

Pilot report - Piper Twin Comanche

[Reprinted from Fliteguide / Imperial Aviation]

The Twin Comanche is a classic with a reputation. Achieving something of a cult status amongst its followers, it is an aeroplane that in many senses was just too good for its time.

Piper has always appeared to be a company that built stodgy, characterless aeroplanes. Cherokees, in particular are designed and built to a price. Their construction is simple and rugged but lack any level of excitement. Simply put - most Pipers lack any sex appeal.

The Comanches are different. In retrospect, it seems as though Piper was uncomfortable with this flash of brilliance. That Comanches were an aberration seems borne out by the company's unseemly haste to stop production prematurely - thus getting back to safe, comfortable mediocrity.

Comanches were built at Piper's Lock Haven factory in Pennsylvania. This was where Piper first set up shop in 1937 to build Cubs. In June 1972, Hurricane Agnes caused extensive flooding and the Susquehanna River burst its banks and put the Lock Haven factory under water. This effectively ended Comanche production. The PA-30 Twin Comanche had been in production for less than ten years, with a total of 2152 built.

The PA-30 grew out of the single PA-24 Comanche, which had already established a firm reputation as a fine performance aircraft soon after its launch in 1958. The then current light twin was the tubby Apache, which even by Piper's standards, was boring, lumpy and somewhat overweight. And so, in a rare moment of brilliance, the inspired Ed Swearingen was commissioned to convert the single Comanche into a twin. The result was an aircraft greater than the sum of its already good parts, in that it was not just a single with two engines, as for example, the Seneca I. The Twin Comanche redefined the light twin category, improving on every aspect of the Apache's performance by a margin of some 20 percent.

What could not be appreciated at the time was that the Twin Comanche was so good that it remains consistently better than its successor, the Seminole. The Seminole has Piper's much-vaunted tapered wing and an extra 40hp, yet a 1963 Twin Comanche will out climb and out run a 20-year more modern light twin at all power settings. While the Seminole has a 200lb greater all up weight, the useful loads are almost identical - a tribute to the PA-30's efficient design.

The Twin Comanche range started with the A-series in 1963. The B-series was launched in 1965 following the rave reviews of its predecessors. The major difference was the introduction of a third side window and the inclusion of two seats in what was the luggage compartment. The floor was hollowed out to give more legroom and the two extra seats work surprisingly well, allowing two six-foot adults a reasonably comfortable ride. The seats are limited to 230lbs. A nice aspect of the Twin Comanche is that the normal weight on the nosewheel is about 700lbs so that even if the aircraft is loaded from the rear first, it is unlikely to fall on its tail, unlike most comparable singles.

Also new to the B-model were the optional 15-gallon tip tanks which increased total fuel capacity to 120 gallons. An interesting aspect of these tanks is that when full, the gross weight goes up from 3600lbs to 3725lbs. If the tanks remain empty, gross weight stays limited to 3600lbs. I have yet to hear a rational explanation for this quirk.

Minor changes in 1969 created the C-model but the most significant improvement occurred in 1970 and was marked by a change in designation from the PA-30 to the PA-39. This improvement introduced contra-rotating propellers which restored Vmc to original design goals. A total of 159 PA-39's were built and they are now much valued by their owners.

With the exception of the A models, Twin Comanches were offered with optional Rayjay turbochargers with manually controlled wastegates. These are turbo-normalised blowers giving sea level boost to 10000 feet. The turbo will cruise at 225mph at 20000 feet. Not bad for barely boosted 160hp engines.

Range is one of the Twin Comanche's strong points. A grossly overloaded PA-30 was once flown non-stop from Cape Town to Florida, USA. With tip tanks installed, range with IFR reserves is over 1100nms at 65% power in a bladder-bursting seven hours. For the turbo at 20000 feet, range exceeds 1300nms. The key to this range is the aeroplane's ability to extract maximum benefit from minimum power. I think that if ever Mooney were to turn to building a light twin, they

would be proud to achieve the Twin Comanche's efficiencies.

Just how successfully the PA-30 translates avgas into seat miles can be judged from a direct comparison with the Mooney 201, the peak of legendary Mooney efficiency. The 201 claims a top speed of 201 mph on 200hp with four seats, i.e. 50hp per bum. The Twin Comanche has a total of 320hp and manages 205mph with six seats, i.e. 54hp per bum. Yet this is a twin, with all the extra frontal area and drag of two engines.

The PA-30 has real elbowroom. There is enough space to put a fair-sized flight bag between the two front seats. The aircraft shares the single Comanche's basically square cabin section. At 45 inches across, this is substantially wider than a Baron. The cabin provides plenty of headroom.

