

MONGOOSE II40

By Harold & Tracy Ackeret



**If you haven't tried a
taildragger, the
Mongoose II 40 is a good
place to start.**

The original Mongoose II was designed as a 60 pattern ship, see RCM March 1983. The 60 was designed because we saw a need in pattern for a ship which could do all the necessary maneuvers without a lot of speed plus one which was easy to build and didn't need a big hot 60 with tuned pipe and all the fancy goodies normally associated with a pattern ship. The Mongoose II we believed filled that void. It flies great and does all the required maneuvers gently and without a lot of speed. It is light in comparison to most pattern ships and weighs in around 8 pounds. Plus it was built around a fixed gear and a taildragger so no need to hassle with retracts. The novice flier has enough to contend with and shouldn't have to fight retract problems also. And, of course, it costs less because any good 60 engine is enough, no retracts or tuned pipe, so a novice can get started a little easier.

Due to the cost of fuel we then saw a need for a good 40 size pattern ship. As the Mongoose II was such a great ship, we decided that the best approach was to turn it into a 40 ship also. Well, the Mongoose II 40 retains all the great aspects of the 60, and burns a lot less fuel. It flies great and does all the maneuvers without a lot of speed and doesn't need a pipe or retracts to be competitive.

Don't fly pattern, but would like a great sport 40 ship? Well the Mongoose II 40 is for you also. Not sure about taildraggers? If you haven't tried a taildragger, the Mongoose II 40 is a good place to start. You will find it is easy to handle on take-offs and in the air. You have a choice of lifting the tail off before take-off or the tail will stay down and just lift off all three gears at once, and no need to pull back on the elevator, it just lifts off nice and easy when it is ready to fly.

With proper wood selection and building technique you will have no problem keeping the weight to around 5½ pounds. Due to this, any good 40 engine will do a good job. We have used the Fox 40 BB Schnuerle and it really performs fantastic in the

Mongoose II 40. If you want an excellent engine without a big price tag, give the Fox engines a try.

Another nice thing about the Fox engines — if you need parts or service they are easy to obtain. The personnel at Fox are some of the most cooperative and dedicated people we have dealt with.

So you say, this is the plane for me, so let's start building.

CONSTRUCTION

First as with any airplane, take some time just studying the plans, before even cutting any wood. Some of the items to note: We have provided templates for all major parts, on a separate sheet, so you don't have to cut up the main drawing to get good templates. Study the simple construction.

Check out how the tail wheel and rudder work. The tail wheel is controlled by a separate pushrod, so when the rudder deflects fully the tail wheel only moves a small amount, which gives great ground handling, and makes take-offs very smooth. If you should want more tail wheel movement it is easy to change, just reposition the reduction arm.

Check how all formers, etc., fit into the plane, how the top sheet fits, and really give the plans a good going over. As you go along you will find it relatively simple construction. You will note we have provided the templates of the tail section as a complete drawing. Cut the complete drawing out, glue to some sort of construction cardboard (we use 3M 77 spray contact cement). Now cut the individual templates from the complete drawing, this way you will ensure every part will fit properly. After all templates are cut out you are ready to start cutting wood. You will note you must splice a couple small pieces to the 3/16" x 4" x 48" to make the fuselage sides, you can cut this from the excess length of the sides. If you cut out all your parts now, you won't need to stop construction to cut out later.

Be sure the front of the fuselage sides are square with the top "0" degrees for the engine. I recommend you cut the complete horizontal stab from only two pieces of 1/4" x 3", the leading edge piece being medium to hard. Later we will join the two pieces together and then cut in half to add the anhedral. By using only two pieces of balsa, the weight of both halves should be about the same, and it is much easier than using four pieces to make

ABOUT THE AUTHORS

Harold and Tracy (father and son) started flying R/C in 1976. They have always been avid fans of tail draggers and pattern is no exception.

Harold, originally from Ohio, came to California from St. Louis. He is employed by McDonnell Aircraft as a Lead Engineer, Flight Test Data Lab, Maintenance, at Edwards Air Force Base. He and his wife, Nancy, own and operate H & N Electronics, which markets electronic gear for modelers. For the most part, Harold flies sailplanes which are natural in the high desert where he lives.

Tracy is a recent graduate of Spartan School of Aeronautics in Tulsa, Oklahoma, and is presently employed by Computer Sciences Corp., as an Electronics Technician at Edwards Air Force Base, Ridley Mission Center. He is not only an R/C pilot but also flies full size sailplanes, which he says is the world's greatest high. Tracy is the R/C test pilot of the pair and does all the test flying and evaluation while Harold does most of the designing and building.

MONGOOSE II 40

Designed By:

Harold & Tracy Ackeret

TYPE AIRCRAFT

Pattern/Sport

WINGSPAN

58 Inches

WING CHORD

9¾" (Avg.)

TOTAL WING AREA

565 Sq. In.

WING LOCATION

Low Wing

AIRFOIL

Symmetrical

WING PLANFORM

Swept L.E.

DIHEDRAL EACH TIP

15/16"

O.A. FUSELAGE LENGTH

50½ Inches

RADIO COMPARTMENT SIZE

(L) 11" X (W) 2½" X (H) 3"

STABILIZER SPAN

24½ Inches

STABILIZER CHORD (incl. elev.)

6¾" (Avg.)

STABILIZER AREA

166 Sq. In.

STAB AIRFOIL SECTION

Flat

STABILIZER LOCATION

Mid Fuselage

VERTICAL FIN HEIGHT

6¾ Inches

VERTICAL FIN WIDTH (incl. rud.)

5⅞" (Avg.)

REC. ENGINE SIZE

.40-.45 Cu. In.

FUEL TANK SIZE

8 Oz.

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

4

CONTROL FUNCTIONS

Rud., Elev., Ail., Throt.

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa, Ply & Basswood

Wing Foam, Balsa & Ply

Empennage Balsa, Ply & Basswood

Wt. Ready To Fly 84-96 Oz.

Wing Loading 21.4-24.5 Oz./Sq. Ft.



the stab. We'll break the construction down into major components, i.e., fuselage, wing, stabs, etc. This will enable you to jump around during construction. Throughout construction we will assume you have already cut out all parts. Be sure and glue on a flat surface when splicing parts together.

Fuselage:

Before starting, make sure both fuselage sides are identical. Measure back 1/4" from front edge (firewall) and make a line parallel to edge. Glue the 1/4" x 1/2" top stringer in place with Hot Stuff, starting at the line you just made on the sides. Be sure you make a left and right side. During construction you will find we use a lot of Hot Stuff. It has been our experience that Hot Stuff for practically the whole plane, makes for an exceptionally strong airplane, plus saves a lot of weight and speeds up the building process. Hot Stuff and Hot Shot makes a very good filler where parts do not mate properly. And, Super T and Hot Shot works well for those larger gaps. Locate the nose doublers and position per plans. Using Super T, glue the nose doublers in place. Position wing saddle doublers in place, using the wing bulkhead to obtain correct spacing between the nose doublers and wing saddle doublers. Glue the wing saddle doublers in place with Super T. We have tried many glues for doublers but Super T really works great and it is fast.

