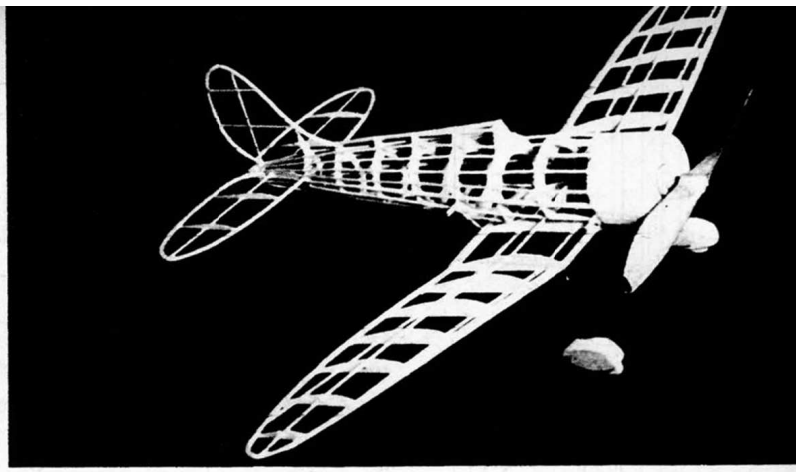


NAKAJIMA 96

No one should fail to build this swell performer—its construction has been simplified so that all who start should finish it

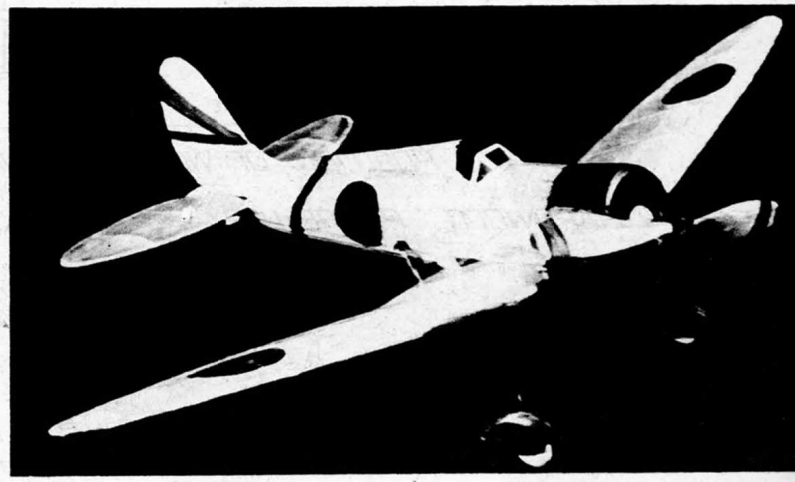
by **J. BLIGH & N. KIRSCHBAUM**

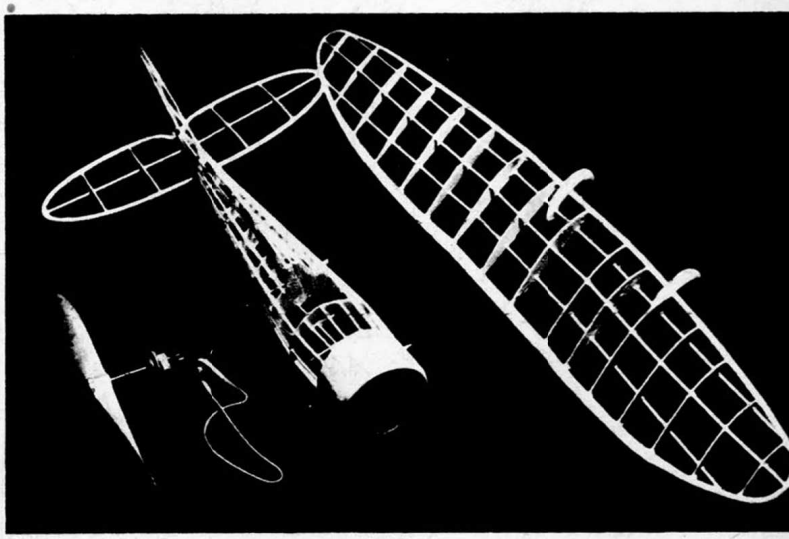
HERE is a stubby-nosed snappy little Jap fighter model worth anyone's time and effort to build and fly. This Nakajima 96 single seater resembles the old Boeing P 26A and was most probably copied from it. The Nakajima is a 1936 model and was good in its day. Some were still used in the more remote fronts confronting Japan at the beginning of her onslaught against the Allies. The ship is exceedingly maneuverable being able to turn on the proverbial dime. Eyewitnesses in China reported that this wicked little machine could stick its nose up and pull straight away from any pursuer, then "flop over in an impossible loop of 300 or 400 feet" and dive for a kill. This feat is attributed to the two-foot-high-fin that runs from the cockpit back to the rudder fin. The ship manages to hit 285 mph with its 750 hp aircooled engine. A retractable landing gear version topped 315 mph. It has a wing spread of 35 ft. 6 in., a length of 25 ft. and a wing area of 170 sq. ft. Service ceiling is 31,000 ft. and its range is estimated at 440 miles. Its landing gear is non-retractable.

