PIPER COMANCHE: AMAZING GRACE

Out of production for over a decade, the stylish PA-24s hold their own against modern competition.

BY MARK TWOMBLY

PHOTOGRAPHY BY WILLIAM A. FORD

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The Comanche was Piper Aircraft Corporation's clean break with its past. General aviation was maturing when the prototype Comanche first flew on May 23, 1956. Single-engine aircraft increasingly were being used for business travel, at night and in instrument conditions. A fast, efficient airplane had to look the part, and the Comanche did.

The Comanche was generations ahead of the Tripacer, the model it replaced as Piper's top-of-the-line single. The Tripacer was an obvious spin-off of the Cub, and an ungainly one at that: stubby, fabric-covered fuselage, short, thick wings and that unmistakable pug-nosed Cub snout. Even the twin-engine Apache started as a tube and fabric fixed-gear design.

The Comanche, on the other hand, had an aluminum skeleton of stringers and formers and aluminum skins. The wing had a tapered planform and a laminar flow profile. The vertical fin was swept back—the first swept-tail on a general aviation aircraft. The Comanche also was the first general aviation aircraft to have a stabilator.

With its other modern touches, including a low wing, electric retractable landing gear, constant speed propeller and roomy cabin, the Comanche came well-equipped to compete with the reigning flagship of the single-engine fleet, the Beech Bonanza. The 1958 Comanche 250 was about 17 knots slower the the 1958 250-hp J35 Bonanza, but the Comanche climbed better, flew farther, weighed less and carried more. It also sold for an average of $21,250 equipped; the Bonanza sold for $28,890.

More than a decade after its 14-year, 4,856-unit production run ended, the Comanche still is holding its own against contemporary competition. When *Pilot* published a report on the new Socata Trinidad, a 250-hp, four-place single built in France (see "Socata Trinidad," September 1984 *Pilot*, p. 44), Herbert Yuttal of Denton, Texas, called: "Why do you publish stories about expensive new airplanes that don't do anything more than my Comanche? My airplane has the same engine, uses the same amount of fuel and has better range. For $105,000 [Trinidad's list price in the United States], you should be getting something *new*."

Yuttal owns and flies a 1961 Comanche 250. He bought it in 1972 by trading in a 150-hp Commander 100 plus $8,000. Yuttal logs between 400 and 600 hours a year in the Comanche on his cross-country rounds as the U.S. representative for a Swiss watchmaker. He would like to buy a new airplane, but he says he cannot find one that will outperform the Comanche that doesn't cost a small fortune.

Of course, it is an apples-to-oranges comparison to stack a 1961 Comanche against a 1984 Trinidad, at least in terms of price. Yuttal's 1961 Comanche would sell for well over $105,000 if it were built today. However, Yuttal says there is no incentive for him to buy a new, expensive aircraft that has little or no performance advantage over the Comanche. The Piper Malibu's pressurization, 1,500-nm range and 216-knot cruise speeds have caught his attention, but those virtues carry a price tag of $350,000. Yuttal has no immediate plans to stop flying his Comanche.

My initial impressions of the Comanche were formed during a round-trip flight from western New York to San Antonio, Texas, in August heat. There were four adults plus our weekend baggage on board the PA-24-260. Despite a nine-hour flight down to Texas, there were no complaints from anyone about cramped legs or hunched shoulders. I decided

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Looks, power, handling and comfort won a loyal following.

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that any single-engine airplane that could leave passengers smiling after an all-day flight was worthy of praise.

That trip also left me with pleasant thoughts about the Comanche's flying characteristics. The flight controls are beautifully balanced. Pilots who are apprehensive about wrestling with a high-performance single will be bowled over by the smooth, easy handling of the Comanche.

My euphoria ended on the landing flare. The Comanche is a floater, and it also is easy to touch down nosewheel first. The flaps extend to 32 degrees on 1962 and later Comanches, and the main gear struts are short, so a springy cushion of ground effect piles up underneath the airplane to forestall the touchdown. Comanche pilots have developed several techniques for minimizing float and a wheelbarrow landing. One is to retract the electric flaps during the flare. However, this procedure rates a thumbs down from many instructors. Aircraft accident statistics are replete with incidents of pilots reaching for the flap switch but activating the gear-up switch instead.

