After spending 17 hours flying it, PILOT editor describes Piper's new model as 'about as delightful a new airplane as the industry has produced in recent years.' Factory completes 'bug' elimination program and plane now ready for distribution

If it is really possible to come up with an acceptable twin in the price class of some present-day single-engine general aviation aircraft, Piper has probably made the breakthrough with its new *Twin Comanche*. Now that I've completed some 17 hours of all types of flying, including a considerable amount of IFR and night flying, I'm nearly as enthused over the *Twin Comanche* as is Howard "Pug" Piper (AOPA 97315), Piper engineering vice president; Fred Strickland, chief design engineer; and just about everyone else at Lock Haven, including the normally blasé flight personnel.

The history of the *Twin Comanche* goes back to 1960, when Pug Piper asked Ed Swearingen, owner of an engineering and modification business in San Antonio, Tex., to undertake a project that Piper's own engineering department was unable to handle because of more pressing work. Piper sent Swearingen a single-engine *Comanche* and gave him the job of designing the most efficient low-powered twin-engine installation that he could.

Swearingen came up with the forerunner of the present production *Twin Comanche* by using two four-cylinder 160 h. p. Lycomings, converting them to fuel-injection, then burying them in two of the slickest cowlings anywhere in civil aviation. Though Piper's engineers ultimately made many changes in the Swearingen prototype, the one feature that was kept throughout the development of the production airplane

Flight shot shows rear-cabin air intake at forward base of new twin's vertical fin

With one engine feathered, the Twin Comanche cruises 120-125 m.p.h. on other engine at normal cruise power. Yaw is so slight the plane is easily held with rudder pedal

TWIN COMANCHE: A Plane With A Future

by MAX KARANT • AOPA 18

was those cowls, which Piper today call their "tiger shark" cowls. These flat, sleek units are due largely to the fact that the fuel injection system permits the smallest possible frontal area, whereas the conventional carburetion system would have required large bulges under the cowls.

From the very first flight, Swearingen's prototype made people whistle—including Pug Piper. That airplane did quite a bit of flying around the country, and AOPA was the first to publicize its existence. When Swearingen's assignment was completed with the development of the twin-engine installation, Piper took the plane back to Lock Haven for further tests, and to consider whether or not to produce and sell it.

That decision was made more than a year ago, and the prototype was turned over to Piper's engineering department for completion of the entire aircraft for ultimate production. There were many and varied changes, ranging from the upswept rudder (which Sales wanted for esthetic reasons) to the present Bendix fuel injection system. Finally, the *Twin Comanche* (or PA-30 as the purists insist on calling it) was ready for production, and the lines started to move.

Then came the things all manufacturers are constantly plagued with—bugs. Worst of about six bugs was the fuel injection system. The other bugs included smaller but nevertheless undesirable items, such as an overly noisy ventilation system, cracking engine mounts and an unsatisfactory rudder-trim system. At this point Piper management made a wise though expensive decision: ground the plane until all fixes are completed and tested, even though actual production had already started. At one time there were dozens of grounded *Twin Comanches* tied down on the airport, awaiting modification.

Because of this bug-curing program, AOPA's article on the *Twin Comanche* is probably the tardiest to appear in a major aviation publication. Articles on the *Twin Comanche* which have already appeared were based on the unmodified prototypes, later grounded.

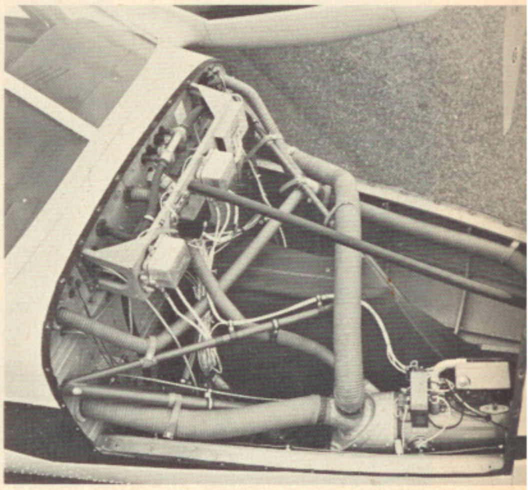
One of the first *Twin Comanches* to be released after modification—N7003Y—was turned over to me for this article. It was the Sportsman 322 version, one of the 13 variations in which the *Twin Comanche* is offered. Equipment included two Narco Mark 12's (one a 360-channel communications version), Motorola ADF, and a complete Altimatic (Mitchell) autopilot system. These, plus the special exterior paint, leather upholstery and curtains, brought the list price of 03Y to $42,385. Most expensive version offered is called the Professional 422, and lists for $45,245, which includes such things as DME, glide slope, and two 360- channel Mark 12's.

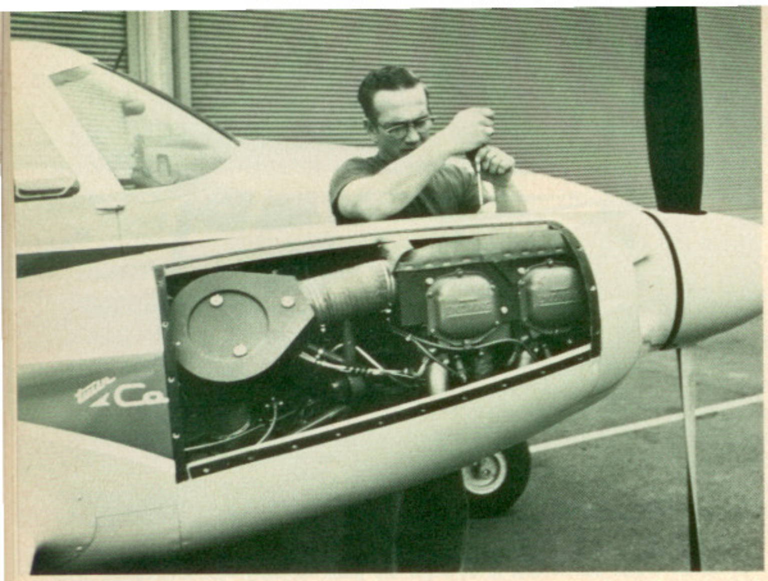
Empty weight of 03Y was 2,306 pounds. Gross is 3,600 pounds, which left a useful load of 1,294 lbs. Allowing 555 pounds for oil and 90 gallons of fuel, this left 739 pounds for passengers and baggage. There were four people in 03Y during much of my flying. With baggage, the total weight came to within 35 lbs. of maximum gross.

