



Colette Cashion does a very nice job of displaying her father Ken's "BOOMER". It is Monokoted in white, red, yellow, and black, with pale blue cockpit . . . Oh hell, who gives a damn about the airplane!! Photo by Ken Cashion.

"BOOMER"

• THE TWIN BOOMER • THE TWIN BOOMER •

By BERT STRIEGLER . . Two anodized aluminum hunting arrow shafts will get you well on the way to building this out-of-the-rut Standard Class R/C sailplane. Then get yourself an old '67 VW "Bug" and

• The "Boomer" is a stand-out in a world of look-alike gliders. If you like airplanes that look different, you will have to agree that the Boomer fills the bill.

This glider has contest caliber performance, combined with a rugged structure. It may look difficult to build,

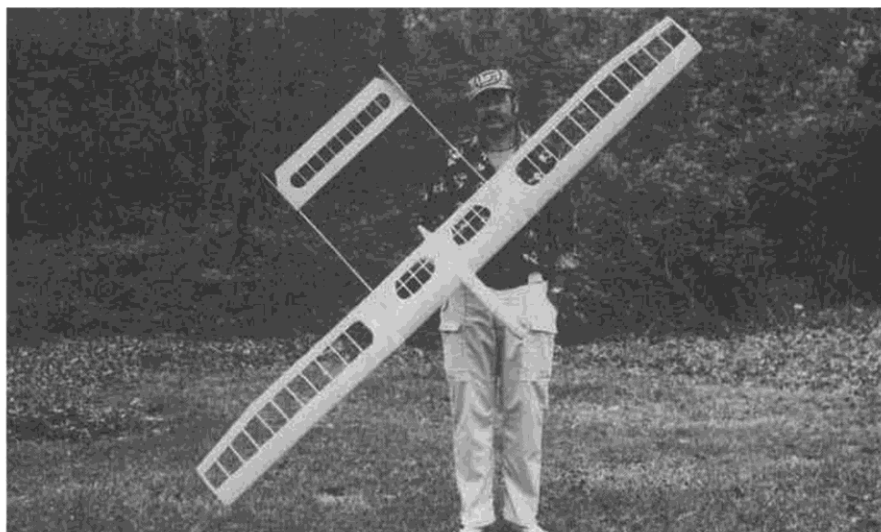
but it is really much easier than it looks. This project actually started about two years ago when my good friend, Herb Brown, and I, started trying to optimize on some of the simple, common-sense rules of good model design. Many of the design ideas incorporated into the Boomer are the result of years of free-

flight experience. We agreed in the beginning that the availability of really good proportional radio gear has allowed us to get a little careless in design. Who cares if the airplane is not quite stable? Stalls can be damped out by ginger application of elevator control. Good design practices, such as light wing tips, light stabs, low inertia, rear fuselage construction, and short nose moments, went by the wayside. Most fliers never even trim their ships. The radio was able to overcome these deficiencies if the pilot was good enough. I considered all of these problem areas and incorporated some unusual solutions into the Boomer.

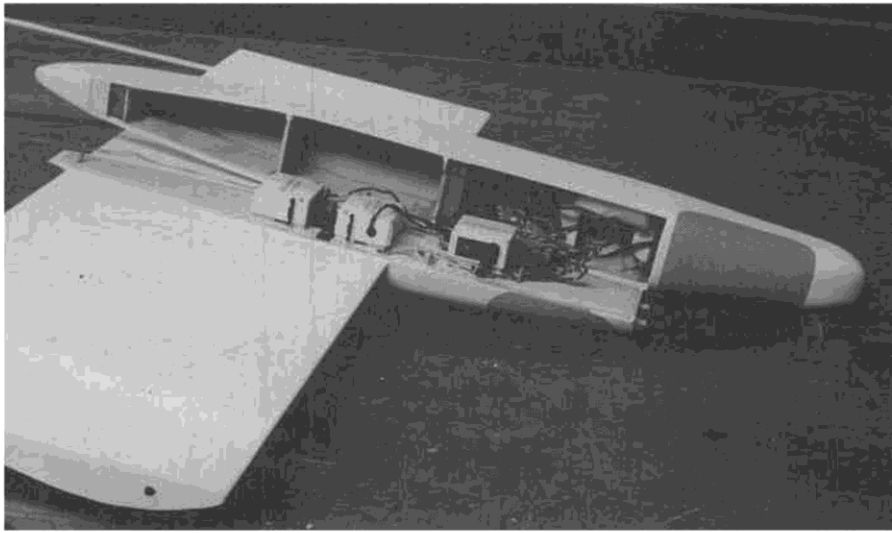
The Boomer is not just another model . . . it is an idea airplane. You can build it just like the plans show, and I can assure you it will make a fine glider. Even better, you might want to incorporate some of its unique construction ideas into your own design.

