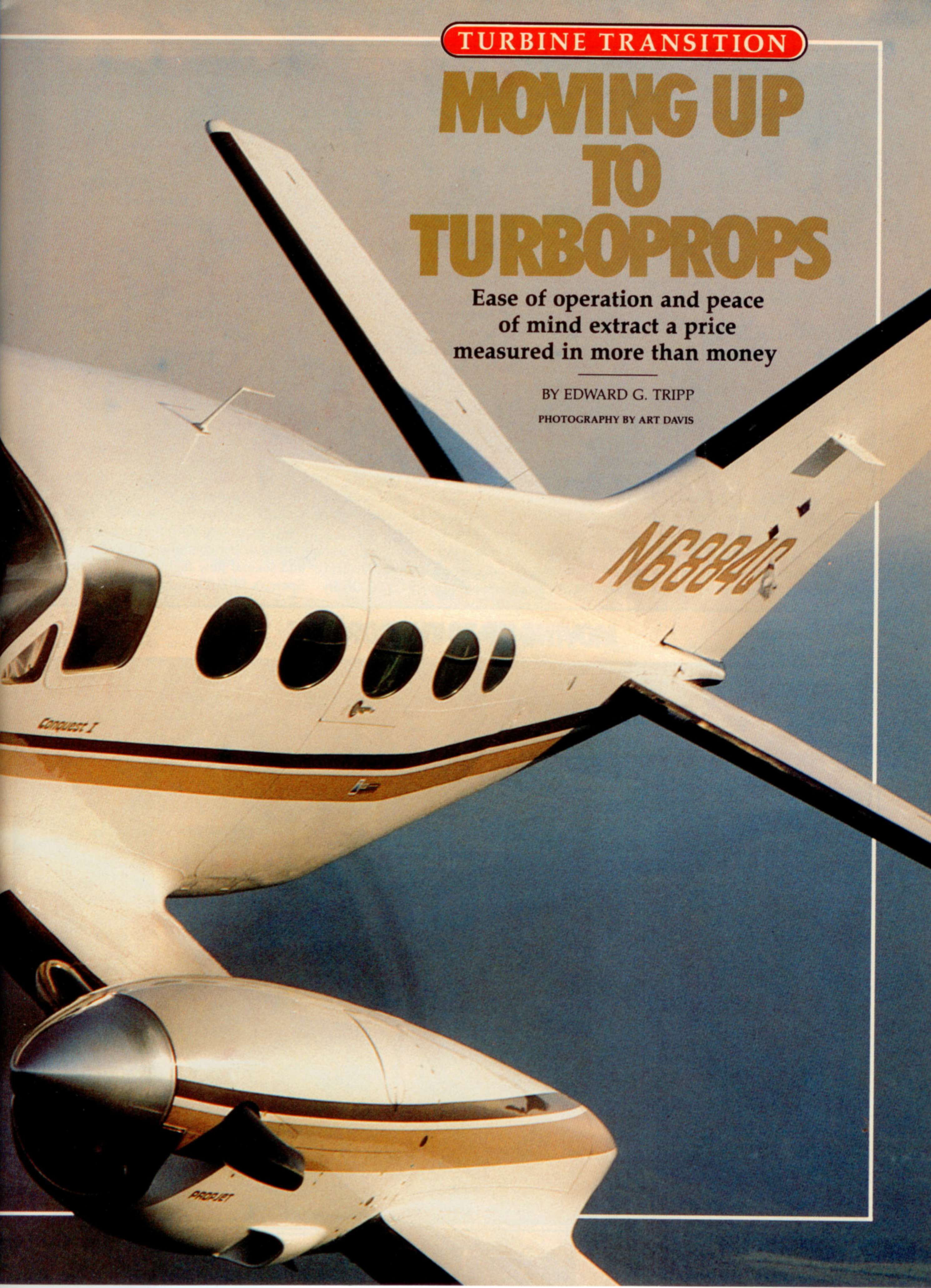
TURBINE TRANSITION

MOVING UP TO TURBOPROPS

Ease of operation and peace of mind extract a price measured in more than money

BY EDWARD G. TRIPP

PHOTOGRAPHY BY ART DAVIS



A significant number of businessman pilots have moved up from the prosaic singles, through light and medium twins, into turboprops. Most of these pilots have done so for the greater operational flexibility, simplicity and security that turboprop aircraft, in general, can provide.