An interesting thing about loading the *Twin Comanche*. Its center of gravity range turned out so well that the plane's within limits even with a single person in the front seat, two in the back seat, and 200 lbs. in the baggage compartment.

Of all the features of the *Twin Comanche* with which I had to become familiar, the most difficult was the Ben-

This photo, looking down on fuselage nose, shows Fiberglas panel removed. Heater, at right, is easily reached and serviced, as is instrument panel at left





Ease of access to engines is a feature of the new Piper twin. Fiberglas nose panel comes off, too, laying bare entire engine without having to remove prop

This is the Twin Comanche's Palm Beach leather-upholstered cabin, with right front seat removed. Fuel valves are in floor beside seat. Panel to rear of them is sump-draining system. In front is access hatch to emergency gear-extension system

dix fuel injection system. It was (and is) cranky in the *Twin Comanche*, just as it has been perennially in every other Beech, Cessna and Riley airplane I've flown recently with fuel injection. Several of these airframe manufacturers have spent small fortunes trying to make supposedly perfected fuel injection systems work at least as well as the old carburetor systems. In seeking the reasons for this puzzling situation, when it would normally be expected that the manufacturers of the fuel injectors should pay for the development and perfection of their own systems, I have been told by several aircraft manufacturing officials that fuel injection has taken on the aspects of a fad, to the point where they feel they have to make fuel injection available, sometimes against their own better judgment.

Fuel injection has two major advantages: elimination of carburetor icing, and a smaller engine nacelle. Icing has caused trouble in aviation's past history, but proper carburetor heating systems have made the problem all but academic. The smaller engine nacelle, however, is one of the most important features behind the *Twin Comanche's* excellent performance. So fuel-injection is here to stay on the *Twin Comanche*, despite the fact that it adds about $2,000 to the plane's price.

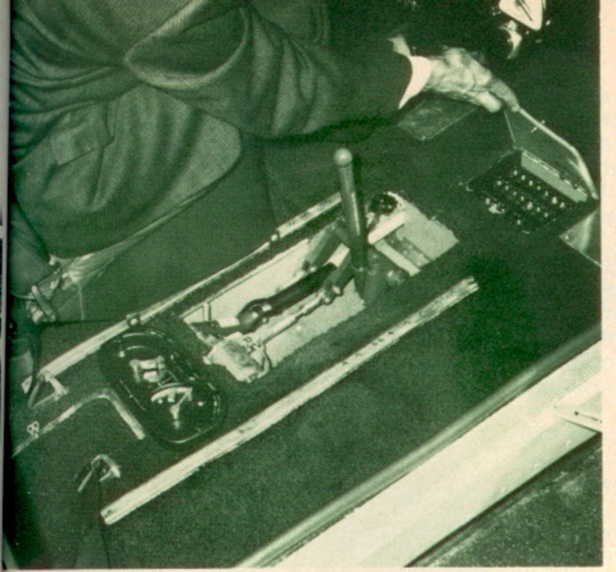
There were two problems with 03Y's fuel injection: tricky starting (which is true of all fuel injection), and roughness at idling. But once under way, the *Twin Comanche's* 160 h. p. Lycomings were so smooth they surprised me. Even in climbs both engines ran almost as smoothly as turboprops. This is an unusual accomplishment, particularly with four-cylinder engines. Much of this is due to new engine mounts that were designed and installed after production had started.

Also, there's a new Hartzell full-feathering constant-speed prop that makes its debut on the *Twin Comanche*, and it seems to work well in all phases. I feathered it twice, flew on one engine for a while, and was quickly and easily able to unfeather and restart.

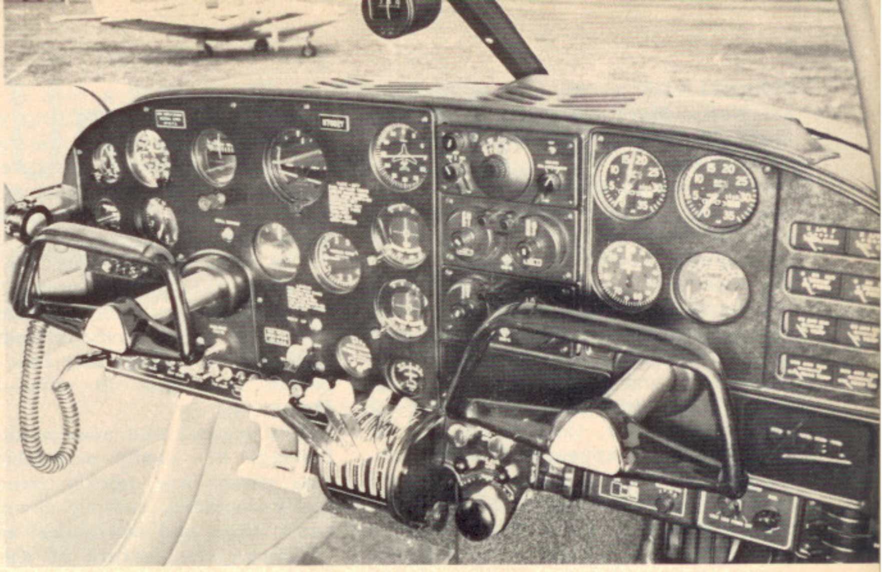
Perhaps one of the best over-all observations I can make about the *Twin Comanche* is that it does almost exactly what Piper claims of it. Piper's true airspeed indicator (just a circular slide rule designed into the face of the airspeed indicator) repeatedly showed true airspeeds for the power and altitude that appear in the plane's specifications. This in itself is highly commendable, and the result is that this 320 h. p. twin should attract the serious attention of any owner of such higher-performance single-engine airplanes as Piper's own 250 *Comanche*, the *Bonanza*, Cessna 210, etc.

