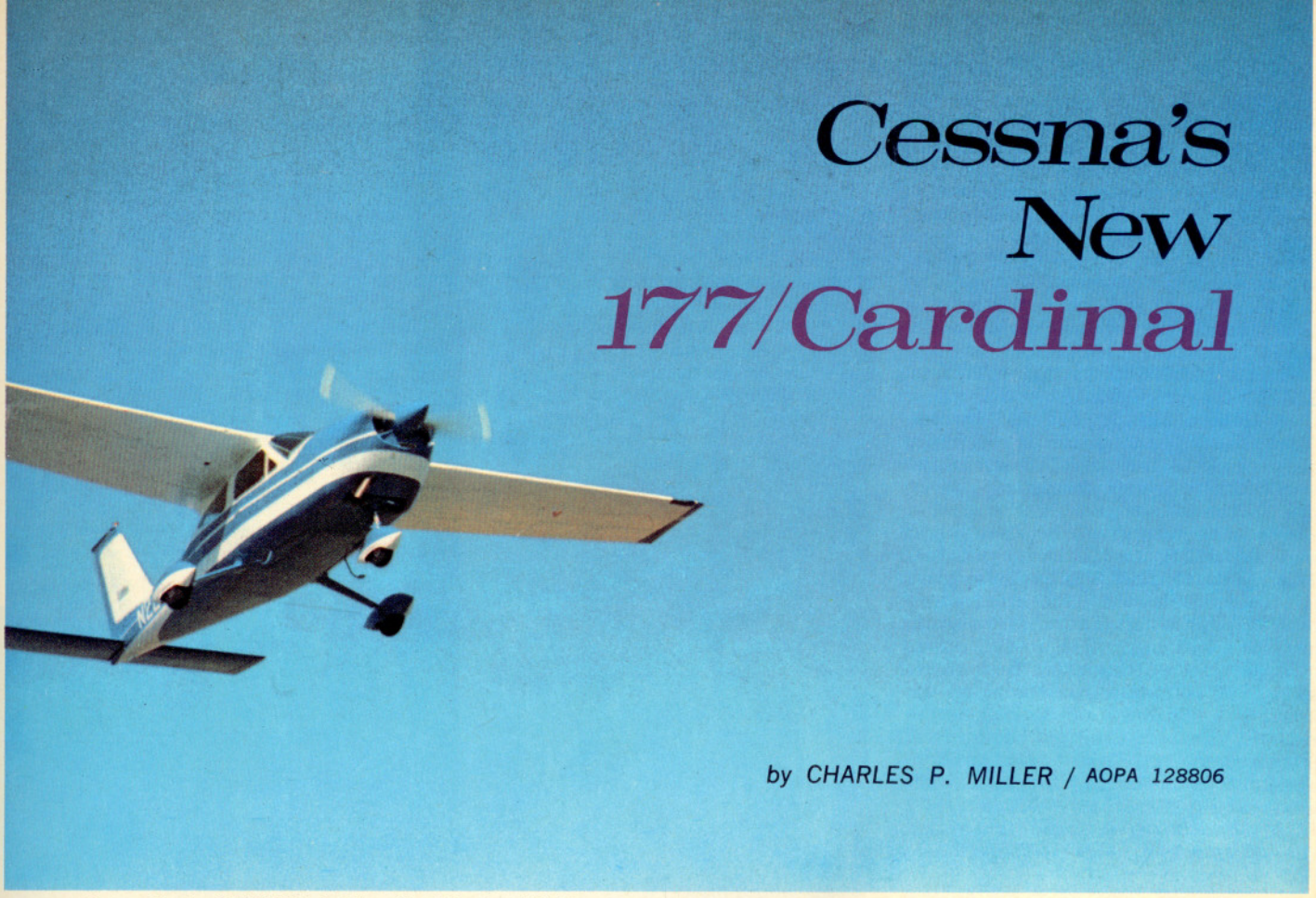
Cessna's New 177/Cardinal

by CHARLES P. MILLER / AOPA 128806



Cessna Cardinal (N2213Y) climbing after takeoff at Wichita.

■■ For the first time in five years, Cessna dealers, zone distributors and their associates gathered at Wichita, Kan., from various parts of the United States and abroad for a three-session sales meeting. From all indications, what they learned at the Cessna Aircraft Company sent them home in a pretty good frame of mind.

Much of the satisfaction of the 1,500 persons attending the Wichita event stemmed from the introduction of a new series of airplanes—the single-engine, four-place Cessna 177 and *Cardinal*—optimistic forecasts for 1968, a look at the Cessna 1968 Utililine planes and the Cessna 150, a new warranty plan, the phenomenal success of Cessna's "learn to fly" promotion program and other bits of good news.

