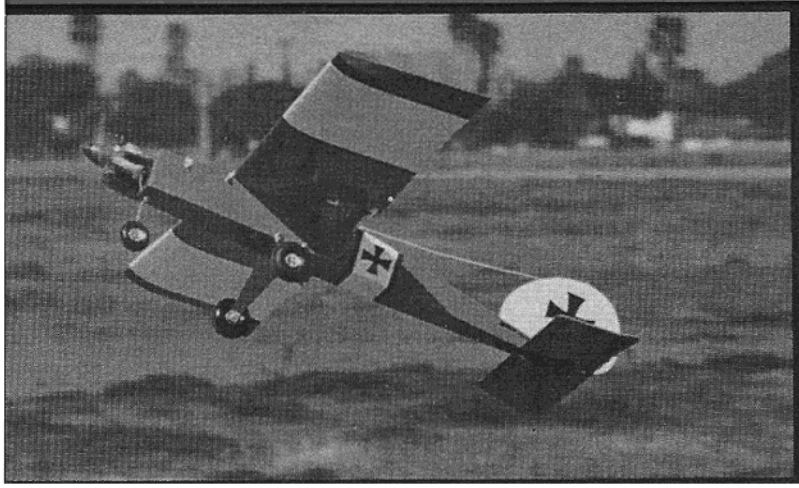
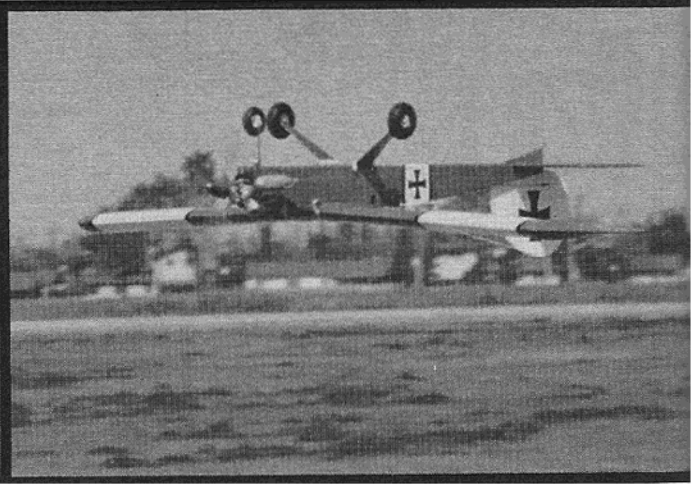
DAS UGLY STIK

Part II

By RCM Staff



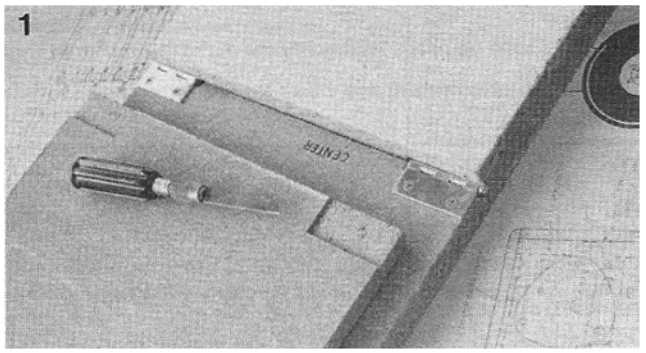


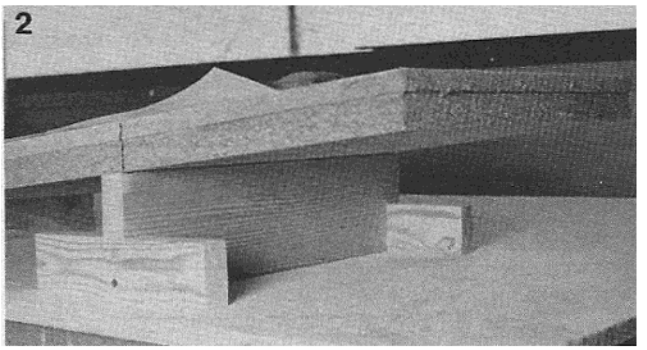
Conclusion Of Construction For This Classic R/C Design

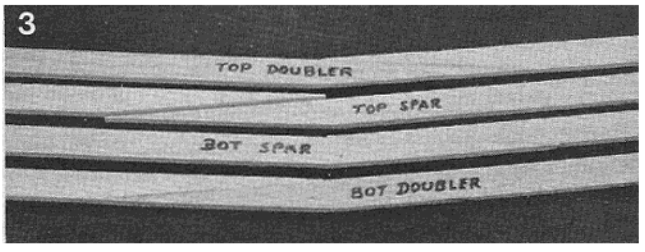
Last month we related the origin of Das Ugly Stik along with the construction instructions for the fuselage and tail surfaces. This month we shall conclude the project with the detailed instructions for building the wing and with the final assembly. Without further ado, let's get on with it.

