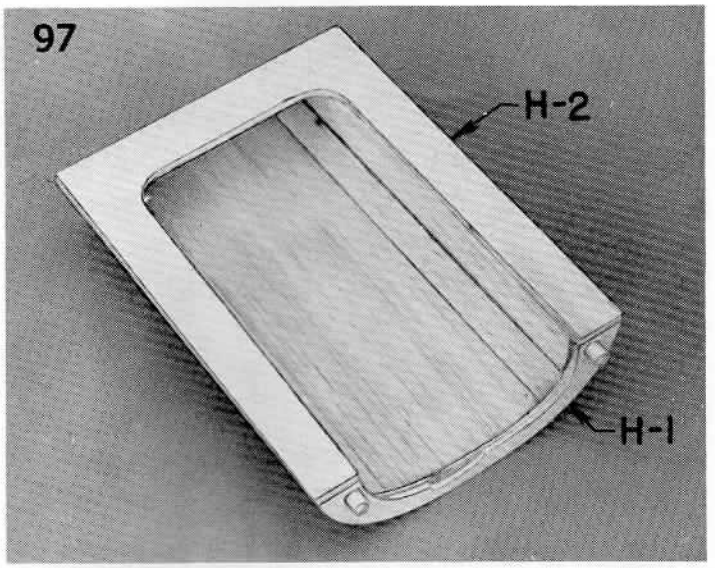
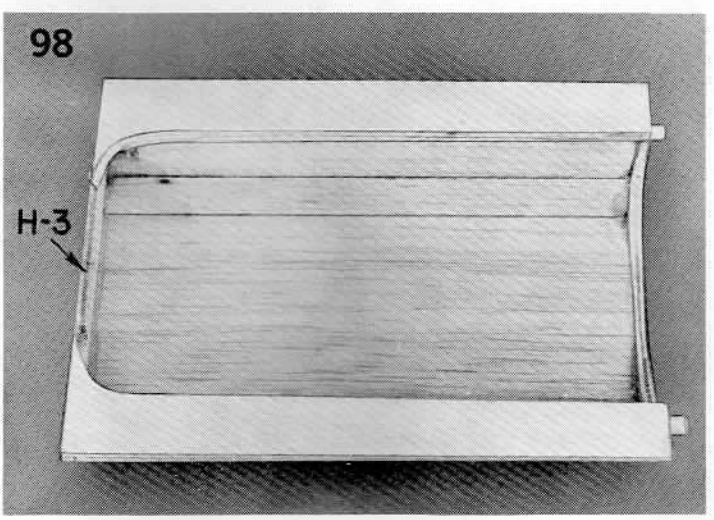
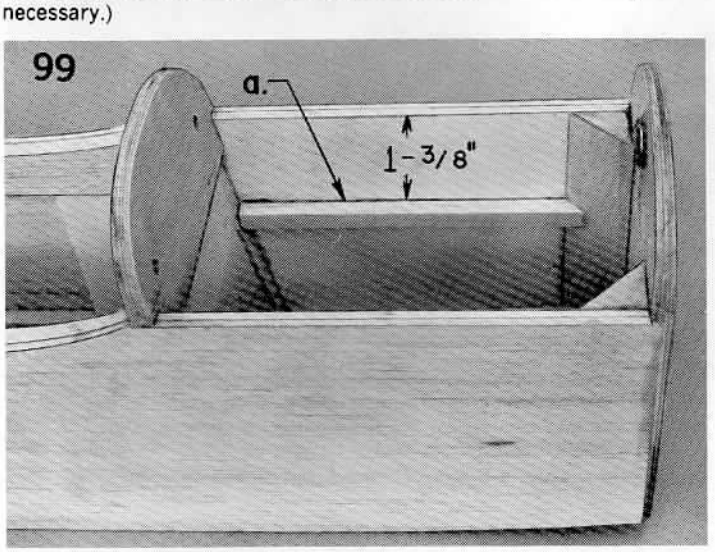


97. As assembled from the kit parts, the hatch is intended for use with a Sullivan RST 10 oz. tank.

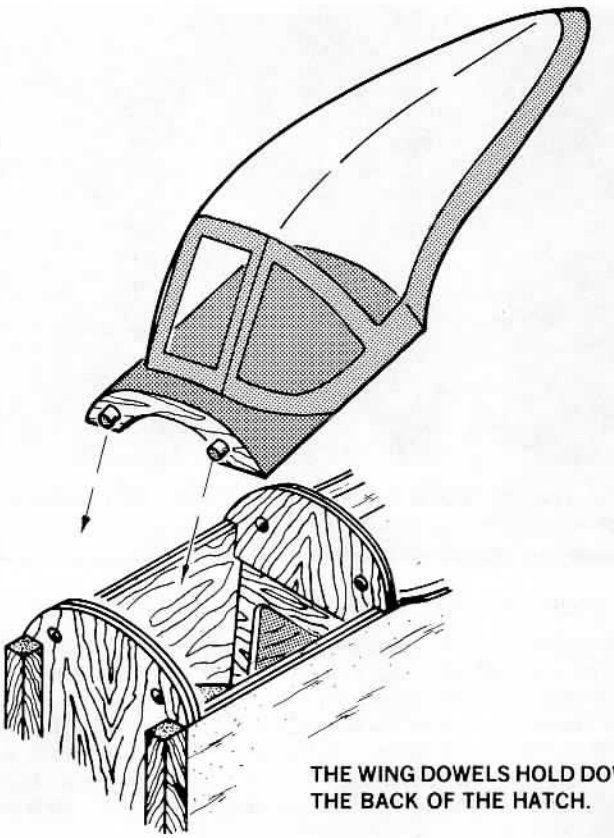


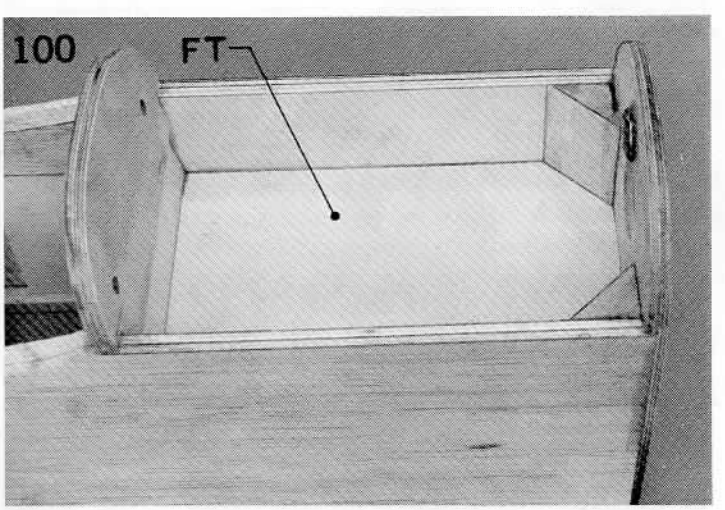
98. To use a 12 oz. tank Sullivan RST tank, the hatch must be modified as shown, cutting away the back to make room for the longer tank. (The 12 oz. has the same cross section as the 10, so no other changes are necessary.)



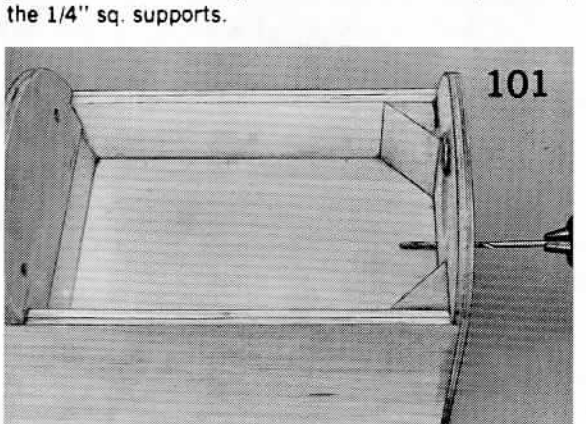
99. a. Glue a 1/4" sq. piece of balsa on the reference line previously drawn on FN. (Put it below the line.)

100. Fit and glue FT, the 1/8" Lite Ply bottom of the tank compartment, into place on the 1/4" sq. supports.

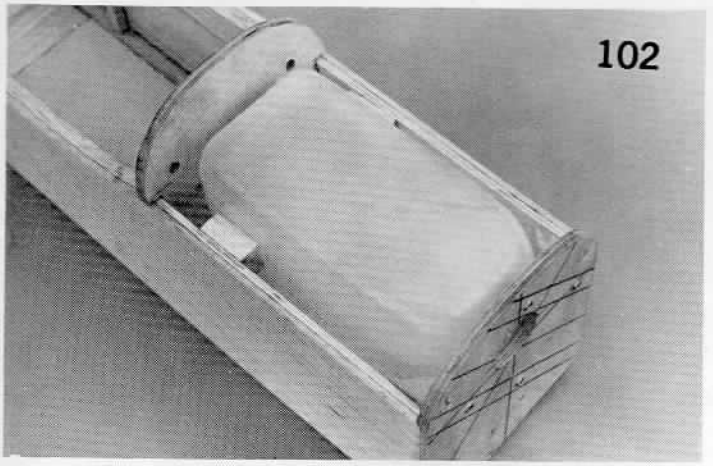




100. Fit and glue FT, the 1/8" Lite Ply bottom of the tank compartment, into place on the 1/4" sq. supports.



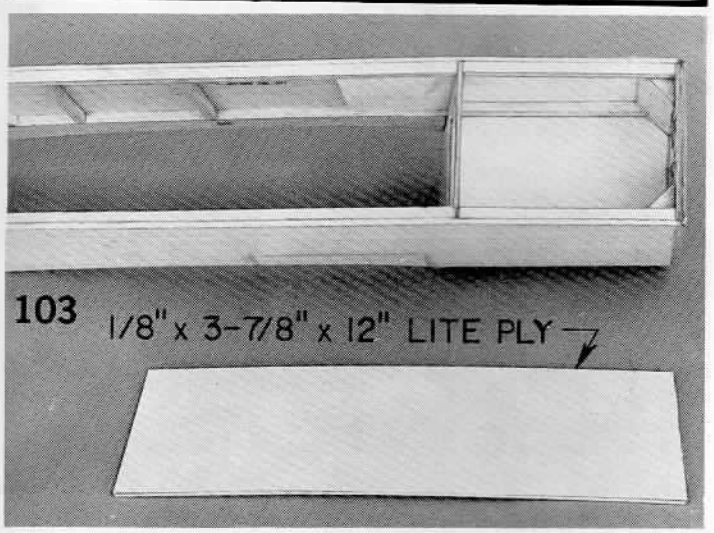
101. Drill a drain hole into the tank compartment from the front of the firewall. (It is suggested that the tank compartment be oil proofed by painting it with fiberglass resin or epoxy glue.)



