Son of Centurion

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All the elements of a classic weather accident were there: marginal weather getting worse, with high winds, heavy snow possibly mixed with freezing rain on its way and a strong possibility of another front along the route of flight; darkness; a long day; a desire to get home and a thousand miles to go—and a light, single-engine airplane.

The Skylane was rattling in its chains on the darkened ramp. Overhead there was a solid overcast two to three thousand feet thick. After a last weather check was made and a flight plan filed, the pilot went over the aircraft and checklists thoroughly. With the clearance received, maximum takeoff power was set before brake release, and the Skylane was off.

It didn't level off to grope around in the clouds and possible ice, however. With maximum climb power and an airspeed of 90 knots, this Skylane was through the overcast and out the top in three minutes and was still climbing at 1,300 fpm through 12,000 feet. It took just over 15 minutes to reach flight level 190 where, at 350 pounds below gross (3,100 lb), the aircraft blistered along at 185 knots true. Groundspeed was 235 knots. We were dying to have someone ask what kind of Cessna we were.

Finally, bouncing through the cold clouds approaching St. Louis, ATC asked if we were showing many echoes on our radar, and we were able to tell someone that we were ". . . just a little old Skylane."

Cessna's TR182 is a Skylane in name only. Pulling up the gear and adding a turbosupercharger has given pilots who need to go the ability to do it many times when they would have had to sit it out with many other aircraft.

The Skylane RG was introduced in 1977. In addition to retractable gear, it features a different engine from the 182's 230-hp Continental O-470U; a 235-hp Lycoming O-540L3C5D with a recommended TBO of 1,800 hours. The turbosupercharged version officially joined the line last October. At the same time, the entire Skylane family was converted to wet wings, which increased fuel capacity from 61 gallons standard (80 optional) to 92 gallons standard. Usable fuel is 88 gallons.

The only visible external difference between the RG182 and the turbosupercharged version is that the latter has a single exhaust pipe (unless you want to consider the small "Turbo" lettering on the sides of the fuselage). Aside from the price tag, the blower and the new wet wing, the TR182 is basically the same as the RG182 we reported on in the January 1978 issue of The PILOT. The real difference is the performance turbosupercharging adds to those who can pay the added price.

There are additional demands on the pilot, too, if he intends to realize the flexibility, performance and useful service life turbosupercharging provides the growing list of single-engine airplanes that have received the treatment.

The choices confronting prospective buyers are approaching the stagger point. Just within the Skylane family, considering equipment packages, there are nine varieties to choose from. If one is searching for a turbo single, there are nine basic aircraft to study. And if one is considering capability, the performance of the turbo singles must be compared with that of many twins, for the similarity of payload, speed and range between the types holds quite a few surprises, including price differentials for similar perform-

ance exceeding $200,000. And that 200 grand will not include pressurization on most of the twins, either. What it will include is redundant systems in most instances, together with much higher demands on pilot skill and the requirement for a much greater commitment to professional proficiency standards. About the only thing that money buys is certification to fly in known icing conditions on some, but by no means all, of the twins.

With a typical load, the true airspeed of the Turbo Skylane is competitive with quite a few of the cabin class twins. At full gross weight the 75% cruise of 173 knots isn't that far off. With full climb performance, maximum cruise power and conservative leaning technique, fuel burns will average less than 16 gph.

With radar and alternative of detection systems such as the Ryan Stormscope increasingly available to single-engine aircraft, the only enemy left besides the pilot is ice. If one is willing to stay on the ground a few days a year, single-engine aircraft with blowers such as the Turbo Skylane offer tremendous performance as transportation vehicles for a (relative) price.

While the venerable Skylane offers a good blend of transportation, family fun and airport junketing, the TR182 should be considered transportation, period. How many people can shell out nearly $80,000 to shoot touch and goes or hop 20 miles for a hamburger?

