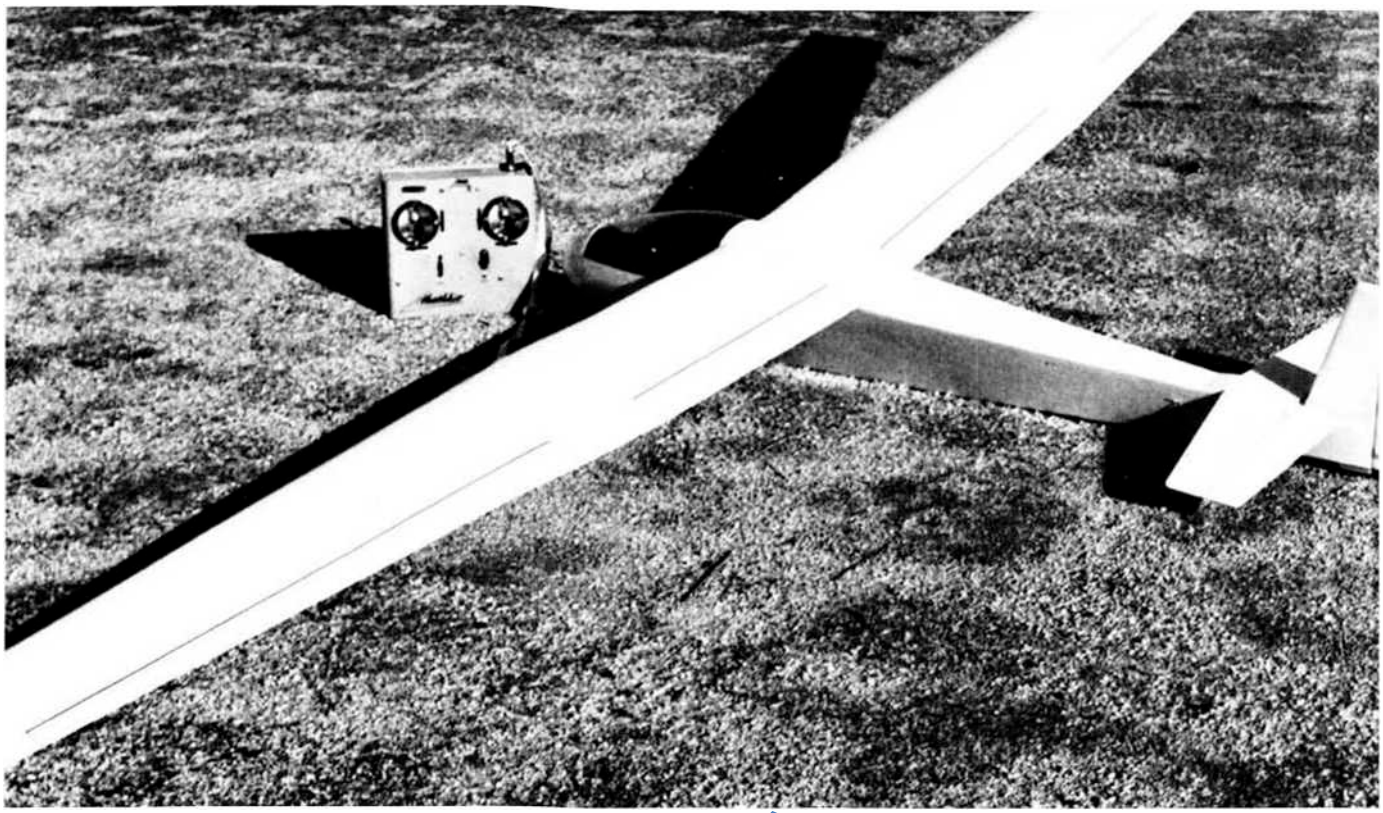


BRIEGLEB BG-12

Following the simple basic structure of its full size counterpart, this 100" scale model sailplane doesn't have to compromise performance for appearance or vice-versa. By CHRIS CHRISTEN

The BG-12, a single-seat high-performance sailplane, is the twelfth in a series of famous designs by William G. "Gus" Briegleb. Briegleb, one of the Grand Gentlemen of Soaring, headquarters his Sailplane Corporation of America on El Mirage Field, near Adelanto . . . on the desert North of the L.A. megalopolis . . . California.