My philosophy of design for the Boomer was really very simple. A short nose moment combined with a very light rear "fuselage" structure and stabilizer was used to provide low moments of inertia in pitch. The outer wing panels are kept light and have slight in pitch. The outer wing panels are kept light and have slight washout to yield better roll stability and quicker recovery. Frontal area was held to a bare minimum to yield a wider speed range. Twin fins and rudders were utilized because they can be built lighter than a large single fin. They also tend to make the stabilizer more efficient by reducing tip losses.

These are all good common-sense design



Ken Kashion and his BOOMER before applying the Monokote.



Cashion's BOOMER. Rudder servo is toward tail, elevator servo in middle, spoiler servo forward. Adjustable tow hook blind nuts seen on fuselage bottom. Photo by Ken Cashion.

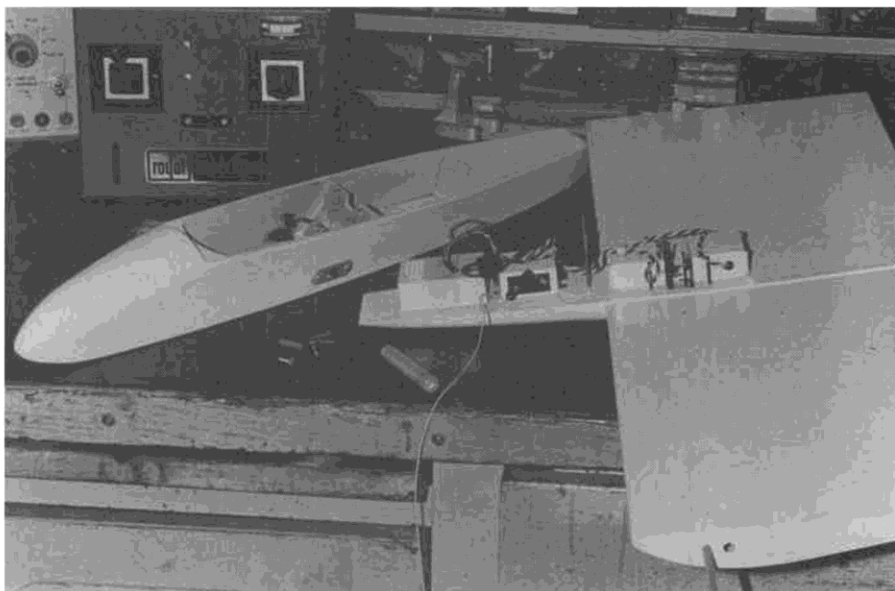
factors that lead to unusually good stability. The Boomer has shown an ability to recover immediately from almost any upset, and can be flown safely over a wide CG range. This is ample testimony to the low moments of inertia incorporated into the design.

Some of the methods used to arrive at the desired design goals are unique and serve as the basis for the statement that the Boomer is an idea plane. The twin tail-booms are made from anodized aluminum arrow shafts. The ones I used are sold in archery shops under the name "Game Getter" No. 2219. This and is incredibly strong. Each boom only weighs 1 oz., and I doubt you could build a rear fuselage structure of that weight that would even approach the strength of these shafts. I really had not given much thought to arrow shafts for tail booms. The fiberglass shafts that were in general use by archers for the past few years were just not rigid enough for my purpose. When I first saw the new

aluminum shafts, I knew this was *it*. They are very rigid and will withstand a shot from a 70 lb. bow directly into a rock wall, even though they are actually lighter than the fiberglass shafts.

