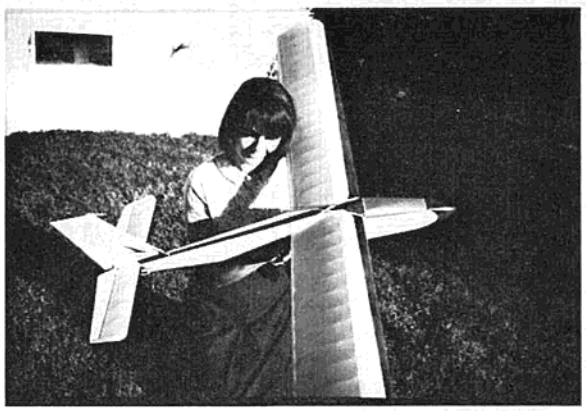
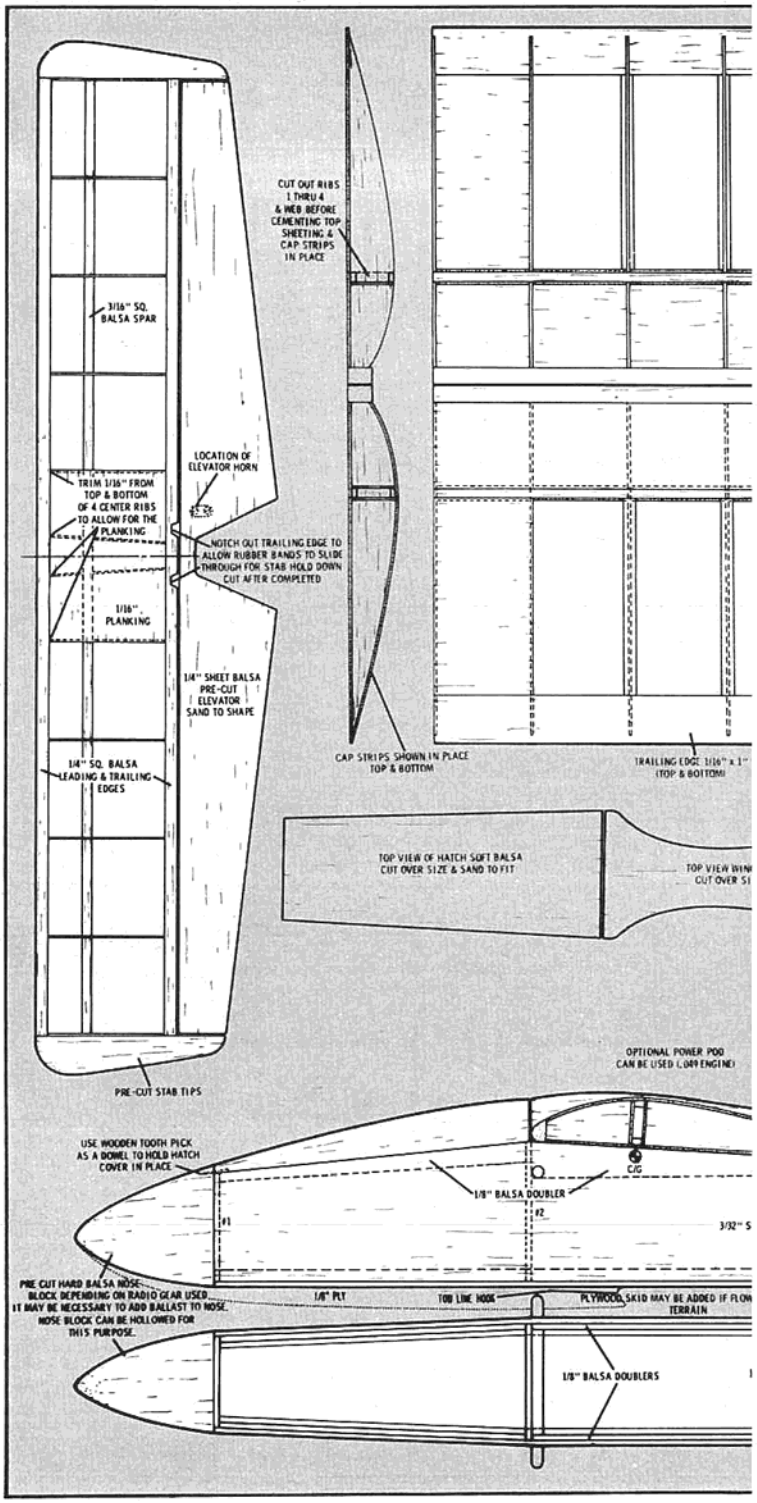


