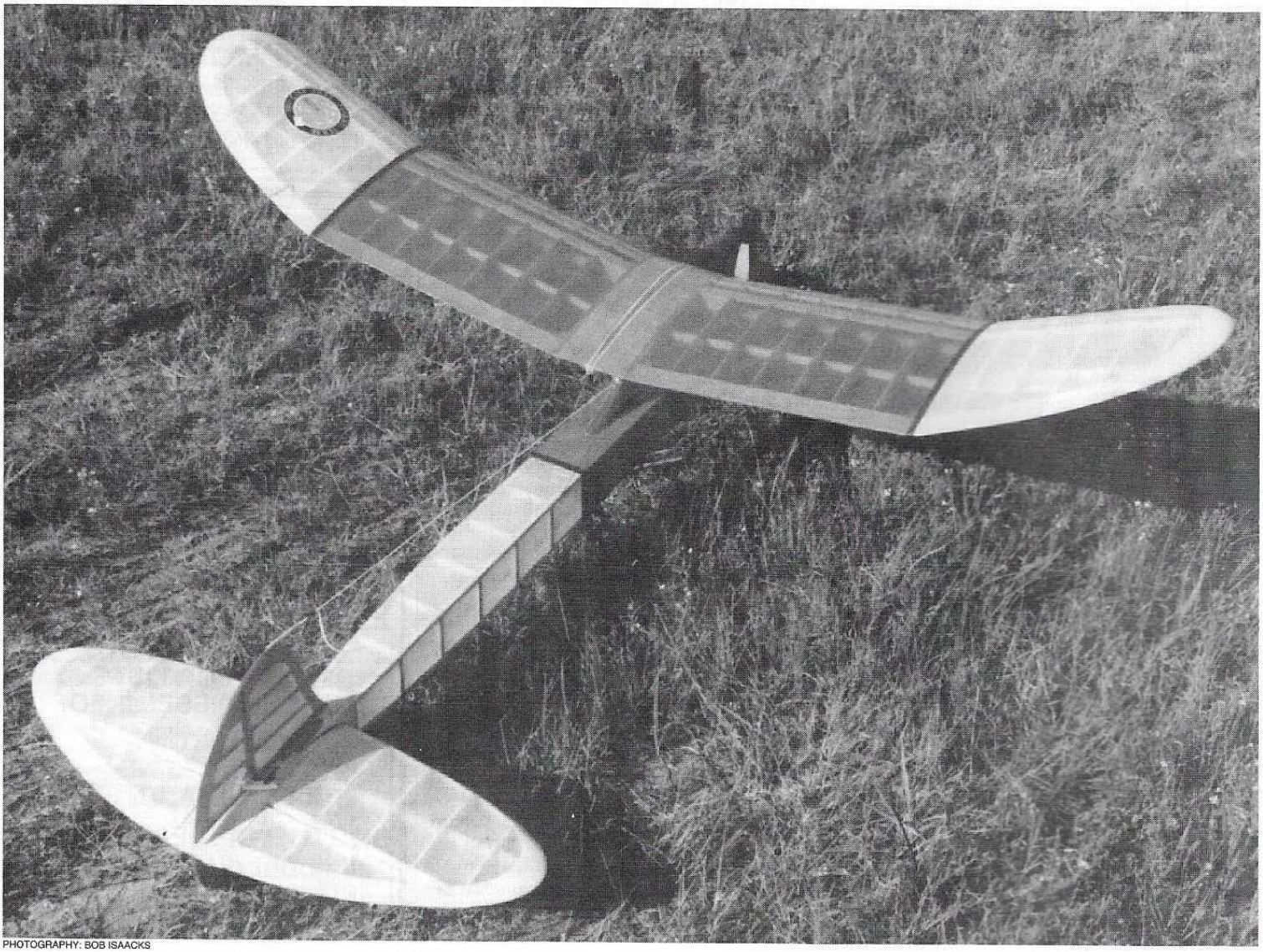
Kerswap 490

By Bob Isaacks



PHOTOGRAPHY: BOB ISAACKS

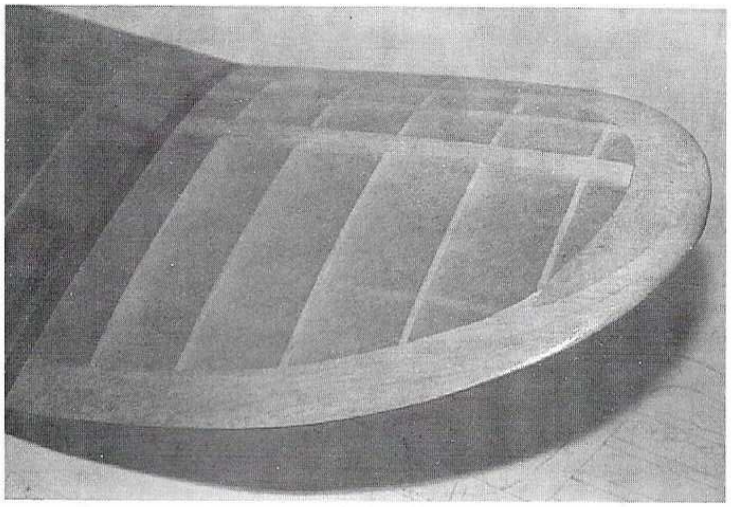
Gil Morris' Old Timer classic has found favor in many S.A.M. events. This version is for all-out competition in the "A" class, using .21s

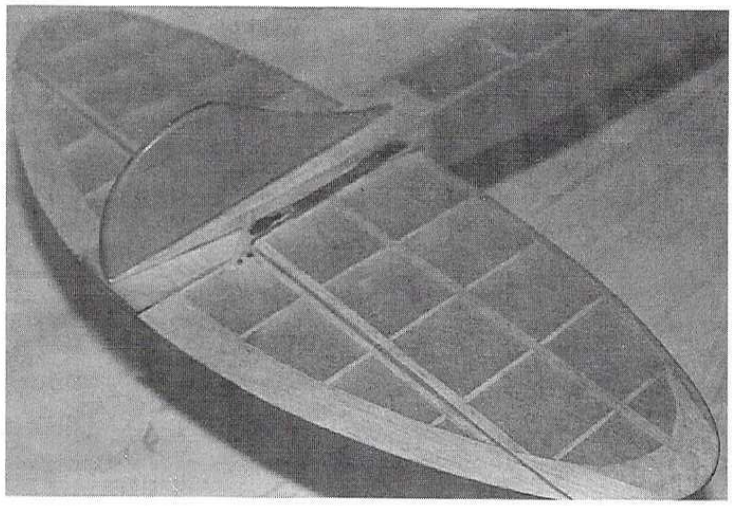
Typically, modelers who build and fly "Old Timers" are divided into two camps. The "traditionalists" insist on replicating the late 30s and early 40s aircraft to the last detail, including ignition powerplants. The "new-breed" instituted changes, including radio control, scaling (up-sizing or downsizing) and—gasp!—modern glow engines. Both camps have their followers, and a sure-fire way to initiate a lively debate is to put several modelers from each camp into a room with the objective of developing a set of competition rules.

When I discussed this article with Bob Hunt, I pointed out that a number of *Kerswaps* have appeared in the model press, including my original size for ½A Texaco (*RCMB* 11/85) and Bob Aberle's (**FM** 11/86, CF-736). The twist on the *Kerswap 490* is that it is "new-breed" all the way. This airplane is radio controlled, scaled up from the original, and structurally designed to handle the power output from the hottest of schneurle-ported glow engines. In short, this one is designed for top level competition and will hold its own in any company.

