

PILATUS PC XII

BIG BIRD

*A turboprop single that'll carry
just about anything you want*

BY THOMAS A. HORNE

A dozen years ago, a small handful of experimenters tinkered with the idea of building a turboprop single. In those days, when the words "turboprop" and "twin" were spoken in the same breath, the idea sounded way too radical to sustain a bona-fide production run. Beech built a pro-



PHOTOGRAPHY BY MIKE FIZER





totop turboprop single—the Lightning—based on the pressurized Baron airframe, then began selling delivery positions. But when the price tag hit the magic \$1-million mark, buyers pulled out. Cessna forged on, and for a while, its Caravan was the only turboprop single built by a mainstream manufacturer.

How things change. Now there are three cabin-class turboprop singles in production: the Cessna Caravan; the Aerospatiale TBM 700; and, the latest arrival, the Swiss-built Pilatus PC XII.

About the only thing these airplanes have in common is a single engine. The Caravan is basically a utility truck with seats. The TBM 700 is a personal luxury hot rod, an 800-series BMW with wings.

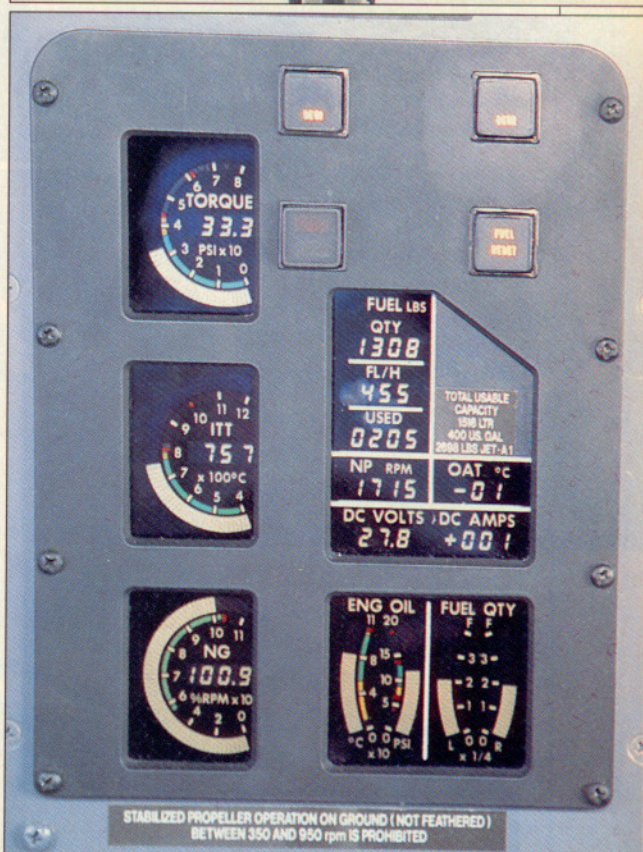
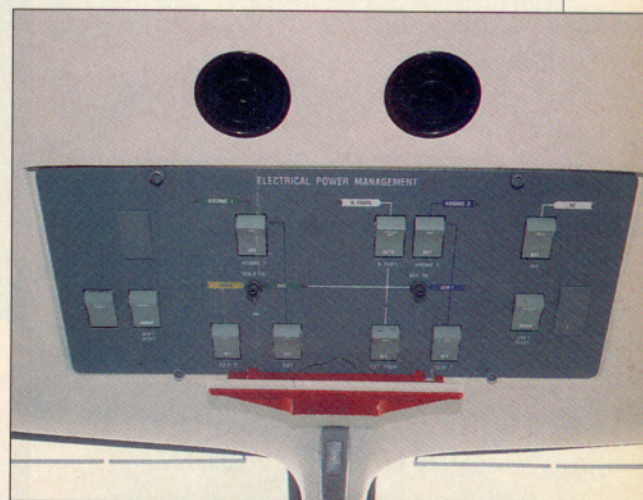
Folks, the PC XII is a big airplane, inside and out. It has a big engine, too—a 1,600-shp (flat rated to 1,200 shp) Pratt & Whitney PT6A-67B. The cargo capacity is 3,087 pounds in a cavernous, 16- × 4-foot area that can take up to 330 cubic feet of whatever you've got. In its corporate commuter configuration, the PC XII can handle as many as nine cabin seats and an aft lavatory. The cabin cross section is wider than the Beech King Air B200's, taller than the Caravan's, and gobs roomier than the TBM 700 all around.