Some Comanche pilots complain that retracting the flaps on the flare leads to an "arrival" or firm landing rather than a smooth touchdown. Their solution to the float is to pump up the main gear struts to increase ground clearance. On the ramp, a Comanche sits in a tail-low attitude, which means that, on landing, the pilot has to get the nose up very high to ensure that the main wheels touch first.

There are other quirks. The takeoff roll can seem interminable. The Comanche requires a lot of speed before the long, narrow wing generates enough lift for rotation and climb-out. Also, early model Comanches have flight instruments arranged in a non-standard pattern. Engine instruments and fuel gauges are located on the right side of the panel, where they are difficult to monitor. Unless the panel has been updated, gyro instruments very well may be military surplus relics.

Piper built seven versions of the PA-24, beginning with the 180 in 1958. The horsepower increased in steps, from 180 to 250 in 1958, to 260 in 1964, to a flirtation with 400 hp in 1964 and 1965 and, finally, to a twin-turbocharged 260-hp Comanche in models from 1970 through 1972.

Although 180 hp does not seem to be quite enough for a four-place airplane with a gross weight of 2,500 pounds, the PA-24-180 proved to be quite popular. There were 1,143 built between 1958 and 1964. The trade-off for a lower climb rate, slower cruise speeds and less payload in the 180, compared to the 250 and 260 Comanches, is lower operating cost. The four-cylinder Lycoming O-360 is more fuel-efficient than the 250- and 260-hp six-cylinder Lycoming O-540s and IO-540s, and the overhaul is less expensive.

The Comanche 180 maintains respectable cruise speeds, thanks to the efficient wing and a constant speed propeller. At 55 percent power, the 180 should cruise at 116 knots while using only 7.5 gph. At 75 percent power, speed increases to 139 knots, with a fuel flow of 10 to 11 gph.

The Comanche's performance increased dramatically with the introduction of the 250. Cruise speeds at all power settings jumped 20 knots, and the climb rate increased more than 50 percent, to 1,400 fpm. Although the 250 is heavier than the 180, useful load increased 125 pounds. Piper began offering two 15-gallon outboard wing tanks as an option on both the 180 and 250 Comanches in 1961. With full tanks—90 gallons—the 250 could cover more than 1,000 nm.

In 1964, fuel injection, another 10 hp and 100 pounds

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Older Comanches such as this 1965 260 often present a mix of modern avionics and archaic placement of flight instruments. The red-leather "Palm Beach" interior was a luxury option.

were added to the Comanche. The 180 and 250 were dropped. Takeoff distance decreased, and the climb rate increased. The 260 was a few knots faster than the 250, but each knot cost an extra gallon-per-hour of fuel.

The basic PA-24 airframe changed little until the 260 B was introduced in 1966. The 260 B fuselage was about six inches longer than previous Comanches, which allowed Piper to add a third set of windows along the side and offer fifth and sixth passenger seats as an option. Gross weight increased 200 pounds, to 3,100 pounds, and the 1,012-pound payload with standard 60-gallon fuel capacity enabled all six seats to be occupied, and a suitcase or two could be stowed in the baggage compartment.

The Comanche reached its aesthetic peak with the 260 C, which appeared in 1969. Piper abandoned the ungainly, blunt-nosed cowl with its gaping, oval cooling inlet surrounding the prop spinner in favor of the tapered "tiger shark" cowl that had been used on Twin Comanches since 1963. The prop shaft on the 260 C was extended slightly to make room for the tapered cowl. The longer nose also helped maintain the center of gravity range, since the baggage weight limit had increased 50 pounds, to 250 pounds.