Using 1/4" x 1/4" balsa, glue the lower stringers to the fuselage side(s), starting 1 3/4" back from back edge of where wing ends. We have not made

templates for stringers, etc., just cut to size as needed. Lay fuselage side(s) on drawing and mark position of vertical stiffeners. Cut stiffeners and glue in place with Hot Stuff. Cut out first three on each side to go over wing saddle doublers.

Mark position of wing bulkhead on one fuselage side, directly behind nose doubler. Make sure bulkhead is square with side and Super T in place. Turn so fuselage is upside down, apply Super T to exposed edge of bulkhead and glue to opposite fuselage side, making sure both sides are square with bulkhead. It is very important on the next steps to assure the fuselage is straight and true. If you use a fuselage jig you should have no problems. If you do not have a jig you must make sure everything is squared up some other way. We draw a line on our building board, longer than fuselage sides. Then, draw another line parallel to the first, the width of fuselage apart. Next, draw a line down the center of these lines. Place fuselage upside down on lines, put waxed paper between fuselage and board, pin in place. Join the sides together at tail, sand stringers to form a V at tail, check drawing for proper width at tail. When you are sure of angle and everything lines up on the centerline, Hot Stuff together at tail. Cut the first four top braces, 1/4" square, starting at wing bulkhead to length, these are all the same size and square with fuselage sides. Hot Stuff in place 2nd, 3rd, and 4th braces, making sure you keep fuselage in line. The number one brace you will install later, after you install firewall, since it is located over the wing bulkhead.

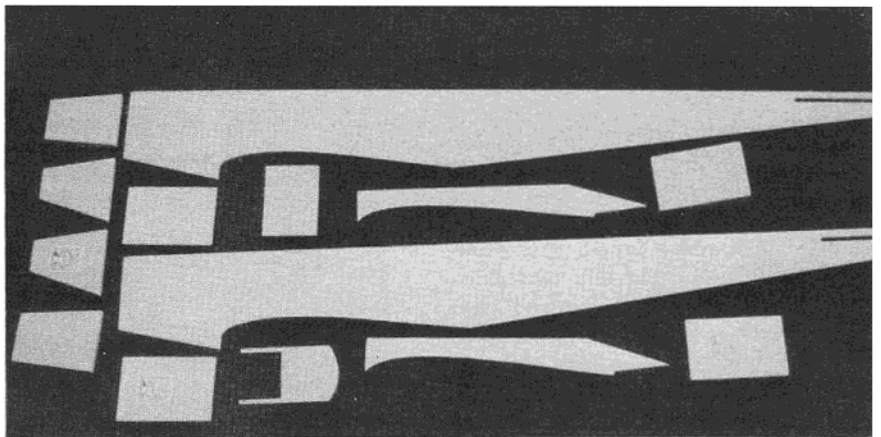
Starting behind wing saddle, glue first cross-grain bottom sheet in place, note the first is 1/4" x 1 3/4" and fits inside the wing saddle doubler cut-outs. Sand this piece flat with bottom of fuselage. Position 1st 3/32" x 3" cross piece in place over the 1/4" you just installed, do not glue. Now position the next piece of 3/32" in place and Hot Stuff. Continue gluing the remainder of bottom pieces in place. Note the last piece on bottom is 3/32" plywood.

Next install the firewall, but first you should drill holes and install blind nuts for your engine. We recommend you use the Fox aluminum engine mount. The Fox mount taps very well and the holes will not strip out after a few engine removals. You will find you have to round off the top tip of the mount to accommodate the cowling. Firewall template shows engine centerline, work from this point when installing engine.

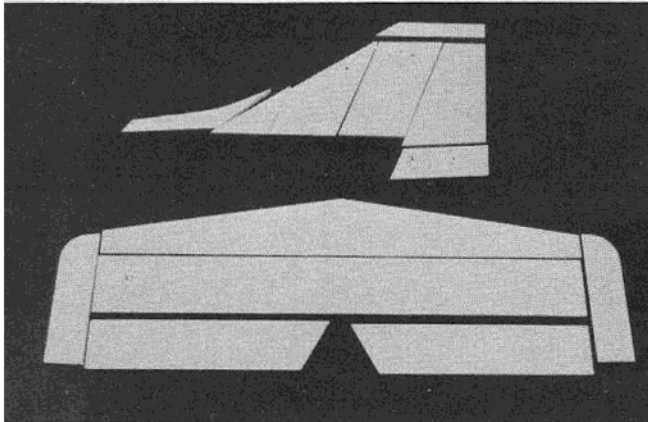
Align fuselage to lines on board and Super T firewall in place, be sure everything remains square. Remove from board, turn over and install remaining top braces, including number one, the remaining braces need to be tapered ends to fit curve of fuselage. Hot Stuff 1/2" triangle firewall braces in place behind firewall. Now is a good time to drill holes for your throttle cable. Fit tank floor in place and Hot Stuff floor and triangle floor braces in place. We have found the Kraft 8 ounce Slim Line tanks work best in this installation. Before you install the fuselage top block, you want to coat the tank compartment using a good sealer. We use Devcon 5-Minute epoxy thinned

down with dope thinner or MEK, so you can brush it on. Be sure and cover the inside of the top block. Using Super T, glue top block in place.

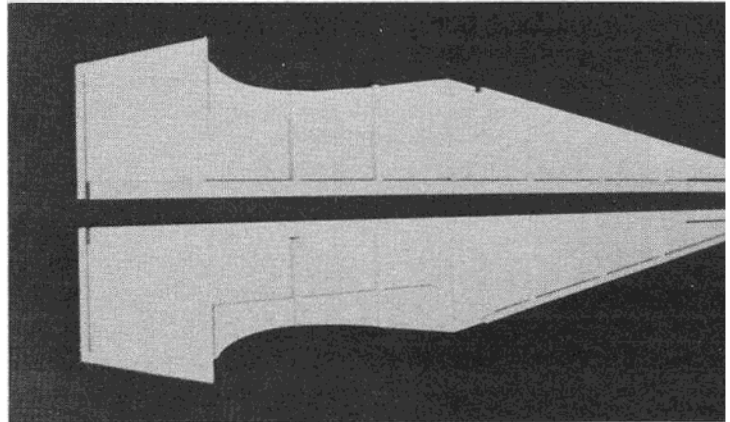
Glue the fuselage formers F1 through F6 in place with Hot Stuff. Fabricate the nose cowl from the parts cut-out, using Hot Stuff. Note the sides fit inside the top and bottom pieces. Hot Stuff the 1/2" triangle pieces inside the cowl with Super T. After sanding back of cowl, check fit to fuselage, with engine mount on firewall. Now is a good time to drill



