

super kaos, jr.

BY JOE BRIDI

Want to save some money on your model fuel?

Have a smaller car and can't get your big one inside without driving with an open window for the wing to stick out?

Or, how about just wanting to fly a great flying ship in the .40 range?

It's the son of the Super Kaos, The Super Kaos Jr.! Even though it's smaller in size than the Super Kaos, Junior builds just as easy and boasts all of the big one's great flying characteristics. And, though some of the other .40 sized ships make it hard work to fly some of the AMA and FAI maneuvers, the Super Kaos Jr. will make it easy for you.

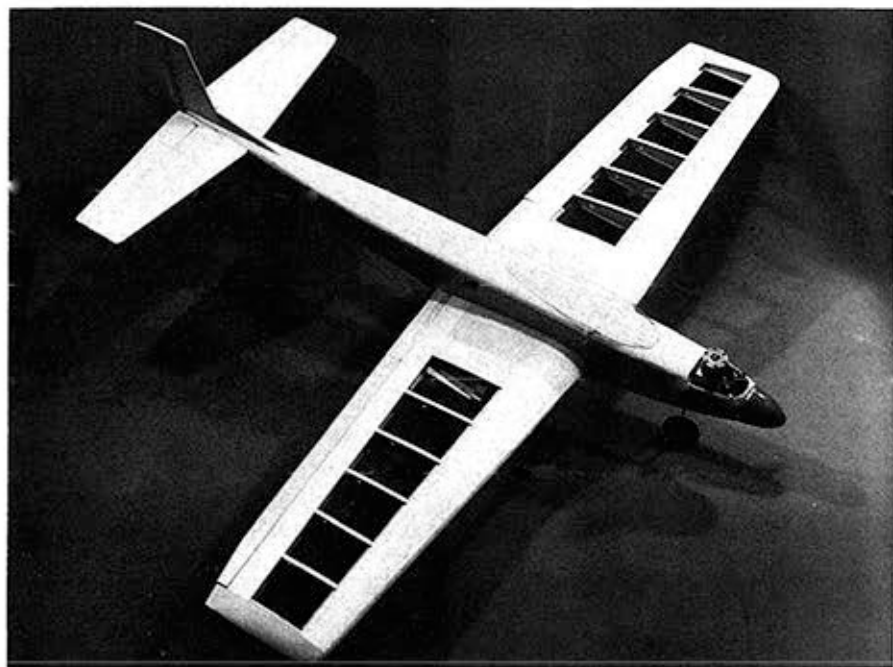
Before we get into the complete building directions, here are a couple of general comments we'd like to make. We simplified the process of mounting a nose gear strut bearing by drilling two holes in the Kraft-Hayes engine mount. It not only saves money but keeps the installation easy. Before you drill out the holes you need in bulkhead No. 1, plan ahead, and get them drilled before you install it in the plane - at least before you install the balsa block at the front of the fuselage. Once you get that block in place, drilling those holes gets hard to do. Also, secure the blind nuts to install the engine mount before you glue one bulkhead in place.

Because of the tight squeeze between the nosegear steering arm and the firewall, we recommend you use NyRod for the pushrod. And just use the wire end, bent to connect to the steering arm. It can be screwed in or out to make adjustments, or, the steering arm can be loosened. Also, check to make sure that the steering arm is cut down as necessary to make sure it doesn't bind on the side of the fuselage.

Now, on with the building.

STABILIZER

Edge glue the stabilizer angled 1/4"



sheet front to the 1/4" sheet rear half. When the glue is dry sand the sheet flat, but don't round the leading edge. Connect the two elevators together using the 1/16" wire and 15 degree offset horn using an epoxy adhesive. Be sure to use the 1/4" sheet spacer to find the correct distance between the two elevator halves, but don't glue it in place. Be sure that the two elevators are flat with each other. See picture number 1.