The surface finish of these aluminum shafts is very smooth, both inside and outside. This led to another idea that saved weight in the rear. A piece of inner Nyrod or Goldenrod was used as a pushrod in each boom, one for elevator and the other for rudder. Instead of using the outer Nyrod for support, I simply glued 1/4 inch long sections of plastic tubing on the inner Nyrod with Hot Stuff at about 4 inch intervals, and let the boom act as the guide. This really works out well in practice.

Another unique feature of this design is the way the radio is mounted. Instead of being fitted into the short fuselage, the servos and the receiver are all placed on the plywood "floor" of the keel with servo tape or mirror mounting tape. Since a picture is worth a thousand



Bert Striegler's BOOMER. Receiver and three servos installed on ply "floor" with double-stick servo tape. Photo by Bert Striegler.

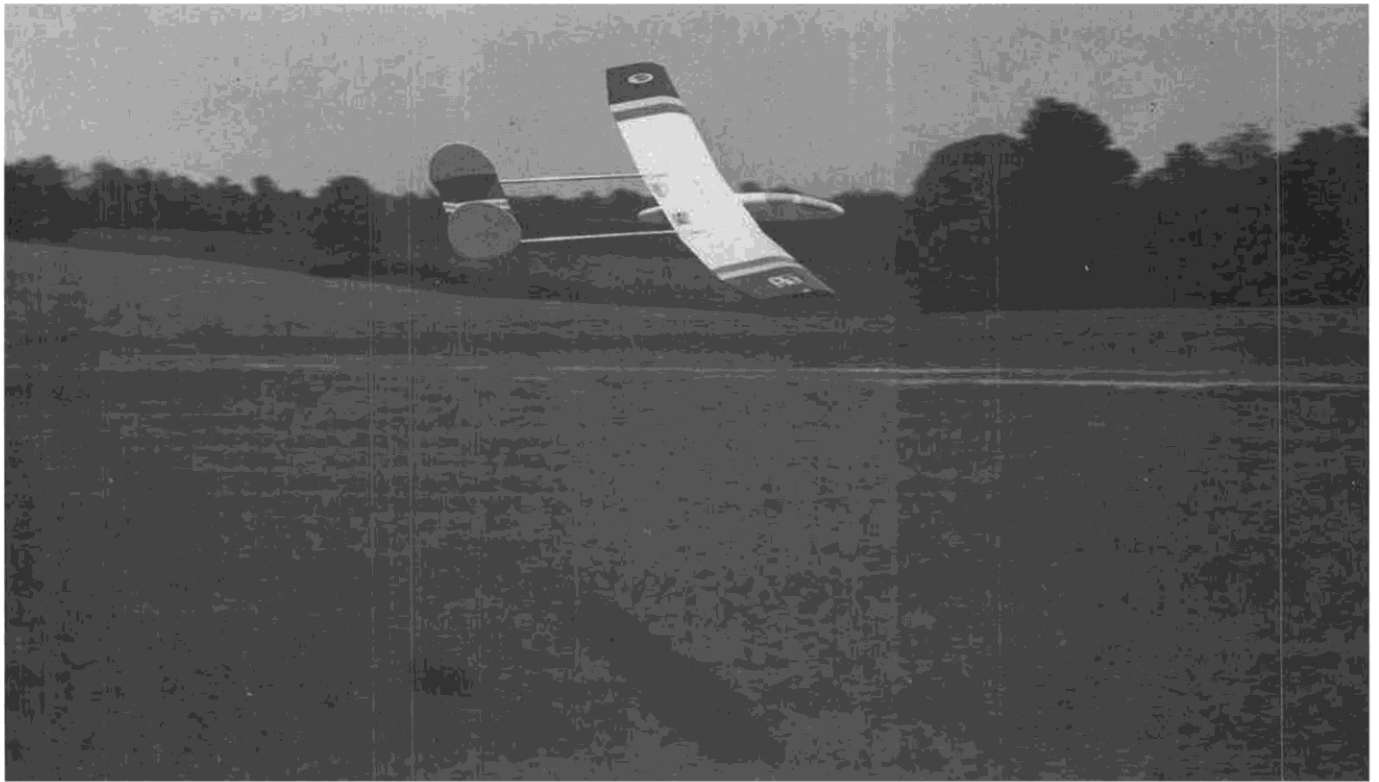
words, I have included a photograph of the installation. Only the battery pack is carried in the fuselage.