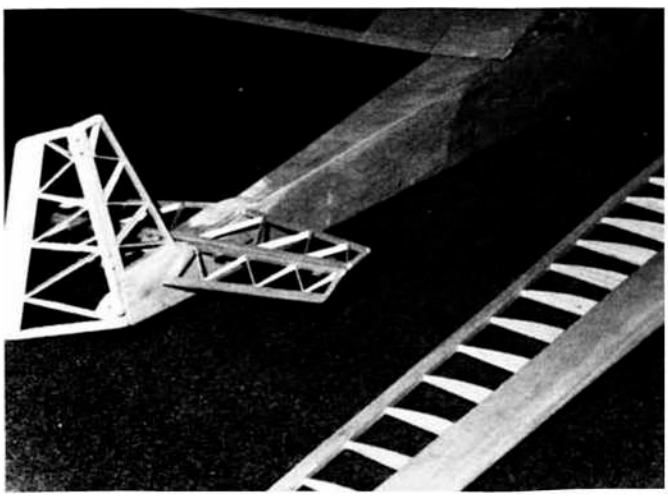
The BG-12 first took wind over its wings in 1956, and 17 years after that prototype flight, the design is still popular with sportsmen pilots and offers competitive performance as well as 1973-sleek appearance. The all plywood construction was designed especially for the home builder, and is quite similar to model airplane practice.

The design specifications claim an L/D max of 34 at 56 mph and a minimum sink rate of 2.25 fps at 47 mph. In comparison, the latest Schweizer . . . the 1-34 . . . is quoted at an L/D of 34 at 55 mph, and a minimum sink of 2.1 fps at 47 mph. Little wonder that more than 200 kits for the BG-12 have been sold, and that many are still active throughout the world. It is quite a basement project.

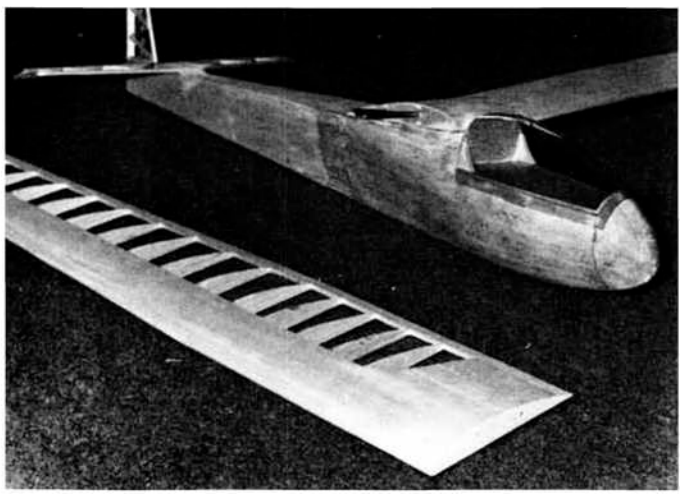
Briegleb's BG-12 has logged an an viable record for any single design, and especially for an amateur built configuration, having established records for distance, duration and altitude at various times in various countries.

But perhaps the most important records are those of safety and longevity. Almost every issue of Soaring . . . SSA's magazine . . . lists BG-12's in the "For Sale" columns at prices to near $4,000.

The original BG-12A utilized a three- piece wing. This was later revised in the -12B and subsequent versions to a two- piece with conventional center joining arrangement. Most BG-12's were and are assigned to Open Class competition with wing spans 9 1/2 inches greater than the maximum 15 meters allowed in Standard Class. Also, all but one BG-12 incorporated center section wing Haps for glide path control, which is a feature not allowed in



Zig-zag ribs in tail surfaces provide strong, light, warp-proof structure. V sectioned fuselage is built upside down over top view.