FIN AND RUDDER

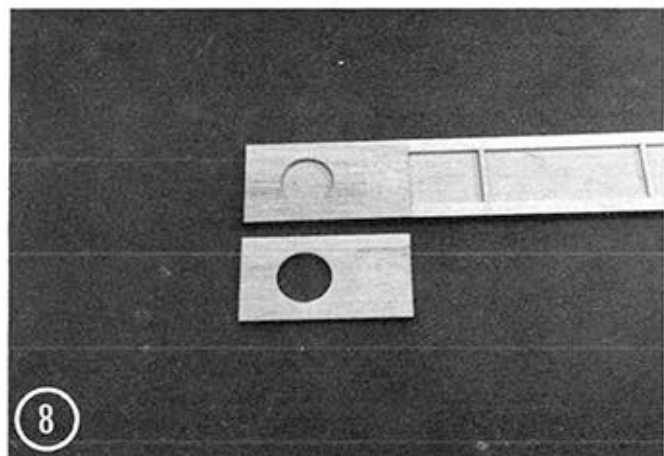
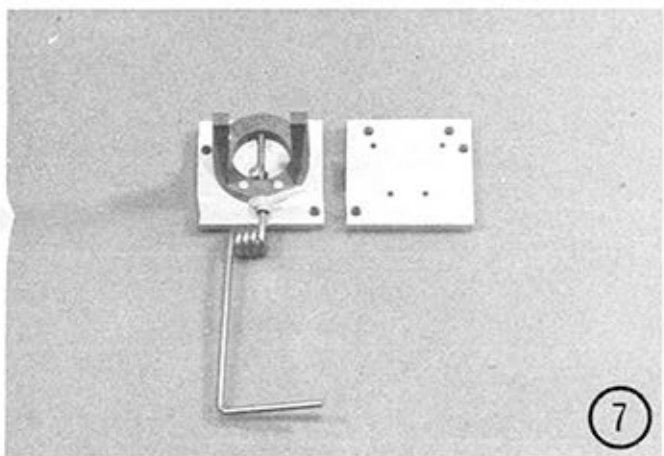
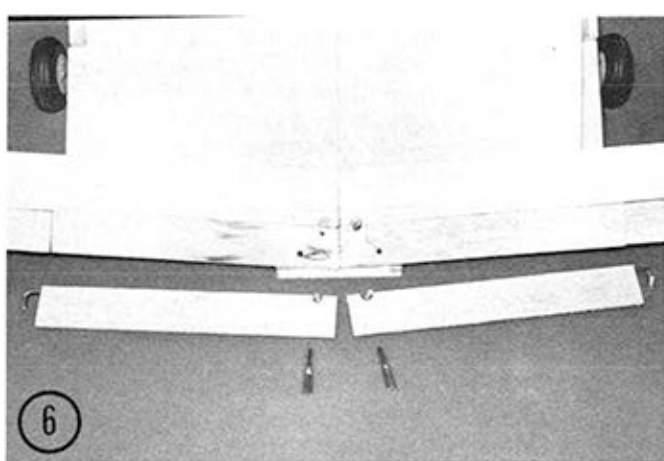
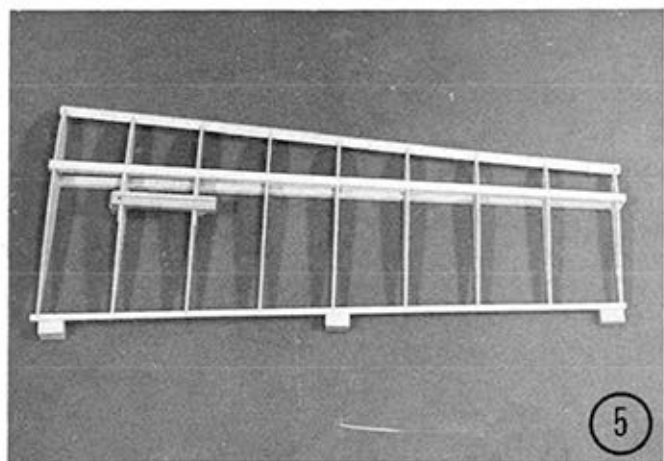
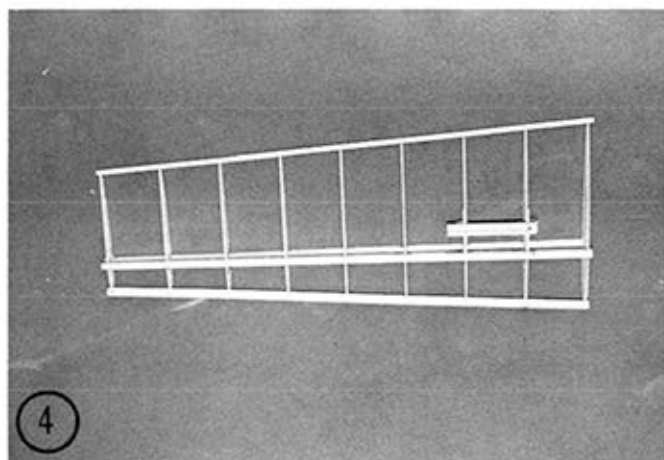
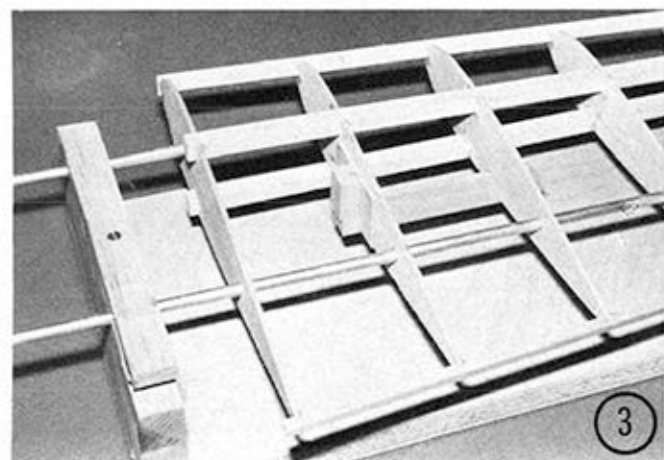
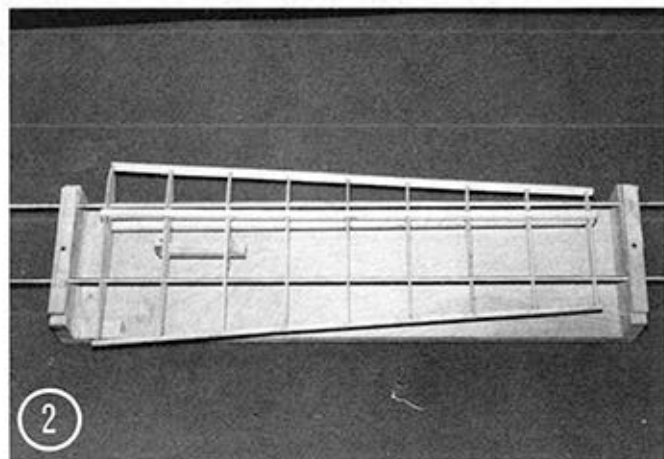
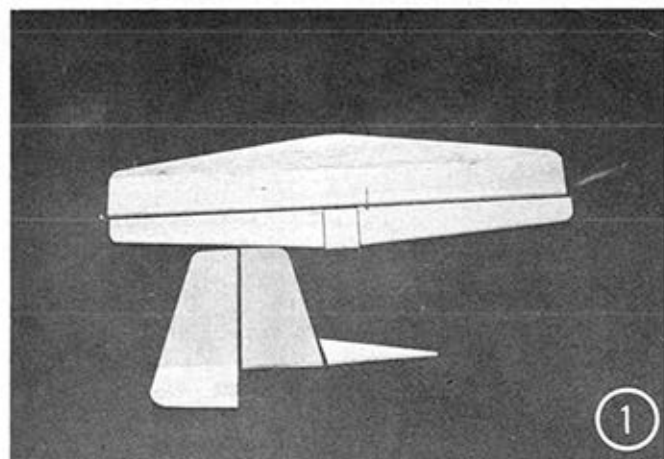
Glue the pine control horn insert, rudder bottom and rudder together. Do not glue the dorsal fin to the fin. It is glued in place after the fin is glued to the fuselage.