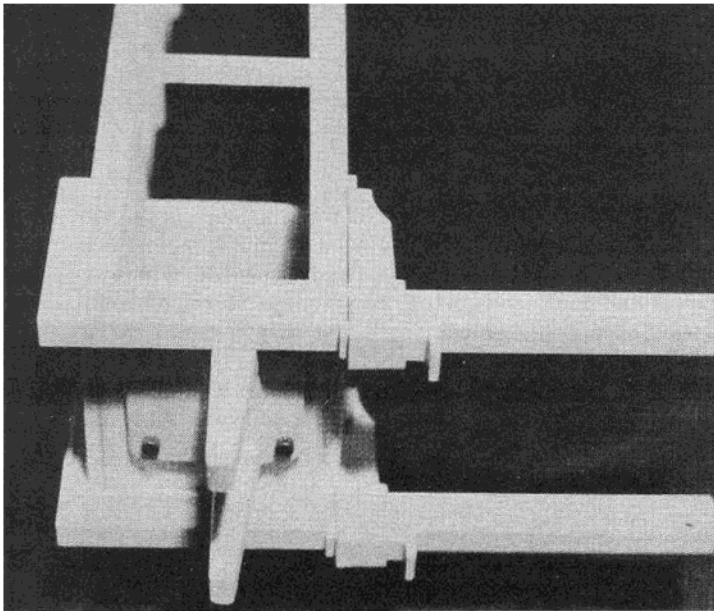
Fuselage parts all complete.



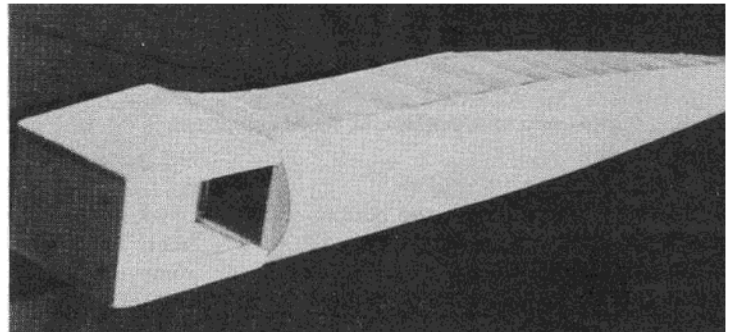
Tailfeathers all cut out.



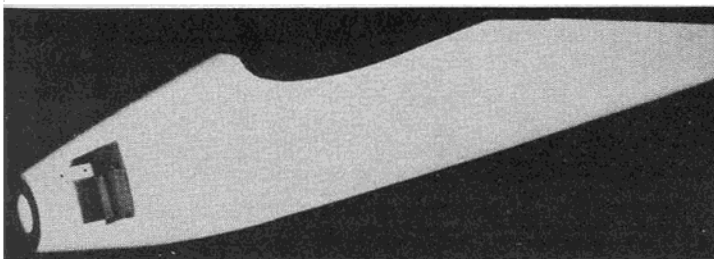
Fuselage sides complete.



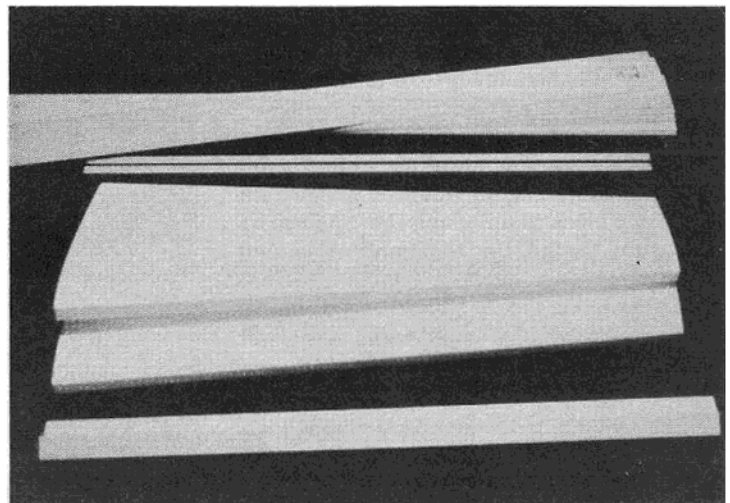
Gluing firewall in place.



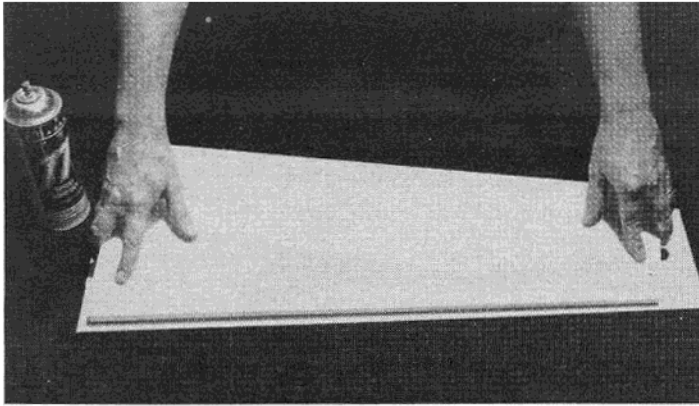
Top sheet in place, glued and held in place with masking tape.



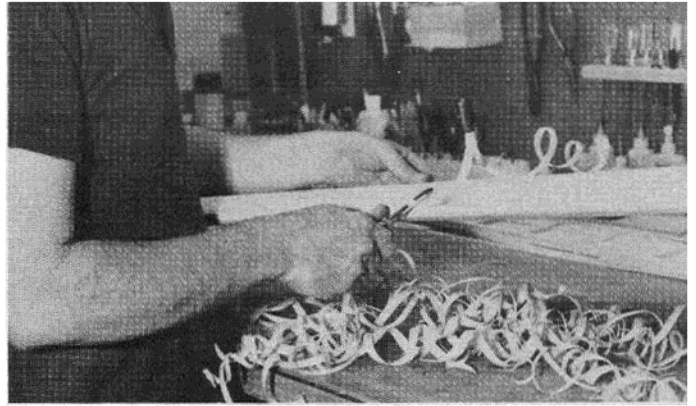
Fuselage carved and sanded to shape.



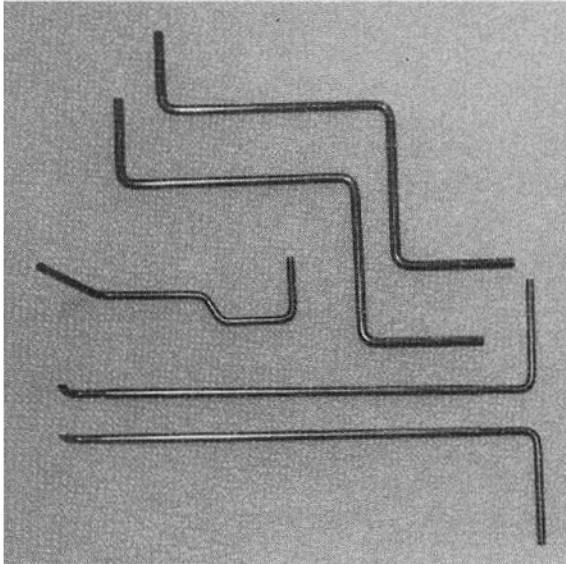
Wing parts ready to start.



