

MAROONEY

My first experience with a throttled .049 was with a Ken Willard Showmaster — great airplane — but the throttle was more or less a “slower-downer” rather than a throttle. Better yet, it acted as an exhaust port cover in case of a nose down landing in the dirt. Since then I have had a lot of throttled 1/2A’s, all of which had to be flown-on and run into the tall grass to stop. The Ace throttle sleeve is different. With it, touch-and-go’s are not only practical but easy and, for the first time — a 1/2A that will taxi. The mid-range on this throttle is almost nonexistent but it is enough to make slow and easy cruising fun.

Marooney was built to take advantage of the Ace throttle. It is an easy to fly airplane, smooth and groovy stable. It is not a bomb but it will perform loops, Cuban eights, rolls, etc., and do them outside as well as inside. Snaps and spins are possible if the fourth channel for rudder is added, and that can be done with very little trouble. A 1 oz. tank will fly Marooney for nearly 10 minutes (the original had a snuff can tank of nearly 2 oz.) so there is plenty of time for T & G’s. The tail skid is necessary to keep from grinding the tail down, since landings are made at rather high angles of attack. Incidentally, I fly a rather low nitro fuel and, although performance is not as good as with hotter juice, the climb angle is still 25-30 degrees and I have flown in 18-20 mph wind with little difficulty. The airplane is strong enough for a .10 without modifications or, if

Kind of a look alike to its big brother, this 1/2A, 3 channel has proven to be pure fun for the Sunday flier.

By Randy Randolph

you prefer more pep, one of the new .061’s with full house might be fun.

CONSTRUCTION

First this is an airplane not a bridge . . . build it like an airplane. Although this design is not an ultra-light one it must be kept within reason as far as weight is concerned. Any additional weight manifests itself as higher flying speeds and results in much more damage to the ground in hard landings.

Wing:

The wing is a good place to start; this one is a tried and true design that is quite strong for the weight. Make a template of the rib from thin, hard paper such as a file folder or notebook cover and trace around it on to a piece of 1/16” x 3” x 36” medium soft balsa. With care, all 22 ribs can be cut from the single sheet with some left over. The trailing edge is sliced from 1/16” sheet

balsa and a 36” sheet 3” wide will provide all four pieces with enough left over for the center section sheeting. The leading edge and spars can be stripped from 3/16” sheet or purchased. The spars should be medium hard and the leading edge, medium soft. While you are stripping 3/16”, cut a few extra medium soft ones for the stab. The webs between the spars and at the trailing edge are important, don’t leave them out. They are cut from soft 1/16” sheet with the grain running vertical. Cut the five dihedral braces and the four gear mount braces from 1/16” plywood and strip a couple of 1/16” x 1/8” balsa pieces for the trailing edge cap.

Select four ribs and cut 1/16” from the top and bottom of each for the center section sheeting; designate these as R-1. Select four more and glue the gear mounting braces on them noting that two ribs have the braces on one side and two have them on the other side. Cut the notch for the gear mount in these ribs and designate them R-2. Cut, glue up and drill the 1/8” plywood gear mount.

Cover the plans with waxpaper and pin the bottom trailing edge sheet and the bottom main spar in place over them. Beginning at the center, glue the first spar web and the first R-1 in position. Add the webs at the spar and trailing edge, then glue in the first R-2 with the plywood gear mount brace facing inboard, followed by more webs and the next R-2 with the brace facing outboard. Continue this sequence of ribs and webs out to the tip. When all ribs are

installed, glue the top front spar and leading edge in place then add the top main spar; bond it to the webs as well as to the ribs. Do not add the top trailing edge sheet at this time. Build the other wing half in the same sequence.

