PILOT editor tests Piper's new single-engine aircraft and finds it delivers all the manufacturer promised. Its performance, simplicity of operation and maintenance ease expected to make it one of world's most popular lightplanes

Cherokee: The Plane With A Future

by MAX KARANT • AOPA 18

If Piper was able to sell as many *Tri-Pacers* as it has, the *Cherokee* should go a long way toward filling the sky with private planes.

A completely new design, the *Cherokee* (Piper's Model PA-28) is the company's modern replacement for the venerable *Tri-Pacer* design—although the *Tri-Pacer* configuration will probably continue down the production line at Lock Haven, Pa., for a long time yet, in the form of the low-cost two-place *Colt*.

But the *Cherokee* is a complete departure from the let's-whittle-some-more-on-the-old-model school of thought that has kept the *Cub*, and its innumerable offspring (*Super Cruiser, Family Cruiser, Vagabond, Clipper, Pacer,* etc. etc.) probably the world's most widely-used basic design. The *Cherokee* was started from scratch at Piper's Vero Beach, Fla., research and development center, and is already in production there; it won't be manufactured at Lock Haven. Man largely responsible for the excellent new design is Fred Weick (AOPA 9893), designer of the *Ercoupe*.

Piper recently turned over *Cherokee* No. 5 (N-5004W) to me to fly for several days, in any way I chose, for this report. Except for two round trips between Lock Haven and Washington, D. C., virtually all the flying I did was local, in and out of airports large and small, under varying conditions ranging from hot to cold days, and from light loads to overloads. After 14:39 of this kind of flying, I feel I learned pretty much what the *Cherokee* is like, what it will do, and what it won't do.

One of the most important characteristics about the *Cherokee* is its superb ground-handling characteristics—and takeoffs and landings. It's no secret that the *Tri-Pacer* is a "hot" airplane, has a high ground-accident rate, and is as likely as not to blow over while standing still if you're not careful where and how you park. The *Cherokee* was designed with this sharply in mind—and the result is a revelation. In my opinion, nothing short of running the *Cherokee* through an open ditch could cause a ground accident with it. Its wide, tricycle gear makes excellent landings and takeoffs almost without regard for what the inexperienced pilot does wrong. Stability under these conditions is so good that crosswind landings and takeoffs can be made with little or no effort; what you do wrong the airplane will correct for you.

Another outstanding *Cherokee* feature is its cabin size. The front seat measures 41 inches across, which is just three inches narrower than the *Comanche's* 44 inches. Back seat dimensions are approximately the same, and there's leg room in back for even long-legged passengers. I carried quite a few in the back seat, and made it a point to question them on the comfort. All were pleasantly surprised. Both front seats are moveable, and in cruising flight are rolled

(Continued on page 60)

A complete departure from old designs, the Cherokee is gaining a reputation for its superb ground-handling characteristics. Note the new model's wide, tricycle gear in the photograph. It is now in production at Piper Aircraft's Vero Beach, Fla., factory

(Continued on page 36)

forward, giving substantial leg room in the rear.

Visibility from all seats is excellent. From the pilot's position, it's better than that of either the *Comanche* or the *Tri-Pacer;* it's comparable to the *Bonanza.*

Normal climbing airspeed is supposed to be 85 m.p.h., indicated. That's the figure I used most of the time. On one occasion I timed the ship's rate of climb with four heavy people, full tanks (50 gallons), outside temperature of 68°. From sea level to 2,000 feet, 04W averaged 650 f.p.m. On another occasion, flying alone this time but with full tanks, I climbed 6,000 feet, averaging 675 f.p.m., and 9,000 feet averaging 590 f.p.m.

When I picked up 04W at Lock Haven I was told that normal cruising r.p.m. was 2,450. That's the figure I used throughout my flying, despite the fact that Piper claims the *Cherokee's* maximum performance is obtained at 75% power, which often requires higher r.p.m. At 2,450 r.p.m. the *Cherokee's* normal indicated airspeed at low altitudes averaged 115-118 m.p.h. That usually worked out to about 120 m.p.h. TAS.

Piper claims its optimum cruising speed for the *Cherokee* is at 7,000 feet where, at 75% power, TAS is supposed to be 132 m.p.h. So I set the altimeter to 29.92 and did quite a bit of flying at 7,000 feet pressure altitude. Still using 2,450 r.p.m., I found 04W showed an average indicated airspeed of 104 m.p.h.; that worked out to 117 TAS. Another time, with full tanks and two persons aboard, I climbed to 7,000 feet pressure altitude, carefully set power and trim, then flew a round trip between two omni stations 28.8 miles apart. The air was smooth so I was able to hold altitude quite accurately. Groundspeed for the outbound leg (331°) worked out to 122.5 m.p.h. The return leg (151°) was made at 119 m.p.h. During the flight I asked Washington Radio for the wind at 7,000 feet: 050° at 7 m.p.h.