Canopy is portion of a 16" Sig unit. Forward half of fuselage is strengthened by fiberglass cloth and resin. Wings plug in.

Clean simple lines show up well in this picture. Ship in the background is a Diamont.

Standard Class.

The single Standard Class BG-12 was a -12C modified to 15 meter span . . . 49 feet-2 1/2 inches . . . with dive brakes (spoilers) and no flaps. These changes made it legal under FAI/OSTIV Standard Class requirements.

Gus Briegleb's "Briegleb Glider design Number 12" is an excellent modeling subject for all-around sport flying or for a serious scale project. It's no floater, but its light weight and clean lines give performance beyond what might be expected. Penetration is quite good, and if there's any thermal action worth working, it'll go up.

Exact scale outlines are noted on the drawings for the scale enthusiast, and many full size machines are still around and available for documentation purposes. The BG-12 is unique . . . literally a modern classic.

CONSTRUCTION…….

WING:

Begin construction of the wing by cutting all necessary ribs from straight grain medium weight 1/16 balsa. Make 6 Number One ribs from 1/16 plywood and 2 Number One ribs from 3/32 plywood. Drill all plywood ribs for wing wires.

Make trailing edge stock by planing and sanding 1/4 x 3/4 balsa sheet slack . . . leave trailing edge about 1/16 thick.

Assemble the six 1/16 plywood ribs on two full length brass tubes and pin over wing plan at first six rib stations. Be sure everything is square . . . epoxy tubes to ribs. When set, remove from plan and cut tubes flush with two No. 1 ribs in center . . . you now have a perfectly aligned center section.

Build wing and fuselage on a flat surface such as a second-hand two foot wide door . . . these are inexpensive and very solid. Pin a 48 inch sheet of 1/16 balsa over plan ... be sure to use wax paper or Saran Wrap. Add spruce spar to rear edge of sheeting and while this is drying, fit lower center sheeting and glue. If 48 inch wood is not available, shorter sheeting with splices may be used. Be sure to keep all splices near tip and not overlapping.

Add all ribs, root assembly and shear webs to wing, capping with 1/8 x 3/8 sub leading edge. Wing is finished by splicing and adding trailing edge and gussets . . . allow to dry over night.

Remove wing panel and shape 1/8 x 3/8 sub leading edge strip to ribs.

Then fill area between spars and tubes with a mixture of resin and micro balloons.. . chopped fiberglass may be substituted . . . the main thing here is to achieve no root Ilex.

Repin wing assembly to board and finish by adding all top sheeting and a 3/32 facing rib to root of wing . . . this will later be sanded to match dihedral with wing saddle.

After all this has dried thoroughly, trim top sheeting at leading edge and add 1/4 x 1/2 balsa leading edge. The wing is finished by adding tip block and shaping leading edge.

The left wing panel is constructed over the back of the plan which is made visible by rubbing a small amount of cooking oil on the paper where the wing is located.

WING SADDLE:

Bend the two wing wires to the angle shown on the plan ... be sure that they match. Make up a sheet of 1/16 balsa 6 1/2 inches wide by 4 inches long (grain parallel to 4 inch side) and pin to plan against trailing edge. Glue both bottom spars and 3/32 ribs to this. Add 1/8 x 3/8 sub leading edge.

Fit both wing wires, noting that rear lower spar needs to be notched to clear wire. Add both top spars and shear webs with wire fitted. Temporarily add wing panels to saddle . . . support panels on board and be certain everything is square . . . now is the time to fix any misalignments. When you are sure everything is right, epoxy wires to ribs and let set.

Remove wings and saddle from building board. Mix some more resin and micro balloons and fill area between spars and wires.

