

## PILOT FLIGHT CHECK:

# Cessna's 1975 Fixed-Gear Cardinal

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■ Cessna hasn't made radical changes in its fixed-gear Cardinal since the aircraft's introduction in 1967, but has followed a pattern of small improvements with each model year. This is again the story for the 1975 version of the lightweight four-seater.

The improvement most emphasized by Cessna is the new Cardinal's cruise-speed increase of 7 mph (up to 150) and its top-speed increase of 4 mph (up to 160). Horsepower remains the same, at 180.

Additional new features are larger instrument panel lettering, improved cabin air control, and a pushbutton mixture control.

This year, for the first time, a Cardinal II package can be purchased. Like the Skyhawk II, introduced last year, the Cardinal II has options added to make it an accessory-laden, but basically VFR, airplane. And the cost is somewhat less than it would be if the buyer were to add the same options and tally the individual costs.

The basic Cardinal II is list-priced for 1975 at \$24,980, but that still leaves room for a lot of additional options. One Cardinal II I flew for The PILOT was filled with just about everything you could get from the factory for that airplane. With such options as wingtip strobes (\$390), rear-seat ventilation (\$130), whitewall tires (\$42.50), additional radios (about \$4,000 worth), and an encoding altimeter, the price ran up to \$36,747.

This year the manufacturer has included fuel quick drains as standard equipment; however, the engine priming system remains a \$52.50 option.

Anyone who has flown a Cessna 150 and is aware of constant-speed propeller basics could get into a fixed-gear Cardinal and fly away. A checkride of an hour or two should be more than sufficient to make a Cessna-familiar pilot comfortable in the left seat. (Cessna also makes a retractable model with a 200-hp engine. This beefier and faster Cardinal will not be introduced for 1975 until later this month.)

One of the most unique features of the Cardinal is its lack of wing struts. ("What holds the wings up?" a nonpilot friend of mine asked.) This feature allows for two of the widest-opening doors in general aviation. The four-foot-long doors on each side of the craft open out a full 90 degrees from the fuselage for easy access to front and rear seats.

Cessna points out that the door hinges and their attachment points have been strengthened this year "to help the airplane's large doors retain their tight fit." In addition, a bumper plate has been added at the door latch. It is a little piece of steel designed to prevent skin damage when pilots and passengers pull their door shut with the handle in the locked position.

Though the baggage area is relatively small (a 120-pound capacity in 11.2 cubic feet), the space has been donated to the rest of the cabin. Consequently, rear-seat passengers have more leg room than they would in most automobiles.

The strutless look of the Cardinal adds to its sleek appearance, as does its sharply sloping windshield. That slope is so great it takes about a yard of Plexiglas to cover the space from the cowl up to where the windshield joins the cabin ceiling.

Despite all this Plexiglas, though, I found lack of visibility over the nose to be one of the Cardinal's least desirable features. Visibility everywhere else was fine—up, around, down to the side, and back. But vision over the nose was somewhat blocked (at least for me, a pilot of medium height) by the instrument panel. The panel has all instruments and gauges concentrated on the left side; to the right of the radio stack, the panel top curves downward to make the height of the panel even more noticeable to the pilot.

I tried cranking my seat up all the way—which helped. (Vertically adjusting seats are optional at \$200 each.) Now I could see the top of the cowl. When I pulled my seat forward enough to permit full use of the rudder pedals, however, my knees hit the padded bottom

corner of the panel.

In cruise, seeing over the nose wasn't much of a problem. Once the Cardinal is trimmed up, it assumes a fairly nose-low configuration.

In turns, the Cardinal is one of the best-visibility high-wingers I've seen. Its wings are set pretty far back in relation to the cabin, so it is easy to peek around the wing in a bank. In fact, while you're flying a traffic pattern, it is no problem to keep in visual contact with your touchdown point throughout downwind, base, and the turn onto final.

The instrument panel on the Cardinal has hardly changed in the past several years and, aside from its height, is easy to use. Most of the regularly used flight controls (rudder and elevator trim wheels, flap switch, engine controls, and cowl-flap lever) are located near the center of the panel or on a pedestal extending from center panel to the floor. The controls are arranged in such a manner that pretakeoff and prelanding checklists can be handled quickly, with minimal reaching and scanning.

Radios are stacked top to bottom just to the right of center panel, but on one Cardinal II flown for The PILOT—a model equipped with dual Cessna nav/coms, ADF and autopilot—the transponder was at the far right of the panel—very much out-of-the-way for the pilot.