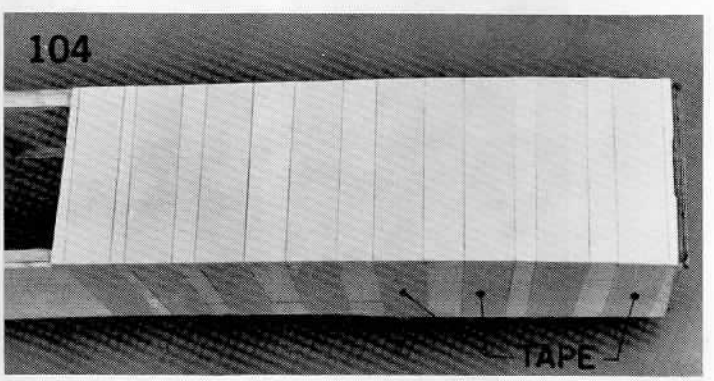
102. Put scrap blocks on either side of the tank to keep it in place. (This photo shows a 12 oz. Sullivan RST tank being used.)

STOP! CONSIDER INSTALLING NOSE PUSHRODS NOW.

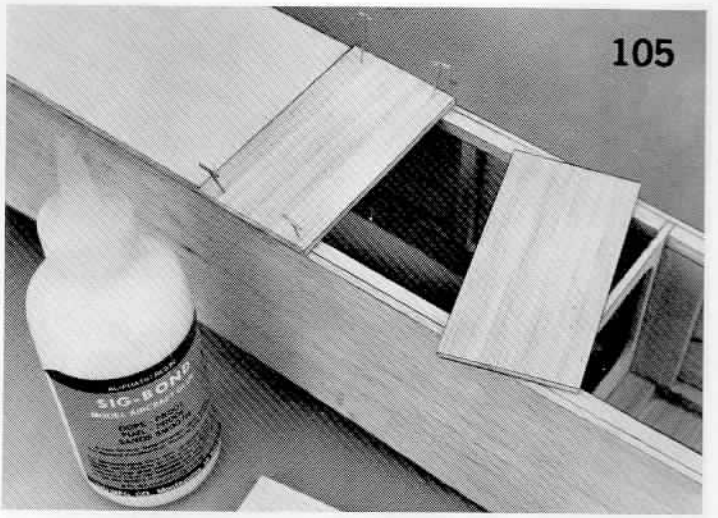
Although the builder of the model in the construction photos did not put the flexible tubing for the nose gear and throttle cables in until later, it is a lot easier to do this now, while there is easy access to the nose, before the bottom is put on the fuselage. The servos can also be mounted now so that the pushrods can be fully installed or left until later. (In this latter case leave the pushrod tubes a little long for final fit later.) Look elsewhere in the book for information on pushrod installation.



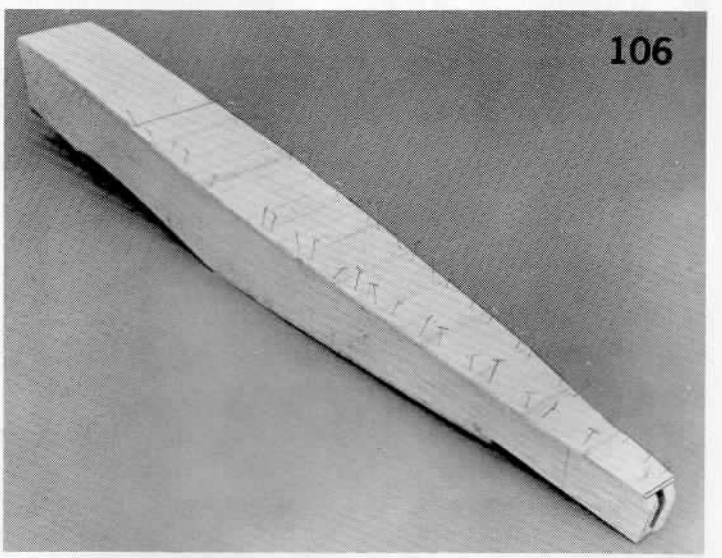
103. a. Notch the front of the 1/8" x 4" x 12" Lite Ply fuselage bottom to fit against the landing gear bracket blind nuts on the back of F-1B.



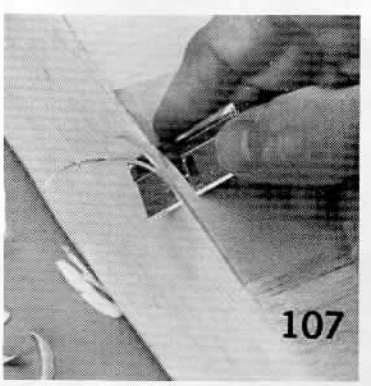
104. Glue the fuselage bottom in place, holding it on with masking tape until dry.

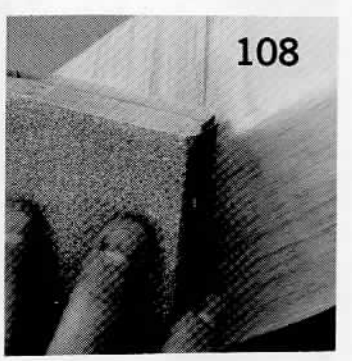


105. Plank the bottom of the fuselage from the 1/8" Lite Ply on back to the tail end with pieces of 1/8" sheet balsa.



106. After the planking pieces have dried, remove the pins and trim the edges even with the fuselage sides.





107. Round the corners of the fuselage by trimming with a razor blade or modeling knife. We like a new single edge razor blade, which seems to cut through the cross-grained top and bottom sheeting cleaner than anything else.

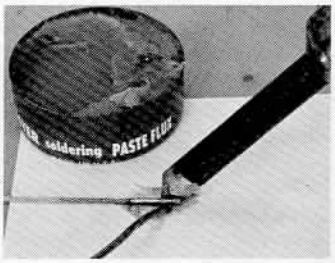
108. Finish and smooth the rounded edges with a sanding block.

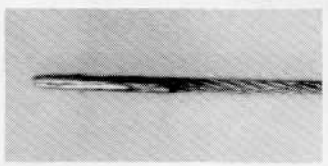
PREPARING CABLE PUSHRODS

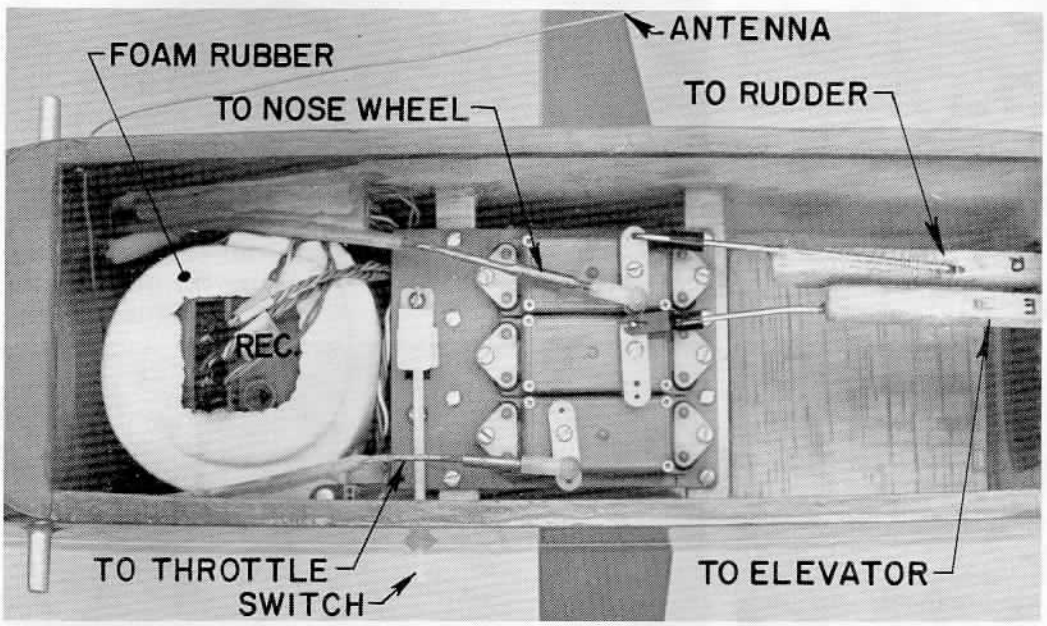
To keep ends of the cable from unraveling during handling, tin the end with solder. Use a non-corrosive paste flux (shown here is Kester, available at hardware stores) and rosin core solder. Have a hot iron and flow the solder completely through the cable.

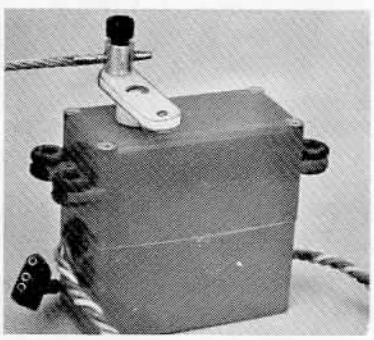
Grind or file the end smooth. Bring it to a point so that it will easily insert into the pushrod fittings.

After the proper length is arrived at, sweat solder the area to be cut so that it will not fray and unravel while being cut. It can be cut with a good pair of side-cutting pliers, filed in two, ground through on the edge of a grinding tool, or cut with a silicon cutting wheel on a motor tool.









The Goldberg PC-1 or similar DuBro 121 are handy for cable end attachment, as on the nosewheel steering arm, but can also be used on servos as shown. They are easily adjustable by loosening the screw and sliding the cable.

THE INS AND OUTS, UPS AND DOWNS OF SERVOS — OR: WHICH WAY DID THEY GO?

Life is not simple in the model game when it comes to pushrod installation. Most servos are standardized as to which direction they move in response to a particular transmitter stick movement but there are exceptions. Regardless of the direction of movement of the servo, you can adapt to it by moving the pushrod to whichever side of the servo output arm or wheel will give you the pushrod movement direction desired. Sometimes this requires that a pushrod brought down the side of the fuselage has to crossover to the inside of the servo output arm to get the desired direction of pushrod movement.

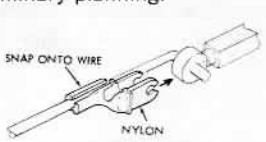
Some radio manufacturers make available reverse direction servos and often include one or more in an outfit for situations where the opposite direction of pushrod movement without changing servo sides is desired. For example, it is desirable to have the hookup for the pushrods to the nose on the outside of the servo so that the pushrod tubing need not be flexed as far as crossing over to the inside would require. At the same time the pushrods to the tail would be on the inside where there is plenty of room to maneuver it around. Several companies make reversing converters that can be plugged into a servo cord to reverse the direction of movement of a standard servo. But if you do not have a reverse servo it is quite possible to get along without it.

WHICH SIDE FOR THE RUDDER PUSHROD?