The Cessna 177/*Cardinal* development, however, was by far the star of the show. Described by company officials as a needed addition to its line of low-cost, four-place models, the *Cardinal* and the 177 are a departure from the traditional Cessna design of the last several years. Basically the same plane—the *Cardinal* having added flight instrumentation and special interior and exterior appointments—the 177/*Cardinal* line features a low profile, fully cantilevered wing, and increased cabin visibility in all directions, coming from contoured windows and an enormous windshield.

In addition to all this, the *Cardinal* and Model 177, among many other new features, have: a new shock-absorbing "Land-O-Matic" landing gear using a one-piece tapered steel tube, which takes the jolt out of rough landings; two four-foot doors hinged forward, and a cabin floor only 23 inches from the ground. The last-named feature makes it possible for the largest pilot to get in and out of the *Cardinal* with much greater ease than he would experience in entering or leaving most of today's automobiles.

Frank Martin, Cessna vice president of marketing, said that the *Cardinal* and Model 177 fill a void at the upper end of Cessna's lowest-cost training and personal aircraft. "They should appeal to those customers at the luxury end of what we refer to as the 'low-cost' market."

Cessna officials were quick to point out that production of the *Skyhawk* and Model 172 would continue. Planning calls for the 1968 models of these two planes to begin coming off the assembly lines in February.

Suggested list price for the *Cardinal* is $14,500 and the Model 177, $12,995 f.a.f., Wichita.

Innovations in styling in the new model series are carried on up to the cowling, where the familiar three-hole scoop has been replaced by a continuous intake around the spinner. The cowling is separated from the fuselage by rubber isolaters which, with effective soundproofing, makes the *Cardinal* cabin one of the quietest in the low-priced field. The plane has a well-balanced, easy handling control system incorporating new ailerons, wide-span flaps and a one-piece stabilator ("flying tail").

Model 177 and the *Cardinal* are powered by a 150 h.p. Lycoming four-cylinder engine (0-320-E2D), which Cessna has designated as the "Blue Streak." Use of a Lycoming engine in a Cessna plane also is an innovation. Continentals have been used exclusively in Cessna aircraft for years. Del Ros-

At top of company's low-cost, 'learn-to-fly' line, the new 'bird'—with low profile and fully cantilevered wing—represents departure from traditional Cessna design. It makes a big hit at Wichita sales meetings

kam, Cessna president, when asked, "Why the switch to Lycoming?" said that when the new system was being developed, the best-suited components were selected for the system and that the "Blue Streak" came out on top. He added that certain economies would result by using the Lycoming power plant in the Model 172 and the *Skyhawk*, along with the 177/*Cardinal* series.

While Cessna gave no details on the 1968 Model 172 and *Skyhawk* other than the expected price of the two models ($11,700 for the 172 and $13,250 for the *Skyhawk*) and the fact that both would be powered by the "Blue Streak," comparison between the two series is inevitable, based upon specifications and performance data of the 1967 models of the 172/*Skyhawk*—which undoubtedly will be changed in some departments with the new engine. The *Cardinal* at 2,350 pounds gross is 50 pounds heavier, has a top speed of 5 m.p.h. faster than the *Skyhawk*, and has a cruising range (at 75% power at 9,000 feet, 48 gallons of fuel, no reserve) of 780 miles compared to the *Skyhawk's* 600 miles on 39 gallons, no reserve. Service ceiling of the *Cardinal* is placed at 12,700 feet, compared to the 1967 *Skyhawk's* 13,100 feet. Takeoff ground run: *Cardinal*, 845 feet; 1967 *Skyhawk*, 865 feet. Landing ground run: *Cardinal*, 400 feet; 1967 *Skyhawk*, 865 feet.

The *Cardinal* lived up to its ground billing during the demonstration rides given members of the aviation press during the first day of the Wichita meetings. This writer, along with two other writers, Bob Hoffman and Tom Guthrie, spent about an hour in N2213Y, a sleek *Cardinal* with an attractive blue and white paint job. Cessna's Herman O. Wine was pilot and "tour" conductor. N2213Y left the runway at 88 m.p.h.

The first notation in this writer's notebook was, "It's quiet inside." The next notation a few minutes later, with the *Cardinal* showing 120 m.p.h., TAS, was "Quiet." Herman opened a sliding vent in the door window, a new feature. Some of the quietness disappeared, but it was cooler inside.

N2213Y turned toward the El Dorado (Kan.) Airport. "Now watch this," Herman told his three passengers, as he trimmed the plane, "we're going to make a power-off, full-flaps stall."

N2213Y lazily turned down her nose, dropped a short distance, leveled off, then dropped her nose and went down again, straightened out, dropped her nose, etc., etc. "She would walk the stairs all the way to the ground if you'd let her," said Herman, with his hands off the controls, "but the last step undoubtedly would be rough."

