

*At first Cessna's model  
177 looked great, but it  
was a performance flop.*

*A year later, one of  
general aviation's  
prettiest-ever airplanes  
was also one of the  
most satisfying to fly.*

*By Bill Cox*

*Photography By James Lawrence*

# CARDINAL

**B**eauty counts. While there's no way of defining the role of aesthetics in any purchase decision, there's little question it's a major factor. Whether you're buying an airplane, automobile, boat, motorcycle or snowmobile, appearance is always a major influence.

It may have been for that very reason that Cessna set out in 1965 to design what they hoped would be the sexiest, fixed-gear, single-engine airplane ever built. Appearance was one of the major considerations in the design of the Cessna Cardinal, perhaps in a perverse sense to the detriment of the finished product.

The original Cardinal was swept, flared and streamlined with a strutless, lightweight version of the Cessna 210 Centurion's wing, an aesthetic success in every respect. The finished airplane was so sexy, it looked almost Italian.

Cessna's original intent was that the Cardinal eventually would replace the Skyhawk, as evidenced by the fact the new model's initial designation was 172J. (It was changed to 177 before introduction.) Trouble was, the airplane wasn't quite ready in other areas. The stabilator was overpowered, the engine was underpowered and full fuel payload was poor.

Still, you couldn't deny that the Cardinal indeed was a futuristic design. Cessna labeled the model 177 "The Airplane of the '70s" and introduced it late in 1967. Reviews were mixed at best, and those

earliest of Cardinals earned a reputation as poor weight-lifters that were tricky to land. Cardinals didn't fly like conventional Cessnas, because they weren't conventional Cessnas. The tail was so powerful, pilots used to the more docile Skyhawk sometimes wound up porpoising a Cardinal onto its nosewheel and prop.

By 1968, only a year after introduction, the company recognized the model's shortcomings and fixed most of them in one fell swoop. Cessna slotted the stabilator to decrease sensitivity, increased power from 150 to 180 hp and bumped up both gross weight and payload over 100 pounds.

The result was an airplane that outshone the well-established and best-selling Skyhawk in nearly every respect.

Using Cessna's own performance numbers for 1969, the Cardinal was seven knots faster than the 172, climbed 115 fpm quicker to a service ceiling that was almost 3000 feet higher and carried nearly 100 pounds more useful load.

Of course, with 30 more horsepower out front, you might have expected some advantages, especially in climb. The O-360 Lycoming and constant speed prop that replaced the O-320 engine and fixed-pitch blades made a big difference. Extra power didn't explain all the performance improvement, though. The wing was notably different from the Skyhawk's. An NACA 6400 series airfoil (later revised to an NACA 2400 "Camber lift" design), it was aerodynamically cleaner, flush-riveted back to 50 percent of the chord, and its 174-square-foot lifting surface was abetted by semi-Fowler flaps that translated aft as they deflected down.

Sounds like a sure formula for a runway bestseller, doesn't it? Not necessarily. Though sales in the first two years numbered over 1100 units, subsequent years saw sales drop to 200 or less fixed-gear Cardinals. Even introduction of a slick and speedy retractable version, the Cardinal RG, couldn't save the model. It was a case of a good airplane that fell victim to its early bad press. By 1979, it was all over, after Cessna had built a total of 2751 Cardinal 177s.

Today, Cardinals newer than 1970 (the

Cardinal 177B) are recognized as among the best used, high wing, fixed-gear singles on the market. At least, most pilots who've flown the type agree the later Cardinals are some of the quickest-handling, nicest-flying Cessnas produced.

Frank Busch certainly thinks so. A retired vice president and chief of operations for TWA who once worked for Howard Hughes, Busch owns a pristine 1976 model Cardinal 177B. He bought the airplane three years ago from Screaming Eagle Aviation in Santa Paula, Calif., and he's been a happy Cardinal owner ever since.

According to *Aircraft Bluebook Price Digest*, Busch's '76 model is worth today about the same numerical price it brought new, between \$30,000 and

\$35,000. (That price obviously discounts inflation. With the CPI factored in, \$35,000 of today's dollars equal about \$15,000 in 1976 terms.)

From the moment you walk up to a Cardinal, you can't help admiring the simplicity and quick lines of the eager design. The airplane is built low, and windshield and tail are rakish and swept to give the impression of high Mach numbers while the Cardinal is standing still. Predictably, the cabin represents a series of compromises, but for the most part, they're compromises that work. The doors open a full 90 degrees to enhance entrance, and even though those big doors are more susceptible to misalignment because of wind gusts, ease of entry is impressive. You merely pop open the door and sit down in the cabin as if you were climbing aboard a Porsche.