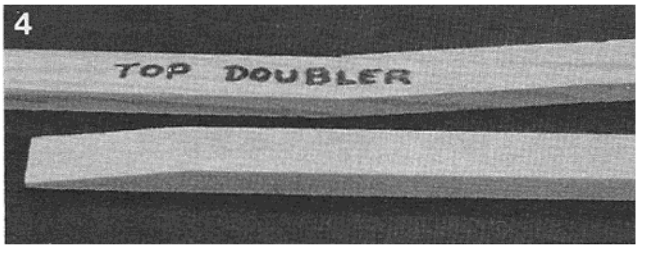
The wing structure for the Ugly Stik is a simple and basic design as can be seen on the plans. The building instructions are rather lengthy due to some of the subtleties of the design. We strongly recommend that the plans be thoroughly studied before starting construction.

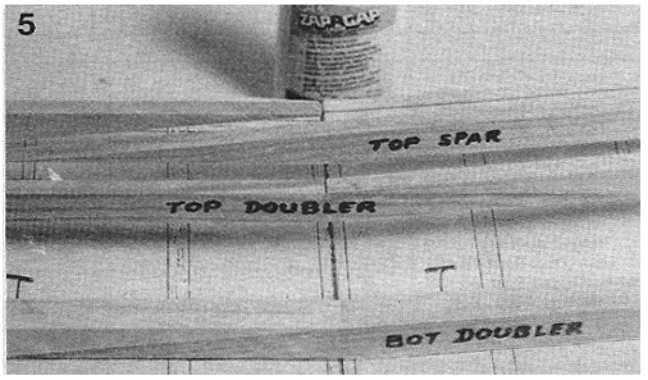
The Ugly Stik design does have a feature that was prevalent 20 years ago which requires the dihedral to be

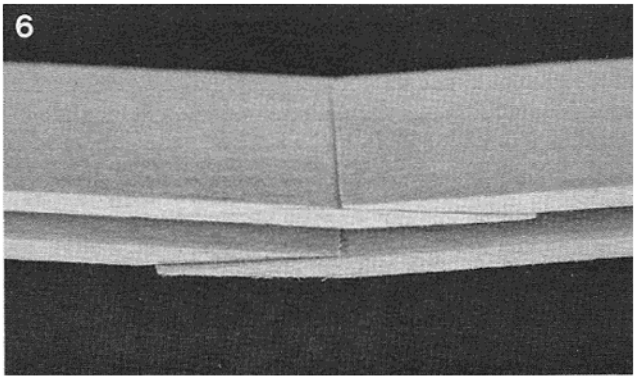












built in at the beginning of the assembly. The easiest way to accomplish this is to assemble a hinged wing building board.

(See Photo 1)

(1) Accumulate pieces of 3/4" x 12" (or wider) x 36" particle board (or flat plywood), two pieces of 1/2" soft cellotex (same size as the particle board) and a pair of 2" butt hinges with removable pins.

(2) Cut relief notches for hinge nodes and fasten the hinges to the particle board with screws. Be sure to face the hinge pin heads toward the outside for easy removal.

(3) Cut hinge clearance in the bottom corners of the cellotex.

(4) Glue the cellotex to the particle board.

(See Photo 2)

(5) Cut a piece of common board to raise one end of the wing building board to the proper dihedral angle. The distance under the Ugly Stik wing tip rib is 3" when the opposite tip is flat.

(See Photos 3 & 4)

(6) The first step on the wing assembly is the fabrication of the spars and spar doublers. Using the 1/4" x 1/2" x 36" spruce strips, cut the taper carefully to match the plans. Do not cut to length at this time.

(7) Trial fit the tapers and fit by placing the spars and doublers on the wing building board that has been blocked up to the proper dihedral distance.

(See Photo 5)

(8) Glue the splice joints together as shown on the plans.

(9) After splicing, identify top and bottom spars and doublers being sure to alternate the splice joints.

(10) Cut the doublers to finished length and bevel per plans.

(11) Glue the doublers to the spars.

