



In-flight insights

Commander tricks and techniques

BY STEVEN W. ELLS



After more than a year of getting to know the Commander 112A, the author admits to having been taken in by her charms.

pulling 65-percent power at 6,000 to 8,000 feet msl. The pilot's operating handbook (POH) predicts slightly better speeds at these altitudes—132 KTAS—but so far we haven't seen those speeds.

In late June, the turbonormalizer installation was completed. This system permits 100-percent power settings at any altitude and temperature up to 16,500 feet msl. Setting the power to 70 percent in cruise upped the cruise speeds by 10 to 11 knots over the stock airplane. The turbonormalizer installation made a difference in the time to cover a typical cross-country leg of 400 nautical miles—for example, six minutes short of three hours versus three hours and eight minutes—or 14 minutes.

However, the turbo installation made the airplane, in my mind. I grew up flying in the mountainous western states—including Alaska—and was underwhelmed with the performance of the Commander before the turbo installation. Bolting on the turbo transformed the AOPA sweepstakes airplane into a true 50-state cruiser. It will permit the winner to fly safely into and out of high-altitude airports, climb with some dispatch, climb up to and cruise in smooth air, and take advantage of the push provided by high-altitude tailwinds. Unfortunately the speed increase came at a cost—the turbonormalizer installation reduced the useful load by 26 pounds.

Although the post-autopilot installation numbers aren't finalized, the addition of the new avionics, instrument panel, propeller, quieter and more comfortable interior, and turbonormalizer improvements took a heavy toll. When the AOPA Commander rolled out of the factory in 1974, in its previous life as N1169J, the empty weight was 1,750

Flying the AOPA sweepstakes Rockwell Commander is a lot like driving a classic English sports car. English sports cars had a hard time competing against the Porsches of their day, and many cars on the road during that

era were more practical, but such matters don't carry much weight with those who are smitten by an MG, Morgan, or Triumph. Likewise, it's a sure bet that, on occasion, every Commander 112 pilot has wished for more load-carrying capability or shorter takeoff runs, but these inconveniences are easily dealt with through prudent planning—like English sports cars, Commanders make lifelong friends very easily.

Within a few months a lucky winner will instantly become the owner of a well-equipped, good-looking airplane. To better acquaint the new

owner with N112WN, I'm going to pass on my impressions based on my time in the airplane.

Super equipment, but less-than-super performance

With all due respect to Commander 112 owners everywhere, the stock Commander 112 is not at the top step of the performance ladder for four-place, 180- to 200-horsepower, retractable-gear airplanes. During the first six months of its life as the AOPA sweepstakes airplane, N112WN consistently cruised at 127 to 128 knots true airspeed (KTAS) while

AOPA SWEEPSTAKES

pounds. Computations indicate that N112WN now has an empty weight of approximately 1,839 pounds. Subtracting this from the maximum gross take-off weight of 2,650 pounds leaves a useful load of 811 pounds. When the fuel tanks are topped off—68 gallons with 64 usable—the useful load is 403 pounds. This is enough for the average American couple with two suitcases. For perspective, no light four-place retractables (200 horsepower and fewer) can be considered true “four-place airplanes” with full fuel tanks.

Filling the fuel tanks to the tab indicator reduces the fuel load to 48 gallons, permitting 120 more pounds of useful load. If the captain wants to fill all four seats for a scenic flight or short hop to a local vacation spot—with two 170-pound males and two 150-pound females, for example—the maximum fuel load would be limited to 28 gallons.

Cruising in the Commander

The Commander POH cites an economy fuel flow of 9.4 to 9.6 gallons per hour at 65-percent power. With the installation

of the turbonormalizer came instructions from Robin Miley of RCM Normalizing—the STC developer—to run the engine at 2,400 rpm, with 26 inches manifold pressure (69- to 70-percent power) and leaned to 12.5 gallons per hour. This fuel flow is very close to the best-power mixture settings located at 80 to 100 degrees Fahrenheit rich-of-peak exhaust gas temperature (EGT).

Mathematicians in the crowd will realize that an 11-knot increase at a cost of three gallons per hour is similar to walking into a room backwards and telling everyone you’re leaving—it doesn’t make sense. What those mathematicians aren’t factoring in is a huge expansion of the performance envelope that comes with the turbonormalizer.

The combination of a set of custom-matched GAMIJectors, the engine temperature-detecting precision of the J.P. Instruments EDM-800 engine monitor, and the durable Lycoming factory-rebuilt engine will permit the winner to experiment with mixture changes to determine which mixture-power setting combination works best for each mission (Lycoming leaning recommendations permit operating at peak EGTs at 70-percent power).

Long legs with ease and comfort

One of the reasons for the conservative performance is the size of the fuselage—it’s wide. Width translates into living-roomlike comfort compared to other airplanes in this class. Wide-cabin comfort and superb visibility are Commander strengths. Commander lovers swear that these features more than outweigh the conservative performance of the airplane.

I grew to quickly appreciate these qualities and logged many three-and-a-half- to four-hour legs without pain or strain. Although these aren’t Commander exclusives, each flight contained a bonus because of the PS Engineering PMA8000-SR audio panel with Sirius satellite radio and the Lightspeed top-of-the-line Thirty-3G headsets. I can’t comment on the intercom system because I flew alone, but I sure enjoyed being able to listen to the cornucopia of offerings from Sirius.

