Steady as a rock on a fly-by the Bug presents a nice profile. Swept rudder used for this version. No that's not a revetment back of pilot just the usual hi-way dept. diggings for new road.

Note the winter togs so necessary on our East Coast. Note after flight glop on fuselage side.

the Klutz bug

WANT A REALLY GOOD MULTI PROPORTIONAL TRAINER? THEN WHY NOT TRY OUR UNPRETTY EFFICIENT BIRD.

Get that right wing up Gus or is it drop that wing, no matter how we say it there will be those who will take us to task. Orbit proportional used for this swept rudder version of bug.

By GUS GEISSINGER

► *R.C. EDITOR: Gus has done what many of us have talked about doing for several years. He has designed a real, honest to goodness multi trainer. Showing tremendous restraint amidst the constant pressures of canopied Candies, tried and true Tauruses, prefabbed plastics, and Instant Insects, he has kept the lines simple, the materials to a minimum, and the stability inherent.*

If you are about to move up to multi, or you have a new "glitch rig" on the way, put aside that hot new Class III world beater and "leave the flying to Klutz."

The Klutz-Bug! What a ridiculous name for a model airplane. But what's in a name anyway? The fact is, the airplane flies (surprise to my flying buddies) and is a very good multi/proportional trainer, per the original intention (surprise to us).

To be serious, a couple of us were gassing one day as to what would be a good, easy to build, gentle, forgiving and rugged trainer for 'full-house' proportional. Needless to say, we couldn't think of such an airplane in the current crop of planes (apologies to whomever is offended). The problem seems to be that the experienced RC guys fly the hotter low wing Taurus type of plane, and some die-hards (us) even the shoulder wing Stormer type, but these aircrafts are not what you'd call trainers, nor are they particularly easy on the old pocketbook. Be that as it may, we volunteered to design a so-called multi-trainer for a couple of our guys in an attempt to help them over the hump and on their way to the hot stuff.

Not having designed an RC model for a few years, and in fact never having designed a *good* one, we needed some help. So, we sort of borrowed a little (or a lot depending on your outlook) from many of the current R/C aircraft. The original design objectives included; power in the .35 range, plus wing loading and fuselage space large enough to haul any of the current proportional gear. Our area of the U. S. is known as Dee Bee land, so needless to say the original Klutz Bug was outfitted with a 6-21 Quadruplex.

Our original design objectives were met and some far exceeded with the Klutz Bug, hence, our desire to pass this information on to you. Like all construction articles, building the Klutz Bug is elementary (dear Watson) and should provide no problems to the average R/C type. If it is not an insult to your intelligence, we think a few areas do require a word or two.

We have gotten into the habit of using tracing paper to make overlays of any parts which must be cut out. We then snip the tracing paper apart, not on the traced lines (*Continued on next page*)

Original Klutz Bug with straight-up vertical rudder. This version used a McCoy .35 R/C engine and DB 6-21 radio equipment proved design philosophy of a good proportional trainer.

