



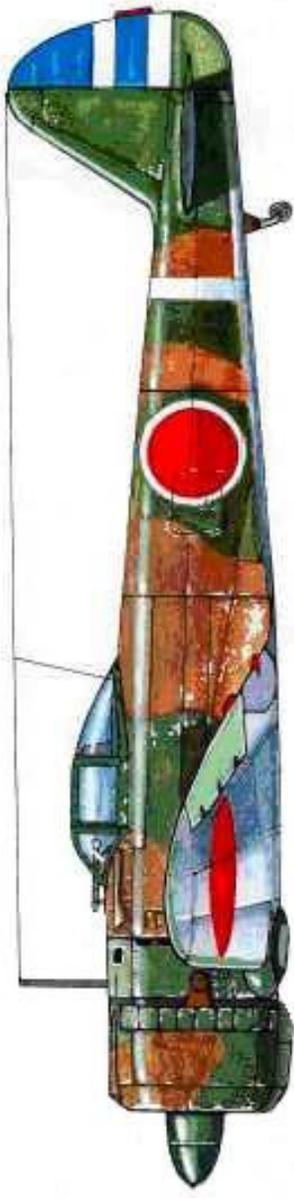
WARBIRDKITS.COM

Naka jima Ki-43-1 Hayabusa

Allied Code Name "Oscar"

Manual Version 1.01 – 15 March 2006

Scale: 1/12
Wingspan: 35.6 in
Area: 212 sq in
Length: 27.75 in
Weight: 20 - 24 oz
Power: Brushless 400-size



Materials

This kit contains the following materials:

- This construction manual
 - Plan sheet
 - Decal sheet
 - Laser-cut wood pack
 - Vacuum-formed plastic canopy
 - 3/8" x 3/4" Balsa for wing leading edge
- To complete this kit, you will need the following additional materials:
- 3/32" Aluminum tubing, 3"
 - 1/16" Music wire, 20"
 - 1/16" x 4" x 18" Balsa sheet for wing and fuselage skin, 6 each
 - 1/8" x 4" Hardwood dowel
 - 1/64 or 1/32 ply and foam blocks for fillets
 - Wing mounting bolt
 - Hinges (ailerons, elevator)
 - Miscellaneous servo mounting materials and pushrods
 - Covering materials and paint
 - Glue
 - 400-size brushless power system

NOTE: We recommend that you read this entire manual before beginning construction.

Construction

Wing Skins

- Each wing bottom skin consists of two laser-cut pieces: forward, center and aft. Gently clean up the mating edges of the pieces with 220-grit paper on a sanding block.
 - Lay the pieces of a wing skin on a flat board or table, with the outer surface up. Run a length of masking tape along the join lines. Turn the assembled skin over, bend the joints open, and run a bead of aliphatic resin or wood glue down the joints.
 - Lay the assembled skin back down on the board – masking tape side down. Run a damp paper towel over the joints to remove excess glue. Place a sheet of wax paper over the assembled skin. Then weight it down with another board, books or what have you. Keep the weight on the skin until it is completely dry.
 - When the skin is dry, remove the masking tape. Lay a skin on a flat board with the outer surface up, and sand it smooth with 120-grit paper on a long sanding block. Be sure to keep your sanding motion at a 45-degree angle to the joints and wood grain. Clean the skin with a tack rag.
- Note** – it should not be necessary to sand the inner surfaces of the wing skin. Just be sure to remove any excess glue.

- Follow the same steps to assemble two wing top skins, using 1/16" x 4" x 36" balsa sheets.
- Lay a bottom skin on a top skin. Trace the shape of the bottom skin onto the top skin, adding a 1/4" margin at the trailing edge. Cut out the top skin.

