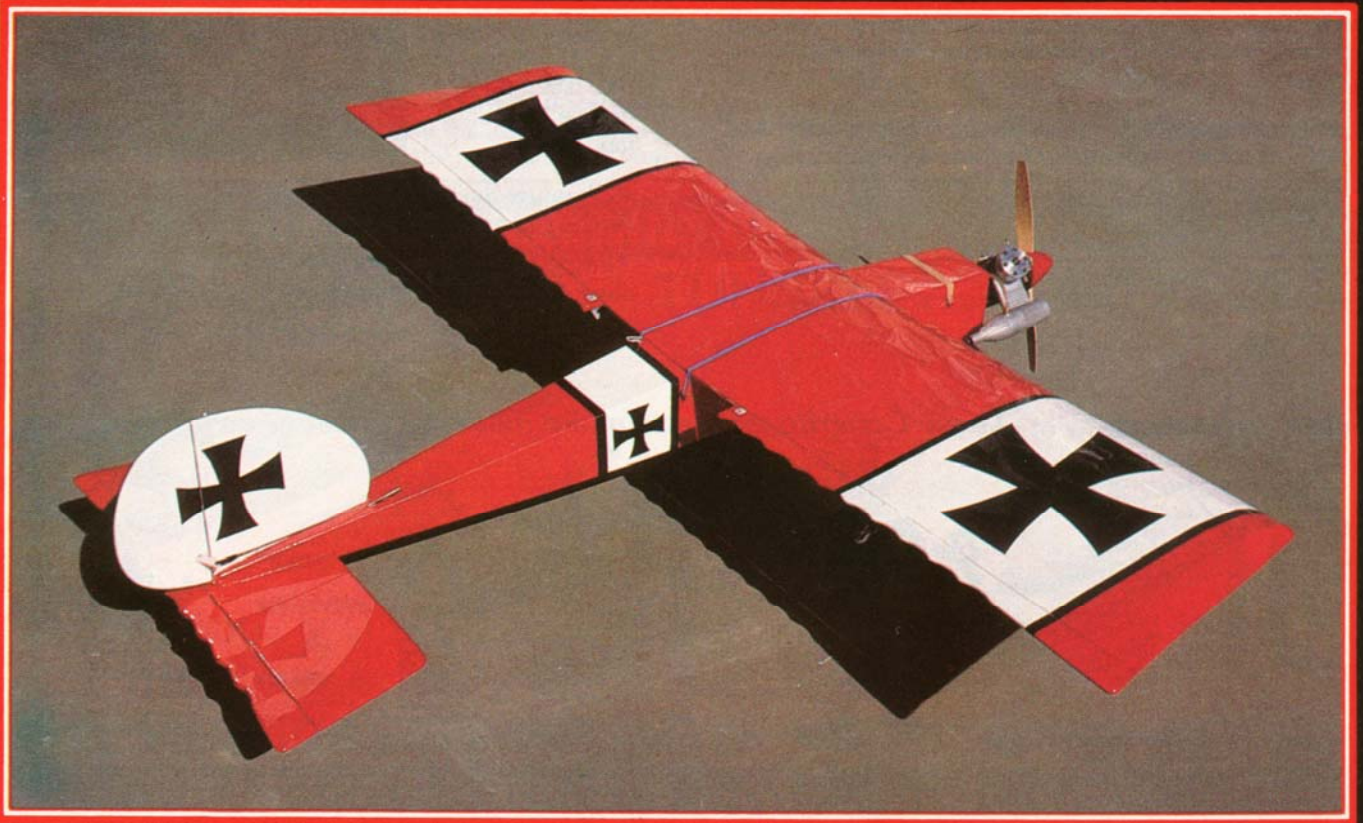


DAS UGLY STIK

A classic design that has survived for 10 years.
By RCM Staff



Part I

Das Ugly Stik, designed by Phil Kraft, has probably sired more Stik offsprings than any other R/C design. With the passing of time and the introduction of the various Stik designs, Phil's name seems to have gotten lost in the shuffle. Be it known to one and all, Phil Kraft was the designer of the original Ugly Stik!

In the May-June 1966 issue of Grid Leaks, Phil Kraft wrote the following:

The original concept of the Ugly Stik was to design a radio controlled aircraft which could be built in an absolute minimum of time. Its purpose was towards a flying test bed for new proportional control developments and an all around shop airplane which could be used as a loaner for visiting fliers testing repaired equipment, and any use which required an airplane which could be considered as expendable.

In the original form, the Ugly Stik was completely square. All surfaces were merely cut out of standard sizes of wood with no curves or frills whatsoever. The plans were finished on a Sunday afternoon some two years ago. A visit to our local hobby shop was made at approximately 4:30 to purchase the wood and other necessary materials. Taking time out for Sunday dinner, still the framework was completed by 10:00 o'clock that evening. Two more evenings were required for covering and doping, and on Thursday of that week, the ship was first flown.

Obviously not much time was taken in sanding or painting. This was to be an expendable, utility airplane. As with most straightforward functional designs, the Ugly Stik proved to be an excellent flier. It was extremely stable, very easy to fly, and quite capable of contest performance. I am not sure who first applied the name Ugly Stik to the design, but whoever it was certainly applied a descriptive name. Wherever it was flown, I was subjected to a great deal of kidding about finally having developed an airplane even uglier than the Kwik Fli. There were also a great many requests for plans, particularly among the newcomers to radio control who wished for an easy-to-fly, rugged expendable airplane to learn on — which this surely is.

There was in this early square design something suggestive of a World War I type aircraft. As a joke with assorted scribbling on the plans, we came up with a design vaguely reminiscent of the Fokker Eindecker. The results were perhaps no less ugly, but did tend to produce a design with a certain amount of charm and appeal. Certainly it never fails to create a great

deal of attention among the spectators at the local flying field.

Performance-wise, it of course cannot be classed as an all-out competition Class III model. However, it is certainly capable of winning contests in the hands of a good flier. While the design has not been used a great deal for contest work, it has

unless the beginner is of remarkably unusual talent, he's going to have minor or major accidents due to misjudgment in learning. Therefore, the Ugly Stik fits the requirements perfectly as a trainer. It is about as simple as possible to construct. As stated before, it is rugged and very easy to fly.

Flying of the Ugly Stik is equally as simple as the construction. The design is not overly critical to Center of Gravity location. It should balance approximately on the main spar. No thrust offsets are used.

To sum up, considering the minimum amount of time and effort put into construction, I doubt that we have ever had more fun flying a radio controlled model aircraft. We believe it is an excellent choice for the beginner and an ideal trainer for multi proportional flying.

