



In-flight insights

Twin Comanche tricks and techniques

BY THOMAS A. HORNE

As the lead person on the AOPA Win-A-Twin Sweepstakes project, my job has two main components. One is administrative, and has to do with keeping the 1965 Piper Twin Comanche moving through its upgrade phases, and

scheduling its movements and appearances. While rewarding in its own way, this is mainly a clerical function that doesn't get the blood pumping nearly as much as the other component: flying the Win-A-Twin.

I've logged about 70 hours in the airplane, and in that time N204WT has really been many different airplanes. That first flight, from California to Florida with AOPA Pilot Associate Editor Steve Ells, was in a beat-up old bird with innumerable failings, squawks, defects, and other shortcomings (see "AOPA Sweepstakes: Win-A-Twin Comanche,"

February *Pilot*). Now it's a modernized, nearly trouble-free airplane.

Still, it has its idiosyncrasies. When I fly it these days, my familiarity with the airplane makes me aware of how much I've learned, and come to terms with Twin Comanche quirks. Quirks that you, potential winner, could benefit from in the sharing. There are many, but let's concentrate on the basics.

Let's start with, well, starting. Immediately after an engine starts make sure you pull the mixture control back about halfway. If you don't, the spark plugs will foul with lead. This shows up

later in the runup, in the form of a huge drop in rpm during the magneto checks.

During the taxi, you might notice a tightness in the steering linkage. That's because the landing gear was totally re-rigged and given an overhauled nosewheel assembly. Before the re-rigging, a mechanic at Fessler Aviation put the airplane up on jacks. I extended the gear, then crawled underneath and grabbed the main gear. You could shake them this way and that, which is a sign of worn-out bushings (one was missing altogether). Now the gear track is as tight as a racecar's.

Get ready for a big quirk during the takeoff run. Multiengine pilots are told to lift off at V_{MC} plus 5 knots, to bank airspeed as a safety measure. In our model Twin Comanche, V_{MC} (minimum control airspeed with the critical



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engine inop, marked by a red radial line on the airspeed indicator) is 90 mph, or 78 knots. So as you build speed and accelerate down the runway, the expectation is that you'll hit 90/78 (primary airspeed markings are in mph, a potential gotcha), let the airplane reach 95/82, then exert a little back-pressure to lift off.

Instead, the airplane will get light on its feet at about 70 mph, and want to fly off the runway way before V_{MC} . Any attempts to hold the airplane on the runway result in hopping and skipping, and maybe even a little wheelbarrowing on the nosewheel. Our/your Twin Comanche has the fix designed to minimize this: a nosewheel with a radius one inch less than that of the main gear. This "small nosewheel" modification is designed to keep the wing chord at a slightly negative angle to the relative wind, something that should—but doesn't always—keep the airplane on the ground until you reach V_{MC} plus 5.

My strategy for the smoothest takeoffs involves letting the airplane come off the runway when it's ready, leveling and accelerating to the 105-mph or 91-knot V_{YSE} (best single-engine rate of climb airspeed) in ground effect, then climbing away at V_{YSE} . Should an engine quit before the climbout phase, the procedure is to close both throttles and land straight ahead. Come to think of it, this may be a good procedure if an engine quits during the early phases of the climbout, as well. It all depends on the situation at hand. A Twin Comanche flying on one engine probably won't be able to climb at all at high weights and high density altitudes, and may not be able to clear nearby terrain or obstructions.

There's a takeoff flap position, but I've found that the extra lift created by flap extension can aggravate the premature-lift-off phenomenon. So unless the airplane is very heavy, I take off with flaps retracted.

The Win-A-Twin is great for long trips, but this means you must fill all six of the fuel tanks, including the tip tanks. This amounts to 120 gallons, or 720 pounds, of fuel. This extra weight at a moment arm so far from the center of gravity means that you can get into some annoying rolling motions right after liftoff. In turbulence, too. For this latter reason, I switch to the tip tanks



Flying the Twin Comanche is easy. It's the landings that cause all the excitement! For best results, make sure you've slowed down and stabilized before crossing the threshold. Here we are, turning onto final, at blue line. The goal is to try for a greaser. Full-stall landings are a no-no!

immediately after reaching cruise altitude. After an hour of feeding off the tips, the wingtip heaviness goes away, and handling goes back to its normal, excellent behavior.

Cruise flight is a breeze compared to the funky experience it once was. Gone are the creaky old VORs, and gone is the need for a handheld GPS to serve as a primary navaid. In their place are all-new instrumentation and avionics.

The J.P. Instruments EDM-760 lets you keep precise track of your fuel burn—that, and your clock or quarter-pounder pilot watch (the ship's fuel gauges, like every light airplane's, are subject to the usual inaccuracies associated with float-driven fuel measurement systems). The Garmin AT GNS 480 lets you quickly feed routings and load approaches—and even talks to the EDM-760 to show how much fuel you'll have in reserve at the destination. The MX20 multifunction display depicts low-altitude IFR en route charts, and can show Nexrad radar returns, METARs, and TAFs via WSI's In-Flight datalink weather service. And the Meggitt/S-Tec System Fifty Five X autopilot's GPS roll steering function automatically follows your flight-planned routings, guides the airplane around holding patterns, and flies instrument approaches. You don't even have to change the course arrow on the Honeywell Bendix/King KI 825 electronic horizontal situation indicator (EHSI).