The lucky winner will have access to a mother lode of Commander information, technique, and opinion, thanks to the Commander Owners Group (www.commander.org). The winner and his mechanic will get the answers they need to best enjoy (and enjoy



The PS Engineering PMA8000-SR audio panel with Sirius satellite radio provides the pilot and passengers with hours of listening pleasure.

maintaining) the Commander. Here's a good example:

For quite a few months I couldn't figure out why the Commander was reluctant to jump into the air like a proper airplane—as evidenced during a late-afternoon takeoff from Atkinson Municipal Airport at Pittsburg, Kansas, one hot summer day. I had landed for fuel after an uneventful flight from Oshkosh following EAA AirVenture 2005. With full fuel tanks I turned onto Runway 34 and firewalled the throttle, checked that I was getting all 28 inches of power—airport elevation is 950 feet msl—and started running down that 5,500-foot-long

runway. According to the POH, at the outside air temperature (OAT) of 41 degrees Celsius (106 degrees F) and the airplane load I had, we should have been 50 feet above the runway in 2,850 feet. But we weren't. It felt as if N112WN was dragging an anchor on that hot, hot summer day. As we clawed our way skyward I remember thinking that I would have to figure out how to tactfully tell the winner to plan for long takeoff runs and anemic initial climb rates when the air temperature tops the century mark.

Part of the mystery of the land-loving Commander fell into place during the recent annual. Mark Standrich—former

Commander Aircraft lead mechanic and owner of a maintenance business in Oklahoma City that specializes in Commanders—serviced the main landing-gear shock struts. This simple maintenance action raised the tail of N112WN. That decreased the angle of attack of the wing during the takeoff ground run. Before the adjustment, the wing was at a positive angle of attack during the takeoff run—as the airplane accelerated, both lift and induced drag increased. Now drag doesn't build during the takeoff run at the same rate because the wing is at a negative angle of attack until the pilot pulls back for takeoff.

The Commander doesn't lack power—other small four-place, single-engine retractables perform well with the same power loading. Power loading is derived by dividing an aircraft's maximum gross takeoff weight by the maximum horsepower output of the engine. The Commander's power loading is 13.25 lb/brake horsepower.

The relatively small wing surface area is the performance-limiting factor. Wing loading is gross takeoff weight divided by wing area in square feet. The Commander has 152 square feet of wing and a wing loading of 17.4 lb/

AOPA SWEEPSTAKES

square foot. By comparison, a Piper Comanche 180 has a wing area of 178 square feet and a wing loading of 14.3 lb/square foot and a Piper Arrow has 170 square feet of area and a wing loading of 15.6 lb/square foot. One of the consequences of higher wing loading is higher landing and takeoff speeds, but that is somewhat offset because higher wing loading translates into a smoother ride in turbulence. Once again, although the Commander isn't a rocket ship, the winner is sure to enjoy hours and hours of trouble-free, smooth, and comfortable cruising as long as the airplane's limitations are understood and given the proper respect.

A sample flight

Two wide doors make entry easy. Once aboard, the seat is adjusted and comfy inertia-reel shoulder harnesses and seat belts from AmSafe and B.A.S. Inc. are clicked into place. A momentary push on the fuel boost pump and a turn of the key awaken the Lycoming engine, which quickly settles into a steady beat. A flick of the avionics and electronic flight information system (EFIS) master switches brings the three screens to life. Wait a bit for the EFIS to test itself and initialize; this is a good time to check that the databases in the Chelton Flight Systems EFIS and the JeppView subscription displayed on the Garmin AT MX20 multi-function display are current.

Run the engine up to 2,000 rpm and run down the pretakeoff checklist. Set 10 degrees of flaps, check for free controls and takeoff trim settings, and turn on the boost pump—it's takeoff time.

During the takeoff run, check for full power and wait until 70 shows up on the airspeed meter. A gentle pull and you're airborne. Retract the gear and set the trim for a climbout speed of 85. Retract the flaps, and when 1,000 feet above the ground, turn off the boost pump. If it's needed during takeoff, the turbonormalizer's red vernier knob located by the pilot's right knee should be turned clockwise to maintain 28 inches during takeoff and climb—go ahead and get in the habit of working that vernier because you will grow to depend on it during climb and cruise.

Upon reaching cruise altitude, close the cowl flaps and start rolling in forward trim as N112WN accelerates. Pull the rpm back to 2,400 and adjust the

turbonormalizer vernier control to maintain 26 inches—that's 70-percent power. It's easy to set these values because they, along with a catalog of engine operating data, are displayed on the engine monitor. I use the AeroTrim electric trim to relieve any aileron pressure that may occur because of cabin or fuel loading imbalance.

The dual Garmin AT SL30 nav/com radios have been peerless. The pilot can automatically transfer frequencies from the airport information database in the Chelton into the standby window of these radios. The lower SL30 in the center stack feeds its nav signals—glide slope and localizer—to the primary flight display of the EFIS. The



The AeroTrim electric trim gauge manages any imbalance in aileron pressure.

upper radio feeds nav and localizer signals to a Garmin GI 106A nav indicator to the right of the stack.

Handling is well balanced and the rumor about limited rudder authority can be handled by limiting flap extension to 10 degrees and coming over the fence on final 10 to 15 knots faster than normal. There's nothing exotic or unusual about this solution.

Speaking of landing—the pilot will soon learn to keep some power on final at 85 to 90 knots, level out above the runway, and ease the power back

for consistent landings. The airplane will slow quickly and touch down smoothly—a nose-high full-stall configuration isn't necessary.

The Commander isn't a short-takeoff or -landing airplane, nor does it burn up the sky with its speed, but it is a solidly built, good-looking, comfortable, easy-to-fly airplane that will make its new owner proud.

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

E-mail the author at steve.ells@aopa.org.

MIME FIZER

AOPA