Hope you enjoy it!

We are presenting the version of the Ugly Stik that was originally kitted by Jim Jensen. We have incorporated a few updates such as using a plastic engine mount and a modern radio system. The Futaba FP-4L radio was selected because it is a reliable, economical system with servo reversing switch feature.

Also, in response to numerous reader requests, we are presenting a most comprehensive set of building instructions and photos. Due to the length of these instructions, this article must be presented in two parts with the second part appearing next month.

Now we can get on with building our very own Ugly Stik.

(See Photo 1)

(1) Cut fuselage sides from 1/4 sheet. Sides are spliced in aft end to allow the use of 36" long sheet stock. Various holes are drilled as shown at this time.

(2) Glue aft splice parts into position.

(See Photo 2)

(3) Cut out the remaining fuselage parts.

(4) Assemble forward ply bottom to aft bottom sheet using the 1/8" x 1" ply doubler on the top side.

(5) Mark the top side of the bottom for bulkhead and 1/4" square rudder support locations.

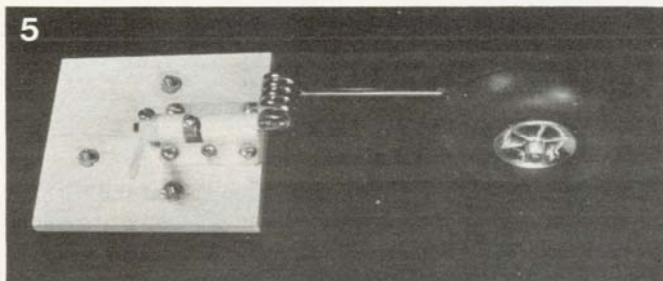
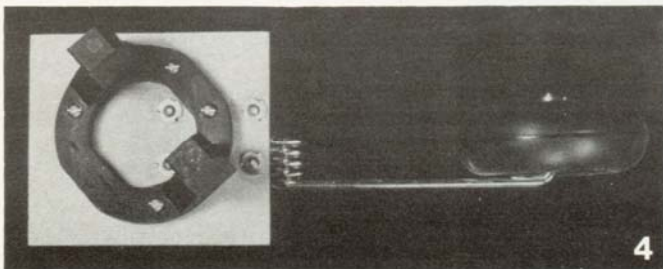
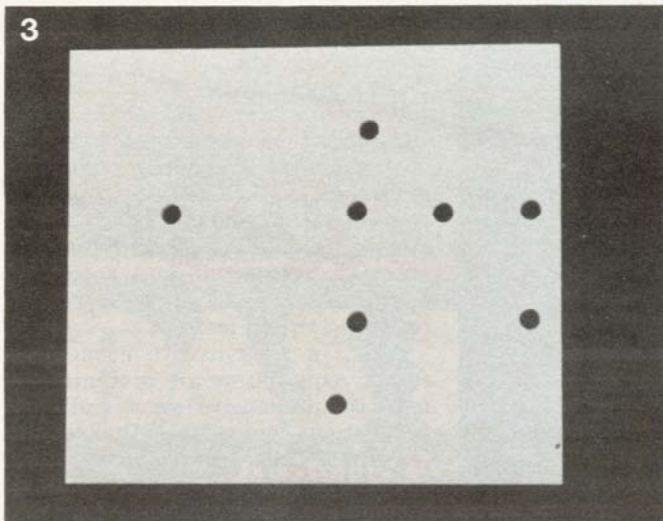
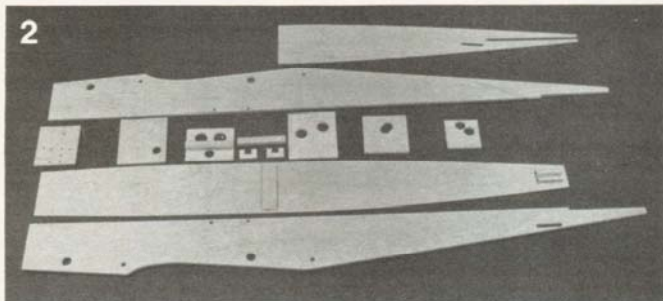
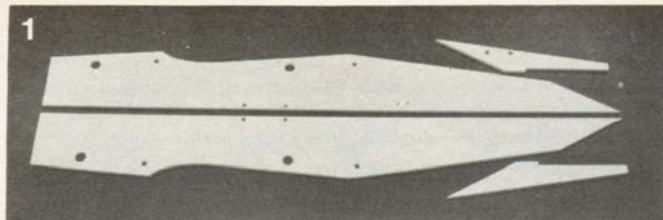
(6) Glue rudder supports to bottom as marked.

(See Photo 3)

(7) Drill holes in 1/4" ply firewall for engine and nose wheel mounts. Our model used a Kraft engine mount and a Carl Goldberg 5/32" steerable nose gear set. If you use a different brand of these units you may have to drill the holes to fit your selection.

DAS UGLY STIK
Designed By: Phil Kraft
TYPE AIRCRAFT Sport
WINGSPAN 60 Inches
WING CHORD 12½ Inches
TOTAL WING AREA 720 Sq. In.
WING LOCATION Shoulder
AIRFOIL Semi-Symmetrical
WING PLANFORM Straight Constant
DIHEDRAL EACH TIP 1½ Inches
O.A. FUSELAGE LENGTH 46 Inches
RADIO COMPARTMENT SIZE (L) 11½" x (W) 3½" x (H) 3½"
STABILIZER SPAN 22 Inches
STABILIZER CHORD (incl. elev.) 7½ Inches
STABILIZER AREA 160 Sq. In. (approx.)
STAB. AIRFOIL SECTION Flat
STABILIZER LOCATION Bottom Of Fuselage
VERTICAL FIN HEIGHT 8 Inches
VERTICAL FIN WIDTH (inc. rud.) 11½ Inches
REC. ENGINE SIZE .40-.61 Cu. In.
FUEL TANK SIZE 12 Oz.
LANDING GEAR Tricycle
REC. NO. OF CHANNELS 4
CONTROL FUNCTIONS Eng., Rud., Elev., Ail.
BASIC MATERIALS USED IN CONSTRUCTION
Fuselage Balsa, Ply, Pine
Wing Balsa & Spruce
Empennage Balsa
Wt. Ready To Fly 96 Oz.
Wing Loading 18½ Oz./Sq. Ft.

several wins to its credit in Class III. Its main virtue is as a trainer for the beginner in proportional control. I have always felt that is a waste of time for newcomers in our hobby to spend over a hundred hours on an elaborate Class III design to learn on. Inevitably,