The spoiler was another unique installation. It was incorporated into the center section instead of the outer wing panels, in spite of dire predictions by some of my friends that it might blank the elevator when it was deployed. I'm happy to say it is effective and works just like any other spoiler. The installation of this spoiler is very simple, both structurally and mechanically. A piece of Nyrod was bent over a candle flame to serve as a guide for a piece of monofilament which goes directly to the spoiler servo. The spoiler is held down by a light spring and pulled up by the servo. Nothing has to be disconnected to remove the outer wing panels, and the outer panels are kept lighter to reduce moments of inertia.

Another feature of the Boomer is that it can be completely dismantled for transport. The tail can be removed from the booms by taking out 4 sheet-metal screws and removing the clevis at the control horns. The booms can be removed by loosening the clamps on the wing center section and sliding the boom off over the Nyrods. The two outer wing panels can be removed by pulling them off of the wire fixtures in the usual fashion. The result is a package that will fit in a space only 36 inches long. Another unique feature.

Structurally, the Boomer is a relatively conventional airplane. The center section of the wing is the structural heart of the airplane and should be built first. Please note that all the spars are spruce and that hardwood inserts are used where the booms enter the wing. The booms plug into a hole in the hardwood brace that is attached to the main spars. You should be sure this is a snug fit to prevent movement of the booms. The boom is held in place where it exits the wing by a small clamp fashioned from a scrap of aluminum. The main spars are fully shear-webbed by hard 1/16 sheet balsa with the grain running vertically. The control bellcranks are mounted to a small piece of ply in the same manner as aileron bellcranks are installed in a powered RC model. Be sure to position these carefully so the pushrod does not bind against the end of the tail boom at full control-throw. I used 1/16 music wire pushrods to the servos and supported the rod with scraps of plywood where it passed through the wing ribs. Stack-drill the plywood outer ribs for the wing-wire tubes. Be sure to install all pushrods and wing-wire tubes before planking the wing.

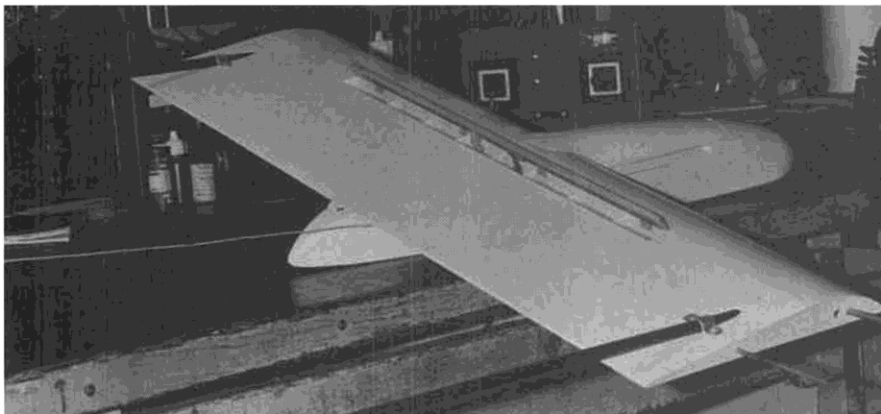
Now, glue the plywood "floor" and keel to the wing center section. Add the soft balsa fairing blocks and carve and sand to shape. Cover the center section with Silron, silk, nylon or rayon. Use plenty of dope. This will make the center section much more rigid than it



"Somebody down there is following me!" Ken Cashion's BOOMER drifts across a Mississippi meadow. Photo by Ken Cashion.