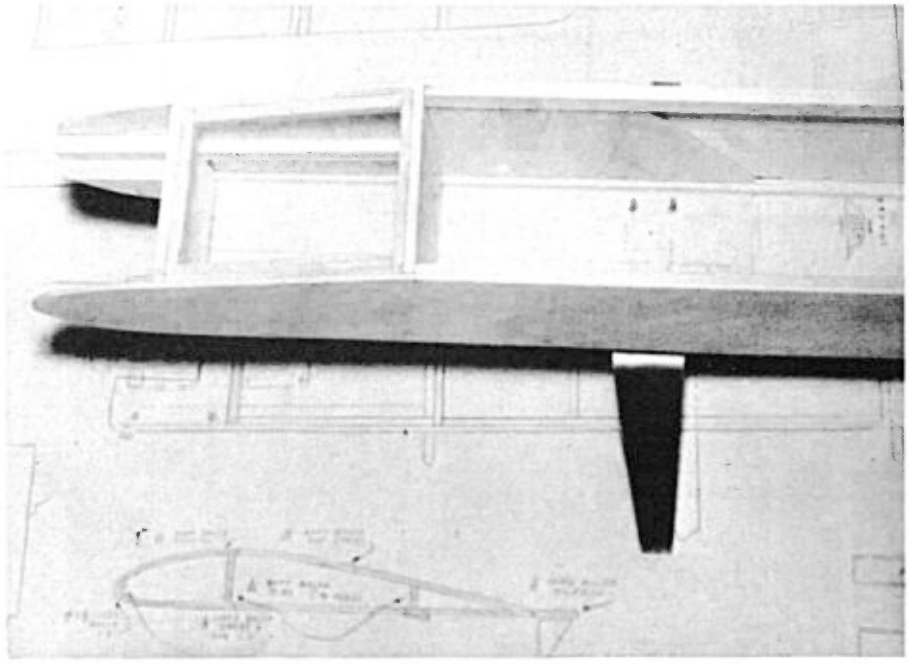
necessarily and glue the tracing paper directly to the wood with paper cement (also known as rubber cement). In the case of the fuselage sides, or where you want two or more identical pieces, spot glue the wood together with the same paper cement. After cutting right to the traced lines on the paper, the paper can be readily peeled off and discarded. The remaining paper cement can be removed by rubbing the wood with your fingers which rolls the cement up into little pieces.

Oh, while we are at it, we prefer to make a rather durable wing rib template, again with the tracing paper bit, but this time we used soft dural, plywood or our favorite .060 epoxy fiberglass board. A couple of pins epoxied to the template with the tips protruding between 1/16 and 3/32 keeps the template from sliding around during the rib cutting chore.

Actually cutting the ribs is probably less work than you'd expect, and in our opinion the end products are more uniform than kit supplied die cut ribs. After all the ribs are cut, stacked and pinned together (neat, aren't they?), mark the location of the spar slots and proceed to make the slots in all the ribs at once. We use a hand-held buzz saw (vibrating coping saw) for this purpose, because it happens to be the only power saw we have.

Next come the spars. To each his own, but we sort of took a liking to the full depth "egg-crated" spar routine, which probably stems from a strong association with that good old Stormer again. So slice the spars and ailerons out of rather hard ⅛ balsa, and if you do it right only 2 pieces of 3 x 36 will be required. Locations of the rib slots are shown on the drawing, and once again the buzz saw makes short work of this job. We prefer to slot all four spars at once, and do so by tack gluing both forward and both rear spars to each other and then the rear spars to the forwards right smack in the middle, depthwise, so that one pass with the saw will cut all four pieces to the proper depth. (It is not really as bad as all this sounds.)

We prefer to build the entire wing in one shot using a jig, and with a flat bottomed airfoil such as our Klutz Bug sports, you can even stick the lower rib cap strips on before the ribs, if you are really careful. Actually, the only work remaining once the wing is removed from the jig, is to plank the lower center section, smooth up the leading edge sheeting sub leading edge area and slap on the ¼ x ½ balsa leading edge. Oh, and of course clean up the tip area and install the tip blocks. You know, come to think of it, there is no reason why the lower center section sheeting couldn't be installed first before the spars and ribs are glued down. How about that? Think we'll do that on our next one. One other thing, you will notice the use of nylon tubing for the aileron drive. We had originally planned to make conventional barn door ailerons, but after thinking about all the work involved, what with pushrods, bellcranks and so forth, we kind of shuddered. Then for some reason after the wing was removed from the jig, placed on the fuselage and held up in the air, (you know why) it seemed that we either had too much span or not enough chord. Guess, you could say that we are greatly influenced by the School of Eyeball, therefore, if the thing doesn't look right, it won't have a chance of flying right! (*Dig noted. R/C Ed.*) Suddenly the light came on, and we decided that 1 inch strip ailerons would solve all our problems. So on went the ailerons, and to avoid the mess which hangs down into the fuselage with conventional strip aileron drive mechanisms, we decided to drive them at about half span. This has the added advantage of lessening the tendency for aileron twisting and possible flutter. So, to complete the aileron system, we went to nylon tubing and cable drive route. It really works, despite the misgivings some of our gang advanced in the beginning. Anyhow, as a general practice we sweat solder the cable, any place it is unsupported by the tubing, and this stiffening allows the cable to take a good bit of compression without buckling. (*Continued on page* 52)