(12) The spars may now be cut to finished length. Some of us prefer to leave approximately 1/4" extra length on spars and leading edge strips to trim and sand smooth after assembly.

(See Photo 6)

(13) The 1/8" x 1⅞" x 36" trailing edge sheets are beveled for alternate lap joints at the center section.

(14) Position the plans on the building board making sure that the centerline of the plans line up with the center joint of the building board. Cover the plans with plastic food wrap, Saran Wrap or equivalent.

(See Photo 7)

(15) Position and glue the lower trailing edge splice joint over the plans.

(See Photo 8)

(16) With the lower trailing edge sheets pinned to the building board, score the sheets at the outboard edge of the tip ribs about halfway through the thickness and block up the front outboard corners with pieces of 3/16" thick scrap wood. Keep the trailing edge flat.

(See Photo 9)

(17) Cut out the wing ribs. There are several precautions to be taken. Notice the different notch widths and that the bottom aft edge of the ribs is flat. Also the notch for the bottom secondary spar in the false rib is different from the top notch. It is wise to mark the bottom edge of all the ribs for future reference.

(See Photos 10 & 11)

(18) Start the wing assembly by placing the bottom spar in position. Place the ribs in their appropriate locations. Slip the top spar into its slot in the ribs. Place the top secondary spar into its notches. The 3/8" square leading edge is held in place with pins. We have a good snug fit between all the parts because we were very careful when we cut out the ribs weren't we?

(19) Check the alignment on all the parts and zap them securely with instant glue.

(See Photo 12)

(20) Position the bottom secondary spar into its notches and insert the false ribs.

(21) Check the alignment and apply the instant glue.

(See Photo 13)

(22) Hold the top 1/8" sheet trailing edge in place and zap it to the ribs and to the bottom sheet along the aft edge.

(23) Press the forward outboard corner of the top sheet down and glue it to the bottom sheet.

(24) Sand the leading edge and spars flush with the tip rib.

(25) Check the fit of the 1/4" wing tip to the tip rib and trailing edge.

(See Photos 14 & 15)

(26) Glue the wing tip in position.

(See Photo 16)

(27) Cut the notches for the servo mounting rails in the center rib deep enough for the rails to bridge straight across the 3 center ribs.

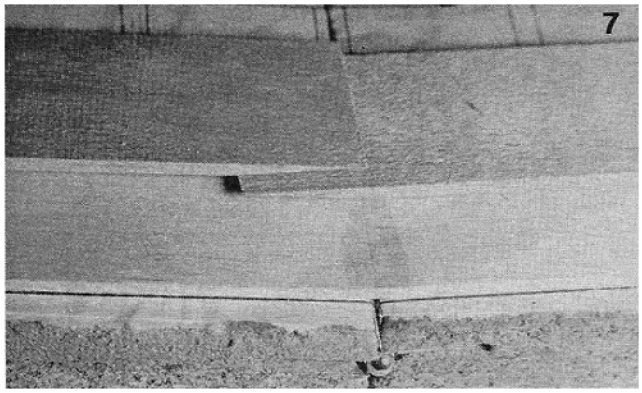
(See Photo 17)

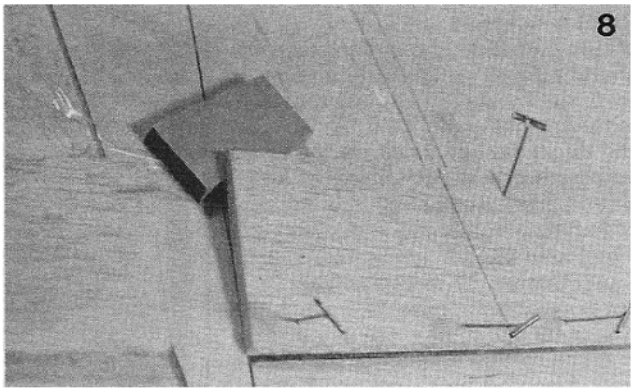
(28) Glue in the servo rails.

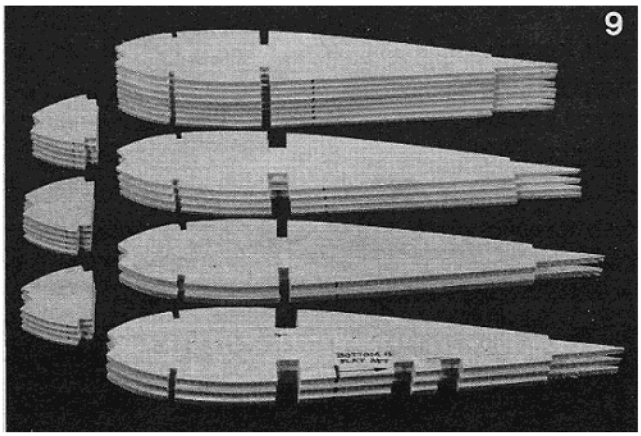
(29) Trim the center rib down flush with the servo rails.

