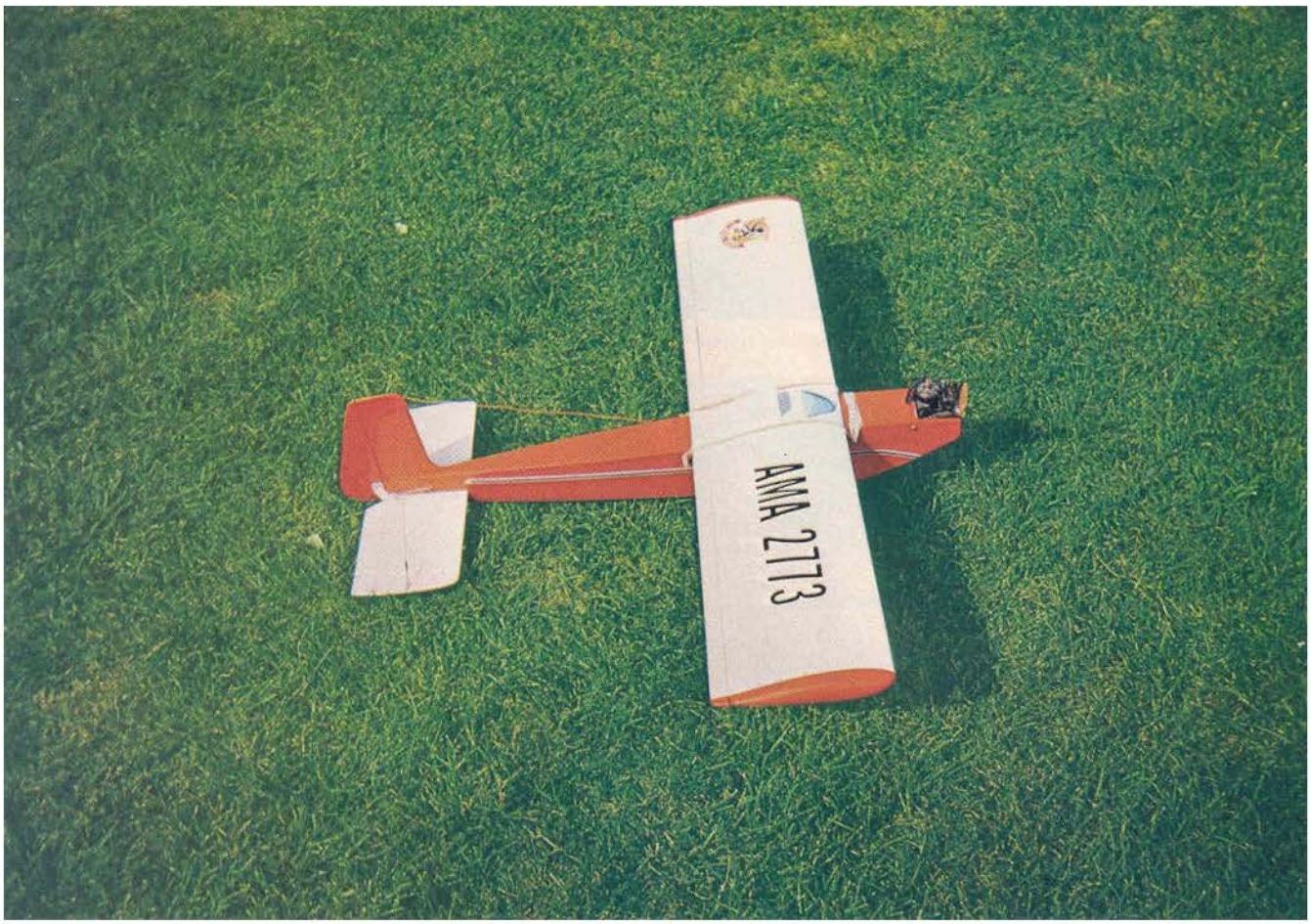
SCOTCH LASS

AN EASY-TO-BUILD, RUN-OF-THE-MILL SHOULDER WING—UNTIL YOU GO TO FLY IT! THREE VERTICAL SNAP ROLLS FROM LEVEL FLIGHT WITH A .15 . . .