Back up to about 4,000 feet, the Cessna pilot then said, "I'd like to show you one of the most dangerous things you can do in this plane—a full power-on, climbing-turn-to-the-left stall—that is, if you fellows agree." He called the roll, and all three of us told him to go ahead. Herman gave her the power. There was a tight turn to the left, which felt as if it were an excellent beginning for a spiral. There was considerable buffeting as N2213Y stalled. Herman then gave right rudder a slight "kick." Old faithful finished her recovery all by herself.

Several touch-and-go landings were made on the 3,000-foot asphalt runway of the El Dorado Airport. There were no jolts. That asphalt strip was too easy, so the final landing was made on the airport's sod strip, with speed at 65 m.p.h. at touchdown. We didn't measure the length of the ground run, but it looked to be about 400 feet. Still no jolt. N2213Y seemed to squat down on landing; the fixed gear appeared to spread out. That new Land-O-Matic gear really is something.

But we will leave it to Don Downie to give you the lowdown on the *Cardinal*. He was commissioned by The PILOT to do an article on a ferrying flight from Wichita to San Francisco, Calif., in one of the first 100 Model 177 and *Cardinals* delivered to dealers and distributors at the Wichita series of meetings. His article on the cross-country flight starts on page 32.

Introduction of the Model 177 and the *Cardinal* brings Cessna's product line to 30, compared to four models—a twin and three single-engine planes—as late as 10 years ago.

Production of the new models started at about five a day and was scheduled to increase to 10 a day, going up to 12 to 14 if demand for the new models justifies the increase. The factory had about 800 orders on hand at the time of the meetings, company officials reported. The backlog would have been higher if the dealers had been given more information about the new plane which was in the works. But the 177/*Cardinal* development was a pretty well-kept secret up until about a month before its introduction at the sales meeting.

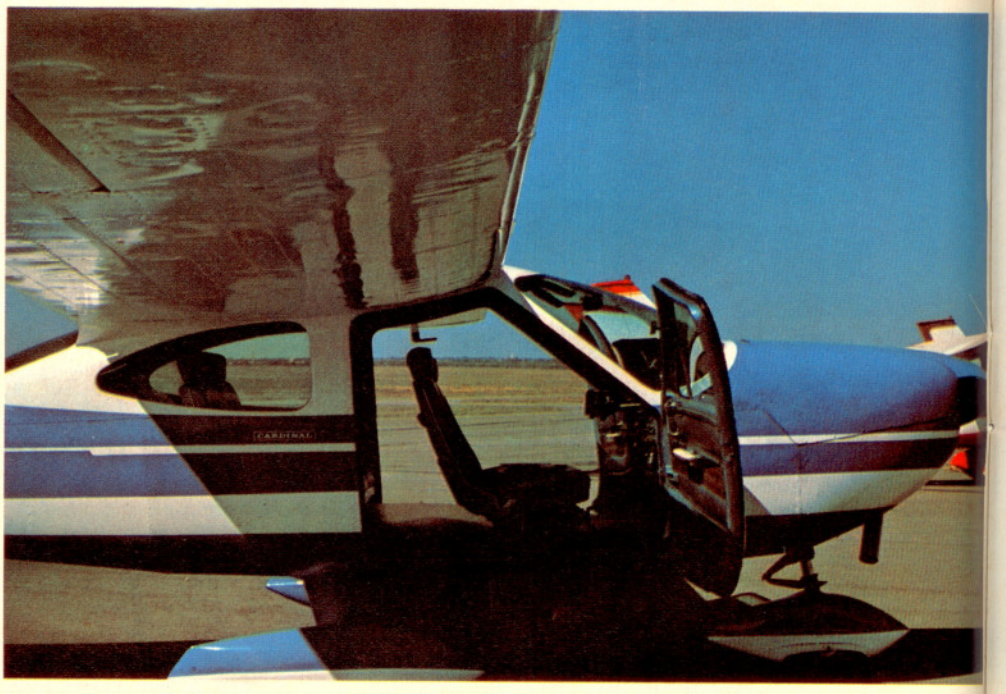
At a press briefing Cessna officials expressed high hopes for the new model. Its sales, combined with those of the 172/*Skyhawk*, are expected to lead the industry in unit sales. No overall total was given for this group. However, predictions were made that sales of the 1967 Cessna 150, the company's popular trainer, would exceed 3,000 units during the 1968 model year.

In answering questions at the press briefing, a Cessna official said there were no specific plans at the present time to increase the power of the *Cardinal* and Model 177.

While the new single-engine series was the star of the three gatherings, the company's other announcements pleased the people whose business it is to sell the products. One, the announcement of a new warranty plan, was of particular interest to them.

