eternity you are rolling slowly and it's time to unlock the tail-

wheel to make the turn to head back to parking.

Drawing to a stop at the chocks, you take your time going through the shut-down checklist; you want to savor this awhile longer, the powerful bass rumble of the big radial, the austere, functional cockpit, and the oil-scented breeze through the open canopy. Mixture to idle cutoff and the prop coasts to a stop, taking much longer than the airplanes you ordinarily fly. Yes, you flew it. You were able to fly an ancient pelican, after careful review of its complex systems, although you were at the ragged edge of your ability a few times, and it's good you did the stalls way up high and had a very good instructor. Nevertheless, you did it. Yes, it will probably take you 20 or 30 hours before you are comfortable in the SNJ, but a modern pilot with a decent skill level, a willingness to use rudder pedals, and a fair amount of determination can fly one of the hot ships built for the Greatest Generation. **ACPA**

Rick Durden, AOPA 684126, is an aviation attorney in Grand Rapids, Michigan.