

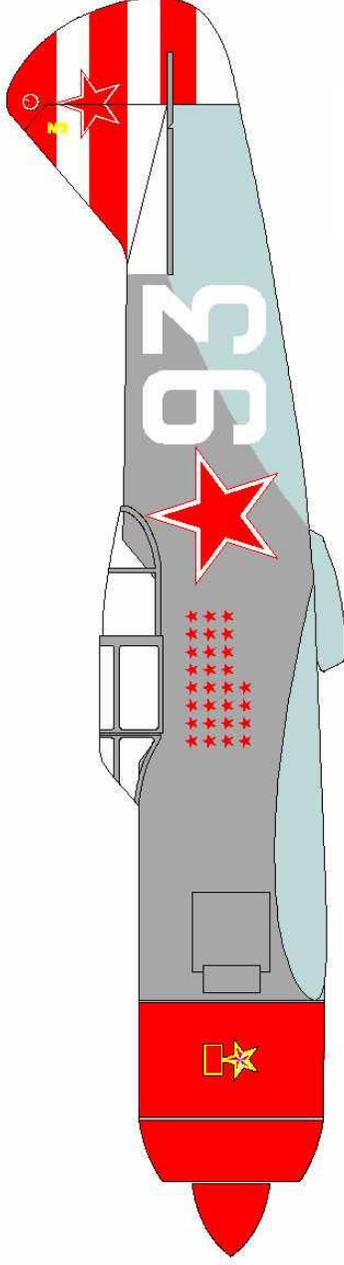


**WARBIRDKITS.COM**

# Lavochkin La-7

Manual Version 1.1 – 19 July 2006

Scale: 1/12
Wingspan: 32 in
Area: 188 sq in
Weight: 18 – 22 oz
Power: Brushless 400-size



Kit 8005

## 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 motor
  - 1-3/4" Spinner

**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 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 the 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 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.
  - Make aileron ribs from scrap 1/16 balsa and glue them to the rear of the aileron leading edge and the bottom sheet.
  - Cut four 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 four 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, W3 and W4. Install scraps of balsa to support the innermost bearings.
  - Using scrap balsa, make a bearing block for the aileron crank. Glue it in place, but 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.
  - Glue scrap 1/16" or 1/8" balsa reinforcements to the outside front portion of rib W1 where it is notched for the locating dowel.
  - 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.
  - Place the laser-cut 1/8 balsa washout jigs under the trailing edge of the wing, and under the tip rib. This will build in about 2 degrees of washout.
  - Cut a hole in the top wing 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. Please download and use the leading edge templates from our web site.
- Repeat these steps with the opposite wing panel.

### Wing Panel Joint

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- 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 wing joint by wrapping it with nylon or glass cloth. Saturate the wrap with CA or epoxy.
- 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.
- Cover the wing as desired.

- Install the 1/8" dowel in the leading edge. The dowel should project about 1/4" forward of the wing.

### Fuselage

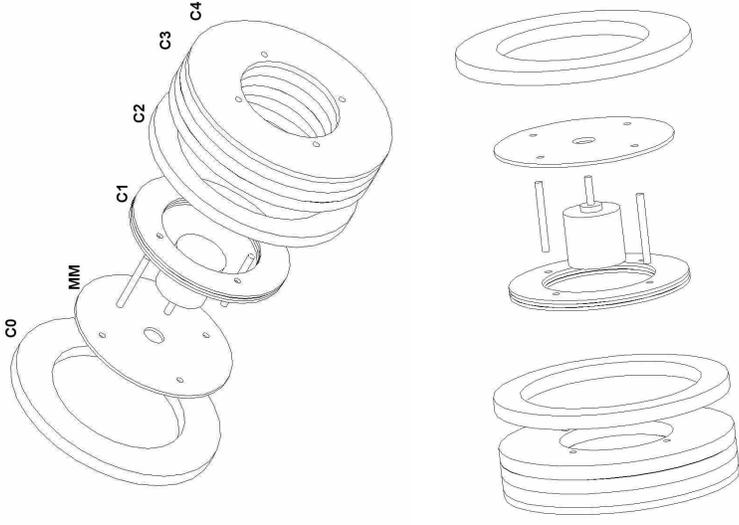
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- Laminate the two former F5 pieces together.
- Place a sheet of wax paper on your building board. Glue the two crutch halves together and pin the assembled crutch to your building board.
- Glue the upper former F1 to the crutch. Make sure it is fully seated on the crutch tab, and that it is perpendicular to the crutch.
- Glue upper formers F2 through F9 to the crutch.
- Glue cockpit floor CF in place between formers F4 and F6.
- Glue horizontal stabilizer platform HSP in place between formers F8 and F9.
- Glue a 1/8" square balsa upper keel in the notches from F1 to F4.
- Glue the dorsal keel in place between formers F6 and F8.
- Using 1/16" balsa, sheet the forward top of the fuselage from F1 to F4. Note that the crutch provides a ledge for the sheet.
- Sheet the upper fuselage with five pieces of 1/16" balsa, as follows:
  - Use two sheets to cover the framework between F4 and F9.

