BY KEN KETNER / PHOTOS BY TROY ELLISON

THE BUZZER 100

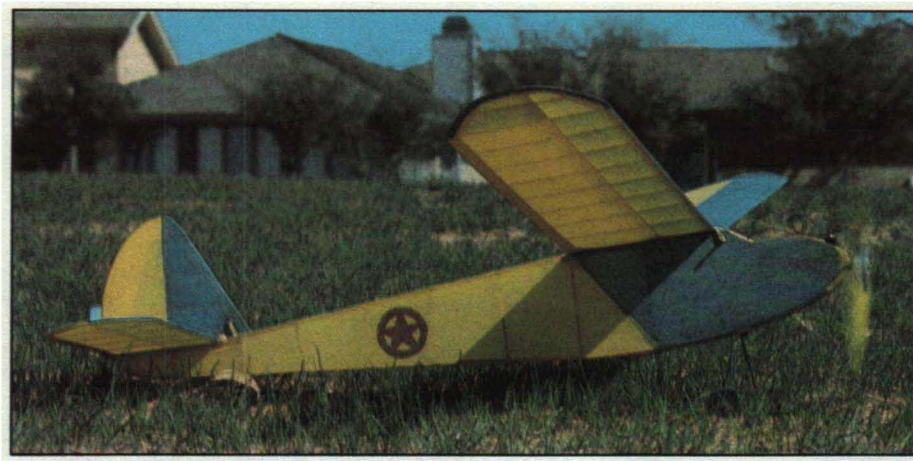
An oldie but goodie! The author presents a redesigned version of Bill Winter's 1948 cabin free flight, for the Brown B-100 or similar size CO2 motors. Won 1st place in the Open CO2 event at the 1994 AMA Nats!

Have you dreamed of having a model that wanted to fly away every time, was easy to build, a beauty to view and was powered by a motor that was a cinch to start, made almost no noise, and required almost no maintenance? Perfection is not to be expected, of course, but let me tell you how I came close to this ideal.

A new Brown B-100 CO_2 motor—factory serial number 363—arrived at my Lubbock, Texas mailbox a few months ago. (It's part of the fun to "send off for things" and to have them appear miraculously!) After a couple of test runs I could see that it was a little jewel, so I began to search for an airframe that would be its equal. I happened at the time to be reviewing my favorite older model magazine, *Air Trails*, especially issues from the late '40s and early '50s. I particularly love the full-size plans they put in almost every issue. On page 50 of the December 1948 issue, I stumbled upon the ideal ship, the Buzzer, designed by none other than the old master, Bill Winter, and with a fold-out plan!

In 1948, Bill Brown, the powerplant genius, released his CO_2 motor through OK-Herkimer. Brown's Campus Industries had also introduced the smaller Campus A-100. Not to be lost in the CO_2 boom, Polk's Hobbies, which featured a line of gas engines under its "Buzz" trade name, produced the Buzz CO_2 motor, which had a bore of 3/16-inch. Winter's Buzzer was designed for the Buzz motor, and Bill Brown's new B-100 looks to be about the same size.

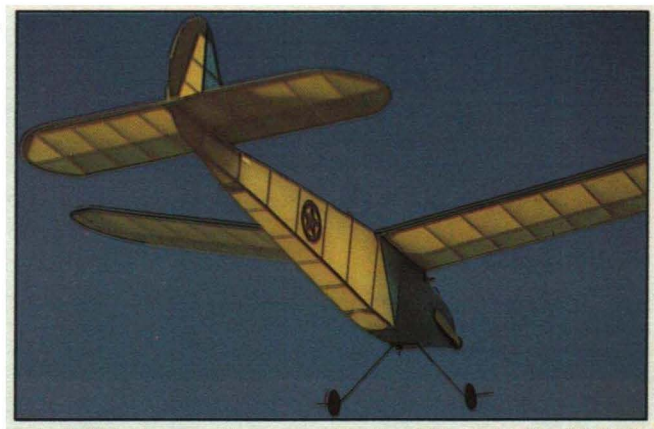
With that thought in mind I photocopied Winter's Buzzer plan, then set about modifying it for my B-100. I planned to install a dethermalizer and make a number of other modifications while using some innovative construction techniques I had been developing. The result is a ship that is easy to trim and won't stay on the ground. The airframe and motor are a beautiful pairing. Mine has flown away twice; only luck, and the help of my clubmates, the Latex Rangers (Flying Aces Club Squadron No. 25), brought it home in one piece.



The author's prototype Buzzer 100 ready for action. The little Brown B-100 motor looks lost in the cowl; the Gasparin-designed GM-120 would be another good choice. Both of these motors and their associated chargers are available through Peck-Polymers.

BUILDING THE BUZZER 100

The plan is printed on both sides of the magazine centerspread. One side includes both wing panels and the horizontal stab; the other has the fuselage, which is too long to be shown in one piece. Build the wing and stab first, then cut and splice the plan as shown to make a complete fuselage profile drawing.



For best glide performance, Ken recommends using a folding prop such as this Sonic-Tronics 6x4, developed for electric powered RC sailplanes. The star-in-a-circle is the logo for Flying Aces Squadron No. 25, the "Latex Rangers."