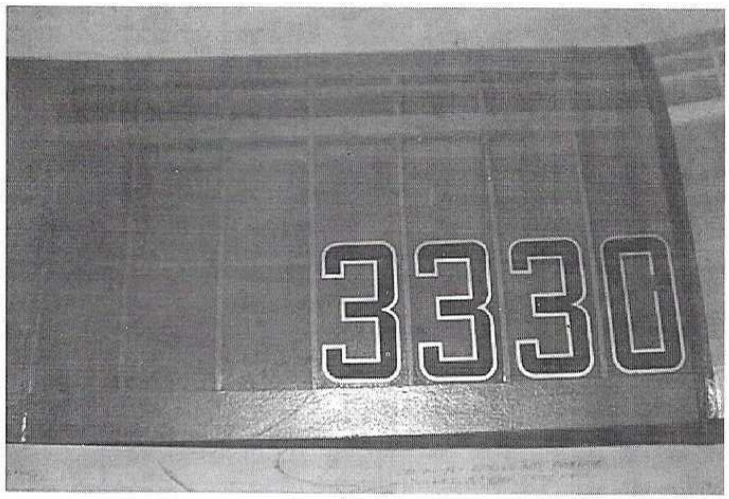
Interestingly, the *Kerswap's* designer, Gil Morris, dropped me a note after my ½A Texaco model was published. Gil said that the airplane really should have been named the *Kerthrash*. It seems that Gil was having a problem trimming out his fleet of the little ships and, inevitably, they would pile in. Gil's buddy would yell *Kerthrash* which sounded to Gil like *Kerswap*—hence the name which stuck.

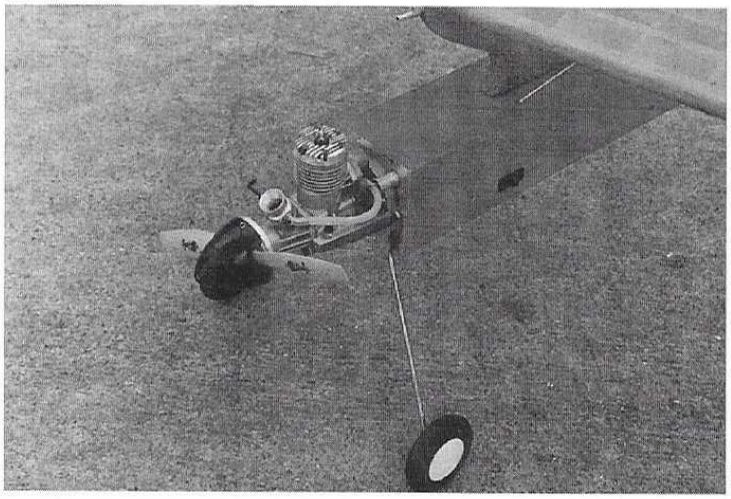
SAM Old Timer rules allow scaling (R/C only) with some pretty simple formulas. To be legal for SAM OT R/C, a design must have a minimum of 225 square inches of wing area for each .10 cubic inches of engine displacement. Since my flying buddy, Bob Frazier, promised to provide the engines for this project and he owned two each of the super hot 3.25 and 3.5 K&B front rotor schneurle ported engines, a design starting point was built in. It was determined that 490 square inches of wing area was "about right" for this project. This would allow some quick engine swapping to make the airplane eligible for either "A" or "B" LER





The extreme wing tip gets an extra layer of 3/8-inch sheet **(above left)** to fair more smoothly into the trailing and leading edge. This bottom view of the horizontal stab **(above right)** shows the sub-fin skid but also the grain direction for the leading edge, trailing edge, and wing tip. Traditional silk covering was applied to the wing **(below left)**, along with AMA numbers. Just above the engine mount, in the corner, the fuel "strangler" protrudes through the firewall **(below right)**.





(Limited Engine Run) events and provide a few extra square inches of wing area to aid the effort of trying to build to the minimum weight limit of 10 ounces/square foot.

After weighing all the components (engine, Futaba mini receiver and servos, landing gear components, and other miscellaneous items necessary for radio installation) it was determined that only 14 ounces were available for building and covering the complete airframe.

