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The ultimate cross-country in the Robinson R44 Raven II BY TIM McADAMS

uring the summer of 2000, my wife and I ferried a Robinson R44 from the factory in California to Maryland (see "Coast to Coast," September 2000 *Pilot*). Back then, Robinson Helicopter had just introduced the R44 Raven model with hydraulically boosted flight controls. That was a big step for comfort and smoothness. Now Robinson has added more muscle by adding fuel injection to the Lycoming engine and larger main rotor blades for more lift and less vibration. The new model, dubbed the Raven II, also has a 2,500-pound maximum gross weight (that's a 100-pound increase), a 28-volt electrical system, and a carbon monoxide warning system.

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When my friend Duane Zentgraf purchased a new Raven II, I thought a summertime flight back to his house in Maryland would be a great comparison opportunity. However, this cross-country was going to be more work than the previous one, as he had not piloted a helicopter in 10 years. So getting him current was a goal as well.

Zentgraf selected the R44 Raven II for its low operating and acquisition costs combined with impressive performance. He plans to use it to support his Maryland-based real estate business. Two years ago, he petitioned the local zoning board to allow him to land and take off from his property. At the hearing, some local residents objected, asserting intolerable noise and danger. Using flyover sound data from an FAA test and demonstrating a clear approach and departure path, he was granted approval. He then constructed a concrete landing pad and hangar.

With his property located on the Chesapeake Bay and his approach and departure path over water, he decided to equip the R44 with optional pop-out floats. They add about 65 pounds to the Raven II's empty weight of 1,506 pounds and result in a slight reduction to its 117-knot cruise speed. They are a unique design using a mixture of helium and CO_2 to inflate the floats rapidly. In fact, the pre-production design inflated so fast that company President Frank Robinson described it as "explosive." To slow the inflation, he installed a different type of valve.

Small changes, big performance

Since I had never flown a Raven II. Robinson Helicopter's Chief Production Test Pilot Doug Tompkins gave me a quick "differences" lesson. The only operational change is in the start procedure. The keyed magneto switch is no longer used to engage the starter and has a new position marked Prime. After turning the master battery switch on and pushing the mixture control full rich, the engine is ready for priming. To prime, hold the key switch in the spring-loaded Prime position for 3 to 5 seconds and note that the auxiliary fuel pump light goes out. Next place the magneto switch in the Both position, pull the mixture all the way out, and press the starter button located at the end of the collective. As the engine begins to fire, smoothly push the mixture to full rich.

Tompkins also pointed out the lack of a carburetor heat control. He noted that eliminating carburetor-icing problems is an added safety benefit of the fuel injection.

After flying to Catalina Island to take some photos, we departed Torrance, California's Zamperini Field for Las Vegas. I handled the navigation and ATC through the Los Angeles Basin so Zentgraf could focus on getting comfortable at the controls. I took advantage of the dual Garmin GNS 430 GPS/nav/com receivers to thread our way through the Class B airspace. What I like about this arrangement is the ability to set one 430 on a one- or two-mile scale, allowing you to see airspace boundaries and terrain features, like highways and rivers, in detail. The other unit can be set to a farther scale for long-range flight planning.

Zentgraf made his first approach to landing in a decade to Runway 8 at California's Barstow-Daggett Airport, our only fuel stop en route to Las Vegas. Typical for pilots not used to the low parasite drag of the R44's airframe, he had trouble slowing down and sailed right past his landing spot. We decided to practice more approaches later as the outside temperature was close to 100 degrees Fahrenheit and the cockpit was even hotter. In this environment, air conditioning would be a welcome option—one that Robinson Helicopter is evaluating.

A flying refresher

We arrived at Las Vegas' McCarran International Airport that evening. During the flight from Torrance, Zentgraf



quickly regained his skills at holding altitude and heading. Throughout the flight we discussed the new airspace classifications and correct ATC procedures because I wanted to get him talking on the radio as soon as possible.

The following morning, using his updated knowledge, Zentgraf called clearance delivery and got us out of the Class B airspace. We decided to make this an easy day and headed for Tucson, Arizona. Our first stop was Lake Havasu, Arizona, to refuel and practice some approaches. It didn't take long for Zentgraf to get the feel right and start making proficient normal and steep approaches. With his progress performing basic maneuvers going so well, we started working on more advanced ones such as off-airport landings, out-of-groundeffect hovering, and maximum performance takeoffs.

The next day was going to be long, as we intended to reach the Garland/DFW Heloplex Heliport just northeast of Dallas. Our plan was to spend two days there and visit Ken and Connie Pyatt. They own SKY Helicopters, manage the heliport, and are the dealers who sold Zentgraf his R44. Plus, this would give us an opportunity to spend an entire day doing flight training. The owner added the special option of bubble windows. The windows curve out, providing more shoulder room in the cockpit. Our route to Dallas would take us through El Paso, Texas, a great spot for high-density-altitude work. Not only would this give Zentgraf some exposure to flight conditions not normally found on the East Coast, but also it would let me test the Raven II's highdensity-altitude performance. This is where the more powerful engine and wider main rotor blades should make the most notable difference.

