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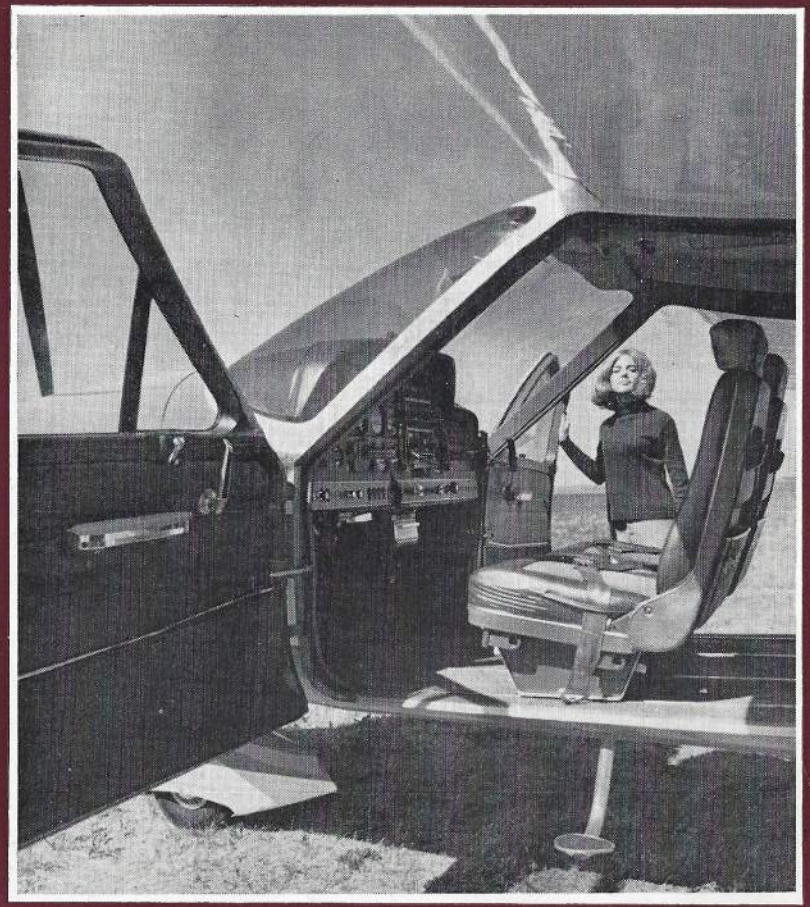
AIR FACTS



THE MAGAZINE FOR PILOTS

Fifty Cents

What will planes of the '70s be like?

Cardinal: Built around the idea that four-place flying ought to be at least as comfortable as your family car. Test pilots call it one of the most comfortable, quiet, stable, responsive, softest-landing airplanes ever built. You'll call it the most exciting four-place plane you *never* had to crawl into.

Cessna introduces the Cardinal...the plane that does for four-place flying what Cadillac did for driving comfort...what Volkswagen did for driving economy.

Ask your Cessna Dealer about the plane of the '70s.

and go around—your gear is not down!"

I, feeling very foolish, pulled the nose up to level flight, added some power, dropped my gear and, with the Tower Controller's permission, went on to a normal landing—obviously farther down the long runway than I had originally intended.

In taxiing back to the hangar I couldn't understand why I hadn't received a horn warning when I closed the throttle on final approach with my gear still up. Upon investigation it developed that about a month previous to this incident I had had my fuel injection system completely overhauled and reinstalled in the airplane. In the process of reinstalling it some mechanic overlooked connecting up the horn-operating mechanism with the throttle assembly. The result was that my gear warning horn was inoperative, and had it not been for the alert airline pilots and Controller, I would have indeed come to grief in a wheels up landing. Furthermore, the horn itself from lack of use was dirty and needed cleaning and adjusting.

I recently mentioned this experience to a pilot friend who also flys a retractable, and he has given me a new addition to my check list, which I am herewith passing on to other pilots who fly retractable gear airplanes. My friend stated that after having an experience similar to mine some years back, he makes it a point in every approach just prior to dropping his wheels to close his throttle and thus make sure that the gear horn works.

Since my talk with him I have followed this practice, and believe me, the loud "Beep" "Beep" when the throttle is closed and the wheels are still up has become a very friendly sound.