In the April issue of RCM, I mentioned in my regular column that I would be presenting a small aircraft in this issue called "The Brat." When the El Cid of the modeling world, and editor of this publication, was proofing my column and read that remark, he yelled so loud we could hear it all the way down in Texas! It seems that Uncle Don and Dick Kidd, his Technical Art Editor, don't take too kindly to having an aircraft design suddenly thrust upon them for immediate publication when they have their designs scheduled three months in advance! When our Fearless Leader momentarily stopped screaming, I told him I'd send him a set of plans and all he'd have to do is build it, photograph it, and write the construction article prior to the next issue. What ensued, following that simple request, could not be printed in this, or any other publication! I really don't understand the problem, since he had almost two weeks in order to complete this project before the next deadline. As it ended up, he agreed, although somewhat incoherently, with certain specific conditions. It seems our editor feels that every aircraft has to have a reason for its existence, and assigned me the task of writing the so called "design philosophy" behind this model. The second condition was that the name be changed from "The Brat" to something with a little more class. The latter part was easy, since I vividly recalled what he had told me, earlier, to do with my latest design. Condensing it down, the name was changed from "The Brat" to the "Scotch Lass".

With regard to the "design philosophy", the basic reasoning behind this little shoulder wing model was three-fold: First, it was to be a model that could be flown in closely confined areas such as school grounds, parking lots, etc. Second, it had to be easy to fly so that it could be used to introduce my young son to RC (and in so doing, to prove out the worth of the EK "Buddy Box" system). Third, it had to be economical, easy, and fast to build.

If you go to an aircraft too small in size it becomes difficult to mount the standard miniaturized equipment in its interior. Additionally, if you get it too small the weight-to-power-to-wing-area factor goes way up, making for a hard-to-fly aircraft. The Scotch Lass is a compromise on these points. It is small enough to fly nicely with an OS Max .10 yet will take an EK Log III radio mounted on its standard servo/receiver board with room to spare. A Max .15 will yank this little bird about with lots of zip if



The 'Scotch Lass' with O.S. Max .15, E.K. Logictrol radio, and Super MonoKote covering. Wipe MonoKote with acetone before applying Finishing Touch decals.

you just simply have to have lots of power. The shoulder wing set-up was chosen because it allows for a more forgiving aircraft, and is also less prone to get torn up on a hard landing. With this little ship you can buzz around your school ground, get in and out of tight corners, and generally live it up close to home. **Please, don't** do this if you are a beginning pilot! Get out in the country, or at your club field, where you can have lots of room to allow for your natural mistakes without endangering others.

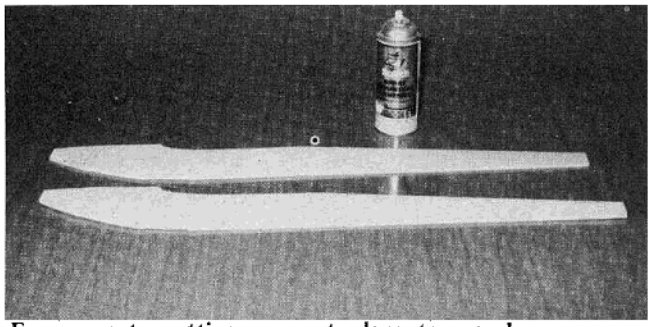
Country flying was another reason for selecting the shoulder wing configuration for the Scotch Lass. With a shoulder wing, you can hand launch your aircraft from any type of field. There is no need for a paved runway, or even a smooth grass runway. Of course, your landings might become a bit hairy if the grass is over your head, but it sure saves on props!

If you are a beginning pilot, or you are using the Scotch Lass to teach someone else to fly, shim the leading edge of the wing for one degree positive incidence and set the control movements on all surfaces to about 1/8" full-up and down elevator; 3/16" up and down on ailerons; and ½" to ¾" right and left on rudder. This way you can gently fly about the sky without over-controlling. Be sure to use the smaller size engine. If you choose to eliminate the ailerons and fly with rudder, then the amount of movement given will be enough for this mode of flying.

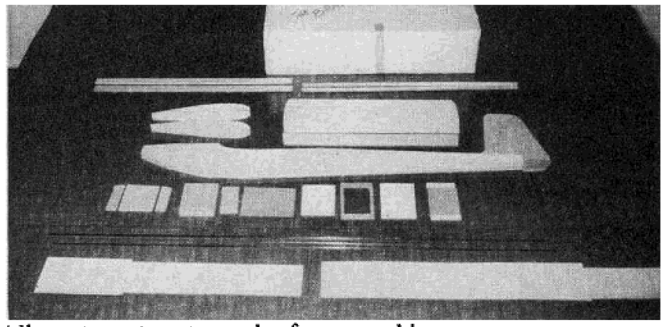
If you can't build the Scotch Lass in just a couple of evenings for a total outlay of less than $10.00, cash-type money, then perhaps you'd better take up tiddley winks because you're in the wrong field! The fuselage goes together in nothing flat, and you can build the wing almost as fast. If you favor foam wings, as I do, then you can chop out a wing, skin it with dime store cardboard, glue together with Devcon 5-Minute Epoxy, and be ready to paint in just a couple of hours. The Scotch Lass should really live up to her name – Scotch to build, yet a fine young lady to own and to fly.