If I had used the advertised 75% power at that altitude, according to the *Cherokee* owner's handbook I would have had to run the engine at approximately 2,600 r.p.m. According to a power chart in the handbook, true airspeed then would have been 130 m.p.h. Working the chart backwards, I found I had used 64% power at that altitude, and the true airspeed shown for that power is almost exactly what I got.

On another occasion, I cruised at 9,500 feet MSL, again using 2,450 r.p.m. Temperature up there was 35° and indicated airspeed was about 105. That worked out on the chart to 63% power and 123 m.p.h. TAS.

Maneuverability and controllability of the *Cherokee* are excellent. It's quite stable in level flight, and has excellent stall characteristics. Fully loaded and with flaps down, the stall warning light came on just above 60 m.p.h. and actual stall at about 55. Piper has made a mistake in its use of the stall-warning instrument, I feel. They use the Safe Flight device, but have eliminated the horn, leaving just the red light on the panel. I believe this is an unnecessary hazard, because inadvertent stalls are not likely to happen when the pilot is staring at the instrument panel. The classic inadvertent stall takes place in a turn, usually at low altitude, when the pilot is looking at something outside the airplane. Chances are excellent he won't see the light at all, or until it's too late. Only excuse Piper could have for disconnecting the horn—an excuse used by others before—is that the stall horn might be confused with the gear horn. The *Cherokee* has fixed gear, and should have the stall-warning horn connected.

Layout of the cabin interior is quite a bit like that of the *Tri-Pacer.* The instrument arrangement is much the same; O4W was equipped as a Super Custom model and had two radios (Piper's low-cost Auto Nav direction finder, and a Narco Superhomer). Instruments included a directional gyro and gyro horizon. The *Cherokee* has the old Piper braking system: the single handle under the center of the instrument panel, with the nosewheel being steered by the rudder pedals. This system is peculiar to some Piper models (the *Comanche* now is being changed over to rudder-pedal toe brakes), and the *Navion.* It's particularly awkward to use on the ground because, for some unknown reason, they've installed the microphone in the center of the instrument panel, to the right of the throttle. Flying the *Cherokee* from a busy airport like Washington National was little short of cockpit acrobatics. Besides operating the mike, I also had to control the throttle, the flaps, and that hand brake, all with my right hand. The only practical solution I found was to get a clearance to land, ignore the radio from that point until I'd landed and pulled off the runway somewhere and stopped. Then I'd change to ground control and explain the delay. Unless I'm just a creature of habit, I'd say it would be much easier—and safer—for the pilot if the mike was mounted on the pilot's left and the airplane had toe brakes. At least that would distribute the work between both hands and your feet.

Noise level in cruising flight is fairly high, but you still can use the overhead speaker for radio work. The noise level was high at 2,450 r.p.m., and higher at 2,600 r.p.m. Even so, I found it quite possible to converse with passengers in both the front and back seats.

Another item I noted, and which undoubtedly should be changed, is the location of the magnetic compass. Current *Cherokees* have it installed in the far left-hand corner of the main instrument panel, where it's both hard to see and probably unduly affected by metal and other instruments in the panel. The vertical center strip in the windshield has nothing else on it, and would probably be the most logical place to move it.

Just to look at the *Cherokee* might give the impression that it's a simple, unsophisticated airplane. But you only have to look a little closer to see that it's really an ingenious design, intriguing in many ways. Of course, it's all-metal—but it has some 400 fewer parts in it than the *Tri-Pacer.* Simplicity and ease of construction and maintenance are the watchword. Wherever possible, complex—and costly—internal structure has been eliminated. Wing surfaces, for example, are large single sheets, wrapped around the leading edge and riveted at the trailing edge. So is the "flying tail" elevator and tab. The rudder and fin also are simple, wrap-around structures, but with added strength obtained by pressing corrugations into the skin itself. This technique is also used to reinforce the ailerons and bottom center section of the fuselage. The appearance is strongly reminiscent of John Thorp's (AOPA 22461) *Sky Skooter.*

The wing itself is unusually thick and stubby, and looks somewhat like the wing on the *Pawnee* agricultural plane. The two 25-gallon tanks are another example of ingenuity. Each is simply a standard-sized sheet section, wrapped around the leading edge and taken back to the wing spar. Side walls have been added to this unit, and the whole thing sealed liquid-tight. To service or change a tank, you simply unscrew that section from the leading edge and take it out.

The wing tips, nose cowl, elevator tips and rudder and fin tops are Fiberglas, and are easily repaired or replaced.