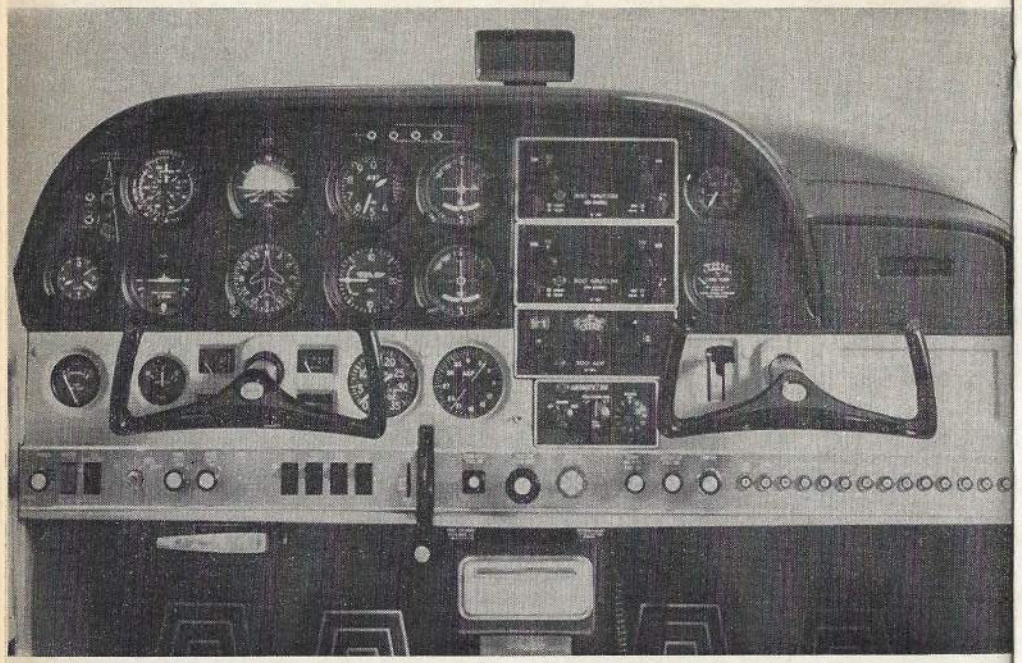
An airborne sports sedan.

Cessna's Cardinal Airplane

BY
RICHARD L. COLLINS

THEY said at Cessna that you could take your choice on the meaning of the name Cardinal. It could be named after the bird, but they aren't going to paint all of them red so the bird seems out. Webster's definition of cardinal as an adjective is: "of basic importance." That tends to be very descriptive of this all-new airplane.

What is it? Well, it's been described as a Skyhawk without struts and with an all new fuselage and



The Cardinal's panel is all new, and is in keeping with the styling of the aircraft. The elevator trim control is at the bottom of the panel, SE of the pilot's control wheel. Note that right side of panel is lowered.

wing and landing gear and tail and engine. That's pretty close, but Cessna likes to think of it as a Cardinal—a new airplane in their line designed from scratch for people whose needs are well served by the performance of an airplane in the 150 horsepower class, but who want the comfort and good looks usually found only in more expensive airplanes. They took aim at the target on this basis, and their shot landed in dead center. It's a real GT with wings.

Walking around the airplane you can see that the wing is a new one. It's laminar flow, with the thickest point at about the middle in the fore and aft sense. This is where the spar goes, so they are able to have a small protrusion down into the cabin between the front and rear seat passengers for a centersection, and, presto, no wing struts. The wing has more twist, that is the tip is always flying at a lower angle of attack than the wing root than is normally seen and this contributes to very responsive ailerons which work well at high and low speeds. The flaps are very long and wide, and they look like they would

contribute a lot to lower landing speeds.

The fuselage is all-new, too. It's not possible to find a single place where it looks like they even might have used an old jig. The windshield sweeps back into the top of the fuselage. The doors are four feet wide with a rakish window plus vent windows on each side which crank in and out. The back window is big. The cowling doesn't look even vaguely like anything you have ever seen on a Cessna before. That also goes for what's underneath. The engine is a 4-cylinder 150 h.p. Blue Streak powerplant built for Cessna by Lycoming.