Before the wing halves can be joined, the center spars, and leading and trailing edges must be beveled to match at the dihedral angle. The easiest way to do this job is with a sanding block and the side of the workbench. Block up the wing tip of each half 1" and use the side of the workbench as a guide to sand in the bevel. Trim the notches in the R-1's and R-2's near the center section to accept the dihedral braces and join the 2 wing halves. Use clothespins to hold spars & braces in alignment. Check for any built-in warps and correct them. Add T.E. dihedral brace & top T.E. sheet, followed by 1/16" x 1/8" T.E. cap.

Cut the two remaining R-1's at the main spar notch and trim them to fit from the main spar to the leading edge and from the main spar to the trailing edge. If the airplane is to be flown three channel, glue these ribs together and install them at the center of the wing. If full house is anticipated, glue the leading edge ribs together and install at the center in front of the spar; the aft sections of these ribs are separated, as shown in dotted lines on the plans, to form a nest for the aileron servo. Complete the center section sheeting.

Slip two pieces of 1/8" brass tube 2" long over two pieces of 3/32" music wire 8" long and bend the aileron torque rods. Glue the tubing in place at the trailing edge and notch the trailing edge for free movement of the torque rods. Hollow a piece of 1/4" sq. hard balsa to fit over the tubing and form the fairings on each side of the center. Cut the ailerons from soft 1/8" sheet and sand them to a streamlined section. Cut the tip pieces from the ailerons and glue them to the trailing edge of the wing at the tip. The ailerons will be installed later when covering the wing. Make the wing tips from the saddle cut outs in the fuselage sides and glue them in place. The gussets at the spar locations hold them secure against the stretch of the covering. Sand the completed wing with 150 grit sandpaper followed by 400.

Fuselage:

The fuselage sides are cut from one piece of 1/16" balsa 6" wide which is made by edge gluing two sheets of 3" x 36" medium stock together. Cut the firewall doublers from 1/16" scrap balsa and strip some 3/32" sq. for the longerons and uprights. The wing saddle doubler and servo mounting rails are 3/32" sheet. Glue the doublers, uprights and longerons in place on the inside of the fuselage sides, one left, one right. When both sides are complete, pin them both together with the doublers and longerons on the outside and sand them to the same outline with a sanding block. While they are still pinned together cut the stab slot and the wing saddle (use the saddle cut-out for the wing tips) as well as drill the 1/4" holes for the wing hold-down dowels.

MAROONEY

Designed By: L.F. (Randy) Randolph

TYPE AIRCRAFT	Sport
WINGSPAN	41½ Inches
WING CHORD	6½ Inches
TOTAL WING AREA	265 Sq. In.
WING LOCATION	Low Wing
AIRFOIL	Flat Bottom
WING PLANFORM	Constant Chord
DIHEDRAL EACH TIP	1 Inch
O.A. FUSELAGE LENGTH	27¼ Inches
RADIO COMPARTMENT AREA	(L) 8½" x (W) 2¼" x (H) 3"
STABILIZER SPAN	16 Inches
STABILIZER CHORD (incl. elev.)	3¾ Inches (Avg.)
STABILIZER AREA	60 Sq. In.
STAB. AIRFOIL SECTION	Flat
STABILIZER LOCATION	Mid-Fuselage
VERTICAL FIN HEIGHT	5½ Inches (Avg.)
VERTICAL FIN WIDTH (incl. rudder)	4" (Avg.)
REC. ENGINE SIZE	.049-10 Cu. In.
FUEL TANK SIZE	1-2 Oz.
LANDING GEAR	Tricycle
REC. NO. OF CHANNELS	3-4
CONTROL FUNCTIONS	Elev. Ail. & Throt. (Rud.)
BASIC MATERIALS USED IN CONSTRUCTION	
Fuselage	Balsa and Ply
Wing	Balsa and Ply
Empennage	Balsa and Ply
Wt. Ready To Fly	23½ Oz.
Wing Loading	13 Oz./Sq. Ft.

Cut the firewall from 1/8" plywood and build up the other two bulkheads from 3/32" balsa.