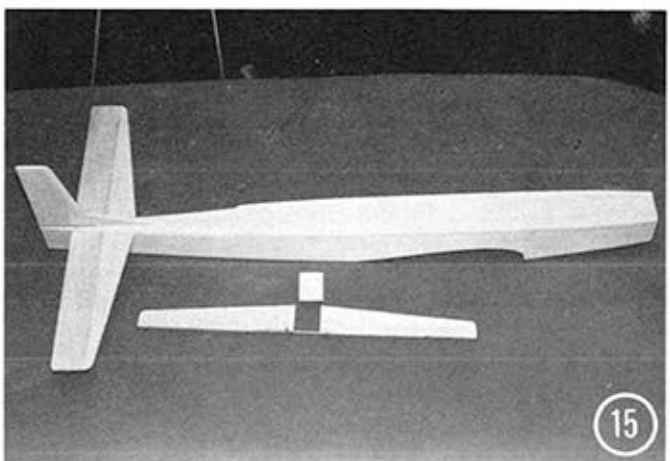
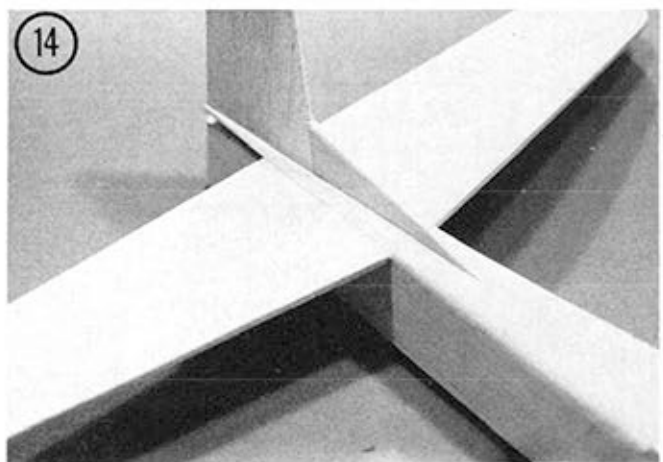
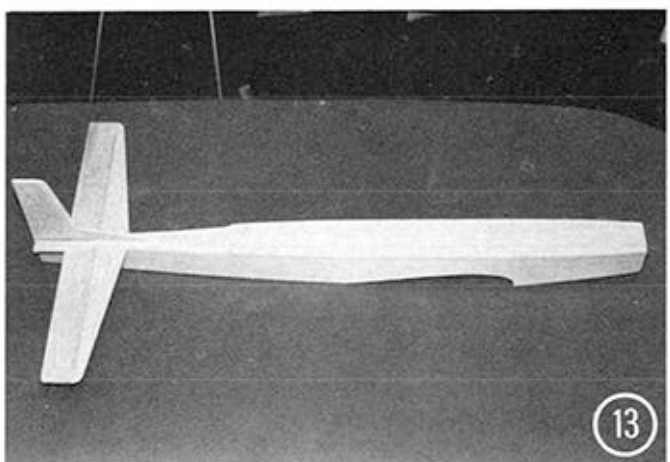
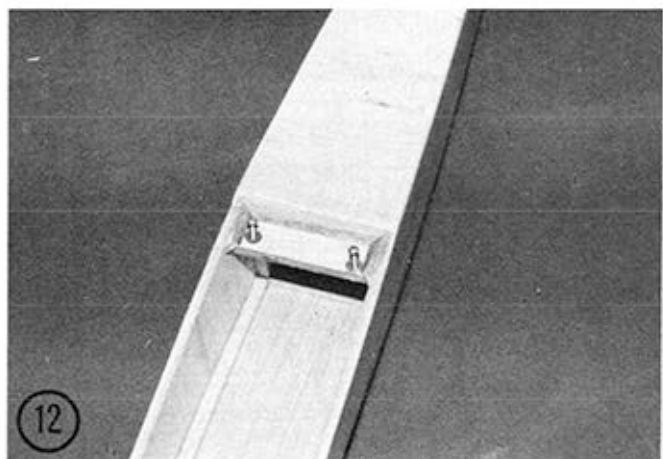
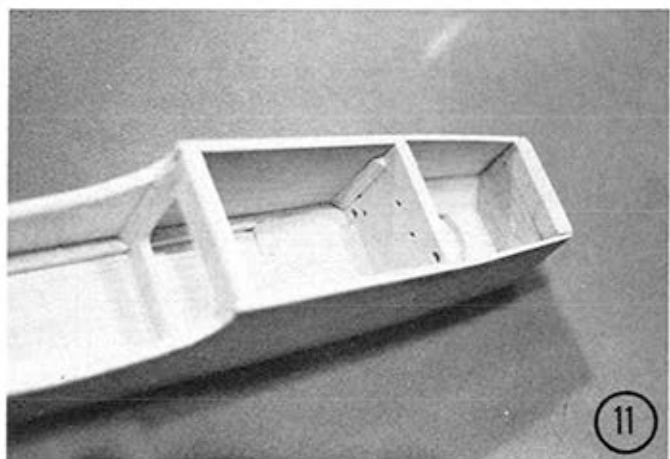
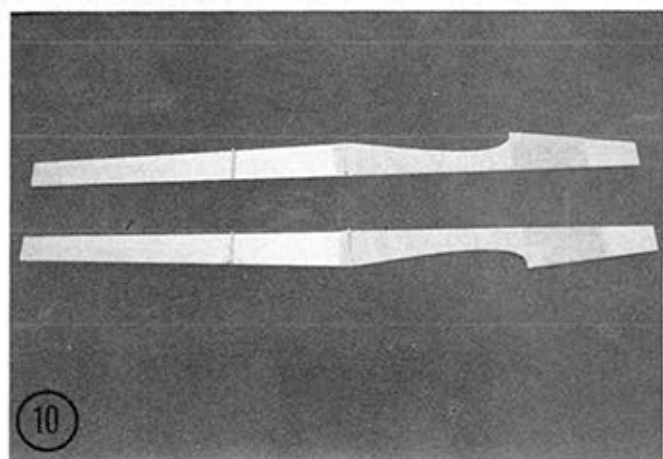
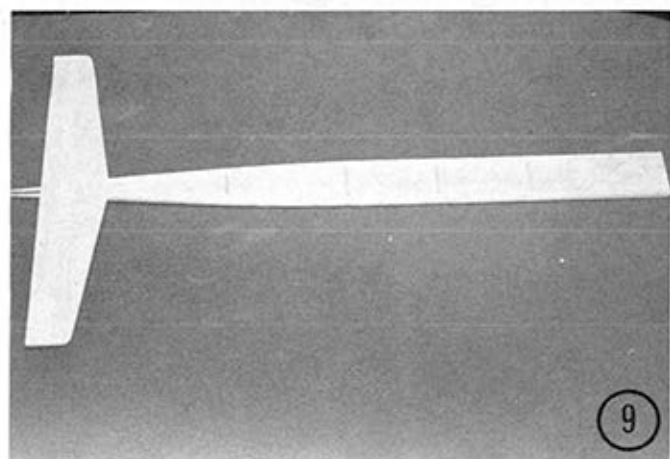
STARTING THE WING