Piper has developed some interesting operating-cost figures for the *Twin Comanche*. They figure it can be flown 300 hours a year for $19.20 an hour, or 10.2 cents per plane mile. At 500 hours

Specifications	PIPER Twin Comanche	BEECH Travel Air	FLEET Super V	PIPER Apache H
Engines	IO-320-B1A	IO-360-B1B	O-360-A1D	O-320-B2B
H.p. and r.p.m.	160 at 2,700	180 at 2,700	170 at 2,700	160 at 2,700
Gross (lbs.)	3,600	4,200	3,400	3,800
Empty (lbs.)	2,160	2,555	2,200	2,320
Useful load (lbs.)	1,440	1,645	1,200	1,480
Span (ft./in.)	36	37'10"	33'5"	37
Wing area (sq.ft.)	178	199.2	181	207.56
Length (ft./in.)	25'2"	25'11"	25'2"	27.1'
Power load (lb./h.p.)	11.25	11.7	10	11.9
Wing load (lb./sq.ft.)	20.22	21.1	18.78	18.3
Fuel capacity (gals.)	90	80	100	72
Top speed (m.p.h.)	205	210	210	183
Cruise (sea level)	181	188	200	161
Optimum cruise	194	200	200	171
Stall (m.p.h.)	69	70	69	56
Climb (sea level f.p.m.)	1,460	1,250	1,550	1,300
Single-engine climb (sea level f.p.m.)	260	205	300	180
Absolute ceiling (ft.)	20,000	19,700	23,000	18,500
Service ceiling (ft.)	18,600	18,100	21,000	17,000
Single-engine absolute ceiling (ft.)	7,100	5,900	9,450	5,500
Single-engine service ceiling (ft.)	5,800	4,400	6,850	4,000
Fuel consumption (g.p.h.) at 75%)	17.2	21.3	19.8	18.8
Fuel consumption (g.p.h. at 65%)	15.2	17.8	17.8	16.3
Maximum range (S.M.)	1,025	885	1,100	1,260
List price (standard)	$33,900	$49,500	$34,995	$37,990



Pilot is holding open the circuit-breaker compartment. That's gear-operating mechanism for emergencies right behind it; fuel valves are next, then the closed sump-drain unit



Instrument panel of Twin Comanche shows radios stacked in center. Radio panel switches are below right wheel. On throttle quadrant, pairs of handles are (left to right): throttles, props, mixtures

the hourly cost drops to $16.78 and the cost per mile to 8.9 cents. That's remarkably close to some of the costlier single-engine models flying today. Beech, for example, gives the operating cost of the current *Bonanza* as $12.90 per hour at 500 hours a year.

This, Piper officials say, is the actual goal of the *Twin Comanche*—to exceed the performance of the best of the high-performance single-engine planes presently on the market, at a price competitive with them, and with the added advantages the twin has for instrument and night flying. If Piper can hold their present price, single-engine owners should flock to the *Twin Comanche*. Piper's so sure they will that they've programmed 480 *Twin Comanches* for their first year's production, or two a day throughout their production year.

The first thing any single-engine owner (like myself, incidentally) asks is "How is it on one engine?" I quickly made it a point to find out. The ship cruises along between 120 and 125 on one engine, with very light rudder forces to counteract the dead engine, and it does this carrying a substantial load. Though it has rudder trim, I didn't even bother using it. I found no reason to question the single-engine rate of climb at low altitude of 260 f.p.m. (I was able to do this), nor the 7,000-foot single-engine ceiling. And maneuvers into the dead engine were as gentle and uncomplicated as in any twin I've flown.

Landings and takeoffs are easy, simple, and with no special tricks. Single-engine speed is 80 m.p.h., and the *Twin Comanche* accelerates to that very quickly. Best rate of climb is at 112 m.p.h. indicated, and I always saw a rate of climb better than 1,000 f.p.m. at that speed.

My cross-country flying of 03Y included a trip from Lock Haven to St. Pierre, a tiny French island off the south coast of Newfoundland. The trip was symbolic of all the advantages of the *Twin Comanche* over its comparable single-engine sister. Nearly 470 miles each way were over open ocean. Several hours were flown at night, and included a number of night landings on small, strange airports. And I spent 02:45 on actual instruments, including a flight through a front.

These are flight conditions that make twins mandatory in the minds of many pilots. And before the *Twin Comanche*, single-engine owners invariably couldn't afford such current twins as the *Travel Air*, Cessna 310, or Piper's own *Apache 235* or *Aztec B*. The *Twin Comanche* bids fair to change all that, and enable a considerable number of present-day owners to change their normal flying habits to include a lot of night flying (for example), and a good deal more instrument flying.

Depending on how much of O3Y's 90-gal. capacity I expected to have left upon landing, I used 65% or 75% power. At 75% I quickly found I used an average of 20 g.p.h. (10 per engine), which is 2.8 g.p.h. more than Piper's manual claims. This is probably due to the fuel-flow gauge in the airplane, which is the device you're supposed to use to set the power required. Based on my experience with my *Bonanza*, I'd guess that an Alcor exhaust temperature gauge on each engine would quickly give me the specified rate, or better.

Even when heavily loaded, O3Y showed 187-190 indicated airspeed at 9,500 feet at about 70% power. As fuel burned off, the airspeed would tend to increase slowly; I made a number of notes at 9,000 and 9,500 feet, both IFR and VFR, of the fact that the airspeed showed between 193 and 195 true. These notes turned up so often that I found I could reliably use 170 knots for flight planning purposes.

Once I became accustomed to O3Y's flight characteristics I learned how to make short field landings and takeoffs, although the landing characteristics (particularly) are somewhat different from those of the *Apache 235* or *Aztec*. Probably because the entire weight-carrying limits of the *Twin Comanche* are between rear wheels and nose wheel, you can't make the kind of tail-down landing you can with an *Apache* or *Aztec*. Once the rear wheels touch, the nose wheel quickly settles to the ground; a "typical" *Twin Comanche* landing is noticeably flatter. Stalling speed, gear and flaps down, is 69. In addition, the *Twin Comanche* has new all-metal brakes and linings, which tend to increase their holding ability when hot, rather than fade.

Only ground problem I had was at St. Pierre, where the runway is loose gravel. The *Twin Comanche* prop tips are within 10 inches of the ground, and the blades picked up a number of rocks which nicked them.

The *Twin Comanche* is excellent on instruments, is gentle, and very responsive to the controls. I flew through quite a bit of turbulence, both in clear air and while penetrating a front, but felt quite secure in the knowledge that the *Twin Comanche* is red-lined at 245 indicated, the yellow arc is 194-245, and maximum maneuvering speed at gross is 162. Maximum gear speed is 150 and for flaps it's 125.