The model employs a wing construction method I developed that assembles fast and flies great. Refer to the sketches on the plan. Place the 1/16x1/2 trailing edge, the 1/16x7/16 center spar and the 1/8 x3/16 leading edge down on the plan. Cut 20 front rib blanks (7/16x1-1/2 inches) and glue them in place between the L.E. and spar. Cut 20 rear rib

blanks (7/16 x 2-3/4 inches), stack and notch them for the T.E., then glue them in place.

Now comes the nifty part. Remove the panels from the plan, and with a sharp pair of scissors, cut the rib blanks from the spar toward the L.E. in an approximate airfoil shape—ditto from spar toward the T.E. Then, using a good straight sanding block, sand each wing panel and the center section to final airfoil form.

Add the tips to each wing panel. Glue the wing panels to the center section with the proper dihedral angle, and install the gussets. Also add gussets where the spars join the center section. With this method one can build a strong and light wing very quickly. Use a similar method to construct the stabilizer.

The fuselage is a standard box using hard 1/16 square longerons and uprights. The front section is 1/16 medium sheet, as is the main former at the wing L.E. station. The firewall is 1/16 plywood. Add gussets as you see fit to add strength at crucial points. The landing gear is made from two separate pieces from 1/16 music wire, sandwiched between the main fuselage former and pieces of cross-grained 1/16 sheet. The wheels are sandwiched balsa circles glued to aluminum tube bearings.

There is a small piece of 1/16 plywood near the landing gear to support the CO_2 loading pip. This must be firm to resist the fair amount of force used in loading; note that it is offset to one side to bear against the edge of the balsa fuselage side. Mount the motor, tank, and loading pip before covering. Use a piece of balsa to wedge the tank in place. I used 0-80 machine screws to mount the motor. No nut is needed if you drill the plywood slightly undersize; the screws will thread into the plywood. Use small balsa shims under the motor to get thrust settings.

The fin is standard 1/16-inch thick stick construction. Add a trim tab mounted with copper wire. Add a 1-inch wide stabilizer platform of 1/16 hard balsa (cross grain); set the platform so that the right stab tip is 1/2-inch above a level reference line. This stab tilt will give a nice right turn glide.

I covered the entire model with gift-shop tissue, the kind found on racks with many different colors. Cover the bottom of the wing and stab first, then the tops. To shrink uniformly, spray water on both top and bottom. Allow the wing and stab to dry while clamped to your building board to ensure they will be warp-free. The whole model was brushed with one heavy coat of 50-50 nitrate dope.

FLYING

Find a place with a lot of room because this design has a good glide ratio. Be sure the CG is located as shown on the plan. Test-glide the model on a calm day and make adjustments as needed. Shim the wing to adjust the glide—a bit under the T.E. if it stalls, a bit under the L.E. if it dives. When you have a solid glide with a slight right turn tendency, you are ready to enjoy the pleasures of CO_2 power.

Load the tank with a *gas* charge (note: the charger tip above the supply tank gives a gas charge; the charger tip below the supply tank gives a liquid charge). With a gas charge, your CO_2 motor is like a compressed air motor but at a higher pressure. With a liquid charge, it's like a steam engine, the liquid CO_2 boiling at ambient temperature to produce gas, hence a longer run.

Start the motor and rotate the cylinder to give a slow tickover. I use a Sonic-Tronics 6x4 folding prop designed for electric powered RC sailplanes. It seems ideal for this motor and model—the motor runs well with it, and it folds for a neat glide. You can start a CO_2 with such a prop by holding one tip, rotating the prop clockwise against the gas pressure, then releasing it. The motor will start and run in the proper (counterclockwise) direction. Don't try that with a glow or diesel engine!

After you can load and run your motor on a gas charge, and have a slow speed setting, load and start it, let it run until there's about 15 seconds left, and launch the model as in glide testing. You should get a slow toodle to the right. With this as a base point, and continuing to use short gas charges, gradually increase power by rotating the cylinder and launching. Don't go to higher power until you are getting good flights at the present setting. With full power and the final flight trim now dialed in, the initial power burst gives my model a straight-out run before turning into a steady right-hand climb under power. Such a pattern seems ideal to me.

Set power trim with thrust adjustments and possibly a little bit of rudder. Mine flew best with a right power pattern and right glide. If yours wants to go left naturally, that's fine too. Lube your motor with a drop of light machine oil in the cylinder and behind the prop driver every half dozen flights. Try to keep your motor runs short for this phase of trimming. Remember, your Buzzer 100 is a creature of the air and will fly away at the slightest excuse.

I get motor runs of about 30 seconds maximum on a gas charge. If the air is cold and inactive, one can have nice sport flights on gas charges. For some *real* action, load a liquid charge, *be sure to set your dethermalizer fuse,* then let 'er rip. You will get motor runs of around 2 minutes. I recall one flight in particular early in my trimming and testing when, on a liquid charge and a calm day, the 'ol Buzzer climbed majestically to about 100 feet in graceful circles, cruised around at that altitude for 4 minutes, then landed perfectly right at my feet as if it had been piloted by a leprechaun. Who says aeromodeling is a hobby? When one experiences flights like that, I would say instead that it's a way of life! ***MB***