Six years ago, when Pilatus originally floated the PC XII concept, the company had a notion that the airplane would fill a role as some kind of utility hauler for small, aggressive companies, rather like a more stylish, personalized Caravan. One magazine advertisement reads: "One pilot. Five workmen. And 1,400 pounds of cargo. Halfway across Texas for a day on the job. And back again for dinner."

Well, maybe.

This reveals yet another European misconception about how Americans use their airplanes. We're not

*The cockpit is so big
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Transport-category
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the copilot's side.*



going to load oil drums and crates into our PC XII's; we're going to take this airplane on vacation, and we're taking all our friends, all the luggage we want, and all our toys, too. By toys, I mean snowmobiles, motorcycles, golf carts, that sort of thing.



**Americans will take
their PC XIIs on
vacation, and take all
the friends, luggage,
and toys they want.**

With radar, copilot EFIS, and a multifunction display, this PC XII demonstrator's panel is loaded but has room to spare. The cabin in this airplane is a hybrid, part executive layout, part freighter.





Quite simply, this airplane has the makings of a party machine. Decked out in its "executive" configuration, the PC XII has an interior with six swiveling, reclining, and lateral-tracking leather seats; two slide-out tables; enough extra room for a wide-screen TV; a full wet bar; and a bathroom. *That's what Americans want.*

The market says so. Of the PC XII's 23 firm contracts and 21 options to date, nearly all have been placed by wealthy individuals who'll put the airplane to the kind of uses just mentioned. Pilatus' first customer was Bud Carlson, an Iowa native with a second home in Florida and an insatiable craving to hunt and fish in such places as Alaska and Canada. He bought his PC XII (the one photographed for this article) because his Piper Malibu couldn't haul as much as he'd like.

Although it's true that the PC XII has a maximum useful load of some 3,200 pounds, filling the fuel tanks to their 402-gallon capacity cuts that to about 523 pounds. At maximum range power, though, it'll fly that 523 pounds as far as 2,050 nautical miles. Things will soon improve in this department, as a 220-pound gross weight increase is on the way. All of the 220 pounds will apply to the airplane's useful load.

Like all airplanes, there's a trade-off of fuel for payload. Carlson can make the 1,000-nm trip from Iowa to Florida non-stop, all right, but if he's taking friends, he'll have to balance his load between Jet A and passengers/possessions. It's only with very light fuel loads (and 200-nm trip lengths) that you can take full advantage of the PC XII's cabin loadability.

The cockpit's proportions match the rest of the airplane's. It takes a Transport-category reach for the pilot to check the right sidewall circuit breakers, for example, and the panel sits high and wide.