Simple enough isn't it! Plenty of room in engine compartment, battery and fuel tank section as well as the fuselage area for servos and receiver, making everything easily accessible.

The Klutz Bug

(*Continued from page* 28)

The fuselage is very basic, and can pretty well be assembled in one evening session. Fuselage sides, doublers, top and bottom planking all come out of two sheets of ⅛ x 6 x 48 balsa. As noted in the drawings, the forward half of the fuselage bottom is ⅛ plywood. This permits bolting the main gear directly to the bottom, which makes a much cleaner job of it all. We prefer to glue the engine mounts, doublers, longerons and all that jazz to the fuselage sides, leaving space for the fire wall and bulkhead A. Seems the front end of the Taurus is built up the same way—n'est ce pas? Since the bottom of the bird is flat all the way, we pin down and glue the stab, aft bottom planking and the plywood forward section, on our building board. A center line drawn down the middle helps to maintain alignment later. Next, the bulkheads can be glued to the bottom, followed by the sides. There is one point here where it seems you could use at least three hands, or develop a technique for driving pins with your mouth. Anyway, once this is over, the fin can be set in place. Notice how it extends through the top planking and sets on the horizontal stab? (Boy, that makes it strong.) Next comes the top fuselage sheeting, dorsal fin, etc., and you know what, that's about it.

If the 3/16 stab material has you worried, it can be made of ¼ as long as you keep to light wood. Guess it could also be built up if you want to take the time. With those ¼ longerons inside of ⅛ planking, the corners of the fuselage can be rounded to your heart's content without fear of weakening the joint. We prefer to cover the fuselage and associated surfaces with Silkspan, so as to save a little weight. The wing can be covered with silk or nylon or what have you. Our drawing shows a .35 RC engine (started out as a Red Head, but turned brunette after a while) which has plenty of zip, especially for a new comer to full house. Any engine in this range will do the job.

Did you ever hear or read the expression that, "It flew right off the board or out of the box"? Well, at the risk of seeming facetious, the Klutz Bug did just that! By some quirk of fate, or just dumb luck, everything worked out as if it had really been planned, much to our delight. Once the initial excitement had subsided, we were approached with questions as to how did you figure the moments, force set-up, down thrust, area relationships, and so forth. Well, in our own modest way, we proudly threw out our chest and admitted to everyone that we designed it by 'eye' with the help of numerous magazine construction articles.

Be that as it may, the Klutz Bug is a fine airplane, makes nice sane maneuvers and believe it or not, even flies inverted with only a small amount of down elevator. Outside lops are nice, however, they probably wouldn't be termed the 5-point contest type. The airplane is very responsive to rudder, will do rudder rolls, and has a tremendous roll rate when aileron and rudder are combined. Best part of the Klutz Bug flight routine is the landing. Must be all that stab/elevator area, but the plane is rock solid on the aproach and gives the impression of being on a track or wire on the way in.

So far we've had the pleasure of breaking in three fellows to the fun of 'full-house' proportional, two of whom had little or no prior experience. About one minute of "over the shoulder dual time" is about all that is required to get a student on his own doing "up in the air work." Two or three "dual" take-offs and landings seem to be about all that is required to get a beginner used to the Bug, (or the Bug used to the beginner).

So, if you've already got the RC bug, you might as well make your wife's misery complete and build the Klutz Bug to go with it.