

INTRODUCTION

TESTOR'S Senior "9" is the fourth in a series of four progressive achievement level kits designed to train the amateur modeler in the art of building and flying control-line stunt planes. If you haven't already done so, you should first build TESTOR'S Freshman "9", Sophomore "9" and Junior "9" before building this model. This kit has been carefully engineered to match the McCOY "9" Engine, the TESTOR McCOY "9" Propeller, and TESTOR'S "39" Fuel. When powered by the McCOY "9" Engine, the Senior "9" offers you the ultimate of stunt performance in control-line flying. This tailored combination provides the modeler with a matched power unit and a perfect fourth step in the hobby of controlline flying. The TESTOR kit for the McCOY "9" engine has the green label.

If you do not have a sanding block, make one from a block of wood approximately 6" x 2" x 1" as shown. It is best to wrap the sandpaper around the block and fasten it with thumb tacks. This makes it easy to replace the sandpaper when it becomes worn. Use number 1/2 sandpaper for rough shaping operations, and number 3/0 for smooth shaping. The sanding block is used to shape the tips of the wing, and to round the edges of the rudder and elevator parts. Remember to sand with the grain of the wood during every sanding operation.

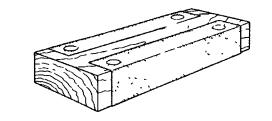
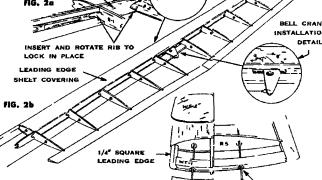


FIG. 1

Start assembly of the model by building the wing. Separate

the ten wing ribs marked R-1 through R-5, the two wing spars, the four tip formers marked T-1, and the four tip leading edge covers marked T-2 from the die cut sheets. Trim or sand smooth edges of all die cut parts. Using TESTOR'S Formula "B" Cement, join the two main spars together using the $3/32'' \times 1/4'' \times 3-1/8''$ basswood spar bracer to reinforce the joint at the center of the spar. The dotted lines on the spar show this position. It is unnecessary to provide a brace at the bottom of the joint inasmuch as the basswood pivot screw block to be cemented in place later will also act as a spar brace. Make certain that the top edge of the spar is in a straight line while the center joint 15 drying. Bevel one end of each of the two 1/4" square x 15" balsa strips, and splice together as shown in the splicing detail in Fig. 2. The bevel should be about 1/2" to 3/4" long. This piece will be used as a leading edge spar. Now insert the ribs in the proper notches in the main spar as shown in Fig. 2a. Rib R-1 goes in the notch marked 1, R-2 in notch 2, etc. The ribs may be cemented after they are in place. Cement the trailing edge onto the ribs. The end of the trailing edge having the longes distance from the notch to the end is placed at the center of the wing. Cement the 1/4" square balsa strip in place to form the leading edge. Cement the 1/4" x 5/8" x 3-1/8" basswood pivot screw block in place flush with the bottom of the two center ribs and the back side of the spar. It block acts as a reinforcement at the center of the spar and serves as a place to mount the bellcrank. Mark the location of the bellcrank pivot screw according to the location on the top view drawing. Thread the two lead out wires through the wing and secure them to the bellerank as shown in Fig. 2b. Slip the bellcrank into place and screw it to the pivot screw block at the proper location with one of the 3/8" long wood screws. Place two washers underneath the crank, and one on top of it. Do not turn the screw completely in, but allow enough play to insert the pushrod in under the bellcrank later. The wing leading edge sheet covering may now be cemented into place overlapping the 1/4" square leading edge and flush with the shoulder on the ribs. The shoulder may have to be trimmed in some instances to make a good fit. It is imperative that alignment be checked frequently to insure against warpage of the wing when adding the sheet covering. The center section of the wing between the two ribs R-1 is covered both top and bottom with 1/16" sheet pieces W-3 and W-4. Cover the BOTTOM ONLY at this point as the top must be left uncovered until the control mechanism has been completed

Cement two of the pieces marked WT-1 together, one on top of the other. This will insure extra strength for the wing tip. Cement one of the double thickness WT-1 pieces in place on each wing tip as shown in Fig. 2c. The end with the marking goes toward the leading edge. Drill two holes in the LEFT wing tip directly in line with the holes in the ribs and insert a 1/16" dia. x 1/2" long eyelet in each hole for the control wires to pass through. Cement the two 1/16" sheet covers marked WT-2 in place on each wing tip. Sand the square corner of the leading edge to an even roundness, and sand the tips to an even contour so as to prevent any bumps or protrusions after the tip is covered with paper or silk. To insure a smooth overall job, check each rib and trim or sand flush with the leading edge sheet covering and the trailing edge. Do not cover the wing until later, as indicated in the instructions.

