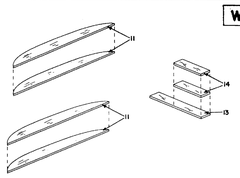
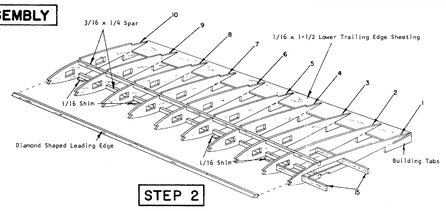
WING ASSEMBLY



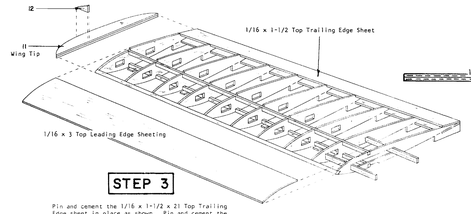
STEP 1

For rapid assembly of your model, first complete the sub-assemblies shown as follows: Cement two #11's together forming a double layer Wingtip and make two of these assemblies. Cement #14's together then to top of #13 as shown. When #13-14 assembly is dry, drill a 5/32 Dia. hole at Bellcrank Mount location shown on Full Size Wing Drawing.



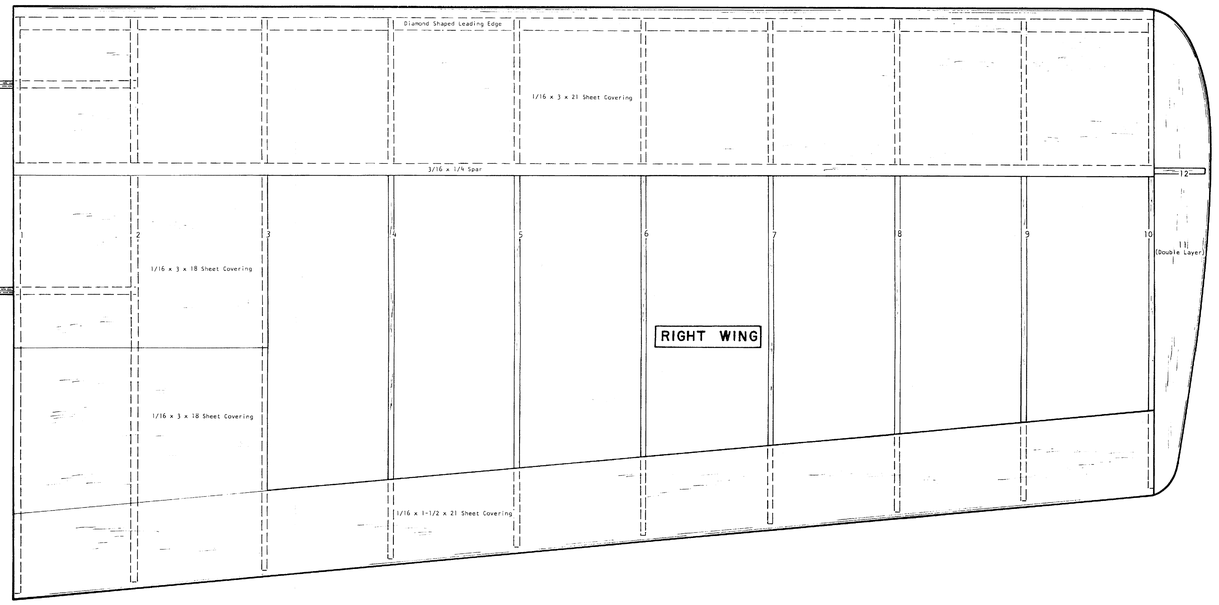
STEP 2

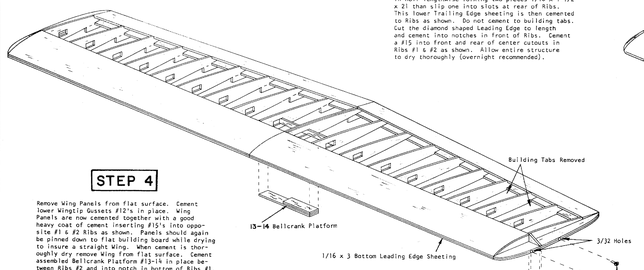
Be sure to select a FLAT building board to construct Wing on. Remember your Wing can only be as true as your building surface. Any clear plastic kitchen film (not supplied) spread over plan will prevent parts from sticking to plan during assembly. Wing panels are built directly over full size drawings on plan. Cut bottom 3/16 x 1/4 spar to length then pin in place blocking it up with 1/16" thick shims (cut from scrap) as shown. Pin and cement Wing Ribs from #1 to #10 vertically in place as shown then add top 3/16 x 1/4 spar. Note that building tabs at rear of Ribs allow Wing construction to continue on flat building board. Cut a piece of 1/16 x 3 x 21 Balsa sheet covering in half lengthwise forming two pieces 1/16 x 1-1/2 x 21 than slip one into slots at rear of Ribs. This lower Trailing Edge sheeting is then cemented to Ribs as shown. Do not cement to building tabs. Cut the diamond shaped Leading Edge to length and cement into notches in front of Ribs. Cement a #15 into front and rear of center cutouts in Ribs #1 & #2 as shown. Allow entire structure to dry thoroughly (overnight recommended).



STEP 3

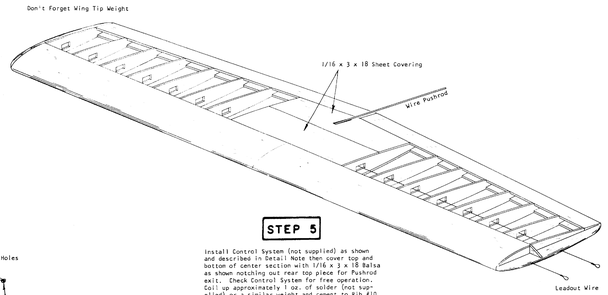