For performance checks, a basic Cardi-



**Aerodynamic speed increases and new  
marketing arrangements mean the Cardinals  
are better buys than ever**



## CESSNA CARDINAL II

### Specifications

Engine	Lycoming O-360-A1F6D, 180 hp
Propeller	76-in, constant-speed
Empty weight (approximate)	1,580 lb
Gross weight	2,500 lb
Baggage	120 lb
Wingspan	35 ft 6 in
Wing area	174 sq ft
Length	27 ft 3 in
Height	8 ft 7 in
Fuel capacity (usable)	
Standard	49 gal
Optional long-range	60 gal
Oil capacity	9 qt
Wing loading	14.4 lb/sq ft
Power loading	13.9 lb/hp
Basic price	\$24,980

### Performance

Top speed	160 mph
Cruise (75% power)	150 mph
Range (75% power, no reserve)	
Standard tanks	735 mi
Long-range tanks	900 mi
Service ceiling	14,600 ft
Rate of climb	840 fpm
Takeoff distance	
(over 50-ft obstacle)	1,400 ft
Landing distance	
(over 50-ft obstacle)	1,220 ft
Stall	
Flaps up	63 mph
Flaps down	53 mph

nal II with long-range (60 usable gallons) tanks was flown. It had a useful load of 896.4 pounds, with maximum gross weight of 2,500. Full tanks, a 200- and a 145-pound occupant, and 10 pounds of cameras filled the Cardinal II to within 164.4 pounds of gross weight. Add an autopilot and IFR radios (the Nav Pac option) and you've added more than 30 pounds to the craft's weight, which in our case would have left us about 130 pounds under maximum gross.

In flight the Cardinal is comfortable and smooth except for a little bit of noticeable vibration at full power settings.

On a flight out of Morristown, N.J., where Cessna's northeast zone headquarters are located, the Cardinal was run through basic flight performance checks. Full throttle at 5,500 feet proved the Cardinal could exceed its rated cruise speed, but the power settings required were a little above the settings suggested in the performance tables of the operator's manual.

With manifold-pressure and prop needles hanging at the top of the green arc (24.5 inches mp and 2,675 rpm), the Cardinal trued out at about 150 mph. At a more comfortable and quiet power setting, 21 inches and 2,400 rpm, about 67% power was being produced by the Lycoming 180, resulting in a true airspeed of 136 mph. According to the pub-

lished performance figures, that's about 2 mph below book figures, but pilot technique, atmospheric pressure, and scores of other variables can account for such a difference.

At a lower altitude, 3,000 feet, with a temperature of 40°F in choppy air, I again redlined the gauges and found my airspeed topping at about 152. Although I was in a plane considerably under

gross weight, I was nowhere near Cessna's claimed 160-mph maximum speed for the Cardinal.

During portions of a long cross-country flight in another Cardinal II, a PILOT staff member reported 150-mph true cruise at full throttle while maintaining 7,500 feet. At the time he was holding 22.5 inches mp, and 2,300 rpm, or close to 75% power. At a lower altitude, and