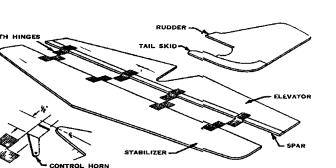


LEADING-EDGE SPLICE DETAIL

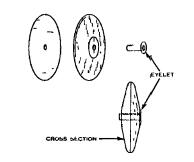
Remove the stabilizer, rudder, tail skid, and elevators from the die-cut sheets and sand any rough edges smooth. Cement the rudder and tail skid together as shown in Fig. 3. Cement the elevators to a basswood spar, using the top view drawing as a guide. Round the edges of the rudder, stabilizer, and elevators with the sanding block. The edge of the stabilizer that joins the elevator may be left square. Hand sand the tail surfaces with 4/0 sandpaper. Using TESTOR'S Formula "B" Cement, apply the control horn on the elevator spar 3/8" to the right of the center (looking toward the front of the plane). It is a good idea to squeeze the horn down on the spar with pliers. Use cement liberally, coating the joint a second time after the first application dries. Cut eight 3 4" cloth hinges from the long strip of cloth supplied in the kit. Cement these in place as shown in Fig. 3. Join the elevator and stabilizer by cementing the top elevator hinge cloth to the

under side of the stabilizer and vice versa. Be very careful to

prevent cement from getting on the hinge's where they bend.



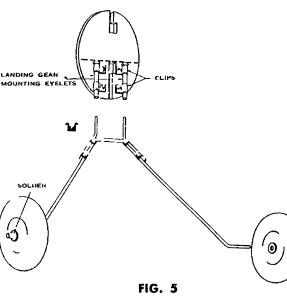
Cement the wheel halves together making sure they are cross grained and that the holes are aligned properly. See Fig. 4. Cement the eyelets in the holes using the cement liberally. It is recommended that you use these wheels inasmuch as they are light and very strong. A single coat of TESTOR'S Black STA is sufficient to finish them.



as shown in Fig. 5. These mounting eyelets serve as guides if the gear is to be droppable, or act to hold the gear securely to the firewall if you prefer to have the gear fixed. Fasten the eyelets securely to the firewall with the 1/4"-long wood screws, as shown. The flanges of the eyelets are flush with the top of the lower slot in the firewall. If you intend to have the gear permanently affixed it is a good idea to solder the clips to the eyelets. Assemble the gear from the three prebent wire parts as shown in Fig. 5. This can best be accomplished by binding the parts together with the soft wire furnished, slipping the gear temporarily in the eyelets on the firewall, and soldering the assembly together. Avoid overheating of the assembly to prevent charring of the firewall. Do not allow the solder to run into the eyelets or the landing gear will not be removable. Solder a washer to the inside of each landing gear axle, slip the wheels on the axle, and solder a washer on the end of each axle. Be careful not to solder the washer to the wheel bushing. Acid core solder is best for this particular job. The landing gear may be put aside for the time being. The landing gear detail has been

omitted from the top view drawing in the interest of clarity.