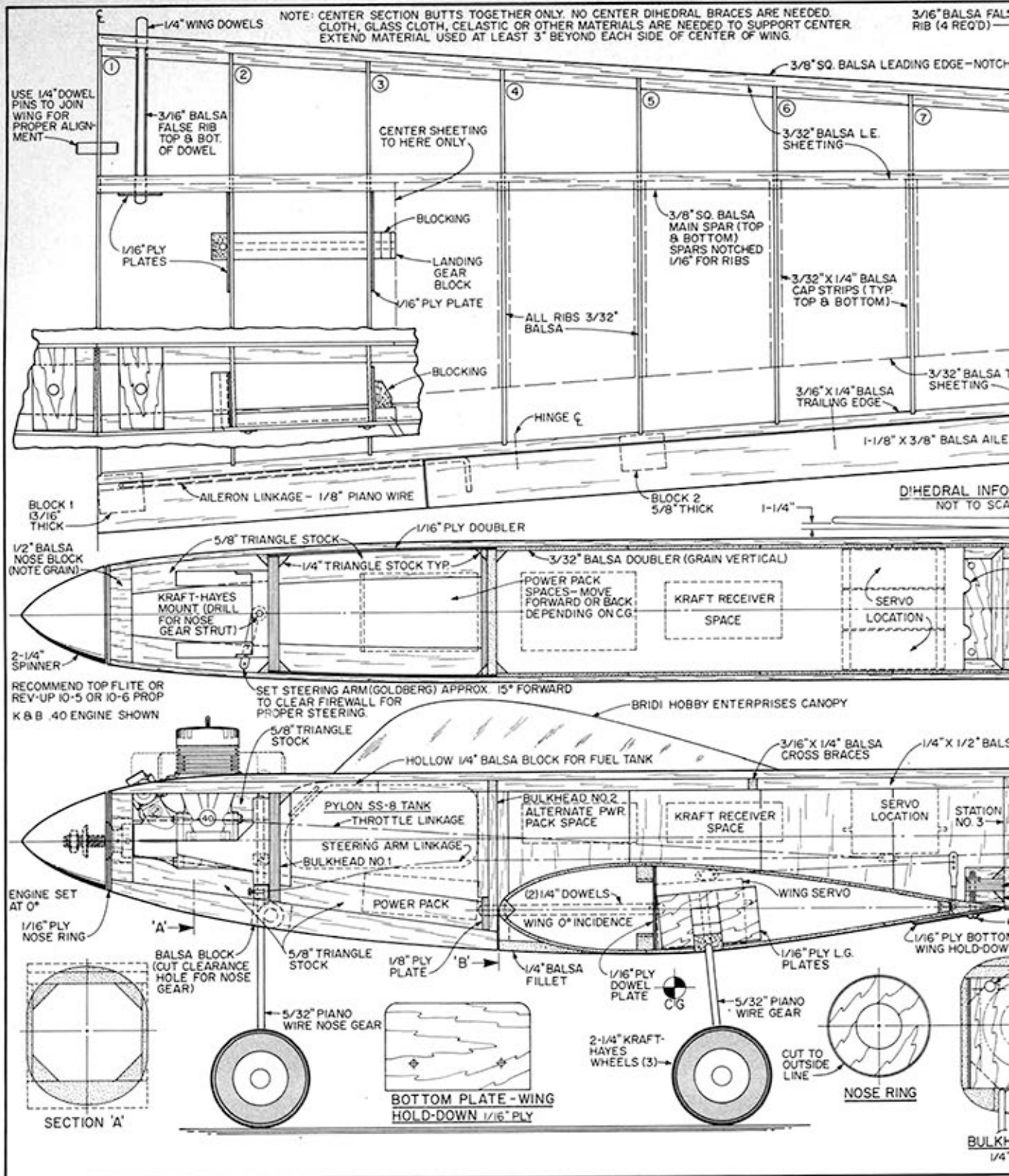
The RCM Wing Jig is highly recommended to assemble the wing. (See the August 1967 issue of RCM or send to RCM for a copy of the article for \$1.50.) Using 1/4" steel rods through the holes drilled in the ribs, this jig can give you a true wing in much less time

and work than usual construction methods. Picture number 2 shows a wing panel on the RCM Jig. Picture number 3 shows the landing gear blocks glued in place along with the 1/16" ply doublers. Be sure to make one left and one right panel. When gluing the first prototype wings together we used the new Hobby Shack model adhesive called Kwik Tak, and found it excellent. It's fast drying and it can be sanded without gumming up; a good adhesive to try. The entire panel can be completed on the jig, but do not glue the bottom leading edge sheeting, the false ribs, or the 1" piece of 1/4" dowel in place yet. These will be glued in later.

To build the wing on a building board (flat board, please) jig blocks are furnished. See picture number 5. Begin by drawing a line through the center of the tip and root rib so the line passes from the leading to the trailing edge of the ribs. Pin the spar to the building board with the notched side up. Glue the tip and root ribs in place on the spar, then glue the notched







trailing edge in place onto the tip and root ribs.