The primary reason for the Twin Comanche's efficiency is its wing. Almost laminar flow, its spar runs under the middle seat row leaving a beautifully smooth leading edge for the front 40% of the chord. The wing is a thing of beauty - in contrast to the Cherokee's 'Hershey bar' section. The only advantage of the Cherokee wing apart from being cheap to build is its docile stall.

On a single Comanche, the NACA wing gives a crisp stall break with little tendency to drop a wing. On the twin, with both engines throttled back the stall is equally safe. However, the PA-30 hit the market during a period of bureaucratic lunacy.

With a level of officialdom mixed with stupidity, the FAA recommended that Vmc demonstrations in twins be done at low altitudes to ensure maximum power from the live engine. Even in the placid Apache, low-level Vmc demonstrations could be terminal. For training schools the PA-30 was an ideal Apache replacement. Small, economical and with great handling, it was a popular choice as a primary multi-engine trainer. The only problem is that its high performance wing does not cut the pilot much slack or tolerate abuse from pupils.

With the benefit of 20/20 hindsight we now know that no light twin, (except Cessna's 336/337) should be stalled with one engine dead. The wide distribution of weight in the engines and fuel has an aggravating affect under asymmetric thrust. Once the rudder has run out of effective control (below Vmc), a stall may quickly turn into an unrecoverable flat spin. At FAA recommended low altitudes, this was a great prescription for killing pilots in training and is exactly what happened. It led to the Twin Comanche acquiring a totally undeserved reputation.

In belated recognition of demonstrating the dangers of Vmc, the FAA responded in 1969 by a simple stroke of the pen, to increasing the PA-30's Vmc from 80 to 90 mph. The implications of this can be seen when evaluating the aircraft.

So what is the Twin Comanche like to fly? The pre-flight starts in the cockpit, which is reached by an easy step up from the ground, straight onto the wing. This very low stance gives the aeroplane one of its most infamous and irritating handling quirks - the landing.

Once inside the cockpit you open a hatch on the floor behind the fuel selector. To test the fuel for water you hold up the two drain knobs in turn and check the fuel flowing through clear plastic tubes through holes in the belly. You have to select and drain four of the six tanks separately for contaminants. In theory, that is the way it is supposed to work. In practice, the pipes are usually covered in dust so you can't tell fuel from water. Moreover, at least one of the pipes tends to creep back inside, so fuel spills into the lower fuselage before leaking out. This does not make the cabin a good place to smoke. The best way to check for water is to drain the fuel and then get down on hands and knees looking for beads of water in the fuel puddle. If water is found you will then have to get back inside and drain all the tanks in turn again. Not one of the Twin Comanche's best features.

The rest of the pre-flight is otherwise normal. Access to the engines is limited to a tiny hatch for the dipsticks. There is no separate baggage area in the PA-30. Even the nose has no storage space as it is filled with the wheel well, battery and Janitrol heater.

When moving the ailerons by hand to check hinges and movement, the skin pops in and out with a disconcerting boom. This is despite an AD requiring the aileron bracket strengthened.

Preflight complete, starting is standard fuel injection Lycoming. Prime till fuel flow registers, mags on, mixture to idle cut-off and throttles cracked. The engines start readily and settle down into the usual throbbing four-cylinder Lycoming beat. Small Continentals have always idled better than the somewhat agricultural-sounding Lycomings. After-start checks must

include switching the generators on (no, not alternators). The switch is tucked away on the right hand panel against the power quadrant.

The Twin Comanche's empty weight is a fairly average 2397lbs, giving a useful load of 1328lbs - significantly better than the F33 Bonanza's 1200lbs. For the test, we were two-up and 80 gallons of fuel - i.e. some 510lbs below gross, which was sufficient for a further three passengers. Alternatively, we could have filled four seats and brought along 170lbs of baggage. The 80 gallons (out of a total capacity available of 120), would have given us over four hours plus VFR reserves.

Once on the move, taxiing, even down a tar runway, is reminiscent of old British sports cars. The short, stiff main gear legs transmit every surface bump to the seat of your pants. They say that if you taxi over a coin you should be able to tell if its heads or tails.

Run-up is straightforward, the mixture is set, the mags are checked with deft finger work on the four switches at 2200rpm and the props are cycled to feathering at 1500rpm. With vital actions complete, its time to line up. We were flying on a 30-degree C afternoon with a density altitude of 8500 feet. The flaps are left up for takeoff as it's one less thing to clean up if we lose a motor. Acceleration is swift.

The nosewheel steering is light making it easy to track the centreline. The airspeed indicator is marked in miles per hour and at 70mph the aeroplane flies itself off thanks to its nose-high stance. Gear up, we stay low to build up speed. We are below the official Vmc of 90mph for a few seconds but the PA-30 will remain completely controllable without its critical engine.

