

Time in type

The Cardinal's first cross-country to greet the flock

BY JULIE K. BOATMAN

There are things you just won't know about an airplane until you fly it. When we launched the 1977 Cessna Cardinal we're refurbishing for this year's AOPA sweepstakes on its initial test flight, we made sure every square had been checked. And we followed the instructions Lycoming produces for engine break-in, which called for an initial test flight lasting 2.5 hours. The results would tell the tale.

During that flight, we closely tracked exhaust gas temperatures (EGTs) and cylinder head temperatures (CHTs) on the J.P. Instruments EDM 800, as well as oil pressure and temperature and other system parameters. With the engine running straight mineral oil and so early in the engine's life, we expected temps to fluctuate and perhaps be on the high side, and that played out. But for the most part, with careful mixture and altitude management, we kept EGTs as close as possible to the recommended 1,325 degrees Fahrenheit and CHTs below 400 degrees F.

After an hour at 65-percent power, and the next one running between 65- and 75-percent power, Dan Gryder of The AvNet ran the engine up to full power for the last segment. Upon landing, he taxied over to the hangar, and Jeff Swords of Don's Dream Machines pulled the filter and cut it, in search of metal. Nothing significant. A thorough postflight revealed no anomalies, and we called the flight a success. All the hard work from our shops in Griffin, Georgia—including quality avionics work from Precision Avionics Specialists, Air Wrench's airframe expertise, and Advanced Aircraft Refinishers's final paint touch-ups—had paid off.

At that point, with a healthy local flight, we commenced the next portion of flight testing and engine break-in: cross-country flight at best power cruise. These hours would serve several purposes. First and most important, flight in the cross-country regime is ideal for engine break-in, as it keeps pressures within the cylinders appropriately high for



The Cardinal takes off for its first engagement—a four-hour cross-country flight to Ohio.

Once settled into cruise, the Cardinal trims out precisely, and flies hands-off.



On final for Runway 9, Oshkosh, Wisconsin.

Tools from the trenches

5 ways to leverage type club resources

1. Get specific. Find out the best fit for your airplane, and your kind of flying. Do you own one airplane and fly it exclusively? Do you rent other aircraft as well? Although some aircraft have a single type club, there are a few that offer options; the Internet can help you find the choices out there. See the listing of type clubs on AOPA Online.

2. Find your parts. Type clubs are often the best places to go for specialty maintenance advice on a make and model, and many offer parts—they'll link you to parts suppliers or perhaps they manufacture some under parts manufacturer approval.

3. Participate in the forums. Most type clubs offer forums, whether via e-mail or the Web, that allow members to exchange information directly. Along with make and model information, fellow members can offer tips on the best mechanics, shops, and retailers—as well as flying tips, destinations, and other tidbits. Just take any advice with a grain of salt—and consider the source.

4. Fly in for a good time. One of the best things about type clubs is the ability to gather with pilots who own and fly your type or model airplane. The flavor of fly-ins varies widely based on the folks who gather—and you'll often find new friends in the process. You already have something in common, right?

5. Join. You can't reap the benefits if you don't sign up! —JKB

proper seating of the piston rings. Second, we could spend quality time with the new avionics and systems. And last, but not least, we could take the airplane to its public flying debut.

So?

First, I'll answer the burning question in your mind: "How does it fly?" Since we

started flying the airplane again, that is, hands down, the most frequent question I field from members.

Support from Freeman's Just Plane Hardware allowed us to change out all the hardware in the control systems, and we completely re-rigged them. As a result, the controls feel noticeably tighter than when I flew the airplane last fall. I felt this during my before-takeoff checks, but it became most apparent when rotating on takeoff. I lifted the nosewheel around 65 knots and let it settle into a climb at 90 to 95 knots, keeping a nice low profile for better engine cooling. The stabilator is substantial, and on the whole makes the Cardinal fly like a much larger airplane. The ailerons induce roll like they're on bearings, with a feel more akin to that of a 210 than a 172.

Once settled into cruise, the Cardinal trims out precisely and flies hands-off. The only times I went off course were usually caused by my looking out the side window too long and unwittingly pulling the airplane with me.

More on climb performance with the new tuned exhaust from Power Flow



Featured contributors

Power Flow Systems

Power Flow Systems, the brainchild of Robin Thomas, branched out from Laminar Flow Systems, an airplane speed-mod company, in 1997. PFS, of Daytona Beach, Florida, creates tuned exhaust systems for light airplanes, starting with the Cessna 172 with an O-320 engine—a mod that increased power by 23.75 horsepower over airplanes equipped with the stock exhaust.

Now the PFS line includes many singles with Lycoming O-320 and O-360 engines. The exhaust system on the Catch-A-Cardinal is a great example, with stainless-steel components and slip joints for improved durability. The distinctive external exhaust stack comes standard; most systems also can be fitted with the "Short Stack" for a smaller external exhaust profile. The PFS is standard equipment on the Diamond DA40; development continues on systems for the Cessna 177RG and aircraft with larger Continental engines, such as the Beechcraft Bonanza. PFS has shipped more than 3,000 systems to date. Call 386/253-8833 or visit the Web site (www.powerflowsystems.com).