Pin and cement the 1/16 x 1-1/2 x 21 Top Trailing Edge sheet in place as shown. Pin and cement the 1/16 x 3 x 21 Top Leading Edge in place as shown. Cement assembled Wingtip #11's in place centering on Leading and Trailing Edges then cement top Gusset #12 in place. Allow Wing Panel to dry thoroughly. Opposite Wing Panel is built in same manner except #15's are obviously omitted. Note that Bellcrank Platform #13-14 is drawn in place with dotted lines on full size drawing of Left Wing Panel. This is for location only and is cemented in place in next step.





STEP 4

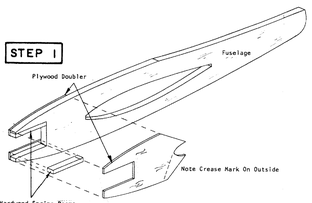
Remove Wing Panels from flat surface. Cement lower Wingtip Gussets #12's in place. Wing Panels are now cemented together with a good heavy coat of cement inserting #15's into opposite #1 & #2 Ribs as shown. Panels should again be pinned down to flat building board while drying to insure a straight Wing. When cement is thoroughly dry remove Wing from flat surface. Cement assembled Bellcrank Platform #13-14 in place between Ribs #2 and into notch in bottom of Rib #1. Note that #14's are in Left Hand Panel. Using 1/16 x 3 x 21 Balsa cement bottom Leading Edge sheeting in place. Carefully cut off building tabs along crease marks at rear of Ribs then sand entire Wing smooth rounding Leading Edge and Wingtips as shown in next step sketch. Drill 3/32 holes thru Left Wingtip at locations shown for leadout lines then cement the long Eyelets in place as shown.



STEP 5

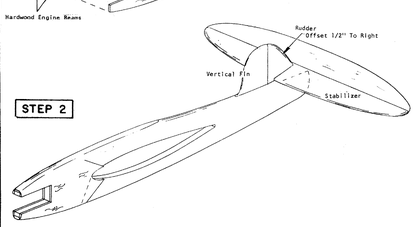
Install Control System (not supplied) as shown and described in Detail Note then cover top and bottom of center section with 1/16 x 3 x 18 Balsa as shown notching out rear top piece for Pushrod exit. Check Control System for free operation. Coil up approximately 1 oz. of solder (not supplied) or a similar weight and cement to Rib #10 on Right Wing Panel. Wedge weight in place with scrap Balsa and apply a second coat of cement to be sure weight does not break loose. Wing is completed by sanding center section sheeting smooth.