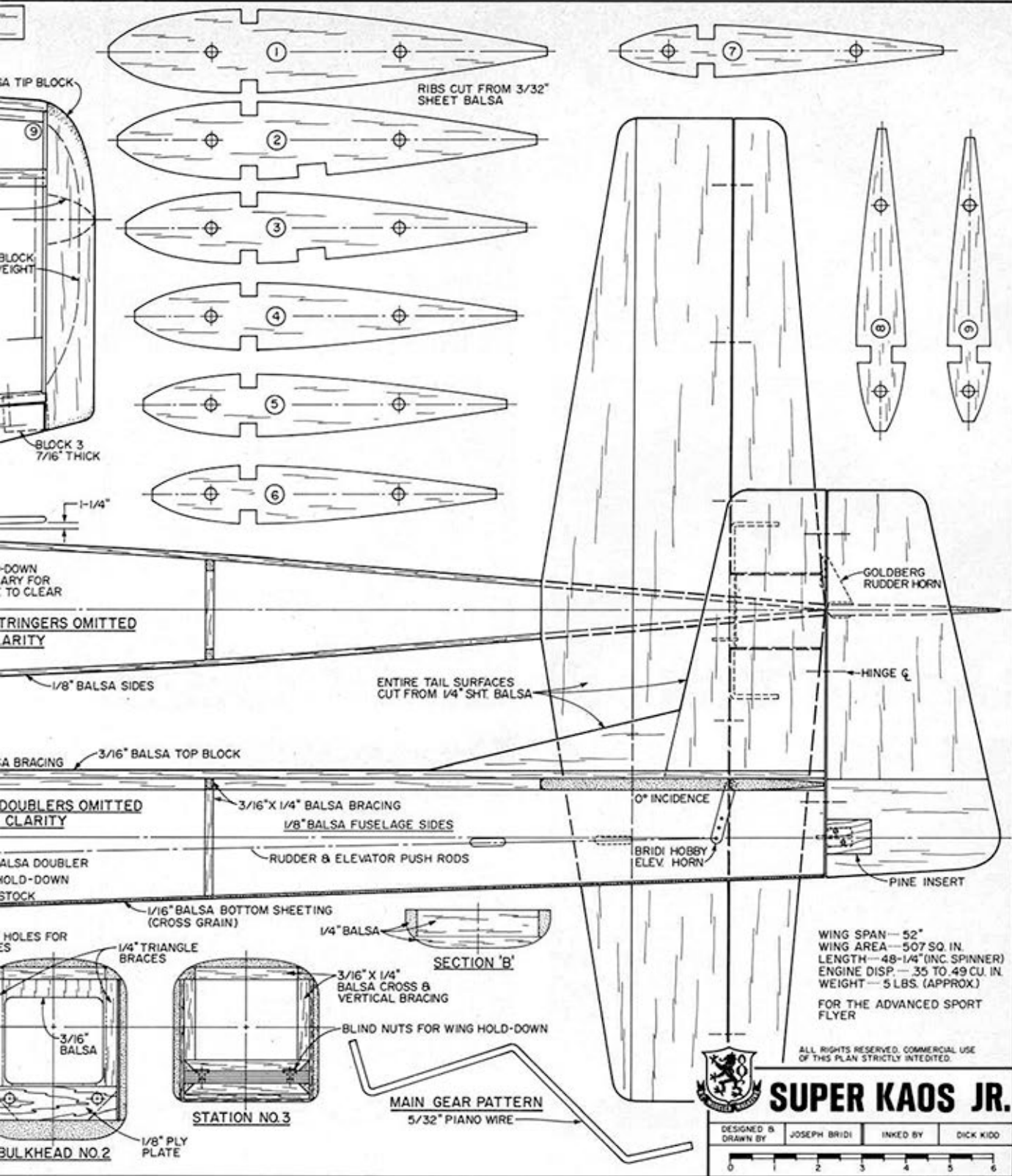
With the root and tip ribs glued to the spar and the trailing edge, it's time to set up the wing on the building board. begin by placing the largest jig block under the trailing edge of the root rib so the line you drew through the center of the rib is parallel to the surface of the building board. Then place the smallest jig block under the

trailing edge of the tip rib so the center line of this rib is also parallel to the board. Finally, place the middle sized jig block under approximately the center of the trailing edge. Move the jig block back and forth under the trailing edge until the trailing edge is straight. Check it with a straight-edge. Then pin the jig blocks in place.

Glue the ribs to the spar and to the notched trailing edge. Be sure

that the landing gear notch in ribs number 2 and number 3 are DOWN. Do not glue the false ribs or the 1/4" dowel in place yet. With all of the ribs glued down in place, glue the top spar into position. Glue the notched leading edge to the ribs and let the wing glue dry.

With the wing rib leading edge, spar, and trailing edge glue dry you're ready to glue the front and rear



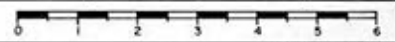
WING SPAN—52"
 WING AREA—507 SQ. IN.
 LENGTH—48-1/4" (INC. SPINNER)
 ENGINE DISP.—35 TO 49 CU. IN.
 WEIGHT—5 LBS. (APPROX.)
 FOR THE ADVANCED SPORT FLYER

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SUPER KAOS JR.

DESIGNED & DRAWN BY JOSEPH BRIDI INKED BY DICK KIDD



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sheeting in place. Note that the leading edge of the front sheeting is tapered. When you glue the front sheeting in place it is recommended that the outside surface be dampened with water. This will cause the sheeting to curl and conform to the rib curve more easily without cracking. Then glue the capstrips and center section sheeting in place.