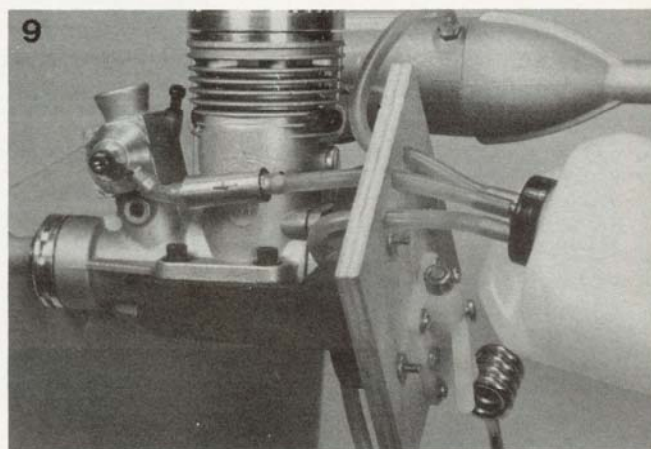
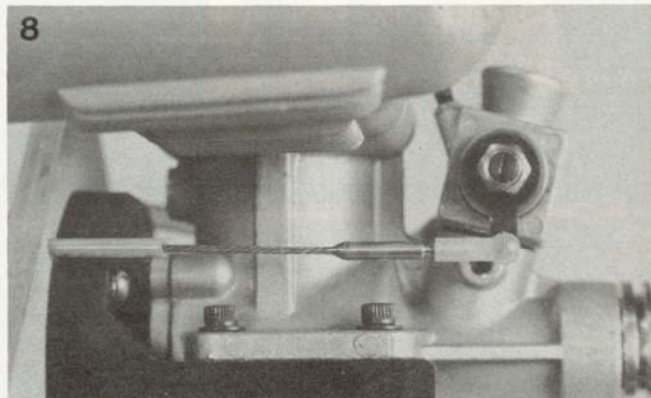
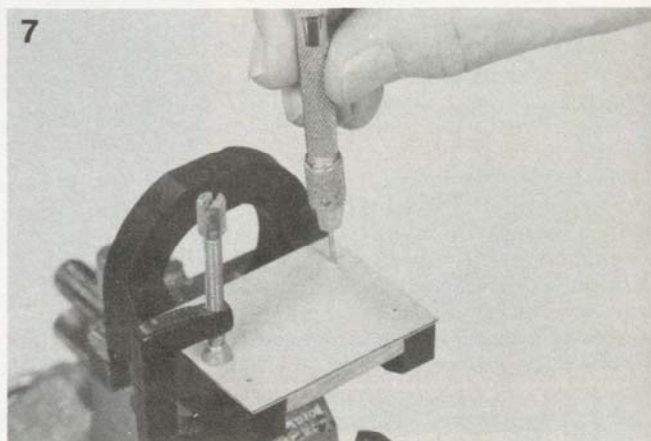
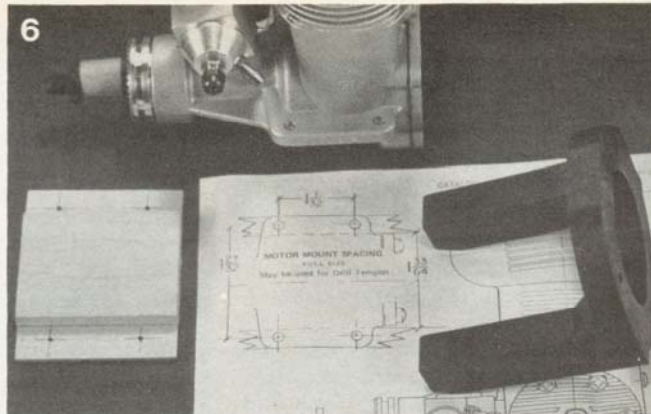


(See Photos 4 & 5)

(8) Make a trial fit of the engine mount and nose gear onto the firewall.

(See Photo 6)