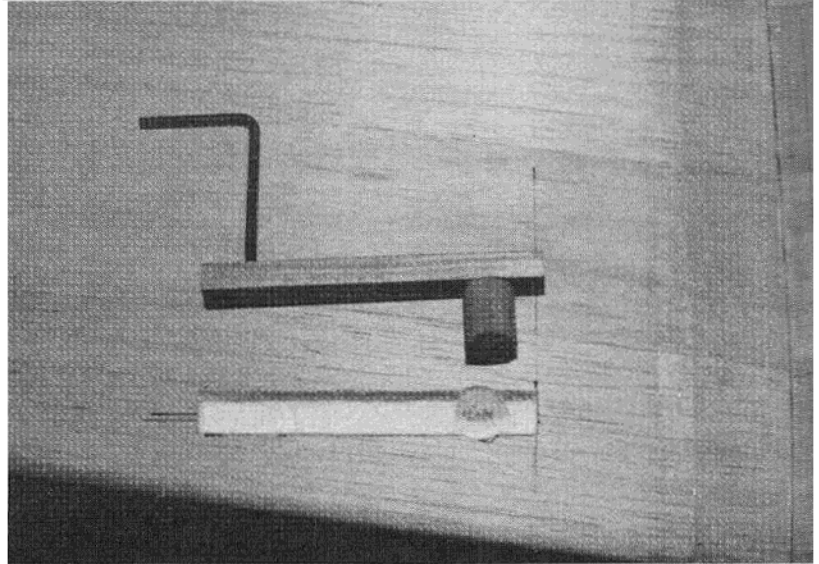
Sheeting wing with 1/16" balsa.



Wing completed and carving leading edge with vegetable peeler, it works great.



Gear wires and aileron torque tubes completed.



Installing gear in wing.

your drain hole in the bottom of the cowl.

Draw two lines, one 3/4" and one 1 1/4" down, use a felt tip pen, so not to groove wood, parallel to top of fuselage. The 1 1/4" line will be necessary when you install wing and stab, as the 1 1/4" line will be the "0" degree of the fuselage. And, since you will be sanding top to fit top sheet, you will lose the "0" degree line, which is the top of the fuselage sides. Using a plane and/or sanding block, sand fuselage forming chamfered edge from top block to tail using the top formers and the 3/4" line as a guide. Also sand F1 through F6 to proper slope to accept top sheet, front to back. Using a light to medium 1/8" x 36" balsa sheet, wet the entire sheet with warm water, or if you don't mind the odor use ammonia, the household kind. We personally have found the ammonia works best.

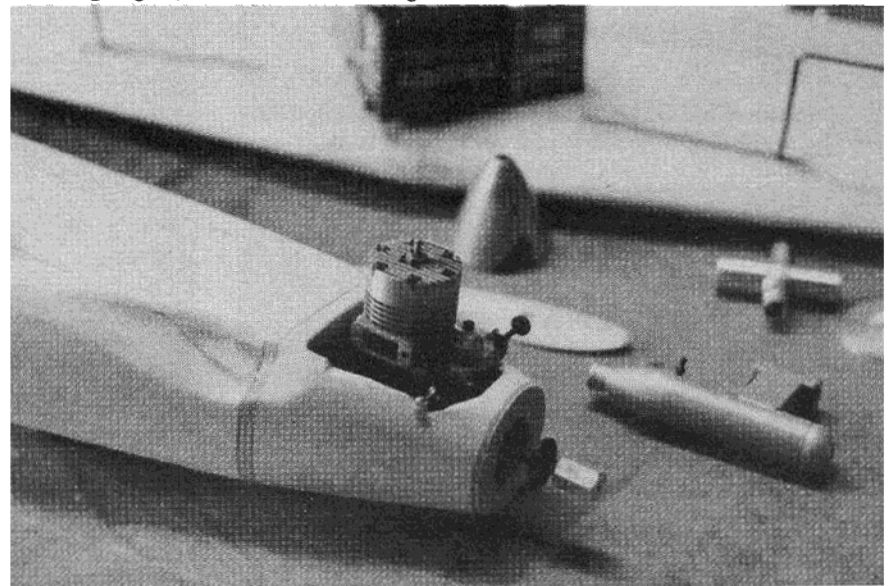
Apply a film of white glue to formers along the entire length of fuselage sides, chamfered edge. Place top sheet in place and hold in place with

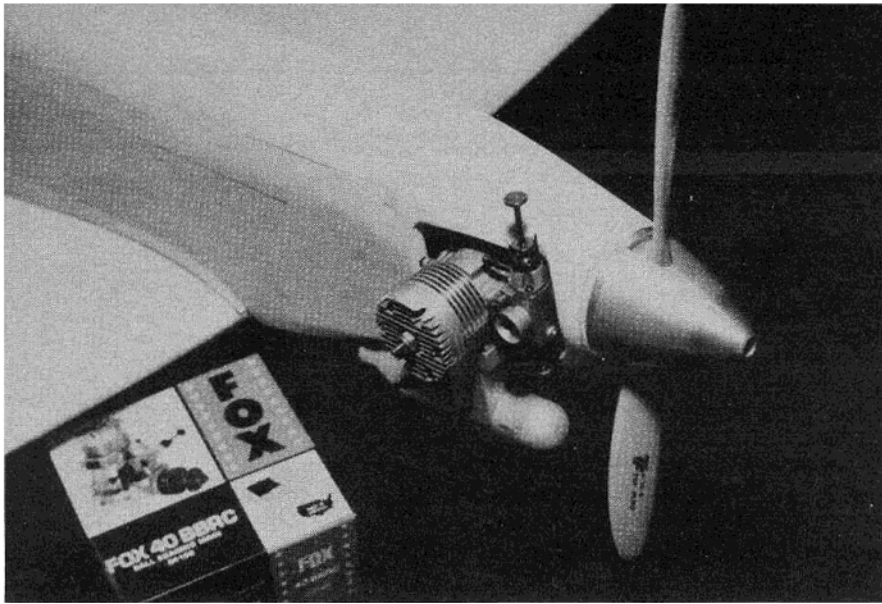
masking tape (don't tape so tight it dents the wood) until dry. When dry remove tape and trim sheet to sides of fuselage. If you are careful and don't work too slow you can use Super T to glue the top sheet in place.