These are very real benefits for properly trained—and periodically retrained—pilots who operate and maintain their aircraft according to the recommended procedures. Flying is the easiest part of the total consideration and, without question, the most pleasant. There is much more involved than just the purchase price or lease payments in realizing the advantages that turboprops offer. Considering and acting on the other, less visible costs can help make the move up to a turboprop aircraft a productive, highly satisfying experience.

An article in the December 1982 issue of *Pilot* covered many of the training aspects of moving up to turboprops ("Report from Finishing School," p.48). A representative sample of the makes and models of turboprops available has been covered in *Pilot* in past years.

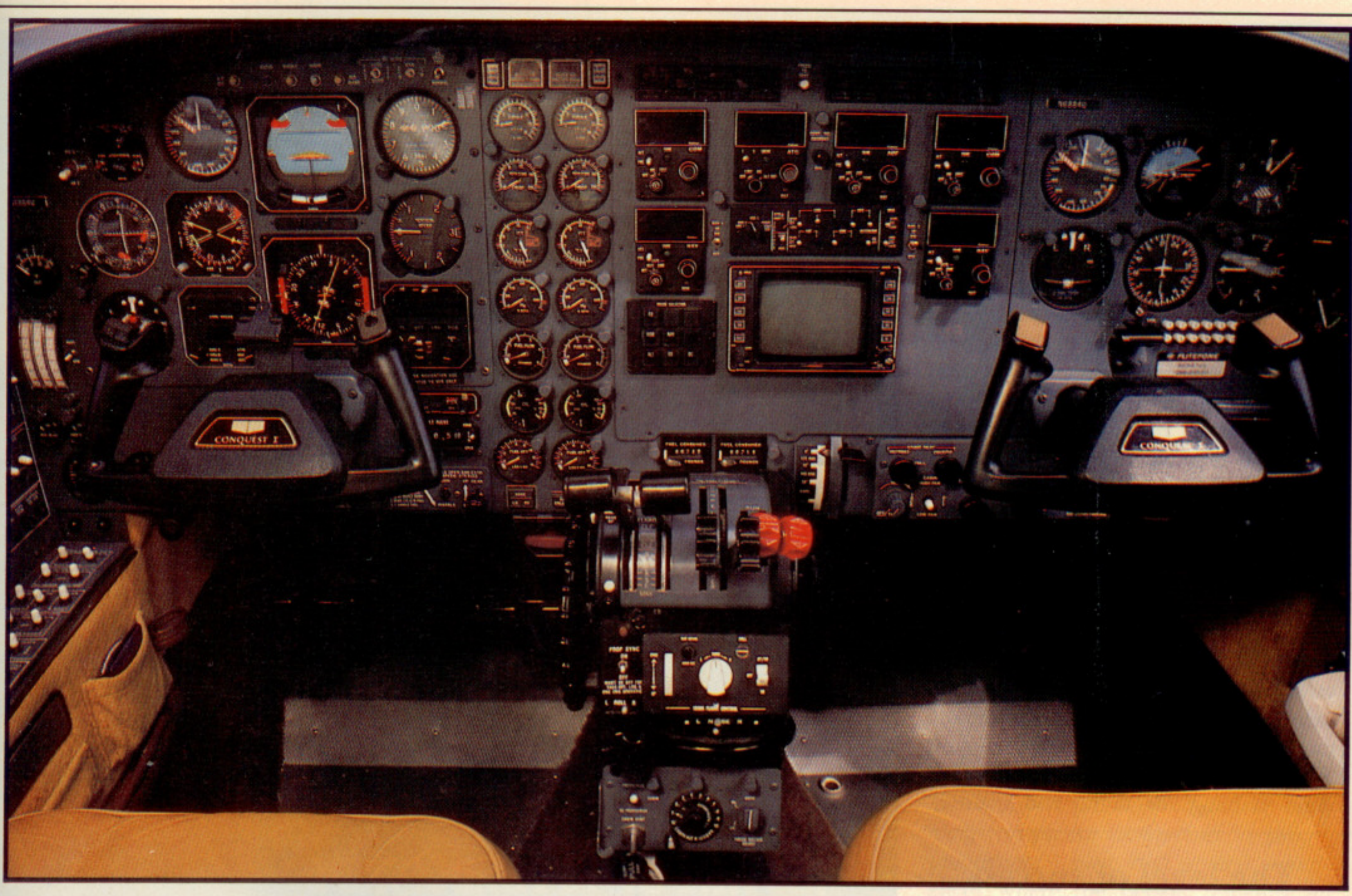
With the increasing number of owner-flown turboprops, marketers have designated several aircraft as entry-level models. The Cessna 425, which started out as the Corsair and is now called the Conquest I, fits in this category (see "Cessna Corsair: The Pursuit of Business," March 1981 *Pilot*, p. 116. That article includes a more detailed description of the 425 and its systems). A random sample of operators discloses an interesting mix of owner-flown, professionally flown and combinations of the two. In its current form, the Cessna Conquest I provides a good blend of operating ease, speed, range, cabin comfort and payload. One operator I talked to calls the Cessna 425 a baby carriage, since it is so easy to fly, relative to other aircraft he has operated.