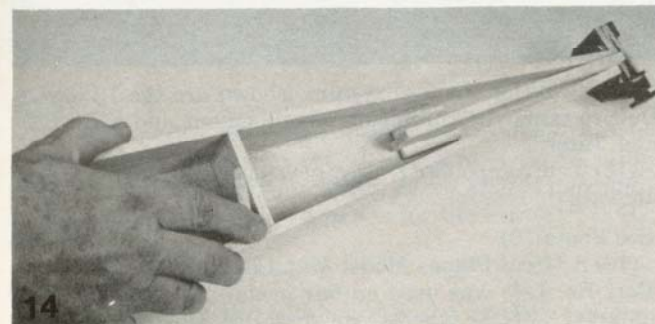
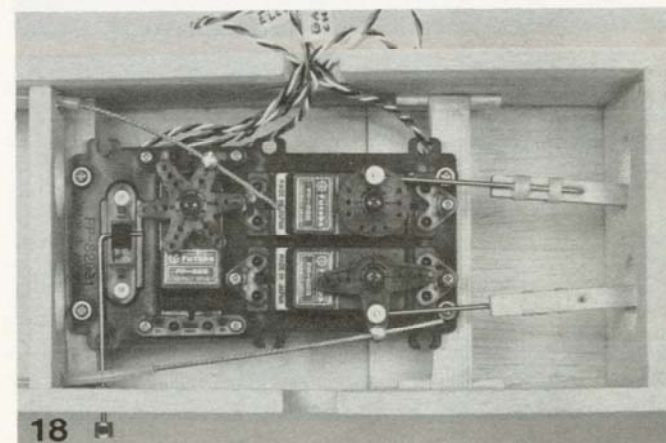
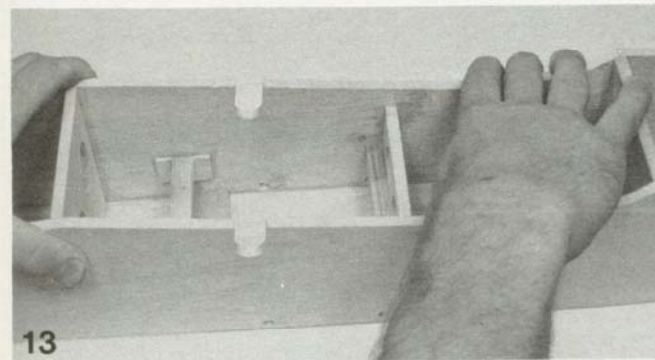
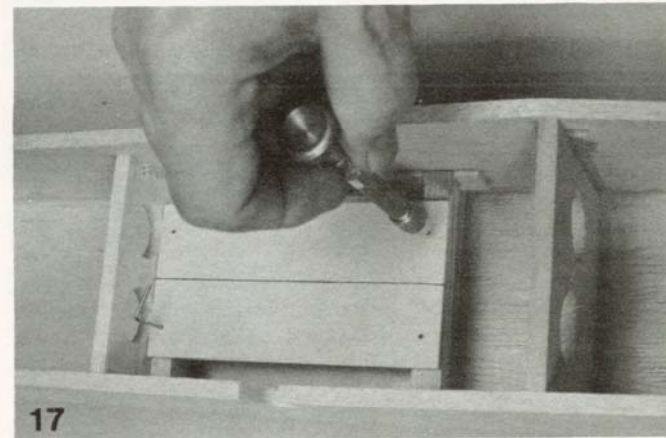
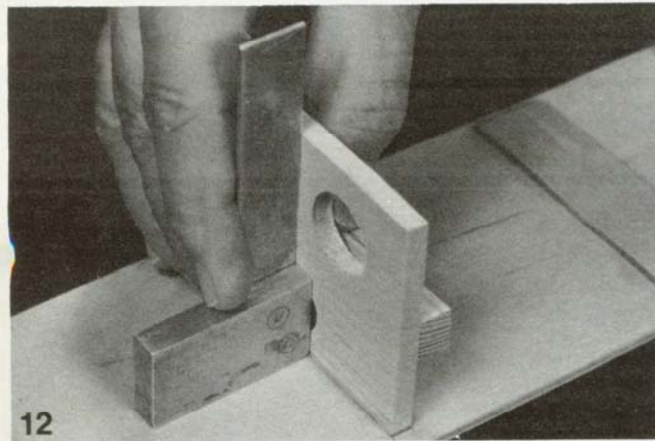
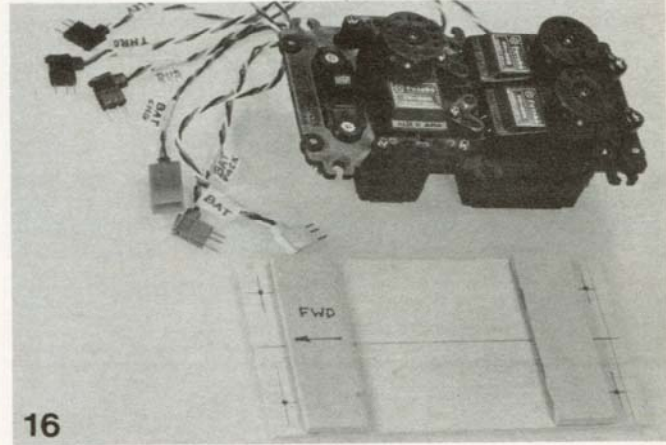
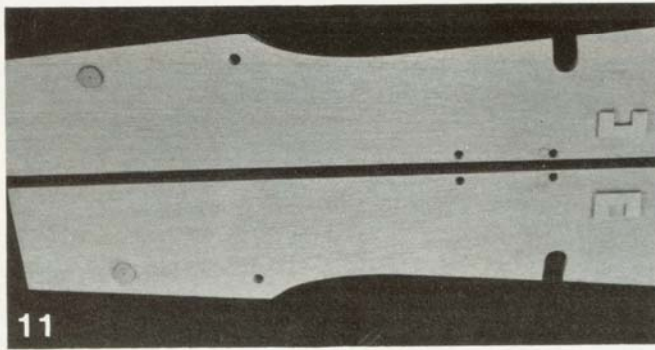
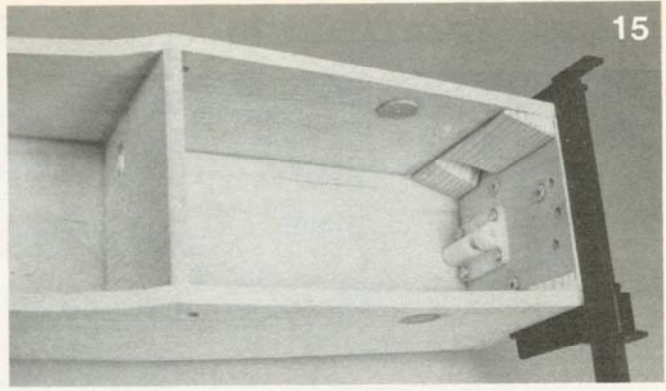
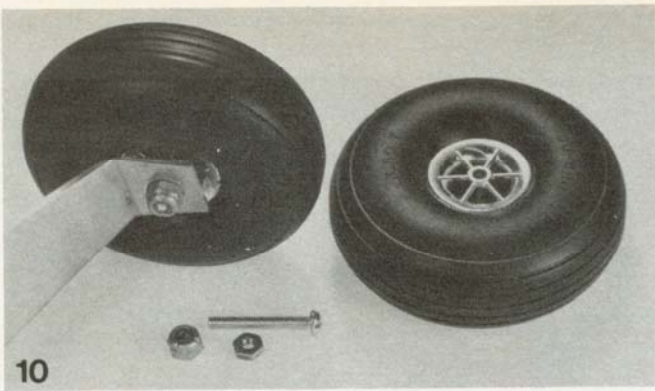
(9) Remove the engine mount. Make a simple jig to locate the engine mounting holes. Use either the engine instruction sheet or measure your engine for the correct hole pattern.



(See Photo 7)

(10) Clamp the drill jig to mount and mark the hole locations.