On my previous cross-country in the R44 Raven, the density altitude in El Paso had been 7,600 feet. That aircraft's IGE (in ground effect) hover ceiling was 6,400 feet at 2,400 pounds, so lifting off with full fuel that day was tricky. The Raven II's IGE hover ceiling at 2,500 pounds is 8,950 feet, and with the density altitude the same as before, the Raven II should have handled the thin air with ease. Indeed it did, as we were able to achieve a 1,000-fpm rate of climb on departure.

Late that afternoon we touched down at the Garland heliport. Zentgraf and I were up early the next morning to get a solid day of flight training accomplished. We flew to Rockwall Municipal Airport and practiced autorotations. Consistent with this helicopter's slippery fuselage, it seems to want to float forever. In fact, it takes a focused effort to slow the helicopter to 65 knots, its normal autorotative speed. At its maximum glide configuration of 90-percent rotor rpm and 90 knots, it will glide one mile for every 1,300 feet of altitude.

That night Zentgraf planned the rest of our trip and he correctly figured about 10 hours of flight time left. We decided to do it in two days with an overnight stop in Nashville. The next morning that ever-so-important check for temporary flight restrictions changed our plans. President Bush was going to be in Nashville. A prohibited area with a 30-nm radius around the airport was in effect during our arrival time. We decided to plan a direct flight to Chattanooga to keep us well south of the TFR. We made several fuel stops, practicing more maneuvers each time.

The initial flight plan for the final day of our trip took us just south of the Washington, D.C., ADIZ (Air Defense Identification Zone) en route to Cambridge, Maryland. But since Zentgraf would be flying in this area, we decided to alter our route to the north so he could practice filing an ADIZ flight plan. We landed at Zentgraf's helipad early that evening and put the helicopter away for the night in a specially built bay at the end of his warehouse.

After a two-week break, we spent an entire day flying in the local area, practicing emergency procedures and maneuvers with the hydraulics control system switched off. Without hydraulics the control forces are much higher and the tendency is to overcontrol the aircraft, but practice is all it takes to smooth out the control touch. By the end of the day, I signed off Zentgraf's flight review and Special Federal Aviation Regulation 73 endorsement (uniquely required for Robinson helicopters).

Business sense

Zentgraf sees tremendous value using the helicopter in support of his land development business. He says he can look for property around Maryland's Eastern Shore and Delaware in a couple of hours instead of spending days driShown flying over the Catalina Island shoreline, the Raven II has been equipped with pop-out floats. They are the gray bags located on the aircraft's skids.





The R44 Raven II supports Robinson Helicopter's reputation for using innovative engineering to increase the safety and acceptability of helicopters. The company's products are always evolving, so count on more enhancements in the future. It is that commitment to excellence that attracts customers such as Zentgraf.

Tim McAdams of Mechanicsburg, Pennsylvania, is an ATP in helicopters and airplanes and a helicopter CFI. He is the aviation department manager for Rite Aid Corporation.



SPECSHEET

Robinson R44 Raven II Base Price: \$346,000 Price as tested: \$395,000

Specifications

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Powerplant
Lycoming 10-540, de-rated to
205-hp continuous 245-hp for takeoff
Length
Width
Height
Main rotor diameter
Standard empty weight
Max gross weight
Standard fuel capacity
Auxiliary fuel capacity
Passengers/baggage w/standard fuel810 lb
Passengers/baggage w/auxiliary fuel700 lb

Performance

Cruise speed	 .7 kt
Max range (no reserve)	 3 nm

Hover ceiling IGE	8,950 ft
Hover ceiling OGE @ 2,300 lb	7,500 ft
Hover ceiling OGE	4,500 ft
Rate of climb @ 6,000 ft	1,000+ fpm
Max operating altitude	14,000 ft
V _{NE}	130 kt

For more information, contact Robinson Helicopter Company, 2901 Airport Drive, Torrance, California 90505. Telephone 310/539-0508; fax 310/539-5198; www.robinsonheli.com.

All specifications are based on manufacturer's calculations. All performance figures are based on standard day, standard atmosphere, sea level, gross weight conditions unless otherwise noted.

The Raven II's panel features a Garmin 430 setup (above). There's not a lot of difference in the panel from the original Raven, although the mixture control has been moved from the lower pedestal to the upper. The owner has attached a hangar to his warehouse next to his house on Maryland's Eastern Shore (right).

ving around. The helicopter also helps with existing projects. One of these is a 1,000-acre planned community with 3,200 home sites and a golf course. He has flown government officials over the site to show the land use and how it will fit in with the existing communities. Helping them to understand a project of this size speeds up needed approvals and avoids the potential for miscommunication. He adds that builders and engineers also benefit from viewing the project from the air.

Another timesaving use is his weekly commute to his other business just west of Baltimore. The hour-and-ahalf drive, which includes crossing the Chesapeake Bay Bridge, is reduced to a 30-minute flight. To keep it fun and in line with his conservative style, he only flies there when the weather is good.

Since he hangars the helicopter at his house, he stays in touch with his immediate neighbors to ensure that the helicopter doesn't bother them. He complies with the Helicopter As-