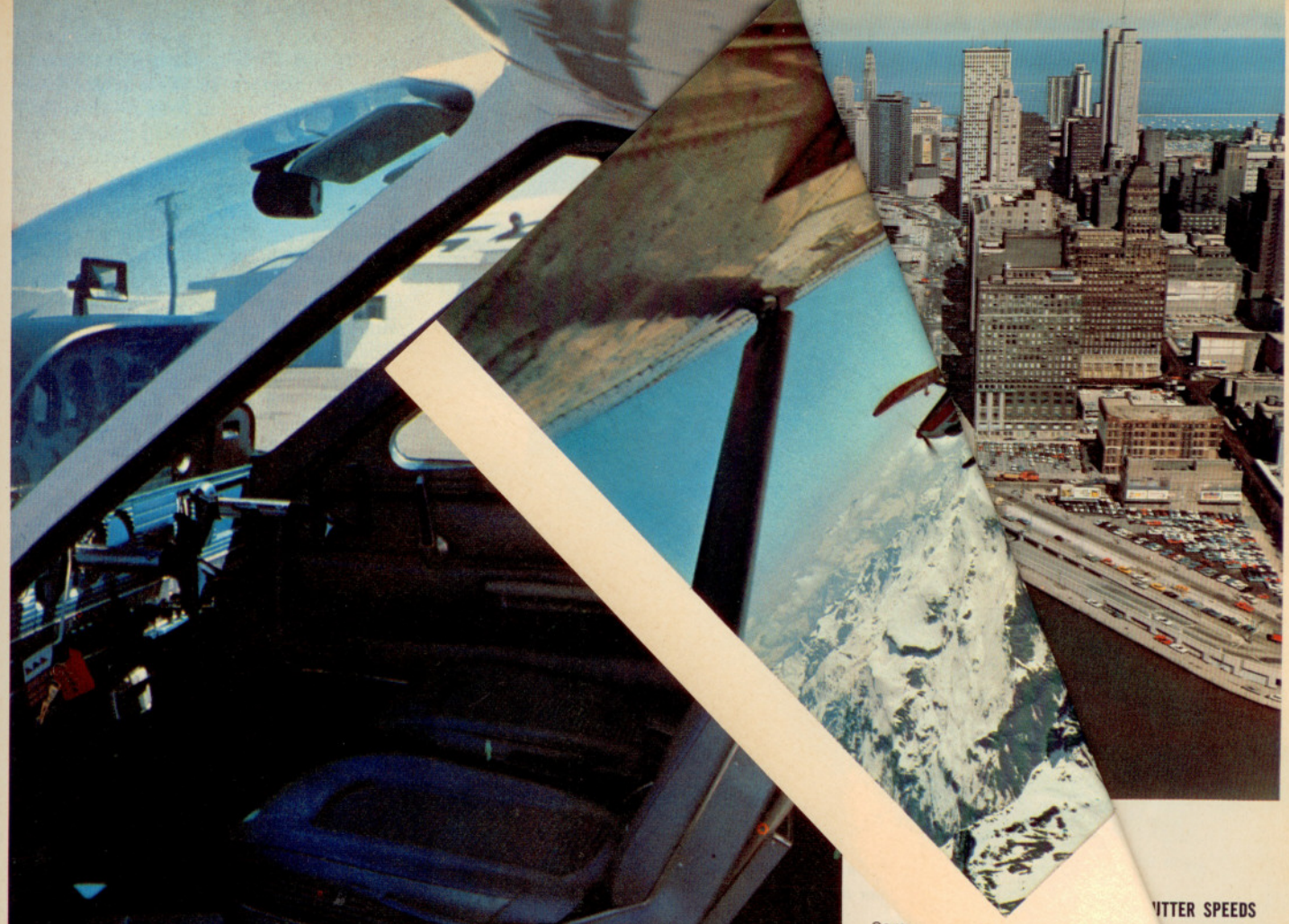
L. C. Gartin, director of customer service, said the new plan extends coverage for both parts and labor on the complete aircraft and all its components—including engines—for a period of six months, with no limitation on flying hours. Under this plan, the warranty labor can be done by any Cessna dealer, anywhere in the world. Previously this has been confined to the selling dealer. Cessna will pay the repairing dealer's posted prices.

Description of the company's line of utility aircraft reveals that developments



A four-foot door on each side of the cabin makes the Cardinal an easy plane to enter or leave.

PILOT photos by C. P. Miller



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Cessna Pilot Herman Wine
writers Tom Guthrie and Bo
prior to a demonstration fli
which also carried the author.

incorporated in the low-priced field have been adopted for other Cessna models. One is the availability of the wing-leveling system in four new models in the utility line. These are Models 180, 185 *Skywagon*, *Super Skywagon* and Turbo-System *Super Skywagon*. Other "utililine" aircraft are the two *Ag-wagons* and the twin-engine Turbo-System Model 402.

Gifford M. Booth's startling announcement of the success of Cessna's "learn to fly" program was one of the highlights of the meetings. He said that the program, launched 28 months ago, has produced revenue as follows: $13,630,000 in 1965; $27,090,000 in 1966, and $19,189,000 during the first seven months of 1967.