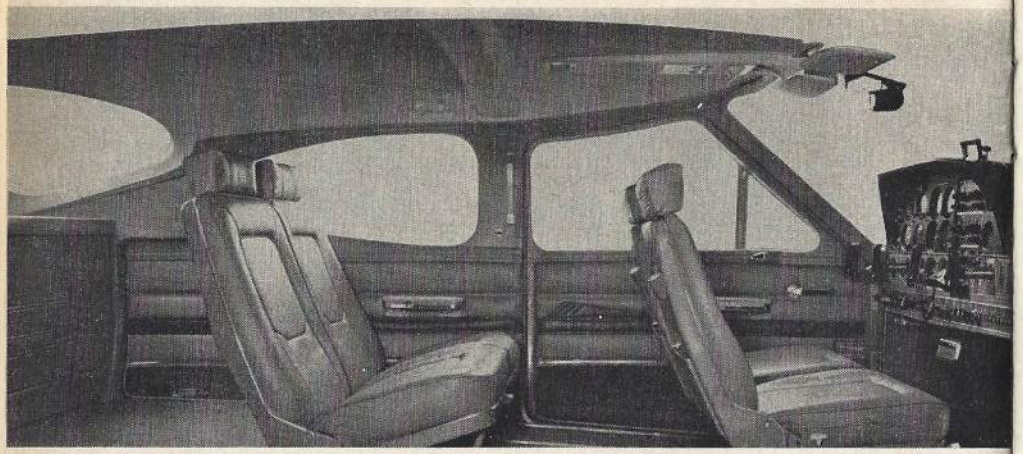
The tail is all new—the vertical fin is a new shape, and there's a big stabilator in place of the horizontal stabilizer and elevator.

The landing gear is a tubular steel spring, covered by a fairing. It moves in just about every direction: up and down, fore and aft, and it even seems to twist.

Open the door, the 4-foot wide door (but open it carefully if downwind) and look inside. The instrument panel is exceptionally attractive. The leg room between front and back appears cavernous even with the front seats back. And, to get in, all you have to do is turn around and sit on the seat and swing into the airplane. The floor is only 23" from the ground.

Go Look

Have we gone overboard? There are a lot of Cardinals around now so go look at one for yourself, and see if it doesn't strike you the same



The Cardinal's interior, shown above, is very spacious. It's well finished, too, with a wide choice of materials. An optional child's seat can be installed in the baggage area which has a 120 lb. structural capacity.

way. It was certainly designed to impress people this way, as if it didn't there wouldn't have been much point in spending the money developing it when they already had the Skyhawk. In showing the airplane to several people, including salesmen of other airplanes, there was unanimous agreement that it is one of the most striking looking airplanes built. One fellow, after seeing it, remarked: "Where are they going to build this, in Detroit?" It does have full measure of the auto industry's knack of making last year's model look obsolete by always making the new one longer, lower, and wider.

Fly It

A fellow can't sit and look at his airplane all the time, though, so let's fly.

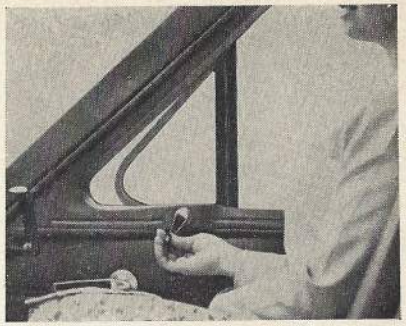
It's a simple airplane, so to start about all there is to do is push the mixture in, turn on the master, and turn the key to start. Fuel on? Always in the Cardinal, as the fuel on-off valve is under the panel, safety-wired in the "on" position. There is a selector on the floor to select left, right, or both. Fuel capacity is 48 gallons.

Taxiing, it's easy to see that the steering has had a lot of attention. It is responsive, and the airplane will turn in a very tight circle. The engine is smooth at idle, too, and quiet. Ventilation on the ground is good through those little windows which roll out and let the prop blow air back into the cabin. The ride, on rough or smooth surfaces, is exceptionally good, and turns can be made at good speed as the main gear tread is over 8 feet, more than a foot wider than a Skyhawk.

Unusual?

When Cessna introduced the airplane to the press they did something which seemed unusual. First there was a demonstration with a Cessna pilot flying and the press riding. When all the press-types were in Wichita for the 421 introduction they ushered one into the left front seat from the start—at ten times the price. Why then did they demonstrate the Cardinal first? It has to do with the take-off.

The stabilator is big, and it is powerful, and it is light. Especially without the allowable 10 degrees of flap for a take-off it could become an awkward exercise for a pilot who hadn't first been told, and shown, and that's why they demonstrated the Cardinal first. The exceptionally light stabilator is nice at times, but first time around the tendency to overcontrol it is very strong and it seemed like everyone's first take-off was a bit wiggly, in the longitudinal sense.



There's a crank operated vent window on both sides in the new Cardinal. The prop blows plenty of air back for ground ventilation, and the windows can be opened in flight up to 120 IAS.

