The only airplane designed by people named Piper was the PA-15 Vagabond. They economized by using shortened Cub wings and a new and shorter fuselage.

Short-Wing Pipers

Clipped wings and cost-cutting saved the day

BY PETER M. BOWERS

Big things were predicted for private aviation at the end of World War II, and for a while it appeared the predictions were true. There was a boom in personal-aircraft sales, with the leading firms—Aeronca, Taylorcraft and Piper—producing relatively minor updates of their well-established prewar models in great quantities.

The boom collapsed in early 1947, forcing quite a few firms to either cut back, change hands or shut down completely. Piper Aircraft Corporation of Lock Haven, Pennsylvania, whose popular "Cub" model had given its name to a whole family of low-powered, two-place aircraft, teetered on the brink of bankruptcy. The bankers then sent in a troubleshooter with absolute power. He shut the plant down for six months, slashed the payroll from 2,607 to 157, fired William T. Piper, Jr., (one of founder W.T. Piper's sons) from a high management position and stripped the Piper patriarch himself of his authority.

When production resumed in January 1948, only one previous Piper model—the Cub—survived. But it was no longer the famous grass-roots trainer and personal putt-putt. With more power, flaps and other refinements, it became the "Super Cub," a workhorse, utility model that is still being produced today.

For the trainer market, the troubleshooter ordered the development of an entirely new model, to be designated the PA-15 "Vagabond." It was the only Piper airplane designed personally by people named Piper. W.T. Piper's sons—Howard (Pug) and Thomas Francis (Tony)—assisted by designer David Long, laid out the new model in six weeks. The Vagabond was about as simple and austere as a trainer could get, and it turned out to be the first of a series of six very similar models that are discussed here.

Design and production shortcuts were taken by using standard Cub parts, such as tail surfaces and wings, from the huge stock on hand. But there was little other resemblance to the classic Cub, except its single high wing and famous Cub-yellow paint.

The fuselage was an aerodynamic horror—it was twice as wide as the Cub, which provided side-by-side seating with stick controls, but was nearly four feet shorter, producing one of the stubbiest lightplanes of all time. The long wing panels of the Cub, largely responsible for its famous "float" on landing, were shortened three feet on each of the inside ends. With the original aileron length, this provided great maneuverability but made for high induced drag and a high sink rate that effectively removed all vestiges of a "float." As on the Cub, the aileron cables were external.

The lines were modern in that the 65-hp Lycoming engine was enclosed in a neat cowling, but the economy was reflected in the use of a wooden propeller and minimum instrumentation. The fuselage was fitted with a forward hinged door on the right side only, and the Cub's horizontal tail was modified with a tab for longitudinal trim instead of the Cub's stabilizer jackscrew. A 12-gallon fuel tank fit between the panel and the firewall. The landing gear was rigid, using only the 8 × 4 tires as shock absorbers. Economy was carried so far that there was no fuselage stripe on the early models.

The prototype Vagabond flew in October

The fairings on this PA-17 carry the rubber shock absorbers that, along with a new engine, distinguish it from the earlier PA-15.

