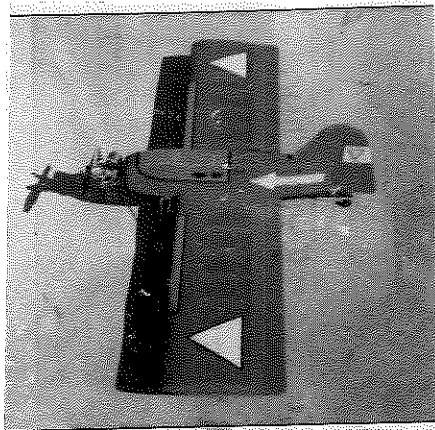


# The Whirlwing

BY TYRONE PARKER



**W**hirlwing derives its name from its unique flat spin. This machine spins so flat that it resembles helicopter blades whirling around. If you execute a stall turn and pull full up and full left aileron while holding full right rudder as it comes over the top, it will tumble end over end in a knife-edge attitude. If you apply full down, full left aileron and full right rudder while blazing along at full speed, it will tumble upward, snap spin a couple of times as it slows, then fall into an inverted flat spin. If at any time the action becomes a bit confusing, simply neutralize the controls; the nose will drop and you can easily pull out and away.

Despite the wild gyrations the plane will execute, it is very stable in level flight and docile at slow speed. If you are interested in a really fun-to-fly and attention-getting change of pace, this is the plane for you.

## CONSTRUCTION

Cut wing parts from balsa as indicated on plans. Glue spar halves together then glue spar joiners in place. Glue trailing edge halves together and add T.E. joiner. Glue W-2 aft ribs and W-2 aft tip ribs to back of spar, and taking care to keep it straight and level, attach trailing edge. Add remaining W-2 aft ribs. Glue W-1 front ribs and W-2 front tip ribs to spar front. Taking care to keep them straight and level, attach sub leading edges,

then add remaining W-2 rib fronts. Using a sharpened 1/8-inch diameter brass tube, punch left ribs and spar tip to accommodate antenna tube, then fit and CA antenna tube in place. Bevel sub leading edge and trailing edge to rib contour, then attach leading and trailing edge sheeting. Sheet center section, then add fillets and cab strips.

Cut elevons to length from light balsa trailing edge stock. Glue fixed elevon tips to trailing edge tips with bevel on bottom to provide slight airfoil reflex. Fit elevon control torque rods to trailing edge center section. Notch elevon center section to fit, and again with bevel on bottom, CA in place. Drill and notch elevons to fit torque rod ends, then bevel elevon leading edges and set aside. Attach wing leading edge, carve round and sand. Attach wing tip and sand completed wing structure smooth.

Cut fuselage sides from light 3/16-inch sheet balsa and take special care to get a snug fit around wing openings. Glue 1/4-inch balsa top and bottom fuselage longerons in place. Slide fuselage sides onto wing and CA into place. Bevel inside of fuselage at tail, soak fuselage sides aft of wing trailing edge thoroughly with ammonia, then carefully press fuselage tail ends together and clamp till dry. When dry, secure with CA. Bend landing gear to shape from 1/8-inch diameter music wire. Cut L.G. mount core to shape from 1/8-inch lite-ply. Cut L.G. mount front and back plates from 3/32-inch aircraft ply and laminate to core with CA. Notch bottom fuselage longerons to fit and CA L.G. mount into place. Cut front and back L.G. mount braces from 1/4-inch balsa triangle stock and CA in place.

Cut firewall core from 1/8-inch lite-ply. Cut firewall front and back plates from 1/16-inch aircraft ply and laminate to core with CA. Drill motor mount holes, fuel line holes and throttle cable hole, then CA firewall into place. Cut firewall braces from 1/4-inch balsa triangle stock and CA in place. Cut fuselage front plate from 1/8-inch lite-ply and CA in place. Sheet fuselage top and bottom with 3/32-inch balsa. Mark hatch outline on fuselage and cut hatch loose. Glue hatch hold-down plate to fuselage. Cut F-1 and F-2 to fit and CA into place. Glue hatch tongue to hatch and add H-3, H-2, and H-1.

Inset 1/32-inch ply hatch hold-down screw crush plate to fit flush with hatch top and CA in place. Fit hatch into place. Tack scrap 3/16-inch balsa to fuselage top where fin will be fitted. Fit tailwheel bracket into place but do not secure yet. Carve fuselage edges round and sand structure thoroughly. Cut strakes to fit from 1/8-inch balsa and CA in place to wing leading edge and fuselage sides.

Cut servo mounts to fit from 1/8-inch ply and CA in place. Cut 1/4-inch balsa triangle servo mount braces and CA in place under servo mount ends and against fuselage sides. The servo slider shown on the plan has proven to be effective and trouble free, though if you are fortunate enough to own a transmitter with electronic mixing, you can

save yourself a little weight and a lot of tedious cutting and fitting by simply installing a mini-servo for each elevon surface and using your transmitter mix.

Cut fin and rudder from light 3/16-inch balsa and CA fin into place. Bend tail gear to shape from 1/16-inch diameter music wire but do not bend top over yet. Solder inside wheel retaining washer, add tail wheel, and solder outside retain washer. Solder inside main gear retaining washers, add wheels and solder outside retaining washers. Thread washer and tailwheel bracket onto tail gear and bend top over. Drill and notch rudder to fit tail gear, bevel rudder leading edge and set aside.

Cut out right front fuselage side to fit engine. Install throttle and rudder cable housings. I used tissue to cover all sheet balsa surfaces, applied with Balsarite and followed with two coats of thinned Sig Lite-Coat clear dope. I covered the wing with translucent Micafilm. After MonoKote trim sheet, trim and stick-on decals were applied, I sprayed on two coats of Black Baron clear epoxy.

Hinge elevons to wing trailing edge with EZ hinges. Glue tail wheel bracket into place, and hinge rudder to fin and fuselage tail with EZ hinges. Install rudder control horn. Install servos. Install Du-Bro Kwik-switch mount and remaining radio gear. Install fuel tank, motor mount and engine. Epoxy main gear into place. Install control cables and solder tailwheel bracket retaining washer. Install elevon control pushrods. Check all controls for smooth operation and correct direction. You'll want about 3/16-inch up and 3/16-inch down elevator and about 1/4-inch aileron on top and on bottom of that. About 1/2-inch left and 1/2-inch right rudder will be fine to begin with.

Affix prop and spinner and carefully check balance. Note that the balance point is quite far forward, and unless you really want a heart attack, do not take off with the balance more than 1-1/2 inches back from the wing leading edge.

## FLYING

For your first few flights, simply take off, fly up to altitude and cruise around until you are familiar and comfortable with the somewhat strange visual configuration of the plane. Make a few slow fly-bys to familiarize yourself with its slow flight characteristics. Bring it in flat at a fast idle, throttle on down when you're over the runway and let it sink on in. Avoid the rudder if possible, until it rolls to a stop, as it is close coupled and consequently sensitive on the ground.

As you begin to wring it out, you will find that the speed and attitude at which you enter the various maneuvers are fairly critical, and it may require some time and serious concentration to perform, in a predictable and consistent manner, the various gyrations of which the plane is capable. I don't think you will mind so much though, as the plane is intriguing and really fun to fly. The plans are of the fifth generation that I have constructed and flown during the past five years, I hope you will enjoy yours. **MB**