"If the present rate of activity continues in 1967, the program could top $33,000,000 this year," he added. Analyzing the figures, Booth said a total of 135,000 introductory flight coupons at $5 had been redeemed during the 28-month period, which amounted to $678,025. In addition, 3,386 solo flight courses were sold during the period, amounting to $474,040.

He said a total of 1,383 new airplanes and 2,003 used aircraft sales could be traced directly to individuals who started out with a $5 coupon. This accounted for $16,751,000 in new aircraft dollar volume and more than $12,000,000 in used airplane sales. □

Comfort is built into the Cardinal cabin. There is no crowding with four persons aboard and the seating is luxurious for a plane in the lower price range. Note the contoured windshield and upward visibility from the pilot's seat.

Cessna Pilot Herman Wine (left) briefs aviation writers Tom Guthrie and Bob Hoffman (right) prior to a demonstration flight in N2213Y, which also carried the author.

A Cardinal Goes West

Cessna's new single-engine plane gets stiff workout on flight through Rockies to West Coast

by DON DOWNIE / AOPA 188441

■■ We raced the sunset to the Golden Gate, and won. San Francisco International's approach control handed us off to the tower and we were cleared to land on 24R. With the omni-vision cockpit, it was distressingly easy to see a DC-8 gobbling up the airspace behind us as he zeroed in on 24L.

As the tires of N2214Y squeaked softly at SFO, the first of a hoard of new Cessna *Cardinals* had been delivered to the West Coast. Two days earlier, this same airplane had reigned over a spectacular dealer/distributor showing at the Wichita factory. She'd been on the ramp in front of the new employee center and was the first of the new 177/*Cardinal* series that Cessna's visiting sales force had been able to touch, squeeze and pat.

The ship was pulled out of the static display to enable AOPA to make this edition. It is natural at the Delivery Center that our preflight inspection was more painstaking than most since 14Y had been the object of a solid week of professional "tire kicking." One window-opening crank was replaced before we took off into a gusty 30-knot wind for the West. And the prairie wind was, naturally, right on the nose. It would have been a wonderful day for flying east.

Why not climb aboard the luxurious, spacious cabin and go along for the ride? I sincerely wish that someone had, since it's more enjoyable to have company to swap stories with than a solo flight where your conversation is limited to an occasional FAA/FSS operator.

First, let's go back a day and get checked out in the *Cardinal*. I'd recommend a check ride for every pilot of this pretty new bird because, like everything that's brand new, it's a little different. Our smooth-flying check pilot was James T. Banks, regional sales supervisor. His region is Africa!

We drove out past the long lines of brightly painted new Cessnas, accompanied by Phoenix aviation writer Paul Dean (AOPA 311310), and found N2205Y. The walk-around inspection was done while the *Cardinal*—it's named for regal splendor, not for the bright red American songbird—was securely tied down. Kansas surface winds were a steady 30 knots gusting to 40 knots and it was touch-and-go whether or not we'd fly. (On my early-morning weather call the next day, the Weather-or-not Man on duty confided that he'd been out driving his brand-new VW at the same time and had nearly been blown off the road.)

"I'm sorry about the weather," said Banks. "You won't be able to get a chance to really appreciate the smooth ride we get with this all-new airplane."

That was fine with me. Airplanes are designed to handle weather—in moderate amounts—so a high-wind checkout would show me more than the same thing on a calm day. Besides, I was going to get plenty of time (I thought!) to settle down with the new *Cardinal* in calm air on the trip West.

The new 177/*Cardinal* series—the 177 is the economy version for $12,995 vs. the $14,500 tag on the *Cardinal*—is an all-new airplane with the exception of the wing which comes out of the same jigs that build the time-proven 210. The cabin is lower and four inches wider and longer than earlier models so there's plenty of room for tall pilots. Perhaps this is a Cessna feature since Chairman of the Board Dwane Wallace and President Del Roskam are both 6'4" and if they can't fold up comfortably in a new airplane, it's back to the drawing boards.

Check Pilot Banks outlined the important new features of the *Cardinal* briefly. The two four-foot-wide doors are well forward and make entrance to the cabin a cinch and virtually eliminate the possibility of tripping over the wheel fairings on deplaning. I have skinned my shins over the years trying to deform Cessna's wheel pants, but I didn't have this painful trouble with the new model.

For the first time since the days of the strutless Cessna 190/195 series, Cessna has made an engine change from Continental to Lycoming. You won't find this in any of the literature, but the 150 h.p., four-cylinder power plant under the *Cardinal's* smooth cowling is a Lycoming. The factory refers to it as a "Blue Streak" engine. It has a carburetor and starts easily every time. It also ices up, but there's a black knob just to the left of the throttle labeled "Carb Heat" that takes care of that in a hurry.