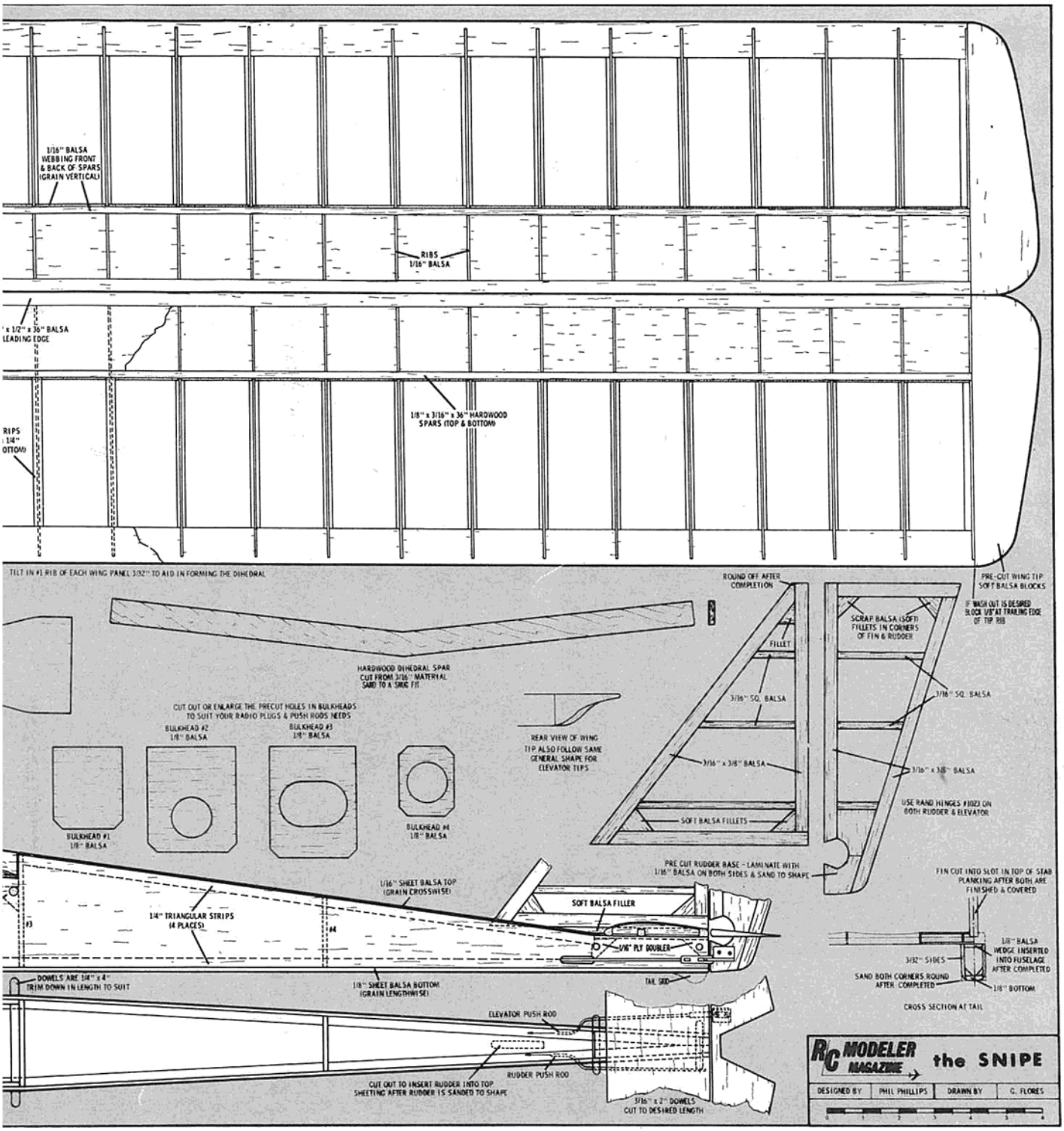
SNIPE

By Sgt. Phil Phillips, U.S.A.



Sgt. Phillips' six-foot glider is a natural for newcomers to slope soaring. Easy-to-build, features optional power pod.