Though the cabin of the *Twin Comanche* is essentially the same as the single-engine *Comanche*, there are differences. The nose wheel has been moved forward, so the nose-wheel well now is well forward in the *Twin Comanche*, giving more leg room. Except for the new throttle quadrant in the bottom center of the instrument panel, the panel itself is very much like the *Comanche*. The radios are stacked in the center of the panel; 03Y had a

Motorola ADF on top, then a 360-channel Narco Mark 12, and a 90-channel Mark 12. The autopilot was mounted beneath them. A Narco marker-beacon receiver was on the pilot's side of the panel. Of all this equipment in 03Y only the autopilot gave trouble. First an amplifier had to be replaced, delaying departure from Lock Haven about two hours. Then there would be sudden, unexplained actions which would stop just as suddenly. Once 03Y started to make left and right turns quickly, without warning. After shutting off the whole system, then reengaging it, the gyrations disappeared. But throughout the rest of the trip the wings dipped gently (I estimate about 2° to either side) back and forth whenever the autopilot was on. And the heading lock always averaged between 6° and 10° off of the heading being held on the directional gyro. But aside from these mysterious happenings, the autopilot flew 03Y beautifully, holding headings and altitude within 20 feet.

The cabin floor has the neat fuel-management system directly between the two front seats. Ahead of that is the emergency gear-extension system. And where the *Comanche's* nose wheel well used to be, all circuit breakers have been placed in a flush compartment, easily accessible. The sump-draining system of the *Comanche*, which the pilot operates easily from inside the cabin, is directly behind the fuel valves.

If I were able to rearrange things on the *Twin Comanche* panel (which is often not possible because of lack of space behind the panel) I'd get the radio-control panel of switches over on the pilot's side, instead of on the far right, in front of the co-pilot. And I'd move many of the switches directly in front of the pilot to other places, because they are not used nearly as much during the course of a flight as are radio switches.

And I'd get the bottom omni indicator with its track-setting knob out from behind the prop controls. I'd also fix the night-lighting system so that all the important instruments and switches are easily found and used. While trying to use the landing lights I turned all sorts of things on and off while trying to find the right switches, ranging from electric fuel pumps to the generators. All these switches are lined up side by side, and are identical.

Visibility from the cabin is restricted in two ways. The windshield is the same as the *Comanche*, covering a relatively narrow forward arc. Then those sleek beautiful new cowls stick out forward quite a distance, and also are tucked in close to the fuselage. The result is that visibility to the sides and down is also restricted, quite a bit more than in the *Apache 235* or *Aztec*.

Piper has done an outstanding job of soundproofing the *Twin Comanche*—so much so, in fact, that the ventilation system became a noise problem. There are two large vents at the bottom corners of each side of the windshield, and forced air comes in from an opening in the tip of the nose. With those vents open, there's quite a roar of air. But they can be closed, cutting down the noise level notably, and the rest of the system still gives excellent ventilation. There's another air intake at the forward base of the vertical fin which serves the two rear seats.

The seats in 03Y were the same as those in the Palm Beach *Comanche*, and just as luxurious and comfortable. The large baggage compartment should hold all the baggage any four ordinary people can come up with—including Mom's.

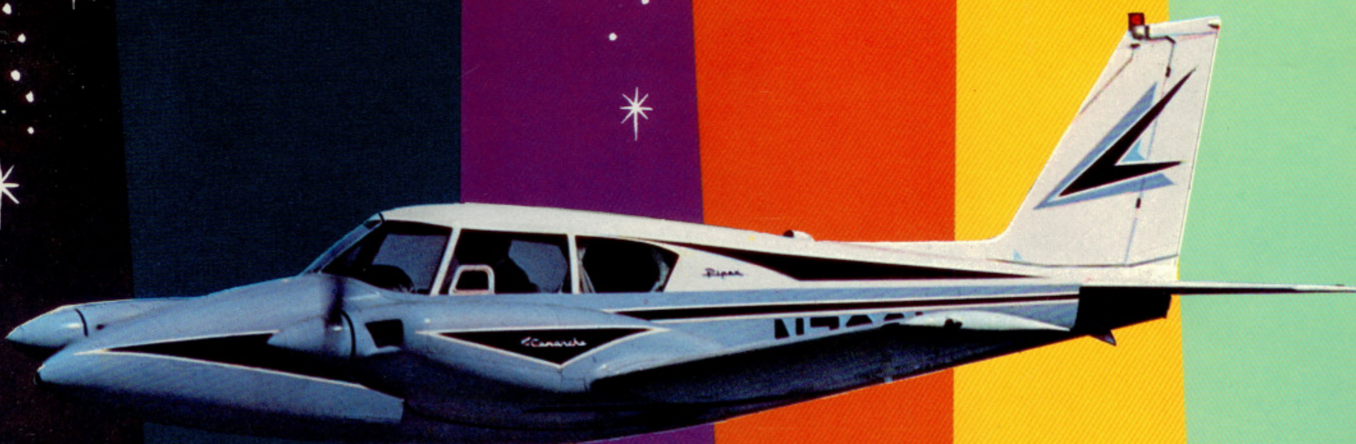
The engines and nose section of the fuselage are easily accessible. Fiberglas panels are quickly removed and easily replaced, cutting down maintenance costs and mechanics' acrobatics.

There's one feature of the fuel-injection system that pilots seem to misunderstand: the method of stopping the engines. The fuel injection system has a tendency to keep running after the mixture controls are pulled to idle cut-off, when the engines are good and hot. So Piper added a small spring at the bottom of each throttle's quadrant. If the engines continue to fire after the mixture controls are pulled, the pilot simply pulls the appropriate throttle down against the spring, which assures a positive engine stop. I was concerned about what this innovation might do if a pilot pulled the throttles through these springs in the air. Piper test pilots have already tried it and find the props continue to windmill, and the engines resume operation the moment the pilot releases the pressure on the throttle handles.

The *Twin Comanche*, then, is about as delightful a new airplane as the industry has produced in recent years. It is a highly commendable compromise between a high-performance twin and single-engine economy. From the day the first photographs appeared, pilots everywhere remarked on the plane's beauty. Now that I've had a chance to live with one for a while, I'd say its features and performance match its beauty. The *Twin Comanche* is undoubtedly the most significant model Piper has produced since the original *Apache*. If this guess is true, it should soon become one of the world's most widely used twins.