Fellas, that is a tough assignment! Most of the people that have become interested in OT R/C have come from other segments of the R/C hobby. Your average R/C sport airplane is kit built with whatever wood comes in the box. With few exceptions R/C kit wood is heavy! You are going to have to haunt your favorite hobby shop and pick through a lot of wood to get the 7-8 pound/cubic foot wood necessary to build this airplane to the minimum weight requirement.

If you can get your *Kerswap* built within a couple of ounces of the minimum weight, you will be rewarded with the hottest flying Old Timer you have ever had the pleasure of flying. That's enough of the soap box and history; it's time to get this beast together!

Putting it together

Fuselage. The fuselage is a square box, evenly tapered at the rear. I use a soft pine building board and jig-build my fuselages by using wire brads tacked through scrap pieces of 3/8 square balsa to pin the work to the board. The procedure is very similar to the method used to build wing ribs on full size, homebuilt aircraft. The advantage of using this method is that each fuselage side will be an exact duplicate of the other, and you can use the jig to assemble the sides into the completed box. Use dead soft balsa to fill in the front fuselage bays as indicated on the plan.

It is helpful to build the fuselage complete to the rear of the structure, then notch out for the stabilizer which is mounted at 0 degrees incidence. Be sure to recess the bottom cross pieces 1/16 *inside* the fuselage at the bottom front of the fuselage where the hatch cover is fitted. Study the isometric sketch of the pylon area to see how slots are constructed in the fuselage top for fitting of the pylon. Aluminum sheet (1/16) was epoxied to the front of the firewall to prevent the hot rear exhaust of the K&B's from frying the front of the airplane.

Note the isometric sketch which illustrates the fitting of the landing gear wire with "J"-bolts. Note also that a notch was machined on the rear of the motor mount to retain the gear wire; I have found this system hard to beat for ease of construction and positive landing gear retention.

The hatch cover of 1/16 plywood is held in place with small self tapping screws. Spruce gussets were added at appropriate inside corners to give the screws something to tap into.

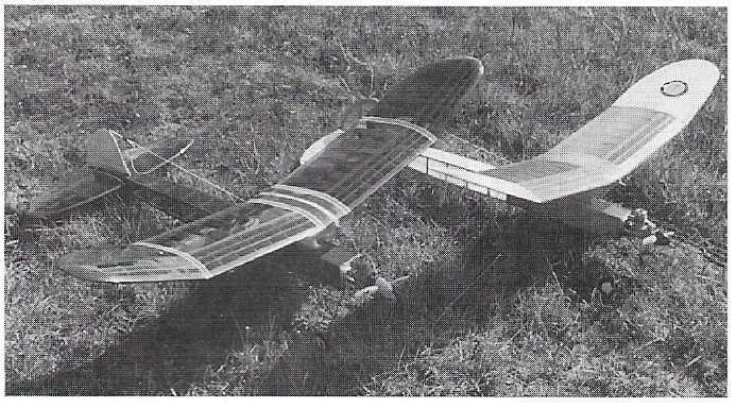
The fuel "strangler", i.e. engine cutoff, merits some discussion. The concept is simple enough; the fuel line is "kinked" as it is pulled into a large diameter tube. I used a 3/8-inch diameter brass tube which is epoxied into the firewall, the tubing projects 3/4 inch forward of the firewall and approximately, 1/8 inch into the firewall. Drill a 1/8-inch hole through the center of the brass tube (and firewall) into the radio compartment. The yellow inside component of a Sullivan pushrod is then epoxied from the firewall to within one inch of the throttle servo arm. This serves as a guide for the 1/32-inch music wire "strangler" which has a loop on one end large enough for the fuel line to pass through and small enough to be retracted *inside* the 3/8 inch brass tube.