Anyway, after a few rounds one becomes used to it, and it doesn't take long to become a fan of that light stabilator. It sure makes flying easier when it's used properly. For a take-off this means using 10° of flap which seems to have a damping effect, a level run—hands off in a fore and aft sense anyway—up to about 65. Then with just a few pounds back pressure the airplane can be transitioned to a climb attitude and away you go. If the nose is lifted early in the run, which that big stabilator will do if the wheel is pulled back, the take-off run would be prolonged quite a bit. This would be something to especially avoid on a short field.

Landing

Let's get around and down once before doing anything else.

The first 10 degrees of flap can go down at speeds up to 130 for a

bit of an air brake. The rest of the flaps can go down at 105, and the new flap switch allows positioning in any amount automatically—just put the switch to the amount you want, turn loose, and that's what you get.

Approaches feel real good at 70 or 80 with full flaps. If it gets much slower than 70, and the approach winds up a little low, it takes a lot of power to drag it in.

The landings are great. That powerful stabilator enters here again, and the first time or two if you touch before a full stall it seems par to pull back just a bit and rather simulate a little bounce. Once there's been a little time with the light stabilator though, the bounce is gone and landings are way tail-low after which the nose wheel can be gently lowered to the runway. Those tail low landings can come with any allowable loading, flaps up or down, it doesn't matter.

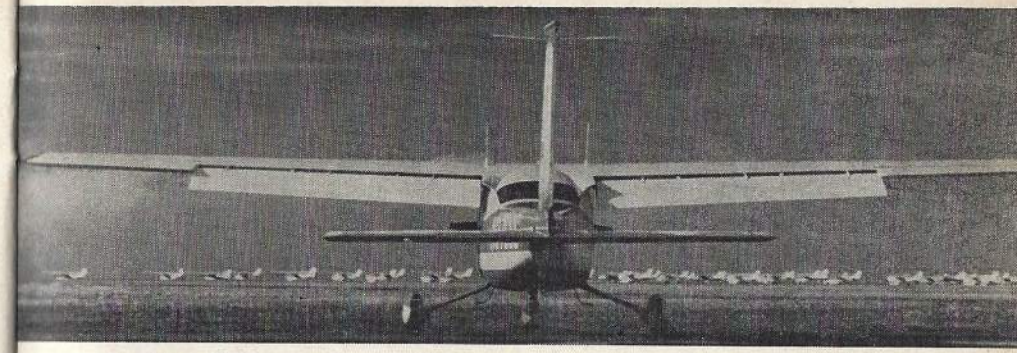
Second Flight

One Cardinal was flown at Wichita during the press presentation, and a few days later another one was borrowed from Cessna's East Coast Zone office at Morristown, N. J., for some more flying. This is where we really got to know the airplane—alone with it for a few hours, hopping passengers off sod airports, and letting other people try their hand at Cardinal flying. It was sometimes a little tough getting back off after stopping because the airplane attracted quite a crowd at each stop.

We have always thought that airplanes should be judged on their own merit, but on the subject of the Cardinal it's impossible not to always think back to the Skyhawk. At least everyone seems to think like this. So, we picked a brand new 1967 Skyhawk to fly to Morristown to get the brand new Cardinal. Sam Payne, a part-time pilot at Trenton Aviation and full-time King Air co-pilot went along to fly the Skyhawk back, and to race it with the Cardinal.

Race

Which is faster? If they were in a race, we'd flip a coin and then bet. A full throttle race is what always seems best, and we had agreed before take-off that this was what it would be. When the Cardinal was levelled off at full throttle, though, the rpm went on past the redline pretty fast, and had the airspeed been allowed to build it seemed almost certain there would be a pretty substantial overrev. So, a match at 2500 rpm was decided upon. At this the Skyhawk was indicating



Cardinal flaps run practically from tip to tip, and are very efficient. They reduce stalling speed by 11 miles per hour. The ailerons are wide chord, short span, and are very responsive. Note wide span stabilator.

122, the Cardinal 125, and the airplanes ran along right together.

That done, the Cardinal was pointed toward Sky Manor, near Pittstown, N. J., famous for its friendly service, and rolling and slightly rough runway with tall trees at one end. The landing there was one of our more graceful entrances to Sky Manor, with most of the credit going to the new landing gear.