Glue the two cabin bulkheads to the inside of one fuselage side; use a square to properly align them. Glue the other side to these bulkheads and again use a square to position the second side exactly over the first. Bring the tail together, bevel the insides to fit and glue the two sides together. Drill the firewall for the engine mount and the fuel and throttle lines, install the blind

nuts for the engine mount and glue it in position on the fuselage sides. Hold the sides together with masking tape until the glue has set.

Before sheeting, install the outer NyRod to the elevator (and rudder) and the inner NyRod for the throttle. Glue a 1" wide piece of 1/16" plywood on the fuselage bottom where the nose gear steering exits the airplane and install the inner Nyrod from this plywood to the aileron (or rudder) servo location. Install the fuel tank and fuel lines, then sheet the fuselage top and bottom with soft 1/16" balsa. Trim the sheeting around the nose to fit the engine and sand the completed fuselage with 150 then 400 grit sandpaper.

Tail Group:

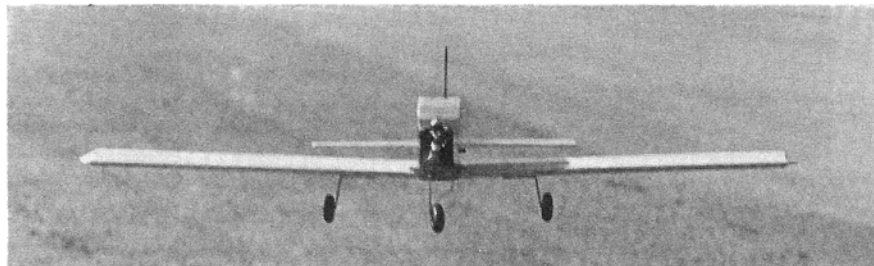
The stabilizer is built from soft 3/16" sq. balsa with a 1/32" x 3/16" plywood doubler at the trailing edge. The elevator is cut from soft 1/8" sheet balsa. Hold the stab and elevator together with masking tape and sand the tips to match; sand the leading and trailing edges round. Bend the elevator carry-through from 1/16" music wire and epoxy it to the leading edge of the elevator before the rudder clearance cut-out is made — this keeps the elevator in alignment. The surfaces will be hinged when they are covered. Make the rudder from soft 1/8" sheet balsa. If four channel operation is contemplated, make the cut-out for the movable surface.

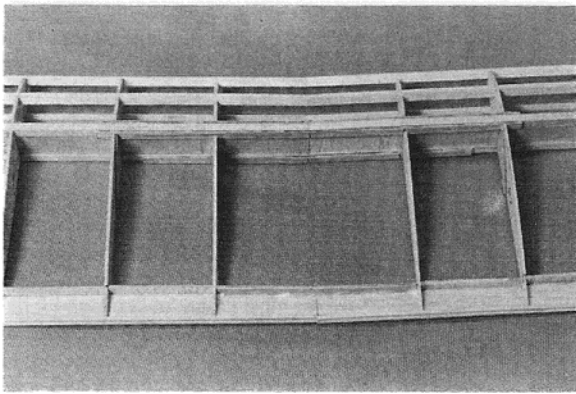
Finishing:

Before covering, notch and drill the leading edges of the ailerons to receive the torque rods; and if MonoKote type hinges are used, cover all surfaces before hinging. Follow the instructions packed with the film you choose for covering. Join the ailerons to the wing by epoxying the torque rods in place then covering them with a separate piece of film ironed over the wire and to both sides of the aileron as they are hinged.