From this point I'll turn it over to our Editor for his building notes and flight reports.

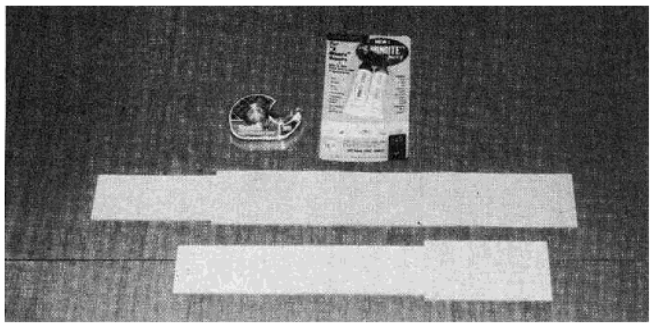
DON DEWEY: Before we begin the actual construction of the Scotch Lass, I'd like to pass on a few general notes about the aircraft, itself. To begin with, our amiable, anplitudinious, Texan threw us a curve by mentioning in his last column that he would present a new design in this issue. He compounded the felony by sending us a set of plans with a cursory note to the effect that I'd better build the airplane in a hurry since it was raining throughout Texas! The



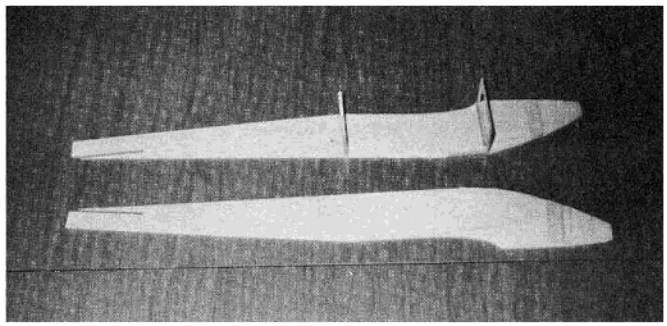
For accurate cutting, cement plans to wood.



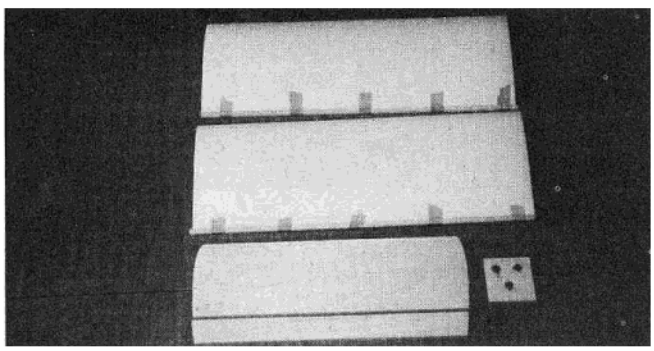
All parts cut out, ready for assembly.



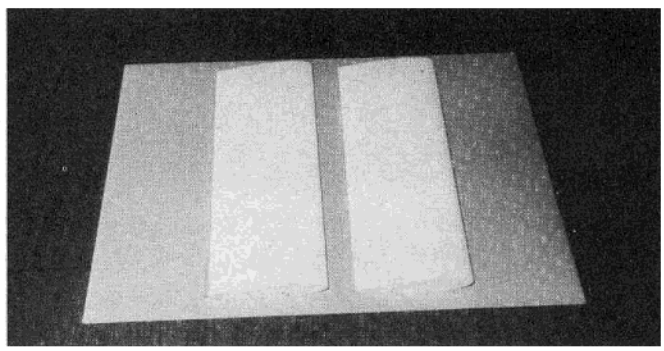
Join top & bottom cross–grain planking.



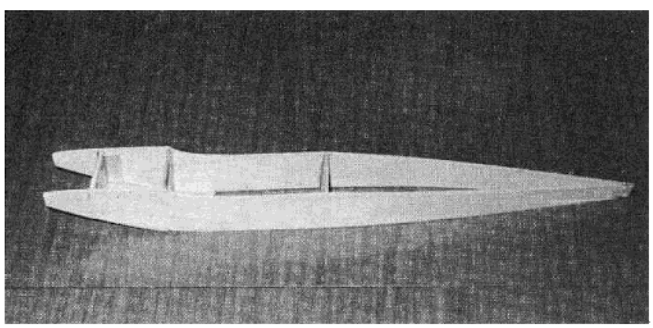
Glue main bulkheads in place with epoxy.