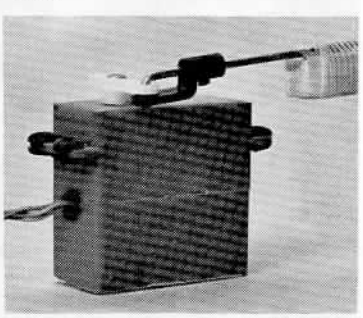
The choice of which side of the fuselage the rudder pushrod will exit from is determined by the position of the throttle control arm on the engine to be used. If it is on the right (most common), use the servo nearest the right side of the fuselage for motor control. Use the servo nearest the left side of the fuselage for the rudder, with the rudder pushrod coming out to the left side of the rudder and the nosewheel steering arm hooked up on the left side of the nose gear bearing.

As you can see, it is best to know in advance the radio and motor brand you will be using before you install permanent cable pushrods. Decide on which type of fittings you will use in the case of the cable pushrods and have them on hand during construction because the type chosen will affect the location of the pushrod exit holes through the firewall, etc. The balsa pushrods to the rudder and elevator are not limited as to location and can be adapted to any of the types of connectors shown without preliminary planning.

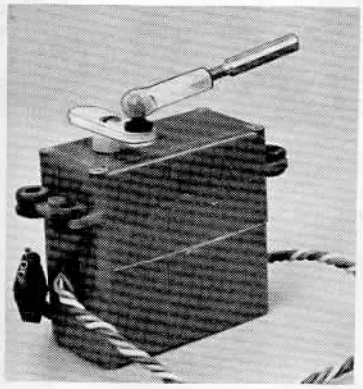
SNAP'R KEEPERS



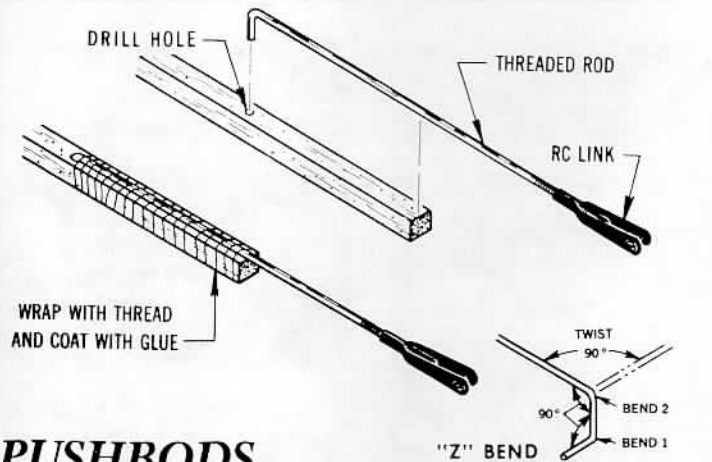
The Sig SH-184 or Goldberg Snap'R Keeper can be installed on a wire pushrod after it is bent, due to the design of the body of the fitting.



The Rocket City 07 Pushrod Retainer works okay for hooking the wooden pushrods to the servo unless the movement or pushrod angle chosen makes it bump into the center post of the servo at the extreme end of the movement. (This can be fixed by changing the angle of approach to the servo or using a longer arm to bring the retainer out farther away from the center post of the servo. This retainer is very easy to attach and detach.



Du Bro Ball Links, which come in several different types — threaded, bolt-on, rivet, etc. — gets the pushrod action up above the control arm so the pushrod can approach from a variety of angles without any chance of interfering with the servo center post. It is good for cable pushrods. A fine adjustment can be made by screwing the end in or out.



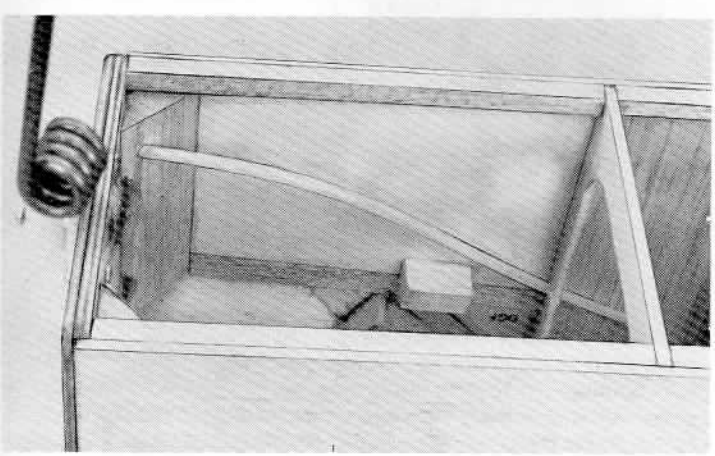
PUSHRODS

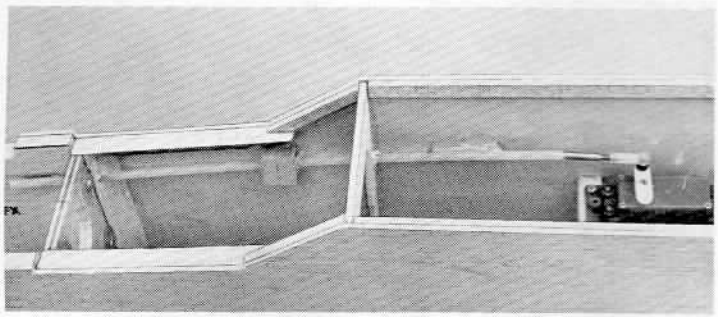
5/16" square balsa sticks are provided to make the fuselage pushrods that run to the elevator and rudder. Bind the fittings to each end with heavy thread and epoxy glue. Use threaded rods with RC links at the tail end of the pushrods so that trimming adjustments can be quickly made. Straight pieces of 1/16" diameter wire are provided for the other end of the pushrods to allow hookup with the servo arm.

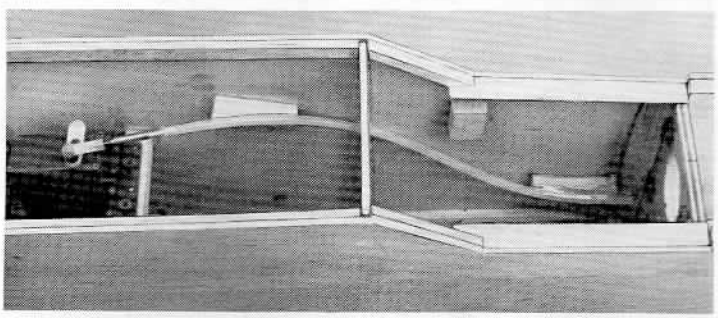
Make control surface ends of pushrod first by attaching RC link rod. Feed through fuselage, hook RC link to surface, cut servo end of balsa to exact length needed, measure and install servo connecting wire end.

Some of the variety of detachable pushrod retainers for securing the pushrod wires to the servo that are available are shown here. Or you can make a "Z" bend in the end of the wires to go into the servo. When a "Z" bend is used, the pushrod must be put onto the servo outside of the fuselage and then threaded through the fuselage, which is more difficult to manage than the pushrod alone, as is the case when a retainer fitting is used.

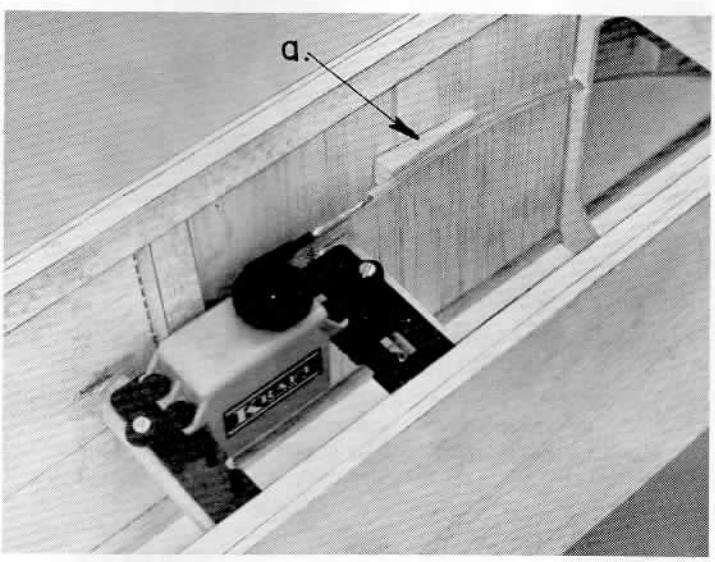
The following photos show installation of flexible nylon tubing — cable pushrods. They are in other models, but the principles are the same.





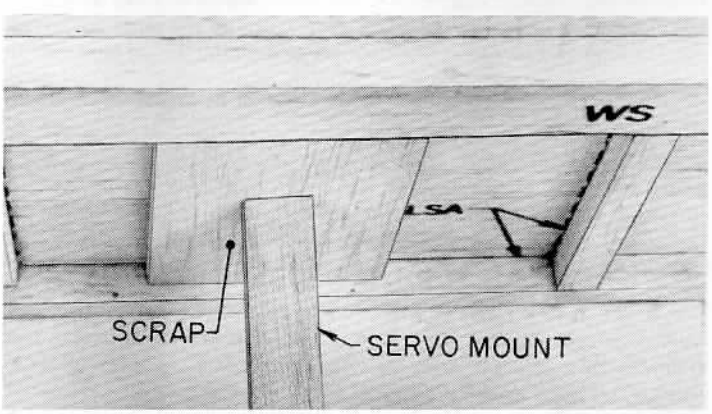


Run the tubing in flowing curves from the nose to the servo location. The photos show a typical tubing installation in another model, but the Komander Mark II is similar.



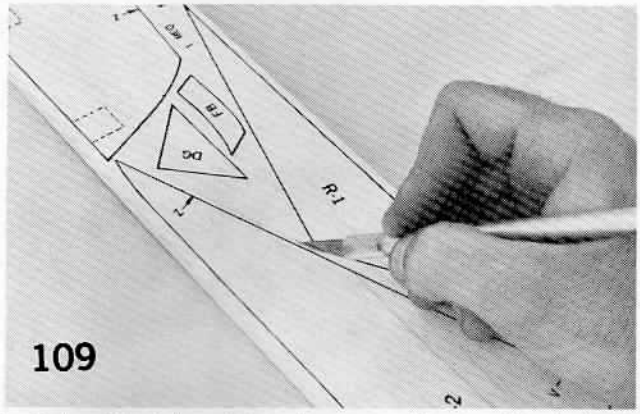
a. Scrap block standoffs can be used to hold the pushrod tubing in position.

b. After the tubing is located, the cables can be completed and installed. (See box on page 27 for instructions on use of cable pushrods.)

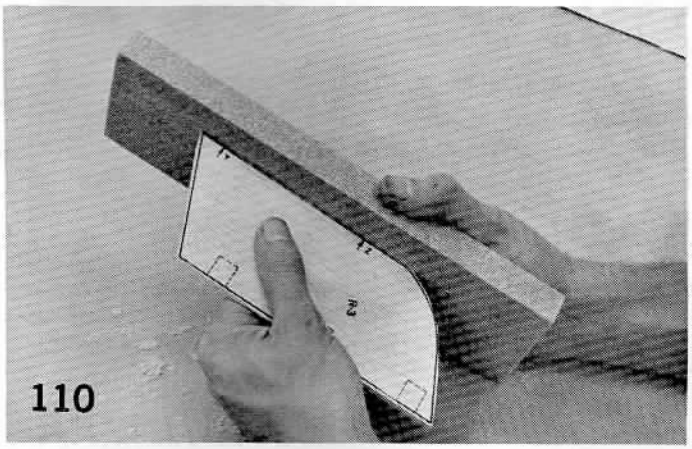


Use scrap wood to make a scab on the fuselage side to strengthen the area where servo mounts are attached.