The 425 was introduced officially in November 1979, and certificated in July 1980. The initial base price was $825,000, just $100,000 less than the Garrett-powered 441 (the original Conquest, now called the Conquest II). The 425's price increased to $1,125,000 in 1984; in the last four years, the price spread between the two Cessna turboprops has grown to $670,000.

In the slightly more than four years that the Conquest I has been on the market, 215 units have been built. During its production run, quite a few improvements have been made, many of which are the result of operational and service experience.

The single most significant change introduced for the 1983 model year is an increase in maximum takeoff weight from 8,200 to 8,600 pounds. The 400-pound increase permits an additional 374 pounds in useful load, which significantly increases payload with full fuel and, in turn, operational flexibility. The maximum zero fuel weight increases from 6,740 to 7,000 pounds; maximum landing weight remains 8,000 pounds.

Some of the operational improvements to the airplane include improved static discharge wicks, dual master warning system (in bright light, the annunciator panel is often difficult to see) and several new flight director options. Sperry's SPZ-500 autopilot system is a



The cockpit is organized well for lone pilots. Below: the money gauges.

new option that any potential buyer should consider—this is due to the fact that the standard ARC 1000 autopilot is one of the weaker links in the Cessna 425's systems.

The torque indicating system in the 425 is another weak link. Checking the system for leaks averages 20 man hours of labor. A less work-intensive procedure that involves bleeding the lines to remove any air has not, in the experience of several operators, solved the problem.

Many of the changes are optional and can be retrofitted. For instance, there is a revised fuel nozzle configuration that reduces concentration of heat on certain portions of the burner can during engine starts that could significantly reduce the cost of hot section inspections (which are mandatory every 1,250 hours of operation). Another converts the torque indicating system from a wet gauge system, which has 14 fittings that are prone to leak, to an electrical system.

Later versions of the Cessna 425 have improved interiors that are not only more attractive than earlier models but make more leg room for the occupants of the four club seats in the main cabin of the airplane. These interior improvements to the airplane also should help the interior better resist wear and tear.

In 1982, Cessna's programmed maintenance program, called Cescom, was made available to operators of the 425. The program recently has been modified to a continuous inspection program that permits a full cycle to be completed over 600 hours of operation or 18 calendar months as opposed to the original 200 hours or 12 months. It enables more flexibility in scheduled maintenance and reduces downtime. It also reduces the number of hours of labor for each cycle, which translates into reduced cost.

There have been two airworthiness directives (ADs) issued on the 425. One deals with improperly drilled mounting holes on the windshield, which could lead to failure; the other requires replacement of the nose gear actuator rod end.

This is not an exhaustive list of the modifications and changes to the Conquest I in the past few years. It is intended only to indicate that Cessna has been improving the product on a continuous basis and has made most of the improvements available to existing customers.

Other manufacturers have put similar efforts in top of the line products. In fact, the general product improvements in airplanes of this category are something potential buyers should consider. There are many attractively priced used turbine aircraft for sale that have helped slow the sales of new aircraft to a trickle. However, some of the apparent bargains should be evaluated carefully from the standpoint of the state of the art of their systems. Doing the homework beforehand will help the buyer to avoid many operational and maintenance problems and the unanticipated expense that goes with them.