THE Snipe is a simple, quick and easy glider to build. It is the direct result of a conversation between two glider nuts who thought it was time for a glider that could be bought, built and flown in less than a week. It was decided that this glider should be capable of flying the big gear as well as some of the smallest — it can, and has been flown using my Bonner 8 channel receiver and two big servos at an all-up weight of 2½ pounds. The glider has also been flown with my wife's Kraft reed set at a weight of 2¼ pounds. The Snipe also has flown using my Mustang 200 galloping ghost gear with two Bellamatic servos at a flying weight of two pounds. Since it is of relatively light construction it is not indestructible — in fact, there are only five pieces of hard wood in the entire kit — four spars and a dihedral brace. The first test ship weighed 18 ounces with four coats of clear dope and covered with silk span. I then placed the big gear in and the Snipe weighed a shade under 2½ pounds — and flew with no trouble at all. This was a calm day with little wind and no thermals and the plane did not gain too much altitude under these conditions. The next flight was on a moderately windy day with heavy gusts and the Snipe was off and running! It looped with ease and flew inverted for awhile, but this is **not** why it was designed. The Snipe is primarily a beginners R/C glider. The construction has been kept as simple as possible. The instructions are laid out for a step-by-step guide to help the beginner build his first R/C glider. The fuselage can be built in about 1½ hours, and set aside to dry while you build the wing. Both wing halves appear on the plans to make building move along as quickly as possible. All this can be completed in the first nights work. The following night the rudder and stabilizer can be built and the sanding of the fuselage and wings should be started. Cover the wings the third night, then sand the stabilizer and rudder. The fourth night I covered the rudder and elevator and finished sanding and doping the fuselage. The fifth night I made pushrods, installed the R/C gear and placed the fourth coat of dope on all surfaces. It flew on the sixth afternoon with four



coats of clear dope and the big gear!

If you are a beginner I feel that by following the step-by-step directions, you should have no trouble. If you are an experienced builder you will probably make your own changes, and build it to suit yourself. However, it might aid you in building the Snipe if you would read through the instructions just to see how it was supposed to be built. Then go ahead and have a ball changing things to suit yourself. The webbing in the wings serves two purposes, one, they form a dihedral box and two, they greatly add to the overall strength of the wing. I would **definitely** follow this part of the construction as I have seen the wing with and without this webbing and it does make a lot of difference in the overall strength.

By carefully pre-locating your R/C gear before you actually bolt it down, you should be able to balance the Snipe with no ballast needed. I place my R/C gear in loose, rubber band the wings on, put the rudder and elevator in place, then I know where to place my R/C gear. I had to put the Bellamatics in **front** of the #2 bulkhead to make it balance without any ballast. However, those big servos went up flush against the **back** of #2 bulkhead and it balanced out with no ballast needed. I am not going to attempt to tell **you** where to place your R/C gear, because we all seem to do things a little differently. The noseblock has been made 3 inches long so you can hollow out a place for any ballast if the need should arise.

You may also want to add a tail skid and undercarriage. Where I fly we don't need either. If you fly from sand, or hard ground, they could be easily added.

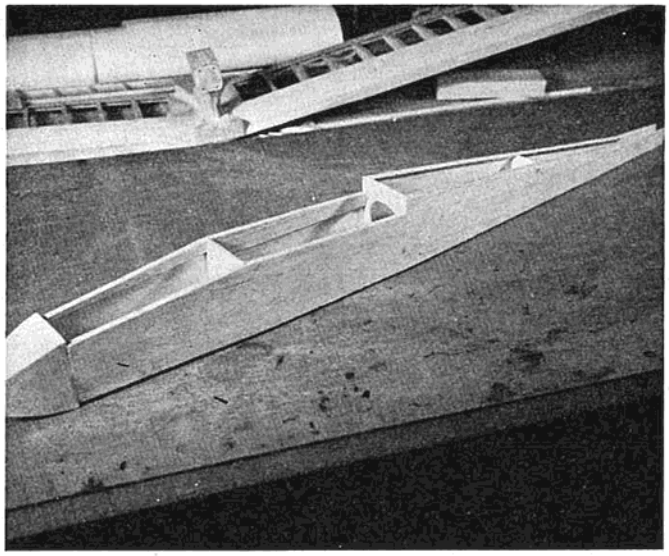
Hinges and control horns are shown on the plans, however, you can use any type you like. They are of no importance to the over-all flying performance of the Snipe.