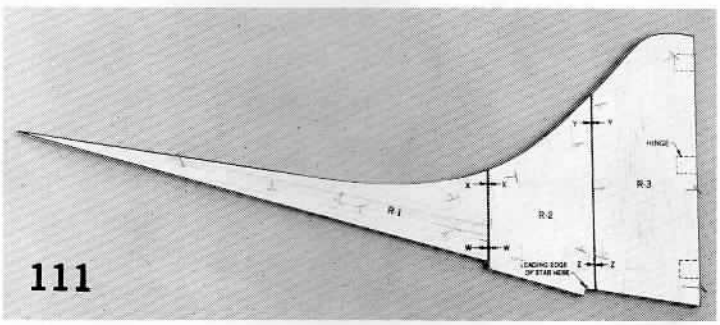
TAIL CONSTRUCTION



109. Cut out the tail parts on a jig saw or with a modeling knife. Don't cut too close to the lines.

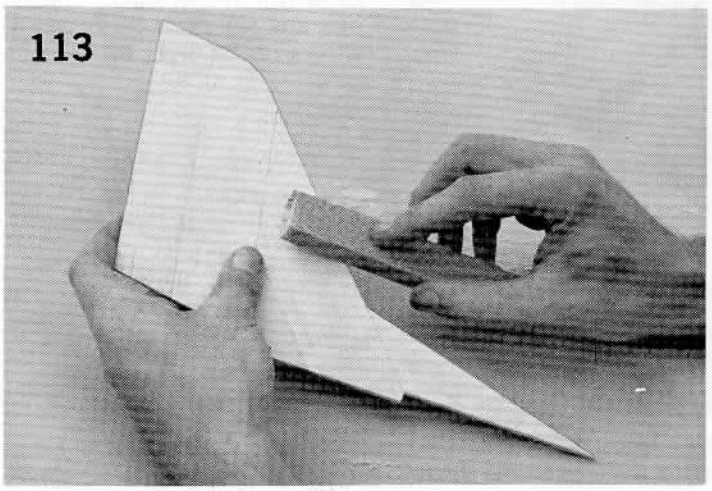


110. Sand down to the outline.

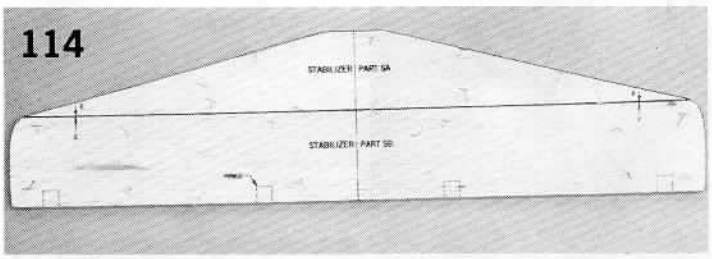


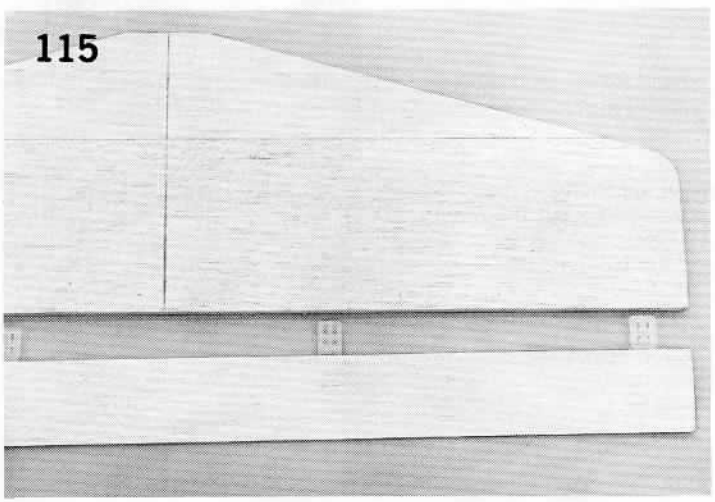
111. Glue the fin parts together.

112. Sand off the lines and smooth both sides of the fin.



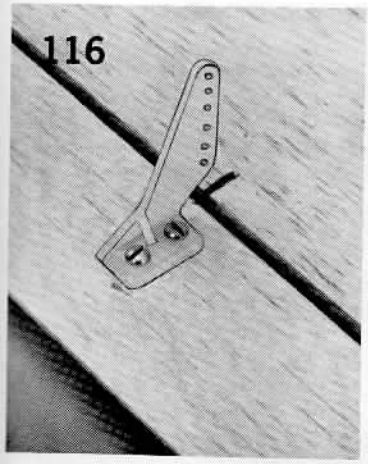
113. Round the front edge of fin. Do not round the trailing edge or the bottom.



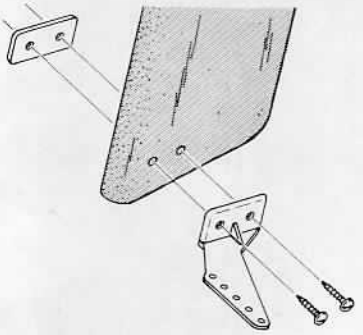


114. Sand the stabilizer smooth with a sanding block. Round the leading edge in the same manner as the fin was shaped previously. The elevator is hinged to the stabilizer in the same manner as the ailerons.

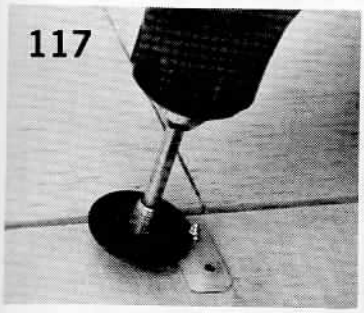
115. Cut the slots for the hinges, but do not glue the hinges in until after the tail parts are covered, either with silk or iron-on covering. It is particularly necessary with iron-on covering to cover before assembly so that the iron can be properly applied to the edges. (Some builders like to color dope and/or decorate the parts also before joining.) Join the tail parts together after covering is completed. Cover the fuselage before gluing the tail to it, but cut away the covering to expose the bare wood in the spots where the tail is glued on. Always have wood-to-wood joints. Never have covering between the parts. Be sure that the stabilizer is lined up square with the fuselage. Coordinate the fitting of the stab with the fitting of the wing so that they are both aligned properly.



IF THE RC LINK FITS TOO TIGHTLY IN THE NYLON HORN, DRILL OUT THE HOLES IN THIS HORN WITH A NO. 51 DRILL BIT.

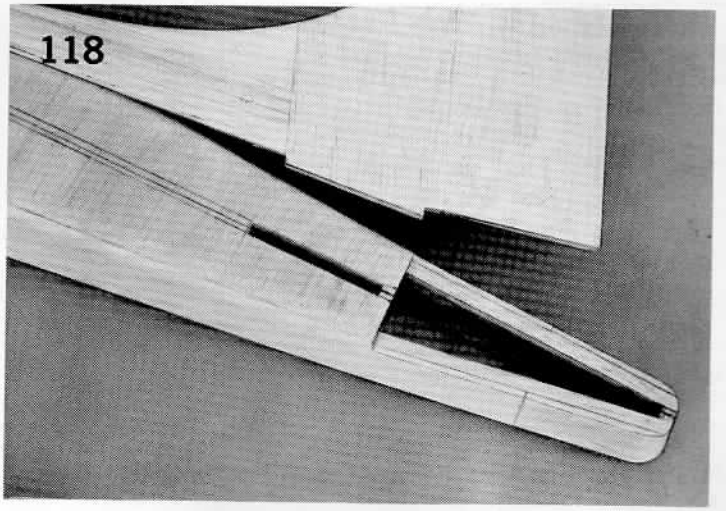


116. Install the nylon control horns. Take note that the elevator horn arm is centered on the elevator, not the horn mounting holes, which must be offset to locate the arm in the center of the fuselage opening.



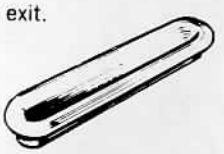
117. Cut or file off the ends of the horn screws.

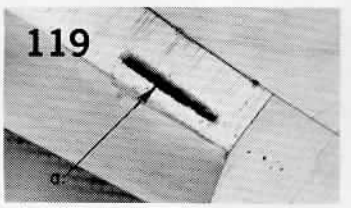
Some of the photos in the book are of other models but the construction procedure is the same for the Komander MK II.



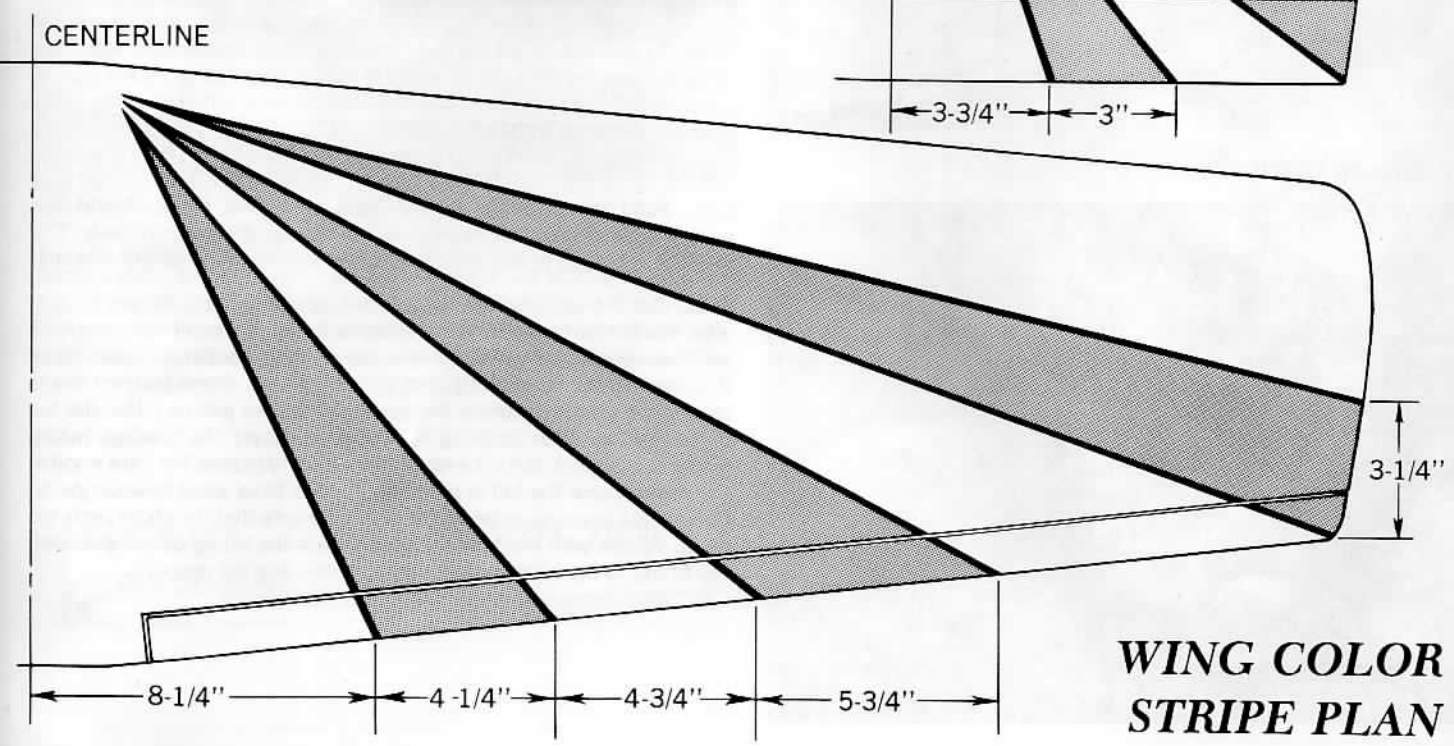
118. Draw a centerline on the fuselage and mark the cutout required for the fin tab slot. Cut out the slot.