A year later, Piper brought out the Turbo 260 C. In those days, turbochargers were new to general aviation singles. Two Rajay Industries turbochargers were fitted to the Lycoming IO-540 engine, one on each exhaust stack. The pilot controlled boost through a manually operated lever located to the left of the throttle on the power quadrant. Power management was critical in the Turbo Comanche. The penalty for overboosting 10 inches in excess of the 30-inch manifold pressure redline was a mandatory engine overhaul. Piper built only 28 Turbo Comanches.

An earlier Piper experiment in high-altitude performance produced the Comanche 400. A massive, eight-cylinder Lycoming IO-720-AIA engine and Hartzell three-blade propeller were fitted to the basic PA-24 airframe. The philosophy was simple: More power available at sea level meant more power and speed available at altitude. The price to be paid was higher fuel consumption, expensive overhauls and more weight.

At 8,000 feet and 75 percent power, the Comanche 400 gulps 23 gallons of fuel an hour. However, most 400 pilots power back to about 55 percent, where the fuel burn is a more acceptable 15 to 16 gph. Cruise speed drops from 185 knots at 75 percent power to 163 knots at 55 percent. The 400 has a standard fuel capacity of 100 gallons, with 30 more available in the optional tanks.

The Comanche 400 was an interesting variation of the PA-24, but the experiment lasted only about a year. Piper built 148 400s, and, today, despite an engine overhaul burden of about $18,000, most are worth between $35,000 and $40,000—just what they cost 20 years ago.

Comanches have been hit with a raft of airworthiness directives addressing almost every part of the airframe: control surfaces, stabilizer, landing gear and wing spar. AD 72-22-5 was issued in response to tail flutter. It calls for either placarding a lower Vno (maximum structural cruising speed) of 167 mph/145 knots CAS and lower Vne (never exceed speed) of 188 mph/163 knots CAS, or attaching balance weights to the tips of the stabilator and/or rudder. Most owners have opted for the placard. AD 75-12-6 mandates an inspection every 100 hours of the vertical fin forward spar fuselage attach point to check for cracks. AD 82-19-1 re-

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quires a 100-hour inspection of the wing lower main spar caps and upper main spar attachment.

Other ADs address problems with control surface attachments and actuators and landing gear assemblies. AD 77-13-21 mandates inspection of the complete landing gear system on Comanche 250s, 260s and 400s every 1,000 hours and replacement of bungee cords every 500 hours or three years, whichever comes first.

Comanche owners should consider joining the International Comanche Society, Incorporated (Box 468, Lyons, Kansas 67554). The society publishes a monthly magazine and holds regional fly-ins. It also keeps close tabs on the supply of Comanche parts—an important consideration, now that Piper has closed down its Lock Haven, Pennsylvania, plant, where the Comanche was manufactured. Piper officials say the company will continue to provide parts and technical support, but the remaining Comanche tooling is in storage, and no new parts are being fabricated. Orders are being filled from existing inventory.

Some parts are no longer available from Piper. For example, cylinder head temperature and fuel gauges for the Comanche cannot be bought new. There are enough spare parts in the field to keep all active Comanches flying, according to Dudley Hill of Hill Aviation in Lancaster, Pennsylvania, a Comanche service center, but shortages of some parts are likely to start occurring.

Why did Piper stop building the Comanche in 1972? The PA-24 was born during a time of transition at Piper, and it faded away in the same manner. At the same time the Comanche was being developed in Lock Haven, Piper was making plans that would change the company forever. Howard "Pug" Piper, son of William T. Piper Sr., wanted to build a new research facility outside of Lock Haven. Piper decided to open a new plant in Vero Beach, Florida.

The first model to be developed and built at Vero Beach was the PA-28 Cherokee. It started as a two-seat, 140-hp trainer, but evolved into the basic template for all Piper singles, except for the Malibu. The four-place, retractable-gear PA-28R Arrow, first with 180 hp and later with 200 hp, emerged as a competitor to the Comanche. The Arrow's performance was not up to Comanche standards, but it was difficult to ignore the difference in price. A 1967 Comanche 260 B sold for about $32,800 equipped. The 1967 PA-28R-180, the first Arrow, listed for $22,800, equipped. The dollar gap widened. In 1970, the 200-hp Arrow sold for $26,800, while the Comanche 260 C had climbed to $40,500.