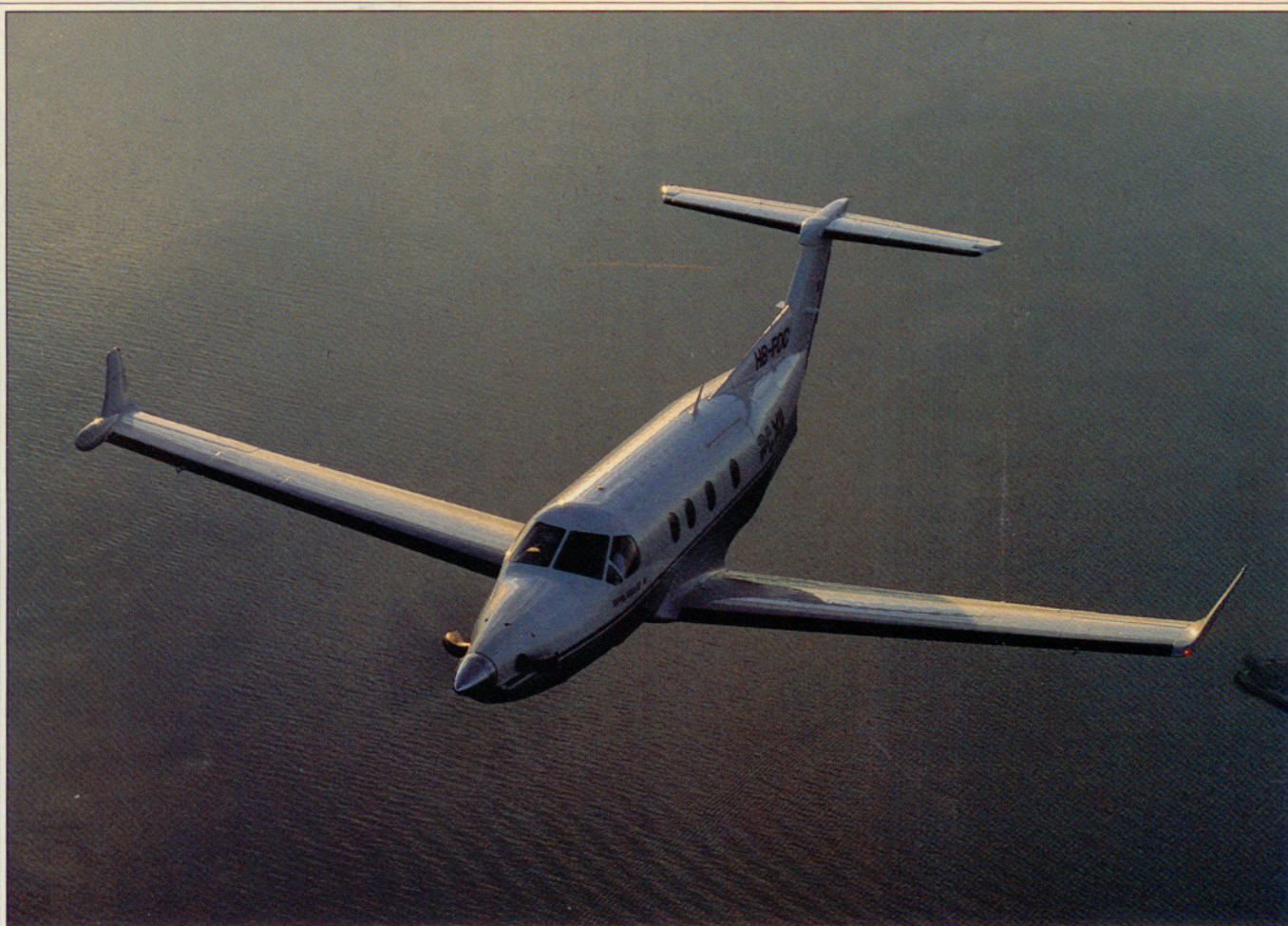
Bendix/King avionics predominate, with the ED 462 EADI and EHSI standard on the pilot's side. A KFC



325 autopilot is standard, as are dual nav/coms, an RMI, an altitude/vertical speed preselector, a digital ADF, marker beacons, and a transponder.

There are master warning and caution lights that signal urgent and abnormal situations and a large, centrally-mounted annunciator panel that identifies specific faults. A neat package of LCD engine gauges is off to the right of the primary flight instruments. They show engine torque, ITT, and compressor speed, as well as fuel flow, fuel quantity, hydraulic pressure, and other system readings.