What of its future? Speculation over this particular airplane can be fun. If Piper follows its usual practice, it may resort to the "brute-force" technique of improvement, which I call their frequent additions of more and more sheer horsepower. This is what happened with almost everything Piper makes, from the *Cub* trainer right up through the *Apache* and *Comanche*. In the *Twin Comanche*, I hope they will keep these same small, economical engines, and perhaps some time in the future try to come up with a small turbocharger that would give the *Twin Comanche* sea-level horsepower at, say, 10,000 feet.

This might make what appears to be a very useful, economical twin into even more of a long-lived "standard" in general aviation. ●



PIPER

twin Comanche


N7001Y


N7001Y


twin Comanche

PIPER twin *Comanche*

As Fast as Twins Much Higher Priced
As Economical as Many Single-Engine Aircraft
With Styling and Stunning Good Looks
Beyond Compare

Here's the most exciting, the most talked-about airplane in a decade . . . the beautiful, all-new Twin Comanche. As fast as twins costing much more, yet priced just slightly higher than a number of single-engine aircraft.

Imagine! Here's a go-anywhere, go-anytime, night and day airplane at a price never heard of before for a four-place twin. It tops 205 mph, cruises at 194, ranges over 1,000 miles. Its well-behaved flight characteristics make it ever so easy to fly.

And, on top of all this, here's an airplane whose stunning good looks can't possibly be compared or matched, regardless of price.

Here, indeed is a *very* significant new airplane. It provides all the utility of 200 mph transportation with little regard for weather, night and day, and the economy of operation that puts it on a par with less versatile single-engine aircraft.

Visual Excitement...Comfort Unsurpassed

From streamlined spinner to swept tail, the Twin Comanche is designed to delight the eye of the perfectionist. Nowhere is the flowing blend of beauty and function better expressed than in the spacious cabin. Here rich, durable, color drenched vinyls and top quality fabrics combine to create a setting of superb luxury. All seats are generously proportioned, contour curved and reclinable, and forward seats individually glide fore and aft at the touch of a lever. Headlinings are flatteringly light, carpets soft and deep-piled.

Backing all this viewable comfort are some very advanced, very practical engineering features. New super soundproofing, for instance. A double layer of fiberglass soundproofing material—one an unbroken blanket separating cabin walls and ceiling from structure—cocoons the entire fuselage. Side windows are double-paned with sound-absorbing airspace in between that stops condensation and frosting, too. Even the floor boards are separated from supporting structure by a blanket of soundproofing—and attached by screws, not rivets, for easier under-floor access and maintenance.

Net result? Sound suppression and noise isolation so absolute you'll wonder where the engines went.

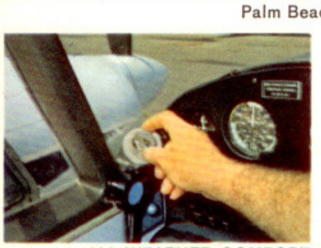
Heating, ventilation and cool fresh air are all abundantly provided for with individual controls front and back. Armrests, hat shelf, ash trays, assist straps, coat hooks, sun visors, overhead lights, cabin speaker, glove compartment, map shelves and pockets—and optional head rests and pillows—all the pleasant pluses that make Twin Comanche travel so relaxed and pleasant.

Palm Beach interior in Castilian Red

BEAUTIFUL STYLING Deluxe Palm Beach Interior, as shown, is used in the Sportsman model. Standard styling is similar, with tough vinyls substituted for leather. Back seat is quickly removable to accommodate freight or stretcher.

Palm Beach interior in Vista Blue

ALL-WEATHER COMFORT 27,500 BTU combustion heater keeps windshield defrosted and cabin comfortable even in below-zero weather, can be used on ground to pre-heat cabin before departure. In warm weather, cabin can be amply cooled through four high capacity adjustable air inlets – two forward, as shown in photo, and one over each rear seat, plus cool air from nose vent ducted through four heater system outlets and two defroster outlets. Cabin exhaust vent keeps air fresh and circulating • **MAP LIGHTS** Individual front seat map lights are standard equipment, located in the overhead panel. Lights focus on the pilot's lap, make it easy to read maps or papers without causing glare on instruments, windows or windshield. Two cabin lights plus no-glare instrument floods are also included. • **BIG BAGGAGE COMPARTMENT** Two hundred pounds of baggage can be quickly, conveniently stowed in the big 20 cu. ft. baggage compartment with its separate outside door. Even golf bags can be accommodated. • **UNCLUTTERED FLOOR SPACE** Under-floor location of the manual landing gear extension leaves space between the two front seats clear for approach chart books and maps. Compartments are provided under each front seat for filing maps and other equipment – handy but out of sight. A hat shelf provides generous space for other in-flight necessities. •



ALL-WEATHER COMFORT

MAP LIGHTS

BIG BAGGAGE COMPARTMENT

UNCLUTTERED FLOOR SPACE

High Performance with Flying Ease and Economy

As quiet, roomy and comfortable as the Twin Comanche is, the best part about this airplane is its performance and all around flight characteristics.

It is beyond question one of the nicest—most pleasant-handling airplanes you'll ever fly.

On the ground it handles with ease, thanks to steerable nose wheel. On take-off it's a going piece of machinery. The thrust of 320 horsepower accelerates you to climb-out speed in just seconds. The rate of climb, even fully loaded, approaches 1500 feet per minute. There's a solid, stable feeling that's a combination of the Comanche's all around stability and the extra stabilizing "fly wheel" effect of two propellers.

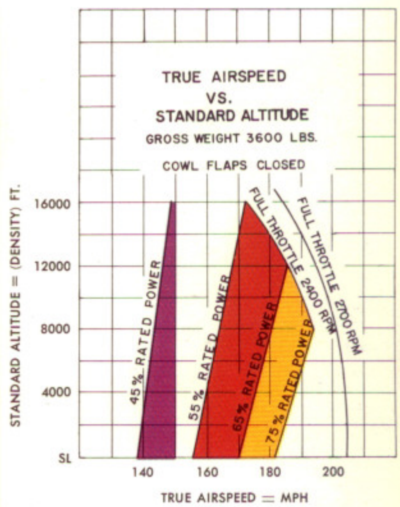
Control action is light, just-right, and nimbly responsive in all speed ranges. The exclusive all-moving stabilator gives extra, positive, assuring control at low speeds.

And when you level off, you know this airplane was meant to go cross country. At 8000 feet your true air speed is 194 mph at 75% power. At 65%—you cruise 182 at 8000′, 186 at 12,000′.

Approach and landing in the Twin Comanche will surprise even the most inexperienced pilot. This airplane seems to say "I'll do it for you."