Slip the clips in place on the landing gear mounting eyelets

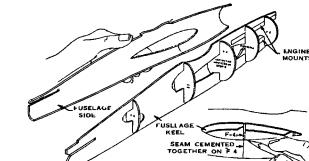


Separate the pieces marked fuselage keel, the firewall, and the formers 1-2, 1-1, 1-5 and f-5 from the diecut sheets. Trim or sand the edges smooth and even. Insert and turn into place formers 1-1, 1-5 and f-6 in their respective notches in the tuselage keel. Secure them in place with cement. Cement the firewall and former 1.2 in place on the keel. The proper location is indicated on the keel. Do not cement f-2 to the portion indicated to be cut out. All of the formers and the firewall should have 1 15 spacing between their top and bottom edges and the top at d bottom edge of the keel. There is a dotted line on the kecl that indicates this and shows the area to which the molded tusclage covering is cemented to later. After the meanth olding f-2 is dry, the portion of the keel indicated my cur away. Do not cut away the portion between the dotted lines on f-4 and f-5 until later. The engine mounts may be installed at this point. The upper mount is squared off at 1 appared end which goes toward the rear of the plane. The read as inserted in the receptacles provided in former f-2. A le frewall the he notched side of the front end to the 11, ht . . . (looking from the rear to the front of the plane). The lower mount has a curved recess at the rear which clear, and section of the wing. The mounts

should be taken that they are conted properly. This model is of a very light consumment in any extreme care must be taken that all cemented joints in the seportion be well made. The model will possess an externity high strength-to-weight ratio if built properly Check the left fuselage and ded sheet covering for a correct fit on the keel and form as so 'y'y. Trim if necessary and cement the covering in

lang certain it is cemented to all the formers, the firew 1 . the keel. This is extremely important. Rubber bands is no may be used to hold the covering in place white it; nent dries. Make certain that the keel remains absoluted straight while the cement dries so as to prevent permanent it is signment of the fuselage. After the cement holding the covering is dry, cut away the indicated portion of the formers 1 1 ans -5. Also trim or sand the front edge of the cover quare with the keel. Trim the right side fusclas control to lit into place but do not install

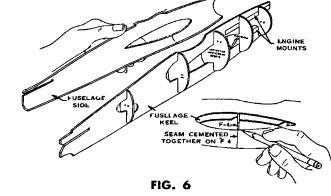
The engine may be a sill apporarily at this point with the four 3-8" wood seew, provided. Drill small holes to



it at this time.

prevent splitting 6 and Make certain that there is no up or down thru is necessary 2° of right thrust is provided for automatically by the notches in the engine mounts. It is a good to plug the exhaust and intake openings with a small procession to clean rag to prevent harmful dirt from gettin ... the engine. The nose block may now be cemented into the after trimming to clear the engine. It will be necessary 6 provide clearance for the needle valve and fuel line tal also. It you are going to use a spinner, to clear the back to cot the spinner. Install the spinner temporarily and car indisand the nose block so the contour flows evenly into the contour of the spinner. If you do not intend to use a spinic valve and sand the nose block to a smooth curved contour to complete the lines of the nose. Trim the right side fuseline covering to clear the engine. You may prefer to cur a h. tch for access to the tank and engine after the model is completed. Do not cement the right fuselage cover into place until later, as noted in the instructions. Remove the spring and the engine and give the entire engine and tank compartmene two coats of clear or colored TESTOR'S

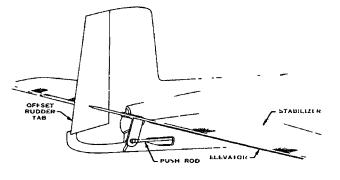
STA, with exception of the edges and surfaces that are to



Trim the wing slot in the fuselage assembly, if necessary, to fit the airfoil section at the center of the wing. Slip the wing into the slot, push the push rod through the proper holes in the formers with the right angle bend toward the center of the fuselage, and link the bend in the push rod into the hole in the belierank from the underside. Tighten the bellerank screw sufficiently to prevent the push rod from slipping out and still permit the crank to pivot freely. Cement the wing in place 1/2" off center to the left. Use plenty of TTSTOR'S Formula "B" Cement for there is considerable stress at this point during flight. Be sure the wing is square with the tuselage. This can best be accomplished by laying the plane. down on the drawing to check alignment. Now cement W 4 and then W-3 into place to complete the wing center section covering. These two pieces have to be slid into place and then cemented.