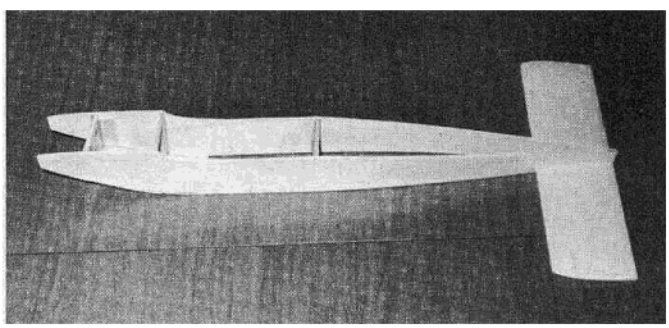
T.E. glued on wing cores; stab assembly.



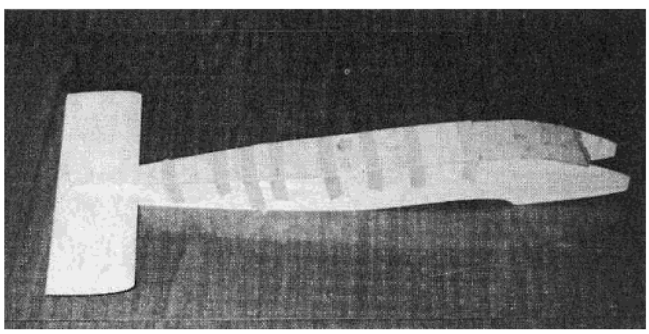
Sanded from wing cores and cardboard for skins.



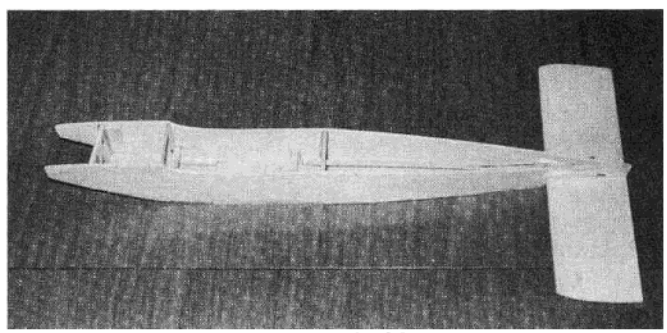
Fuselage basic assembly.



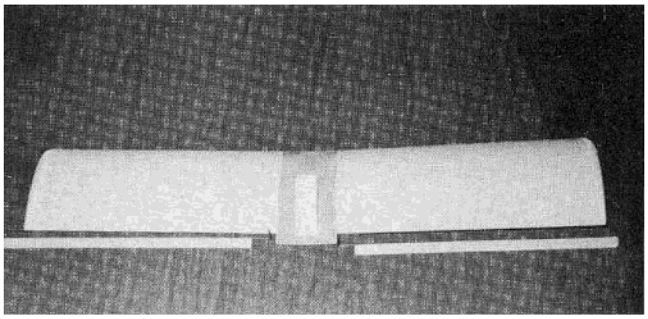
Stabilizer added to basic fuselage.



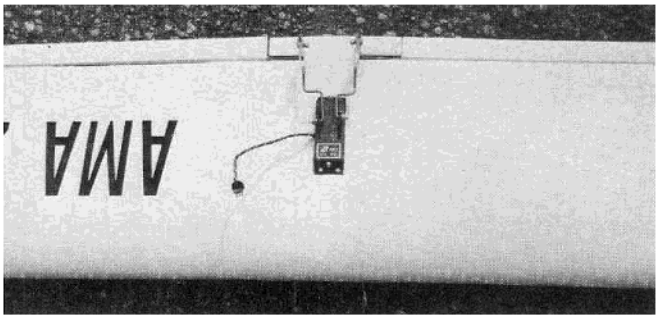
Bottom sheeting glued in place.



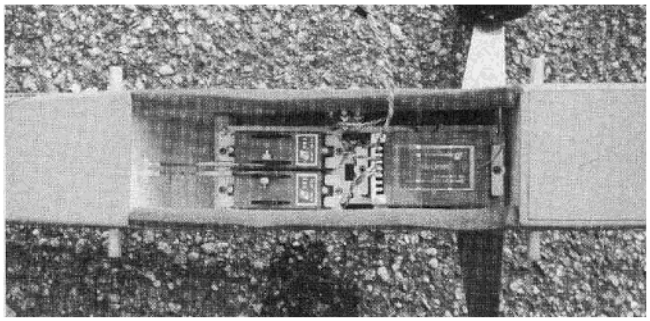
NyRods installed before top planking.