The tricycle gear, wth extra wide tread and big nose wheel, makes every landing just about automatic.

The Twin Comanche is an "honest" airplane in every respect— one that veteran pilots will recognize as the finest; one which novices will fly with the greatest ease and confidence.



"SINGLE-ENGINE" ECONOMY

At 75% power, 194 mph cruise, the Twin Comanche does 11 miles per gallon. That's fuel economy better than any other twin on the market.

2½¢ PER SEAT-MILE

With only 300 hours annual utilization, total operating costs, including all direct and indirect costs—based on average maintenance, insurance, hangar, fuel, but no depreciation—amount to just 10.2¢ per mile, or approximately 2½¢ per seat-mile.

Such economy of operation means the Twin Comanche approaches the operating economy of high performance single-engine aircraft.

GENEROUS LOAD ALLOWANCE

The Standard Twin Comanche, with a useful load of 1445 pounds, carries full fuel and oil, four 170 pound passengers with 195 pounds remaining for baggage. Even the most completely equipped model offered, the Professional 422, permits full fuel, full passenger load with baggage allowance left over.

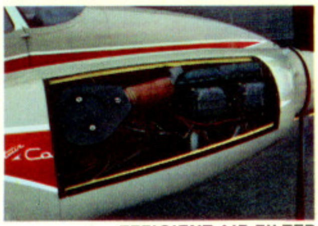
EASY ENGINE-OUT HANDLING

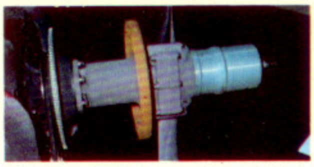
In level flight or normal climb, loss of an engine results in negligible yaw easily corrected with rudder or trim tab. Single engine ceiling is over 7000 feet; nearly 10,000 feet with medium load.


Comanche
Piper

PIPER
twin Comanche

EFFICIENT AIR FILTER keeps dirt out of induction system. **INTEGRAL PROP SHAFT EXTENSION** permits sharp drag-reducing entering edge of Tiger Shark nacelles. New lightweight Hartzell props save 32 pounds total weight. **FLAT NACELLES,** thanks to no carburetor under crank case. **COWL FLAPS,** manually-operated, are included but rarely needed, even on take-off or climb—thus create no drag. **90 GALLON FUEL SYSTEM,** consisting of two 30-gallon mains, and two 15-gallon auxiliaries built into the wing, is controlled with central fuel management console. Sumps can be drained by pilot when in airplane with visual shut-off safety feature.


EFFICIENT AIR FILTER


INTEGRAL PROP SHAFT EXTENSION


FLAT NACELLES


COWL FLAPS


90 GALLON FUEL SYSTEM

Power Plant and Fuel System Features

DEPENDABLE LYCOMING POWER

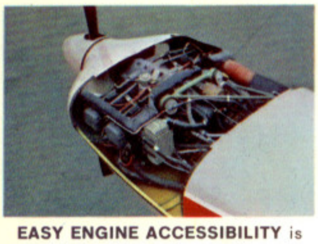
Cleanly Cowled for Maximum Performance Per Horsepower With Superior Bendix Fuel Injection

High performance with economical power stems largely from the extra clean, low-drag Tiger Shark nacelles housing the flat four cylinder 160 horsepower Lycoming IO-320-B engines. Advanced engineering of the cooling system has proven so efficient that cowl flaps are rarely needed even on take-off or climb.

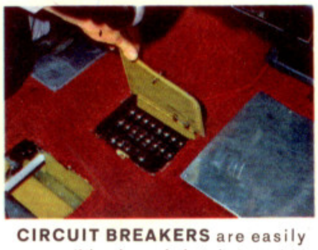
The "ruggedized" Lycoming engines, developed down through the years to their present state of super dependability, are equipped with the Bendix fuel injection system, which has a number of superior features. These include a self-purging servo system which obviates vapor lock and consequent hard starting problems. The Bendix system uses no return line to a fuel tank, thus simplifying fuel management and eliminating the possibility of pumping fuel overboard. An automatic leaning feature is also incorporated.

A highly efficient, Piper-developed cross-over exhaust system permits maximum effective horsepower on take-off... in fact, produces a "bonus" by effectively scavenging exhaust gases.

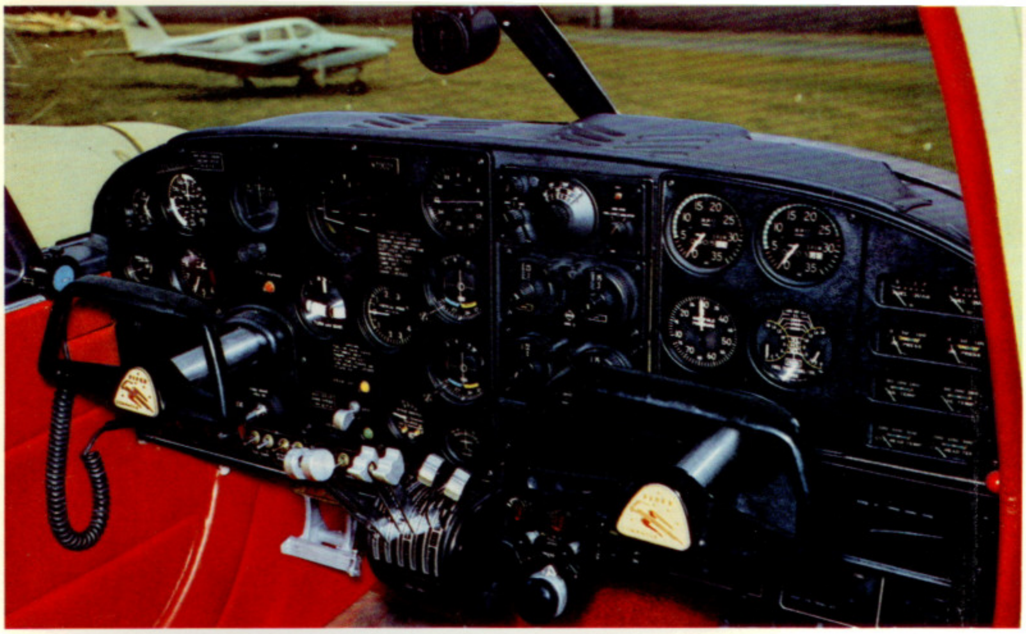
Twin Lycoming power in the Twin Comanche means dependability of the highest order.