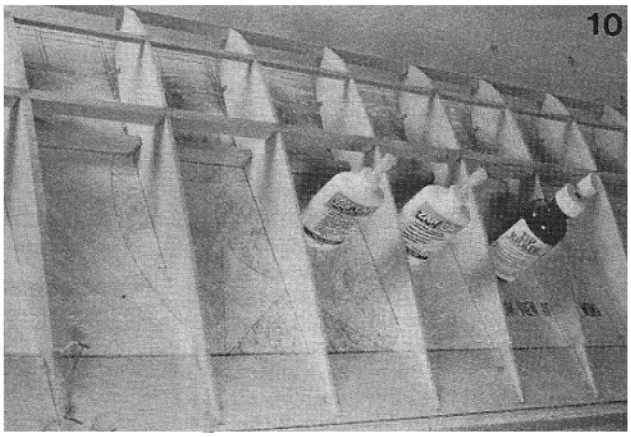
(30) Sand the aft edge of the bottom trailing edge sheet flat across 2" from center.

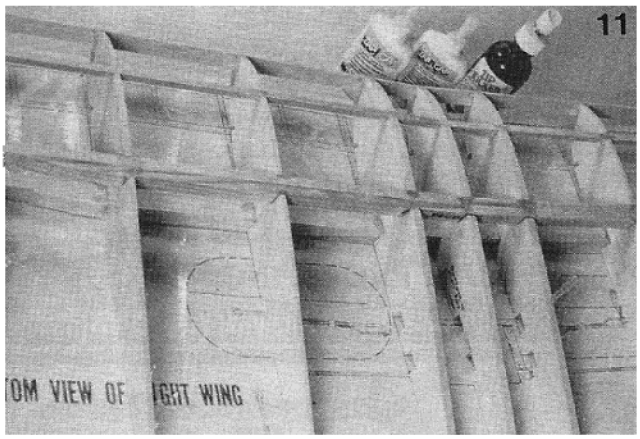
(31) Glue 1/4" x 1/2" x 1½" aileron bellcrank supports in position as shown on plans.