FUSELAGE CONSTRUCTION

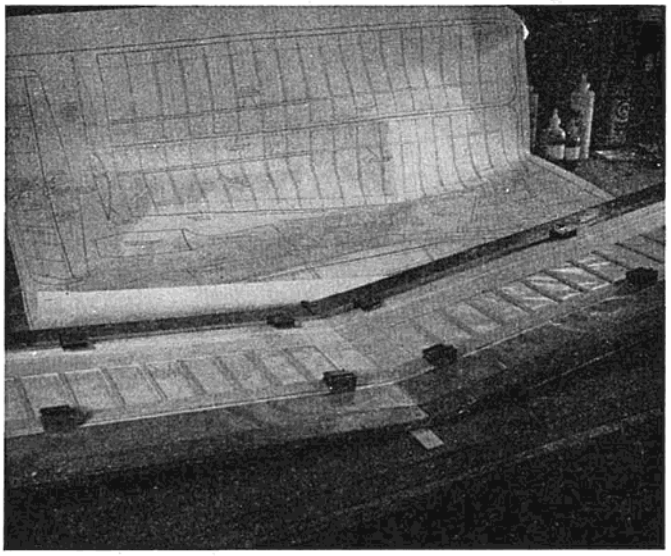
Step F-1: Cut a strip of ¼" triangular balsa 16¼" long.

Step F-2: Glue this piece to the top, back inside of the fuselage and pin in place. Leave ⅛" clearance where bulkhead #3 will be placed later.

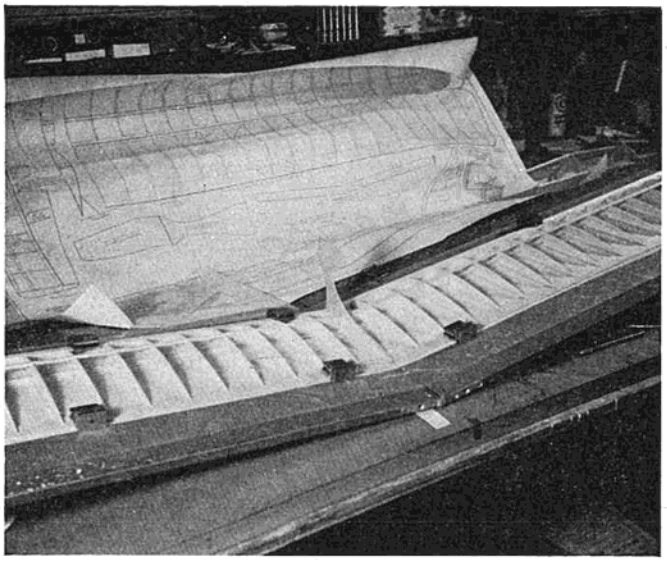
Step F-3: You will notice there is a 3 inch



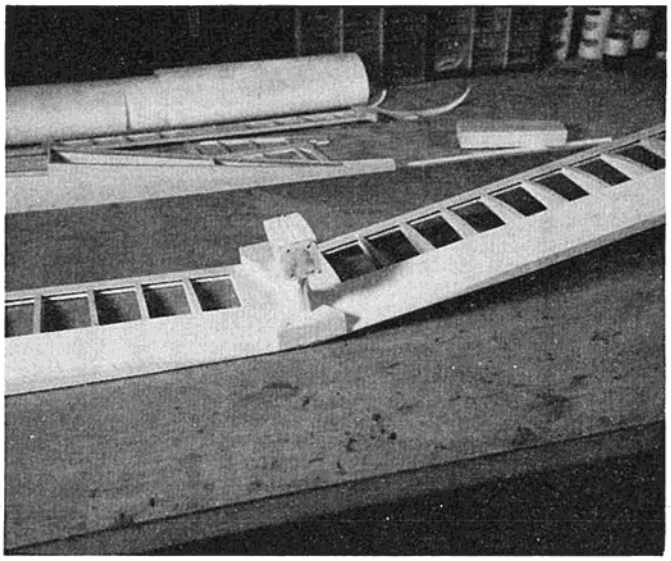
Basic fuselage structure, less top sheeting and canopy block.