For cruise power, I usually use 24 inches of manifold pressure and 2,500 rpm, and fly in the 6,000- to 9,000-foot range. For best power, the mixture is set at about 9 gph per side. The result is a true airspeed of 175 knots or so—and a four-and-a-half-hour endurance, with IFR fuel reserves. That cruise speed is about 10 to 15 knots higher than published Twin Comanche numbers and an affirmation of the effectiveness of Lo-Presti Speed Merchants' airframe modifications. That, and the power of the Superior Air Parts Millennium engine overhaul and upgrades to the original 160-horsepower Lycoming IO-320s.

All this speed and slipperiness must be managed during descents and on approaches. The airplane gives up airspeed reluctantly, so it's best to make power reductions early and incrementally to arrive at target altitudes at the proper airspeeds. Leveling off in the pattern after coming out of cruise flight, you'll have to reduce manifold pressure to about 15 inches to make the airplane slow to the 150-mph/130-knot V_{LO} (maximum landing gear operating speed). This may take about 30 seconds. Then, after you extend the gear, airspeed slows to the 125-mph/108-knot V_{FE} (maximum flap extended speed) in another 20 seconds or so.

Landing techniques and behavior provide the richest sources of Comanche and Twin Comanche lore. Let's just say that consistently smooth landings are elusive in the Comanche brand.

With all the Win-A-Twin's high-end avionics, situational awareness is great. If you get lost flying this airplane, maybe you should take up pottery.



It all has to do with the airplane's slippery form and laminar-flow airfoil. On the early segments of the final approach leg, with partial flaps, you can fly the target speed (which is V_{YSE} , marked by a blue radial line on the airspeed indicator) using just 14 inches or less of manifold pressure at light weights. But you'd better start pulling off a lot of power as you near the runway threshold. If you maintain 105/91 for too long you'll

float forever as you try to force a graceful landing.

It won't happen. You'll balloon and skip, eating up runway as you go. The laminar-flow wing, riding so close to the runway, keeps flying in ground effect if approach and flare airspeeds are even a little too high. And a full-stall landing isn't the answer, either. Try it and you're asking for an abrupt stall a few inches above the runway—and a hard landing.

I've found that the best tactic is to cross the threshold at 75 to 80 mph (65 to 70 knots) with half flaps, then hold a slight nose-high attitude. This usually lets you roll it on with a minimum of fuss. Full flaps can mean a lot of re-trimming at a busy time, as you try to keep the nose up—unless you have a fair amount of weight in the backseats or baggage compartment.

But that's just my opinion. If you want a lively discussion, just ask any Comanche or Twin Comanche driver about the best way to land these airplanes. Then stand back for the erudition.

On the whole, the Twin Comanche is a great airplane. The Win-A-Twin is an outstanding airplane. Sure, it has oddities. What high-performance airplane doesn't? And anyway, the winner will get the hang of it under the tutelage of an experienced Twin Comanche instructor. Pretty soon, dear winner, you'll be handing out a little erudition of your own.

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i Links to additional information about the Win-A-Twin Sweepstakes Twin Comanche may be found on AOPA Online (www.aopa.org/pilot/links.shtml).

Member feedback

The Win-A-Twin Comanche has been at three big aviation events—the AOPA Fly-In and Open House, Sun 'n Fun EAA Fly-In, and EAA AirVenture—and at each stop members have shared loads of nostalgia and opinions about the airplane. Not surprisingly, given the age of the airplane and our typical member profile, many have said that the Twin Comanche was their multiengine trainer. Others say it was the first light twin they ever owned, and that the ownership was marked by very low operating costs.

A lot of visitors said that they currently own a Twin Comanche; one member said he had two! And on at least five occasions there were detailed questions about the Win-A-Twin's refurbishment. Seems that many members are using our Win-A-Twin magazine articles and AOPA Web site progress reports as checklists and guidelines for their own personal upgrade projects.

Spend a few hours watching people at the airplane and you'll also see some common behavior patterns. Gawkers make stops at the same places, for example. Here's a typical tactile voyage around the airplane:

- Stand back a bit, mention that you like the paint job, or
- Stand back a bit, mention that you hate the paint job.
- Go to a tip tank. Open its fuel cover. Pry open the thermos-type fuel cap. Look inside. Observe lack of fuel. (Hint: It's never full at airshows.)



You just *have* to touch it, don't cha?

- Stick entire hand inside the LoPresti "Wow Cow!" opening.
- Go to nosewheel area. Get down on knees or back and observe worn nosewheel steering stops. Make comment about worn stops. (They've been fixed.)
- Look in hole at pointy end of nose. Ask if rain goes in the hole, and, if it does, where it goes. (Answer: "I don't know, but my feet get awfully wet when it rains.")
- Stop at stabilator. Grab edge of stabilator and shake. The visitor is checking for bearing play, which is the subject of an airworthiness directive. (It's a new stabilator, and there is no play.)
- Still at stabilator area, inspect stabilator torque tube slot for cracks. (Like most Pipers with stabilators, there are a couple hairline cracks there, but they are of no structural or safety import.)

torque tube slot for cracks. (Like most Pipers with stabilators, there are a couple hairline cracks there, but they are of no structural or safety import.)

- Pause at ground power unit access plug. Flip cover up and down repeatedly, remark that the cover spring is broken. (This we know! And it, too, has been fixed.)
- Touch baggage door, remark that door should be on the other side. (No, it's in the right spot. It's the 1966 and later Twin Comanches that have the baggage door on the left side—and the third side window, too.)

You get the idea. The Win-A-Twin is an attention-getter. Keep those comments and wisecracks coming! And hey, what's that? There's a fastener loose on the left cowling...and I'm not kidding.

—TAH