7

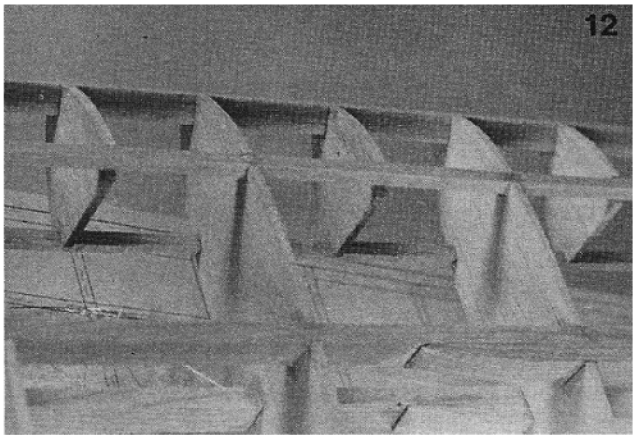

8

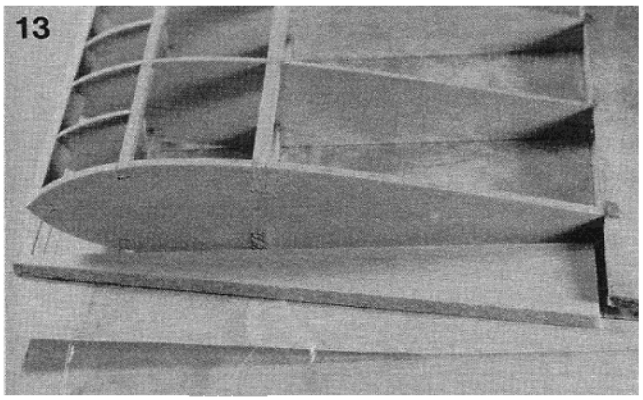

9

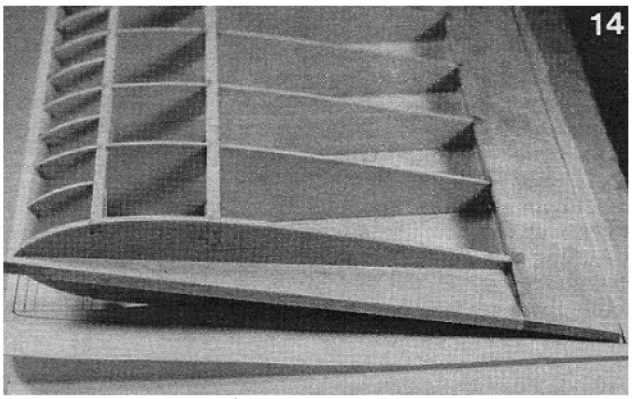

10



11


12


13


14

(See Photo 18)

(32) Make slots and fit hinges per plans. Do not glue the hinges in place at this time.

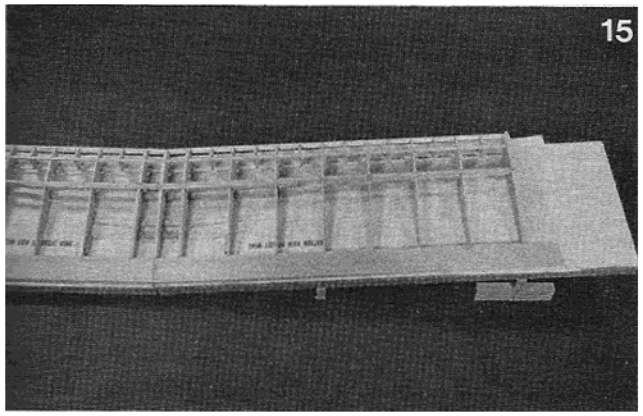
(33) Sand a radius on all the outside edges including the ailerons.

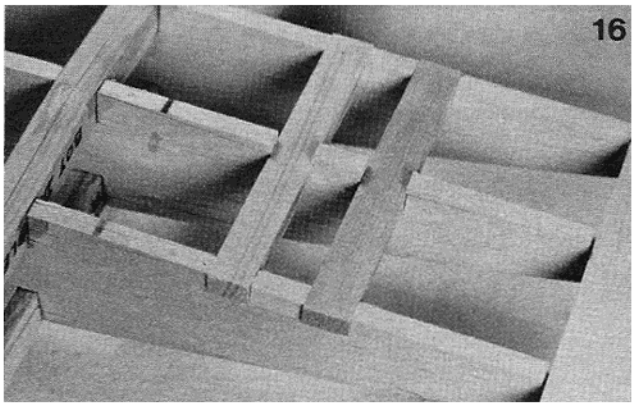
(See Photo 19)

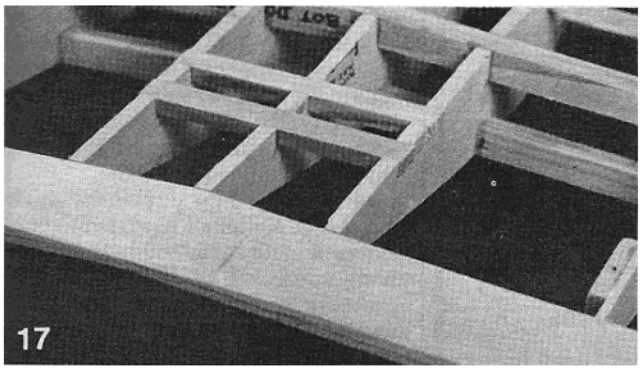
(34) A flat mount is required for the aileron servo. If your radio set includes a plastic flat mount, use it. We made ours from a piece of 1/8" lite ply and 2 pieces of 1/2" thick pine.

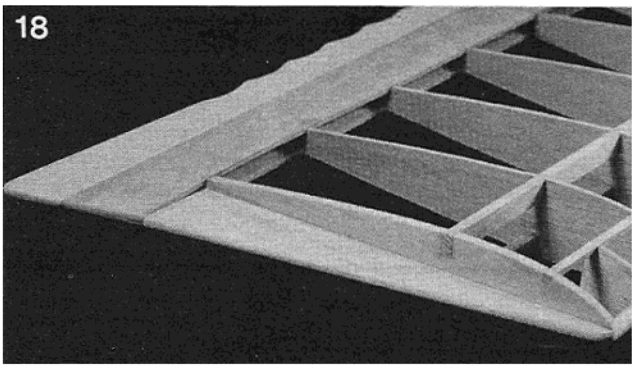
(See Photo 20)