This bird is new from nose to tail. The wing has been moved aft to give excellent ahead-of-the-leading-edge visibility in turns, from either seat. In moving the wing aft, more elevator control was needed so the designers went to a one-piece stabilator "flying tail" that's almost 12 feet wide. It's the action of this new elevator that makes flying the *Cardinal* series just a little different and makes a first-time check flight a good idea.

The main landing gear has a one-piece tapered steel tube that will flex not only up and down but fore and aft. It's a definite improvement, as is the new nose gear which is steerable with the rudder pedals through 12° and at slow speeds, with brake application, up to 45°. Two days later, when I taxied into a skimpy parking spot at Butler Aviation in San Francisco, the line boy gave me a cutoff sign and was prepared to push 14Y back into the tie-down area. However, there was enough room to taxi through the hole, make a sharp 180° turn and pull in over the ropes. The line boy gaped at me and I had to grin.

"I never saw a Cessna do that before," he said.

James Banks, Paul Dean and I untied the factory demonstrator and we climbed aboard through the Alaskan-sized doors. Banks took the left seat with the comment, "We've worked out a routine with the six of us who fly demonstrations. We fly the first flight with a complete set of stalls, slow flight, full-flap approaches and a first landing. Then we'll change seats and you can try anything you want to."

It's a sound procedure, since it gives the first-timer a chance to look at the new model under the best possible conditions.

Fortunately, the wind was almost parallel with Cessna's runway and we were off into the bouncing blue in much less than the 845-foot gross weight takeoff roll. Sea level rate of climb with the 150 h.p. Lycoming "Blue Streak" is 670 f.p.m., a figure that is

identical with that of the latest two-place Cessna 150.

As expected, visibility is outstanding. The cabin was quiet and comfortable. The complete impression was one of plushy excellence. All controls were responsive and handled the "moderate" turbulence with ease. Banks climbed up over the flatlands to about 3,000 feet—it was a little smoother there—and demonstrated a series of stalls that put us in some rather ridiculous flight attitudes; yet the *Cardinal* was always under complete control. There's a reed-type stall-warner that sounds like the last gasp of an ailing cat, but no *pilot* really needs this audio system. As the *Cardinal* approaches a full stall, there's plenty of warning with a good solid buffet from the big stabilator. Watching the one-piece horizontal tail during these stick-back maneuvers, it was possible to see the stabilator "working" and see the slight buffet that was transferred to the controls.

While we didn't go high enough to try it, the *Cardinal* does have enough up-elevator to stall out the laminar flow wing and permit a spin. However, a pilot would have to deliberately force the aircraft off into a spin. The Owner's Manual states, "For spin recovery, apply full opposite rudder followed by neutral stabilator. When airplane rotation has stopped, use moderate back pressure on stabilator to avoid excessive loads while recovering from the resulting dive. Intentional spins with flaps extended are prohibited."

The FAA required both an engine-driven and electric back-up fuel pump despite the gravity feed from the two 24½-gallon fuel tanks. It seems that with only one person aboard and a low fuel load, it is possible to get the nose at such an extremely high angle of attack that the gravity system skips a beat or two.

"We really don't need the fuel pumps," explained Banks, "because it's just about impossible to get into that high an attitude, but according to FAA specifications, we still had to put them aboard. You don't use the auxiliary fuel pump for takeoff."

After our gyration that convinced me of the *Cardinal's* forgiving nature, we headed for an outlying field at El Dorado, 23 miles downwind from the factory. I took over the right-hand controls while the factory pilot called Unicom and received "surface winds gusting to 40 knots. No other reported traffic."

In weather that I'd term at least "moderate" turbulence, the big stabilator proved quite sensitive. There was a slight tendency for the gust loads to transfer back to the wheel and trap a pilot into fighting the wheel and overcontrolling (pilot-induced oscillation). During a subsequent discussion with two members of the Engineering department, it was pointed out that the *Cardinal's* flying tail does not use the customary "bob-weight" or extended counterbalance weight common to many other "flying tails." They felt that this damping weight was not necessary because of the hinge-line location of the stabilator.

When Banks pointed out the 2,500-foot sod runway that lay into the wind (in other areas, it might be called a gale) and made no effort to take over the controls, I pulled on carburetor heat, eased off on the power and set up a bumpy pattern. We discussed flap and approach speeds. Because of the turbulence right down to the ground, I elected to not use any flaps and come in a little "hot." Later Banks told me that I was carrying an indicated 85 m.p.h. across the road at the end of the field. Needless to say, I made no effort to hold the nose wheel off and make a full-stall landing under these conditions. Yet we stopped easily before reaching the one paved runway. Under normal full-flap conditions, the landing roll is only 400 feet.

After time out for a couple of pictures while Paul Dean flew, we returned to the factory and tied down.

