Cowl Assembly:
Assemble the right and left halves of C1 on a flat surface. Stack C1, C2 and C3 and trim if needed so that they all have the same shape. Note the slight non-scale bulge in these components that provides space for the DA 100 spark plug caps. Cut the inside surface of the nose bowl with a scroll saw or hand saw. Then glue the two halves of the nose bowl together on a flat surface. Rough-carve the outer surfaces of the nose bowl with a razor plane guided by a template made from the template as shown on the plans.

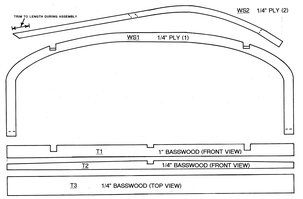
Temporarily clamp C2 to F1 and tap F1 for four ¼ x 20 nylon bolts. Harden the threads with CA and wrap.

Cut six ¼" sq stringers, each 3 ½" long. Pin one of these stringers to the building board over the plans and glue the bottoms of C1, C2 and C3 to the stringer at the distances shown on the plans. Verify that they are all exactly vertical and aligned with each other. Glue the top stringer in place before the glue wet. Add the remaining stringers, one at a time, making sure they are vertical and equally spaced. When dry, remove from the building surface and lay C2 flat on the table. Glue the remaining stringers in place, verifying that each is exactly vertical.

Trial-fit the dummy engine to C1 and the nosebowl. Trim the valve covers as necessary for the nose bowl to fit over the dummy engine. Drill holes in the dummy engine if necessary to allow a long ball driver to reach the mounting bolts. Paint the dummy engine and the inside of the nose bowl and glue them to C1.

Glue 4" wide 1/32" ply to the cowl formers. Note how the ply shorting extends ½" past C3.

Finally, complete the final sanding of the outer surface of the nose bowl.



Assembling the Winscreen and Overhead Windows:
Assemble the fuselage including the rear section up to the tail and attach the overhead crossbeams T10 to T7 and WS1. Bevel WS1's edges to the curvature of the windscreen.

Add the two WS2 windscreen frames. Trim the lower edge of each WS2 to touch the surface of the cowl. Bevel the front of WS2 and bevel the leading edges of the upper fuselage side frame to match the curvature of the cowl and form flush gluing surfaces. That is, so a piece of clear plastic can be laid upon them and allowed glued firmly to them.

It will be too difficult to paint the inside surfaces of the window frames and the cowl after the windows are in place so paint them now. Complete the cockpit interior too.

Place a small piece of transparent tracing paper over the two WS2s. Trace the center line of each WS2 onto the paper. Also trace the center of T1 onto the paper. Trace the curved bottom of the paper where it contacts the cowl. Cut out the traced pattern and fit it to the WS2s. Retrace if necessary until the paper is a perfect fit between the centers of the WS2s, the cowl and the center of T1.

Use the pattern to cut a piece of 0.030" clear plastic and glue it in place with canopy glue on the WS2s, the cowl and T1.

Repeat the above process for the side portions of the windscreen between the upper portion of WS2, the fuselage side frame and WS1. Use the paper pattern to trim the edges of these parts to form a flat gluing surface for this part of the windscreen. This is the probably most difficult and tedious part of this airplane's construction. Several attempts may be required. Be patient and persistent. Welcome to scale modeling!

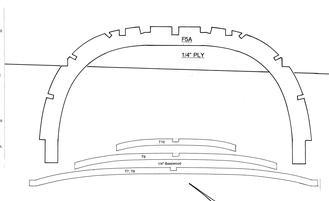
When the pattern finally fits well, use it to cut a clear plastic window and glue it in place with canopy glue. The two sides may not be exactly the same so a separate pattern might be needed for the other side.

Now make a paper pattern for the side windscreen windows below WS1. Cut the plastic and glue it to WS1, WS2, the window frame above F3 and the cowl surface.

A single large piece of clear plastic can be glued in place from the center of T1 to the center of T4 without a paper pattern. Or separate pieces can be attached from T1 to T2, from T2 to T3, and from T3 to the center of T4 if that is more convenient.

Finally, repeat this process for the rear windows aft of the wing.

The window frames can now be painted over.