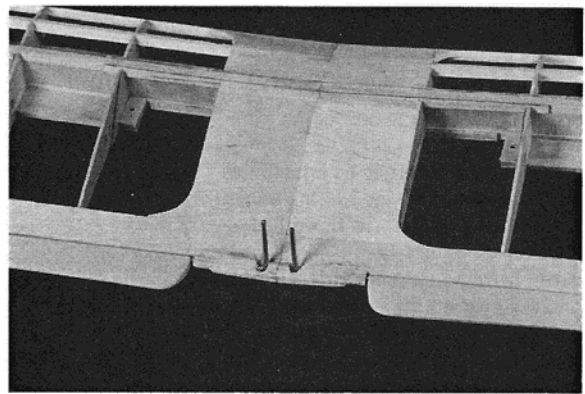
After the fuselage has been covered, paint a coat of epoxy on the firewall and cowl area and overlap the seams in the covering in these areas. Cut the covering away from the stab cut-out and cut a notch in the fuselage top covering to accept the rudder. Epoxy the stab and rudder in place.

Bend the main gear from 3/32" music wire and, if a coil bender is available, bend the nose gear from the same wire, otherwise it can be purchased. Attach the main gear to the gear mounts in the wing with mounting straps and small wood screws. Drill the engine mount to accept the nose gear, and bolt it to the firewall. Drill a hole in the bottom of the cowl to clear the nose gear.

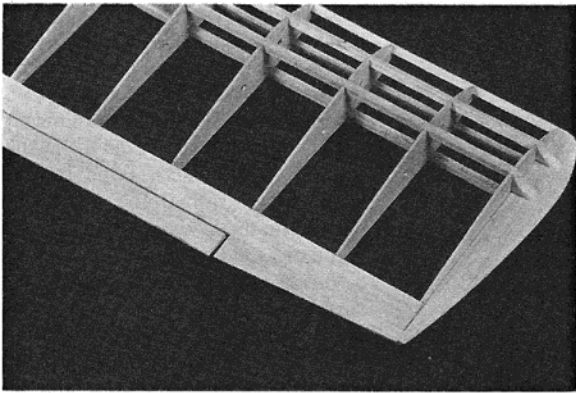




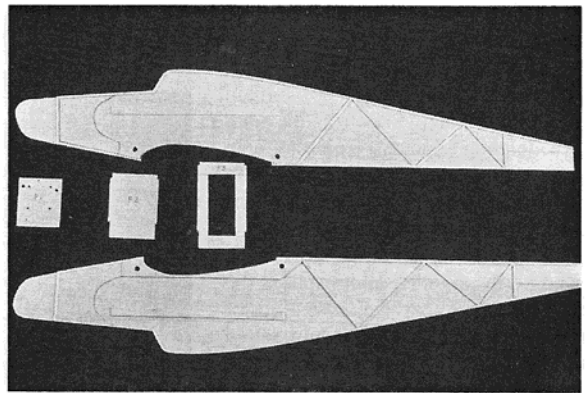
The four center ribs are trimmed at the spar notch to receive the dihedral braces.



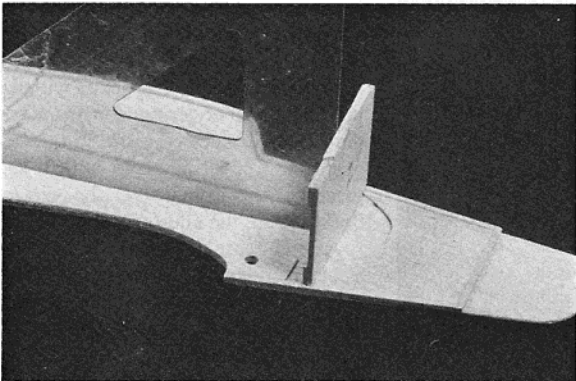
Balsa fairings added to torque rod bearings, don't attach ailerons until all surfaces are covered.



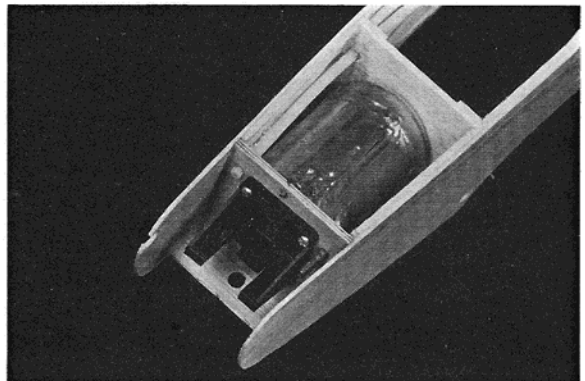
Wing tip is made from cut-out in fuselage sides. Aileron tip is glued to trailing edge to complete wing.