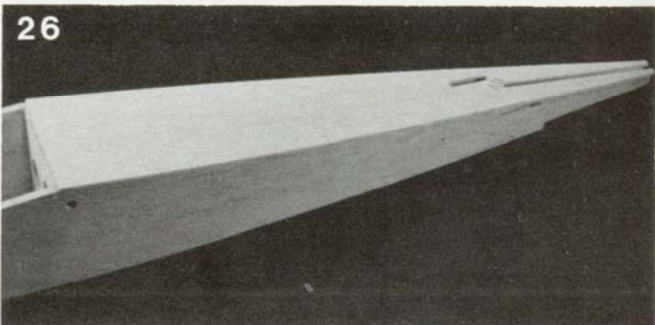
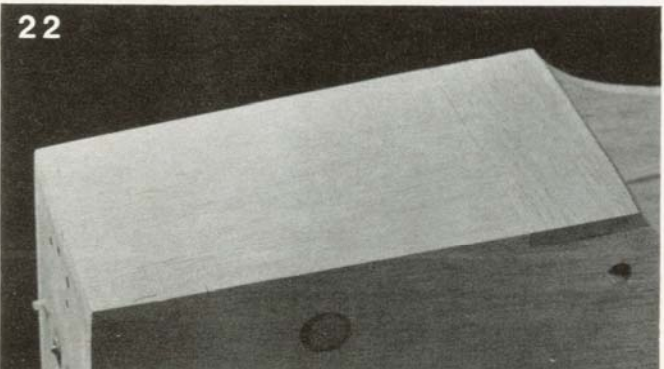
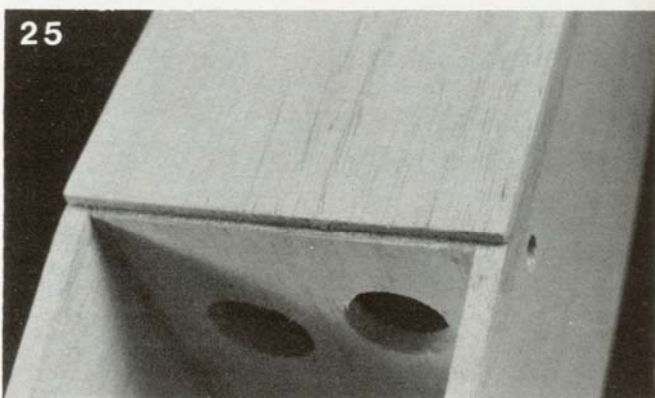
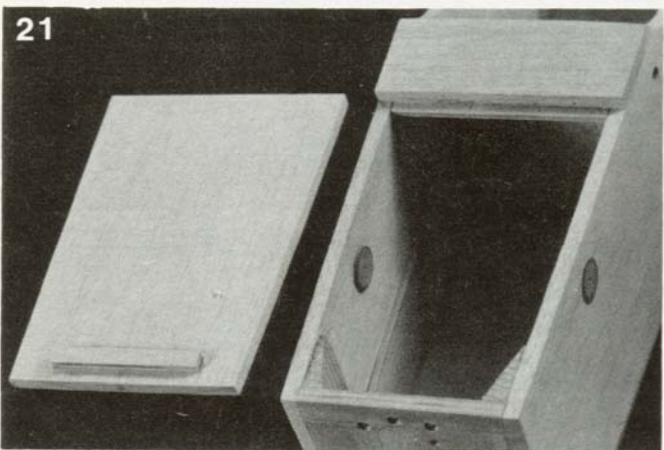
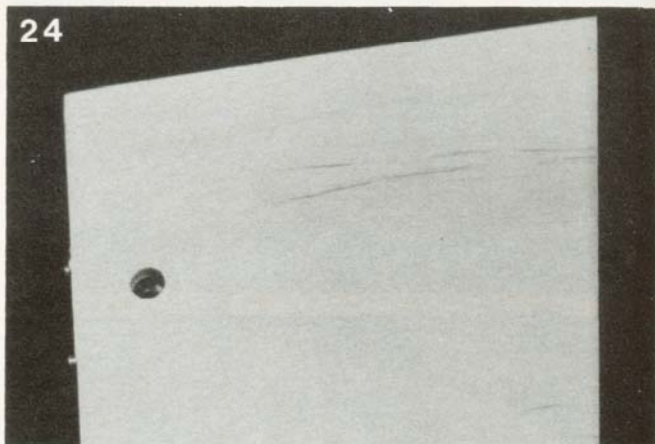
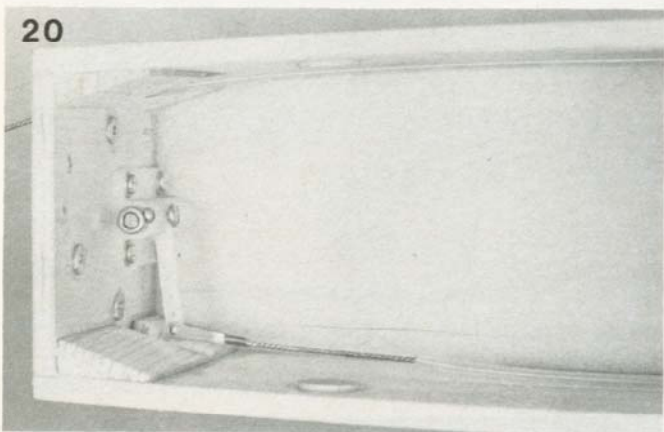
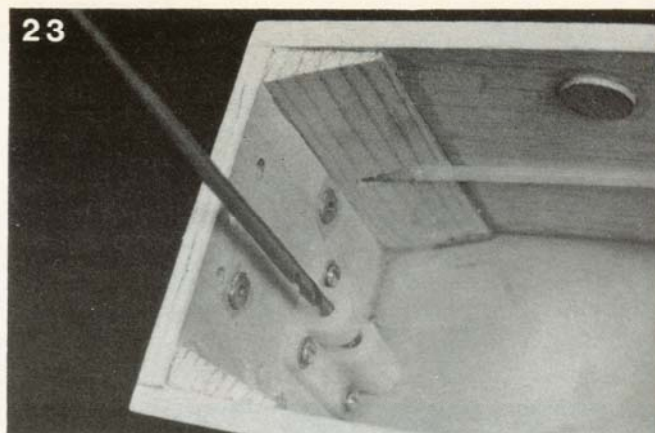
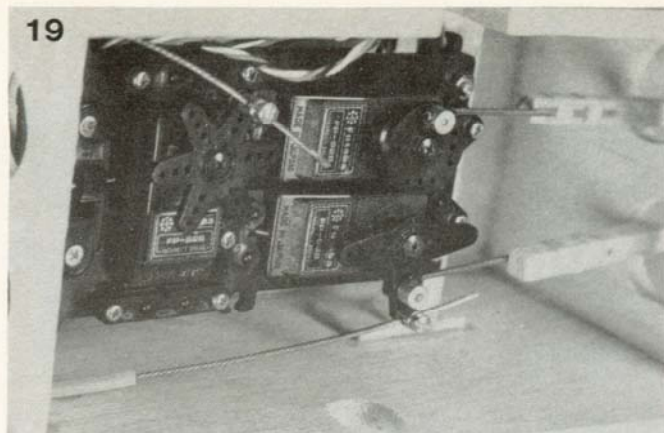
(11) Remove drill jig and drill holes as marked. We prefer to drill and tap the holes. It is acceptable to use self tapping



screws or to drill clearance for machine screws and use lock nuts on the bottom of the mount beams.

(See Photo 8)

(12) Secure engine to mount and reinstall on firewall.



(13) Locate and drill a hole in line with carburetor throttle arm for the pushrod. Photo shows the Du-Bro ball link, threaded pushrod coupler soldered to flexible cable and nylon tube pushrod guide.