The *Cardinal* is such a sleek bird that anything less than perfection really stands out. Looking at the airplane from straight ahead, you can see the unpainted bottom of the firewall as a flat plate aft of the smooth engine cowling. The opening at the bottom of the cowl is to exhaust air from the engine compartment, but a dab of paint would make it less conspicuous. Originally, a cowling lip had been planned for cooling, but the "Blue Streak" power plant cooled well without this addition. (I noted the next morning that someone had painted the goldenrod trim color of N2214Y on this section of bare aluminum.)

While it is not classed as a trainer, the 177/*Cardinal* retains the rear-view mirror across the top of the instrument panel.

The *Cardinal* looks so big and capable that I was surprised to find the control wheels similar to the smaller Cessna 150 trainer. Engineering stated that they had tried more massive wheels, but that they covered up part of the lower instrument panel and the small control column had been used. Perhaps this is just a matter of personal choice.

I was fully prepared to dislike the nonsafetied mixture control set close to the right of the throttle. Pilots on demonstration flights have already pulled out the mixture when they were reaching for the carburetor heat. However, this control is fitted with a rachet-type brake that makes it feel different from the mixture control. By the time I had spent a day and a half alone in the airplane, I felt fairly well at ease with this system.

There is a step below each door, but it's only 23 inches from the floor to the ground. Depending upon the whims of ladies' fashion designers, these steps could easily be eliminated and perhaps pick up an extra mile of cruising speed.

Details of the 177/*Cardinal* were among the best kept secrets of the industry. All plant tours at Wichita were stopped in late June as production began. However, the prototype *Cardinal*, painted a military olive drab, made its first flights a year ago in July, explained Public Relations Director Bill Robinson, with a wide smile. "We have a great many unusual models flying around here, usually in O.D. paint," he commented quietly. The secret of the *Cardinal* was kept well enough so that the industry knew only that it would be Lycoming powered, might have no struts, might have a retractable gear and might have a controllable prop. Many guessed that it would carry 180

Cardinal N2214Y on display at Wichita, Kan., before its flight to California with Author Downie at the controls.

Cessna photo

h.p. or more. At least one prognosticator thought that it would be a small four-place "push-pull" 337 with the front engine removed. To all these leading questions, Robinson sat back, a bit like a thin Buddha, and benignly commented, "I make it a point never to visit our experimental department. In that way, I can honestly say 'I don't know.'"

N2214Y was to go to Bill Bergines, Cessna's Western Regional manager near San Francisco. A phone call to him disclosed that the airplane was still on display and would not be available until very late in the day, after all the visiting dealers had departed. With the winds as they were, I had no objections to waiting until morning when things would hopefully improve. It didn't do much good, but during the ensuing bumpy flight westward, I had a fine chance to learn and respect the *Cardinal*. I was on the ground at Garden City 2:05 hours—and 17 gallons of 80 octane—later. Since this flight was all at not more than 2,000 feet above terrain to stay out of even worse headwinds, that thrifty fuel consumption of 8.2 g.p.h. at 2,500 r.p.m. compares favorably with the 7.8 listed for 4,500 feet. I was deliberately running a little rich to "baby" the brand-new engine.

A check of the weather (or not) at the FAA/FSS disclosed a fast-moving cold front with high winds reported and forecast for the Rockies. I delayed the decision whether to head south for Albuquerque or plough over the Rockies by making two short hops with an additional weather check at La Junta, Colo. (1:27), and Pueblo (0:27). While there was still an hour and a half of good daylight remaining, I decided to let the front pass during the night and get off early for a smooth flight. There's no tiedown charge for your first night stop in Pueblo and the Holiday Inn has courtesy ground transportation.

The sun was up, barely, when 14Y lifted off Pueblo, Colo., and headed up over the Royal Gorge and into the backbone of the Rockies. A surface wind from the north made it easy to ridge soar over the 11,312-foot Monarch Pass and admire the multi-hued aspen at timberline. For once it was calm and the *Cardinal* loved it. Since there was no oxygen aboard, we let down from 14,500 to 10,500 once the Sawatch Mountains were behind us and trued out at 133 m.p.h. with 2,700 r.p.m.

I remembered that during our question-and-answer session the Engineers had said the 12,700-foot gross weight service ceiling was calculated, not yet test flown. However, even with full tanks, the 14,500 feet required to cross the Rockies safely should be "no sweat" flying solo. It proved to be a most comfortable, scenic ride.

Flight time to Grand Junction was 1:58 for the 240 statute miles (the way I stayed within sight of Interstate 50) and considering the climb to altitude and increasing headwinds, the 121 m.p.h. ground speed was right on-the-money.

There was light rain at Grand Junction, and a real, live Weather Man on the airport. So I received a good briefing for the remainder of the trip. It was the same old story, increasing headwinds and turbulence. If you flew really high to get out of the turbulence, the winds approached 40 knots right on the nose, so we stayed low—for that part of the country—and let the *Cardinal* fight the weather.

At the suggestion of the FAA/FSS, I filed to Delta, Ut., up over the Wasatch Plateau via the town of Ephraim.