Install filler block in bottom of nose section. Make this block from light

balsa. The reason this block is needed is because a lot of mufflers will not clear the fuselage side without carving away some of the bottom block. In doing so you could carve completely through the bottom block. So, by adding this filler block you can carve away a lot of wood to make

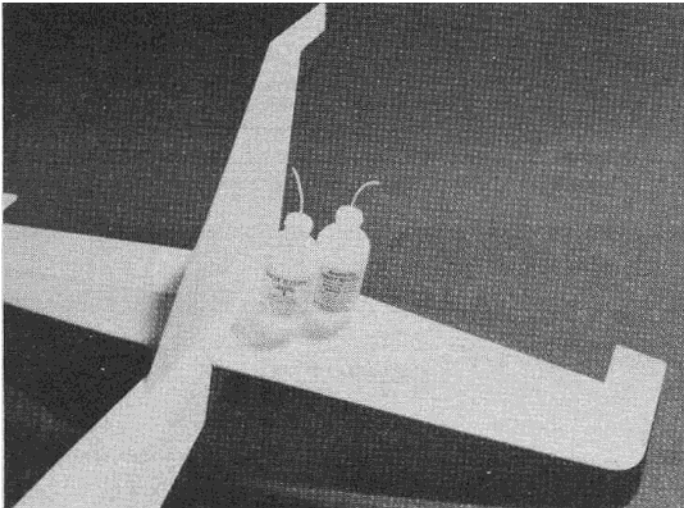
Installing engine, note cut out in fuselage to clear muffler.



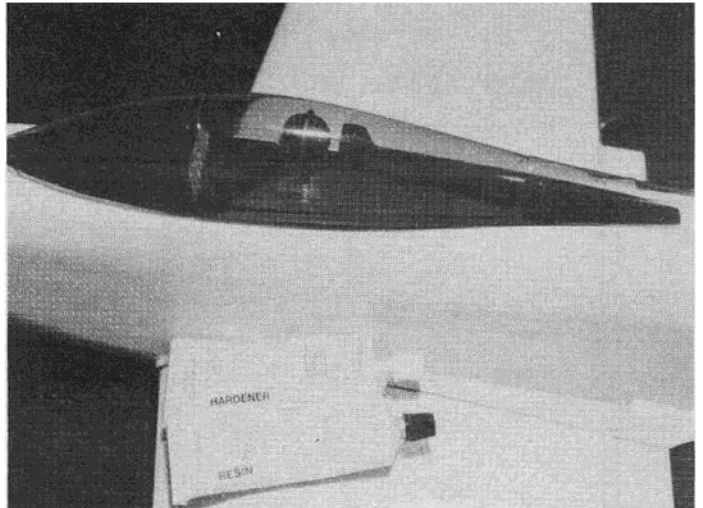


Completed engine and spinner installation.

cowl (where nose ring fits), and engine position. Sand as required to obtain clearance and alignment needed for the 1/16" nose ring. If for some reason the cowl is too short to give a good fit, increase nose ring thickness as necessary. Draw a line around nose ring when sure of fit. Remove spinner and engine. Super T nose ring in place. Using X-Acto knives and sanding blocks, 80 to 120 grit, shape fuselage to shape and contour as shown on drawing. You will find you need to carve off a lot of wood in shaping, particularly around nose section, but you must cut off to shape properly. After shaping, check engine and spinner fit, if all is okay, remove cowl and Super T permanently in



Installing tail feathers with Hot Stuff.



Ready to install canopy.

muffler fit. See photo. After filler block is installed, complete by installing the bottom block.

Tack cowl in place with Hot Stuff. Cut a large hole in center of right cowl

and gradually enlarge size of hole to accommodate engine installation and removal. Temporarily install engine and CB spinner and backplate on engine and check alignment of nose

place. After shaping, sand with 320 grit and finish with 400 for a nice smooth finish.

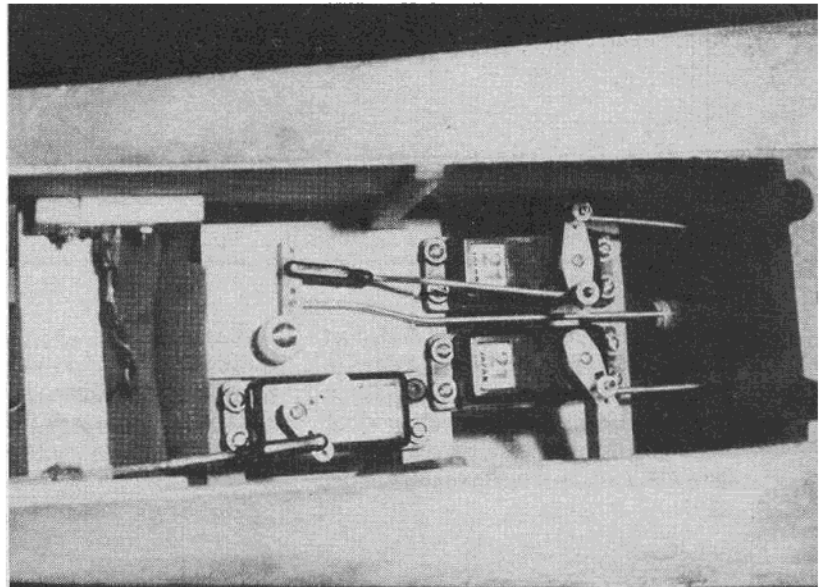
Wing:

If you cut your own foam wing cores,

Installing bottom wing fillet, note plastic bottles for wing bolts.



Servo installation, note tail wheel reduction.



From Page 29

tip and root templates are included on drawing. If you wish, Wing Mfg. Co. has foam cores available. Use Dirty Birdy 40 cores and modify leading edge per drawings. I use the Wing Mfg. Co. cores as they have some of the best available.

First of all, lightly sand your cores using 240 grit paper; do not sand too hard or the foam will flake out. After sanding, replace the cores in the block and set aside for now. I will assume you have already cut your wing tips. Select six sheets of 1/16" x 3" x 36" balsa, light to medium. The way we sheet a wing is use a medium leading edge, then light, then medium trailing edge — this gives strength and lightness. Take each sheet and trim the edge so all edges are straight and will join the next sheet nice and straight. After trimming each sheet, lay the six sheets out in the following manner — medium, light, medium, medium, light, and medium. Now make sure every sheet joins the next properly. If everything lines up okay we are ready to glue them together. I have tried a lot of glues for this but CA glue works best. Place waxpaper on your bench and place first (medium) and second (light) sheet on paper, butt together and join with Hot Stuff. Turn over and make sure other side is glued okay. If so, turn back over and now Hot Stuff next sheet (medium) to the others. Continue joining each sheet to the group until you have all six sheets joined. You should now have one large 1/16" x 18" x 36" sheet. These six sheets are enough to cover one wing panel, both sides, so you will need two of them. After completing both sheets, lay the cores onto one of them, to see where you must make a diagonal cut to form two sheets — one for each side of the wing panel. Mark position of diagonal cut and cut sheet along this line.