Ten years ago a stripped Skylane listed for $18,895; this year the base price is $39,995 and a good all-airspace VFR/basic IFR version goes out the factory door at $46,395. Considering the Skylane for a minute as a recreational vehicle, that's pretty competitive with a lot of boats, motor homes and what have you. Adding pull-up gear—the RG182—costs another $12,900 but adds 12 knots' cruise and a minimal 10 nautical miles' range. An additional $6,000 adds turbosupercharging together with a greater variety of choice in flight planning, 29 knots in cruise (at altitude) and 5 nautical miles' shorter range.

Once one remembers to retract the gear, most of the characteristics of the Skylane RG's are not that different from the basic Skylane. Procedures are straightforward and familiar. One has to find a way to get to the top of the wing to check the fuel tanks and caps, but it's the only troublesome aspect of preflight. Fuel samples are taken from three points: each wing has a probe drain near the trailing edge (lazy folk can reach them from the front seats), and the fuel strainer drain control is reached through an access door on the right upper cowl. The dipstick for the sump is there, too.

Both of the retractable Skylanes feature an induction system which takes ram air through a recessed, NASA-type scoop on the left rear side of the cowl. Both also are carbureted (which is unusual for a modern turbo engine). Alternate air for carburetor heat and in the event of icing of the carburetor induction air inlet is taken from a shroud around the exhaust manifold.

Priming for cold starts employs a manual primer, which is the same type as those used for other carbureted Cessna singles. The electric fuel pump is for emergency use in the event the engine-driven pump fails. Cold and hot starts are very easy, with the engine catching in just a few rotations.

An EGT gauge is standard equipment. We strongly recommend that the aircraft be ordered with the op-

tional ($160) carburetor air temperature gauge, too.

In addition to being carbureted, there are other characteristics unique to this installation. Cessna buys the engines from Lycoming and the turbosuperchargers from Garrett AiResearch and mates them at the factory. The system features a variable waste gate, which is operated by the throttle control. The first half of throttle controls the butterfly in the carburetor as with a normally aspirated engine; the second half of the throttle travel controls the turbo's variable waste gate.

Maximum manifold pressure is 31 inches, and it is easy to overboost this engine. The turbo system contains a pressure relief valve just upstream of the carburetor, which is designed to open if pressure reaches 34 inches. Momentary overboost is not considered serious, but we prefer to act as though the whole thing will explode if 31 inches is exceeded and not trust the relief valve to protect the engine. An overboost annunciator at the top of the glare shield would be a useful addition, since throttle setting changes require careful monitoring of the manifold pressure gauge, which is mounted too far to the right for quick reference. The times one must use it are the busiest.

The recommended procedure for takeoff is to stabilize power before brake release. The few times we had to accept a rolling takeoff we kept the manifold pressure below 30 inches to avoid overboosting. With a ground run of 1,000 feet at gross weight on a 40°C day, or 1,935 feet to a 50-foot barrier, using 20 degrees of flaps, there aren't many—if any—airports where slightly less than optimum power will present a problem.

As we've said before, throttle jockeying should be avoided with any powerplant, but it is particularly critical with a turbosupercharged one. The aircraft we flew, 4475R, seemed very sensitive right at the maximum cruise power setting of 25 inches, particularly when first establishing cruise. Small throttle changes produce large manifold pressure changes.

Another characteristic of this turbo system is that it will not hold a manifold pressure setting throughout a climb or descent. As with a normally aspirated engine, manifold pressure must be monitored and adjustments made with altitude changes.

Power management is one of the prices of increased performance and flexibility. In this installation one can't set the power and forget it. Manifold pressure, EGT, cylinder head and oil temperatures must be watched closely. Increased rpm will increase manifold pressure. Mixture, altitude and airspeed changes will also affect it.

Temperatures were well within tolerances during our flights at altitudes ranging from 3,000 feet to FL 190. The higher the density altitude, however, the more closely temperatures need to be watched. Our airplane, 4475R, was still in its break-in period, so we used the recommended maximum cruise power settings at all times to help seat the rings. In addition, although the engine is approved for operation at peak EGT, we used the recommended lean setting (50 degrees rich) at all times. We may be nervous nellies, but running any engine at peak EGT is not appealing. Had the engine had sufficient time on it to sample various power and mixture settings, we are willing to bet that flight at the upper altitudes would have required use of cowl flaps to maintain normal operating temperatures with peak EGT. We prefer to use avgas.