- Use two sheets to cover the framework between F1 and F4. You will need to cut a dart in each sheet, from F1 to F2, to fit the compound curve.
- Fit a small sheet between F4 and F6 for the cockpit framing.
- Fit and glue the 1/4" dorsal cap in place.
- Remove the upper fuselage from the building board.
- Glue the lower halves of formers F1 through F8 to the crutch, making sure that they are seated in their notches and perpendicular to the crutch.
- Glue a 1/8" square balsa stringer in the notches from F1 to F2. Glue another 1/8" square balsa stringer in the notches from F5 to F8.
- Glue 1/16" ply former F2A to the front of the lower half of former F2.
- Dampen the wing saddles and glue them to formers F2 through F5.
- If desired, add a battery tray to suit your battery.
- Laminiate the two 1/16" ply wing mounts WM. Then fit the WM assembly into the slots in the wing saddles. Trim the WM assembly flush with the wing saddles, and glue it in place.
- Sheet the fuselage bottom with 1/16" balsa sheet from F1 to F4.
- Plank the bottom of the fuselage from F5 to F8 with 1/16" x 1/4" balsa strips.
- Glue TB2, TB3 and TB4 together. Then tack-glue them in place aft of F8.
- Carve and sand the TB assembly to final shape. Remove it from the fuselage. Hollow it out to reduce weight, then glue it back in place.
- Using the wing saddle as a guide, trim out the wing opening in the lower fuselage.
- Carefully drill a 1/8" hole in F2 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

- Study the diagrams to see how the cowl and motor mount work together. This system is designed to permit you to install and remove the motor from the front of the model.
- Part MM is the motor mount. Your motor attaches to part MM. Part C1 (3 pieces) holds the blind nuts for the MM mounting screws. Part C2 provides a sand-able ring around part C1. Parts C3 and C4 are used to space part C1 away from former F1.
- This system enables you to adjust the location of the motor mount (part MM) as much as 7/8" aft. To do this, enlarge the inner holes in the appropriate combination of C3 and C4 spacer rings.
- Drill MM to fit the mounting screws on your choice of motor. **DO NOT GLUE MM** to any other parts.
- Using two 1/8" dowels to hold them in alignment, glue parts C3 and C4 together. **DO NOT** glue the dowels in place.
- Glue the three parts C1 together. If you will be using blind nuts for the MM mounting screws, install them in the C1 assembly now. The blind nuts should go in the holes opposite the dowels
- Glue the C1 assembly to the C3/C4 assembly, using the dowels to hold the parts in alignment.
- Glue the balsa ring C2 to the C3/C4 assembly, around the C1 parts.
- Glue the balsa ring C0 in place on the front of balsa ring C2.
- Sand motor mount MM until it will easily slip in place inside balsa ring C0.
- Remove the dowels. Then trim them so that they project about 1/8" forward of assembly C1 and project about 1/8" rearward of the C3/C4 assembly.
- Glue the dowels in place.
- Glue the cowl assembly in place on F1, using the dowels for alignment. Then shape the cowl assembly per the plans.



## Empennage

- Join the two elevators E1 together with a 1/16" music wire joiner. Hinge the elevators to stabilizer S1.
- Glue the rudder to the fin. (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 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 on premium inkjet water-slide decal paper. 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.
- 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.
- Apply some warm, soapy water to the model where the decal is to be positioned. (Use dish soap for this.)
- 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.
- Spray a coat of Krylon Crystal Clear varnish over the decal.

## Flying Setup

- Keep the model as light as possible for best performance.
- Your La-7 model should balance at 2.7" behind the leading edge at the center chord. This is approximately 25% 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](mailto:tom@warbirdkits.com).

## Updates and Corrections

**NOTE** – The location of the port side machine gun shown on the plans is incorrect. The port side should be symmetrical with the starboard side; i.e., each should be equidistant from the aircraft's centerline.

**NOTE** – Please download the leading edge templates from our web site. These will help you shape the wing to the correct airfoil.