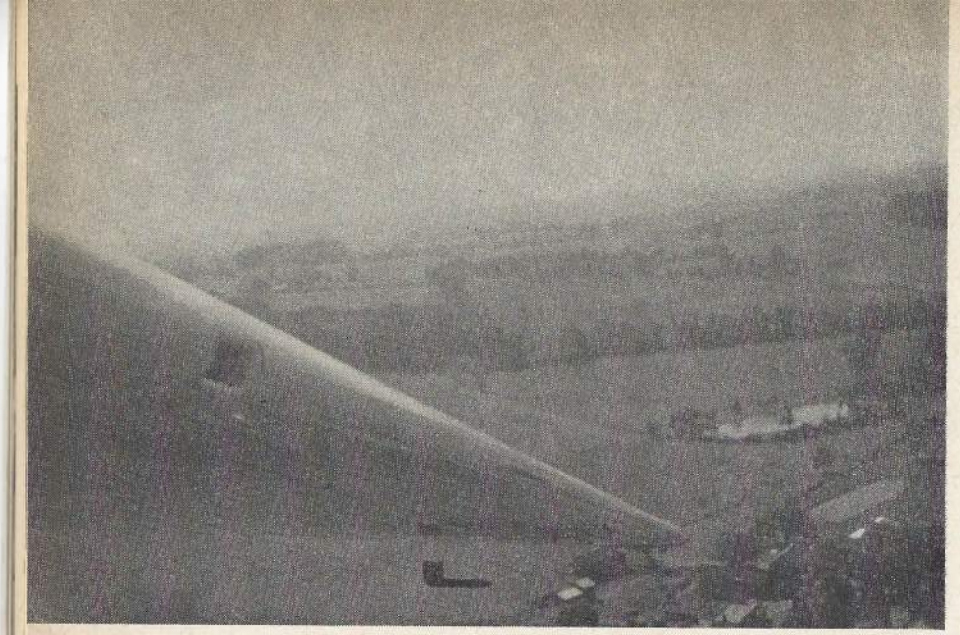
George Kouba, the owner, his wife, and their dog "Piper" were on hand to look the airplane over right away, and they admired it so much that a ride seemed in order.

With three aboard (the dog stayed behind), the airplane was within one or two hundred pounds of gross, and a take-off uphill, toward the trees was indicated by the light wind. The airplane seemed to get off well enough, and fly right on out. There was a moment, coming up the hill, when it seemed sluggish, but then they all seem sluggish at that point. George seemed to think that the airplane was unambitious from about 45 to 65 mph, but after 65 was reached the acceleration and climb seemed quite good to him. This was compared to his Skyhawks which he flies off that runway all day, every day.

Visibility

Everyone is very impressed with the visibility out of the Cardinal. It's possible to get a pretty good look back over the wing in a turn. The windshield is big, and the side and rear windows are big. You get the feeling that it is really an airplane you can do your part in on see and be seen.

At Sky Manor we got a gripe from the back seat passenger. She bumped her head when we hit a bump. The headroom in the back, and in the front, isn't overly generous—it's much like that in modern automobiles. Also, the seats are lower to the floor than in other Cessnas. That is how they were able to keep frontal area down and



If you lean way forward it's possible to get a view like this back over the wing of a Cardinal while turning. It doesn't take a lot of effort to watch for other aircraft in a Cardinal, as window area is generous.

keep performance up. It is a wider, but lower, cabin than the Skyhawk, in keeping with the trend in automobiles.