Another piece of equipment that must be monitored closely and kept in good working order is the oxygen system. While quite a few operators of turbo aircraft say they rarely, if ever, go above 12,000 feet, we think it pays to do so whenever it means getting above tough weather or when the winds are at your back. We don't mind wearing an oxygen mask, which is the penalty one accepts to operate at turbo levels without pressurization.

The Turbo Skylane's optional 48-cubic-foot system includes a high-capacity mask with built-in microphone for the pilot and retails for $1,325. The installation is good, with a console in the overhead which contains a selector, two ports for the front seats and a gauge. The rear-seat outlets are above the side windows. A full tank will sustain four people for 3.25 hours or the pilot alone for 8 hours.

Filling the tank to capacity requires warm temperature, however; in the cold Wichita air, 4475R took 1,600 psi as opposed to the maximum 1,800 psi. This should have been sufficient for 6.25 hours. Fortunately, we included the 0_2 gauge in our periodic checks and noticed it seemed to be emptying faster than anticipated. When it ran out after a bit over three hours, we

had an opportunity to test the emergency descent procedures (which aren't covered in the operating manual). Reducing power to 20 inches and dumping the nose to hold 165 knots (just into the caution range) resulted in an initial rate of 2,000 fpm in still air. With a time of useful consciousness of 15 minutes at 18,000 feet, a quick descent to 12,500 feet or lower should be no concern in the event of problems with the system. We maintained 20 inches all the way down, kept the mixture leaned, and were able to maintain good cylinder-head and oil temperatures. It took less than four minutes to descend below 12,500 feet.

Rough air would have called for a different technique. Indicated airspeed was 137 knots. With gear and first (10 degrees) flap-setting speed of 140, it would have been easy to drop both and hold that airspeed. Moderate or worse turbulence would require a substantial power reduction, however, as the maneuvering speed is a relatively low 112 knots IAS.

The aircraft handles well in all flight regimes. As is characteristic with all the Cessna singles, elevator forces are quite high and one learns to fly with generous applications of elevator trim. Rudder trim is used a good bit in the Turbo Skylane, also. Healthy right rudder is needed during takeoff and climb. The relative trim change from climb to cruise is significant.

Lateral and pitch control and stability are good, making for good close-in maneuvering and low work load at cruise. Slow flight is solid and stalls are clean with quick recovery, even when horsing the airplane into a full break. Rudder is sufficient to pick up a dropping wing throughout the stall. Pitch trim changes when selecting gear down or first flaps can be balanced out by selecting flaps immediately after gear.

The nose really points at the ground during final, and it takes a good bit of elevator to flare—which means high effort if lots of elevator trim isn't used during the approach. Final at 75 knots, reducing to 65 over the fence, produces a chance for a gentle touchdown while providing enough elevator for the roundout. The Turbo retains the good short-field performance of the Skylane, needing only 650 feet with little braking on a hot (40°C) day, or a total of 1,400 feet to clear a 50-foot barrier.

All in all, it is relatively easy to transition to the TR182, particularly if one has flown other Cessna singles. There are no surprises in handling and there will be no surprises in using its full capabilities if one takes the time to understand the systems and operates them properly.

Visibility is greatly improved in the RG series. The cowl, instrument panel and glareshield are lower than on most other aircraft in the Cessna single-engine line. With articulating seats, one can select a position that provides good forward visibility and requires less ducking to see out the side windows than in the rest of the line. Skylight windows are an available option that should further improve visibility, particularly in the traffic pattern. Our only major complaint was windshield distortion in the lower corners.

Cabin comfort is good. Standard seats feature three-position backs for the back-seat passengers as well as the front. We think the additional $260 each for articulating front seats is worth it, if for no other reason than the improvement in visibility mentioned above.

Rear-seat shoulder harnesses are a $100 option. Inertia reel harnesses for the front seats, which we consider much more comfortable, cost an additional $195.