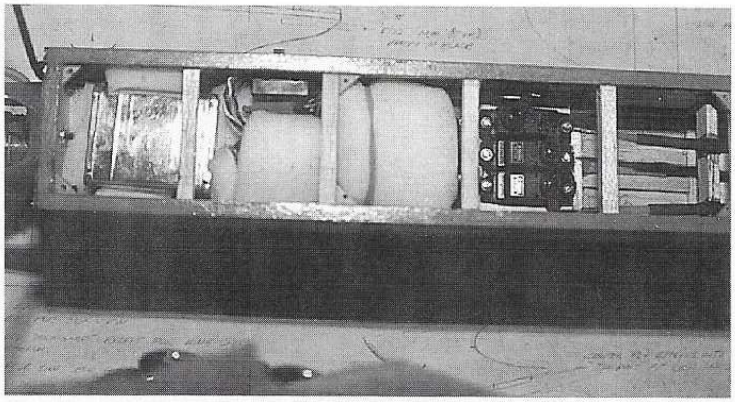
The loop should hold the fuel line near the edge of the brass tube when the engine is running; at shut off the servo pulls the fuel line *into* the brass tube. O.T. Rules allow for a twenty second engine run on schneurle ported engines. Since it takes about three seconds for the strangler to shut off the K&B (and the sound to reach the ear of the timer) I normally chop the throttle at a count of seventeen. The photos of the front of the airplane should answer any remaining questions.

Using a small square for alignment, glue the wing saddle to the pylon, and the pylon assembly to the fuselage. If you are using silk for covering, as I did, you will find it easier to cover the pylon separately, then glue to the fuselage at final assembly.

Wing. Since I hate to cap strip ribs, this wing was designed to eliminate their use. The spar webs shown on the plan are not necessary, unless you are using 6-7 pound

Kerswap 490





Choosing a more modern covering method **(above left)**, the author's friend, Bob Frazier, applied green MonoKote to his Kerswap on the right of the author's silk/silkspan covered model. A bottom fuselage hatch comes off to provide access to all the equipment **(above right)**. Note the gussets for the fastening screws.

balsa; however, don't forget to add the plywood dihedral braces.

I usually build wings of this type by gluing the ribs to the leading and trailing edges *only*. The wing is completely assembled, including dihedral breaks, before I add the spars. I have found that this is the best way to get perfect fits on spars at the dihedral joints; also the wing structure retains enough "flex" to allow for washout to be built in at the time the spars are added.

Study the picture of the wingtip and you will see that I added a second layer of balsa tip pieces in order to achieve a smooth transition of trailing edge/leading edge into the tip. Note also that the leading edge is laminated at the tip.

Rudder/stabilizer. The stabilizer leading edge is laminated, I use Sig slow-curing epoxy and "A"-grain wood for this.

My procedure for cutting out the curved pieces is as follows: my office copier is used to make copies of the various components from the plan. Make sure that the copier that you use makes *exact* size copies. (I use a Ricoh which has an enlarge/reduce function.) Once you have good copies on bond paper, cut them out with scissors, and using rubber cement, glue the templates to the proper size balsa observing grain orientation.

I use a Dremel saw to cut the templates out and use a small sanding block to smooth out any unwanted "jiggles". The template can now be peeled off the balsa leaving no unsightly lines to mar the covering job. A little rubbing with your finger will clean off the rubber cement.

Note that dual elevators were used on this *Kerswap* version; I have found that a single side elevator supplies some unwanted turn along with the up and down control. This turning tendency is of little importance on slow-flying ships, but on hot airplanes the turn can be a handful in a windy situation.

Make sure that the elevator joining wire clears the rudder and sub-fin at surface travel extremes.

Covering/finishing

I prefer traditional covering on Old Timers. The *Kerswap* is covered with a combination of silk and gas-model silkspan. The forward fuselage, wing center panels and rudder/sub-rudder are covered with red silk; the remainder of the airplane is covered with white silkspan. I have found this to be the best combination of colors for *my* eyes. In a sky which is predominantly blue, the white wingtips show up well, the red silk shows up well against a background of cumulus clouds. The airplane is also fairly easy to see with a gray sky for a background.

If you use silk, be sure to use enough dope to completely fill the weave of the cloth. Also use a few drops of commercial plasticizer (or castor oil) to prevent the covering from becoming brittle. I prefer to cover each component separately, then glue them in place using extra care to insure that decalage angles are correct and that each component is square and properly aligned.

