1969 version of Cessna's popular plane, with power increased to 180 h.p. and other improvements, is described as beautiful and 'an extremely satisfactory flying machine'

Cardinal Reappraised

by DON DOWNIE / AOPA 188441

■■ "Take the new 180 h.p. *Cardinal* and try it out at altitude," requested the editor. So we did. Two hours later, Cessna demonstration pilot Dave Bowman (AOPA 172081), an ex-Navy birdman from San Francisco, and I were making a full-throttle climb from Brackett Field, east of Los Angeles, toward the 6,750-foot-high ribbon of asphalt at Big Bear Lake.

New 180 h.p. *Cardinal* N30363 had full fuel (49 gallons of 100/130 octane) less perhaps five gallons burned on the flight across Los Angeles from Van Nuys. In addition to Bowman (160 pounds) and this reporter (180 pounds) we had Forest Service Photographer Tom Roberts, at 200 pounds, and at least 20 pounds of assorted cameras. There was no other baggage. That totals out at about 825 pounds of fuel and people, give or take a couple of pounds. Add the weight of eight quarts of oil—another 15 pounds—in useful load and we were grossed out carrying roughly 840 pounds or 320 pounds under the full 2,500-pound gross weight of the *Cardinal*. The less expensive, less "plushy" 177 version can carry an extra 75 pounds.

Our "guesstimated" ground roll was about 700 feet at 997 feet above sea level and took 15 seconds. From the time the throttle started forward, we took 1:45 to reach 1,000 feet above the runway. This is below "the book" figures, but it involved a within-the-airport 180° turn off the busy Brackett runway and the expected inaccuracies of a pilot who had flown the older *Cardinal* 150 h.p. model on only two previous occasions. (PILOT Nov. 1967 and June 1968.)

Holding a climb speed of 90 m.p.h., give or take two or three m.p.h., we passed 5,000 feet (actual) in seven minutes with an indicated rate of climb of 600 f.p.m. It took us 17 minutes to reach 9,500 feet, where we were still showing a rate of climb of 450 m.p.h. despite the far-above-average outside air temperature of 85°F over the hot San Bernardino Valley.

During climb-out I explored the hands-off stability of the new *Cardinal*. It's excellent. The original, nonmodified *Cardinal* had a disturbing tendency to oscillate vertically (in a Phugoid curve) up to 500 feet between dips. However, the new model was completely stable in smooth-to-mildly-turbulent air.

The 23-item "Cardinal Rule" modification kit (PILOT June 1968) was supplied at factory expense to the 1,164 owners of the original 150 h.p. *Cardinals*. This kit seemed to alleviate most of the vertical oscillation. The new 180 h.p. *Cardinal* does even better.

While the 180 h.p. *Cardinal* looks almost like the beautiful lower-powered model that came out a year ago, it's a markedly different airplane. Addition of 30 h.p. has upped the useful load by 130 pounds while the stabilator modification has erased the vertical "hunting" characteristics.

We cruised to within reach of the Big Bear strip and tried a series of stalls. Everything was normal, the control wheel "tapped you across the knuckles" as the reed-type stall-warner wailed. You could look back through the "omnivision" and see the big stabilator buffeting and only then did the ship stall straight ahead.

The tetrahedron and smoke blowing at Big Bear indicated a brisk 90° crosswind from the south that was going to be no help for either approach. "The book" (pilot's operation manual) calls for a clean stall at 66 m.p.h. calibrated or 62 m.p.h. actual airspeed. With 10° of flap, the numbers are 6 m.p.h. slower with another four-mile drop at 30° or full flaps. The three-position slotted flaps move aft as they go down; 29½ square feet of flap area that increases slightly as flaps are extended.

We circled in the increasingly turbulent air over Big Bear and elected to land westbound toward the lake. There are no obstructions for almost 10 miles off that end of the lake in case of a go-round. Over the dry Baldwin Lake, I dropped 10° of flaps when the airspeed indicated 90 m.p.h., plus or minus, gusts.

"If it's okay with you, I'll try to hold 80 across the fence," I told Dave Bowman who nodded casually as a good company check pilot would. There were both thermals and downdrafts on our long final approach and it took a bit of throttle-jockeying to handle the crazy, mixed-up air. However, the 180 new horses under the cowling took care of everything quite nicely. We made the little 15° turn around the corner of the drive-in theater screen and lined up on the ribbon—perhaps 30 feet wide—of

Cessna pilot Dave Bowman and the author (right) with the 1969 Cardinal at Big Bear Lake during Downie's test flight.

Instrument panel of the 180 h.p. Cardinal while in flight.

the asphalt and rock strip.

Once across the fence, I eased back on both power and stabilator for a short touchdown. We touched down okay, but I kept coming back on the wheel for aerodynamic drag and neglected to spill the flaps. So we went back into the air about three feet for another crosswind landing. It was safe enough but sloppy and I swore. However, the new one-piece tapered steel-tube "Land-O-Matic" gear took care of my heavy-handed stabilator control with ease. This new tube gear is a definite improvement.