119. a. Cut out a slot for the pushrod exit.





If desired you can add a nylon pushrod guide (not furnished) as shown here. The elevator pushrod exits through the openings in the fuselage rear. Open it up as required to pass the pushrod. The pushrod wire may be bent slightly if it tends to rub on the fuselage.

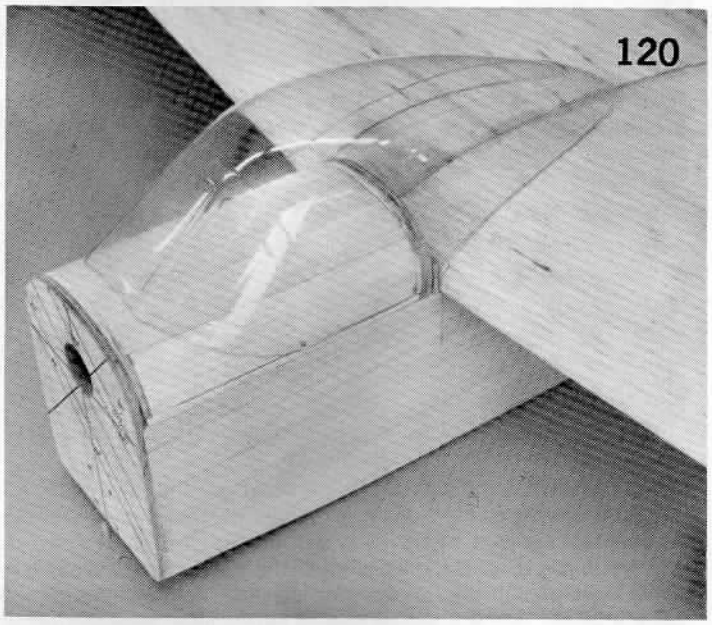


CANOPY

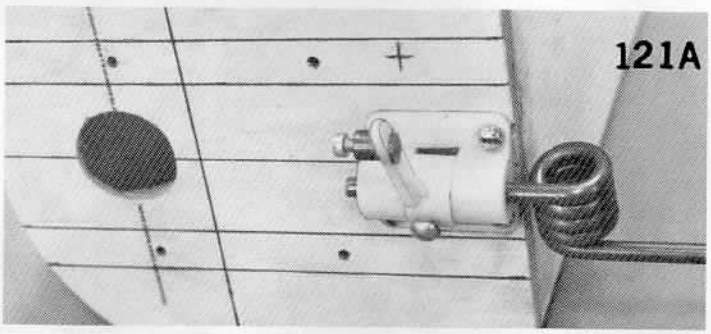
Cut out the cockpit canopy around the edges indicated by the arrow heads formed in the plastic. Cut it slightly oversize for the first fitting.

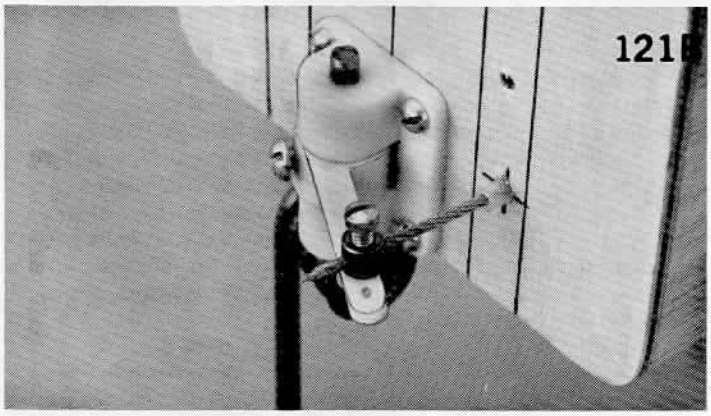
With the wing and fuselage top hatch in position, fit the canopy, trimming the edges where necessary. Trim the front edge to fit against the back of the cowling.

Cover and/or paint the hatch cover before installing the canopy. See Covering and Finishing section for canopy painting instructions. The canopy may be fastened to the hatch with "super" glue or a small amount of Sigment. Use some shortened pins (scale rivets!) along the bottom edge to help fasten it on and keep it on. Put a few specks of epoxy glue on the pin shanks before inserting permanently.



NOSE GEAR INSTALLATION



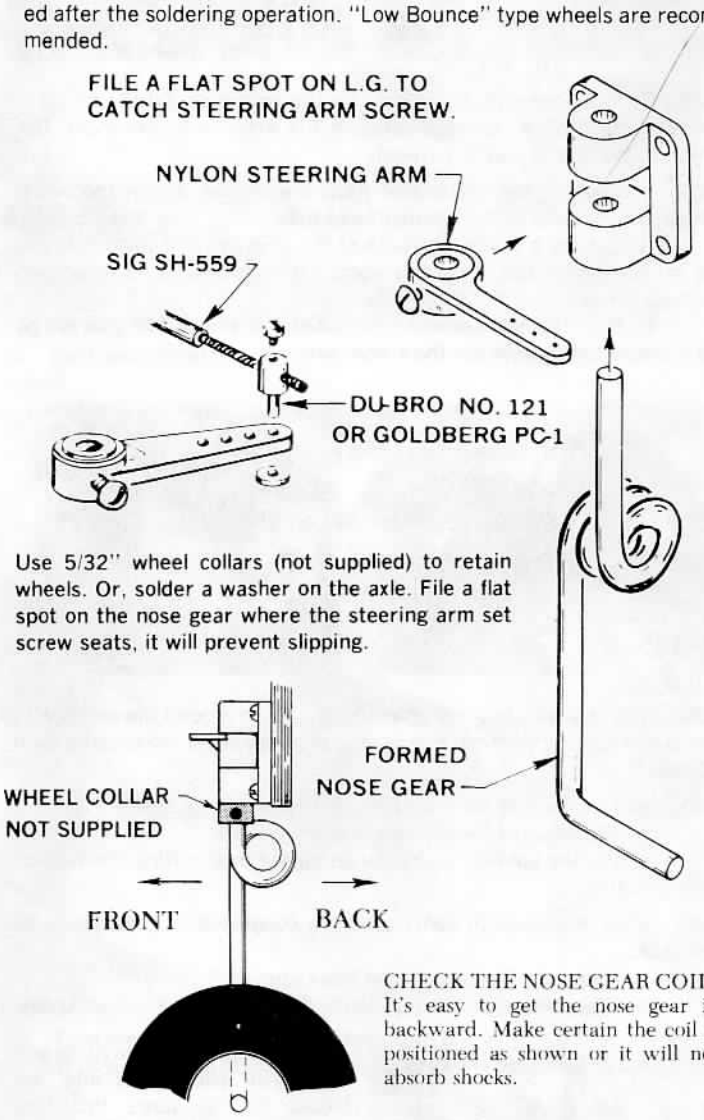


121. a. The nose gear is held in the nylon bearing by the steering arm. Angle the arm forward so that when the servo pulls it back for a left turn, the arm will clear the face of the firewall.

b. A flexible steel cable pushrod with nylon outer tubing not furnished) is recommended for the hookup of the nose gear, such as the Sig SH-559 Flexible Cable Pushrod. Run the nylon outer tubing through the firewall at the right spot to connect the inner cable to the nylon steering arm. Epoxy around the tubing at the firewall so that no oil will leak back into the fuselage.

c. Sweat solder the last 1/2" of cable and file the end to a point so it can easily be inserted in the adapter fitting on the steering arm.

d. Hold the wheels on the axle with a 5/32" diameter wheel collar (not furnished). Or you can solder a washer on the end of the axle. Protect the wheel with a shim of light cardboard that can be torn and removed after the soldering operation. "Low Bounce" type wheels are recommended.



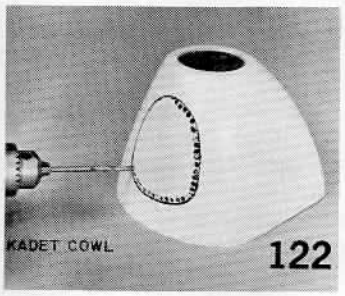
CHECK THE NOSE GEAR COIL! It's easy to get the nose gear in backward. Make certain the coil is positioned as shown or it will not absorb shocks.

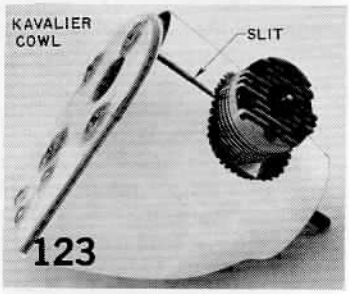
The wheel collar suggested as optional for the nose gear is not furnished. File or grind a notch in the collar so it will fit down on the coil farther. The collar permits altering the height of the nose gear slightly if desired. Don't try to make large adjustments in nose wheel height with the wheel collar because the landing gear is more easily bent on a hard landing if the coil spring is located very far below the nylon nosewheel bracket. Large adjustments should be made by changing the wheel size.

KOMANDER WHEEL SIZES

MAIN WHEELS - 3" Diameter
NOSE WHEEL - 2-1/4" Diameter

COWLING INSTALLATION



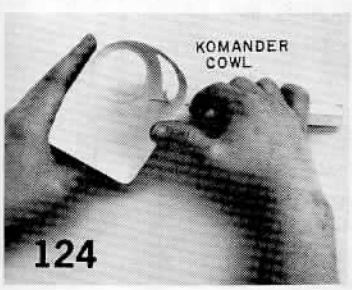


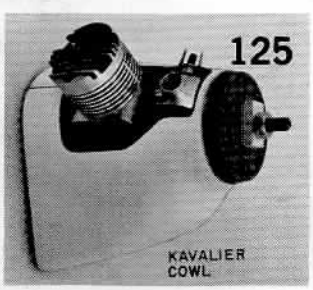
122. To make openings in the cowl for the engine, first drill a series of holes about 1/8" in diameter around the area to be removed. Cut through the bits of plastic between.