FUSELAGE ASSEMBLY



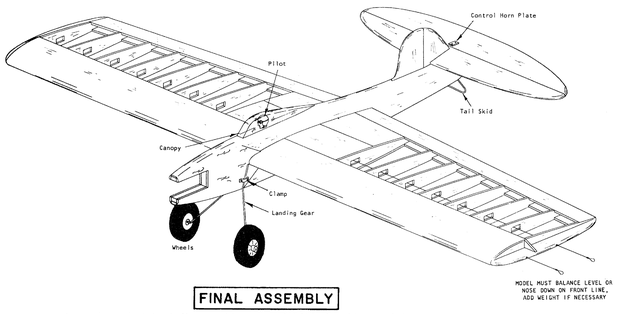
STEP 1

Prepare Fuselage by removing die cut Wing and Nose sections. If die cutting is not completely thru, cut lightly with knife or razor blade on reverse side of Fuselage, then carefully push out section. Since Width of Engine Crankcases vary somewhat, you should decide what engine you are going to use now so that Engine Beams can be adjusted to suit. Place Hardwood Engine Beams into front of Fuselage and check seperation with your Engine. If they must be further apart, cut out the Balsa Fuselage to suit, (equally on each side). If they must be closer, just substitute wider Beams. Engine Beams are securely cemented into top and bottom corners of cut-out as shown followed by the Plywood Fuselage doublers as shown. Note that there is a Left and Right Hand doubler so that the crease for the Landing Gear is on the outside on both sides. Place assembly on building board and hold pieces in place with weight until dry..



STEP 2

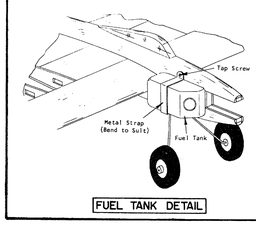
for a graceful and streamlined appearance, as well as weight reduction and increased efficiency, it is advisable to round off Fuselage to the approximate cross section shown. Be certain you check area where Canopy fits and you do not sand off any of the flat section at the Top Rear where Stabilizer is cemented. Prepare Stabilizer and Elevator unit as described in Detail Note then cement Stabilizer horizontally to Top Rear of Fuselage. NOTE: Stabilizer portion only is cemented to Fuselage, Elevator extends beyond Fuselage as shown. Allow to dry thoroughly. Cement Rudder and Vertical Fin sections together at angle so that Rudder is offset 1/2" to Right. When dry, round off edges and cement to Fuselage and Top of Stabilizer as shown. Be certain Fin is vertical and Stabilizer is horizontal and allow to dry thoroughly.



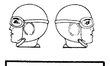
MODEL MUST BALANCE LEVEL OR NOSE DOWN ON FRONT LINE, ADD WEIGHT IF NECESSARY

FINAL ASSEMBLY

Many modelers prefer to fly the Ringmaster without the Landing Gear. It does make a lighter model with less drag and therefore increased performance but it does necessitate a hand launch and a grassy surface to land on. If you desire a Landing Gear, slip it in place in front of Wing cut-out as shown. Set Gear at forward angle into crease marks in doublers and secure with Landing Gear clamps and screws as shown. Slide finished Wing thru Fuselage. Check for alignment, Wing must be centered, horizontal to Fuselage, and in line with Stabilizer. It may be necessary to trim Fuselage cut-out to achieve this alignment. Securely cement Wing in place and allow to dry thoroughly then add a second and even a third coat of cement to Wing installation. Locate and install Control Horn on Elevator so that it aligns properly with Pushrod. Connect Pushrod to Horn and secure with retainer. Entire model is now sanded smooth to prepare for covering. Silkspan is provided to cover Wing as follows: Apply two coats of clear dope to perimeter of areas covered and sand smooth. Cut Silkspan about 1" over size to cover panels, with grain spanwise. Place Silkspan on flat surface and moisten with damp cloth. This will remove all wrinkles. Cover frame while Silkspan is wet, gently pulling it out smooth. Silkspan is held in place with a coat of clear dope brushed thru it around perimeter where it contacts wooden framework. Silkspan will dry and shrink to drum tight smoothness. Apply about ¼ to 6 coats of clear dope to entire model checking Wing for warps between coats. If any warps should develop they can be taken out by applying next coat and twisting Wing in opposite direction and holding until dry. Color dope can now be used to suit your own individual taste. Make Profile Pilot as described in Detail Note and install on top of Fuselage. Cement Clear Canopy in place as shown. Install 2-1/2" Main Wheels (not supplied). Bend Tail Skid as described in Detail Note and insert and cement into Rear of Fuselage as shown. Bend Pushrod Guide as described in Detail Note and insert into Fuselage side over Pushrod. Apply Decals at locations shown on photos. Mount your Engine (not supplied). Prop (not supplied) selection should be in accordance with Engine manufacturer's recommendations. Factory models with Fox .35 Engines used 10-6 Props. The addition of a Spinner (not supplied) makes a graceful looking and more efficient front end. Mount a ¼ oz. Fuel Tank (not supplied) to Fuselage with aluminum strap and screws as shown. Company models used Sullivan SS-4 Slant Type Tanks. Your Ringmaster is now complete. Good Luck!! Good Flying!!