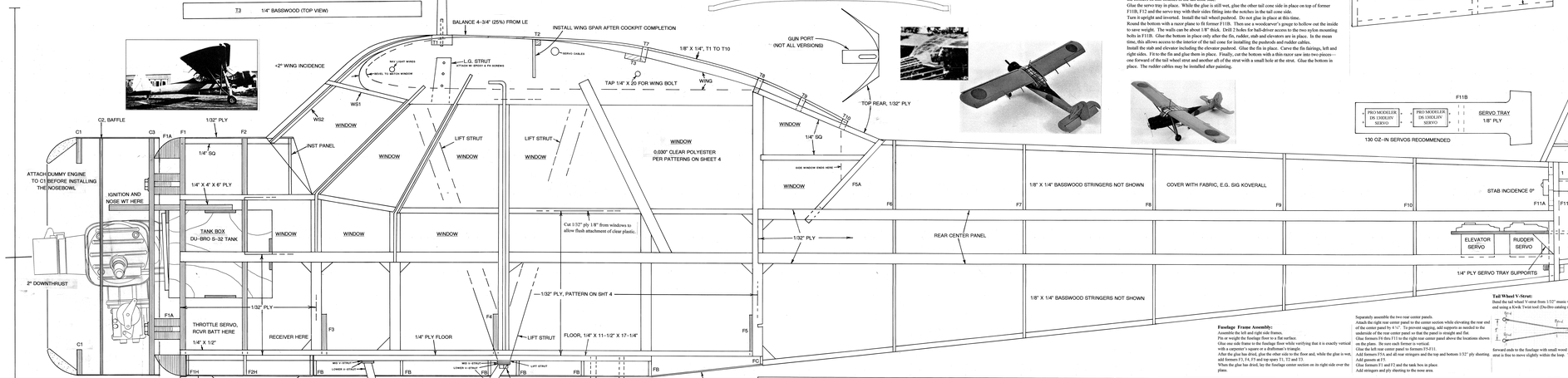
Scale Antenna:
Construct the removable scale antenna from hardwood. Suggested size is 3/8" x ½" at the base, tapering to 1/8" x ¼" at the top. Install a 1/8" dowel in the base and drill a 1/8" hole in the center of cabin brace T1. Insert the antenna into the hole with some friction so that it is removable for storage and transportation. Note that this friction will be increased by the gentle tug of the antenna wire and airflow.

Embed a clevis in the fin so that only its threaded shaft is exposed. Attach the end of the antenna wire to a 1/0 AWG ball-link connector and screw it into the clevis shaft.

The dowel is intentionally the weakest part of the system. In a nose over or ground loop, it will break. Drill out the remains of the dowel and replace it.

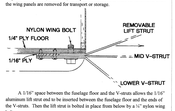
Tailcone Assembly:
Assemble formers F11B and F12 including the tail wheel strut on F12. Bevel the edges to the taper of the tail cone as shown below.

Cut and assemble the 1/32" ply tail cone sides, and install the ¼" sq stiffeners as shown in the side view.
Lay one side on a flat surface and elevate the rear by ½ inch.
Glue formers F11B and F12 in place while verifying that they are exactly perpendicular to the surface. Note how the formers fit into notches in the tail cone slide.
Glue the servo tray in place. While the glue is still wet, glue the other tail cone side in place on top of former F11B, F12 and the servo tray with their slide sides fitting into the notches in the tail cone side.
Turn it upright and inverted. Install the tail wheel pushrod. Do not glue in place at this time.
Round the bottom with a razor plane to fit former F11B. Then use a woodcarver's gouge to hollow out the inside to save weight. The walls can be about 1/8" thick. Drill 2 holes for ball-driver access to the two nylon mounting bolts in F11B. Glue the bottom in place only after the fin, rudder, stab and elevators are in place. In the mean time, this allows access to the interior of the tail cone for installing the pushrods and rudder cables.
Install the stab and elevator including the elevator pushrod. Glue the fin in place. Carve the fin fairings, left and right sides. Fit to the fin and glue them in place. Finally, cut the bottom with a thin razor saw into two pieces—one forward of the tail wheel strut and another aft of the strut with a small hole at the strut. Glue the bottom in place. The rudder cables may be installed after painting.



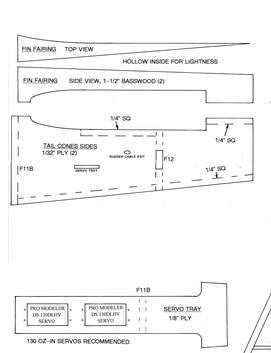
Fuselage Frame Assembly:
Assemble the left and right side frames.
Pin or weight the fuselage floor to a flat surface.
Glue one side frame to the fuselage floor while verifying that it is exactly vertical and perpendicular to the surface and parallel to the other side.
After the glue has dried, glue the other side to the floor and, while the glue is wet, add formers F3, F4, F5 and top spars T1, T2 and T3.
When the glue has dried, lay the fuselage center section on its right side over the plans.
Separately assemble the two rear center panels.
Attach the right rear center panel to the center section while elevating the rear end of the center panel by 4 ½". To prevent sagging, add supports as needed to the underside of the rear center panel so that the panel is straight and flat.
Glue formers F6 thru F11 to the right rear center panel above the locations shown on the plans. Be sure each former is vertical.
Add the left rear center panel to formers F5-F11.
Add the top F9A and all rear stringers and the top and bottom 1/32" ply sheeting.
Add gussets at F5.
Glue formers E1 and F2 and the tank box in place.
Add stringers and ply sheeting to the nose area.