We had some concern about staying warm during flight at high altitude, but the system was up to the task. We even had to turn it down a bit in the −20°C outside temperatures.

Noise level is typically high, although wind noise was better than some other Cessnas we've flown. The only wind noise came from the wing root ventilators (which can also collect water). Main and baggage door sealing seem to have been improved.

There is a generous mix of lighting available for night flying, all controlled by rheostat. A combination of post and flood lights made most of the instruments quite visible with relatively low light settings. Separate map and overhead lights provide all but the most myopic with plenty of bright light for checking charts and plates.

There have been a lot of detail improvements in the Cessna singles we have flown in the recent past, which reflect more care in systems and operational design. The Turbo Skylane has a separate panel containing avionics circuit breakers and an avionics master switch. A welcome small touch we noticed when using the hand-held microphone in 4475R is

the addition of Velcro® to the control wheels. Instead of bending over to snatch (or replace) the mike in the central control pedestal, you can stick it to the yoke without looking, keeping it handy for busy times.

The TR182 can carry a good load, but it should not be treated as a fill-it-and-go machine. Standard empty weight is 1,815 pounds; gross for takeoff and landing is 3,100. The aircraft is certificated with a maximum ramp weight of 3,112, as well, which provides an extra bit of fuel to handle start, taxi and runup.

Cessna 4475R has 97 pounds of optional equipment, which brings the useful load down to 1,188 in flight. Full fuel weighs 528 pounds, so the payload with full fuel is 672 pounds. That's almost four FAA standard souls with no allowance for baggage, charts, coffee and the other usual cockpit clutter. So it should be considered three plus baggage, or a less-than-full-fuel airplane. Filling each tank to the bottom edge of the filler neck will provide a reduced fuel load of 32.5 gallons of usable fuel per side . . . provided refueling is done with the aircraft on a level surface.

The reduced fuel load will mean approximately 1.5 hours less endurance.

The Bottom Line

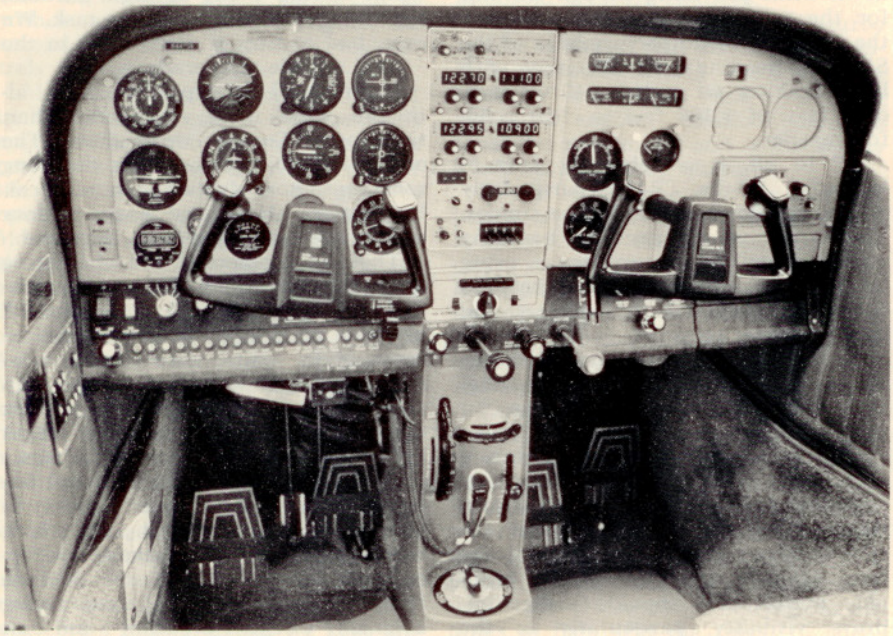
A few years ago Cessna developed a package pricing philosophy which we think represents a definite improvement. Base price now includes practically all the instrumentation and lighting one needs for basic day-and-night VFR flight, although, surprisingly, such basics as dual controls are still "optional." The II series package brings this up to light IFR and includes a basic avionics package of Cessna avionics including a single-axis autopilot with couplers, one nav/com, ADF, transponder, ELT and all the necessary plumbing for a price of $6,400 in the Skylanes. Their Nav-Pac adds a second nav/com, glideslope and marker-beacon receivers for an additional $3,250. If one prefers a different brand of avionics or a different arrangement, it's necessary to go back to the lengthy option list to equip the airplane.