When all of the glue is thoroughly

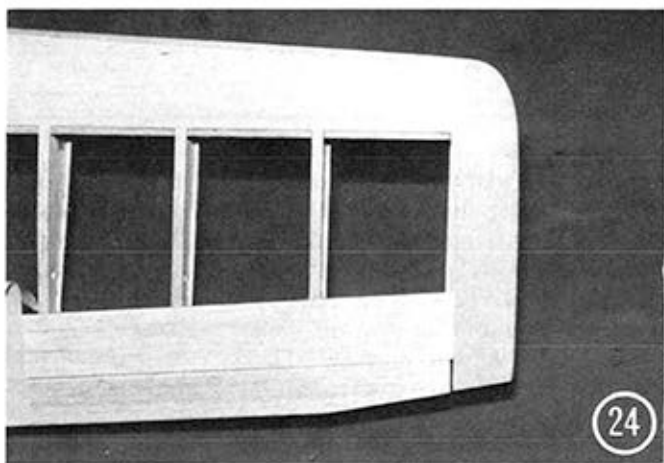
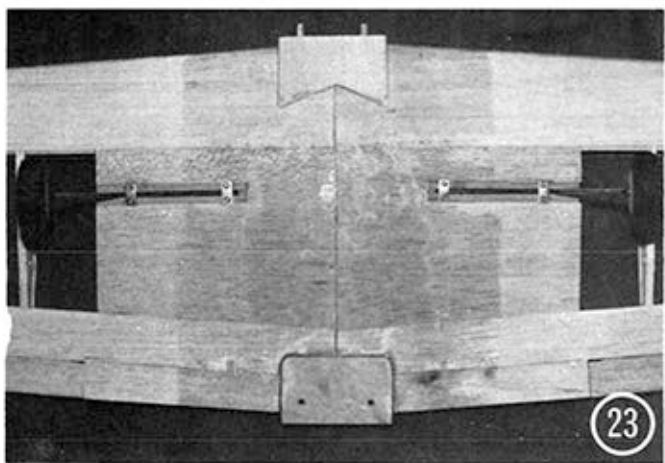
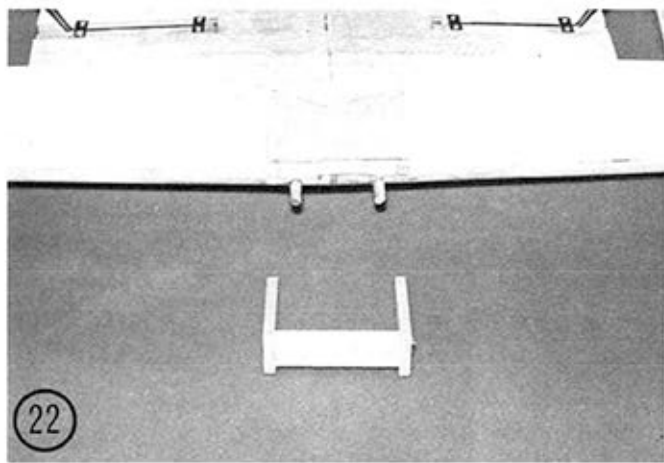
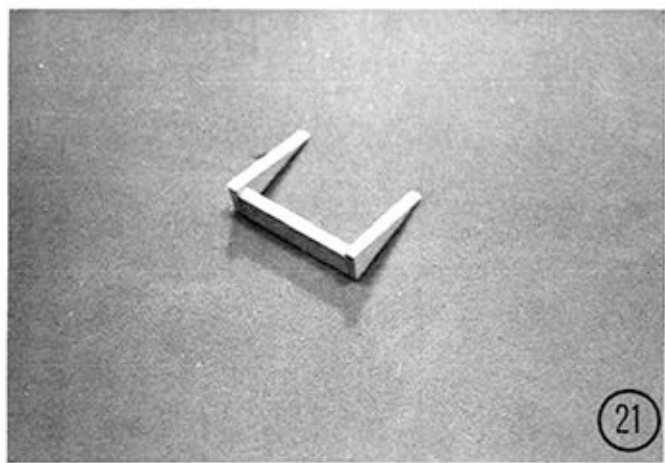
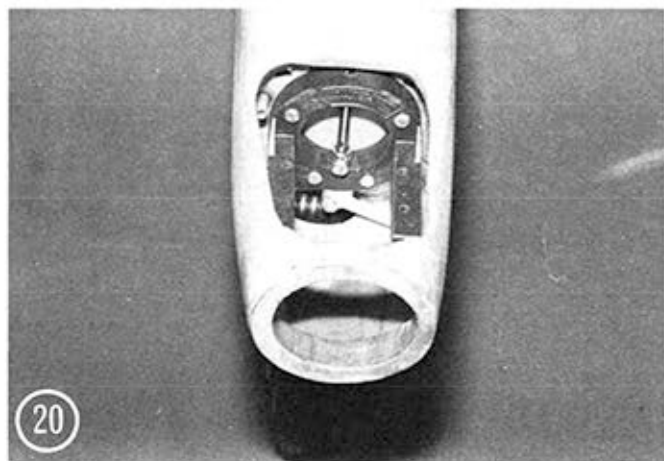
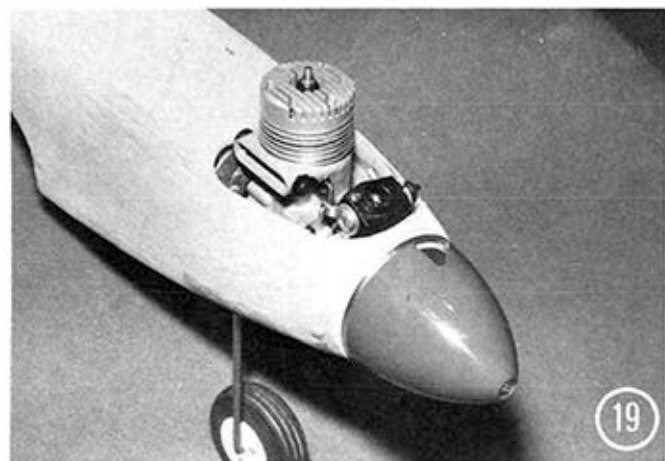
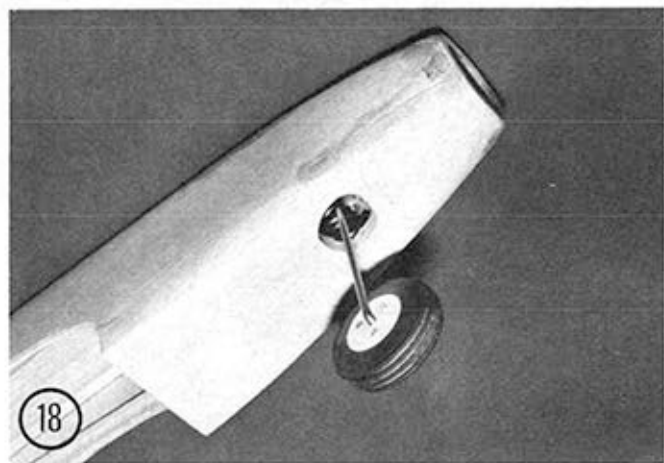
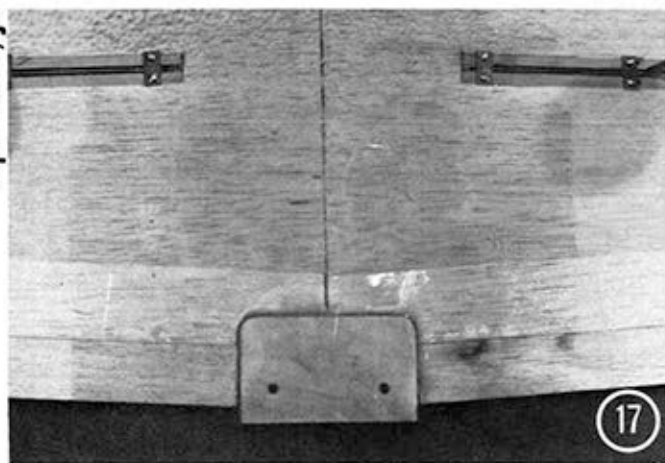
dry, turn the wing over and glue the rear sheeting in place. Do not glue the bottom front sheeting in place yet. Glue the plywood landing gear doublers to the ribs and install the landing gear parts as shown on the plans.