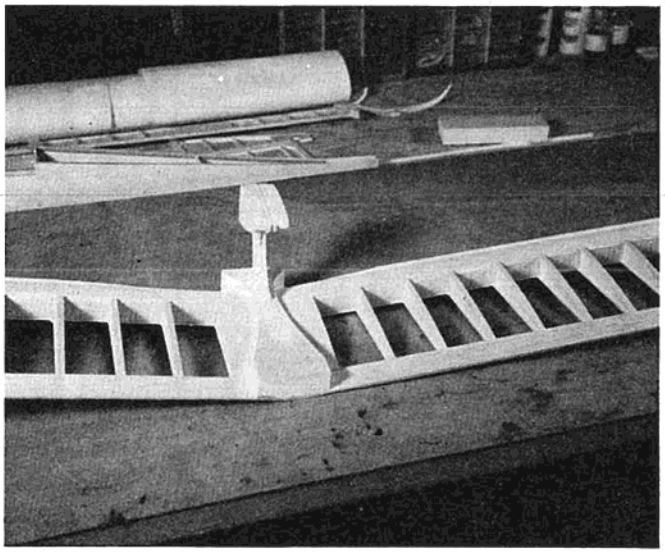
Lower wing sheeting and capstrips in place on Magna-Jig.



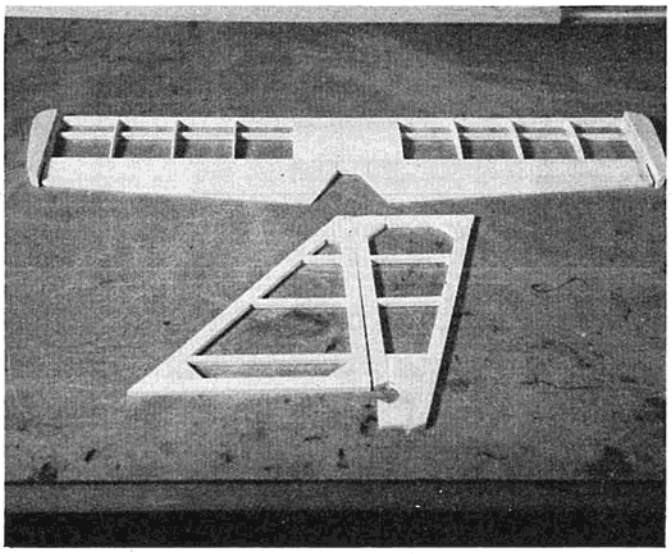
Ribs, spars, L.E. and power pod core.



Front view of finished wing, prior to sanding.



Rear view of wing showing pod and center wing block.



Basic empennage parts prior to final sanding. Sterling Coverite used on entire structure.

straight cut extending to the end of the fuselage. Do not put any triangular balsa along this edge.

Step F-4: Repeat this process for the other half of the fuselage. Let these halves dry while you are laying out the bottom of the fuselage.

Step F-5: Pin pre-shaped section firmly to a level work area. Be careful to place pins approximately 1 inch back from the front and rear of the fuselage or you may not be able to remove these pins later, especially at the rear of the fuselage

Step F-6: Cut one 19 inch strip of triangular balsa. Keep this piece handy as you will use it after the next step is completed.

Step F-7: When the fuselage sides are dry, place the right half of the fuselage on the table and slide firmly against the bottom half of the fuselage and pin in an upright position. Do not attempt to glue these halves together as this will interfere with sanding later.

Step F-8: Place glue down both sides of the 19 inch triangular brace you have cut, and press firmly down against the bottom and side, then pin in place.

Step F-9: Repeat this process for the left half of the fuselage. Use a straight edge to check the body halves and see that they remain vertical.

Step F-10: Glue #3 bulkhead in place, making sure it is flush with the upright cut on the fuselage sides (where the trailing edge of the wing will fit later) and pin in place.

Step F-11: Bend in the fuselage sides up to bulkhead #2 and pin in place.

Step F-12: Cut a 7½ inch triangular strip, glue and press down against bottom and sides, then pin in place.

Step F-13: Do this to both halves.

Step F-14: Bend in the two front sides against the bottom of the fuselage and pin in place.

Step F-15: Pin and glue #1 bulkhead in place.

Step F-16: Cut a 6½" triangular strip, glue and press down against the bottom and sides and pin firmly in position.

Step F-17: Using ⅛" scrap, measure, cut and glue doublers in place along top insides of the fuselage halves between bulkhead #1 and #2.

Step F-18: Use clothspins to hold these doublers in position.

Step F-19: Repeat this process along the top inside edge of fuselage halves between bulkheads #2 and #3.

Step F-20: Use clothespins to hold these in position.