(See Photo 9)

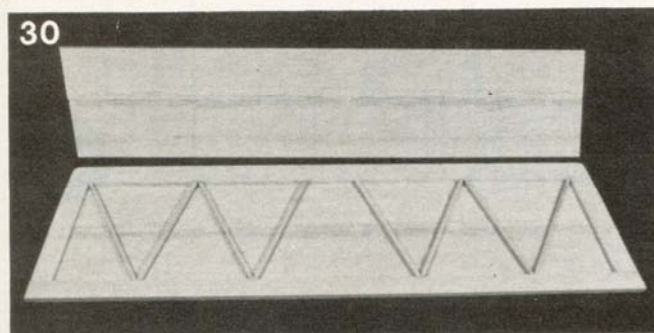
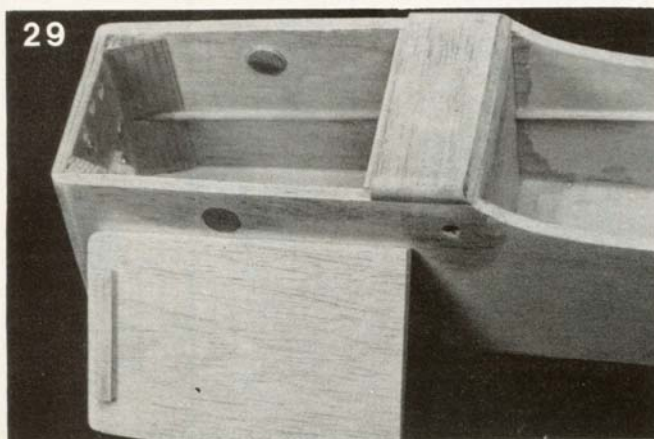
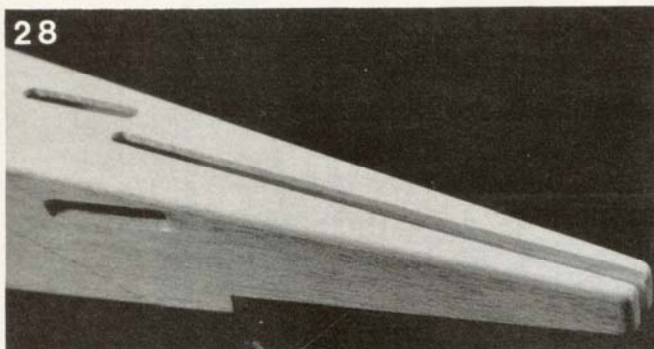
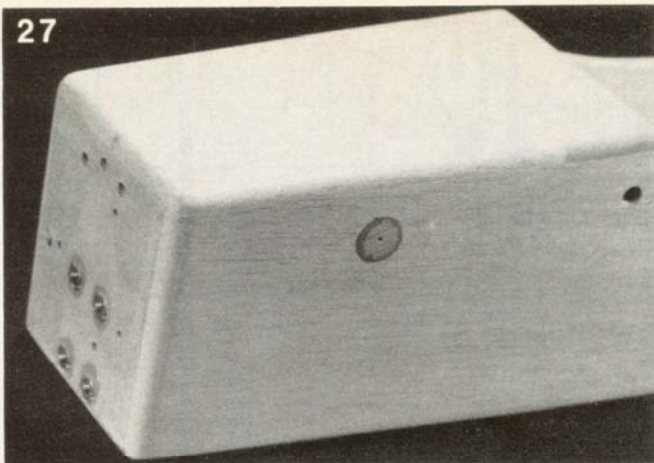
(14) This is an opportune time to locate and drill holes in

the firewall for the fuel system. Shown are the 12 ounce Du-Bro tank, the three tube arrangement and a Du-Bro final filter.

(15) The components may now be removed from the firewall.

(See Photo 10)

(16) A Great Planes Model Mfg. Co. dural landing gear (Part No. L-4) was used on our model. The Du-Bro 3½" diameter (3.50T) wheels are installed with 8-32 x 1½"



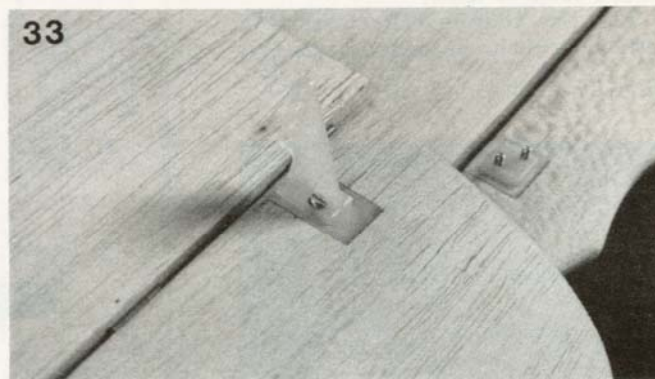
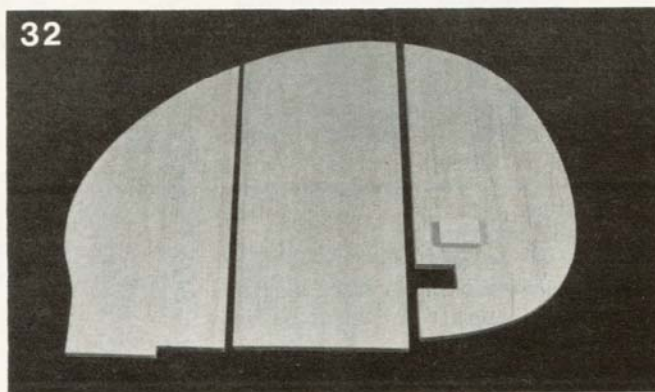
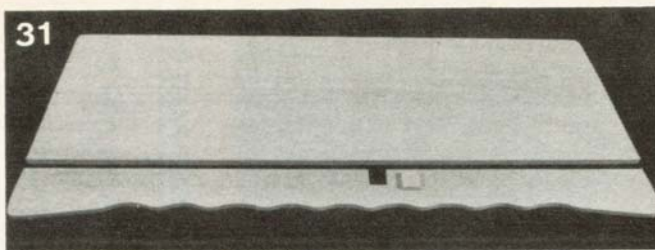
machine screws, plain nuts and self locking nuts.

(See Photo 11)

(17) Install the hardwood inserts in the front hatch position and retainers for the aft servo rails. Servo rails must be located to fit your radio servo tray. The radio installation shown on the plans is for the Futaba FP-4L system.

(See Photo 12)

(18) Assembly of the bulkheads to the fuselage bottom



may now be started. Proper alignment of the bulkheads to the location marks on the bottom is important as is the squareness. Bulkhead F-3 is shown in the photo with the forward servo mounting rail glued in place.