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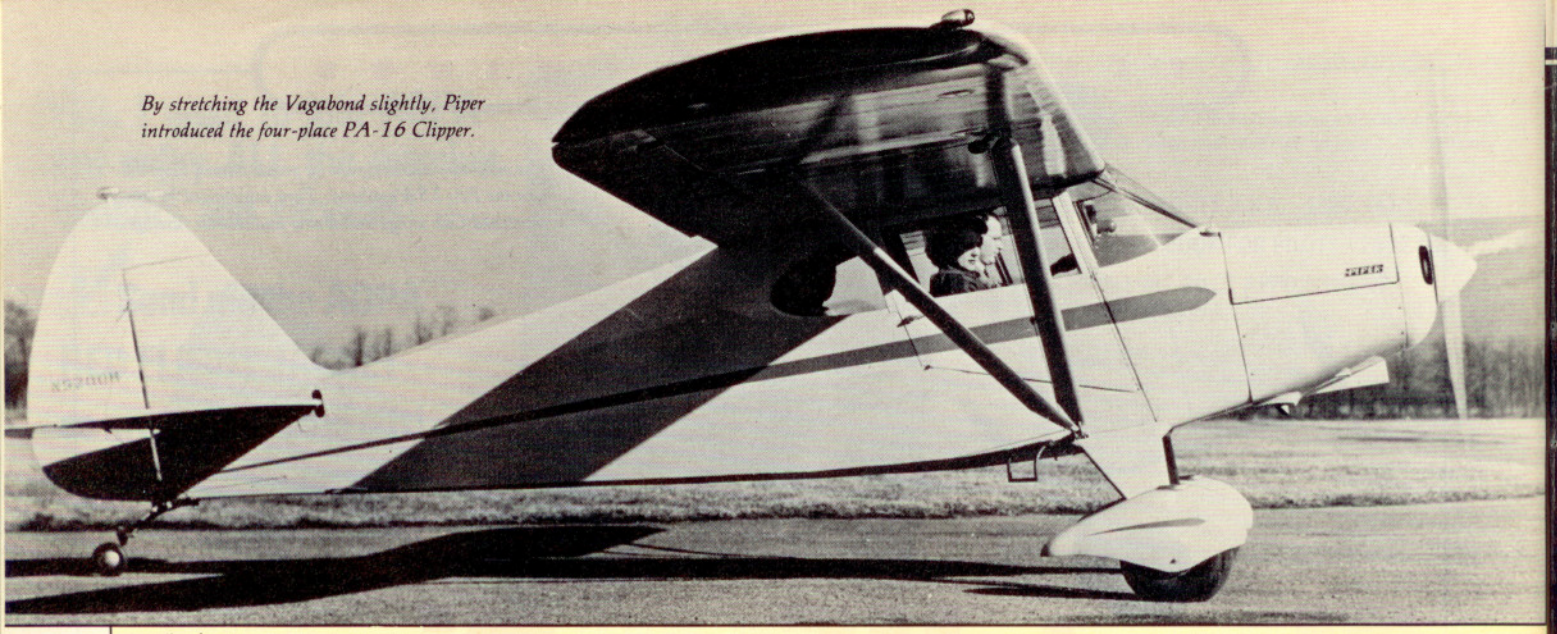

By stretching the Vagabond slightly, Piper introduced the four-place PA-16 Clipper.

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1947 and received Approved Type Certificate (ATC) A-800 on July 1, 1948. Altogether, 388 PA-15s were built and sold for $1,990 each to get Piper heading on the upward path again.

The bare-minimum PA-15 did what was expected of it, but it was soon evident that the customers were willing to pay a little more money for a little less austerity. The PA-15, therefore, was upgraded to the PA-17, still called Vagabond. Since Lycoming just had quit making its 65-hp engine, Piper switched to the Continental A-65 for the PA-17. With 170 cubic inches compared to the Lycoming's 145, the A-65 delivered more thrust and gave the PA-17 better performance. Also, rubber-cord shock absorbers were added to the landing gear.

The PA-17 received ATC A-805 on August 26, 1948, and replaced the PA-15 on the production line. A total of 215 were built and each carried a price tag of $2,195. When the Vagabond was phased out in early 1949, Piper withdrew from the two-place trainer market that had been the mainstay of its business.

The PA-15 was designed with growth in mind, which made it easy to stretch the little Vagabond into a four-seater. The result was the PA-16 "Clipper," which actually appeared later than the PA-17 and received ATC 1A-1 on October 18, 1948. (The different style of ATC number resulted from a change in government procedure. ATCs were no longer issued consecutively from a central point; certification was now handled within numbered FAA regions; so 1A-1 was the first model approved in FAA Region 1.)