Now you should have four sheets of covering. Put your cores back into the block so as not to damage them. Using 120 and 240 grit paper, sand each sheet, both sides to a nice smooth finish. After sanding, wipe and vacuum all dust from sheets. After vacuuming, use a tach rag and wipe all dust from sheets. You are now ready to apply the sheets to the wing core.

I have tried different glues for gluing sheeting to the foam but have found 3M 77 spray contact cement to work best. It goes on easy and is very thin, but very strong. **Do not use 3M 77N spray**, it will attack foam.

Even before you use 3M 77, check it on a small piece to make sure it will work okay.

When you are certain the glue will not attack your foam, take one wing panel and one balsa sheet and lay out

To Page 34

From Page 34 To 36

exit. You will find you need to slope the block to wing at front edge. Be sure and install the 3/4" hardwood dowel also. I glue the dowel and block together then fit into wing. Carve and sand block to shape and Devcon 5-Minute epoxy in place.

Next install your wing bolt bushings — we use fiberglass Arrowshafts, epoxied in place. Leave them sticking through the bottom of the wing about 1/2" (this is to accommodate for fillet on center front of wing). See drawing for location of bushings. Now install a 3" wide fiberglass tape to complete wing center section. I use 5-Minute epoxy thinned with MEK or dope thinner to hold tape in place. I cut out servo openings in wing and install hardwood servo rails with Devcon 5-Minute epoxy, then coat cut-out completely with epoxy also.

All that remains is to cover your wing, here I suggest Super MonoKote, it holds up great and is easy to install, and makes a much lighter wing than painting. I use a very, very light coat of Balsarite on the wing before applying MonoKote. If you use Balsarite in excess it could soak through the wood and attack foam core. When you finish covering the wing with Super MonoKote, cover the ailerons with MonoKote also. Take your time for a good finish. You can now attach the ailerons to the wing. Just a drop of Hot Stuff on each hinge will hold it in place. I Hot Stuff the hinge to the wing first, then fit aileron to this and finish by Hot Stuffing hinges on aileron side.

Install landing gear wires into wing. Cut a slot in MonoKote where gear is to fit into block, install gear wire and secure with straps. I recess my straps so I have a nice smooth contour. When gear is secure, cover area with a piece of MonoKote. Thus, if for some reason you must remove gear, all you need to do is remove the small piece of MonoKote over gear.

Horizontal Stab &

Vertical Stab & Rudder:

Join the two 1/4" x 3" pieces of the horizontal stab together with Hot

Stuff, make sure you use a medium to heavy piece for the leading edge, to insure strength. Install the stab tips on stab using Hot Stuff. Now cut the stab in half so you can add anhedral to it, see plans for proper amount and how to measure. Sand center section for correct angle and glue two halves together with Super T. Make sure you glue on a flat surface.

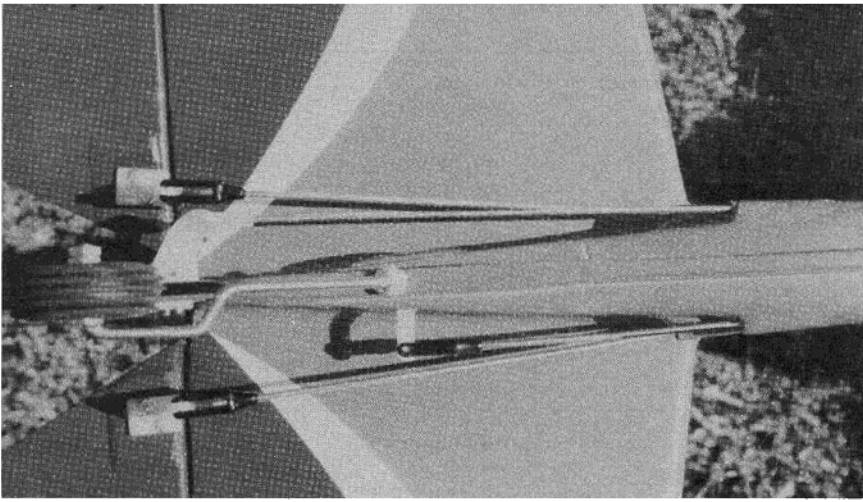
Glue two pieces of rudder together with Hot Stuff. You can make rudder from one piece if you wish. Now Hot Stuff the basswood sub-rudder to rudder. Lay three pieces of vertical stab on flat surface and Hot Stuff together. Be sure and keep everything square. Temporarily install rudder on stab. Sand stab and rudder to airfoil shape, do not sand down front too far since you will be joining the dorsal fin to stab later.

Assembly:

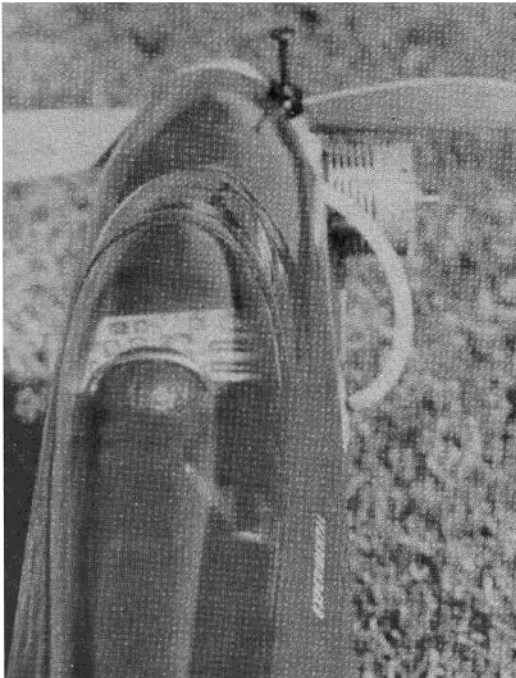
We shall assume that you have shaped and sanded all components to where you are ready for finishing, i.e., painting or covering. Weight is a critical factor in any plane, so to keep weight down we recommend covering the wing with Super MonoKote and painting the fuselage with K & B Super Pox.

Cut your wing hold-down blocks from hard maple or oak. Sand and shape as necessary to fit into fuselage, do not glue yet. Position wing on fuselage and check incidence, 0 degrees. If not correct, sand and shape wing saddle until it is correct. Square wing up on fuselage by measuring from wing tip to fuselage end. When you are sure of incidence and squareness put wing hold-down block in place and align with wing. When happy with fit, epoxy hold-down blocks in place. With wing in place and centered, mark and drill back hold-down block only, be sure you drill at correct angle. Tap the back hole for a 1/4" x 20 nylon wing bolt. Install wing and hold in place with back bolt. Make sure wing is square on fuselage & drill down through front bolt bushings into front block. Remove wing

To Page 37??



Bottom of tail section showing all linkage, note tail wheel steering.



