

ZERO BUILDING INSTRUCTIONS

Notes.

Apart from the somewhat unusual sequence of assembly (stabilizer must be built first) this model is straightforward to build. In one area you are given a choice between two different methods, and this is in the manner of sheeting the fuselage. Sufficient $\frac{1}{8}$ " sheet is provided for either way. You can:

- a) Cut panels of $\frac{1}{8}$ " sheet to cover large areas of the formers at a time. This is called **skinning**, and it helps to wet the wood to aid curving. If you use this method make sure that joints are "staggered",
or –
- b) Cut the supplied $\frac{1}{8}$ " sheet into strips $\frac{3}{8}$ " wide. Use a long metal straightedge to cut the strips and "lean" the X-acto alternately **toward** you and **away from** you. This will result in strips with their sides very slightly bevelled and make a better fit going around the formers. Glue the strips side-by-side, again "staggering" lengthwise joints as far as possible, until the whole is covered. This method is called **planking**.

Of the two, planking is preferable because it makes a much stronger, lighter result; also it tends to make a superior flowing shape. While it might seem that planking would be very time-consuming such is not the case having in mind the fast-setting glues we use today ("Zap"). Certainly, it does take longer than skinning. However, we plank all our models, considering the better result worth the extra time. The choice is yours . . .

STABILIZER

1. Glue two S-9's together one atop the other to make the $\frac{1}{4}$ " thick trailing edge. Repeat for the other side. Cut $\frac{1}{4}$ " sq. spar to length and mark positions of all ribs. Glue two $\frac{1}{4}$ " sq. leading edges at center with S-8 (2 thicknesses).
2. Slide the ribs onto the spar. Position but do not glue. Pin the spar in place over the plan, also the joined leading edge; both supported underneath by $\frac{1}{2}$ " deep shims at intervals. Glue ribs to leading edge. Glue trailing edges in place. Then, glue rib/spar joints.
3. Make hinges H-5, cut slots thru T.E. and glue hinges in place with scrapwood fillers to strengthen them. Check that a piece of $\frac{1}{16}$ " wire can be fed thru all hinges and will form a straight line. Glue hinges well. Add gussets.
4. Make elevator horn as shown. Slide H-6 hinges onto it and glue the entire assembly into stab. Make sure horn-wire is centered on T.E. viewed from aft end. Glue fill blocks to bearing tubes and make whole assembly strong.
5. Glue elevator core to horn-wire. Insert $\frac{1}{16}$ " wire hinges. Check rotation. Mark out elevators and add L.E. blocks, ribs etc. Shape and sand to section.
6. At this point it will be found easiest to cover the elevators. This job will be awkward later owing to the overhanging skin at the stab T.E. We used "Solartex"; if you prefer something else, stay with that.
7. Join pieces of $\frac{1}{16}$ " sheet for stab. skins, cut to size and sand thoroughly. Glue to stab, bottom and top.

Note: – skin overhangs T.E. Add tip blocks, shape and sand. Sand whole tail smooth.

FUSELAGE

Note.

Because of the limitation of width of balsa, some of the formers need to be joined from parts. Refer to cross-sections on plans and join appropriate parts together to end up with a **top** and **bottom** half of each former.

When this is done, make all holes in formers for pushrods, etc. per the cross-sections.

1. Pin $\frac{1}{4}$ " sq. crutch sides to plan, joining as necessary to make length. Cut & fit cross-braces. Glue down top halves of formers 1, 2, 3 & 4. Add F-18 & F-19 tank box pieces. Check squareness of all parts!

2. Glue top halves of formers 5 thru 12 onto crutch. Add F-17 and those pieces of formers F-13, 14 & 15 that the stab rests upon.
3. Carefully lining up as to incidence, lateral level, and plan view squareness, glue the stabilizer in place. Add top sections of F-13, 14, 15, and 16.
4. Glue $\frac{1}{4}$ " sq. top keel into formers F-5 thru F-16. Glue $\frac{1}{8}$ " sheet side-doublers from F-3 to F-5. Make up and install the service panel onto F-1.
5. Now skin or plank the entire upper half of the fuselage, installing the gun hood and canopy tracks at appropriate points during the procedure.

VERTICAL FIN

1. Build the vertical fin directly onto the fuselage upper half. Do not sheet the fin at this time, but install all hinges etc. Note that the T.E. (V-6) leans back at a slight angle. Check the fin structure is truly upright.
2. Build and install the rudder in similar fashion to the elevators. Check for freedom of movement. When all is satisfactory the fin can be sheeted, the tip block installed, and micro-balloons fairings added.

FUSELAGE, continued . . .