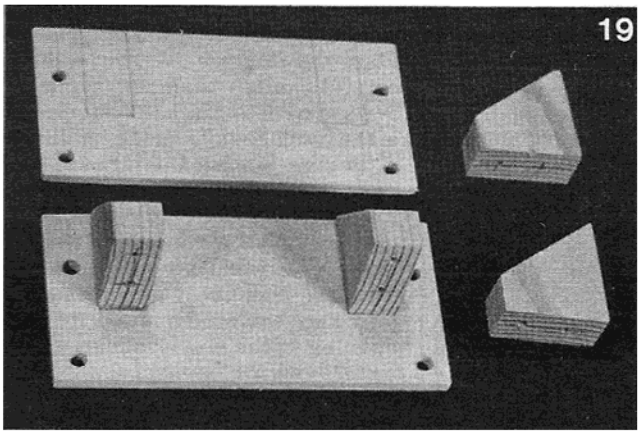
(35) Make a trial installation to fit the aileron controls as shown on the plans. The Williams Brothers 60° bellcranks provide aileron differential (more up than down travel). For future

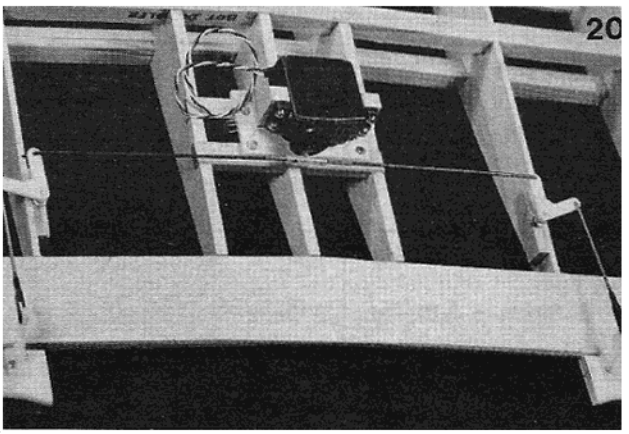

15


16


17


18

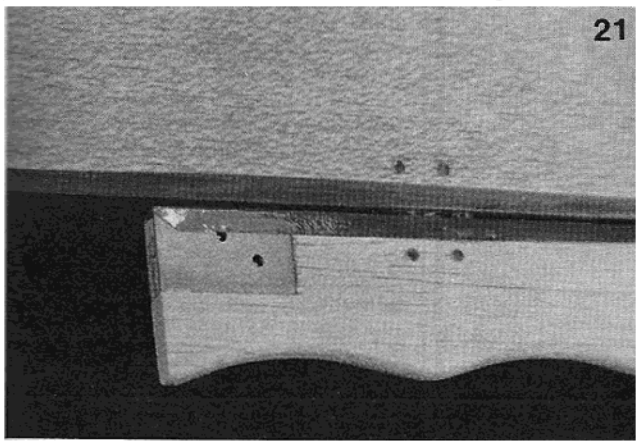

19

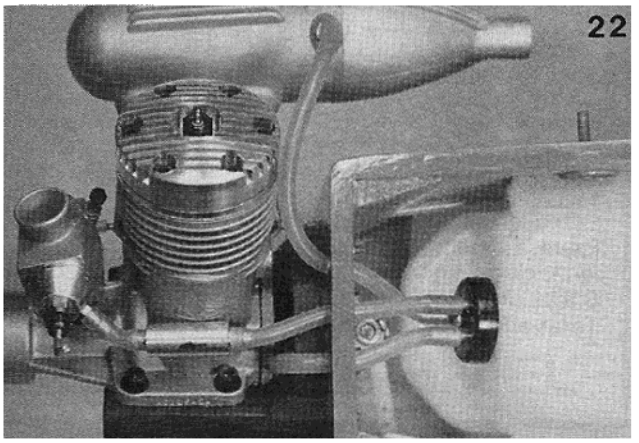

20

reference, the bellcrank pivot screws are installed after the bottom wing surface covering is applied and before the top side is covered. After aileron control linkage works smoothly and with no slop, remove all the components in preparation for covering.

(36) We covered our Ugly Stik with Super MonoKote and we suggest that you use the covering material of your choice. Our first instruction on covering is to read and follow the manufacturer's instructions that come with the material. RCM offers a comprehensive book on covering with heat shrinkable self-adhesive plastic films entitled Tom's Techniques by Tom Ingram and Harry Higley. This most informative book is listed in RCM's Anthology Library Series along with the price and ordering instructions.