Wing Panels

- Pin a lower wing skin to your building board. Pin behind the spar position only. The lower skins are the ones with the rib and spar positions etched into them.
- Glue the ribs and main spar to the bottom sheet. Note that the spar is notched at the dihedral angle for root rib W1. To maintain an accurate Clark Y airfoil, moisten the leading edge of the sheeting and pack it up so that it follows the curve on the bottoms of the ribs.
- Glue the 3/8" x 3/4" leading edge strip in place against the front of the wing skin. Note that the leading edge strip sits on your building board, not on the wing skin.
- Glue the aileron spar to the bottom sheet and ribs.
- Glue the aileron leading edge to the bottom sheet, about 1/32" aft of the aileron spar. DO NOT glue the aileron leading edge to the aileron spar.
- Glue the stub ribs to the rear of the aileron leading edge and the bottom sheet.
- Cut three aileron crank bearings from 3/32" aluminum tube. Make them about 1/2" long.
- Make an aileron crank from 1/16" music wire and the three bearings.
- Trim a slot in the aileron leading edge for the aileron crank. Glue the aileron crank in place, with glue on the bearings where they pass through ribs W2 and W3. Install scraps of balsa to support the innermost bearings.
- Use scrap balsa to make a bearing block for the aileron crank. DO NOT glue the music wire crank to the bottom skin or to the bearing block.
- Glue scrap 1/16" or 1/8" balsa reinforcements to the outside rear portion of rib W1. Using a sharp #11 blade, cut a slot in root rib W1 for the wing bolt, but don't cut the reinforcements. The center of the slot should be about 1/2" forward of the trailing edge. Notch the bottom skin so that you can find the bolt hole later.
- Using a long sanding block and fine grit sandpaper, sand the assembled wing panel to prepare it for the top skin. Sand the airfoil angle into the trailing edge, so that the trailing edge is about 1/32" thick.
- Using scrap 1/8" balsa, shim the trailing edge of the wing so that it is 3/16" high at the outer end of the wing, and flush with the building board at the inner end. This will build in about 2 degrees of washout.
- Cut a hole in the top skin for the aileron crank.
- Apply a thin bead of Pro-Bond or aliphatic resin to the tops of the ribs and spars and along the top of the leading and trailing edges. Lay the top skin in place and pin it firmly to the ribs and spars. Let the wing assembly dry.
- Laminate two WT pieces to make a wing tip block. Glue the wing tip block to the wing.

- Carve and sand the leading edge to shape.
 - Notch the leading edge for the 1/8" dowel.
 - Sand the wing panel to its final shape.
 - Repeat these steps with the opposite wing panel.
- Wing Panel Joint**
- Use a long sanding block to prepare the root rib faces for joining.
 - Join the panels using 15-minute epoxy between the root ribs. Use masking tape to hold the bottom skins flush. With one wing tip flat on the building surface, elevate the other wing tip to the required total dihedral.
 - Reinforce the root rib joint by wrapping it with nylon or glass cloth. Saturate the wrap with CA.
 - Use a 1/8" drill bit to clear the wing bolt hole and the dowel hole in the leading edge.
 - Use a sharp blade to cut the ailerons free from the wings. Use a sanding block to finish the aileron leading edges and the aileron slots in the wing.
 - Cover the wing as desired.
 - Hinge the ailerons.
 - Trim the wing trailing edge as shown on the plans.
 - Install the 1/8" dowel in the leading edge. The dowel should project about 1/4" forward of the wing.

Fuselage

- Laminate the two former F5U pieces together. Laminate the two former F5L pieces together.
- Place a sheet of wax paper on your building board. Lay the crutch on the building board so that the nose of the crutch is slightly over the edge of the board. This will allow you to install former F1 on the crutch. Use a straight edge to align the sides of the crutch, and pin the crutch in place.
- Install and align the crutch extension piece to the main crutch. Glue it in place.
- Glue former F1 to the crutch. Make sure it is fully seated on the crutch tab, and that it is perpendicular to the crutch.
- Glue formers F2U through F8U to the crutch.
- Glue cockpit floor CF in place between formers F3U, and F4U.
- Glue a 1/8" square balsa upper keel in the notches from F1 to F8U.
- Sheet the forward top of the fuselage from F1 to F4U with 1/16" balsa. Note that the crutch provides a ledge for the sheet.
- Sheet the rear top of the fuselage from F4U to F8U with 1/16" balsa.
- Remove the upper fuselage from the building board.
- Glue formers F2L through F8L to the crutch.
- Glue former F9 and the HORIZONTAL STAB PLATFORM HSP in place.