Completed and ready, note instrument panel, makes it look great.

on newspaper. Make sure all dust has been removed from the sheeting and core before continuing. Once dust free, spray one side of the core and one side of the sheeting, make sure you spray the correct side of the sheeting to mate the core you spray. You will want the full 3" sheet at the leading edge of the wing. Let cement dry until it is very, very tacky. Lay the sheeting on a flat surface and, starting at the leading edge of the wing, gently roll the core onto the sheeting. Make sure leading edge and sheeting are lined up, because once the two are put together there is no turning back. Turn core over, with balsa side up and smooth down with your hand. Select another sheet of balsa and glue to other side in same manner. Now do the same with the other wing panel. Once all four sides are covered, trim some excess

sheeting from wings. It is not necessary to completely trim at this time.

Take the two panels and put them back into the block from which they were cut, make sure the block is square. Find a flat surface where you can lay the block, with covered cores inside. Now take some books or other heavy objects and lay on top of the block and leave set for about 24 hours. Just make sure your block is straight and square. This procedure will assure everything comes out nice and straight while the cement completely sets.

Remove wings from block and trim and sand all edges flush with foam. Select the leading and trailing edges and glue in place with white glue. Hold in place with masking tape until dry. Now glue on the wing tips with epoxy, but carve out tips to lighten before gluing. When everything has set up, sand and shape leading and trailing edges and tips to proper shapes. Now that both panels are

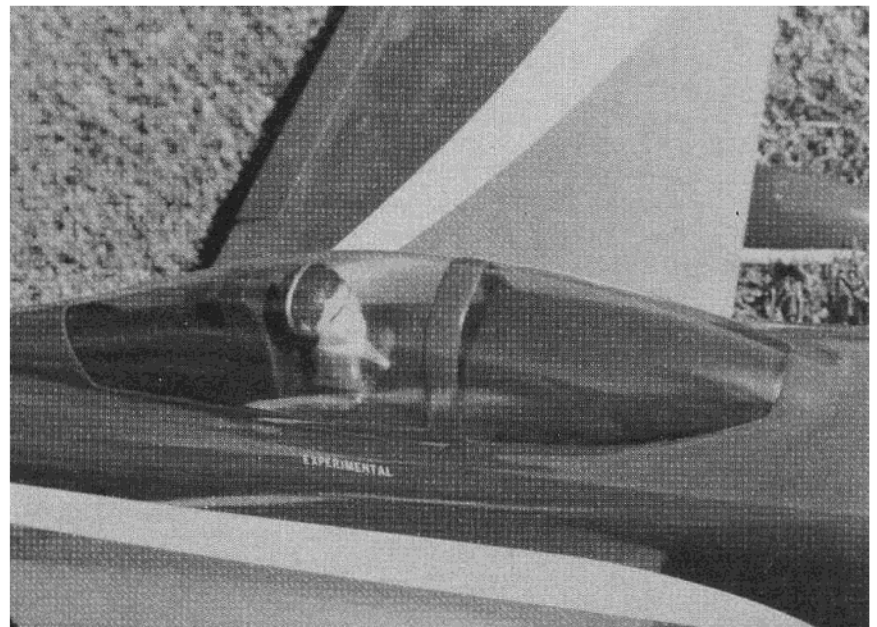
shaped, we will join the panel together. Sand the necessary dihedral into the center section. See drawing for proper amount and how to measure. When you are sure you have correct angle, epoxy the two halves together.

If you have not already done so, make up your aileron torque assemblies. Make sure you bend the torque rods at the correct angles, make a left and a right. Using your aileron stock cut the ailerons to size, use the remainder of stock for center section. Cut the back center sections to proper size and shape and install torque into center sections. I have found a piece of 1/8" brass tubing the best thing to use to carve out for the torque assemblies. Just sharpen one end of the tubing and use like a chisel to cut out the sections. Put a small dab of Vaseline on each rod where it enters the brass tubing, this keeps glue from getting into them. Epoxy the torque tube assembly and the section to the back of wing.

Sand the front of each aileron to proper slope for correct movement and temporarily install on wing with Rocket City Living Hinges. I have tried a lot of hinges but always return to Rocket City, they are easy to install and stay put. Just a small drop of Hot Stuff keeps them in place. And just a slot with an X-Acto knife is all that is needed to install them. Do not glue ailerons to wing at this time, we will install them after we cover the wing.

Next install the landing gear blocks. Locate position of blocks per drawing. Carve out wing to accept the blocks, make sure you install at correct angle. The gear should be at about a right angle to wing at spot of

A little time and effort really shows up when completed, it is worth the effort.



and if necessary increase size of holes and tap for 1/4" x 20 bolt. Reinstall wing and Hot Stuff the first bottom cross-grain sheet in place, shape as necessary to fit back of wing. Sand bottom sheeting to flare into back of wing. By putting in back bolt first, and assuring wing is centered when you do, then squaring before drilling front holes, your wing should be on nice and square.

Position horizontal stabilizer on fuselage and align with fuselage and wing tips. Prior to installing permanently, check for correct incidence, 0 degrees. When you are happy with alignment, tack in place with Hot Stuff. Now install vertical stab in place and align. Make sure it is vertical and straight. Align by using wing tips as a reference. Tack in place with Hot Stuff — when you have double checked all alignments, glue in place with Super T, fill any large gaps with scrap balsa, Hot Shot and Super T.

Remove wing and install plywood wing fillets. Install dorsal fin using Hot Stuff. Install ventral fin with Hot Stuff. **Note**, rear part of ventral fin is basswood for fitting tail wheel assembly, spray with Hot Shot before Hot Stuffing. All that remains is to make your fillets on wing and tail assembly. To keep tail light we recommend you fill in on the stab and fin bases with some scrap triangle balsa. Hot Stuff in place before applying fillets. We use Sears Filled Epoxy for our fillets. It is already mixed with a filler but we add a lot of micro-balloons to make it lighter yet. Keep smoothing fillets with a wet finger until you are happy with contour.

Cover top of wing, center section, with a plastic wrap, hold in place with masking tape. Reinstall wing on fuselage and hold in place with wing bolts. Using Sears Filled Epoxy and micro-balloons build up wing fillets. Here again you can fill some of the area with balsa before applying the fillets. Just build up your wing fillets using the base as a guide for size. Allow to dry overnight before removing wing. Install wing on fuselage, place plastic wrap between leading edge and fuselage, we now are going to build up wing bottom fillet to contour of fuselage. You should have left the wing bushings long in front. One at a time cut these down to proper length, we cut them down to about 1/4" below fuselage contour. Then take a small plastic bottle, a little bigger

diameter than the head of your wing bolts, drill a 1/4" hole in center bottom of bottle. Put wing bolts through hole in bottom so head is inside bottle, install screw back into wing. When you end up, the heads of the two forward wing bolts will be recessed into the fillet. We use the Sears Filled Epoxy here, with a lot of micro-balloons. When dry, sand to shape of fuselage. Cover wing with Super MonoKote.