The Clipper was considerably more than just a stretched Vagabond with the same short wing. Powered with the 115-hp (108 hp for full power lasting longer than one minute) Lycoming O-235 with starter, it was far better equipped, but control was still through dual sticks. There was now a second door on the left side of the cabin for the rear seats and the longitudinal trim reverted to the old stabilizer jackscrew; the aileron cables were still external. The Vagabond's 12-gallon fuel tank was retained in the fuselage, but an 18-gallon tank was added to the left wing for a total of 30 gallons. In spite of the bigger engine and four-place cabin, the Clipper was less than two feet longer than the Vagabond. The spacing and angles on landing gear struts differed considerably and wheelpants were added. The Clipper also could be fitted with pontoons and as such was designated PA-16S (for seaplane). Initial price tag was $3,295 and 736 were built.

Like some of its contemporaries, the Clipper was a marginal four-seater at full gross weight but was a dandy two-seater. However, production was short-lived, ending in 1950. Pan American Airways had copyrighted the name "Clipper" and went to court to stop Piper from using it. (Remember the Packard Clipper car? The airline squelched that one, too.)

The prohibition of the use of the name did not kill Piper's four-seater, however. They simply changed the name to "Pacer" and made enough small changes to the airframe to justify a new model number—PA-20. The most notable change was the switch from stick controls to wheels and the shortening of the old Cub ailerons to make room for flaps on the wing. The aileron cables were now all internal, and two 18-gallon fuel tanks were in the wings.

The original powerplant was the O-235 Lycoming used in the Clipper, and the original identification was "Pacer 115." However, the engine quickly was changed to the 125-hp Lycoming O-290-D, and the airplane became the "Pacer 125", selling for $3,795. Two options on controllable-pitch propellers and other extras resulted in the "Pacer 135" model, which sold for $4,625. The PA-20 received ATC 1A-4 on December 21, 1949.

In the late 1940s, some operators of Cubs did something that was to have a great effect on subsequent Pacer production. With tricycle landing gear clearly dominating the market, they turned the existing Cub gear around to move the main wheels aft of the center of gravity and added a nose wheel. In fact, one operator started selling modification kits. Though this modification was not a significant improvement for the docile Cub, it did show that an old design could adapt to a modern trend. Since the Pacer was new and was considerably heavier and

A copyright held on the name Clipper forced Piper to change its aircraft's name. Some improvements were made, and the result was the PA-20 Pacer. It had flaps, control wheels and a 125-hp Lycoming O-290D engine.

If you look closely at a Piper Colt of the early 1960s, you will discover that it is simply the PA-22 Tri-Pacer airframe with one door, no flaps and the 115-hp Lycoming O-235 engine of the PA-16.

Originally offered only as an option, the Tri-Pacer became the principal production model of short-wing Pipers. This is an early model with the original designation, Pacer 125. Eventually, the designation became the Tri-Pacer 160.

more powerful than the Clipper, Piper decided to offer tricycle gear as an option. The existing Pacer gear could not simply be reversed as on the Cub, so new gear and some fuselage structural changes had to be made. These required a new ATC—1A-6, issued December 12, 1950—and justified the new model number, PA-22.

At first, the PA-22 was just another Pacer 125, albeit with a nosewheel. Unlike those of its contemporaries, the nosewheel was the same size as the main wheels, making it much more prominent than it otherwise would have been. What started as an option to a basic model soon became so popular that the roles were reversed; the taildragger was soon the optional version and was phased out in 1954 after 1,121 were built. This three-wheel model, now named "Tri-Pacer," went on to become Piper's principal product of the time. The power increased from 125 hp to 160 hp with Lycoming's O-320. There were equipment options galore, including a 150-hp version dubbed the "Caribbean," and the price tag climbed to $9,345. The Tri-Pacer was in production for nearly 13 years and 7,668 were sold.

All of the short-wing Pipers used late-1920s structure, but they brought prosperity back to the company and made it possible to fund research into new structures and models. Piper entered the light-twin market in 1952 with the all-metal PA-23 "Apache" and soon followed it with the high-performance PA-24 "Comanche" single. The company then sought a new trainer in order to regain its role in that field.

