

**AUTOGYRO COMPANY
OF ARIZONA**

Soda Pup-E



An easy building sport-scale autogyro with vintage lines

by Thayer Syme

Slimline's new "Richard Bong" pilot figure is a perfect match for the Soda Pup-E. I used contact cement to secure him to the balsa structure above the servos.

PHOTOS BY WALTER SIDAS AND THAYER SYME



The Cermark motor is mounted on a small light-ply standoff to establish the appropriate thrust lines. I used push pins to position the screws that secure the plastic fuselage skins and cowl—all cut out of 2-liter soft-drink bottles.



The Soda Pup-E park flyer autogyro kit from Autogyro Company of Arizona (ACA) is an easy-to-build laser-cut sport-scale kit that is sure to inject some novel fun into your RC lineup. Inspired by a full-scale autogyro called the "Pitbull," this is just the model to reach for when you want a change of pace.

ON THE BENCH

Everything you need in terms of wood and hardware is included in the Soda Pup-E kit, and ACA also offers power system combinations to ease that guesswork. Beyond the novelty of the autogyro concept, the actual construction utilizes an "out of the box" design concept. The fuselage structure is a relatively simple balsa skeleton that's skinned with plastic pieces cut out of a couple of 2-liter soft-drink bottles. These plastic parts are much lighter than an equivalent balsa structure, and you can go from cold beverages to trimmed and painted parts in just an evening or two.

The balsa formers are sleeved onto two longitudinal spines and are reinforced in a few places with thin plywood facings. A subassembly of 1/8-inch light plywood forms the battery tray and landing gear mount, strengthening the forward fuselage significantly. The fuselage's uniquely shaped tail section goes together very easily. The aft fuselage has a central spine that's laser-cut with numerous indexing holes. A series of laser-cut pieces glued into these holes form a "stair-step" tail cone, as shown. I used Perma-Grit sanding tools to knock off the steps, and then I finished up with a few swipes of 220 sandpaper. Though it may look complicated, the process goes very quickly. Just sand away the corners to reveal the proper shape.

The tail surfaces are solid sheet. You will only need to sand the outlines to a smooth contour and then cover and hinge them. I used SIG AeroKote Lite for all the covering, as I find it easy to work with and nicely opaque. The elevator is hinged with a wide CA hinge in the center section, and the rudder is mounted with Robart hinge-points. I cut the slots and drilled the holes for the hinges before I started the covering.

ROTOR ASSEMBLY

This is my third ACA project. I have reviewed the Gyro Bee and Scamp autogyro ARFs (January 2005 and February 2007, respectively), and they came with rotor blades that were assembled and ready to go.

The rotors in the Soda Pup-E kit had to be assembled. Each blade has only five pieces, so there really isn't much that can go wrong. The instructions have you begin by sanding

SPECS

- PLANE:** Soda Pup-E
- MANUFACTURER & DISTRIBUTOR:** Autogyro Company of Arizona
- TYPE:** Sport-scale autogyro
- FOR:** Advanced pilots
- ROTOR DIAMETER:** 48 in.
- DISK AREA:** 1,809.6 sq. in.
- FLYING WEIGHT:** 36.6 oz.
- DISK LOADING:** 2.91 oz./sq. ft.
- LENGTH:** 26 in.
- RADIO:** 4-channel required; flown with a Futaba 6EX FASST 2.4GHz transmitter, Futaba R607RS receiver, 1 Hitec HS-85MG servo for rotor tilt, 2 Hitec HS-81 servos for rudder and elevator
- POWER SYSTEM:** Cermark 2820-1200 brushless outrunner motor, APC 10x5E propeller, Cermark 30BL speed control, Flight Power 3S 2150mAh LiPo battery
- FULL-THROTTLE POWER:** 21.4 amps, 209.7 watts, 5.73 W/oz., 91.7 W/lb.
- TOP RPM:** 8,895
- DURATION:** 10+ min. cruising
- MINIMAL FLYING AREA:** Ballfield
- PRICE:** \$169, Soda Pup-E "Bare Bones" (laser-cut kit with limited hardware); \$199, "Bare Bones with Kibbles" (basic "bare bones" kit with all finishing hardware); \$119, Cermark motor, speed control and prop
- COMPONENTS NEEDED TO COMPLETE:** Electric power system with 2 1/4-2 1/2 lb. of static thrust, 4-channel radio with metal-gear miniservo for rotor-tilt control.

SUMMARY

The Soda Pup-E park flyer kit builds quickly into a charming sport-scale replica of the North American Rotorwerk's "Pitbull." This laser-cut kit uses two 2-liter soft drink bottles to skin the skeletal balsa fuselage and cowl the motor, saving you hours of building and shaping a complex structure. Once completed, the Soda Pup-E will delight you with its distinctive outline and unique flight characteristics.



AIRBORNE

Flying something different is the great appeal of any autogyro. You will want a day with light but steady breezes to help you spool up the rotor for your first flight. Be patient; there is nothing worse than launching an autogyro that is not fully in its autorotation mode. I made this mistake at the NEAT Fair last year and still have not replaced the Scamp's broken rotors. The first day out with the Soda Pup-E was decidedly more successful. While it didn't actually seem windy, there was enough breeze to bring the rotors to full autorotation with only a few steps forward.