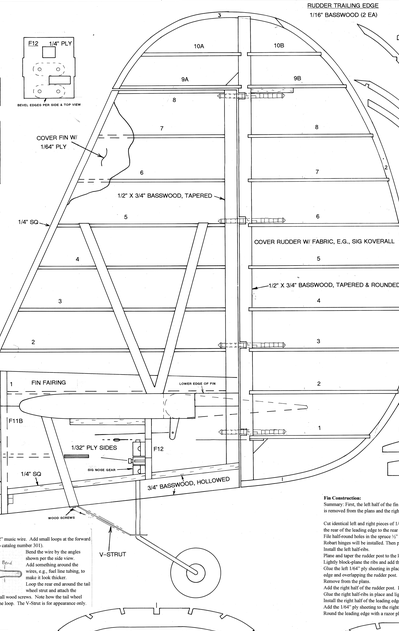
Strut Junctions at F4:
Two V-struts to the landing gear plus the end of the wing's lift strut all intersect at the fuselage floor at former F4. All three are 1/16" short aluminum. The V-struts are permanently attached to the ½" ply fuselage floor with wood screws, although they can be removed, if needed, for repair. The lift strut must be removable when the wing panels are removed for transport or storage.



A 1/16" space between the fuselage floor and the V-struts allows the 1/16" aluminum lift strut end to be inserted between the fuselage floor and the ends of the V-struts. Then the lift strut is bolted in place from below by a ¼" nylon wing bolt.

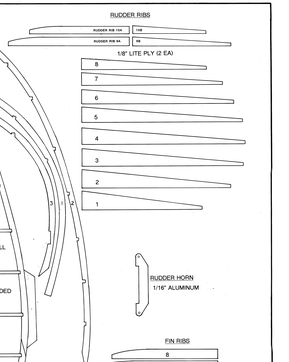
A hole in the underside of the fuselage surface allows the wing bolt to be installed or removed and turned with a ball driver. Alternatively, the modeler can install a small hatch for access to this structure.





Tail Wheel V-Strut:
Bend the tail wheel V-strut from 1/32" music wire. Add small loops at the forward end using a Kwik Twist tool (Du-Bro catalog number 301).

Bend the wire by the angles shown per the side view.
Add something around the wires, e.g., fuel line tubing, to make it look thicker.
Loop the rear end around the tail wheel strut and attach the forward ends to the fuselage with small wood screws. Note how the tail wheel strut is free to move slightly within the loop. The V-strut is for appearance only.

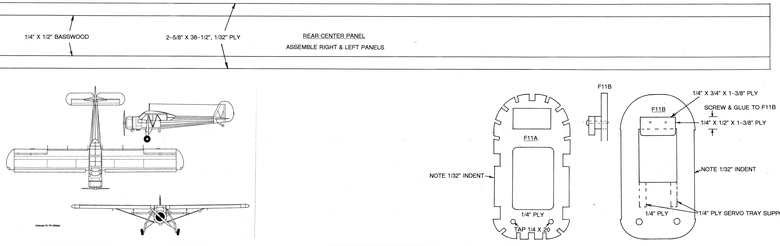


Fin Construction:
Summary: First, the left half of the fin is assembled over the plans. Then it is removed from the plans and the right half is added.

Cut identical left and right pieces of 1/64" ply to the shape of the fin from the rear of the leading edge to the rear of the rudder post.
File half-round holes in the sprues ½" x ¼" rudder post halves where the Robart hinges will be installed. Then pin the rudder post.
Install the left half-ribs.
Plane and taper the rudder post to the level of each rib.
Lightly block-plane the ribs and add the ½" sq. leading edge.
Glue the left 1/64" ply sheeting in place, butting it against the ½" leading edge and overlapping the rudder post.
Install the right half-ribs.
Add the right half of the rudder post. Plane it to match the ribs.
Glue the right half-ribs in place and lightly block-plane them.
Install the right half of the leading edge.
Add the 1/64" ply sheeting to the right half.
Round the leading edge with a razor plane and sanding block.

Rudder Construction:
Summary: First, the left half of the rudder is assembled over the plans. Then it is removed from the plans and the right half is added.

File half-round holes in the sprues ½" x ¼" rudder leading edge halves where the Robart hinges will be installed. Pin the leading edge to the plans.
Add the trailing edge.
Install the left ribs. Trim them to fit into the leading and trailing edges.
Plane and taper the leading edge to the level of each rib.
Lightly block-plane the ribs and add the ½" sq. leading edge.
Glue the left 1/64" ply sheeting in place, butting it against the ½" leading edge and overlapping the rudder post.
Install the right ribs.
Add the right half of the rudder post. Plane it to match the ribs.
Glue the right half-ribs in place and lightly block-plane them.
Install the right half of the leading edge.
Add the 1/64" ply sheeting to the right half.
Round the leading edge with a razor plane and sanding block.
Install the rudder control horn.
Install the Robart hinges and attach the rudder to the fin.
Cover the rudder with fabric, e.g., Sig Coverall.



Kokusai Ki-76 (Stella) in Quarter Scale
Wingspan 148 inches. Wing panel length 48 inches
Length 92 inches. Length with tail extended 74 inches
Recommended power 80 cc to 100 cc
Estimated weight 45 lbs
Designed by John Baligrodski and David P Andersen
during the pandemic of 2020
Plans by David P Andersen, www.mmbgbirds.com
Sheet 1 of 4