"There's a little road that goes through the pass there," explained the FAA man, "and some of the country out there gets mighty lonesome."

It was a soft-sell hint, but I took it. He knew the country better than I.

Approaching Delta, the 150 h.p. "Blue Streak" gave a couple of coughs and I pulled out a handful of carburetor heat control. The outside air temperature was 55° at 10,500 feet. Naturally, the power plant picked right back up to full power. Carburetor icing is easy to detect with a fixed-pitch prop if you keep your eye on the tachometer or your ear cocked for a drop in r.p.m.

After crossing Ephraim without being rolled clear over on my back, I took a second look at my destination. Its elevation was only 4,755 feet and I hadn't made even a dent in the 49-gallon fuel supply of 14Y, so I extended my flight plan by another hour and landed at Ely, Nev., where the altitude was up at 6,255 feet. Total time 2:57—with the highway in sight all the way. It took 26.2 gallons to top the tanks; that's an even nine g.p.h. with 2,700 r.p.m.

The long-range capability of the *Cardinal* is excellent for a ferry flight. However, 49 gallons of fuel at six pounds weighs 294 pounds plus 15 pounds for oil. Flying alone, with two small cameras, a set of sectional charts and a small suit bag, add another 210 pounds. Total empty aircraft and accessory weight of the *Cardinal* is 1,415 pounds. (The 177 is 75 pounds lighter.) So, I could have added 416 pounds of people-and-or-baggage to reach gross weight. Thus I could have carried two 170-pound people and 76 pounds of baggage with full fuel. Many flights with four adults aboard will have to be made (legally) with reduced fuel. The first 100 177/*Cardinals* including 14Y didn't have it, but a 21-gallon level marker, a white line just inside the filler neck, can be used as a guide for partial fueling.

With that roomy, plush cabin and spacious baggage compartment, there's going to be a natural temptation to fill up everything and go. Since any airplane is a compromise, and the *Cardinal* has a power loading of 15.7 lb./h.p. (it's 12.2 on the workhorse Cessna 180), don't succumb to the temptation to go out over gross.

We filed with the FAA/FSS to Reno via Highway 50. The FAA man raised an eyebrow and grinned without comment. The afternoon was hot enough so that our density altitude was above 8,000 feet, but the 20-knot surface wind cut our takeoff roll to less than 1,000 feet without flaps. There's a 10° notch for takeoff flaps and the big 29½-sq. ft. electric slotted flaps can be stopped at any point up to a full 30° deflection with a handy flap-shaped lever just to the left of the copilot's control column.

It was exactly 2 p.m. Pacific time when we left Ely and bounced along over the historic ghost town of Austin, Nev., and on in towards "the biggest little city." As the turbulence flattened out a little, I tried to plan ahead. The charts showed another 195 miles from Reno to San Francisco and some very simple arithmetic proved that if I landed at Reno, it would be dark by the time I reached San Francisco.

So, with that 5.8-hour (no reserve) fuel range, I called Lovelock Radio for the latest bay area weather and a forecast for two hours later. Surprisingly, there was no fog and only broken clouds en route over Lake Tahoe. I asked the FAA/FSS to notify Reno since I couldn't yet reach them and extend my flight plan. I detailed the new airplane and explained the 177/*Cardinal* relationship. I'd filed as a C-177 because I didn't want to explain to every FSS what a *Cardinal* was. The next pilot through this mountainous route probably won't have that trouble because the FAA has already been briefed.

I climbed back up to 10,500 to go over Echo Summit south of Lake Tahoe and added some cabin heat. To that point, 14Y had been a completely regal machine befitting her name. However, a delivery flight in any new airplane without at least a minor malfunction to take your mind off the scenery is not always the case.

As I pulled out on the cabin heat, the selector stuck in the full "on" position. A factory press release advises, "A high-volume cabin heating system insures adequate heat during cold weather operation." I can assure you that this statement is 100% correct. After I topped the Sierra Nevadas and began a letdown south of Sacramento, I had every cabin vent in the airplane wide open. It was hot, but neither dangerous nor unbearable. At 4,500 feet, I leveled off and slowed up to the allowable 120 m.p.h. indicated before cranking open the air-scoop windows at the forward edge of each door. These vents cooled things down considerably.

Sure, I could have landed at Sacramento and had the heater control fixed, but it was only another 75 miles to my destination. Then Mr. Bergines could have his own mechanics solve the minor malfunction.

So, we cruised slowly into SFO—warm as toast and enjoying every moment of the then-calm air. Our total flight time from Ely, an even four hours. Yet each fuel gauge still read over one-fourth tank.

Yes, she's quite a pretty bird. Cessna now has 22 single-engine models and eight twins. The factory explained that the 177/*Cardinal* was designed "to fill the market gap in the low-price, four-place field that would offer a new standard of comfort and luxury."

True enough! □