Carlson's airplane has a Bendix/

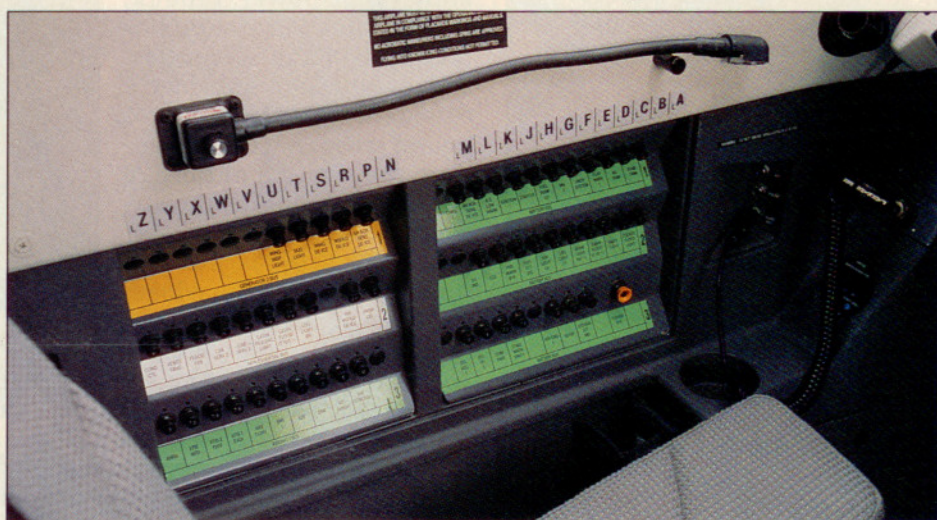


King KLN 90 GPS receiver, but for some reason, it's not standard equipment. Carlson also sprang for every other panel option that Pilatus offers: copilot EFIS and other instruments; a standby attitude indicator; an RDS 82VP color weather radar with vertical profile; and a multifunction display. He also got freon air conditioning, another option that should be standard in an airplane of this caliber (especially one being pitched so heavily in the United States).

Though the PC XII is certified to Federal Aviation Regulation Part 23 standards, there are plenty of big-airplane features. Engine fire detection, known icing certification, and a backup generator top the list. The pilot seats have four-point harnesses and are built to withstand up to a 25-G deceleration. Passenger seats can take 19 Gs.

Unlike a lot of other PT6 engines, the Pilatus' -67 has an automatic start sequence. Just push the "Start" half of the starter-generator

Color-coded breakers (below) identify the buses feeding them: green for generator 1 and the battery; yellow for generator 2; and white for nonessential.



Though certified under FAR Part 23, the airplane has many big-airplane features.

switch and wait for the ITT to show a light-off. After the engine's compressor stabilizes at 46 percent, the starter automatically shuts down and the generator automatically comes on-line.

The main generator has a 300-ampere/hour output and does most of the work. The backup generator puts out 100 ampere/hours' worth of

juice. That'll power both avionics buses and certain essential equipment, but the pilot will still have to do a fair amount of electrical load-shedding in order to go easy on the battery.

The backup's main function is to buy the pilot some extra time—beyond the typical 45-minute countdown to a dead battery—to get on the ground in a less harried, safer manner.

Circuit breaker panels are color-coded according to the buses that feed them. The blue panel is fed by generator one, green gets its electricity from the battery and generator one, yellow is for generator two, and white stands for the nonessential bus. It's a clever way of sorting out an electrical system.

Takeoffs are easy. An automatic torque limiter lets you push the thrust lever all the way to the stop without worrying about busting a torque limit. Rotate at 80 KIAS, wait a moment, and you're airborne. Past 100 KIAS, retract the gear and flaps, then climb out at 120 for an initial rate of climb of about 2,000 feet per minute.

The controls have a tight, solid feel and are a little on the heavy side. Basically, the airplane just stays where you put it—a side benefit of the PC XII's mass-balanced control surfaces and control harmony. For pitch and roll trim, there's a "coolie hat"—style thumb switch on the control yoke. It takes some getting used to: first, you must squeeze an activating trigger with your left index finger, then move the coolie hat before any trim changes register.