Now complete saddle by adding top sheeting and leading edge ... do not shape leading edge until saddle has been epoxied to fuselage.

TAIL SURFACES:

When building both the stab and rudder, be careful to shim leading and trailing edge material to be in center of 1/16 rib stock. Rudder outline shown on plan is scale and work

Structural design of wing allows almost complete assembly on bench before removal. Note those very important webs. Don't leave 'em out!

Chris looks as though he just felt a thermal drift by while posing with his BG-12. The 100" span is convenient for transportation.

The scale outline for the stab is also shown, but is not recommended for beginner pilots or sport flying. The scale stab is only 10% of the wing area and requires very attentive piloting.

After the surfaces have been assembled and allowed to dry thoroughly, sand both to the symmetrical airfoil shapes shown.

FUSELAGE:

Begin construction of fuselage by cutting all frames from clear, medium grade 1/8 balsa sheet. The cutouts shown on frames D, E, F, *& G* may be omitted if you prefer to use Nyrod push rods. If cutouts are retained, be very careful in cutting so that they may be refitted during construction ... see plan note.

Entire construction will be done over the top view on plan. Pin and jog frames C through G, and) at locations shown . . . check for squareness. Install special cockpit stringers, “K,” with frames A and B. Prop securely to proper height above building board.

Now add side stringers, keel, and one inch nose block. Carefully shape and add gussets to frames A and C. Using 1/8 x 1/4 balsa, add frame H.

Install 1/8 x 1/4 top diagonals between frames and corners of side stringers .. . be sure these are flush with building board. Now locate diagonal side braces in the following sequence ... top right “D" to bottom “E;” bottom “E" to top left “F;“ top left of “F” to bottom “G;” bottom “G” to top right “H;” top right “H” to bottom “j.”

If you wish to add wheel detail to the fuselage, see the “Yankee Gull" in March/April, 1972 Model Builder, and install mounting plates now but do not cut keel until sheeting has been completed.

Add 1/16 sheeting to sides now . . . curvature in area of nose, forward of frame “C,” is best done with several narrow sheets.

When dry, remove fuselage and add nose block. Install 1/16 sheet to top of fuselage under wing saddle only, using epoxy or resin ... be liberal.

Build wing incidence block using scrap 1/4 sq. and 1/4 x 3/8 balsa . . . attach on sheeting using epoxy or resin.

Prepare some additional resin to be used to install wing saddle. Mount wing panels onto saddle when epoxying saddle to fuselage in order to give greater length for triangulation in aligning wing to fuselage center line. Secure saddle to fuselage with pins when properly aligned.

Remove panels as soon as center section is pinned, before epoxy sets up.

Build 1/8 sheet canopy tray to outlines shown on plan and shape nose block and filler on wing saddle to match . . . allow for canopy thickness.

Complete fuselage by adding push- rods, top sheeting and tail surfaces . . . add shims to stab to maintain it parallel to top sheeting . . . check squareness with wings mounted. Install tow hook block or support and complete wheel detail, if installed.

Fiberglass the fuselage from the nose to 2 inches in the rear of wing trailing edge, using Le Gray’s methods as outlined in Model Builder (February 1972).

The canopy is fabricated by trimming to fit from the rear portion of a Sig 16 inch canopy.

FINISH:

Cover entire airplane in your favorite material . . . yes, Super Monocote will stick to fiberglass. When covering wing panel, be sure to warp in at least 1/4 inch washout in each wing tip, beginning at rib No. 8.

FLYING

Adjust rudder throw to maximum for initial flights; the elevator needs only 1/4 inch throw. As you become used to flying the short tail moment, pitch sensitivity may be increased.

Check all controls for proper operation and their return to neutral. If wing incidence is correct and C.G. is as shown, the model will exhibit a straight and fast glide from a firm running hand launch . . . caution, fuselage is difficult to hold.

Take your time in these first flights and I'm sure that you will enjoy many flying hours with your Briegleb.