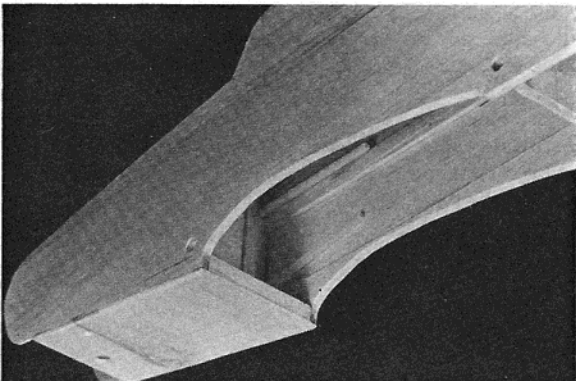
Fuselage sides with doublers, longerons and uprights ready for assembly.



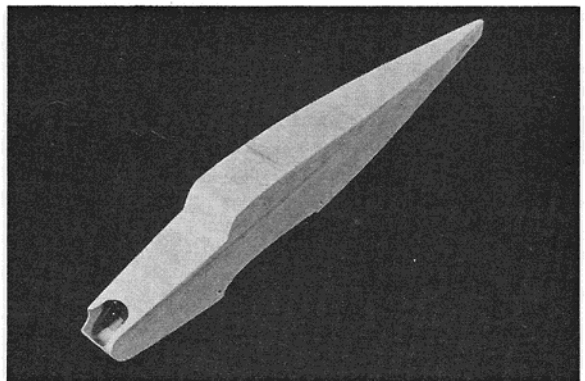
A builder's square assures vertical alignment of formers on fuselage side. Use the square to assure alignment when putting fuselage sides together.



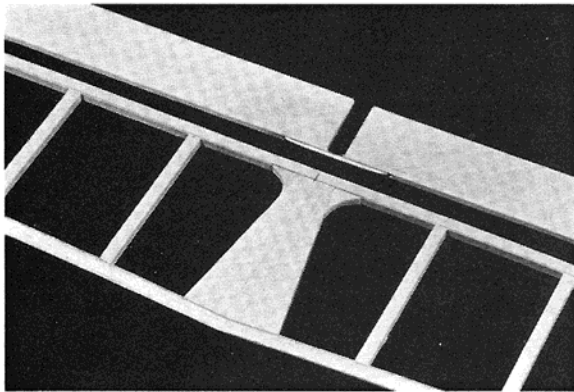
Firewall, engine mount, tank, fuel line and throttle line installed. Snuff can be used as tank in original.



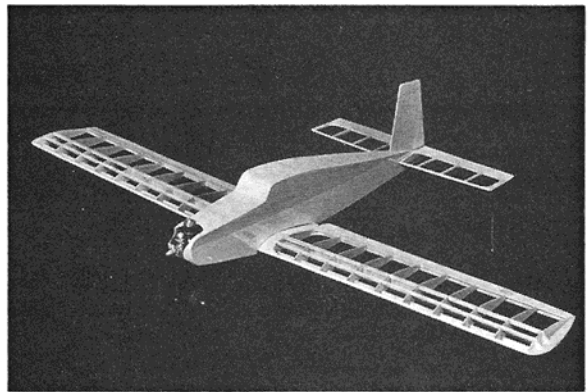
Nyrod used for throttle line and nosegear steering, installed.