At altitude, we tried slow flight and some stalls. Slow flight was unremarkable, but the PC XII's stall warning system is certainly worth a mention. Like many large, T-tailed airplanes, the PC XII doesn't give an adequate conventional stall warning via buffeting, bucking, or other tactile sensations. It stalls without warning. This, and the airplane's tendency to violently drop a wing after the stall break, meant that a stickshaker/pusher system had to be installed.

Approach the stall, and the con-



An airstair door for the passengers, a gaping maw for the cargo. Closing the cargo door is a matter of hitting a belly-mounted push button. Battery power then lowers the door to the locking position.



Past 100 KIAS, retract the gear and flaps, then climb out at 120 and 2,000 fpm.

trol yoke begins to physically vibrate in your hands. That's the shaker part. Ignore the shaker, keep hauling back on the yoke, and the stick-pusher kicks in. The pusher yanks the yoke out of your hands and

abruptly pitches the airplane over. This breaks the stall but can give the back-seaters a nice 0-G ride as the nose goes through the horizon. To recover, make sure you're wings-level, pull back gently, then apply power if needed.

At 17,500 feet, our cruise speed turned out to be 271 KTAS. That's 2 knots over the published maximum cruise speed. Then again, the ITT was pegged, we were burning 449 pounds per hour, and it was ISA + 20° Celsius outside.

Landing the PC XII is a real ego boost, thanks to trailing-link main

gear and superb manners. V_{10} is 177 KIAS, and the first notch of flaps can go down at 163 KIAS, so slowing down/coming down is not a problem for the PC XII.

Pull the torque back to 15 psi (another European idiosyncrasy:

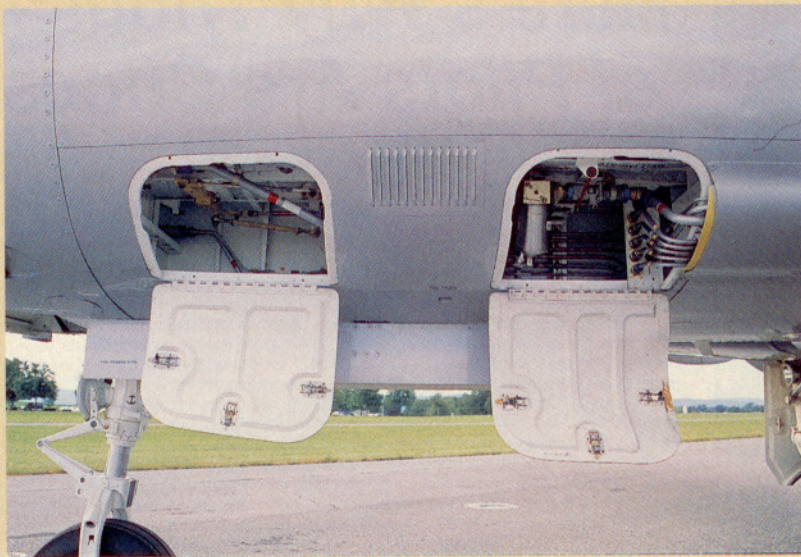
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*Access panels let you deep into the nose's
hydraulic and electric components.*

torque measured in psi rather than foot-pounds, percentage, or horsepower), and by downwind, you're below 130 KIAS, the V_{FE} for the full, 40-degree flap setting. Descend at 110 KIAS on final, go to full flaps when the field's made, then cross the threshold at 85 to 90 KIAS.

A little bit of pull on the yoke yields a lot of payback, so pitching

up just a few degrees works best in the flare. After nosewheel touch-down, squeeze up on the thrust lever's triggers, then pull back for reverse thrust. After a few landings, it's easy to see how Pilatus could make the airplane meet its short-field claims (1,821 feet for takeoff and 1,837 feet for landing—both over the obligatory 50-foot obstacle).