Lucky owner of the car on the cover, Bert Striegler's wife, Beverly, holding the original BOOMER. Wings are held on by plastic insulation tape.



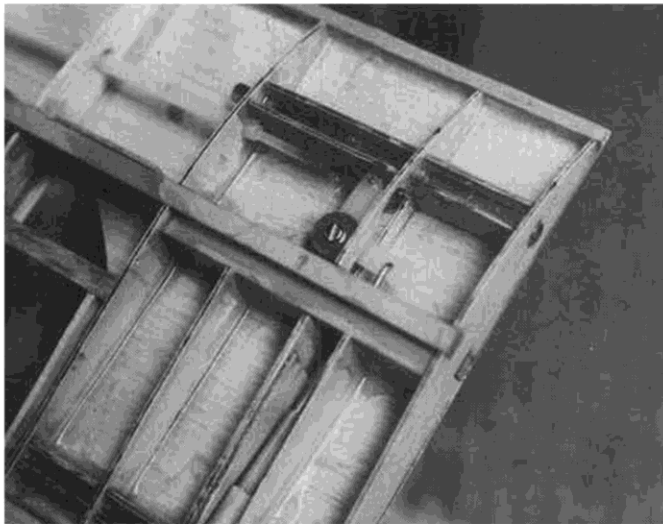
The 1/4 inch sheet balsa spoiler shown in the open position. Spoiler is small, but effective. No, it doesn't mess up air flow over the stab! Photo by Bert Striegler.

would be if it was covered with shrink film.

The outer wing panels are completely conventional. Note that there is a small amount of washout in the tapered portion of the tip. The wing is built flat on the board by placing the lower leading edge sheeting down, the trailing edge sheeting down (with the tip braced up as shown) and the lower spar and leading edge glued in place to the lower leading edge sheet.

Even the lower cap strips are put in place before the ribs are glued on. The top spar is glued on after all the ribs are in place, the top sheeting is installed, short shear webs are put in place, and you are through! Both outer wing panels can easily be built in one evening with Zap or Hot Stuff. The outer panels are covered with shrink film. I used orange transparent Monokote. Each panel only weighs 4 oz.

The tail is also a relatively conventional structure. The stabilizer is built very light by using 1/32 sheet planking. The fins and rudders are made of light 1/8 sheet. The stab ribs have a hole near the trailing edge to accept the tie-rod that connects the two rudders. The tie-rod is made of 1/8 aluminum tubing. Two lengths of tubing are required. Splice the tube in the center by inserting a short length of 3/32 brass tubing with epoxy. The tie-rod ends are made of 3/32 brass tubing that is flattened and drilled to fit the rudder pins shown on the plans. Epoxy one of these in place, insert the tie-rod into the stab and



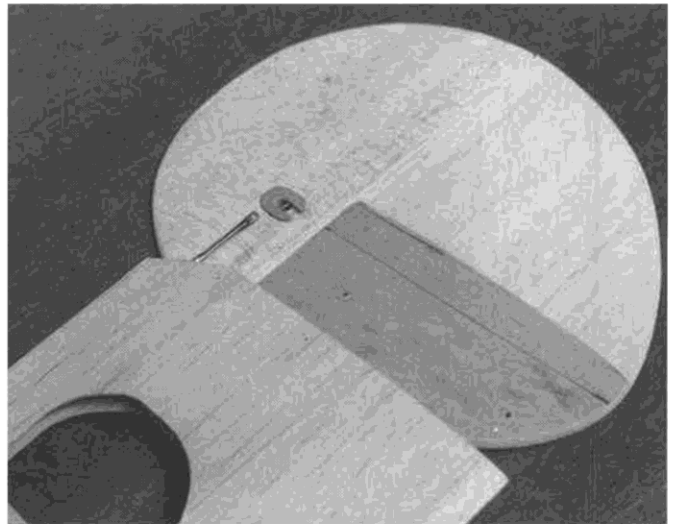
Cashion's BOOMER. Lateral pushrod from servo to bellcrank. Connecting rod exits through boom. Boom secured between ply ribs and into hardwood blocks. Photo by Ken Cashion.

connect the one end to one rudder. Connect the other link end to the other rudder, coat with epoxy, and put into the tie rod. Hold the two rudders straight until the epoxy sets. All this is done, of course, after the fins and rudders are in place on the stab. The stab is easier to cover before the fins are glued in place.