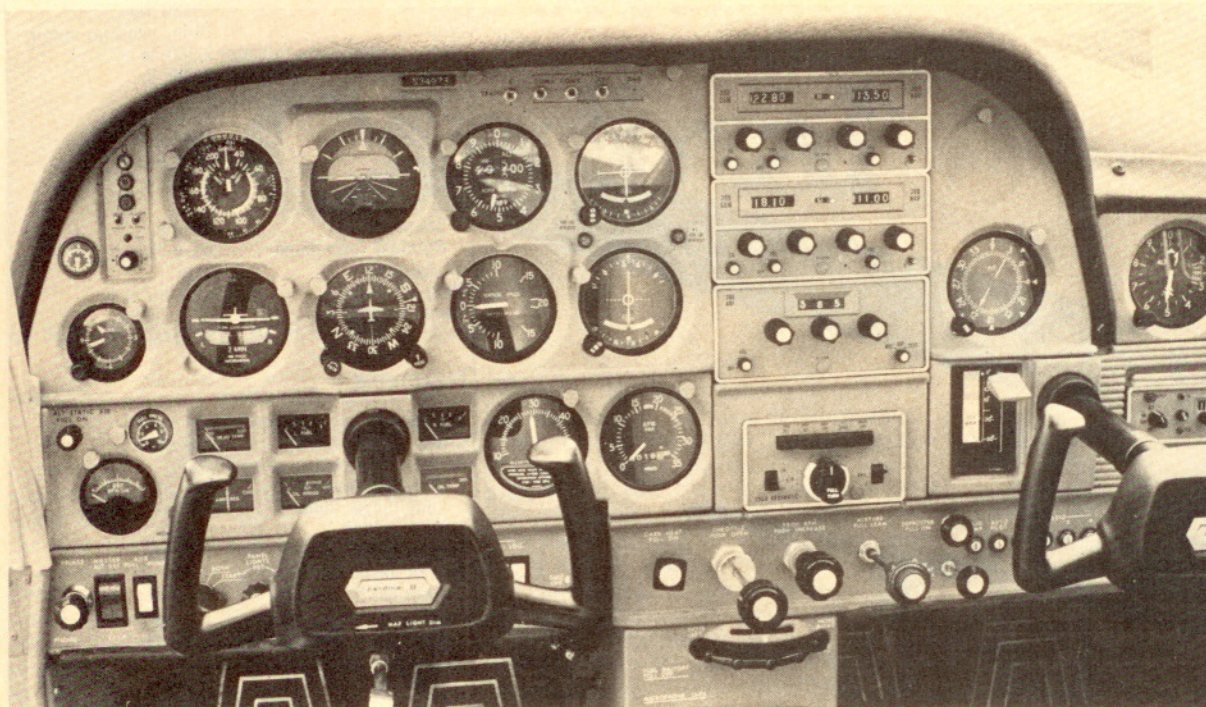
### Cardinal Cross-Country Flight Log

PILOT Western Editor Don Downie recently flew a new Cardinal II from Wichita, Kan., to Ft. Lauderdale, Fla., with a quick side trip to Ocean Reef, Fla. Below are some of the statistics from his journey.

Total miles	1,470 mi
Total time	12.4 hr
True airspeeds:	
Full throttle, 7,500 ft	150 mph
23 inches mp/2,350 rpm at 2,000 ft	132 to 135 mph
Total fuel consumed	143.3 gal
Average fuel consumption (rich break-in mixture)	11.5 gph



All flight and engine instruments are concentrated on the pilot's side of the panel. This Cardinal II was equipped with an electric encoding altimeter, so a standard pressure altimeter (far right, above the transponder) was a required backup.



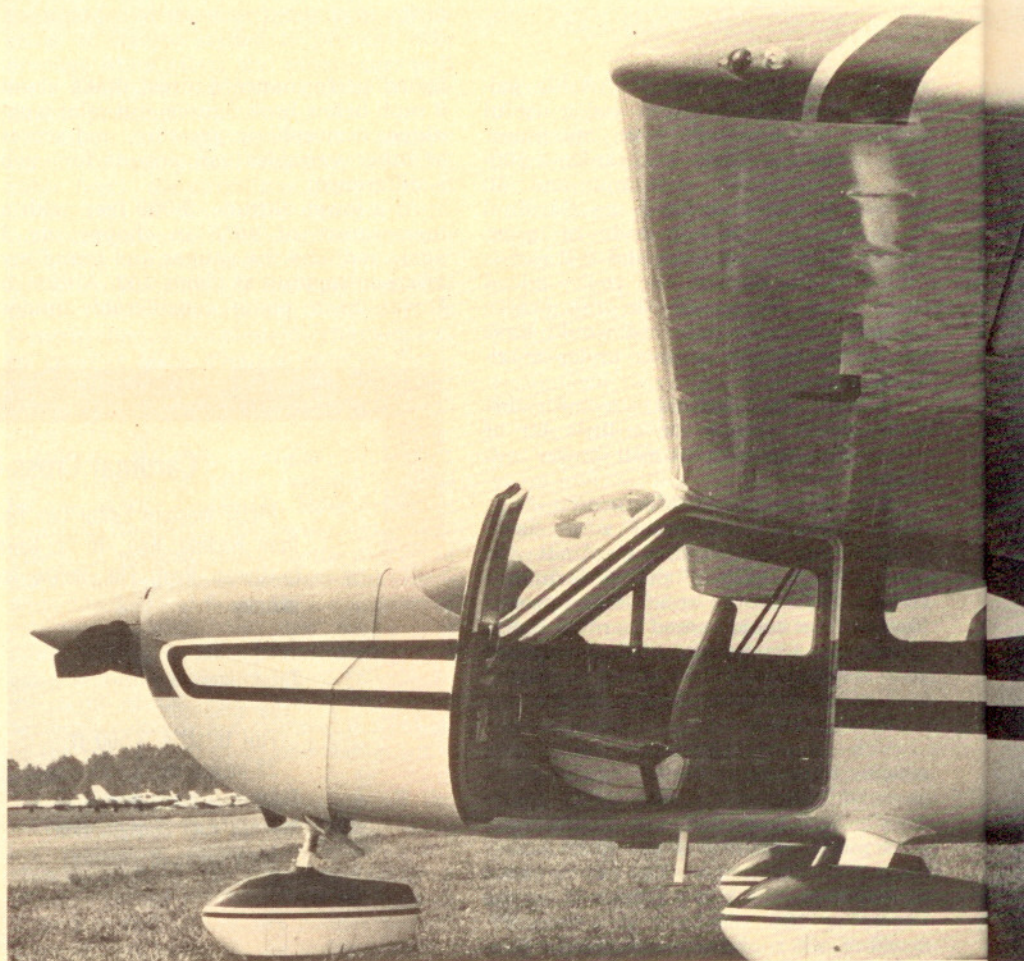
#### CARDINAL continued

with slightly reduced power settings, his speeds again fell several mph below those claimed in the owner's manual.