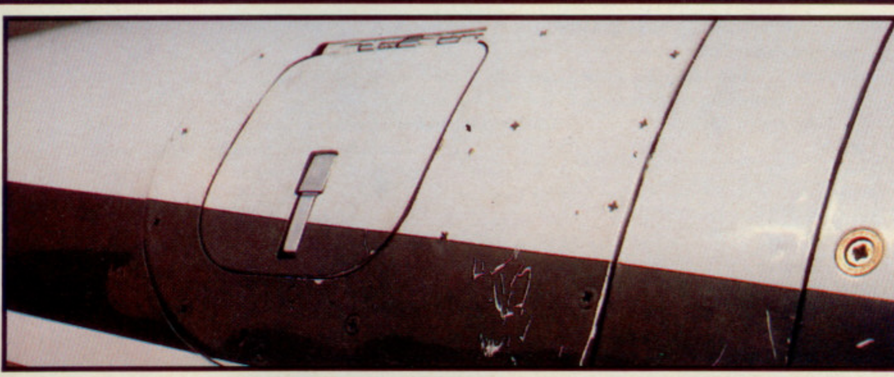
That comment takes me back to my initial point. The experience with any aircraft improves with the quality and quantity of knowledge an operator has and applies, and the amount of effort and money invested in the aircrfaft's care and feeding. The more sophisticated the aircraft, the more important this becomes.

This starts with training. Cessna provides training for flight and maintenance crews in a program developed and run by FlightSafety International as part of the purchase or lease arrangement. Recurrent training is at the customer's expense. In addition to thorough theoretical and practical grounding in the systems and operations of the aircraft, there is a lot of useful experience-derived information included. The latter is another reason for returning for periodic refresher training: to get up-to-date experience from other operators. (Cessna is holding its first Conquest operators' meeting in Wichita on December 6 and 7, which should be another good source of information exchange among operators and between operators and the manufacturer.)

The level of success is in direct proportion to knowledge applied.

One area of training that could be improved for pilots moving into turbines for the first time, particularly for owner-flown operators, is in the variety of record keeping that is required. Good record keeping is essential to make the programmed maintenance work as intended. The Cescom program includes notification of anticipated maintenance scheduling based

The photographs to the left and right exemplify pilot effort required when the flying is over. The engine covers and propeller stops, left, must be installed after the engines cool down. The dinged fuel access panel on the nacelle, right, is an outward indication of why it is necessary to monitor refueling.



on quarterly hours of operation. Some training in record keeping would help make more effective communication between pilots and maintenance personnel possible.

Accurate, timely record keeping is an essential part of the program. You can't just shut down the aircraft's engines and walk away until next time. Separate logs are kept for flight, which includes recording of critical cycles such as engine start and landing, and for squawks. These must be sent to the factory on a scheduled basis to record and track essential maintenance-related information.

Even if the record keeping were not a factor, you still can't just shut down the engines and walk away. Fueling operations should be monitored, if for no other reason than to ensure that careless line boys don't mar the finish banging nozzles into the paint or damage the deice boots. You should also ensure that fuel is added properly, both in terms of quantity and balance. There also is the need to add an anti-icing compound to the fuel in proper proportion. I have had several experiences where the person refueling an aircraft is not familiar with the anti-icing technique.

Oil level should be checked within ten minutes of shutdown. If more is needed, you must ensure that only the type and brand currently being used in the engine is added.

You also must wait for the engines to cool down so that the intake and exhaust covers and the prop stops can be installed. It is no fun on a deserted ramp on a cold, windy night or on a hot day when you are in a rush. But it is necessary.

Another consideration is the location of an approved service center, even for aircraft operators with their own maintenance facility. For most operators, this will be somewhere other than their home airport. Particularly for owner-operators, getting the airplane to and from the maintenance base can be an inconvenience or an expense, or both. This is particularly so for unscheduled maintenance.

If you are a key person in your business, and you plan to do the bulk of the flying as well, you might consider hiring another pilot to handle many of the details—making sure the airplane is kept clean, properly stocked and ready to go—while you tend to business. Several operators of 425s and

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Between the homework is the fun: flying.

similar aircraft—and quite a few operators of piston-engine aircraft, too—have done so.

If this sounds like a lot of work to you, consider it all part of your insurance—ensuring that you get the maximum return from and proper protection for your investment, and that you get all the advantages you intended.