Accelerating to 110mph or Vy, we climb out at a healthy 700 feet per minute. This is not bad considering the density altitude. At sea level we could expect 1460 feet per minute at gross weight. Levelling off at 7000 feet, we set 2400rpm and leave the throttles wide open, getting 21 inches of manifold pressure. 164mph is indicated in the cruise for a true airspeed of 187mph or 161 knots. This is pretty much confirmed by the GPS. Fuel flow settles at 9 gallons per hour per engine.

The noise level is better than most singles. The Twin Comanche has an unusual two into one exhaust configuration which exits without silencers into four very untuned outlets under the wing. For those listening on the ground, the aircraft has a distinctive beat but mercifully, this is not heard in the cabin. With its short wings, the PA-30 is pleasantly stable in flight and punches through minor bumps well, settling nicely into cruise configuration.

Trying out the stall, we pull the power gently back on both engines. The stall warner hoots plaintively at 80mph and the break arrives at 73mph with no roll off. Dirty, i.e. with gear and flaps down, the stall comes at 66mph. Held into the stall the left wing drops and is easily picked up with aileron input. The Twin Comanche's stall behaviour, if anything, is more benign than a Cessna 172's.

Zero thrust setting on the right engine is 11 inches. At a Vyse of 105mph the PA-30 climbs at 150 feet per minute from 6000 feet (8000 feet density altitude). This is not bad at all. According to the book, the loss of one engine will have the Twin Comanche cruising at 7100 feet and higher at lesser weights. Therefore, 99 percent of the time, the aeroplane should get you home on one engine - reassuring to know if you are above cloud and or flying at night.

Continuing to test the Twin Comanche's notorious single-engined handling, we leave the right engine at zero thrust and pull the nose up until speed bleeds off to Vmc. The rudder fails to keep it straight when we reach 72mph and the stall warning is blaring out its dire warning. To avoid a deep asymmetric stall, we restore power and fly away. As the speed comes back so the control feel becomes crisp again.

The engines are throttled back to 15 inches arriving in the circuit. The speed drops to 125mph and the gear and half flaps are extended. The fuel pumps come on with an easily heard whine. Although maximum gear extension is 150mph, a lower speed is wise to avoid straining the nosewheel doors. With gear and flap deployment there is a nose up pitch change - easily countered by a quick turn of the overhead trim handle. Despite its inelegant location and its appearance as an old style sunroof winder, having the trim on the roof works very effectively and it is easier to operate than the usual thumb and forefinger wheels generally found in the panel or floor. With the gear down and half flap (10 degrees), 15 inches of manifold pressure gives us 110mph and a nice steady 500 feet per minute descent.

The Twin Comanche's controls remain crisp and responsive even with full flap on base leg and at 100mph. The final approach is flown by the book at 90mph. 80mph across the fence is a good figure to avoid any excessive floating. Even so

the aircraft is inclined to stay in the air after the flare. With the nose high and the column all the way back, the aeroplane suddenly stops flying so getting the technique right is important. Firm arrivals are not easy to avoid unless your height judgement is spot on. The aircraft is not for the easily embarrassed. The PA-30 is difficult to land smoothly. It floats in ground effect and if you get impatient and let the aircraft sink it will repay you with at least two if not three separate touchdowns.

There are two main schools of thought on how to minimise landing embarrassment. The first is to use half flaps, which will get the Twin Comanche down sooner and with less of a sudden cessation of flying. The second is to simply pump up the main gear legs to maximise their extension length. This addresses two of the main causes; it reduces the nose high stance and increases the gap between the flaps and the ground. Either way the PA-30 is an aeroplane that will punish sloppy technique.

Once down, the landing roll, with moderate braking downhill uses some 2000 feet. The pilots operating handbook quotes a landing roll of 800 feet off a touchdown speed of 70mph. The key is not to have any surplus speed over the fence. Simply speaking, in the hands of an average pilot, the Twin Comanche will use substantially less runway to take off than for landing. In the hands of an experienced and skilled pilot, the aircraft uses similar runway lengths to a Cessna 210.

The Twin Comanche is a great little aeroplane. It provides the best of both worlds - two engines at single engine running costs. Most twins require a 100 percent increase in power to produce at most a 25 percent increase in performance over an equivalent single. The PA-30 provides equivalent performance to singles on almost identical horsepower.

It is often said that light twin, if you lose an engine, the second engine will serve only to take you to the scene of the crash. The basic Twin Comanche is not even turbocharged, and yet in almost any circumstance, it will get you to an airport on just one of its engines. This counts for real peace of mind when it matters; at night or in IMC. Besides, it is great to be logging multi-engine time for the price of a single.

The aircraft uses bullet proof IO-320 Lycoming engines with a 2000 hour TBO. Maintenance costs are probably the same as a single equipped with a fussy IO-520 Continental. In all respects the Twin Comanche represents one of the most rewarding and affordable twins.

[END OF REPORT]

Note: PlaneCheck often has some nice [Piper Twin Comanches for sale](#)