Despite the two landings, N30363 was stopped with moderate braking in well under 1500 feet. We turned around on the narrow runway with the nose-wheel that is steerable through 12° and then swivels to a full 45°. Tom Roberts climbed out to take a couple of pictures and I requested "another go" at the new 180 *Cardinal* and Big Bear. Bowman grinned his acknowledgement and we made a normal no-shut-down check list before blasting back into the turbulence.

The outside air temperature was a whopping 78°F on the ground at Big Bear, jacking the density altitude to 9,550 feet. Yet, without Tom's 200 pounds, we broke ground before reaching the midpoint of the 3,700-foot runway in 24 seconds. Because of the crosswind, I made no effort to hurry N30363 into the air.

Climbout was quite satisfactory with visibility forward improved as long as 10° of takeoff flaps were maintained. There was too much turbulence for any accurate r/c figures and we showed anywhere from zero to 1,200-f.p.m. up. We made one "pass" down the runway for photos and then another for landing. This time I attempted to hold the same 80 m.p.h. approach speed, figuring that the 200-pound lighter airplane would give me a little more "to play with" during flare-out.

Either N30363 figured it was my turn, the wind slackened or I just "lucked out." In any event, the landing was a "grease job" and when we taxied back to pick up Tom, I didn't feel quite so badly about the whole thing.

When you have a chance to read the new *Cardinal* brochure, you'll find this whole situation described as, "Flying qualities have been enhanced as a result of reduced ratio between control wheel and stabilator movement. This contributes to a smoother landing flare."

When you crank in flaps for a landing, it is interesting to speculate what will happen when two pilots with strong leg muscles decide to open both of those 4-foot-wide doors to act as drive brakes on a landing in case of a flap failure. However, this isn't in "the book," so don't actually try it.

After Tom Roberts climbed back into the spacious back seat, we took just 29 seconds to break ground. A quick slide up against the windward side of a ridge and we were soon soaring out of the valley at 1,000 f.p.m. Roberts and the cameras bounced around a little from both convectional and thermal currents. However, Tom reported more than enough leg and head room for his six-foot-plus frame even though we had front seats slid well back for tall pilots. Headroom has been increased on the 1969 model with a restyled, moulded headliner.

It's really "nit picking" to suggest a couple of minor modifications after only two hours behind the controls of this beautiful new package. Perhaps the same situation existed with the original 1,164 150-h.p. aircraft and I didn't notice it, but the first time I applied full rudder with my No. 12 shoes at Brackett Field, the toe of my foot caught behind a blunt-ended heater-ventilator when the rudder pedal was deflected completely to the left. Such a jam-up under a stall-spin condition could be a problem. A simple 45° bevel on this inlet would eliminate such a possibility.

Then, there's the cigarette lighter. It isn't that I disapprove of smoking; merely that I tend to sprawl out in any cockpit during cruise flight. The cigarette lighter on the new *Cardinal* is located at the lower left of the pedestal between the two front seats. If you let your right leg fall out to rest against this center pedestal, the knob of the lighter makes a lasting impression on that leg.

The *Cardinal's* mixture control has a pointed, red-painted knob with a ratchet on the control. However, there's still no definite lock on the control and the mixture-idle-cut-off is within a sweaty palm-span of the throttle. Addition of the standard squeeze-to-pull knob now used on Cessna's *Skylane* series would make this beautiful *Cardinal* bird even more difficult to "prang."

The top of the instrument panel aft of the curved windshield is properly painted dull black. Yet the forward part of the cowling was the same bright yellow as the remainder of the exterior of N30363. Fewer reflections would result from a dark-colored cowling, but it would probably detract from the esthetics of this beautiful paint job.

On the "plus" side, the new *Cardinal* has a 180 h.p. power package with a recommended overhaul time of 2,000 hours. Suggested price for the "full-house" *Cardinal* is $16,995 FAF while the latest *Skyhawk* sells for $13,995. The more austere *Cardinal*-type 177 lists for $15,775 while the corresponding 172 is $12,500. According to Cessna's owner's manual, the *Cardinal* will cruise at 75% power at 9,500 feet at 138 m.p.h., giving a 49-gallon no-reserve flight of 650 miles in 4.7 hours on 100/130 octane. By comparison, the 150 h.p. *Skyhawk* with 75% power at 9,000 feet will cruise 132 m.p.h. for 620 miles with no reserve in the same 4.7 hours, using 38 gallons of 80/87 fuel. The *Cardinal* costs an additional $3,000, has 30 more horse-power and a distinctive modern styling that the factory calls "fastback."

The new *Cardinal* is actually the Mark III version. A series of modifications including the stabilator plus the much-needed addition of power have finally come up with what is not only a beautiful, but an extremely satisfactory flying machine. □