123. a. Remove the carburetor from the engine during the initial stages and work with the cylinder head hole.

b. Cutting a slit out the back of the cowl from the head hole can be of assistance, but if care is used the task can be accomplished without the slit.

c. Start the hole undersize and open it up slowly, fitting as you go so it doesn't end up larger than necessary.





124. The best way to open up the hole is to go around the edges with an "apple-peeling" motion, paring off a small amount of plastic with each stroke.

125. a. Cut the hole for the carburetor last.

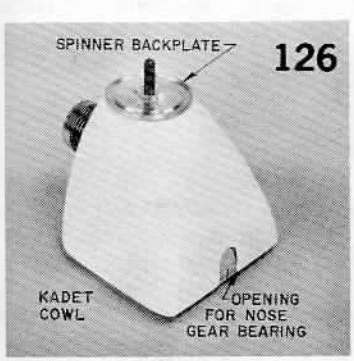
b. Round all of the corners.

c. Put the spinner backplate on during final cutting check exact cowl position.

126. After the fuselage construction is completed, the cowl may be mounted.

a. Epoxy the hardwood cowl blocks to the firewall.

b. Place the cowling in position and put on the spinner backplate.



c. Tape the cowl in place and drill small pilot holes into the blocks for the screw locations.

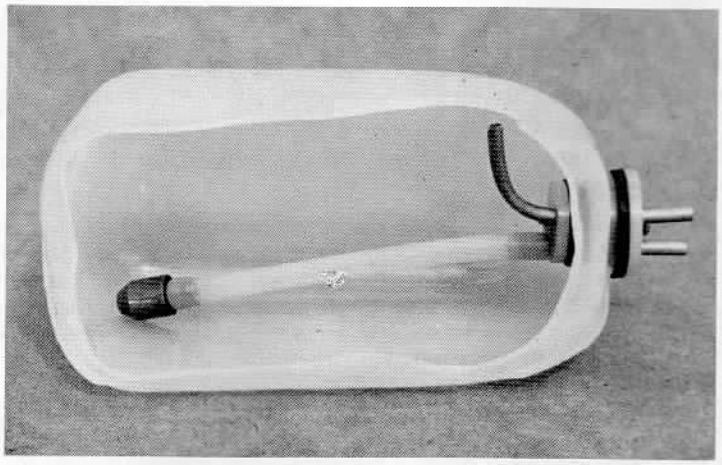
d. Enlarge the holes in the cowling only to pass the No. 4 screws.

(A hole in the front of the cowl to allow screwdriver access to the L.G. set screw is handy. It permits on the field adjustment of the nose gear without removing the cowl.)

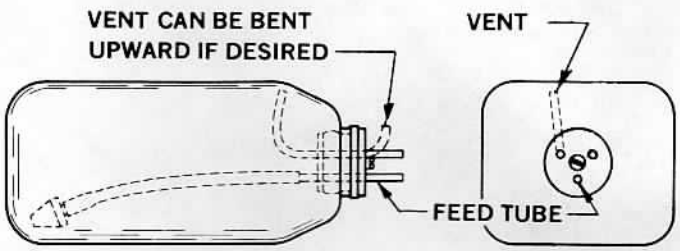
TIPS ON TANKS

Assemble the tank hardware as shown.

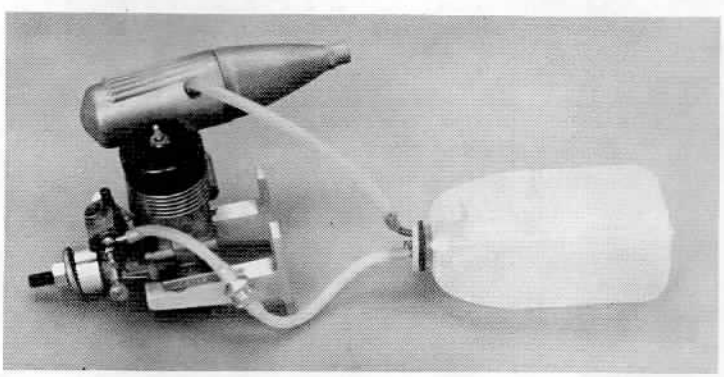
Seal the tank cap in the hole with G.E. Silicone Bathtub Seal (available at hardware stores) or Devcon Silicone Rubber (see Sig catalog). Put an oil-proof finish on the firewall and the tank compartment before sealing the tank cap. Get some of the sealer on the sides of the hole and also put a bead over the edge of the cap on the front. Should you need to remove the tank, push out the silicone rubber seal around the front cap.



The Sullivan RST 10 or 12 oz. tank is recommended for the Komander. A Sullivan SS type of slant front tank could be used if desired. No large cap hole in the firewall is necessary for an SS, only two fuel line holes.



After installation, put fuel tubing on the vent tube and run it to the outside of the cowling on the bottom, so that fuel overflow is not blown over the wing-fuselage joint, where it may leak into the fuselage. The best way to fill the tank is to take off the fuel line to the needle valve and pump the fuel in there until it runs out the vent. Be sure and use a filter on your fuel supply can, and it is a good idea to have a filter between the tank and needle valve also.



PRESSURE FEED

If the engine you are using is equipped with a muffler pressure tap, make use of it for more even fuel feed and reliable operation. The hookup for pressure is shown in the picture. To fill the tank, remove fuel line from the needle valve on the engine and pump the fuel in. When the tank is full, it will overflow through the muffler pressure line. Use transparent or translucent fuel line so you can see the fuel starting to overflow when the tank is full. Should some fuel happen to get in the muffler, drain it out before starting the engine. Do not try to fill the tank in reverse from the pressure line, the tank will not fill properly and fuel may be forced into the engine.

SPARE PARTS

When ordering spare parts, be sure and specify they are for the Mark II.

COVERING AND FINISHING

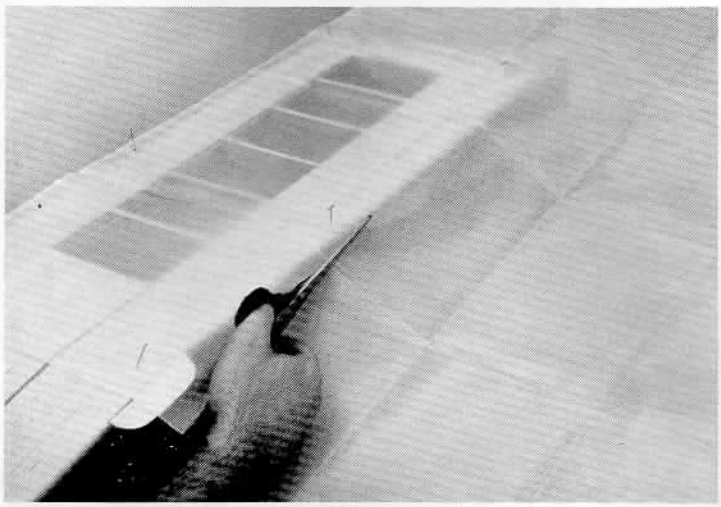
IMPORTANT! Don't skip covering the fuselage and tail just because they are solid wood. Painting them without covering first is not enough. They will be much more resistant to splitting and breaking on hard impacts if they are covered with something — Sig Silk, Silkspan, Sig Silray or iron-on covering material.

The manufacturer's directions for applying iron-on coverings are packed with the material. Follow these closely, for different types of covering have different iron temperatures and techniques of application.

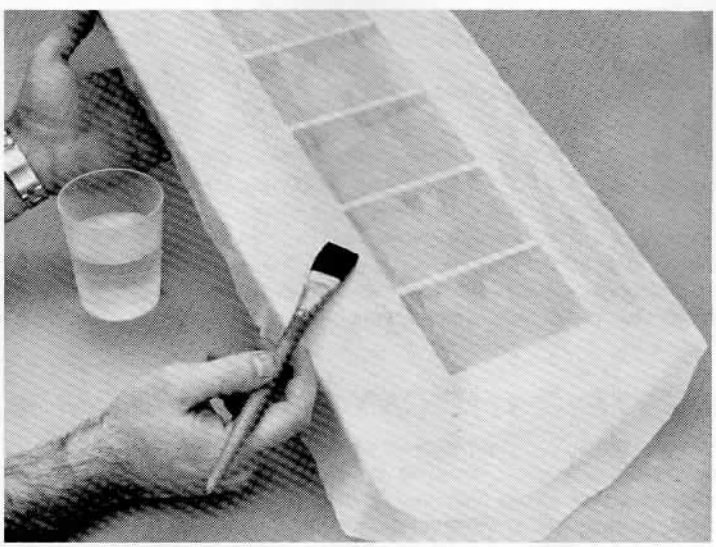
Whatever kind of covering you desire to use, it will not conceal a rough framework. Sand carefully with fine sandpaper before beginning to cover.

COVERING WITH SILK, SILKSPAN, OR SILRAY

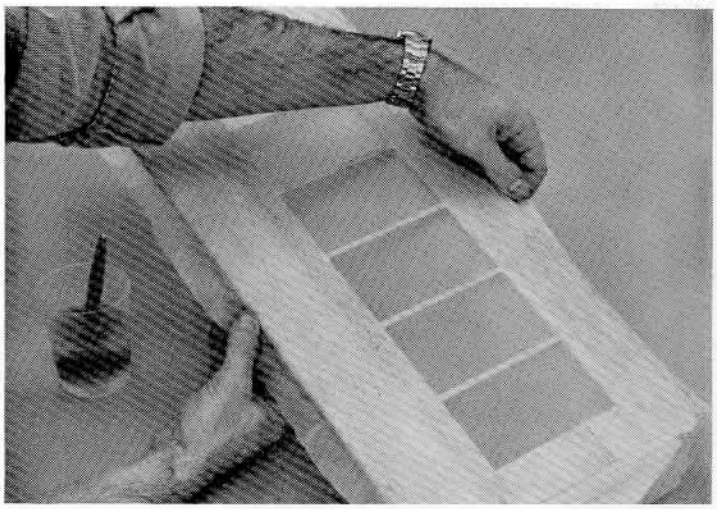
Although we refer to silk in the directions, all of these coverings are applied wet in the same manner, as follows: Brush an unthinned or very lightly thinned coat of clear Sig Supercoat or Sig Lite-Coat Dope over all parts of the framework that will contact the covering. When dry, resand with fine sandpaper to remove any fuzz or raised grain. Brush on a second coat and sand again.