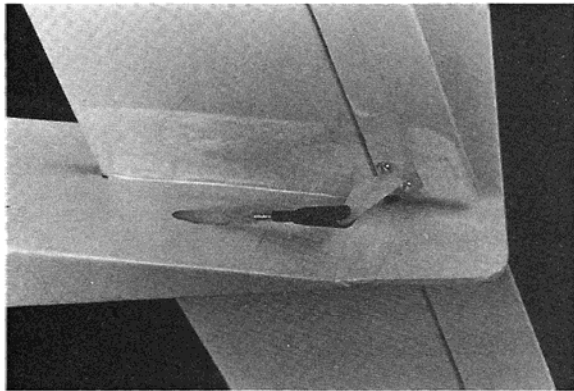
Completed fuselage with engine cut-out and final sanding finished.



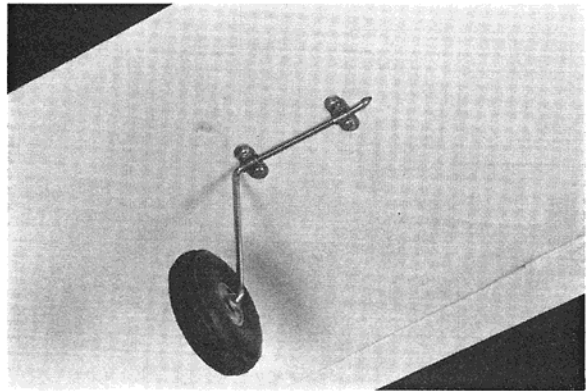
Music wire used as elevator joiner is installed prior to cutting rudder notch in elevator. This view shows completed elevator and stab assembly.



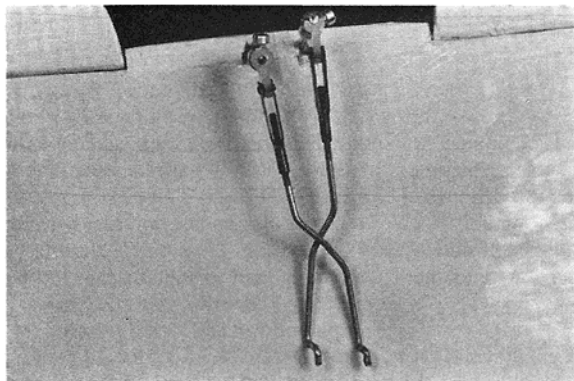
Bare bones Marooney ready to be covered.



Elevator NyRod and horn installation.



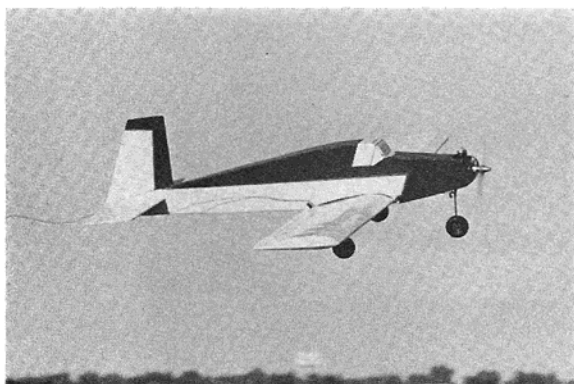
Main gear mounting detail.



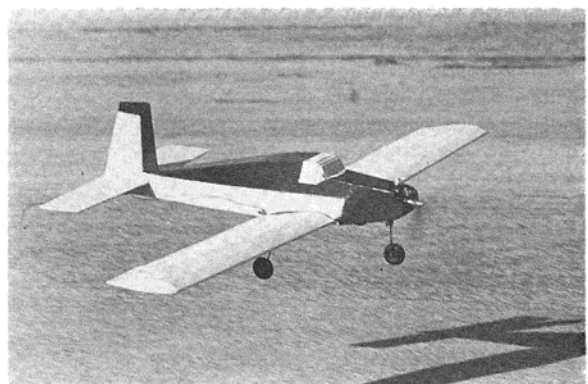
Aileron pushrods and hardware. Rods are crossed to accommodate standard rotation servo and nosewheel steering.