To install wing tip blocks, cut any overhang of sheeting, spars, etc., flush with tip rib; sand flat with large sanding block. If you wish to hollow

tip block, glue at two small spots and sand to shape on plan; now break loose and hollow inside, then glue into position.

To build other wing panel repeat this process BUT BE SURE TO KEEP THE LANDING GEAR NOTCHES UP so you will have a right and left wing panel. Remember that this panel is upside down, so you will not glue the

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bottom leading edge sheeting in place. When the wing panel has dried, turn it over and complete the top side.

Trim all overhang flush with the root rib. Place the bottom of the wing down on a flat building board and block up the tip 1-1/4". With a sanding block, sand square across the wing until the rib is 90 degrees to the building board. When both panels are sanded, check for proper fit. Now glue the two panels together with epoxy or Kwik Tak glue using the 1" piece of 1/4" dowel in the jig holes for alignment between the two panels.

First, drill the 1/16" diameter holes in the aileron brass extension tubes. Solder them on the 1/8" diameter aileron torque rods. See picture number 6.

Epoxy the aileron linkage into the trailing edge stock that has been grooved to accept it. Be sure to coat each end of the linkage with mold release or vaseline to assure the linkage is free to move after the epoxy has hardened. The linkage is installed correctly when the servo connection is on TOP of the wing (make one left and one right). Glue the trailing edge stock, with linkage, to wing.

STARTING THE FUSELAGE

Start the fuselage by drilling all necessary holes for the motor control, fuel tank vent and feed lines, nosegear linkage, and engine mount in bulkhead No. 1. See picture number 7. Also drill the hole for motor control and nose-gear linkage in bulkhead number 2.

The fuselage is built upside down. Place the fuselage top block on the building board and draw a line down the center of it. Start the fuselage top block assembly by placing the elevator spacer's trailing edge even with the rear of the fuselage top block, but do not glue it in place. Use Kwik Tak or epoxy, glue the stabilizer in place. Be sure the trailing edge of the stabilizer is at 90 degrees to the fuselage top block center line, and that the stabilizer is centered on the fuselage.

Add the 1/4" by 1/2" stringers down the sides of the top block as shown in the plans. Hollow out the engine top block as shown in picture number 8 and glue it in place. Add the four cross braces. At this point the fuselage should look like picture number 9.

Make up the LEFT and RIGHT fuselage sides next. Start by using the

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plans to mark the fuselage sides at the point where the 1/16" ply and 3/32" balsa doubler meet. This point is at the front of the wing saddle. Then draw a line across the fuselage side so it passes through this point. The line should be at 90 degrees to the top edge of the fuselage side. Using this line, glue the 1/16" ply and 3/32" balsa doublers in place. Then glue both the 3/16" x 1/4" rear vertical brace and vertical brace at station number 3 in place. Your sides should look like picture number 10.

Make sure the elevator spacer is still in place. It should be lined up with the rear of the fuselage top block. Glue the fuselage sides to the top block. The rear of the sides should be even with the back end of the elevator spacer. But be sure not to glue the elevator spacer in as yet. With the sides in place, add bulkheads number 1 and

number 2 and glue the station number 3 cross piece in place. Angle the balsa cross block which mounts behind the 1/16" ply spinner ring so it conforms to the angle of the fuselage sides. Then glue this block in place as indicated in picture number 11. Install the 5/8" triangle stock along both sides of the engine top block from the cross block to bulkhead number 1.

Add the 1/4" ply rear wing hold-down plate to the inside of the fuselage by station number 3 as indicated on the plans. Be sure not to get the wing hold-down plate too high. See picture number 12. Then add the 1/4" triangle blocking at the wing hold-down plate and at bulkhead numbers 1 and 2 as indicated on the plans.

Glue the 1/16" rear bottom sheeting in place with the grain running across the fuselage. Be sure the sides are right angles to the building board when gluing this sheeting in place.

When the glue is dry, remove the fuselage from the building board and round the top edges of the rear of the fuselage. Add the fin and dorsal fin. Make sure the fin is at a 90 degree angle to the stabilizer. See pictures number 13 and 14.