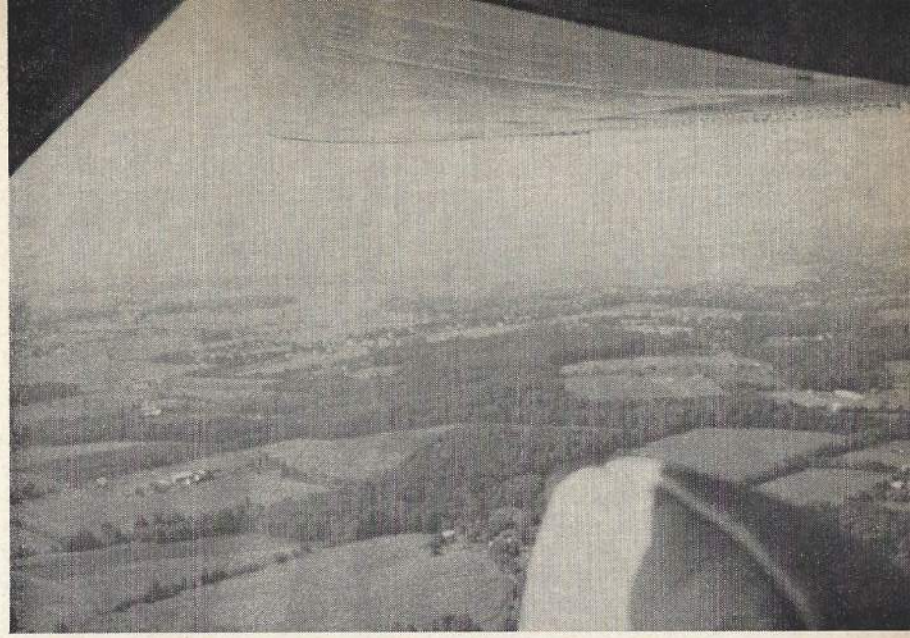
Quiet & Smooth

The cabin sound and vibration levels are very good. Normal conversation is even possible in a full throttle climb, and the smoothness is almost absolute. You can put your fingers gently on the windshield, or on the instrument panel, and all's calm and serene.

The stabilator has had all the attention on flight characteristics so far, and there's one more item which is probably stabilator connected. In pretty good turbulence the nose of the airplane seems to bob up and down a little bit. At Cessna the pilot said it might be because the wheel was inadvertently pulled back a little when the airplane encountered a bump, but in later flying it would do this even hands off. It's just a characteristic of the airplane, we guess, and probably one which results from having such a seemingly free-floating stabilator.

The ailerons are as lively as the stabilator, and it rolls in and out of turns like a fighter. This is great, and the excellent roll control extends on down into the slowest allowable approach speeds. It's not an airplane you will wallow around in on an approach.

The Cardinal's cruise is shown as 134 at 75% power at 9,000 feet, which is 3 miles more than the Skyhawk's top cruise which comes



Look, no strut! In this picture it's also possible to see how much twist there is in a Cardinal wing. With the angle-of-attack so much lower at the tip, the ailerons tend to stay responsive at low speeds.

at 7,000 feet. A while ago it was said that they were the same speed, but Cessna hasn't been caught padding the speed. At 2500 feet the airplane manuals show, at 2500 rpm, a speed of 125 for the Skyhawk and 126 for the Cardinal. That rpm is a little less power in a Cardinal than in a Skyhawk, though, and also the Cardinal obviously is able to develop 75% power at a higher altitude than a Skyhawk, and thus it gains a little advantage there. Also, for travelling, the Cardinal can hold 48 gallons compared to the Skyhawk's 39 gallons, so an occasional fuel stop might be cut out.

Stall speeds? The Cardinal stalls, flaps up, at 64. The Skyhawk stalling speed is 7 miles per hour lower. Flaps down the Cardinal stalls at 53, the Skyhawk at 49, so the Cardinal flap is more efficient.

On take-off distance the airplanes are within 50 feet, with the Skyhawk a little better. On landing, the Cardinal is down and stopped in 100 feet less than a Skyhawk.

Weights

The Cardinal's useful load is 935, the Skyhawk's 960. The Cardinal grosses 50 pounds more at 2350.

The East Coast Cardinal flown, N2288Y, weighed in at 1476 with a Cessna 360 Nav/Comm 1½ system, a Cessna ADF, and a Cessna Nav-O-Matic autopilot along with the other options you would expect to find on a demonstrator. At this, on a 170 lb. souls/petrol/bags basis the airplane could go 4/30/0,

or 3/38/120, or 3/48/61 and be at gross. All possible loading combinations figured were within cg, including one with a 170 pound pilot in front, two 170 pound passengers in the back, 120 pounds of baggage in the luggage area, and 30 gallons of fuel. So, it's versatile from a cg standpoint, and OK on weight. The tanks have a mark in them to restrict fuel to 42 gallons if desired.

The price of the Cardinal is $14,500, which includes paint, deluxe appointments, a full gyro panel including a Turn Coordinator, lights, a clock, and a sensitive altimeter. N2288Y with the equipment mentioned in the preceding paragraph has a retail price of $20,060.00. There's a plain model available, the 177, which has a base price of $12,995.

Here is another comparison with the Skyhawk. The '68 model Skyhawk will be along in February (with that 150 hp Blue Streak engine) and it will list for $1,250 less than the Cardinal.

The Cardinal is one of the most interesting developments in a long time. A new airplane—same performance, flight characteristics that seem a lot better in one area (roll), and not quite as good in another (pitch)—but still a new airplane, designed as a people-pleaser as well as an airplane. How will it do in the market as compared with the Skyhawk? There's possibly a parallel in the automobile business. Ask your local Ford dealer how many Falcons he sold last year, and how many Mustangs.