

Complete to the registration numbers and trimming details, it looks real.

Build An INTERSTATE FLYING CADET

by Sidney Struhl

Details for building a capable and faithfully reproduced flying scale model of a light sport plane.

THE Interstate Aircraft & Engineering Corporation have recently launched their Cadet sports-trainer, and it seems it has already achieved some popularity. The Cadet is of the conventional light-plane design and construction with the exception of numerous refinements. This two-place high-wing monoplane is powered by a Continental motor of 65 h.p., which gives a top speed of 115 m.p.h. and a cruising speed of 100 m.p.h., quite outstanding for *any* lightplane. Several advanced design features have been incorporated in the Cadet, including a patented fabric spring clip with which all fabric is attached to the wing and other surfaces of the plane.

FUSELAGE CONSTRUCTION

COVER the full size plans with wax paper to preserve them. The fuselage is constructed first. Make the

two side frames and then connect them. The longerons are $\frac{1}{8}$ " square and the uprights and crosspieces are $\frac{1}{16}$ " by $\frac{1}{8}$ " strips of balsa.

Cut all the required formers from a light grade of $\frac{1}{16}$ " sheet balsa and cement them in their correct positions. The stringers are next added in place. You will note that all stringers are $\frac{1}{16}$ " square balsa except the bottom stringer which is $\frac{1}{16}$ " by $\frac{1}{8}$ " balsa. The two side stringers are glued directly onto the sides of the fuselage.

Carve the nose block from soft balsa to the required shape, as shown on Plate 1. After the nose block is carved, hollow it out, and sandpaper it. Finally, cement the nosepiece in place. Note that a small square is cut from the front of the block for the rubber motor to pass. The nose may be covered with thin sheet balsa if so desired. The rear hook is bent to shape from .034 music wire, and

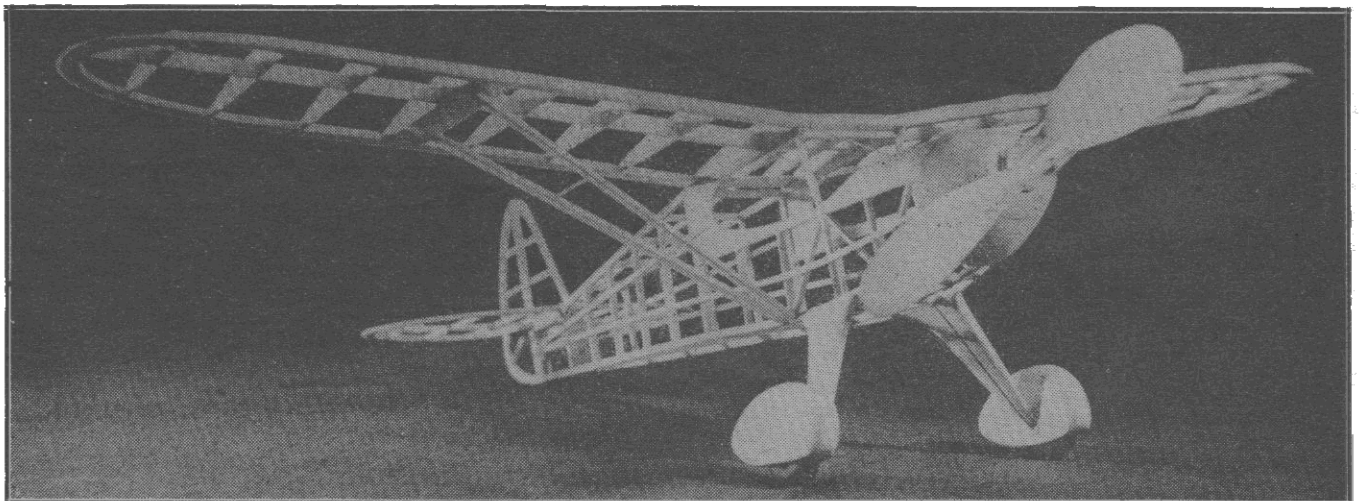
inserted into a piece of scrap $\frac{1}{8}$ " sheet balsa and then cemented as shown.

LANDING GEAR, WING, AND TAIL

THE landing gear wire strut is bent to the required shape from .038 music wire and then cemented very securely to the fuselage frame work. The balsa landing gear struts are shaped from $\frac{3}{16}$ " hard sheet balsa. The cross section of the strut is streamlined. Pants may be used if the modeler so desires. However, for a better performance rather than appearance, the pants should be omitted. The wheels are shaped from balsa and are $1\frac{1}{4}$ " in diameter.

The tail surfaces should be kept as light as possible, so take care during their construction. Cement all joints well. The rudder and stabilizer are built in very much the same way and are constructed directly on the plans. Their outlines are cut from

Note the sturdy construction of the entire model. Use of wheel spats are optional.



1/16" hard sheet balsa. The ribs and spars are 1/16" flat strips. As you will note on the plans, the horizontal stabilizer is built as shown in one piece.

The wing must be constructed with the greatest of care so that it develops no warps which would impair the flight of your Cadet. It is necessary to draw a plan of the left half of the wing because space allows us to present only the right wing panel.

First cut from soft 1/16" sheet balsa all of the necessary wing ribs. Working directly on the plans, proceed to pin the leading and trailing edges in their proper places as shown on Plate 3. Cut the wing tips from 1/16" hard sheet balsa. The spar, which is hard balsa measuring 3/32" by 1/4", is not cemented in position until the wing is completely finished and removed from the plan and the dihedral installed. There must be 1 1/2" dihedral under each wing tip.