Flight characteristics of the Cardinal were straightforward and easy to handle. Especially noticeable was its willingness to quickly come to grips with an altitude and hold it without porpoising. Stalls were gentle; even departure stalls, which came at about 50 mph indicated, were mild.

Without power, the Cardinal fixed-gear model stalled, flaps up, at about 62 mph indicated, and with full flaps at 48. Slow flight could comfortably be held with full flaps at 50 mph, with mushy feel for all control surfaces. Seldom was more than 200 feet lost in identifying the stall and recovering to a climb attitude.

In flight the airplane is not super-sensitive, but it does respond quickly to relatively light control pressures. Just a touch of rudder in turns keeps the ball in place, but as the bank steepens toward 60 degrees, two hands on the yoke are helpful to hold altitude.







The Cardinal, with its strutless, set-back wing, has main doors that open 90 degrees, revealing a very large cabin with easy access. Photos by Berl Brechner.

One unique feel to the Cardinal, different from its single-engine brothers, comes when you lower the flaps. On most Cessna singles, the nose pitches up (requiring down trim) when flaps are lowered. On the Cardinal, it's just the opposite. Down flaps, up trim—not much, but enough to feel the difference.

Both trim and elevator control are sensitive; pitch changes are accomplished with a stabilator rather than the more standard elevator common to Cessna's other singles.

Takeoff and landing performance in the Cardinal is excellent. With almost no wind, landings to a full stop at Blairston, N.J. (elevation 380 feet), were made inside the first 800 feet of runway without any tire squealing. Final approach speed is about 75 mph, with flare at about 65.

Several years back, the company put slots in the leading edge of the stabilator to improve the Cardinal's landing characteristics. Elevator control is available through the landing flare during both full-flap and no-flap landings.

Takeoff can be accomplished (with 15 degrees of flap) within the same 800 feet, and with initial climb of close to 900 fpm, the Cardinal had as much as 400 feet of ground clearance crossing the far end of the 3,100-foot asphalt runway. Temperature at the field on the day of these checks was 54°F, and barometric pressure was 30.47.

With flaps raised, climb can be maintained at 650 fpm, holding 90 mph with 24 inches mp and 2,500 rpm. When I dropped back to 80 mph, climbing through 4,000 feet and pushing in 24 inches mp and 2,700 rpm, the Cardinal registered a 700–800 fpm climb.

Descents can be a lot faster. Full flaps, power off, and 100 mph will drop you out of the sky like a rock. The vertical-speed indicator was fully deflected down, showing a descent of more than 2,000 fpm. At best glide speed, 85 mph and flaps up, the Cardinal makes a much more leisurely declension from the clouds, heading earthward at about 700 fpm.

Cessna is to be commended for including with its single-engine line an abbreviated checklist in addition to the lists included in the owner's manual. The new checklists, for both normal and emergency procedures, are enclosed in sturdy plastic and are much more readily usable than pages out of the owner's manual.

The basic Cessna 177 is list-priced at \$21,065. The Cardinal (a 177 with a few basic options such as wheel pants, all-over paint, landing light, and tow bar) is priced at \$22,535. As noted earlier, the basic Cardinal II with its nav-com, dual controls, ELT, and a few other extras, costs \$24,980. A Nav Pac option, which converts the aircraft into an instrument bird, adds an additional \$3,942 to the cost. Cessna's encoding altimeter costs \$1,694, and the 300A autopilot is priced at \$2,175.

Bob Lair, a senior vice president at Cessna, says the Cardinals "are designed for the businessman who wants fast, spacious, comfortable inter-city transportation at moderate costs, with good fuel economy. The result is a highly efficient business machine that gets 15 miles per gallon at 150 mph."

Cessna offers Cardinal buyers a private pilot course at no cost if they don't yet have their license. And if you include the Nav Pac option in your purchase, Cessna throws in the instrument training.

That's a pretty attractive offer, and it comes with a good-looking airplane. But don't forget to bring along your checkbook. □