Comanche sales were declining, while Piper managers scowled over Comanche production inefficiencies. It took 1,400 hours to build a Comanche; an Arrow took 1,100 hours. The same production line could turn out a variety of Cherokee models, including the Arrow; the Comanche tooling was good only for Comanches. The signals were clear.

The end came when Hurricane Agnes dumped nine inches of rain on central Pennsylvania in 1972, causing the Susquehanna River to climb its banks. The city of Lock Haven and the Piper Aircraft plant were devastated. Comanche tooling, parts and airplanes were damaged or destroyed in the flood. It was a tragic but convenient opportunity to close the book on what many consider the second most appealing single built by Piper. □

	PA-24-180	PA-24-250	PA-24-260	PA-24-260-B	PA-24-260-C	PA-24-260-TC	PA-24-400
Price new	$17,900	$24,000	$30,740	$33,300	$41,400	$48,800	$36,890
Current market value	$17,000	$20,250	$25,500	$28,500	$35,250	$40,250	$37,500
Specifications							
Engine	LYC O-360-AIA 180 hp @ 2,700 rpm 4 cyl	Lyc O-540-AIA5 250 hp @ 2,575 rpm 6 cyl	Lyc O-540-E4A5 260 hp @ 2,700 rpm 6 cyl	Lyc IO-540D 260 hp @ 2,700 rpm or Lyc O-540-E-A5	Lyc IO-540-NIAS 260 hp @ 2,700 rpm 6 cyl or Lyc 540-E4AS	Lyc TIO-540-RIAS 260 hp @ 2,700 rpm 6 cyl + turbos	Lyc IO-720-AIA 400 hp @ 2,650 rpm, 8 cyl
Empty weight (lb)	1,475	1,600	1,700	1,728	1,773	1,894	2,110
Useful load (lb)	1,075	1,200	1,200	1,372	1,427	1,306	1,490
Payload w/full fuel (lb)							
Standard	715	740	740	1,012	1,067	946	890
Optional	N/A	660	660	832	887	766	710
Gross weight (lb)	2,500	2,800	2,900	3,100	3,200	3,200	3,600
Performance							
Takeoff over 50 ft (ft)	N/O	N/O	N/O	1,260	1,400	1,800 normal 1,400 w/Turbo	1,500
Rate of climb (fpm)	910	1,400	1,500	1,370	1,320	1,320	1,600
Max speed, sea level (kt)	145	165	169	169	169	210	194
Cruise speed 75%, 8,000 ft (kt/gph)	139/10.5	157/14	161/19	158/14.1	161/14.1	*	185/23
Cruise speed 65%, 12,000 ft (kt/gph)	133/8.8	152/12	155/15.5	153/12.7	152/12.7	**	178/17.5
Range @ 75%, no rsv (nm)							
Standard	782	680	634	633	639	721	869
Optional	N/A	1,016	973	980	982	1,108	1,147
Range @ 55%, no rsv (nm)							
Standard	1,130	870	717	695	673	825	1,017
Optional	N/A	1,434	1,100	1,101	964	1,238	1,338
Service ceiling (ft)	18,800	20,000	20,600	20,000	19,500	25,000	19,500
Landing distance over 50 ft (ft)	1,025	1,280	1,420	1,435	1,200	1,465	1,820

Footnotes: N/A—Not applicable. N/O—Not obtainable. *Turbo cruise: 25 in, 2,400 rpm @ 25,000 ft, 198 kt, 15 gph
**Intermediate cruise: 27 in, 2,400 rpm @ 12,000 ft, 178 kt, 13 gph.

SPOTTER'S GUIDE, overleaf

COMANCHE SPOTTER'S GUIDE

May 23, 1956: Piper test pilot Jay Myer completes the successful first flight of the new PA-24 Comanche. Although the prototype was powered by a 180-hp Lycoming O-360 four-cylinder engine, Piper had not yet made a decision on an engine for production Comanches. Piper originally planned to start delivery of Comanches to customers in the spring of 1957 but fell about nine months behind schedule. Trailing link landing gear would be replaced by straight struts.