The final tag for 4475R is $78,065 excluding gas and oil. So, depending on your needs and wants, there's more to go after the factory package options, which raise 4475R nearly $10,000 above the II with Nav/Pac list. This includes the oxygen system we consider a must, the instrument-panel lighting system we like so much ($685) and strobes (another must and another $475). Serious IFR additions such as an anti-precipitation kit, ADF anti-precip antenna, DME and heavy-duty battery are included as well.

There are two other options not included in the price list which are needed for the Turbo Skylane and any other aircraft capable of flying above FL 180: an instrument rating and a set of high altitude en route charts.

In balance, the Turbo Skylane is a useful package for the businessman pilot and represents a competitive choice in the performance race among both singles and twins.

It shouldn't really be compared to a Skylane or similar, normally aspirated, fixed-gear singles. In fact, Cessna may find it to be competition for the Centurion since pilots can buy near-Centurion performance (460 pounds less useful load, 23 knots slower cruise, 7,000-foot lower maximum operating altitude) for about $20,000 lower cost at list. □



It looks like any Cessna single instrument panel, but Skylane pilots will be impressed by the improved visibility over the nose and to the sides which has been made possible by reducing the height of the Turbo RG's panel and glare shield.

CESSNA TR 182 TURBO SKYLANE RG

Basic price: $58,895
Price as tested $78,065
Basic price (TR 182 II with Nav/Pac): $68,555

Specifications

Engine	Avco Lycoming O-540-L3C5D 235 hp @2,400 rpm, TBO 1,800 hr
Propeller	McCauley constant speed, 82-in diameter, 2 blades
Wing span	36 ft
Length	28 ft 7.5 in
Height	9 ft 3 in
Wing area	174 sq ft
Wing loading	17.8 lb/sq ft
Power loading	13.2 lb/hp
Passengers and crew	4 (Optional seating for 2 children)
Cabin length (including baggage area)	7 ft 9 in
Cabin width	42 in
Cabin height	48.5 in
Standard empty weight	1,764 lb
Equipped empty weight (as tested)	1,912 lb
Useful load (basic aircraft)	1,348 lb
Useful load (as tested)	1,200 lb
Payload with full fuel (basic aircraft)	820 lb
Payload with full fuel (as tested)	672 lb
Gross weight (takeoff & landing)	3,100 lb
(ramp)	3,112 lb
Fuel capacity (std)	92 gal (88 usable)
Oil capacity	9 qt
Baggage capacity	200 lb

Performance

Takeoff distance (ground roll)	820 ft
Takeoff over 50 ft	1,570 ft
Rate of climb (gross weight) (sea level)	1,040 fpm
Maximum level speed (20,000 ft)	187 kt (216 mph)
Cruise speed (75% power, 10,000 ft)	158 kt (182 mph)
(75% power, 20,000 ft)	173 kt (199 mph)
Cruise speed (66% power, 10,000 ft)	149 kt (172 mph)
(66% power, 20,000 ft)	155 kt (178 mph)
Cruise speed (56% power, 10,000 ft)	138 kt (159 mph)
(56% power, 20,000 ft)	149 kt (172 mph)
Range at 75% cruise (with 45-min reserve)	
(10,000 ft)	845 nm (975 sm)
(20,000 ft)	875 nm (1,010 sm)
Range at 65% cruise (with 45-min reserve)	
(10,000 ft)	910 nm (1,045 sm)
(20,000 ft)	937 nm (1,075 sm)
Certificated maximum operating altitude	20,000 ft
Stall speed (clean)	54 kt (62 mph)
Stall speed (gear and flaps down)	50 kt (58 mph)
Landing distance (ground roll)	600 ft
Landing over 50 ft	1,320 ft