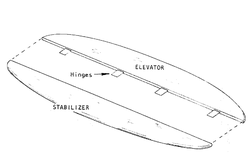


FUEL TANK DETAIL



PILOT DETAIL

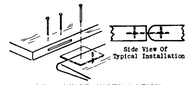
Using drawings above cut Pilot from scrap 1/8" Balsa. Sand smooth rounding off where desired then paint Pilot to suit. When dry, cement to top of Fuselage in Cockpit area as described in Final Assembly.



STABILIZER ASSEMBLY

Round off outer edges of Stabilizer and Elevator. Assemble Stabilizer and Elevator with Poly Hinges as shown in Detail Sketch. Unit is now ready to be installed as described in Step 2.

TYPICAL FUSELAGE CROSS SECTION

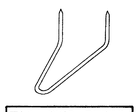


POLY HINGE INSTALLATION

TO INSTALL: Cut strip to desired hinge width (generally about 1"). Slit surfaces to be joined as shown (½ center of thickness). Wax hinge into slits, (hinge line in center between surfaces) leaving enough space for free movement. Secure hinge by pushing straight pins through wood AND HINGE as shown. Pins are clipped flush.

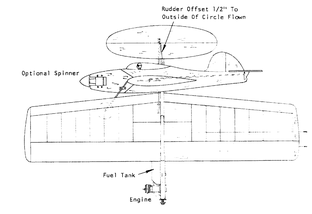
LEAD OUT WIRE DETAIL

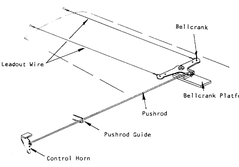
Insert wires thru Wing. Both wires must be the same length. Form loop and leave wire free as shown in Fig. 1. Wrap with soft wire (single strand electric wire, not provided) as shown in Fig. 2. Bend back end of wire and continue binding. Twist ends of soft wire securely together as shown in Fig. 3 DO NOT SOLDER.



TAIL SKID DETAIL

Bend Tail Skid to shape of full size drawing and insert and cement to bottom rear of Fuselage when model has been completed.