One of the most striking things about the *Cherokee's* appearance is its close resemblance to the *Comanche.* At the request of one group of tower operators, I flew slowly by their tower so they could see this airplane for the first time. The controller on the mike summed it up very well: "It looks just like a *Comanche* with the gear down."

The *Cherokee* is the first Piper design to be required to carry two rotating beacons, one atop the vertical fin and the other under the nose cowl. This is the result of a fluke which took place in Washington some time ago, in routine meetings on airworthiness requirements in the Civil Air Regulations. The FAA reviews these requirements annually, and calls in all interested segments of industry to discuss the various proposals. One of these had to do with minimum coverage assured by rotating beacons. Actually, representatives of the aircraft manufacturers were the ones who insisted on certain more-rigid beacon-coverage standards, so the FAA put them in the regulations. But when it came to applying the standards, manufacturers found to their surprise that it would take two beacons to meet the requirements. That's why any new airplane, certificated after the date this change was adopted in the regulations, must carry two beacons. Designs certificated before that date, however, can continue to use the one beacon. Now the manufacturers are trying to get the rule changed

Official Specs and Performance Data—Cherokees 150, 160

	Cherokee 150	Cherokee 160
Engine	Lyc. O-320-A2B	O-320-B2B
H.P. and R.P.M.	150 at 2700	160 at 2700
Gross weight (lbs.)	2150	2200
Empty weight (standard) (lbs.)	1185	1195
Useful load (standard) (lbs.)	965	1005
Wing span (ft.)	30	30
Wing area (sq. ft.)	160	160
Length (ft.)	23.3	23.3
Height (ft.)	7.3	7.3
Power loading (lbs. per h.p.)	14.3	13.8
Wing loading (lbs. per sq. ft.)	13.4	13.8
Baggage capacity (lbs.)	100	100
Fuel capacity, with reserve (gals.)	50	50
Top speed (m.p.h.)	136	138
Cruising speed (75% power, sea level, m.p.h.)	121	123
Optimum cruising speed (75% power, 7,000 ft. m.p.h.)	130	132
Stalling speed (flaps down, m.p.h.)	53	56
Best rate of climb speed (m.p.h.)	85	85
Rate of climb (ft. per min.)	660	700
Service ceiling (ft.)	14,300	15,000
Absolute ceiling (ft.)	16,800	17,500
Fuel consumption (Gals. per hr., 75% power)	9	9
Cruising range (75% power, sea level, std. fuel)	4 hrs., 485 mi.	4 hrs., 492 mi.
Optimum cruising range (55% power, 10,000, std. fuel 7.2 g.p.h.)	5 hrs., 560 mi.	5 hrs., 570 mi.
Cruising range (75% power, sea level, reserve fuel)	5.5 hrs., 665 mi.	5.5 hrs., 675 mi.
Optimum cruising range (55% power, 10,000, reserve fuel 7.2 g.p.h.)	7 hrs., 790 mi.	7 hrs., 800 mi.

again, to make the single beacon legal.

There are two models of the *Cherokee* offered: 150-h.p. and 160-h.p. The ship I flew was a 160. The 160 has a gross weight of 2,200 lbs., the 150 is 2,150 lbs. Piper's performance chart says you deduct two m.p.h. from the 160's figures for the 150. Here's how their prices compare with the 1960 160-h.p. *Tri-Pacer:*

	Cherokee 150	*Cherokee 160*	*Tri-Pacer 160*
Standard	$9,795	$9,995	$9,345
Custom	10,995	11,195	-----
Super Custom	11,995	12,195	11,225
Auto Flite	12,795	12,995	11,975

Official Piper specifications and performance data on the two *Cherokees* may be found in the table above.

Much of the flying I did in O4W was done on hot days. The *Cherokee* ventilation system proved unusually effective; there are individual vents at each seat, as well as a general cabin ventilator on the right side of the main instrument panel.

The fuel system is controlled by a simple panel on the side wall by the pilot's left leg. There's a fuel gauge for each tank and it's a simple matter to change from one tank to the other. There's also an electric fuel pump added to the system, which is always used during landings and takeoffs. Fuel consumption at 75% power is 9 g.p.h., and the engine can be leaned out in cruising flight at any altitude. Best cruising economy is 7.2 g.p.h. at 55% power, which would be a true airspeed of just under 110 m.p.h. at 7,000 ft.

The flap is a simple mechanical device, with the handle between the two front seats. There are three extended positions: 10°, 25° and 40°. I tried full flap for short takeoff a few times, and the performance was quite good. With full flap and nose-up trim, the *Cherokee's* landings are in a class by themselves.

Within a year or so, the *Cherokee* should prove to be one of the world's most popular light aircraft. It certainly is a worthy successor to the *Tri-Pacer*.

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