(19) It is best not to install the firewall F-1 at this time.

(See Photo 13)

(20) The fuselage side panels are now glued in place in the wing area. Side panels are attached to the bottom, bulkheads F-2, F-3, and F-4. The use of instant glue (Hot Stuff, Jet, and Zap) makes this step quick and easy.

(See Photo 14)

(21) The aft ends of the side panels are held together with a small clamp or pins while a piece of scrap 1/4" sheet inserted between the rudder supports and the fuselage sides help provide alignment. Instant glue will secure this assembly while it is being firmly held in place.

(See Photo 15)

(22) The firewall (F-1) is best glued to fuselage sides and bottom with epoxy. The triangle stock corner braces, with clearance cut for steering arm (L.H. only), are also installed with epoxy.

(See Photo 16)

(23) Make a simple fixture to match the mounting dimensions of your servo tray. This will simplify drilling the hole pattern for mounting screws.

(24) Install the engine, rudder, and elevator servos and battery switch in the servo tray per radio manufacturer's instructions.

(25) Take a few minutes to identify each of the connectors. A short piece of masking tape wrapped around the wire and labeled with a marking pen will save a lot of time when making subsequent control installations.

(See Photo 17)

(26) Using the drill fixture mentioned above, locate and drill pilot holes for the servo mounting screws.

(See Photo 18)

(27) Install servo tray.

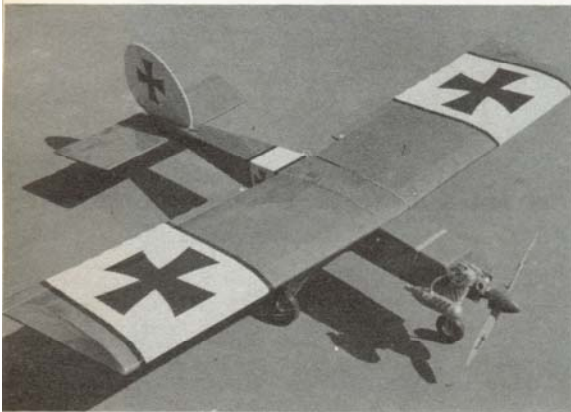
(28) Drill holes along fuselage sides for tubing to retain flex cable pushrods for throttle and nose wheel steering.

(29) Make flex cable pushrod for nose wheel steering.

(30) Make pushrods for rudder and elevator controls. Leave extra length on wire at aft end of these pushrods for final trim and fit later.

(See Photos 19 & 20)

(31) Use your favorite method of attaching pushrods to servo arms. Our



method is to achieve both ease of installation and safe function. Make sure that the pushrods run freely through the clearance holes in the bulkheads.

(See Photo 21)

(32) Glue on top front fuselage piece.

(33) Glue plywood hatch support in place.

(34) Glue hatch stop to inside of hatch at front end.

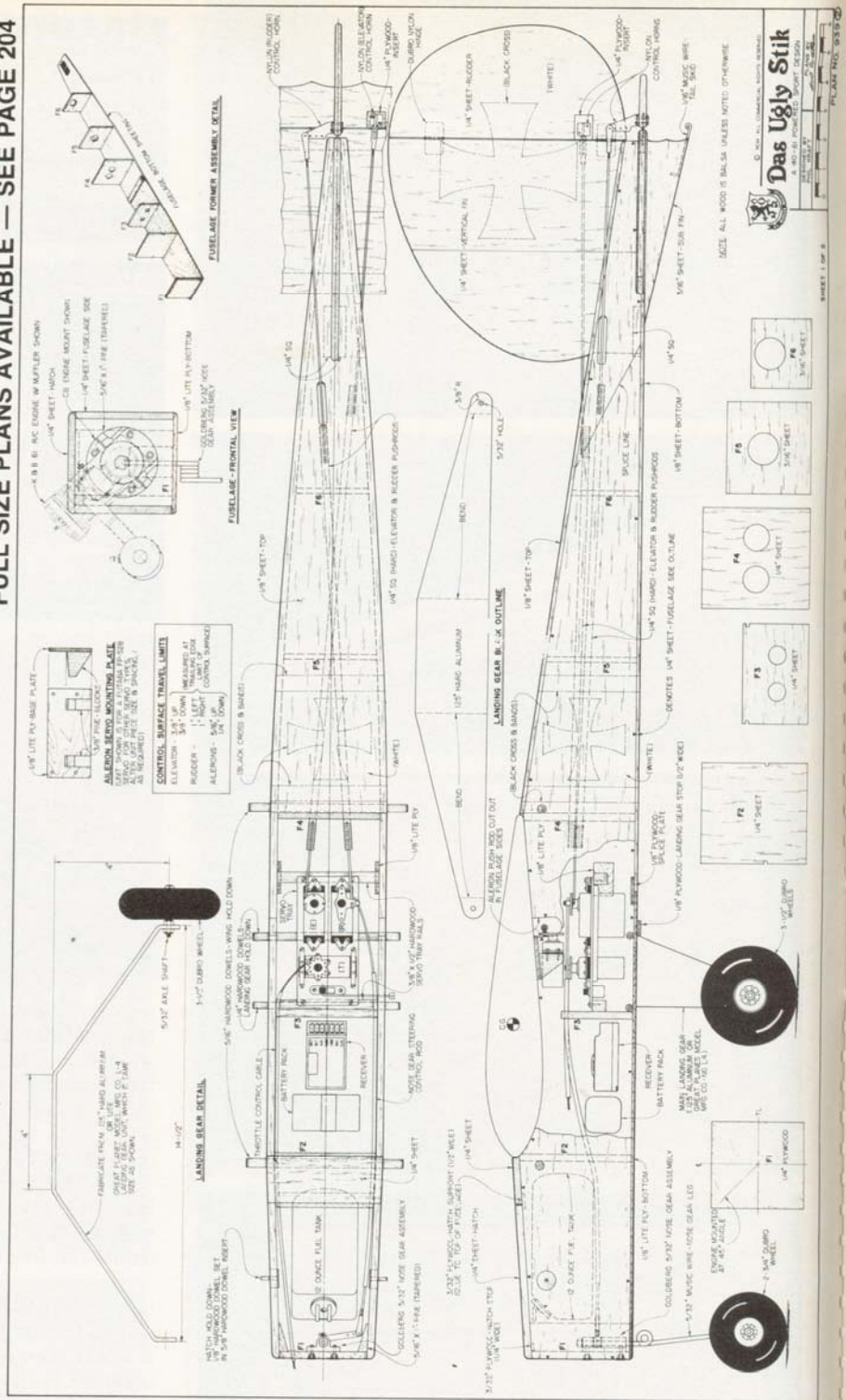
(See Photo 22)

(35) With hatch in place, sand all edges even and smooth.