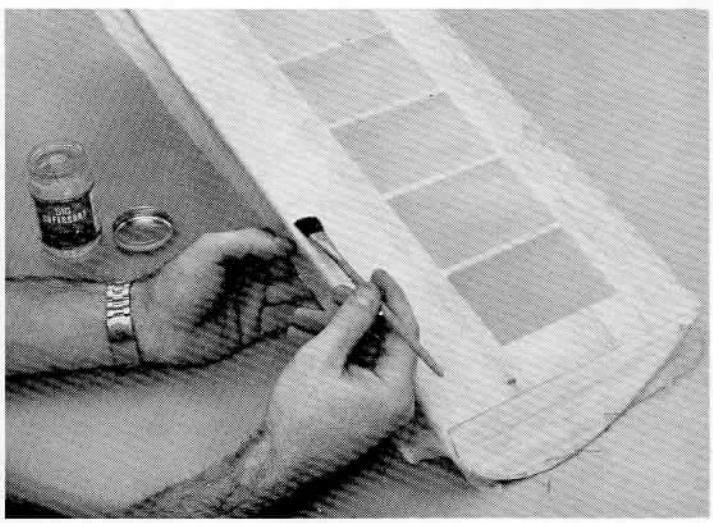
The bottom of the wing is a good place to start covering. Cut a piece of material about 1/2" larger all around than half of the wing, with the grain running lengthwise. (The grain of woven materials runs parallel to the finished bias edge.) Some builders next dip the piece in water and apply it to the wing. I find that the silk sticks together and takes alot of pulling and smoothing to get it in place so I do it a bit differently, as shown in the photo.



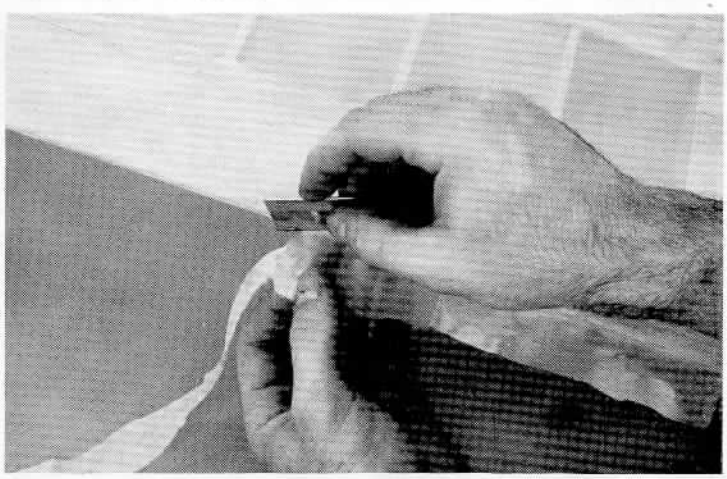
Pin the dry covering in place and "paint" the water on with a brush.



Go around the edges, pulling out wrinkles and stretching the material smooth. You need not pull it up drum tight, in fact going to this extreme is not advisable. Just pull out all of the wrinkles. Use pins, if necessary, to hold the silk smooth, though wet silk usually stays in place without too much pinning. I like to fasten one end — in this case the center joint of the wing — pretty firmly with pins so that you can pull against this anchored end in stretching the silk the long way.

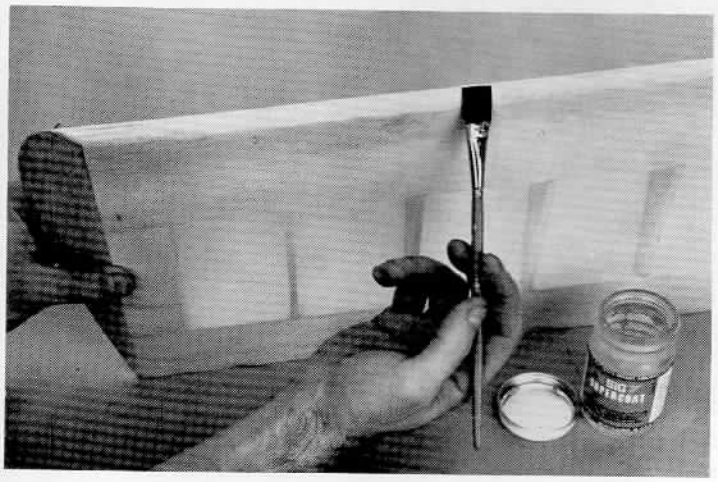


Brush around the outside edge of the stretched silk with clear dope. The dope will soak through the material and adhere to the dope already dried into the framework.



Trim off the edges with a sharp blade. I find that a thin double-edged razor blade is ideal for this, but a single-edged blade does okay and you can't cut your fingers on it. On the bottom, trim off flush with the wing all

the way around. Go over any rough areas or places that have not stuck down properly with more dope and press the loose spots down as the dope is drying and getting stickier.



The top half is done in identical fashion except that the silk should be brought down over the edges instead of being trimmed off flush. On the front, lap the silk over the edge of the bottom, over-lapping about 1/8". At the back, bring the material down over the back edge of the trailing edge but do not lap it over the bottom covering.

Use the same process on the tail section and fuselage.

Use two or more coats of either regular Supercoat clear or Sig-Lite Coat low shrink clear dope on the entire airplane before beginning to apply color dope. Sig Sanding Sealer, used according to the directions on the can, is also a good product for preparation of the surface for color doping. Sand between the surface preparation coats with 220 grit 3-M Tri-M-Ite no load paper. The color dope may be brushed or sprayed.

Supercoat Color Dope should be thinned with Supercoat Thinner for brushing. This helps prevent brush marks and gives smoother coats. Flow on wet coats and avoid rebrushing back over an area already painted. If brush marks show, you need more thinner. For spraying, thin dope about 50-50. Add more thinner if the dope does not go on evenly.

If high humidity causes the dope to "blush" or turn white, the best way to handle this problem is to wait until the humidity situation improves and apply another coat of dope. This will eliminate the blush. If it is necessary to dope during high humidity, Sig Retarder may be used in place of part of the Supercoat Thinner (amount depends on the humidity) to reduce the tendency to blush.

Painting the entire model white is recommended for a good color base, particularly when white is part of the color scheme. Color coats can be sanded with 360 Tri-M-Ite or 400 or finer wet paper. When using masking tape for trimming, seal the edge with a coat of clear dope to prevent the color dope from bleeding under the edge. Don't leave the masking tape on any longer than necessary. The longer it is on, the harder it sticks.

The original model was given 2 coats of sprayed Sig Supercoat yellow on top of the white undercoat. The decoration stripes were then traced lightly on with a soft pencil and the design covered with masking tape. Two coats of Sig Supercoat Light Red were then sprayed on. When the masking tape is pulled off, the design will probably not have perfectly even edges. If you do not wish to pin stripe it with a ruling pen and dope, as described in the next paragraph, use the pen to touch up the edges.

The pin striping was applied with a mechanical drawing ruling pen. Thin the dope slightly with blush retarder to slow the drying process and aid the flow of dope through the pen points. Clean the pen frequently with dope thinner and wipe on a cloth before reloading with fresh dope. Don't try to draw a thick line with the dope and pen but instead draw a thin line on each side of the desired pin stripe (about 1/8" wide were used on the original) and fill in between the lines using the pen free hand and opened up for a wider flow. If you have a steady hand, use a small brush. Use a French curve to outline curved parts of the decorations. The cabin windows were painted silver.

Complete the job with several sprayed coats of clear over the color scheme. This seals the colors and adds gloss. For best results, it is not a good idea to try to mix different brands of paint. Use Sig products from the start.

A CURE FOR FUSELAGE WARPING

You may have noticed that when a piece of balsa is doped on one side and not on the other, it will curl. The same thing can happen on the fuselage sides under the wing opening, particularly when you put on a number of coats. (The rest of the fuselage will not show this effect to any extent because it is four sided and cannot distort.) The effect isn't noticeable until after full cure of the dope and aging, which may take several months. To prevent this from happening, give the inside of the fuselage a coat of dope every time you give the outside a coat. This has an added advantage in making the cabin area fuel proof. In addition, when the hardwood servo mounts are installed, have them a little over-long so that the cabin sides are bulged slightly outward.

FINISHING THE PLASTIC COWL

The plastic parts should be sanded to remove the gloss before they are painted. Don't use coarse sandpaper, which can cut deep scratches. These scratches may open up during doping (which softens the plastic) and become more noticeable. Instead use something like 220 3-M Tri-M-Ite no load silicon paper to start and polish down with 360 Tri-M-Ite or 400 wet paper before color doping.

The plastic cowling may be painted with Sig Supercoat Dope. Care should be used not to apply heavy, wet coats of dope. Put on light coats and allow them to dry thoroughly before applying a second coat. A spray gun is a good method of getting a good finish with a minimum amount of dope. Be especially careful with spray cans not to wet the plastic too much. Spray several light dusting coats with adequate drying time allowed. Plastic may also be painted with Sig Plastinamel, K & B Superpoxy, Hobbypoxy or Du Pont Dulux Enamel. Don't use other paints without testing first on scrap plastic.

PAINTING THE CANOPY

We recommend Sig Plastinamel for painting the framing outlines on the canopy. Dope is very difficult to use on canopy plastic because of its warp-ing action. Epoxy paint can be used, but it does not stick on the plastic quite as well as Plastinamel. Sanding the gloss off the plastic will help adhesion. Other enamels and plastic paints probably can be used, but test in advance, because no assurance can be given for other types.

BALANCING

WHY MODELS MUST BE INDIVIDUALLY BALANCED

It is impossible to produce a kit that will automatically have the correct Center of Gravity (C.G.) position. Balsa wood varies in weight and it is easily possible for the wood in the tail to be an ounce or more heavier or lighter than average. One ounce of extra weight in the tail has to be countered by about 3 ounces in the nose. Don't pile a lot of fillercoat or finish, use excess glue or make large fillets on the tail surfaces. The motor you choose, whether or not a muffler is fitted, the size and placement of your radio equipment, etc. all affect the balance. If you use an unusually heavy motor or muffler you may have to carry the battery in the radio compartment instead of the nose or even weight the tail. Don't consider that whatever C.G. the model builds out to as "good enough". Check carefully and make whatever adjustments are required. With the C.G. properly located, a Sig design should fly with only minor trim changes required.

BALANCE POINT RANGE: Test fly with the balance point located at about 1-3/4" from the leading edge at the wing tip. Sport fly at 2" back from the Leading Edge at the wing tip. Aerobatics - If your model will spin in both directions at 2" it need not be moved back any further. Some models need the balance point at 2-1/4" back for full response. Flying with the balance point any farther back than 2-1/4" from the tip is not recommended unless you are an expert flier, with a purpose for doing so.

SUGGESTION: For test flights, put a piece of masking tape on the bottom of each wing tip and mark the Balance Point range on the tape. This will make it convenient to check the actual balance point location and adjust it as desired.

The balance point range is measured from the leading edge of the wing. Suspend the model on finger tips placed on the bottom of the wing on the marks. Balance with an empty fuel tank, but with all other equipment installed and the model completely finished and painted. It should hang from the finger tips approximately level.

If the tail hangs down, it is tail heavy. Add lead or weight to the nose as necessary to get it to hang level. Be sure and fasten the weight securely. Do not attempt flight in a tail heavy condition.