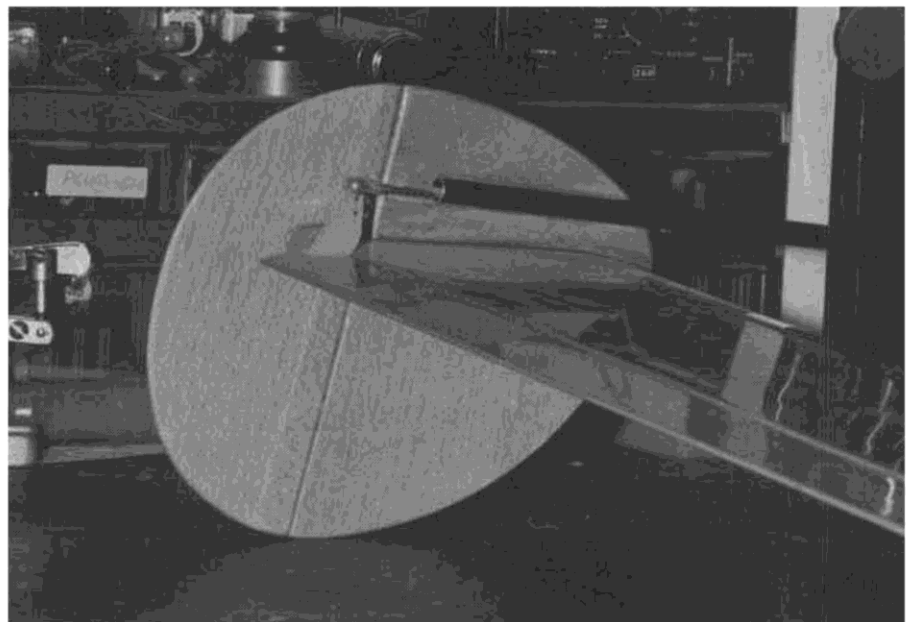
The fuselage is a very simple structure, but I would caution you not to skimp on the 1/32 ply doublers. Even though the fuselage only serves as a "cowling" for the radio, it still is the part that strikes the ground first. With the Kamikaze-style landings encouraged by our strange competition rules, the fuselage has to be pretty strong. Another consideration is that all launching loads are borne by the fuselage. The two tie-bolts transmit this load into the center section structure. I covered my fuselage with silk for additional strength.

Flying the Boomer is easy . . . it's a very docile airplane with no bad habits. If you think it is fragile, forget it! Mine has been cartwheeled several times rather violently, but the worst damage was a glue joint failure where the fin joins the stabilizer. Five minutes later it was back in the air. Make the usual effort to get the CG in the location shown on the plans. Hand glide it to correct any minor trim problems, then stretch out the high-start and let her rip. My first launch was virtually a hands-off affair, and yours probably will be too. The Boomer is a good flat-land thermal glider with the ability to turn very tight without evidencing tip stalling. It has a wide speed range which will extend your thermal hunting territory. It would probably make a decent slope glider, but slope soaring is not a big deal in Houston, which has to be the flattest place known to man!

So, there you have the Boomer . . . a unique glider full of new ideas. Maybe it will start a new styling trend!



Cashion's BOOMER, showing stab with tie-rod which links to hinge pin in rudder. Holes in fin to secure tail section to boom. Note reference line for securing stab. All Monokote hinges. Cashion photo.



Elevator horn is lined up with pushrod coming out of aluminum tube boom. Short lengths of outer nylon tubing, glued at intervals to pushrod tube, prevent buckling. Neato! Striegler photo.



Rear view of Bert's BOOMER. Rudder pushrod comes out left boom, to horn. Tie-rod connects to right rudder. Bert calls attention to his neat, practically NEW work table!