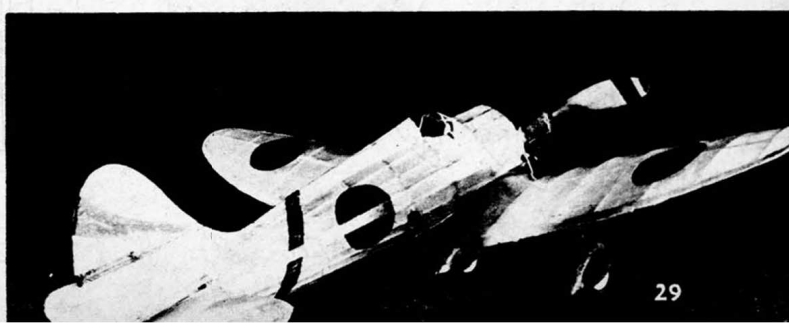
CONSTRUCTION—This model presents the problem of tail heaviness due to its extremely short nose. Two original models were built, the first entirely of pine, and the second entirely of balsa. While the first model had to be corrected considerably for tail heaviness, the second was easier to balance. The solution to this problem, which arose from the long tail moment arm and the comparatively short nose moment arm, was to construct the whole model of light balsa except for the solid nose block and planked cowling. When building this model, construct the whole nose unit of pine or very heavy (hard) balsa. The nose should also be heavily doped. While helping the balancing problem it also creates a crash-proof nose.

Cut the plans out, or trace them, pin them together on a piece of corrugated pasteboard and place a sheet of waxed paper over them.

FUSELAGE—Cut out the four keels (1/16" sheet balsa) and the bulkheads, two from each pattern (1/16" balsa), as shown on the plans. (Also cut out two bulkheads from 1/16" sheet *pine*. These bulkheads are complete circles and constitute the foundation of the planked cowling. Obtain the radius for each bulkhead from the plans.) In cutting out the bulkheads, mark, do not cut, the stringer notches except those for the keels. Pin top and bottom keels to the side view and cement half the bulkheads into their positions. Then cement the third keel (one of the two side keels) into the prepared notches making sure each bulkhead is in an upright position. When the three







Nakajima 96

keels have been cemented and thoroughly dried, remove the structure from the plans and add the remaining bulkheads and the remaining side keel. Next add the 1/16" square stringers to the bulkheads, starting at bulkhead A, cutting out the notches as you go along. Those on the plans show their relative positions. Remember! a tight fit saves glue and lessens weight. If the notches are not cut too deeply the plane, when papered, will present a smooth and streamlined appearance and contour without drag-producing bulkhead bulges. Plank the cowling with 1/16" pine. Cement three 1/8" sheet pine blocks together in constructing the nose block. The first laminated block should have the center grooved out to simulate the engine opening. Cut and sand to desired shape and cement to the first bulkhead.

The nose plug can be built from the details shown on the plan. The propeller shaft is made of .04 spring steel wire in the conventional manner; it is approximately twice as long as shown. A 9" hardwood propeller is recommended; this can either be purchased or made. Note that the nose block is cut out in the center 1/2" square to receive the nose plug.

The recess in the fuselage into which the wing fits is sheeted with 1/32" balsa, although stiff cardboard can be used as a substitute. The center of this sheeting should be cut out to lighten the structure. This sheeting was not added at the time of the skeleton photographs.

WING—The wing is constructed in three sections, two outer wing panels of elliptical shape and a rectangular center section. In building the wing panels, trace the trailing edge from the top view on 1/8" balsa and cut out. Do the same with the leading edge, using the front view pattern this time. Pin leading and trailing edges of panels to the top view, bending the leading edge into the required shape and cement the ribs (1/32" balsa), previously cut and sanded, into their positions between them. Add the tips. Trim the leading and trailing edges, as well as the tips, roughly to shape, then sand the whole structure smooth. The center section is built in the same manner, save the ribs which are cut from 1/16" balsa.