(See Photo 23)

(36) Using nose gear block as a guide, drill a hole through the fuselage bottom with a 5/32" diameter drill.

FULL SIZE PLANS AVAILABLE — SEE PAGE 204



(See Photo 24)

(37) Turn fuselage bottom side up and enlarge the nose gear clearance hole to 1/4" diameter.

(See Photos 25 & 26)

(38) Glue on the top rear fuselage sheeting, making sure that the forward edge overlaps bulkhead F-4 by only 1/8".

(See Photos 27 & 28)

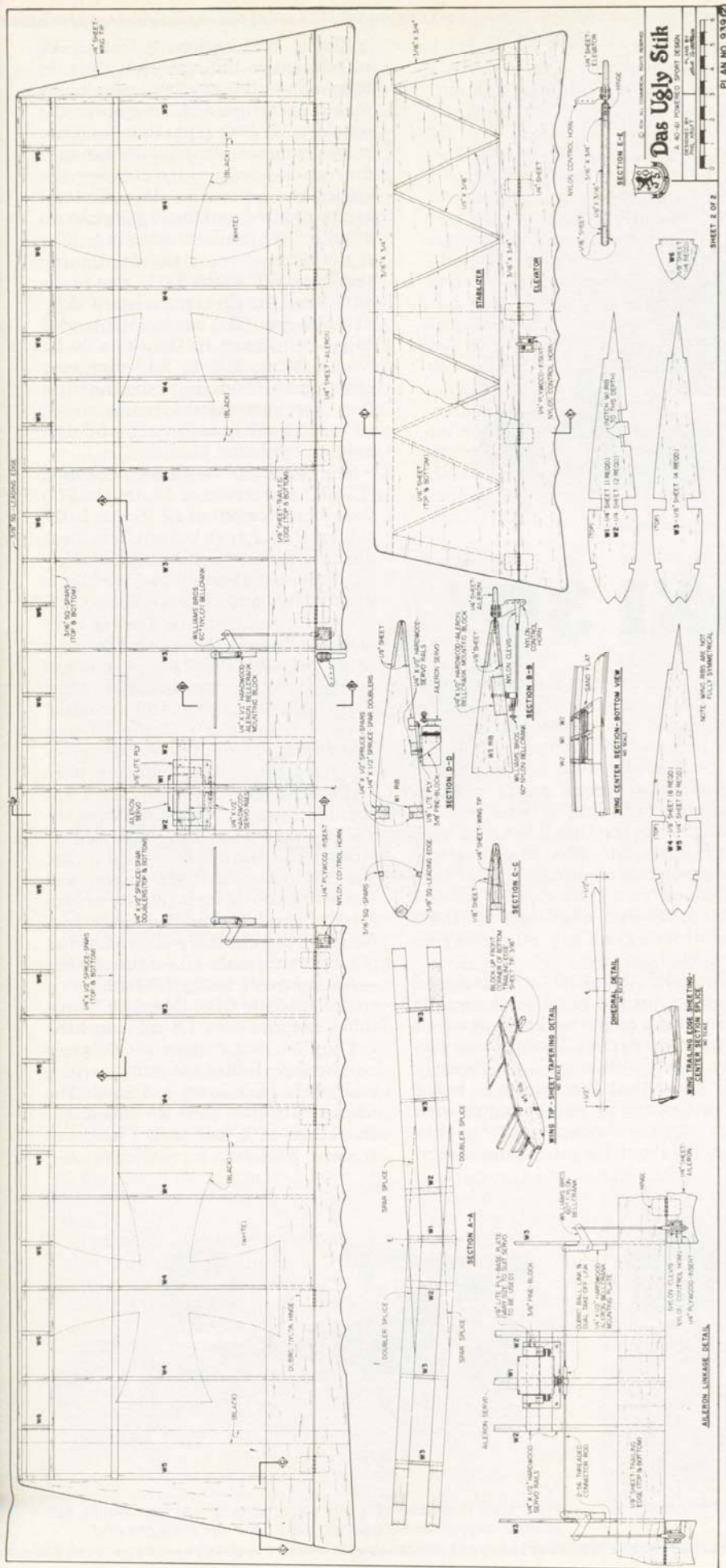
(39) Sand all the fuselage sides

smooth with a radius on all the outside corners.

(See Photo 29)

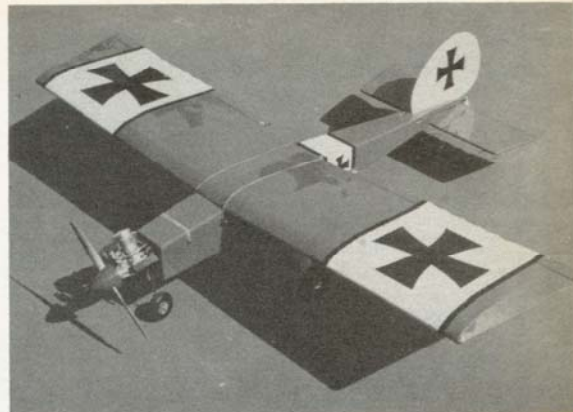
(40) Fuelproof the tank compartment with K & B polyester resin. Also coat the front of the firewall, bottom of the hatch cover, and any of the adjacent edges and surfaces that will be subjected to fuel or exhaust residue.

(41) Sand all of the resin coated exterior surfaces smooth.



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Das Ugly Stik
 A 40 IN. LONG 1/8\"/>

PLAN NO. 939
 SHEET 2 OF 2



(See Photo 30)

(42) The horizontal stabilizer construction starts by gluing the 1/16" sheet skins together and cutting to size per drawing.

(43) Cut the 3/16" x 3/4" edge pieces to length and glue to the bottom skin.

(44) Cut the 1/8" x 3/16" ribs to size and glue in place per drawing.

(See Photo 31)

(45) Glue the top skin to the stab structure.

(46) Cut the elevator from 1/4" sheet and make the control insert from 1/4" plywood.

(47) Glue the insert into the elevator.

(48) Sand the stab and the elevator smooth. Sand a radius on all edges.

(See Photo 32)

(49) Cut the fin and rudder from 1/4" sheet. Make the control insert from 1/4" plywood.

(50) Glue the fin pieces together and glue the insert into the rudder.

(51) Sand the fin and rudder smooth and sand a radius on all the edges except the bottom of the fin.

(See Photo 33)

(52) Install hinges and control horns as shown on plans.

Next month we will continue the construction and finish this Ugly Stik project.