6. Lift the structure from the plan. Turn upside-down. Make a temporary supporting cradle from foam or similar to stabilize the fuselage while work continues.
7. Glue part F-20, motor mounts, the bottom halves of F-1, 2, 3, & 4 and battery box parts F-21's & 22's. (F-2A will be installed later).
8. At this time it is necessary to "stuff" some of the fuselage hardware. Make the elevator, rudder & tailwheel retraction pushrods and lay in approximate position. Assemble the t.w. steering unit onto F-23 and glue to the rear of the ply bottom half of F-6. Add cylinder to this assembly.
9. Glue bottom half of F-16 in place over the t.w. retraction pushrod. Now thread the rest of the bottom formers onto the pushrods in proper sequence and glue formers to crutch. Add rails for rudder & elevator servos and install servos temporarily. Glue conduits for t.w. steering cables followed by the cables themselves.
10. Make and install either the scale t.w. assembly or the "simplified t.w." to F-16. Connect steering cables & pushrod and add $\frac{1}{4}$ " sq. bottom keel piece.
11. Test elevator, rudder and t.w. functions and adjust until satisfied.
12. Add sheet doublers from F-3 to F-5, followed by bottom fuselage planking. Finally add tail cone, fitting and fairing it carefully to the existing structure. Cut away small piece of fin sheet at rear bottom corner – to make level with rudder at bottom edge and rear of F-16 former at rear. Then cut away tail cone upper flat edge for $1\frac{1}{4}$ " or so aft of fwd edge. Cone can now be slipped in place. Finish elevator fairings.

WING

1. Prepare sub-assemblies as follows: –

Glue W-1A & W-1 ribs making 4 thicknesses as shown in plan view. Add dowel. Drill holes for door-lifter. Glue W-4A & W-5A doublers to W-4 & W-5 ribs respectively. Make LH & RH pairs! Drill W-14's & mount bellcranks. Glue 2 layers of W-16 parts for wing trailing edges. Cut $\frac{1}{8}$ " sheet wing jig-piece to tapered shape.

2. Lay one W-13 down on plan (forward view of wing) and glue all four spars to W-13. Glue a scrap of $\frac{1}{4}$ " sheet between spars at center rib location, then glue other W-13 to rear face of spars. Glue W-1 assembly to front face, carefully bisecting dihedral angle. Now pin this assembly down over left plan view in proper location. Pin jig-strip in place over dashed line location.
3. Glue rear halves of W-1's together and add to assembly, glueing to W-13 and tack-glueing to jig strip. Match the tilted angle of the front half of W-1!

4. Glue rest of left-wing ribs to spars installing LG rails as you go, and again tack-glue to jig-strip. W-12 is installed only if building A6M3. Glue in LG rails as you go. Glue rear bottom spar to W-16 assembly, slide into position, and glue to all ribs. Add upper rear spar. Glue leading edge to ribs.
5. Add rest of internal structural pieces to left wing: bellcrank on mount all spar webs, and all filler blocks, W-15 web etc.
6. Glue servo rails in place to suit servos used. The location of the flap servo (if used) is to be as per the plans, while the other servos may be shifted around if more suitable to your radio. We are showing the layout for the JR radio; this should also be right for Futaba radios.
7. When servos are placed, mount switcher, conduits, drop-tank assembly with pushrod, ail. pushrod.
8. Unpin left wing, rock over to right-wing plan and construct right wing to an equal stage. Install air tanks.
9. Construct and install ailerons as per the elevators. Install hinges as you go. Cover and slide hinges into wing. Glue hinges in wing when satisfied with alignment. Hook up to bellcranks and test using radio. Aim for an up & down movement of about $\frac{1}{2}$ " at the trailing edge.
10. **IF INSTALLING FLAPS** construct these at this time. Remember to slide hinge H-2 onto the torque-tube as you go. When flap is completed, trim lower parts of ribs 3 to 6 out, as shown in rib sections. Install flaps and hook up to servo. Test.

Note: Flaps are optional and material is not included in kit. The flaps, while powerful and effective, are not necessary to good land-

ings. Their inclusion is thus more cosmetic than functional.

11. Landing-gear time. Install units, legs and wheels. Do not bother with inner-door closer at this point. Hook up units with air lines etc. and test, using radio. When operation is satisfactory, remove units and legs from model and set aside.
12. The entire bottom of the wing can now be skinned. Do **NOT** cut away L.G. door areas (see finishing booklet for door layup method). When bottom skin is completed, putty some micro-balls in the wing-bolt area to prevent compression of wing by bolts.
13. Check one last time that all internal mechanical systems are OK. Now re-pin the tapering jig in its original location on plan. Lay wing in place (left side) and hold with weights. Cut, join & sand skins for wing tip and glue in place. Now transfer jig to right wing plan and skin the right wing. Add tip blocks and shape.

FUSELAGE, continued . . .

14. Cradle the fuselage upside down on the bench and offer up the wing. Cuit away planking till wing will fit. Add wing hold-down screw block to F-6. Add F-2A. When wing mating is correct, fillets can be made (see finishing booklet for method). Refer to Squadron book 3-view & photos, or plastic kit, for shape.

At this point the model is basically framed-up, requiring only the many small details (guns, doors, door mech., antenna etc.) for completion prior to covering.