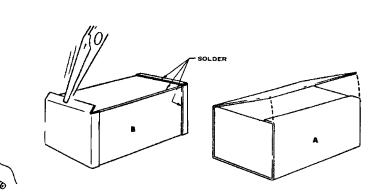
Tocate the center of the stabilizer and coment it into place in the slot at the rear of the fuselage. Check alignment in the same manner as you did the wing. Be absolutely certain not to get any cement on the elevator or the hinges as this will prevent free movement. There should be at least 10 up and 40° down movement of the elevator without binding or sticking. Pin the elevator temporarily in neutral position (straight in line with the stabilizer) and also pin the bellerank in neutral position (straight in line with the fusel ige). Benda right angle bend to the right on the rear end of the pushrod in such a manner that the bent end will slip into the hole on the elevator horn. Remove the pins and test the control system to see that it functions freely. It may be necessary to bend the pushrod slightly at one or more points for best operation. Do not fasten the pushrod permanently to the elevator horn until later, as indicated in the instructions.

Cement the rudder-tail skid assembly into place and add the dorsal fin as shown on the main drawing side view. Make certain that the rudder does not restrict the movement of the elevators. Cut the rudder tab and off-set the rudder to the amount on the main drawing top view



Obtain a McCOY Senior "9" tank and mount it between the engine mounts in the position shown on the main drawing You may want to make your own tank from the sheet metal salvaged from a tin food container. This can best be done by making a block of wood just slightly smaller than the required tank size and shape. The sheet metal may then be cut and fit together over the wood form, and then soldered together. Be sure the engine draws the fuel from the right side of the tank and that the tank is vented properly. Use short pieces of neoprene or flexible plastic tubing to extend the vents outside of the fuselage covering.

Mount the engine and connect a piece of flexible tubing between the needle valve and the tank. It is a good idea to cover the entire cylinder and head of the engine with masking tape at this point. This will prevent TESTOR'S STA from getting on and in the engine when the model is finished later on.



Weight the right hand wing tip with solder or other material until the right wing panel is slightly heavier than the left. I'his will help the plane to bank away from the center of the flying circle thus keeping the lines tight.

Slip the right fuselage covering over the wing and stabilizer,

and check again for correct fit on the fuselage. It may be

necessary to trim the wing slot slightly to fit over the air foil

at the center of the wing. Cement the covering in place,

making certain it is cemented securely to the formers, the

firewall, noseblock, and fuselage keel. Rubber bands and

pins may be used to hold the covering in place while the

cement dries. Secure the pushrod in the elevator horn by sold-

ering a small eyelet on the end. Prevent any solder from

getting on the horn, or the control system will tend to bind.

A piece of cardboard may be slipped on the wire between

the eyelet and the horn and removed after the solder has

hardened. Check the control system for free and easy move-

The wing panels may now be covered with silkspan paper or apanese silk at this point. It is a good idea to cover the eading edge sheet covering and all. Start at the center section using TESTOR'S Formula "A" Cement to hold the fabric covering, making certain the fabric is taut while the cement dries. If you are using silk you may loosen the covering with acetone where it is cemented to the frame in order to pull out any wrinkles. The fabric may be sprayed or moistened with water and allowed to dry. Apply two coats of TESTOR'S Clear Dope on the fabric only, that is to say with the exception of the leading edge sheet covering. This will tighten the tabric considerably, actually eliminating the smaller wrinkles.

Paint the entire inside of the cockpit area with TESTOR'S Black Dope or TFST OR'S STA. Wipe the entire plane clean so that all surfaces are dust free. Apply, either by brush or spraying, two coats of TESTOR'S STA Sealer without sanding between coats. IMPORTANT: Be very careful to prevent any STA getting on the cloth hinges where they bend as these must necessarily be flexible and free moving. Allow to dry 20 to 30 minutes and then sand thoroughly with 4,'0 sandpaper. Again wipe surfaces so they are dust free; then apply two or three coats of colored STA. You may want to use two contrasting colors in a color scheme as shown on the box label. A high gloss may be obtained, if desired, by sanding the last coat lightly and applying a final coat made of 2/3 Clear STA and 1/3 colored STA. If you wish to use decals, they may be covered with a coat of Clear STA, pro-

viding it is applied with a spray gun, or brushed lightly

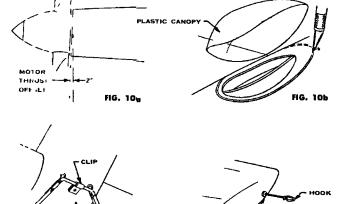
STEP No. 13

3 dl the spinner back plate and a TESTOR'S McCOY "9" oropeller on the engine shaft. Notch the spinner to clear prop and install it in place over the prop. Check to see there is the proper clearance between the nose block the spinner back plate to permit the engine to turn freely.