The Comanche was awarded type certification on June 20, 1957—with a 180-hp Lycoming O-360—and the first production model, N5000P, flew in September of that year. At that time, Piper was planning to build one Comanche per day in Lock Haven, eventually increasing to five per day. The first customer Comanche, N5010P, was delivered on January 7, 1958, to Arkansas Aviation Sales in Little Rock, Arkansas. Less than 10 months after production began, the 500th Comanche was delivered.

On April 16, 1958, Piper certificated a six-cylinder 250-hp Lycoming O-540-AIA in the PA-24. Gross weight increased 200 pounds, to 2,800 pounds, and useful load increased from 1,075 pounds to 1,200 pounds. An Auto-Control single-axis autopilot with heading bug became standard on 1959 Comanches.

In addition to the usual annual change in paint scheme, Piper tweaked the cabin vent system for 1960, redesigned the carburetor air filter system and added reclining seats to highlight a new interior finish.

Standard 60-gallon fuel capacity increased to 90 gallons in 1961 with the addition of two optional 15-gallon wing tanks. No-reserve range of the Comanche 250 with the 90-gallon capacity increased to 1,016-nm at 75-percent power. Gross weight increased 100 pounds, and useful load rose to 1,270 pounds. A small scoop was added to the top of the fuselage for cabin air.

The 1962 Comanche 250 appeared with new "Max-Lift" slotted flaps. Electrically operated flaps extended to 32 degrees to improve short-field performance of the aircraft and, ostensibly, to eliminate the landing float that is characteristic of Comanches.

In 1964, Piper dropped the 180-hp and 250-hp Comanches and introduced the Comanche 260 as their successor. Both carbureted and Bendix fuel-injected versions of the 260-hp Lycoming 540-cubic-inch engine were offered. Piper also changed to single-fork main landing gear assemblies. An extension was added to the top of the vertical stabilizer and rudder, resulting in an upswept look. A number of cabin refinements were introduced: additional soundproofing and double-pane windows; redesigned seats; removable floor panels to facilitate inspections; and improved heating and cooling systems. Cabin fresh-air scoop was removed from top of fuselage and replaced with a duct in the dorsal fin. Electric stabilator trim became an option.

1964 also saw the introduction of the Comanche 400. Piper modified the Comanche 260 to accept an eight-cylinder 400-hp Lycoming IO-720-AIA and three-blade Hartzell propeller. Climb rate was advertised as 1,600 fpm, and, at 12,000 feet and 65-percent power, the 400 was said to cruise at 178 knots burning 17.5 gph. Leather interiors and electric trim were standard.

The Comanche 260 B was introduced in 1966. It featured a longer propeller spinner and a slightly longer fuselage that allowed for optional fifth and sixth seats and a third set of windows. Thicker glass also was installed to aid soundproofing. Max gross weight increased 200 pounds, to 3,100 pounds, increasing the useful load 172 pounds, to 1,372 pounds.

Three years later, in 1969, the 260 B was replaced by the Comanche 260 C, the shapeliest Comanche yet. The prop shaft on the Lycoming IO-540-NIAS engine was extended several inches to permit installation of the sleek "tiger shark" cowl that had debuted several years earlier on the Twin Comanche. The new cowl treatment and extended prop shaft mainly helped maintain the center of gravity range, since baggage capacity had increased 50 pounds, to 250 pounds.

The final version of the PA-24 was the Turbo Comanche 260 C. Two Rajay Industries turbochargers were factory installed on the engine, one on each exhaust stack. The pilot controlled boost with a manually operated wastegate. Power and boost management were critical on the Turbo Comanche C, and the airplane was not a big seller. Only 28 were manufactured between 1970 and 1972. Comanche production ceased in 1972 when floods swept through the Lock Haven assembly plant.—*MRT*