Step F-21: Glue and pin nosepiece in position against bulkhead #1.

Step F-22: Glue and slide #4 bulkhead in place. The exact location of this bulkhead is not critical, simply slide it back until it fits snugly and leave it there. The holes drilled into #3, and #4 bulkheads are sufficient to clear most pushrods. If you have to enlarge them, go ahead, it won't hurt a thing. The hole in #2 bulkhead is to allow your servo wires to be plugged into your receiver.

Step F-23: Remove all pins holding down the triangular strips from #3 bulkhead back to the rear of the fuselage, do not remove pins that are holding down the bottom of the fuselage.

Step F-24: Lay 1/16" sheet strips crossways from bulkhead #3 down past bulkhead #4, stopping at the front of the elevator position. Be sure to place this wood grain crossways as this adds strength to the fuselage. This completes the fuselage construction at this time. Let dry thoroughly (preferably overnight) while you now proceed to the wing construction.

WING CONSTRUCTION

Decide now if you are going to build the wing in one piece or in two halves. The instructions in this booklet are for a two-piece wing. I suggest you have access to both sides of the workbench.

Step W-1: Pin both leading edges down firmly over the wing plans.

Step W-2: Place both bottom trailing edges down and pin in place.

Step W-3: Select one piece of 36" x 2" x 1/16" planking. Glue one edge and place firmly against lower back side of the leading edge. Press down and pin in place. Use enough pins to hold this piece down evenly for the entire length of the planking.

Step W-4: Cut and glue bottom strips in place starting with rib #3 going out the full length of the wing. Should the planking over-lap the hardwood spar, this is okay, simply cut the cap strips to fit.

Step W-5: Using 2" x 1/16" planking, cut sections and lay crossways between ribs #1 and #2, gluing and pinning in place.

Step W-6: Repeat this process for both wing halves.

Step W-7: Cut approximately half way through eight ribs on both sides from where the bottom of the top spar will go to the top of where the bottom spar will be placed. Later the spaces in these eight ribs will be completely cut out to form a tunnel for the dihedral brace.

Step W-8: Place glue on one side of a hardwood 36" x 1/8" 3/16" spar.

Step W-9: Locate the exact position of this spar by using the two end ribs and a center rib as guides.

Step W-10: Tilt in root rib approximately 3/32" to aid in forming the dihedral. This can be sanded to the exact fit later.

Step W-11: Glue and press down ribs and pin in place. Do not attempt to pin through the hardwood spar.

Step W-12: Start gluing every other rib in place in order to hold down and locate this bottom spar while the glue is still wet.

Step W-13: When step W-12 is completed glue and place in the top hardwood spar. Lightly glue this hardwood spar where it fits over ribs #1 through #4. This will enable you to easily remove the spaces when cutting out for the dihedral brace.

Step W-14: Repeat this process on the other half of the wing.

Step W-15: Let this dry for at least 30 minutes (preferably longer), then go to step W-16.

Step W-16: Carefully cut out the four spaces previously cut half way through on the first four ribs of each wing.

Step W-17: Cut and place webbing (this is balsa placed between ribs in a vertical position) between the spaces of the first five ribs on the front side only. Use 2" x 1/16" planking and make sure the grain runs vertically.

Step W-18: Place each piece between the ribs. Shove against the two hardwood spars and glue on the **outside only.** (You don't want to get glue in the wing tunnel or your dihedral brace may not slide in easily.)

Step W-19: Let this dry thoroughly, then test slide in the dihedral brace and check for a smooth fit, trimming and sanding the dihedral brace and the cutout spaces as needed. When you are satisfied the dihedral brace will slide in and out freely you are now ready to place the top planking in position.

Step W-20: At this time remove all pins from the bottom planking as you will be unable to get at these pins when the top planking is in place.

Step W-21: Glue each rib from the leading edge back to the hardwood spar, then glue full length down the top of the hardwood spar.

Step W-22: Glue one edge of a 36" x 2" x 1/16" piece of planking and place in position over ribs sliding forward firmly against the back of the leading edge. Pin thoroughly in position. Don't spare the pins, placing them at least 1 inch apart full length down the leading edge. Press this planking down onto the ribs and against the top hardwood spar.

Step W-23: Use clothespins, placing them close to the ribs, to hold this planking to the hardwood spar.

Step W-24: Taper one edge of the top trailing edge to a fine point by sanding full length down the entire 36" sheet.