Well, almost anyway. The Cardinal employs a full cantilever wing (with a rear spar that runs from tip to tip), and the center section carrythrough hangs down four inches from the roof, intruding into headroom as you make your way into the back seat. Once you're settled into the seats, the situation is better. Cabin width is 44 inches wide at the elbows, notably broader than a

*Look, Ma, no struts! The Cessna  
Cardinal was designed to be the  
loveliest fixed-single ever.*







Details above and right show the attention to swept, uncluttered lines, with lots of unrestricted room for ingress/egress. The initial model was easy to overcontrol in pitch due to a sensitive stabilator.



OPPOSITE PAGE, TOP: The Cardinal has good landing manners: 65 knots in the pattern, 55 touchdown is a breeze. LEFT: Screaming Eagle Aviation's head honcho Doug Dullenkopf goes along for the ride with Bill Cox. Cardinals love short field challenges, says Cox. ABOVE: Basic panel shows room for more goodies.





With 60 gallons at 75-percent power, this bird will fly for six hours plus reserve. To carry four people, though, load limits reduce fuel capacity to about three hours.

Aircraft Comparison Chart			
Aircraft make/model:	1976 Cessna Cardinal 177B	1976 Piper Archer	1976 Grumman Tiger AA5B
Used price:	\$31,000	\$34,500	\$26,250
Max level (mph):	135/155	132/152	148/170
Cruise 75% (mph):	124/143	128/147	139/160
Stall (mph):	46/53	49/56	53/61
Fuel 65% (gph):	8.7	8.7	8.7
Best Rate of climb (fpm):	840	735	850
Service ceiling (ft):	14,600	15,000	13,800
Takeoff over 50-ft obstacle:	1400	1625	1550
Landing over 50-ft obstacle:	1220	1390	1120
Useful load (lbs):	1005	1134	1040
Engine horsepower:	180	180	180
Propeller type:	CS	Fixed	Fixed
Landing gear type:	Tri/Fixed	Tri/Fixed	Tri/Fixed
Fuel capacity (gals):	60	48	51
Seating capacity:	4	4	4

Skyhawk or even a Bonanza.

If there's any compromise with cabin comfort in a Cardinal, it's in height. The airplane's cabin is only about 42 inches tall, and if it weren't for the laid-back, sports car-style seating configuration, seated headroom would be a problem.

Cardinal pilots and passengers find visibility excellent in virtually every direction. There's no center post to inter-

rupt the windshield, and the forward side windows fold well back along the cabin. The pilot sits slightly forward of the wing leading edge, so even the view to the top is better than you might expect. The panel on Busch's airplane is the later version that spans the width of the cabin rather than merely the left two-thirds (with a glove box at far right), a concession to automotive design that

## CARDINAL

never really had a chance of working on an airplane.

Despite the gross weight increase to 2500 pounds, Cardinals are a little shy of payload. The original owner of Frank Busch's airplane (like nearly all other Cardinal 177B owners) opted for the 60 gallon tanks, relegating payload on the test airplane to only 516 pounds. Consider, though, that at nine gph at 75 percent cruise, the Cardinal offers an easy six hours endurance plus reserve, longer than most pilots are willing to sit in one spot without a pit stop. Still, in order to carry four full-size folks, you'd have to offload nearly half that fuel and be left with only 33 gallons, three hours plus. This makes the Cardinal a runner-up to Piper's Archer in payload.

One area in which Cardinals excel, however, is short field performance. The model 177 beats everything in the fixed-gear, 180 hp class off the runway and back onto it by a handy margin. Unobstructed 1500-foot strips will easily accommodate a Cardinal if the pilot knows what he's doing. Short field numbers over the ubiquitous 50-foot obstacle are similarly impressive, about 1400 feet at sea level. With those slick wheelpants installed,

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# EMINENT CARDINAL

## 1976 Cardinal 177B

### SPECIFICATIONS

Used Price: \$31,000  
 Engine(s) make/model: Lyc. O-360-A1F6D  
 Horsepower @ rpm @ altitude: 180 @ 2700 @ SL  
 Horsepower for takeoff: 180  
 TBO hours: 2000  
 Fuel type: 100  
 Propeller make/type: McCauley CS, 76 in.  
 Landing gear type: Tri/Fixed  
 Max ramp weight (lbs): 2500  
 Gross weight (lbs): 2500  
 Max landing weight (lbs): 2500  
 Empty weight (std) (lbs): 1495  
 Equipped weight (as tested) (lbs): 1600  
 Useful load (std) (lbs): 1005  
 Useful load (equipped) (lbs): 900  
 Payload (full std fuel) (lbs): 606  
 Payload (full opt fuel) (gals): 540  
 Fuel capacity std/opt (gals): 50/61  
 Usable fuel std/opt (gals): 49/60  
 Oil capacity (qts): 9  
 Wingspan: 35 ft. 6 in.  
 Overall length: 27 ft. 3 in.  
 Height: 8 ft. 7 in.  
 Wing area (sq.ft.): 173.6  
 Wing loading (lbs/sq.ft.): 14.4

Power loading (lbs/hp): 13.9

Seating capacity: 4

Cabin doors: 2

Cabin length: 10 ft. 2 in.