At \$1.95 million, the PC XII doesn't exactly come cheap. What's more, a 10-percent price increase is coming soon. And that \$1.95 million is for standard airplane configurations, the ones Pilatus calls the "passenger" or "combi" versions. With them, you get nine Spartan passenger seats and a heavy-duty net cargo barrier that can be installed at one of

three fuselage stations. If you have more cargo than passengers, it's easy to remove some seats and move the barrier forward.

The "executive" interior, the one with the six leather seats and the swank furnishings, is an extra \$103,000. The airplane we flew sold for a grand total of \$2,225,000.

These prices should make prospective King Air and TBM 700 customers give the PC XII the once-over. It cruises as fast as the former but costs less to operate, thanks to its single engine. Although it's slower than the latter, the PC XII offers the room that some TBM drivers wish they had.

It will be interesting to watch the response. Sales activity will certainly pick up if the FAA lets single-engine turboprops fly passengers under FAR Part 135 air taxi and charter operations. There are a lot of creaky old Navajos, 400-series Cessnas, and Beech 99s out there in the charter fleet. Their owners are sick of maintaining these jalopies. Their passengers are sick of shuffling, Quasimodo-style, through their cramped and tattered interiors. Both could use a break. □

Pilatus PC XII

Base price: \$1,950,000

Specifications

Powerplant	Pratt & Whitney PT6A-67B, 1,200 shp
Recommended TBO	3,500 hr
Propeller	Hartzell HC-E4A-3D/E10477K, four-blade, constant-speed, fully reversing, 8-ft 9-in diameter
Length	46 ft 9 in
Height	13 ft 10 in
Wingspan	52 ft 9 in
Wing area	277.8 sq ft
Wing loading	31.7 lb/sq ft
Power loading	7.35 lb/shp
Seats	2-11
Cabin length	16 ft 9 in
Cabin width	5 ft 0 in
Cabin height	4 ft 9 in
Empty weight	5,616 lb
Max ramp weight	8,864 lb
Useful load	3,204 lb
Useful load w/full fuel	523 lb
Max takeoff weight	8,820 lb
Max landing weight	8,820 lb
Zero fuel weight	8,159 lb
Fuel capacity, std	407 gal (402 gal usable)
	2,714 lb (2,681 lb usable)
Baggage capacity	3,087 lb, 330 cu ft

Performance

Takeoff distance, ground roll	1,017 ft
Takeoff distance over 50-ft obstacle	1,821 ft

Max demonstrated crosswind component	15 kt
Rate of climb, sea level	2,040 fpm
Cruise speed/endurance w/45-min rsv, std fuel (fuel consumption)	
@ max cruise power	269 kt/5.5 hr (453 pph/67.9 gph)
@ max range power	236 kt/7 hr (344 pph/51.5 gph)
Maximum operating altitude	30,000 ft
Landing distance over 50-ft obstacle	1,837 ft
Landing distance, ground roll	1,394 ft

Limiting and Recommended Airspeeds

V _X (best angle of climb)	110 KIAS
V _Y (best rate of climb)	120 KIAS
V _A (design maneuvering)	148 KIAS
V _{FE} (max flap extended)	163 KIAS
V _{LE} (max gear extended)	236 KIAS
V _{LO} (max gear operating)	
Extend	177 KIAS
Retract	177 KIAS
V _{NO} (max structural cruising)	236 KIAS
V _{NE} (never exceed)	236 KIAS or 0.48 Mach, whichever is lower
V _R (rotation)	80 KIAS
V _{S1} (stall, clean)	85 KIAS
V _{SO} (stall, in landing configuration)	59 KIAS

For more information, contact Pilatus Aircraft, Limited, Post Office Box 7185, Vero Beach, Florida 32961; 800/PILATUS; fax 407/567-4555.

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.