To supply the trainer market while the new PA-28 "Cherokee" was being developed, Piper did a very unusual thing. Where most models in production for a significant time underwent notable increases in power, complexity, weight and cost, Piper went the other way. It took the now-venerable, four-place PA-22 Tri-Pacer and made it into the two-seat Colt. The PA-23 had started Piper's use of Indian names, but this system did not apply when the PA-22 revamping took place later. The rear seats (and windows) were removed and the 150- to 160-hp O-320 engine was replaced by the Clippers old O-235. The flaps and left-hand door were done away with, but the ailerons were not restored to the old Cub/Vagabond length. One 18-gallon tank was standard, a second was optional; and the starter and electrical systems were retained. The Colt sold for $4,995. The PA-22 ATC was amended to include the Colt on October 21, 1960. The new Colt could be built under the Tri-Pacer's type certificate and model number for a very significant saving in certification cost because the airframe was not significantly altered, and the strength factor had actually increased due to the lower weight and power for the same structure. Altogether, 1,822 Colts were sold before Piper short-wing production ended in 1964, with a total of 11,950 built.

As though the regression of the Colt to the old Vagabond's basic configuration were not enough, some owners reversed the Pacer/Tri-Pacer landing-gear option by converting their tricycle Colts to taildraggers, using Clipper or Pacer landing gear.

Except for the everlasting Super Cub and the pioneering PA-25 Pawnee agplane, the short-wing Colt ended Piper's tube-and-rag era, as well as its long association with high-wing monoplanes. □

A biplane caught the eye of Peter Bowers, AOPA 54408, when he was 10. Since then, he has not let airplanes out of his sight.

THE SHORT-WING PIPERS

	PA-15 Vagabond	PA-16 Clipper	PA-17 Vagabond	PA-20 Pacer 125	PA-22 Pacer 125	PA-22 Tri-Pacer 160	PA-22 Colt
Specifications							
Powerplant	Lycoming O-145-B2 65 hp @ 2,550 rpm	Lycoming O-235 115 hp @ 2,800 rpm	Continental A-65 65 hp @ 2,300 rpm	Lycoming O-290-D 125 hp @ 2,600 rpm	Lycoming O-290-D 125 hp @ 2,600 rpm	Lycoming O-320B 160 hp @ 2,700 rpm	Lycoming O-235-C1B 115 hp @ 2,800 rpm
Wingspan	29 ft 3 in	29 ft 3 in	29 ft 3 in	29 ft 3 in	29 ft 3 in	29 ft 3 in	29 ft 3 in
Length	18 ft 8 in	20 ft 1.25 in	18 ft 8 in	20 ft 4 in	20 ft 7.5 in	20 ft 7.25 in	20 ft
Wing area	147.5 sq ft	147.5 sq ft	147.5 sq ft	147.5 sq ft	147.5 sq ft	147.5 sq ft	147.5 sq ft
Empty weight	620 lb	850 lb	650 lb	970 lb	1,000 lb	1,100 lb	940 lb
Gross weight	1,100 lb	1,650 lb	1,150 lb	1,800 lb	1,800 lb	2,000 lb	1,650 lb
Wing loading	7.5 lb/sq ft	11.2 lb/sq ft	7.8 lb/sq ft	12.2 lb/sq ft	12.2 lb/sq ft	13.5 lb/sq ft	11.2 lb/sq ft
Power loading	16.8 lb/hp	15.2 lb/hp	17.7 lb/hp	14.4 lb/hp	14.4 lb/hp	12.5 lb/hp	15.2 lb/hp
Fuel capacity	12 gal	30 gal	12 gal	36 gal	36 gal	36 gal (44 opt)	18 or 36 gal
Performance							
High speed	102 mph	125 mph	100 mph	135 mph	123 mph	134 mph	120 mph
Cruising speed	92 mph	112 mph	90 mph	125 mph	123 mph	134 mph	108 mph
Initial climb	510 fpm	600 fpm	530 fpm	810 fpm	810 fpm	800 fpm	610 fpm
Service ceiling	12,500 ft	13,500 ft	10,500 ft	14,250 ft	14,250 ft	16,500 ft	12,000 ft
Range	255 sm	480 sm	250 sm	580 sm	581 sm	536 sm	324 sm