Trimming for competition

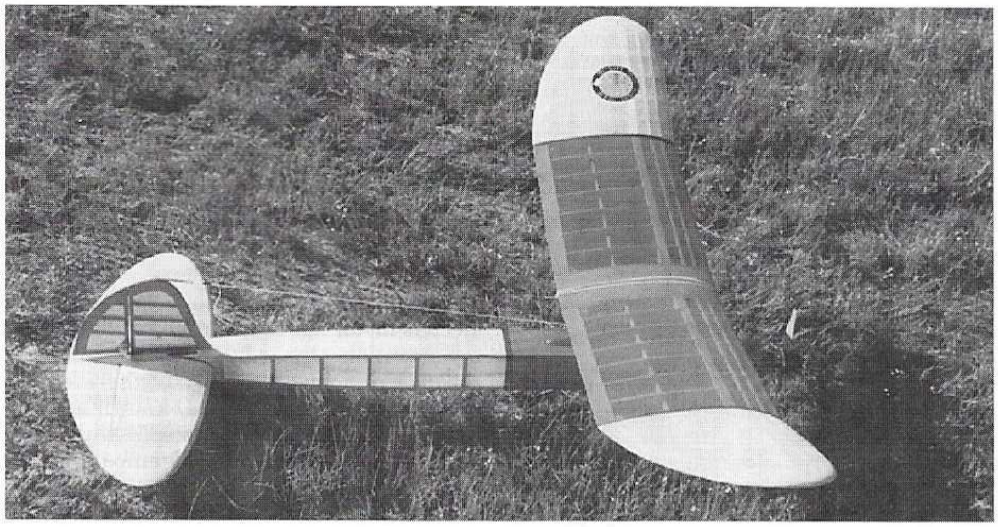
Assemble your *Kerswap* and double check for alignment. Next check the c.g.; if it isn't where shown on the plan you are on your own!

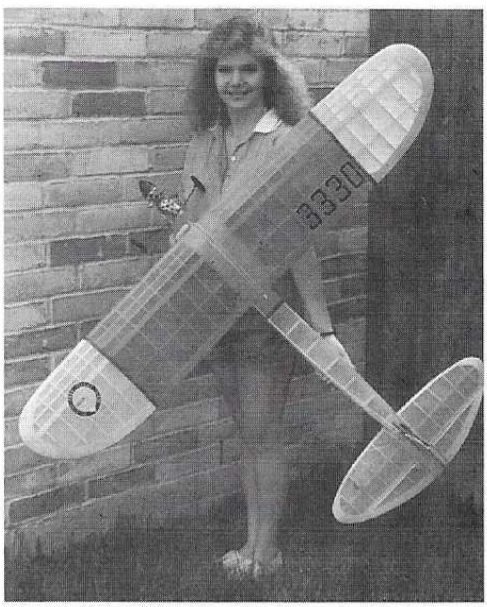
With a hot screamer like the K&B front rotors, I take off with rudder in neutral and *full down trim* on the elevator (this amounts to about one-quarter inch).

When your helper releases your airplane, concentrate on getting the nose of the ship pointed *up*! If you notice a tendency for the ship to loop, add more down elevator. When you chop throttle, immediately return the elevator trim to neutral or slightly up. This should produce a beautiful flat glide. Use rudder trim only to set up your glide circle.

It goes without saying that you should have your engine broken in properly and the fuel cut-off system thoroughly checked for proper operation on the ground before attempting flight. The *Kerswap 490* placed third at the 1987 SAM Nationals in Seguin, Texas in its first contest and has been "in the money" at nearly every contest at which it has been entered. I hope that you can meet with similar success with your version. If there are any questions about this article, write to me c/o FLYING MODELS.

Good luck and hot thermals!





The author's red and white scheme on his *Kerswap* **(above)** proves the easiest for him to see in flight. Lovely Traci Isaacks, the author's daughter-in-law **(at right)** shows off his craftsmanship.