The Conquest I provides quite a few advantages. The cockpit is wide, well organized and comfortable. Visibility is good. Noise level in cruise is relatively low. The airplane will get to altitudes where fuel efficiency is best fairly quickly and, at altitudes in the mid-20s, will regularly cruise in excess of 240 knots, while burning less than 400 pounds per hour. The aircraft's endurance with full fuel at maximum cruise power averages just under five hours with IFR reserves.

Coming down, you can comfortably fit in with other traffic right into the approach if necessary. It is a stable, good handling airplane that makes approaches to minimums quite comfortable and handles missed approaches with aplomb.

The best seat in the house is left front, but you can keep the people in the back of the Conquest I comfortable, and, best of all, you can treat them to a smooth flight. And, so long as you have paid attention to all the necessary pre- and post-flight considerations that are part and parcel of any sophisticated aircraft, you can keep doing it for hundreds of hours a year with very few surprises. □

Cessna 425/Conquest I
Base price $1,125,000
Average Equipped Price New $1,317,573
AOPA Pilot Operations/ Equipment Category*:
All-weather $1,200,000 to $1,445,000 (est).

Specifications	
Powerplants	Two Pratt and Whitney of Canada Ltd. PT6A-112 free turbine, two shaft, flat rated at 450 shp each
Recommended TBO	3,500 hr
Propeller	Two McCauley three-blade, full feathering and reversing; 7.75 ft dia
Recommended TBO	3,000 hr
Length	35 ft 10 in
Height	12 ft 7 in
Wingspan	44 ft 1 in
Wing area	225 sq ft
Wing loading	38.22 lb/sq ft
Power loading	9.55 lb/hp
Seats	6-8
Cabin length	15 ft 10 in
Cabin width	4 ft 8 in
Cabin height	4 ft 3 in
Empty weight	4,922 lb
Empty weight, as tested	5,327 lb
Max ramp weight	8,675 lb
Useful load	3,753 lb
Useful load, as tested	3,348 lb
Payload w/full fuel	1,300 lb
Payload w/full fuel, as tested	896 lb
Max takeoff weight	8,600 lb
Max landing weight	8,000 lb
Zero fuel weight	7,000 lb
Fuel capacity, std	2497.76 lb (2452.2 lb usable) 372.8 gal (366 gal usable)
Oil capacity, ea engine	9.2 qt
Baggage capacity	
Nose	400 lb, 22.4 cu ft
Aft Cabin	500 lb, 30.6 cu ft
Performance	
Takeoff distance, ground roll	2,110 ft
Takeoff distance over 50-ft obst	2,420 ft
Accelerate/stop distance	3,800 ft
Accelerate/go distance	3,360 ft
Max demonstrated crosswind component	24 kt
Rate of climb, sea level	1,875 fpm
Single-engine ROC, sea level	380 fpm
Max level speed, sea level	220 kt
Max level speed, 18,000 ft	260 kt
Cruise speed/Range w/45-min rsv, std fuel at 8,200 pounds (fuel consumption, ea engine)	
@ max cruise power	
26,000 ft	251 kt/1,240 nm (203 pph/30.3 gph)
@ max range power	
26,000 ft	213 kt/1,560 nm (152 pph/22.7 gph)
Max operating altitude	30,000 ft
Landing distance over 50-ft obst	2,120 ft
Landing distance, ground roll	940 ft
Limiting and Recommended Airspeeds	
Vmc (Min control w/critical engine inoperative)	92 KIAS
Vsse (Min intentional one-engine inoperative)	102 KIAS
Vx (Best angle of climb)	102 KIAS
Vy (Best rate of climb)	115 KIAS
Vxse (Best single-engine angle of climb)	105 KIAS
Vyse (Best single-engine rate of climb)	111 KIAS
Va (Design maneuvering)	157 KIAS
Vfe (Max flap extended)	
15°	174 KIAS
45°	145 KIAS
Vle (Max gear extended)	175 KIAS
Vlo (Max gear operating)	175 KIAS
Vmo (Maximum operating limit speed)	230 KIAS
Mmo (Maximum operating Mach number)	0.52 Mach
Vr (Rotation)	98 KIAS
Vs1 (Stall clean)	90 KIAS
Vso (Stall in landing configuration)	84 KIAS

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, at sea level and gross weight, unless otherwise noted.
**Operations/Equipment Categories are defined in June 1984 Pilot, p. 108. The price reflects the cost for equipment recommended to operate in the listed category.*