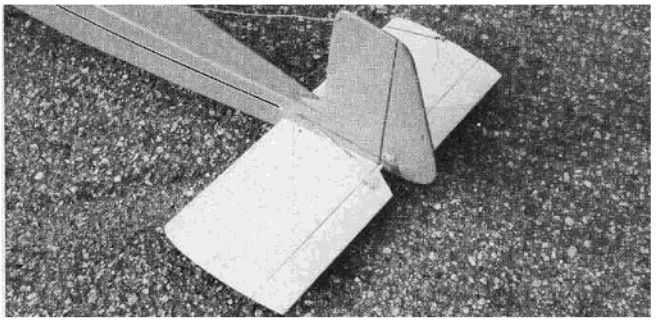
Assembled foam wing with Celastic reinforcing.



Finished wing with E.K. servo in place.



E.K. installation. Throttle servo under receiver.



Close–up of empennage linkages.

total building time for the Scotch Lass, including taking the step-by-step photographs on my dining room table, and dictating the construction notes as I went along, took a total of 11 hours. The finish is Super MonoKote and required an additional three hours. I used a foam wing with cardboard covering from the local Sears stationery department. Construction began on Saturday morning and the aircraft was ready to fly by Sunday evening. I would like to set the record straight as to the type of flying of which this little aircraft is capable. Its appearance is quite deceiving, since it looks like a small Digester, or a "trainer-type" shoulder wing design. The model shown in the photographs, set up with the zero-zero incidence, and with the OS Max .15 engine in the nose, is one hot little number! It retains its initial deception through its slow and easy lift off and gradual climb out. But here the deception ends! From this point on it gains speed rapidly and has a rolling rate that has to be seen to be believed! As a matter of fact, this plane will do three consecutive vertical snap-rolls from straight and level flight almost before you can blink your eyes. Its roll rate is almost too fast to count, and this is with the ailerons set ¼" from the bottom of the standard DuBro Strip Aileron Linkage. The outside maneuvers, with the elevator set in the second hole from the outside of a long Carl Goldberg horn, are approximately 20 feet in diameter. Our first attempt to do an outside loop was so tight, and resulted in such a high G-loading on the aircraft, that the hatch was thrown clear of the airplane and fell to the ground. It performs virtually all maneuvers with complete ease, but again, its landing speed is not the slowest in the world, even though the Scotch Lass only weighs two pounds 14 oz. ready-to-fly.

As we mentioned, this airplane is quite deceptive in its appearance. For the more experienced sport flyer, it is a lot of fun to fly, and one that could be flown economically and in small, confined areas. I would recommend this as an advanced transitional trainer, although it would definitely not be satisfactory for the beginning sport flyer as set-up on the plans. Adding a 1/16" balsa shim under the leading edge to effect positive incidence in the wing, and dropping the engine size to a Max .10 would definitely tame the model down and it then could be used as a trainer and easy-to-fly sport ship for the less experienced flyer.

The prototype shown in the photos used a single stick EK Log 5 radio system, mounted on the EK servo tray that mounts the receiver with rudder and elevator servos behind it, and the throttle servo underneath the receiver. The aileron servo was mounted in a cut-out in the foam wing and the protruding base of the servo covered by the hollow head rest.

All parts were cut out prior to assembly, forming a "kit". Devcon 5-Minute Epoxy was used throughout the construction in order to keep the building time to an absolute minimum. As previously mentioned, Super MonoKote was used for the finish. Other specific items used included Carl Goldberg Long Control Horns; Top Flite 8-4 Power Prop; MK small dural landing gear; DuBro 2" Low-Bounce wheels; foam wing core from International Models; thin sheet of cardboard (available from any stationery store (or Sears for less than 50 cents); 3M77 Contact Cement (for the foam wing skins); Goldenrod cable type pushrods; DuBro Strip Aileron Linkages; a 4" wide band of Sig thin Celastic for the center section of the cardboard covered foam wings; a Sullivan 3 ounce tank; and a Tatone short .15 mount.

CONSTRUCTION

The construction of the Scotch Lass is extremely simple, and is presented here in step-by-step format:

1) Cut out all parts as shown on the plans including cross grained top and bottom sheet planking.
2) Glue the top and bottom planking sections together using Scotch tape and Devcon 5-Minute Epoxy.
3) Lay out bulkhead marks on fuselage sides using a draftsmans triangle and ball point pen.
4) Set the Tatone mount slightly off center on the firewall. Drill for,