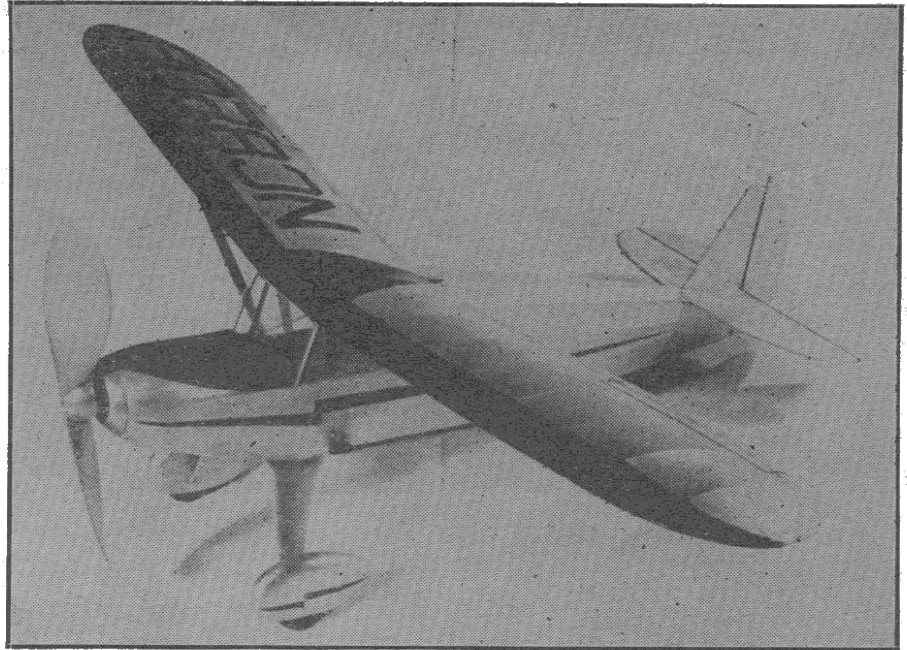
A pair of wing struts is next to be made. The struts are shown in the broken lines on the wing plan. The wing struts are 1/16" by 1/4" balsa strips. The struts are glued to the wing by the piece of 1/16" balsa that is inserted from the leading edge to trailing edge located on the wing plan.

COVERING AND DOPING

IT IS ADVISABLE to use colored tissue instead of applying colored dope to the tissue paper for decorative purposes. Colored tissue will give just as neat a job as will the dope if it is applied with care. The original Cadet was covered with silver tissue with all trimmings being done in black dope. However, the trimmings may be cut out of black tissue and doped over the covering instead of using pigmented dope.

The frame should be prepared for covering by going over it very lightly with fine sandpaper to remove any ridges and roughness. Cover the fuselage first, making sure that the tissue grain is running lengthwise—that is from nose to tail. Thin, clear dope or banana oil should be used as the adhesive. Apply the adhesive only to the extremities of the framework that is being covered.

Spoon type propeller blades increase the model's flying qualities.



Eight strands, well lubricated, keep the ship aloft on steady flights.

This will result in a much finer covering job.

The wing is next to be covered. The bottom of the wing is flat and the modeler need not run into any difficulty here. The top of the wing will have to be covered with several pieces of tissue. One piece for the center section and one piece for the outer wing panels and several small pieces will be needed for the wing tips since there is a two-way taper.

The rudder and stabilizer are very simple to cover, necessitating only one piece of tissue for each side to be covered. Be careful and don't allow the dope to adhere to both sheets.

Glue the wing in place over the cabin. The angle of incidence has automatically been incorporated in the framework. The stabilizer is cemented in its proper place without any angle of incidence. The rudder is next to be cemented in position. Add the wing struts, the celluloid for the windows and such details as the registration numbers, etc.

The entire paper covering is now given one or two coats of thin, clear dope, applied with a wide, soft camel hair brush. Apply the dope lightly.

PROPELLER AND FLYING DETAILS

THE PROPELLER design is clearly shown in the plans. Take your time carving the prop and make sure that it is right-handed with about 1/16" undercamber in the blades. Sand smoothly and properly balance before dopping with banana oil.

Bend the prop shaft to the shape shown in the plans and slip through the removable nose block. Several large copper washers are then inserted on the propeller shaft. To increase the flying time and distance, a freewheeling device and a winding hook on the prop should be employed.

Your first test flights should be conducted over a level stretch of ground, preferably on a windy day. First test glide your Cadet before attempting any power flights. Any corrections for the improvement of the glide should be made with small weights. Any stall during flight may be corrected by a small amount of down thrust. By the application of right or left thrust, the circle can be adjusted.

BILL OF MATERIALS

(All wood balsa except where otherwise specified)

- 8 pieces 1/8" by 1/8" by 18"
- 6 pieces 1/16" by 1/16" by 18"
- 3 pieces 1/16" by 2" by 18"
- 2 pieces 1/4" by 1/4" by 18"
- 2 pieces 1/8" by 1/4" by 18"
- 2 pieces 1/8" by 3/8" by 18"
- 1 piece 3/16" by 2" by 6"
- 1 piece 1" by 2 1/2" by 2 1/4"
- 1 piece 1/4" by 2" by 1 1/2"
- 1 piece 1/8" by 2" by 6"
- 1 piece of .038 music wire
- 1 pair of 1 1/4" diameter wheels

Miscellaneous equipment: celluloid, colored Japanese tissue, cement, small model making pins, washers, clear dope, razor, sandpaper.

THE END