- Glue a 1/8" square balsa lower keel in the notches from F1 to F9.
- Glue 1/16" ply former F2A to former F2L.
- Dampen the wing saddles and glue them to formers F2L, F3L and F5L.
- If desired, add a battery tray to suit your battery.
- Sheet the fuselage bottom with 1/16" balsa sheet. This can be done in three main sections: F1 to F2, F2 to F5, and F5 to F9.
- Fill the area between F8, F9, the crutch and HSP with scrap 1/16" balsa.
- Using the wing saddle as a guide, cut out the wing opening in the lower sheet.
- Laminate the two 1/16" ply wing mounts WM. Then fit the WM assembly into the slots in the wing saddles. Glue the WM assembly to the saddles and fuselage sheeting.
- Carefully drill a 1/8" hole through F2L and the lower keel. This hole is for the wing locating dowel.
- Fit the wing in place on the fuselage. Drill and tap the mounting bolt hole.
- Cut fillet bases from 1/64" or 1/32" ply and glue them to the fuselage
- Place a piece of wax paper or plastic wrap over the center section of the wing and bolt it in place.
- Cut and install 1/16" balsa fillet formers from scrap materials. Add foam blocks and sand the fillets to shape.

Cowl and Motor Mount

NOTE: Use small wood screws to attach the motor mount to F1. This allows you to install and remove the motor from the front of the model.

- Determine the number of 1/16" ply spacer rings needed for your combination of motor, prop adapter and spinner. Glue the spacer rings to the rear of the motor mount. Glue the assembled spacers to F1.
- Screw the motor mount to F1 (or the spacer rings if used). Use the etched guide lines to center the motor mount on F1.
- Glue the two 1/4" balsa cowl rings to the front of the fuselage, and shape them to the correct contour.

Empennage

- Join the two elevators E1 together with a 1/8" dowel. Hinge the elevators to stabilizer S1.
- Glue fin and rudder together. (Optional – hinge the rudder to the fin for rudder control.)
- Cover the fin, stabilizer and elevators as desired. Omit covering from the portions of the fin and stabilizer that will be covered by the tail blocks.
- Glue the fin into the slots in the stabilizer.
- Glue the fin and stabilizer assembly to the horizontal stabilizer platform HSP.
- Shape the tail blocks TB1 and TB2. Glue them in place.

Finishing Your Model

- We suggest covering the fuselage with 1/2-ounce glass cloth and finishing resin for maximum strength.
- The wing can be covered with your choice of coverings.
- Paint and decorate the model as desired – see the *Paint and Markings Guide* on our Website for more information.
- Seal the entire model with a light coat of Krylon clear spray.
- Glue the canopy in place.

Decals

CAUTION: You must seal the decals before immersing them in water!

The decals included in this kit are printed with Epson DuraBrite™ inks on premium inkjet water-slide decal paper available. Follow the steps below to achieve a great looking set of markings on your model.

- Seal the decals with several thin coats of Krylon Crystal Clear™ spray varnish. Make sure you thoroughly cover the ink; this will prevent smears and stains during everyday handling.
- Make sure the surface where the decal is to be applied is smooth and glossy. Matte surfaces will permit tiny air bubbles to be trapped between the surface and the decal, thus spoiling the decal.

- Cut out and trim all the markings that you plan to apply in this session.

- Dip the decal in a bowl of water for about 30 to 40 seconds. Using your fingers, gently try to slide the decal off the backing paper. As soon as the decal slides, slide it off the backing paper and onto the model in the desired position. Use a soft absorbent cloth to gently blot excess water from the decal. Allow the decal to dry.

TIP – You can practice with bits of decal cut from the copyright notice.

- Spray a coat of Krylon Crystal Clear varnish over the decal.

Flying Setup

- Keep the model as light as possible for best performance.
- Your Oscar model should balance at 1.75" behind the leading edge at the center chord. This is approximately 24% of the mean aerodynamic chord (MAC). For the first few flights, you may want to move the balance point forward 1/4".
- Set the control throws to:
 - Elevator: 1/2" up – 1/2" down
 - Ailerons: 3/8" up – 1/4" down

Need Help?

If you have questions or need help with assembly of the kit, drop an email to tom@warbirdkits.com.