If the nose hangs down below level, the model is nose heavy. If it is only a little nose heavy, don't do anything about it. It will be okay to go ahead and test fly. If it is more than a little nose heavy, correct by moving the radio batteries out of the nose and as far back in the cabin as is necessary to achieve balance.

When slightly nose heavy, the model is more stable and less likely to stall or snap roll from over-elevating. It also cuts down reaction of the model to control movements and this is good during test and practice flights, to help prevent over-controlling.

Make any changes in the balance position gradually, checking results and the effect of the change on control responses and the performance of the model in the air.

In addition to the fore and aft balancing procedure described above, the performance of manuevers is improved if the model is also in balance spanwise. For example, if one wing is heavy it may affect turning and loop tracking. Inset weight into the opposite wing tip to correct this problem.

CONTROL MOVEMENTS

Various brands of servos can give different control movement direction and amounts of travel. For this reason, follow the measurements below when setting the Komander MK II up for flight. Shift the RC link to whatever horn hole will produce the amount of movement shown in the drawings below. Measurements are made at the trailing edge of the control surface.

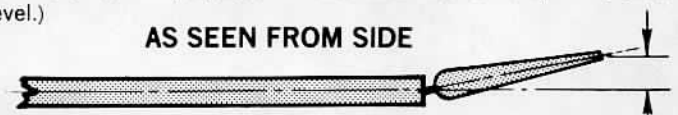
Control measurements below are suggested as a beginning. Test flights may indicate a need for more or less movement, depending on individual model differences, center of gravity (C.G.) location, your personal preferences, etc.

Should the servo output arm or wheel provided on the radio equipment not provide enough movement of the surfaces, accessory output arms that are longer are available for most radios, either from the manufacturer or other sources such as Rocket City.

ELEVATOR IN NEUTRAL

(Flight Tests may determine that the neutral point should vary slightly from level but for purposes of illustration the neutral point is shown level.)

AS SEEN FROM SIDE



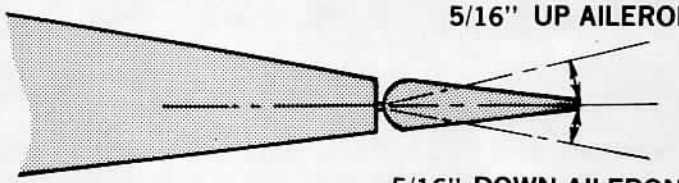
FULL UP ELEVATOR **7/16"**

7/16"

FULL DOWN ELEVATOR

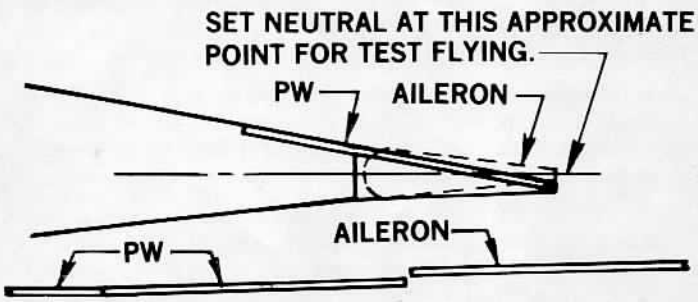
It is not uncommon for the best elevator neutral position to test out to be slightly off from level. This introduces some nose up or down trim to keep the model from climbing or diving when the transmitter stick is in the center. The exact best neutral elevator position for each particular model must be determined during flight testing. With the model flying at about 3/4 throttle, feed in up or down trim in with the transmitter lever until the model flies level. Land and observe this position of the elevator. Adjust the elevator pushrod as required to keep this flight checked "neutral position when the transmitter trim lever is returned to the center. Don't have excessive elevator control movement. If you are not using full stick movement to make the tightest desired maneuvers, reduce movement until full transmitter stick travel is used.

5/16" UP AILERON



5/16" DOWN AILERON

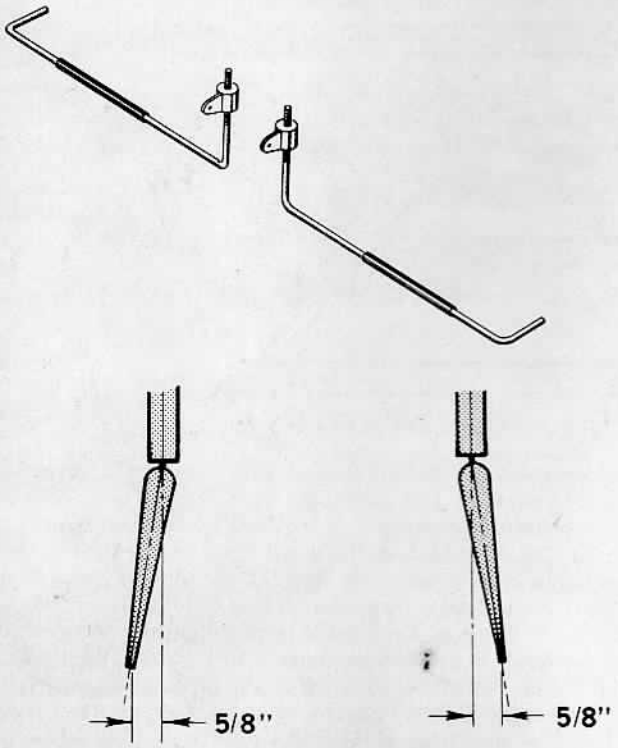
SPECIAL NOTE: NEUTRAL FOR THE AILERON IS NOT IN LINE WITH PW, BUT IS POSITIONED IN LINE WITH THE WING



REAR VIEW APPROXIMATE RELATIONSHIP OF TRAILING EDGES.

The adjustable nylon fittings on the aileron horns supplied with the Mark II provide a fairly good range of possible movement adjustment. Screw the nylon fitting in toward the wing to get increased movement of the ailerons and out away from the wing to get decreased movement. Check your neutral point (or whatever amount of trim displacement you have from neutral) before altering the amount of up and down movement because these points will likely be changed by the raising or lowering of the nylon fitting and will need to be re-established by lengthening or shortening the adjustable RC clevises on the aileron servo pushrods that snaps onto the fitting as required to return the neutral points to where they were originally.

TURN SELF-THREADING NYLON CONNECTORS ONTO THE WIRE AILERON HORNS. RAISE OR LOWER THEM TO ADJUST AMOUNT OF AILERON MOVEMENT.



FULL LEFT RUDDER FULL RIGHT RUDDER

(FOR STUNTING, USE 1" RUDDER MOVEMENT OR MORE.)

FLYING

While the Komander is not as difficult to fly as a low wing RC model, it is not a basic trainer for first time RC fliers. First flights should be made on a slower model such as the Sig Kadet.

It is recommended that novice pilots should not attempt to fly the Komander without the assistance of an experienced pilot. Contact the local model club or ask your hobby dealer for the names of good fliers and a suitable location for flying. (Or, send a self-addressed, stamped envelope to Claude McCullough at Sig Mfg. Co. requesting a copy of the latest list of Academy of Model Aeronautics chartered clubs.)

Many hours of work are involved in the construction of a model and it can all be lost in a moment of beginner's indecision. A skilled flier can help you get past the first critical test and trimming flights without damage to the model and give instruction in proper control.

Be certain to carefully range check your radio equipment and see how it operates with the engine running before attempting test flights. A lot of problems can be avoided if the engine has been well broken-in and the idle adjustment perfected on a test block or in another airplane before installation in the model.

Takeoffs with the Komander from grass fields are easily made if the grass is not too long or the ground too rough. Generally a lot of elevator application is required for liftoff. Be prepared to relax control pressure partially after becoming airborne so the climbout will not be too steep. On surfaced or smooth dirt runways less application of elevator will be needed.

If a good, smooth take-off surface is not available, the model can be hand launched by the pilot's assistant. (Do not attempt to hand launch by yourself — instant action on the transmitter may be required.) Holding the front part of the fuselage with the left hand and under the tail with the right, run into the wind at a fast trot and thrust the model forward with the nose slightly up in a spear throwing motion. It is not necessary to achieve a lot of velocity in the launch — it is more important that it be released smoothly and with the wings level. The model may dip slightly and then should begin climbing at a slight angle. If it does not begin to climb after about fifty feet of flight, apply a small amount of up elevator.

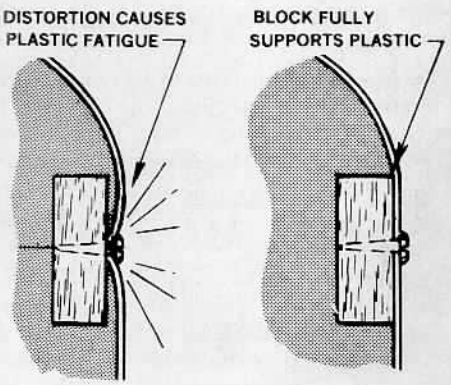
Use the ailerons or rudder to keep the wings level and headed straight into the wind until about 75 feet of altitude is obtained. Keep first turns gentle and not steeply banked. Stay up wind of the transmitter. Use trim levers on your radio equipment where necessary to obtain straight and level flight with the control sticks in neutral position but don't attempt to make these adjustments until the model is at a good altitude. Throttle back at altitude to find out the model characteristics in a gliding condition so that some indication is seen of what to expect during the landing approach. It is a good idea to make several practice landing approaches at a good altitude to get the feel of the model for this approaching critical maneuver. Make your final and complete landing approach while your engine still has plenty of fuel remaining so that the engine is not liable to stop before completion of the flight. This will allow application of power if the approach is being under shot. Notice the percentage of missed landings at an R/C field. Those undershot greatly outnumber those missed by overshooting. So if an approach that looks a little high is maintained, chances are good that a spot-on landing can be made.

After you get through the first flights you should begin to "trim" the model's control surfaces. If it is turning to the right, for example, with the stick in neutral, and you must move the transmitter trim lever to the left to make the model fly straight, then land the model and position the rudder to the left of center by turning the RC link on the pushrod one or two turns on its threads. Check in the air for the result. Repeat the process, if necessary, until the trim lever is centered when the model is flying straight with the stick in neutral. You may find that the reaction of the model is different to high power and low power, requiring changes in trim lever position during flight, as for a landing approach. This is one of the controls you must learn to operate during practice flying, but it is not a critical matter at first since these minor corrections can be made with stick movement alone as you are steering the model along its course.

It is impossible to give exact directions for every case, since individually built models vary slightly and the engine used also affects results. But if the model is not flying in a satisfactory manner, the chances are it is not trimmed properly and should be adjusted accordingly. Do a little tinkering, a bit at a time. This is an instructive way to fathom the mysteries of perfect trim and in the process you can improve your flying performance considerably.

PREVENTING COWL CRACKS

The most common cause of plastic cowls cracking is distortion of the plastic from improper installation of the mounting blocks and screws. If the plastic is fully supported by the block underneath, no strain will occur when the screws are tightened down.



WRONG **RIGHT**

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