EASY ENGINE ACCESSIBILITY is provided with entire cowling, including two-piece nose cowl, easily removed for servicing.


OIL DIP STICK releases through lever action, permits accurate oil level check, need not be screwed in or out, saves burned fingers.


CIRCUIT BREAKERS are easily accessible through hatch in cabin floor, can be pulled to OFF position if desired.


POWER INSTRUMENTS include separate tachometers to record individual engine hours, dual manifold pressure and fuel flow gauges.



Wide, Roomy Instrument Panel

The Twin Comanche instrument panel locates radios, instruments and controls for maximum convenience and visibility, with ample space remaining for additional equipment as desired. Engine instruments are at right, flight instruments at left, radios and twin control pedestal in the center. The full IFR panel of the Executive 200 model pictured here includes ADF T-12; two Narco Mark 12's which provide a 360-channel transceiver, a 90-channel transceiver and two independent crystal-controlled VHF NAV receivers; two VOR/ILS receivers and 3-light marker beacon receiver. Glare ban instrument lighting, Piper TruSpeed Indicator and Piper AutoControl II automatic flight unit are also provided on Executive 200.

SURFACE PRIMING of each metal component is completed before assembly, assuring maximum corrosion resistance, inside and out.

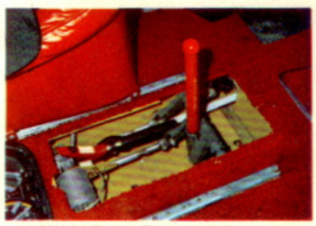
ENTIRE NOSE COWL is quickly removable for access to heater, nose wheel assembly, voltage regulators, autopilot, other equipment for maximum service ease.

CENTER RADIO STACK groups all radios compactly. Accessible to both front seat occupants for greatest convenience.
PIPER AUTOMATIC FLIGHT–2 axis AutoControl II or 3 directional AltiMatic II shown here assures restful, effortless flight. Radio selector panel is at lower right.
COMPACT CONTROL PEDESTAL groups throttle, propeller and mixture controls. Airfoil-shaped flap switch controls electrically operated Max-Lift flaps. Pedestal side plates snap off for maintenance and adjustment ease.

CENTER RADIO STACK

PIPER AUTOMATIC FLIGHT

COMPACT CONTROL PEDESTAL



AUXILIARY GEAR EXTENSION, stowed completely under a quick-release floorboard, provides simple, positive, manual gear extension system.

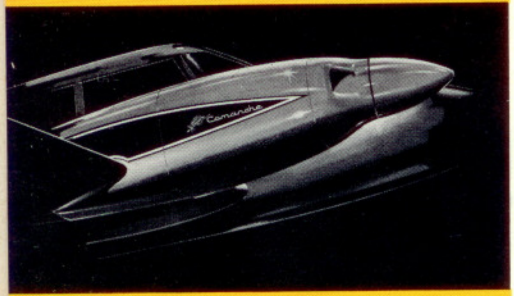
METALLIC-LINED BRAKES do not fade under severe use–tend to be even more effective when hot. Tests indicate metal linings last up to twice as long as organic linings. All 3 Twin Comanche gears use big 6.00-6 wheels and 6-ply rated tires.

PIPER twin *Comanche* EQUIPMENT

SPECIFICATIONS

Model	PA-30
Engines	I0-320-B
HP and RPM	160 at 2700
Gross weight—lbs.	3600
Empty weight (Standard model)—lbs.	2160
Useful load (Standard)—lbs.	1440
Wing span—ft.	36
Wing area—sq. ft.	178
Propeller diameter—in.	72
Length—ft.	25.1
Height—ft.	7.3
Power loading—lb/hp	11.25
Wing loading—lb/sq. ft.	20.22
Baggage capacity—lbs.	200
Baggage space—cu. ft.	20
Fuel capacity—gals.	90*
Wheel base—ft.	7.3
Wheel tread—ft.	9.8

*84 gals. usable



PERFORMANCE

Top speed—mph	205
Optimum cruise speed (75% at 8000')—mph	194
Cruise speed (65% at 12,000')—mph	186
Stall speed (power off, flaps ext.)—mph	69
Take-off run at sea level—ft.	950
Take-off distance over 50' at sea level—ft.	1570
Landing roll at sea level—ft.	700
Landing over 50' at sea level—ft.	1875
Best rate of climb speed at sea level—mph	112
Rate of climb at sea level—ft/min	1460
Best angle of climb speed—mph	90
Best single engine rate of climb speed (sea level)—mph	105
Single engine rate of climb at sea level—ft/min	260
Absolute ceiling—ft.	20,000
Service ceiling—ft.	18,600
Single engine absolute ceiling—ft.	7100
Single engine service ceiling—ft.	5800
Fuel consumption 75% power—gal./hr	17.2
Fuel consumption 65% power—gal./hr	15.2
Cruise range—max. (75% at 8000')—miles	948
Cruise range—max. (65% at 12,000')—miles	1025

Performance figures are based on tests run on a standard airplane under standard conditions as defined by FAA.

PRINTED IN U.S.A.

INSTRUMENTS

- Airspeed
- Sensitive altimeter*
- Ammeter
- Compass
- Two cylinder head temperature gauges
- Flap indicator
- Dual fuel flow gauges
- Two fuel quantity indicators
- Dual manifold pressure gauge
- Two oil pressure gauges
- Two oil temperature gauges
- Two recording tachometers

CONTROLS AND PANEL ACCESSORIES

- Engine controls, teflon lined
- Control pedestal, with propeller, mixture and throttle controls
- Rudder and elevator trim controls
- Dual flight controls
- Fuel selector control with crossfeed
- Glove compartment
- Landing gear warning system with lights and horn
- Steerable nose wheel
- Oil coolers with thermostatic control valve
- Parking brake with control
- Shock mounted instrument panel
- Stall warning indicator
- Toe brakes on left side (provision for brakes on right side)
- Cowl flaps

*Gyro and sensitive instruments are reconditioned surplus — FAA-certified.