For the uninitiated, autorotation describes the condition under which the rotor achieves a stable rotational speed from the airflow through the rotor disk and generates its lift. If you have any question about whether or not you have achieved autorotation, you haven't. There is an unmistakable noise from the whirling blades when

you do, and even more apparent, the exponential increase in lift seems it can nearly pull the model out of your hands. Now is the time to throttle up to about 75 percent and push the Soda Pup-E forward into the air. If it settles toward the ground, increase the power and ease the stick back a bit to load the rotor even further. With the right combination of pitch and power, you will be rewarded with a smooth climb straight out into the wind.

The Soda Pup-E climbs well at full power, so once you are comfortable with its handling you can throttle back quite a bit to maintain a level cruise. Pushing forward on the stick too abruptly can unload the rotor, causing the rotor speed to decay quickly and the lift to evaporate. If you want to slow a climb, simply pull back on the power. To arrest a descent, add power and ease the stick back to increase the rotor load.

My personal flying style is to keep models relatively low and close in so that I can fully appreciate them in flight. This is the envelope in which an autogyro shines. Yes, you can coax the Soda Pup-E through a loop and barrel roll, but it's more fun cruising down low, swishing the air with its large rotor. Between using the throttle for altitude changes and a very effective rudder, the Soda Pup-E is sure to give your left thumb a welcome workout.

Autogyros can not stall. Pull off the power, and the Soda Pup-E will descend on its own all the way to a safe landing. Add power as it gets close to the ground to slow the descent, and pull back on the stick to set down with a gentle touch. Keep it pointing into the wind, and the ground roll may be less than its own length.

a 45-degree bevel into the trailing edge. Instead, I used a chamfering bit in my router table and the job was over in a matter of seconds.

You need to put a 1/4-inch-long, 90-degree bend in the music-wire leading-edge weights, and I ran into trouble here. I clamped the 3/32 wire in my bench vise and promptly snapped off the first piece as I tried to bend it. I then used a propane torch to heat an inch of each wire to a dull red and let them cool slowly. This removed the temper from the wire, and subsequent bending was no trouble. I glued them into place with Zap as recommended and used the shortened one in the heaviest blade blank. The last step before covering was to glue a ballast tube into the rotor tips. The blades have laser-cut slots, so I just roughened the tubes with sandpaper and glued them with thin Zap.

BLADE BALANCING

I covered the blades before I balanced them. The manual directs you to establish the lateral balance of each blade and make them even by adding lead shot to the ballast tubes. I did this and then took the balancing one step further: my laterally balanced blades had a weight difference of nearly 2 grams. This would cause vibration, so I also ballasted the two light blades to equal the heaviest. I ballasted one blade with a couple of layers of red sign vinyl centered on the lateral balance point. The white blade also needed weight, and I didn't have any white vinyl. Sixteen pieces of shot brought the weight into line, so



The tail is made up of numerous layers of balsa that has been laser-cut to the changing profiles along its length. Sand the corners smooth as shown on the right side and the fuselage is ready to cover.

I added eight to the tip ballast tube, and drilled a small pocket in the blade root for the other eight pieces. A final check confirmed that all the blades were within 1/10 gram of each other and laterally balanced to within 1/16 inch. The first time I spooled up the rotor, I was rewarded with tight tracking and no perceptible vibration.

TIPS FOR SUCCESS

Autogyros are unique, so I strongly recommend that you read and follow the manual carefully, regardless of your experience. It is very thorough and clearly details the assembly, setup and flying of this model. Speaking of setup, don't skimp on the servos. The loads on the main rotor are significant, and you do want a metal-gear servo here. The Hitec HS-85MG fits perfectly and does a great job in this high-stress location.

Battery access is through the lower cowl. Since an autogyro always sees positive G loading in flight, the battery can be safely secured with a Velcro pad at the back of the tray only. I have a "blade" of 1/16 plywood that I keep in the flight box to help install and

remove the battery. Place the battery on this blade, and then slide it into the nose. Once the battery is in the proper position, withdraw the plywood and press the battery down onto the Velcro mount. To remove the battery, simply lift its front end, and slide the plywood underneath it to "slice" the Velcro apart.

CONCLUSION

Autogyros are a fascinating throwback to aviation's Golden Age. These intriguing aircraft offer an unusual challenge for RC modelers, and the Soda Pup-E is a satisfying way to explore this niche. Add the reward of being the only one at your field with anything like it, and the decision should be an easy one. Autogyro Company of Arizona has your next pet project ready for adoption. Take a Soda Pup-E home today. 🚁

Links

APC Propellers, distributed by Landing Products, www.apcprop.com, (530) 661-0399

Autogyro Company of Arizona, www.autogyro-rc.com, (888) 783-0101

Cermark, www.cermark.com, (562) 906-0808 (information only), (800) 704-6229 (orders only)

Futaba, distributed exclusively by Great Planes Model Distributors, www.futaba-rc.com, (800) 682-8948

Perma-Grit tools, distributed by Bob Violett Models, www.bvmjets.com, (407) 327-6333

Slimline, www.slimlineproducts.com, (480) 967-5053

ZAP, manufactured by Pacer Technology, www.zapglue.com

For more information, please see our source guide on page 153.