Radio installation, batteries are in front of throttle servo and receiver is aft of aileron and elevator servos.



Marooney makes a slow fly-by. Look at the fun you can have.



Marooney settles in for a touch-down.

Slip a steering arm on the gear along with a wheel collar and slide it into the holes in the engine mount; anchor it with another wheel collar above the mount. Position the two wheel collars as shown and mount the engine and wheels.

The radio is mounted on 1/8" plywood trays with the batteries in front of the wing and the receiver aft of the servos. Install the inner NyRod from the elevator servo to the elevator and mount a horn on the elevator in the proper location. Use a clevis to link the elevator to the NyRod. Insert a piece of florist wire (soft iron wire) into the throttle NyRod. Attach it to the servo with a Z bend and, where it exits the firewall, bend it up and into the hole in the throttle sleeve. Retard the throttle and anchor the ring on the sleeve with a pair of pliers and turn the sleeve until it just closes the exhaust ports on the engine. When the throttle is advanced the sleeve should open the ports to maximum. Attach a fuel line.

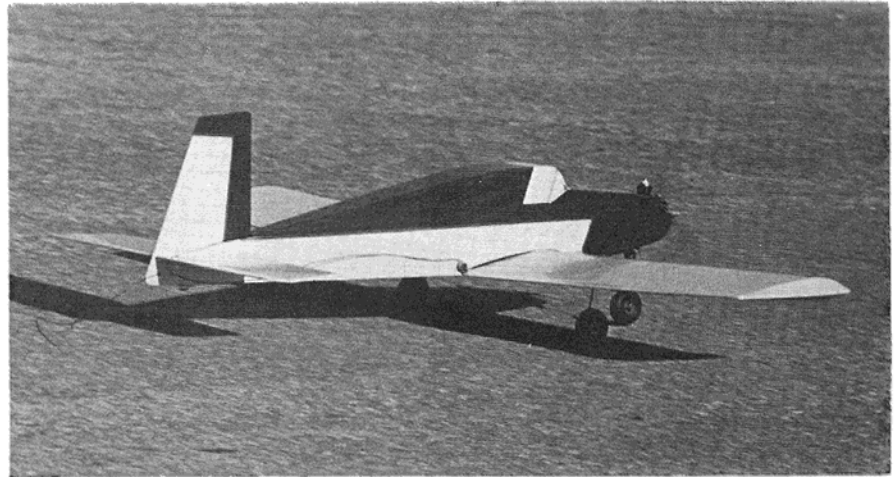
Install wing saddle tape to the wing saddle in the fuselage. Bend the aileron pushrods as shown on the plans. Use standard hardware from the torque rods through the clevises to the pushrods. **The pushrods must be crossed for proper aileron action with standard servos.** Insert the Z bends into the servo arm and place the wing in its saddle; adjust the clevises until the ailerons are neutral when the servo is centered. Make sure the ailerons

move in the right direction upon command. Mount an E-Z Connector in the inside hole of the aileron servo arm and run a piece of .040 steel wire from the nose gear steering arm through the NyRod and into the connector. Center the nosewheel and tighten the connector. Epoxy the tail skid in place, check the C.G. location, and the airplane is ready to fly.

Flying:

Run the engine and check the idle. It should be slow enough for the airplane to remain still, and go easily to full speed when the throttle is advanced. Now for something different with a 1/2A --- taxi out to the

take-off spot, advance the throttle and take-off. Marooney will not fly off by itself, it will require back stick, and remember this is not a hot-shot's airplane so climb out at a nice steady angle. The ailerons are effective but not quick and the airplane is a delight to fly. Landings are a cinch, throttle back all the way and come on in, you will be surprised at how you have to slow the airplane down and at the high angle of attack at touch-down. It's just like they do it downtown. Use forward stick to get good steering on the ground and remember with three channels the ailerons steer the airplane on the ground as well as in the air. □



**Editing By Hlsat.
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