POWER PLANT

- Engines—2 Lycoming IO-320B—160 hp at 2700 rpm; 4 cylinder; dual ignition; dual impulse magnetos
- Bendix fuel injection
- Hartzell constant speed controllable full-feathering propellers with spinners and governor drive
- Engines machined for vacuum pumps (no drives installed)
- Ignition harness, shielded
- Two geared starters—12 volts
- 12 volt, 50 amp generator on left engine
- Alternate air control

ELECTRICAL PROVISIONS

- 12 volt 35 amp battery
- Circuit breakers—resettable switch type
- Cabin dome lights—front and rear
- Gear retraction, electrically operated (Manual secondary gear extension)
- Wing flaps, electrically operated
- Instrument panel light with rheostat
- Two landing lights
- Two map lights
- Navigation lights
- Rotating beacon
- Provisions for radio installation

FUEL SYSTEM

- Two electric and two engine driven fuel pumps
- Quick drain gascolator, cabin-operated, with visual on-off check
- Two main and two auxiliary fuel tanks with 90-gallon total capacity, equipped with NACA-type anti-icing vents

EQUIPMENT	CUSTOM 90	100	112	122	2
Advanced instrument panel*:	•	•	•	•	
Artificial horizon	•	•	•	•	
Directional gyro	•	•	•	•	
Electric turn and bank	•	•	•	•	
Outside air temperature gauge	•	•	•	•	
Rate of climb	•	•	•	•	
Clock	•	•	•	•	
Heated pitot tube	•	•	•	•	
Cigarette lighter	•	•	•	•	
Dual 12 volt, 50 amp generators with paralleling system	•	•	•	•	
Dual vacuum system and suction gauge	•	•	•	•	
Headset, microphone, speaker and 2 antennas	•	•	•	•	
Radio selector panel	•	•	•	•	
Glare ban instrument lights					
Piper Tru-Speed Indicator in place of standard ASI					
ADF T-12 Transistorized Automatic Direction Finder, 190-1725 kc	•	•	•	•	
Narco Mark 12** with VOA-4 VOR/ILS localizer indicator. 90-channel VHF transceiver, 118.0-126.9mc plus separate 100-channel NAV receiver 108.0-117.9mc.Crystal-controlled tuning	•	•	•	•	
Narco Mark 12** with VOA-4 VOR/ILS localizer indicator. "IFR complete" version with 360-channel VHF transceiver 118.00-135.95mc plus separate 100-channel NAV receiver					
Narco MBT 75 mc marker beacon receiver with 3-light indication					
Second Narco Mark 12** "IFR complete" version plus VOA-5 VOR/ILS cross pointer indicator					
Piper AutoControl II transistorized two axis automatic flight control that makes automatic turns or holds precise course with Heading Lock		•	•		
Piper Course Selector automatically turns to any pre-set heading			•		
Piper AltiMatic II full 3 directional automatic pilot with pitch control, course and altitude selector. Turns automatically to any pre-set heading; climbs to, descends to then holds any pre-set altitude precisely				•	
Narco UGR-1A Glide Slope Receiver**					
Narco UDI-2 DME—Distance Measuring Equipment					
Palm Beach Exterior with choice of 3-tone color combinations					
Palm Beach Interior with top grain leather upholstery					
Head Rests and Pillows					
Curtains					

**All Mark 12's for Twin Comanche wired by Piper for glide slope receiver, with quick plug built into unit.

CABIN FEATURES AND ACCESSORIES

- 4 arm rests
- 4 ash trays
- Cabin vents and controls
- Two coat hooks
- Cabin and baggage door locks with identical keys
- 20 cu ft. baggage compartment with tie-downs and 20″ x 20″ separate exterior door
- Provisions for head rests (front seats)
- Provisions for pillows (rear seats)
- Palm Beach-style vinyl interior with fabric seat inserts (vinyl inserts optional)
- Combustion heater with defroster and controls
- Adjustable front and rear seats (rear seats quickly removable for stretcher or cargo installation)
- Cabin speaker
- Assist straps
- Two sun visors
- Double glazed windows
- Super-soundproofing

AIRCRAFT FEATURES

- Removable floorboards
- Tie-down rings
- Tow bar
- Main wheels—6:00 x 6 Cleveland with disc brakes
- Nose wheel—6:00 x 6 Cleveland
- Tires—Main & nose, with tubes, 6:00 x 6—6 ply rating

	EXECUTIVE			SPORTSMAN			PROFESSIONAL		
	200	212	222	300	312	322	400	412	422
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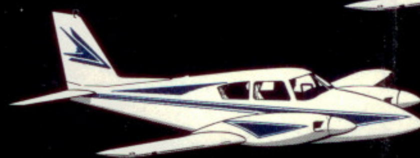
Your choice of a variety of standard and Palm Beach exterior and interior designs

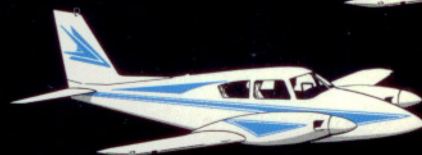
STANDARD DESIGNS
All exteriors with Juneau White base

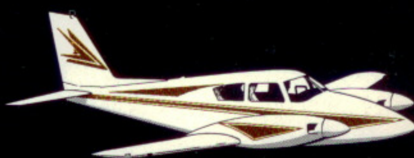

Monterey Maroon exterior
Castilian Red interior


Tampa Green exterior
Boca Tan interior


Newport Blue exterior
Vista Blue interior


Madrid Red exterior
Castilian Red interior


Bahama Blue exterior
Vista Blue interior


Denver Brown exterior
Boca Tan interior


Beaumont Blue exterior
Vista Blue interior

PALM BEACH DESIGNS
All exteriors with Juneau White base; interior upholstery in top grain leathers


Lakeland Blue and Newport Blue exterior
Vista Blue interior


Mocha Tan and Denver Brown exterior
Boca Tan interior


Orlando Green and Tampa Green exterior
Boca Tan interior


Mocha Tan and Madrid Red exterior
Castilian Red interior

NIGHT TIME'S FLIGHT TIME

with the PIPER twin Comanche

Under the stars . . . through the overcast . . .
or chasing its own shadow beneath a brilliant sun—
the Twin Comanche blithely rounds the clock.
The hour or the season makes very little difference, when you're flying "The Twin."
At 200 miles an hour, daylight hours stretch on and on.
But why stop at sunset? Night flight's so routine
and relaxing in your Twin Comanche, fully equipped for VFR or IFR conditions.
Here's night and day, all-weather transportation for four,
plus one spectacular extra— that's the *beauty* of it!

PIPER AIRCRAFT CORPORATION

Lock Haven, Pa. (Main offices) · Vero Beach, Fla.