Step W-25: Glue full length along the back trailing edge and approximately ½" from the end of each rib back to the rear of the trailing edge.

Step W-26: Place the trailing edge in position making sure the tapered end goes down and to the **rear.**

Step W-27: Pin through the trailing edge into the top of each rib or this trailing edge will curl up from the ribs.

Step W-28: Pin down securely the back edge of the top trailing edge out the full length of the wing.

Step W-29: When the top planking is completely dry, remove clothespins.

Step W-30: Cut four pieces of webbing to fit between the first five ribs. Do not glue them in at this time.

Step W-31: Insert the dihedral brace into the dihedral tunnel.

Step W-32: Glue in the webbing, remembering to glue from the outside only and pin these in place.

Step W-33: Slowly remove the dihedral brace. This completely encloses the dihedral tunnel.

Step W-34: If washout in the wing is desired, it should be put in at this time. To do this, shim up the trailing edge ⅛" at the end rib only. The webbing you are going to put in, when glued in place and completely dry, will lock this washout in to the wing.

Step W-35: Starting at rib #5, cut and

(Continued on Page 64)

glue webbing, (again making sure the grain runs vertically) to the back side of the two hardwood spars between each rib out the full length of the wing. Glue these on the inside and press firmly against the hardwood spars — top and bottom. After they are in place, they can be held in position by placing a pin crossways through each rib.

Step W-36: Cut and glue and place on top cap strips starting with rib #3. Do this out the full length of the wing.

Step W-37: Using 2" x 1/16" planking, lay crossways between ribs #1 and #2, gluing and pinning in place. Let wings dry thoroughly, preferably overnight, while you now start on the elevator construction. Steps 38 and 39 should be completed after you have let the wings dry overnight.

Step W-38: Your wing tips can now be added after you have sanded off the edges. Simply locate, glue and pin them in place.

Step W-39: Cut and sand to the desired shape.

STABILIZER CONSTRUCTION

Step S-1: Trim 1/16" from the edges — top and bottom — of four ribs to allow for clearance of the planking that will cover top and bottom of the center four stabilizer ribs.

Step S-2: Pin leading edge and center spar in place.

Step S-3: Cut 1/16" sheet planking to fit between the leading edge and spar. Glue and pin in place.

Step S-4: Cut 1/16" sheet planking to fit between spar and trailing edge. (You will put trailing edge down later). Glue and pin in place.

Step S-5: Glue and place the center four ribs in place.

Step S-6: Glue the remaining ribs in place.

Step S-7: Place glue on the back of all ribs and the back edge of the bottom planking that goes from the spar back to the trailing edge.

Step S-8: Firmly slide the trailing edge against those ribs and bottom planking and pin in place.

Step S-9: Glue and pin both stabilizer tips in place.

Step S-10: Carefully remove pins in area between the center four ribs.

Step S-11: Double glue this area completely.

Step S-12: Pin and glue the top planking in place later. Let this dry while you now build the rudder.

RUDDER CONSTRUCTION

Step R-1: Locate the rudder base (the part with a cut-out section in it). Glue some 1/16" scrap balsa planking onto both sides of the rudder base, below the cut-out portion. Your rudder control horn will be bolted through this part later.

Step R-2: Use C-clamps or clothespins to hold these pieces together until they dry. They can be sanded later.

Step R-3: Build the front edge and to of the rudder, using the 3/8" x 3/16" balsa strip, glue and pin in place over plans.

Step R-4: Now build the front edge and top of the rudder, using the 3/8" x 3/16" balsa strip. Glue and place rudder base in position.

Step R-5: Glue the trailing edge of the rudder snugly against the rudder base and the top of the rudder frame.

Step R-6: Using scrap balsa cut and double glue in all fillets in both rudder and fin. (These help prevent warps.)

Step R-7: Cut and glue in the crossbraces, using the 3/16" square strip balsa. Place the braces over the plans. Pin them down, then slightly lift **up** from the plans so they will be half way between the 1/4" x 3/16" balsa already glued around the framework of the rudder and fin.

Step R-8: Let this section dry completely while you now start to sand the fuselage.

HATCH CONSTRUCTION

Step H-1: Sand the hatch cover to blend into the nose block.

Step H-2: Use a wooden toothpick to make a dowel and glue it to the center front, bottom of the hatch on the inside. Let this completely dry.

Step H-3: Test locate the hatch and see where the dowel hole will have to be located into the nose block.