(37) About now you should have


21


22

decided on the color scheme and trim for your model. Figure the amount of covering material required and procure same.

(See Photo 21)

(38) We started our covering procedure by applying a 3/4" wide strip of film to all of the matching edges between the control surfaces.

(39) Then we slit the film in the hinge locations and spread petroleum jelly (Vaseline) on the hinge nodes. (This is to prevent gluing the hinge together.) Epoxy was forced into the hinge slots and the hinges were inserted. Holes were drilled through the wood and hinges with a 3/32" diameter drill and round toothpicks were forced through the hinge locations. The toothpicks were secured with thin instant glue, trimmed off flush, and sanded smooth.

(40) Proceed to cover the entire airplane. Quicker said than done. Remember to cover the bottom of the wing and install the aileron bellcrank pivot screws before covering the top of wing.

(41) With the covering completed, lay the stabilizer and elevator assembly flat on your workbench. Place the fuselage over the stab and carefully align them for symmetry and squareness. Mark the intersection of the fuselage sides on the top surface of the stab. Remove fuselage and draw lines on the stab 1/16" inboard of the fuselage lines. Carefully cut through the film (do not cut into the wood) and remove the center portion of the covering. Now apply glue to fuselage and reposition on stab quickly aligning to the previous marks.

(42) With the fuselage and attached stab flat on the workbench, insert the fin and attached rudder. Make sure the bottom edge of the fin slips between the two 1/4" x 1/4" supports on the fuselage bottom. Check the alignment and mark the intersection of the fuselage top to the sides of the fin. In the same manner as described above, remove the fin from the fuselage and mark lines on both sides of the fin 1/16" below the fuselage lines. Remove the covering from the bottom portion of the fin. Squirt glue between the 1/4" x 1/4" supports and on the fin at the bottom edge of the covering. Quickly insert the fin into the fuselage and check for proper alignment.

(43) After the tail surfaces are attached, mark the location of the 1/8" x 1/2" plywood landing gear stop on the bottom. Cut and remove a strip of the covering 1/4" wide and glue the ply stop in its proper position. Apply covering to the stop.

(See Photo 22)

(44) Install the 1/8" and 1/4" dowels through the fuselage sides.

(45) Start making the final assembly installations. First install the nose wheel strut and secure the steering arm. Install the nose gear control cable and connect it to the steering arm.

(46) Bolt the engine and mount to the firewall tightly. Place the foam rubber pads in the front compartment and slide the fuel tank into position. The pads should be just slightly compressed, not tightly packed. Install the fuel lines and filter. Connect the throttle pushrods to the throttle arm.

(See Photo 23)

(47) Install the servo tray with the servos and the switch mounted. Connect the pushrods to the servos as previously fitted.

(See Photo 24)

(48) Plug all electrical connectors into their respective receptacles. Wrap the receiver and the battery pack loosely with foam rubber and insert each into a plastic bag. Slip the battery pack into the front of the compartment with the receiver behind it. Make sure the aileron cord and the antenna are available from the top side.

(See Photo 25)

(49) Install the control horns on the rudder and elevator. With the servos at a neutral position and the appropriate connectors attached to the horns, cut the pushrods to the proper length and solder in place. Be sure to use locknuts and keepers on the clevises.

(50) Install the aileron servo mount, with the servo in place, on the wing center section. Attach the previously made aileron control linkage.

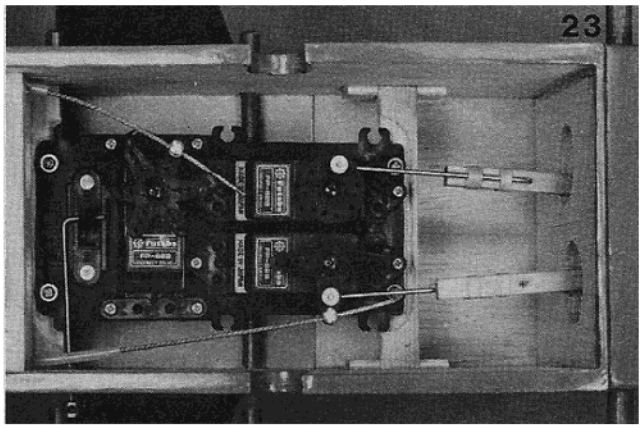
(51) A bit of explanation about final assembly. In the mid 1960s, the common practice was to hold the model together with rubber bands. For this purpose we suggest that you purchase a one pound box of number 64 rubber bands from your hobby shop or stationery supply store. As the Ugly Stik used this method of attachment you will need a good supply to last through the flying season.