J.P. Instruments

J.P. Instruments began in 1986 in Huntington Beach, California. The first product, the Scanner (still available), was an answer to imprecise engine instrumentation found on light aircraft, and it cycled through exhaust gas temperatures and cylinder head temperatures on a simple light-emitting diode display. Next came the EDM-500, predecessor to the EDM-700 series, a multi-probe engine data management system, and fuel flow gauges.

J.P. Instruments has delved into total engine instrumentation with the EDM-930, installed in the Win a Six Piper Cherokee Six (see "A Six to Go," December 2006 *Pilot*). For the Cardinal's cockpit, we chose the EDM-800, with fuel flow indications, and the corresponding EZ Trends engine analysis software and dedicated data port—making it easy for the winner to keep tabs on the Cardinal's engine health for years to come. Call 800/345-4574 or visit the Web site (www.jp instruments.com). —JKB



Hal Shevers (far left) of Sporty's Pilot Shop hosted the Cardinal Flyers Online convention alongside the weekly summer hot-dog feed.

Systems when we're out of "baby the engine" mode—with high power settings on the agenda for the entire flight, for the sake of cooling we kept climbs shallow.

In cruise at 5,500 feet, at 71-percent power (a power setting of 23 inches manifold pressure and 2,300 rpm), we saw 121 KTAS at 10.9 gallons per hour (we're running well rich of peak, also for cooling purposes). Up at 8,500 feet, and 67-percent power (21 inches mp and 2,400 rpm), we eked out a couple more knots, and even bested book speed: 124 KTAS.

Upon landing, the effect of the Micro AeroDynamics vortex generators was clear. Carefully applied to the tops of the wings, each side of the vertical stabilizer, and bottom of the stabilator, the VGs helped me maintain greater control during my first Cardinal approach and landing in more than seven months. We'll do more testing of the airplane's slow-flight characteristics once the engine's signed off for low-power duty and report on them online and in these pages.

Greeting the flock

Our first cross-country trip took us from Griffin up to Batavia, Ohio, for the Cardinal Flyers Online Eastern Convention, hosted by Sporty's Pilot Shop. The CFO has worked right alongside us during the reassembly process, providing seemingly endless insight into the Cessna Cardinal, and the minds of Cardinal owners.

The CFO fly-in also, as luck would have it, coincided with a major event at Sporty's: The now-famous weekly hot-dog feed at the Sporty's ramp would serve its 150,000th hot dog. And the lucky pilot to receive this special dog? AOPA President Phil Boyer, who flew in to visit the CFO and share his experiences flying a Cardinal as a new pilot in the late 1960s and early 1970s.

The winner of the Cardinal will have several organizations to call upon for assistance, technical help, and camaraderie. All three have donated memberships to the winner of the Catch-A-Cardinal. The CFO membership includes its lively and well-edited e-mail digest and access to its online compendium of ownership information, as well as several fly-ins across the country each year.

The Cessna Pilots Association, started in 1984, has a full-time staff including Executive Director John Frank and four technical specialists—all maintenance

CONTACT

- Advanced Aircraft Refinishers**
www.advancedaircraftrefinishers.com
- Air Wrench**
www.airwrenchinc.com
- The AvNet**
www.theaviatornetwork.com
- Cessna Owner Organization**
www.cessnaowner.org
- Cessna Pilots Association**
www.cessna.org
- Don's Dream Machines**
www.donsdreammachines.com
- Freeman's Just Plane Hardware**
www.justplanehardware.com
- Micro AeroDynamics**
www.microaero.com
- Precision Avionics Specialists**
www.precision-avionics.com
- Sporty's Pilot Shop**
www.sportys.com

technicians, pilots, and aircraft owners. Its online forums see between 200 and 400 posts a day on all things Cessna, and the CPA boasts the largest Cessna technical publications library outside of the factory. The CPA hosts seminars around the country for pilots and maintenance technicians.

The Cessna Owner Organization, which is run by the same folks who operate the Piper Owners Society, has been in the business of owner assistance for more than 33 years. Its magazine, *Cessna Owner*, carries sharp photography and feature articles directed at the Cessna owner. Its annual fly-in, Gateway to Oshkosh, offers the opportunity for Cessna pilots to go head to head with Piper pilots in a golf tournament, among many other special events and seminars.

With so much information at his or her fingertips, and so many good folks to call upon for advice, the winner of the Catch-A-Cardinal will never lack for support through that first year of ownership.

I'm jealous of that lucky pilot already—this is one nice-flying airplane.

ACPA

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INTERACTIVE ▶

AOPA PILOT ONLINE



View the Catch-A-Cardinal's test flight and cross-country trip on *AOPA Pilot Online* (www.aopa.org/sweeps/0709).

Who's behind us?

Cardinal Flyers Online's Paul Millner and Keith and Debbie Peterson

Paul Millner's first airplane was a Cessna Cardinal—a fixed-gear model like our sweeps airplane—and now he flies an RG. Millner sent out an e-mail digest to other Cardinal pilots in 1997, and now he and webmasters Keith and Debbie Peterson not only send out a digest most days of the year, but they also manage the most comprehensive Cardinal information site on the Internet.

Combined, Millner and the Petersons have nearly 45 years of Cardinal experience between them, and it shows. With many photos to illustrate common concerns, sources for parts and maintenance, and forums for members to share ideas and experiences, the CFO is a rich resource for Cardinal pilots—or wannabes. The CFO also hosts several fly-ins across the country and in conjunction with airshows. Visit the Web site (www.cardinalflyers.com) for more information.

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