How you assemble the elevator, elevator spacer, and rudder depends on how you will finish your plane. If you are going to use MonoKote or Solarfilm, we recommend you apply a 1/2" width of the covering material along the trailing edge of the stabilizer, the leading edge of the elevator, the trailing edge of the fin, and along the leading edge of the rudder. Then hinge the elevator first. Glue the elevator spacer in place, and, hinge the rudder. If, on the other hand, you are painting your plane you can go ahead and hinge the elevator, glue the spacer in place, and hinge the rudder. Remember, the 1/16" wire that connects the elevator halves must move freely after the spacer is glued in place. See picture number 15 for the parts.

With the elevator and rudder hinged, add the 1/8" ply wing dowel plate in front of bulkhead number 2. Glue the 5/8" triangle stock along the bottom of the fuselage sides between bulkhead numbers 1 and 2.

WING HOLD-DOWN DOWELS AND SCREWS

In preparation for the installation of the wing dowels and hold-down screws, the section of the leading edge of the wing that mates with the fuselage should be rounded to contour so the wing can be brought forward to

its correct position in the wing saddle. See picture number 16. Note that the top of the wing should be complete at this time.

Hold the fuselage upside down and arrange it on your building board or a table so the stabilizer is level — front to back and side to side. Then, place the wing upside down in the wing saddle. Measure from the wing leading edge to the board or table top. Measure from the wing trailing edge to the table top. The leading edge should be the same distance from the table top as the trailing edge. Sand or shim the rear of the wing saddle as necessary. Then measure from each wing tip to the table top. They should be the same height from the surface. If they aren't, sand or shim one side of the wing saddle as necessary.

When the wing rests in the saddle as it should, you're ready to install the wing hold-down plate and dowels. First, block the wing away from the wing saddle for a distance of approximately 1/2 the thickness of the wing tape you are going to use. Then, measure from each wing tip to the fuselage side to center the wing. Measure from a straight pin inserted in the top of the rudder to each wing tip until the distance is the same on each side. Mark the wing and fuselage at the leading and trailing edge of the wing.

With the wing as far forward in the wing saddle as possible, locate the 1/16" ply bottom plate wing hold-down so it overlaps the trailing edge of the wing and closes the gap between the trailing edge and the fuselage. It should also be centered relative to the fuselage. Glue it in place. When the glue is dry, drill the holes in the bottom plate wing hold-down completely through the wing. See picture number 17.

To locate the wing hold-down dowels, first re-check to make certain the wing is properly lined up. Then, working through the bottom of the fuel tank compartment, use the holes in the 1/8" ply wing dowel plate as a guide to mark the location of the wing dowels on the leading edge of the wing. Remove the wing and drill the two 1/4" holes through the leading edge of the wing. Glue the 1/4" dowels and false ribs in place. Glue the 1/16" ply main spar brace in place to support the 1/4" dowels at the spar.

Complete the bottom of the wing by gluing the leading edge center section sheeting and capstrips in place. Then, with the wing installed in the saddle and carefully aligned, drill and

tap the rear wing hold-down plate in the fuselage for the size hold-down screws you'll use. Refer to the plans for completing the reinforcement of the center section.

COMPLETING THE FUSELAGE

Cut a hole in the top of the fuselage for the motor according to the hole outlined in the engine top block. Add the 5/8" triangle stock along the bottom of the fuselage sides between the balsa cross block and bulkhead number 1. Install the engine mount,

using blind nuts. Note that there is no side thrust or down thrust. Mount the engine in place on the engine mount. As you handle the fuselage to install the engine you'll note that the front section is somewhat flexible. This characteristic is used to align the front end. Once the chin block is glued in place, however, the nose section becomes rigid.

Glue the 1/16" ply spinner ring in place as indicated on the plans using Kwik Tak. Install a 2 1/4" spinner on the engine. Then, with the front end of

the fuselage lined up with the spinner, glue the chin block in place. Remove the engine and drill the hole for the nose wheel and spring as in picture number 18. Then shape the nose as shown in picture number 19. Remove balsa wood from the 5/8" triangle stock as necessary to clear the movement of the steering arm. See picture number 20. Note that the steering arm supplied in the kit will be too long. It should be cut off at the outer hole to clear the fuselage side.

The fuselage, rudder, and stabilizer should now be completed.

COMPLETING THE WING

Glue the wing fairing bulkhead and sides together, but don't glue the fairing bottom onto the fairing sides yet. See picture number 21. Install a 1/2" long section of your wing seating tape at the rear of both sides of the wing saddle. File or sand the bottom of the wing fairing sides so they conform to the shape of the bottom of the wing. Install the bottom of the fairing onto the fairing sides. Then, cut and sand the fairing bottom so it will fit the wing airfoil and fairing sides.

See picture number 22. When the fairing is complete, install it on the wing and sand it to mate with the chin block on the fuselage.

The bottom of the wing should now look like picture number 23 at the center section. Picture number 24 shows the completed tip and the cut-off at the aileron tip. Finally, completely finish the airplane and install all of the equipment; engine, tank, wheels, pushrods, etc., except the servos which are mounted in the fuselage.

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BALANCE

With the airplane complete and the engine installed, place the battery pack at the rear of the fuel tank compartment. Then lay the servos on top of the fuselage. Move them fore and aft until the desired balance point is found. (See the plans for the recommended CG.) Then mount the servos inside the fuselage at this position. Then, if a change in CG is found necessary after flying, the battery can be moved or weight can be added to the nose or tail.

FINAL CHECK-OUT

With the plane standing on the ground, measure the distance of each wing tip to the ground. Bend the main gear so they're level. Check to see if the stabilizer is level. Adjust the nose wheel to get it as level as possible.

Check the control surfaces to make sure they operate freely. Make sure the surfaces operate in the direction they should. The elevator travel should be 3/8" up and 3/8" down. The aileron travel should be 1/4" up and 1/4" down. The rudder travel is optional.

Finally, check the roll of the plane to make sure it rolls straight.

We have, in the Super Kaos, Jr., tried to bring you the latest in building techniques and design with easy construction. The Super Kaos Jr. is capable of all F.A.I. and A.M.A. maneuvers with ease, yet it's docile enough for the beginner. □