Step H-4: Drill out a small hole for the dowel and you have a lock that will keep the front of the hatch in place.

Step H-5: Drill a small hole (just big enough for the antenna wire to pass through) approximately 1/4" from the back center of the hatch for your antenna to come up through and lead back to the fin. By placing a small rubber band over the antenna wire, pulling down over the hatch and hooking each end under the front wing dowels you have your hatch pulled snugly down in place.

In case of an unscheduled hard landing your wing will slide forward, your hatch will lift up and then you will have suffered only a minimum amount of structural damage.

FIN LOCATION

Step FL-1: Draw a line down the center of the stabilizer from front to rear.

Step FL-2: Locate the fin over this center line and draw a line down each side of the fin.

Step FL-3: Remove the fin and cut out the area between the two outside lines, so that the fin will slide down into this slot.

Step FL-4: Glue and pin the fin into this slot, check with a straight edge to keep the fin vertical and let dry.

Step FL-5: Check to see if the back of fin is flush with the back of the stabilizer.

Step FL-6: After this is dry, position the stabilizer and fin onto the area at the rear of the fuselage. Any space left in front of the stabilizer where you left off with the fuselage planking can now be filled in.

Step FL-7: You will notice that the front of the fin touches the top of the fuselage. Mark this spot and cut out a slot for the front of the fin to slide into. This guide hole will keep the fin straight and locked in place.

The rear of the fuselage, the rear of the stabilizer and the rear of the fin should all be flush. The space left under the fin and in front of the stabilizer should now be filled in with scrap balsa, and sanded to fit.

WING FILLET

Step WF-1: Cut this piece a little over size to allow you to sand to a close fit. Sand the back to fit first.

Step WF-2: Sand the front to fit up against the hatch.

Step WF-3: If you have cut the proper angle into the front edge of this fillet, you will notice that the bottom will touch the hatch before the tip will, due to the curved shape at this point. Sand slow and easy and this will make a smooth fit.

DOWELS

Step D-1: Locate where the dowels will go. Mark the spot and drill holes just big enough for the dowels to slide through.

Step D-2: Do not glue them in place. In fact there is no need to glue them in at all. They can be held in place by the dope you will use to paint your glider. By not gluing those dowels in place, your finishing will be made easier when you sand the fuselage sides. If you feel you must glue them in, do so after you've completely finished your paint job.

POWER POD

A simple power pod for a .049 can be added by making a hardwood pylon and locating it between the two wing halves.

FINAL ADJUSTMENTS FOR THE BEGINNING R/C FLYER

1. Check to see that all flying surfaces are aligned and free of warps.

2. Check to see if there are any binding parts, such as a pushrod catching on a bulkhead. The pushrod exit slot should be just big enough for the rods to pass through and not touch when you give maximum left or right on the rudder or full up or down on the elevator. Also check to see that when you give left, that the rudder goes left. The same goes for the elevator. Check to see if the elevator goes up when you give up. Do all this checking while standing at the rear of the glider.

3. When you rubber band the tail surface and the wing onto the fuselage use only as many as you feel absolutely necessary.

4. Make sure your batteries are fully charged. This has cost a lot of misery in the past when people forget to charge them. I charge mine overnight and don't take them off charge until just before leaving for the flying field.

5. Make sure your antenna is pulled out all the way on your transmitter. Also make sure the antenna is stretched out as far as it will go on the glider.

6. Turn the switches on in the glider, and the transmitter. A close friend of mine chased his glider quite a distance and found out he had forgotten to turn the switch on in the transmitter. I have had a number of **free flights** in Germany because of failure to turn on the switch in the glider. Check them both before you launch.

7. Pack the battery and your receiver in plenty of styrofoam and sponge rubber, to prevent damage if you should make a hard landing.

8. Balance the glider where the plans show for the first flight. The glider should balance with the nose just slightly pointing down. You may change the CG location on later flights to suit your type

of flying. The CG can and often does change with the wind conditions.

9. Check the weather closely. If you are using a power pod to pull the glider up then you can fly on a calm day. If you use a tow-line, you'll need thermals or a little breeze. If you slope soar you'll need some wind or thermals. If there are birds circling around, get in with them. If the wind is too strong, and I'm primarily talking about your first few flights, don't chance it. Either wait for it to calm down or you will get in trouble.

10. If you're in doubt about any of the above conditions, don't fly. Don't let any one talk you into flying, if the conditions are not right.