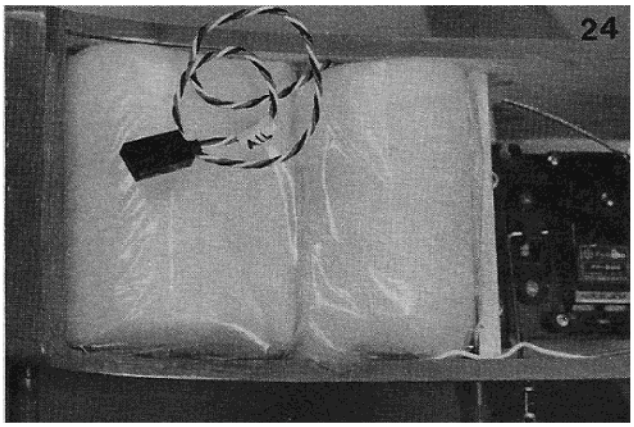
(52) Attach the landing gear and front hatch cover securely with rubber bands. The number of rubber bands required will vary depending upon the quality and type of rubber you have obtained. Just make sure the components are securely in place.

(53) Bring the antenna out of the fuselage and attach the end to a pin stuck in the top of fin.

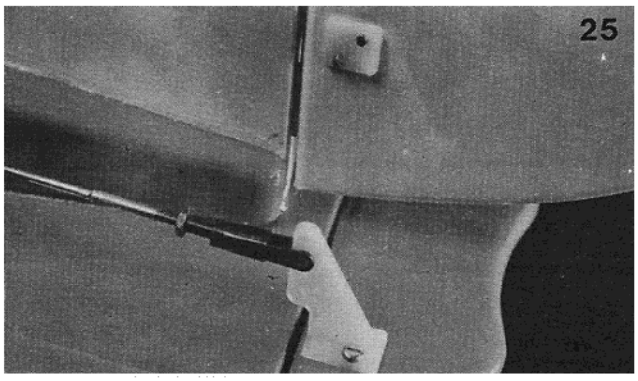
(54) Plug the aileron servo connectors together and rubber band the wing in place.

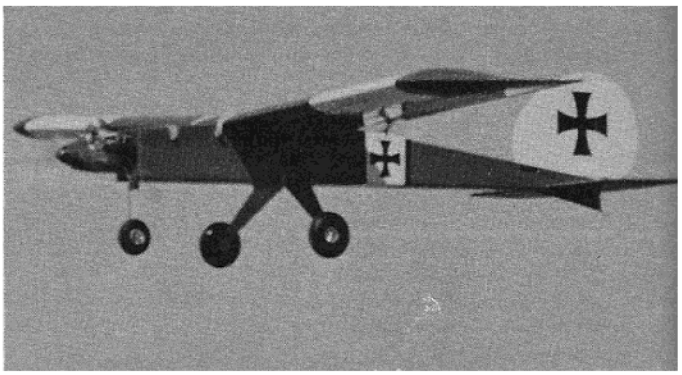
(55) Turn on your transmitter and


23



24


25



(57) Go out to the field and fly it! Our only comments on flying are to get an experienced pilot to assist you on the first few flights if you do not have much flying time. Of course you should have the radio batteries fully charged and fresh fuel. Adhere to common sense courtesy and safety rules and enjoy.

From RCModeler Part 2

Our model required a couple of corrections following the first test flight. First was to desensitize the nosewheel steering by moving the pushrod connector closer to center on the servo wheel. Then we cranked in a bit of up elevator with the clevis at the elevator horn. Those were easy but the other problem was embarrassing. About five minutes into that wring-it-out flight we suddenly had no aileron control. Sorta weird after four point and snap rolls.

Get it down fast, which was no big thing, and pull the wing. Somebody (me!) goofed. When rigging the aileron controls and using an aileron connector ball link, I didn't have a threaded ball so I used a rivet shaft ball to be replaced later with a threaded job. Somehow I forget and the connector had simply slipped out of the servo wheel. No harm was done but there is a moral, check and double check because the bird you can lose might be yours.

One more thing, don't let anyone kid you, a .60 powered Das Ugly Stik is **not** a beginner's trainer. It is one performing dude with lots of straight up capability. Also, it goes where you point it until you tell it differently, no hands off inherent stability like a J-3 Cub.

Thanks again to Phil Kraft and long live Das Ugly Stik.

□