We use the Wing Mfg. Sport Canopy with insert for the Mongoose II 40 because its lines blend well to the design, and it is a very fine canopy. Mark position of canopy on fuselage, install insert on fuselage. If you want, detail your cockpit before this time. We use instrument panel provided with the canopy, painting inside with a black wrinkle paint, with an appropriate sized pilot epoxied in place. We also have tinted our canopy with a blue dye, follow instructions with canopy. The way we shape our canopy is by taping 120 grit paper to the fuselage before installing insert. Then just place canopy on top of sanding paper and move back and forth until you get the necessary fit. You will note we have sanded the bottom of the canopy down quite a lot

Page 39 ??

to reduce overall height. After insert is glued in place cut and trim the canopy to fit contour of fuselage. Note canopy extends over dorsal fin. Hot Stuff, sparingly, around canopy edge. Bob Hunter at Satellite City told us how to keep canopy from fogging when using Hot Stuff, and it works. Just wipe a light film of 3 In 1 oil around the inside, bottom of canopy before Hot Stuffing. And if it should fog on outside, wipe right away with 3 In 1 oil. Using Sears Filled Epoxy and micro-balloons, build a fillet around canopy. If you take your time and smooth epoxy with a wet finger, you should have very little if any sanding when finished.

Install a very, very small fillet along the dorsal and ventral fins, just enough to cover glue line, no bigger. Using appropriate size wire, noted on plans, make your landing gears. You will note the main gear is left long so you can install wheel pants. The best wheel pants we have found, that blend well to the Mongoose II 40 is Williams Brothers 7" balloon pants. They are easy to use and very light and sturdy.

To mount the pants to the gear we use Fox flanged wheel collars. Drill out gear hole in pants 5/32", place Fox flanged collars inside of pants and drill through pants and then collars for a 4-40 screw tap. Remove collar and tap out holes 4-40. Install collars in pants and secure with two 4-40 screws. On side of pants opposite the collars we install a small hardwood block with Hot Stuff and Hot Shot, then after joining the pants we place a drill through gear hole and drill a 5/32" hole into the hardwood block on opposite side, be careful and don't drill on through pants. By doing this you have support on both sides of the pants for the gear wire. I also drill a small access hole in the pants for the Allen wrench to tighten up the collars onto the wire. Now that you have collars and block in both pants, join together with Hot Stuff. Check fit and alignment on gear.

Note how tail wheel is installed, using a 1/4" brass tube for bushing in fin. By using an Allied Hobbies steering reduction arm at the rudder servo (see photo and drawing) and a separate pushrod to the tail wheel, then you can set the throw of wheel for whatever you may need. This arrangement makes for a very good ground handling plane, since the rudder may deflect full but the tail wheel only moves a small amount.

Install rudder and elevators and make sure they deflect okay before gluing. When you install control horn on rudder you will find you must use a ball link on it — this is due to angles involved with rudder deflection. Just install control horn as normal but a little bit higher or lower than normal, then install a ball link on horn. Be sure and keep all surface hinge gaps to a minimum.

Fabricate your pushrods for rudder, elevator and tail wheel steering. We use 3/8" dowels for rudder and elevator and 1/4" for tail wheel steering. We do not recommend the use of fiberglass pushrods, since the fuselage is wood, and the expansion rate of fiberglass and wood is different, your plane could change trim with weather changes. The rudder and tail wheel pushrods are just straight with appropriate length of threaded rod on one end and just rod on the other. We make adjustments only at the surface and not at the servo. The servo ends are bent 90 degrees right into servo wheels. The elevator is single wire one end and V rod connection the other, the elevator is split and adjustable separately. The way we make our

pushrod exits is to cut a hole in fuselage at proper location, then put a short piece of nyrod, outer piece in hole and adjust for correct exit angle and hold in place with Super T. Then, build a streamline fillet around exit. This makes for a good exit and cuts down rod flex.

Radio Installation:

We have used a World Engines radio in the II 40 with S-21 servos, ball bearing type. We used both a Mark IV and Mark IX transmitter and both performed well.

The S-21 servos perform excellent in the II 40. They are a nice size and fit very well. We install our servos directly onto hardwood rails. Seems with servo trays the servos are not where you want them. There is a number of ways to install the tail wheel reduction arm, but after trial and error we found the system we used worked best. See sketch and photo. Since the elevator pushrod is split to each elevator, we keep it pretty much down the center of the fuselage. We keep the rudder off to the side so rod exits nicely. The pushrods cross in the fuselage which is no problem since exit heights are different.

Double check your servo installation and pushrod alignment, do not put any bends into the pushrods where they exit the fuselage. They will align okay without bends and are much stronger when not bent. We install the pushrods directly into the servo wheel and make adjustments at the surface. Be sure and install a keeper on the rod at the servo wheel. We used the H & N Electronics Ack-U-Tach / Pulse to align the two transmitters used so each would perform the same. With this one dual purpose instrument you can check your radio pulses, check servo for center, travel and linearity, plus check your engine rpm.

Finishing:

The difference between a model that just is, and one that really stands out, is the finish. It takes time and patience to put a nice paint job on a plane. First, sanding is very important. Be sure everything is nice and smooth before starting, and fill any dents also. Then prime everything, at least a couple of times. We prime, then wet sand, prime and wet sand, maybe four or five times before we are happy. We don't use any filler before priming, they are okay, but primer is good and usually cheaper.

Now comes what makes it really stand out — the finishing coats of paint. There are a lot of good paints but if you want something better than good, use K & B Super Poxxy paints. It goes on great and stands up to the everyday abuse we seem to give our models. We have painted planes five and six years ago with Super Poxxy and they look as good today as when painted. When you spray, the thing to remember is have the paint thin enough to spray properly. And don't try and cover in one coat, we spray in very, very thin coats and sometimes may take four or five coats to cover good. If you follow directions with the Super Poxxy you will end up with a beautiful finish and one that will take it all.

Make sure your muffler clears the fuselage before painting. Also coat the engine compartment with a good sealer.

Set-up and Flying:

Before you even taxi once, take some time and check all the surface throws, C.G., and balance. We suggest you start with the following surface throws: elevator 1/2" up and 5/8" down; rudder 1" both sides; ailerons 1/4" up and 3/16" down. You will note we use differential ailerons and elevator, we believe this is necessary for smooth flying.

Double check your C.G. and balance and make sure you don't have a heavy wing tip; if so, epoxy a nail in the opposite wing tip to balance. You should have no surprises as far as flying the Mongoose II 40. If you haven't flown a tail dragger, spend some time just taxiing and making speed runs before taking off. Take-offs should pose no problems, you will find it just lifts off when it reaches flying speed. If you are not sure how to trim your Mongoose II 40, we suggest you consult someone who knows, or get a book on the subject. We will not go into trimming because a lot of good books have been written on the subject. But trim is very important to make a ship fly great and not just fly. So do take time and trim properly.

Enjoy your Mongoose II 40 and safe and happy flying. □