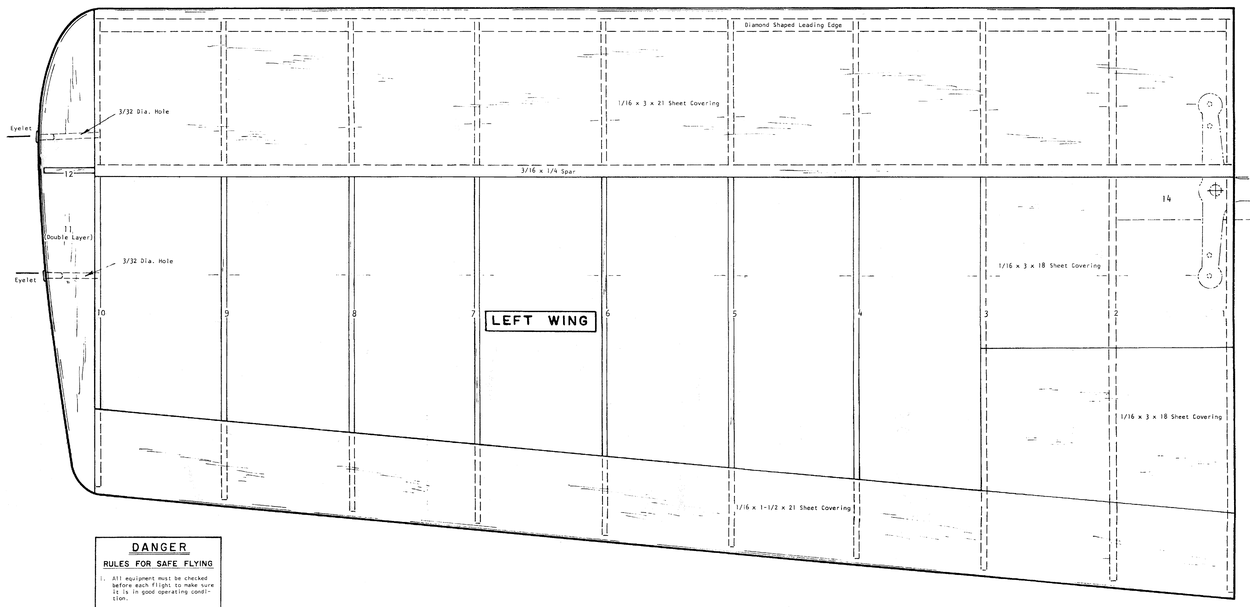


PUSHROD GUIDE

Bend Pushrod Guide to shape of full size drawing and push into Fuselage side around Pushrod as shown in Control System Sketch. Check system for freedom of movement.

CONTROL LINE INSTALLATION

Neither the Bellcrank with its accompanying hardware or the Lead-Out Wires are included in Kit but must be purchased separately. Sketch shows perfect large Bellcrank but any similar one can be used. Lead-out cables which extend thru Left Side of Wing from Bellcrank past Wing Tip, are looped thru holes in Bellcrank as shown. If more sensitive control is desired, use inner hole on Bellcrank. Loops must be large enough to allow Bellcrank to move freely. Wrap with soft wire and solder securely. Install Bellcrank on Platform in Wing when described in Step 5, according to manufacturers instructions, at same time threading Leadrout Wires thru Wing Ribs and Tip. Temporarily hold Bellcrank in neutral position as shown on full size drawing, then make loops in ends of Lead-out Wires as described in Detail Note, DO NOT SOLDER. Both Lead-out Wires must be the same length and extend about 3" past Wing Tip. Release Bellcrank and check for freedom of movement. Bend one end of 1/16 Dia. wire Pushrod at 90° and install on Bellcrank with nylon retainer as shown. Top and bottom of Wing center section may now be covered as described in Wing Assembly Instructions. After Wing is installed in Fuselage, Pushrod Wire is bent to fit into Elevator Control Horn with Bellcrank and Elevator in neutral position. Excess wire is cut off and used for Pushrod Guide and Tailskid. Pushrod is held in place on Control Horn with nylon retainer in same manner as on Bellcrank. Be certain to check that controls move freely and easily before each flight.



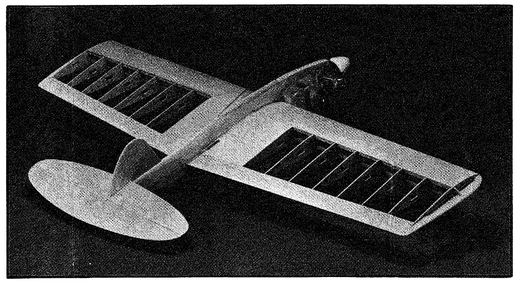
DANGER

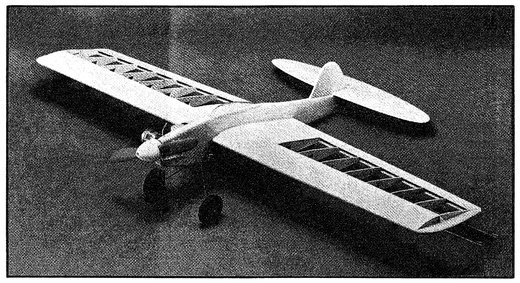
RULES FOR SAFE FLYING

1. All equipment must be checked before each flight to make sure it is in good operating condition.
2. Fly only in a clear unobstructed area.
3. Model must never be flown in the vicinity of High Tension Lines or any Electrical Lines.
4. Model should never be flown when thunder and lightning storms are in the area.
5. Precautions should be taken to insure the safety of all spectators, modeler and property.

Sterling Models, Inc.
Phila., Pa., 19134, U.S.A.

PUSHROD LINKAGE





RINGMASTER

FOR ENGINES .19 TO .35 DISPLACEMENT

Designed and Flight Tested For Stunt Flying

Sterling MODELS INC.
PHILA PA 19134 U.S.A

KIT S-1A
SPAN - 42"