Cabin width: 3 ft. 8 in.

Cabin height: 3 ft. 6 in.

Baggage capacity (lbs/cu.ft.): 120

### PERFORMANCE

Max level speed: 161/185

Cruise speed (knots):

	Altitude	Best Economy
75% power:	7500	124
55% power:	7500	104
Max range (nm):		
75% power:	7500	740
55% power:	10,000	840
Fuel consumption (gph):		
75% power:		10.1
55% power:		7.4
Estimated endurance (65% power) (hrs):		6
Stall speed (flaps down) (knots):		46
Best rate of climb (fpm):		840
Service ceiling (ft.):		14,600
Takeoff ground roll (ft.):		750
Takeoff over 50 ft. (ft.):		1400
Landing ground roll (ft.):		600
Landing over 50 ft. (ft.):		1220

the Cardinal wouldn't be appropriate for rough strips, but leave the wheels naked, and I'd bet the airplane would do an acceptable job in the bush.

Flying with two aboard on the day of my tests, I saw about 900 fpm on the VSI. Loading the airplane up to gross would have reduced that number a little but I'd bet not a lot. Book specs advertise 840 fpm at gross, and past experience in Cardinals suggests that's not far off the mark.

Cardinals have always laid claim to some of the best handling of any Cessna, and N604FB proved the type is indeed something special. Despite Cessna's detuning of the stabilator in 1968, pitch response is quick and light. Better still, though, roll is delightful. The airplane has the quickest roll rate among Cessnas, and I'd bet it would deliver a smooth, fast aileron roll if that were legal. The Cardinal is a normal category airplane, however, so you'll have to content yourself with steep turns up to 60 degrees.

I flew Busch's Cardinal with Screaming Eagle's Doug Dullenkopf riding right seat during a photo session, and it was a refreshing experience. The Cardinal's

big ailerons easily allowed me to offset the vortices of the Saratoga SP photo ship and snuggle up eight to 10 feet out to photographer James Lawrence's satisfaction. That's something I wouldn't do in just any airplane, but it worked well in the Cardinal.

Another nice feature of the Cardinal in a steep bank is that you can sight right down the leading edge of the wing at your reference point. The Cardinal loves to maneuver, and those pilots (such as this one) who enjoy light, responsive handling invariably will be impressed.

If the airplane's looks and handling suggest speed, the 177 delivers good performance, though it's not exactly a screamer. Level at 6500 feet on max cruise, Busch's Cardinal scored a friendly 124 knots. That's hustling right along on only 75 percent of 180 hp, though it isn't up to the pace of a Tiger. It's also arguably not any quicker than an Archer, though Cessna's book figures suggest otherwise.

No matter. Flying a Cardinal is in some respects its own reward. I've always been more of a fan of low wings than high wings, but I've got to admit the Cardinal is a truly impressive airplane in

nearly all areas of comfort, efficiency and performance. Service ceiling is up around 15,000 feet, making the airplane a decent high altitude machine. I'm not certain I'd be wildly enthusiastic about challenging Leadville, Colo., (elevation 9927 feet MSL) in summer, but Denver might be manageable if the load wasn't too heavy.

Landing a Cardinal isn't nearly the challenge you might have been led to expect from early reports. A speed of 65 knots around the pattern, 60 or even 55 knots if you need a super short field effort, works well. Stall speed with full flaps deflected is only 46 knots, so 55 knots provides the obligatory 1.2 Vy.

The initial problem with the flare on Cardinals was the power of the stabilator. On the first airplanes, pitching the yoke forward before the airplane was on the ground and fully stalled sometimes resulted in a porpoise. After Cessna reduced the stabilator's power by slotting the leading edge in the second year of production, the problem went away, but the stigma lives on.

Conversely, Cardinals benefit from flying behind perhaps the most durable engine in the business. The O-360

Lycoming in its various 180 hp versions is rated for 2000 hours.

Like most Cessnas and the majority of other airplanes, Cardinals suffer their share of maintenance problems in other areas, though none are truly severe. In addition to the standard seat rail Airworthiness Directive, Cardinals sometimes experience abnormal corrosion in the rear spar center section inside the cabin where water collects. A steady diet of hard landings tends to buckle the area between the doorpost and firewall. Fuel gauges often are unreliable and the wet wings seem uncommonly susceptible to condensation problems.

Quite often, circumstances conspire to cause the early demise of a good airplane. That's exactly what happened in the case of the Cardinal. The combination of what may have been an over-eager introduction by Cessna and some easily correctable, but well-publicized deficiencies combined with competition from the world's most successful airplane contributed to the Cardinal's death by natural causes after only a 10-year run ending in 1978.

It's a shame. The Cardinal deserved better.

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