When the two wing panels and the center section are completed, add the 1/16" square balsa spars to the prepared notches in the ribs, bending or cracking the spars at the joints in the wing where the panels and center section meet. Each spar should be made of one continuous strip of balsa. Cement solidly the spars, the leading and trailing edges at the aforementioned joints, placing a 2" block under each wing tip to produce the necessary dihedral.

LANDING GEAR—The landing gear is shaped from .04 spring steel wire. Each leg is made in two pieces and attached to the wing by sewing and cementing one arm of the leg to the outer center section

rib and the other arm to the leading edge. Cement heavily! Each wheel pant is made of three sheets of 1/8" balsa laminated together. The center sheet is cut out to receive the wheel, 1" diameter, and the outer two provide the covers. Sand smooth and dope well. Before adding each wheel, fork and glue the landing gear wire into the center piece of balsa. Fix bearings to both sides of the wheels so they will revolve smoothly.

RUDDER AND STABILIZER—Build the rudder right on the side view plan. Cut the sheet outline frames from 1/16" balsa and the ribs and spars from 1/16" square hard balsa. Care must be exercised when building the rudder; sloppy and inacurrate work will only lead to mounting difficulties (in both senses) when rudder and fuselage are joined. This attaching is done before the model is papered.

The stabilizer is built in one piece and attached to the fuselage by cutting out a portion of the last bulkhead and inserting it in place. Note! the solid tail cone is applied *after* the stabilizer has been inserted.

Only the left view is shown. Trace this view and complete it by drawing the right view. Cut the outline frames and ribs from 1/16" balsa and the spar from 1/16" square hard balsa.

PAPERING—The plane is papered with yellow or orange Japanese tissue (truly a Jap model) although white will suffice. Paper both top and bottom of the wing in three sections, that is, panel by panel, making sure the grain of the tissue runs lengthwise. Dope the rib where the dihedral angle is set (the last rib of the center section) and lay the end of the tissue on it. When dry, pull the tissue

tightly—not too much however—toward the tip and pin it there. Then apply dope to the leading and trailing edges, working out toward the tip. Paper the fuselage in sections lapping them neatly together. Make sure the overlapping of the sections is done over a stringer or over a bulkhead, otherwise it will appear patched. When papering, apply dope or banana oil only to the thin ends that overlap; do not daub dope on other parts of the tissue because the tissue where dope has been applied will not shrink when moistened to the same degree as non-doped tissue.

Wrinkles may occur otherwise. The grain of the tissue should run vertically over the fuselage. Cover each side of the rudder and each stabilizer half with a single sheet of tissue. Before covering any part of the structure, however, it must be sanded perfectly smooth and all residue and waste matter removed. After the papering is completed, spray the plane with water to tighten the covering. When dry, apply two or three coats of thin, clear dope. Wait for each coat to dry thoroughly before adding the next. Make sure no warping takes place during this procedure; counteract any such tendency immediately. If the clear dope bleaches while drying, a thin coat of banana oil will most likely remedy this situation. Dope the cowling and nose block red, and the inner part of the nose block (where the engine would normally be seen) black.

Also dope the wheel pants red. Jap insignia can be easily doped right on the surfaces. Add such incidentals as headrest; wind screen, made of stiff celluloid; tail skid; control surfaces; and machine guns, small headless nails nailed in the nose block. These enhance the appearance of the finished model and make it look more realistic. The wing is placed within the recess in the fuselage and a large rubberband is wound underneath the wing and attached to bamboo dowels inserted and glued through the fuselage.

Assembly of the rudder and stabilizer has already been described. Center and align all parts accurately and make certain there are no warped parts included in the assembly.

FLYING—The original models were powered with 12 strands (6 loops) of 1/8" flat brown rubber. Lubricate the motor before placing it within the fuselage. The rubber strands are held in the rear by a bamboo dowel.

Before attempting any flights or test glides, balance the model by holding it by the wing tips and adding weight to the nose or tail. Check the dihedral on both sides of the wing and inspect the empennage for any warpage. Next give the model a little glide into some tall thin grass, nosed slightly down. If it stalls, add weight to the nose or lower the positive angle of incidence of the wing. This may be accomplished by inserting a sheet of cardboard or 1/32" balsa under the leading edge of the wing beneath the fuselage. If it dives, add weight to the tail, or remove some of it from the nose if added there previously. Do not attempt powered flights before the test glides are satisfactory. Continue to balance until good glides are obtained. Powered flights come next, with just a few turns. Give the model down-thrust if it stalls under power, and give left or right thrust to control the amount of circle. Paper tabs fastened to the tail surfaces and the wing are also adequate although it ruins the appearance of the model. Once test flights are satisfactory, "wind 'er up an' let 'er go!"

AIRPOWER FOR PEACE!