Hold the plastic cockpit canopy in place and mark its outline on the luselage with a pencil. Remove a small strip of the SI V along the pencil line with a sharp penknife as shown in hig 10b. This will prevent the canopy from smearing adhere better to the balsa wood than to the finish. Cement the canopy in place.

If you intend to have a fixed landing gear, fasten it into the sucket with a bracket screwed into the bottom of the fuselage as shown in Fig. 10c.

Bend a hook in each control lead out wire so that both wires are the same length when the elevators are in neutral position.



Your airplane is now ready for flying. Use control lines of from .008" to .010" in diameter, and approximately 30 feet long for the Senior "9". Both lines should be exactly the same length. Clips are installed on either end so as to clip the lines both to the lead wires and the control handle. The lines should have the very best of care. Store the lines on a reel 5" in diameter or larger. Be absolutely certain your control system works perfectly and will not fail you. Select a handle on which the lines connect 5" or 6" apart. Pick a calm day to test fly, and be sure to select a spot that is smooth

Start your engine and allow it to warm up sufficiently, Have some one hold the plane until you get your hands on the control handle. Double-check to see that you have the handle with the right end up; that is, when you tilt the control handle

backward, the elevator moves upward. At a prearranged signal, the plane should be released at gight At a prearranged signal, the plane should be released at signt angles to the control lines. From this moment on, be prepared to step back whenever the lines slacken; acloss of control will result in the lines becoming slack. Do not step backward until the lines go slack, for this will drag the plane sideways during the take-off. This burdens your engine and makes for a poor take-off.

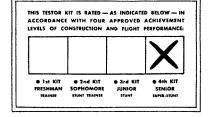
The plane will take-off by just tilting the handle back-slightl and returning to neutral position. It is a common tenden to over-control on most maneuvers, so try to be smooth and without quick changes from up to down movement. Practice level flying at about 10 feet of altitude before attempting any climbing or diving. You'll be a lot more certain of what you are doing if you "get the feel of the ship" first, Climbing and diving will automatically develop into wing-overs if practiced enough. A good maneuver to practice after the wing-over is mastered is the horizontal figure eight. Pull he plane over on its back, with full up movement and as u neutralize the controls after the plane is on its back

soon as the nose starts down give full down to turn the plane the other way and complete the eight. Remember you must neutralize after each maneuver is completed in order to resume level flight. Inverted flight and recovery is accomplished the same way as the horizontal figure eight except emember that up is down and down is up in inverted flight To resume normal flight altitude, give the controls full down as in the last part of the horizontal eight. An inside loop is complished by diving the plane slightly and then giving the controls full upward movement. After the loop is con pleted, it is necessary to neutralize or the plane will do consecutive loops. At first, it is best to start a loop never less than at 10 or 15 feet of altitude. Outside loops are most successful at first if tried from inverted flight position. The procedure is the direct reverse as for inside loops, thereby requiring full down control. It is far better to master the outside loop from the inverted flight position before at tempting one from the upright position. Vertical eights, 3-leaf and 4-leaf clovers are really only variations of the horizontal eight which should be mastered before attempting to perform any of these latter maneuvers. Never attempt any stunts with the engine delivering less than full power.

When the engine stops, nose the plane down slightly to keep up the forward speed. Just before the model touches the ground, ease back on the controls just enough to bring the nose up a little. The plane will lose flying speed and settle to a neat landing. Don't be discouraged if your first landings are poor. They will improve greatly with practice if this technique is employed.

TYPICAL FLIGHT MANEUVERS Upright Inside Loop Upright Vertical. '8'

KIT RATING





SUPER-STUNT FOR THE MCCOX "9" AND SIMILAR SIZE ENGINES TESTOR CHEMICAL CO. (Woodworking Division) ROCKFORD, ILL.

