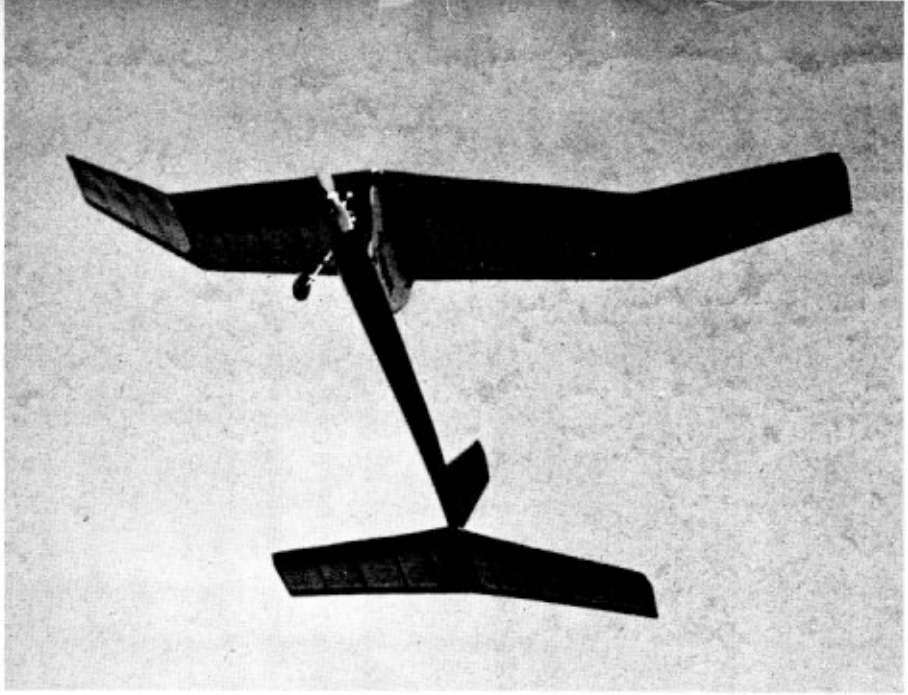


Something different in wings. Sweepback to improve directional stability and forward-placed tips to delay tip stalls, yield good performance when the flier savvies just basic adjustments.

Thermal Thumber

For sport flying, this .02 powered free flight, splendid preparation for contest ships. Simple, quite stable.

For hand glide tests aim nose at spot on ground about 30 feet away—straight ahead if a wind. For sport flying there is plenty of wing area to get good flights with engine adjusted rich.

by GABE BEDISH

► Were Aristotle here to view free-flight, he would probably exclaim about seeing something of a bird. Progress!

The model presented here seems almost predisposed to be away with the slightest thermal activity. Bearing this in mind, the title "Thermal Thumber" was contrived.

Designed for sport-flying, and, as a model to break into high performance free-flight with; the purpose of the development of Thermal Thumber is to put together a model for beginners from which stable, high performance can be found without the modeler having more than basic knowledge of techniques of flight adjustment. The model can be constructed in a day, yet, is sturdy enough to last through any trials which may occur in learning the ways of free-flight.

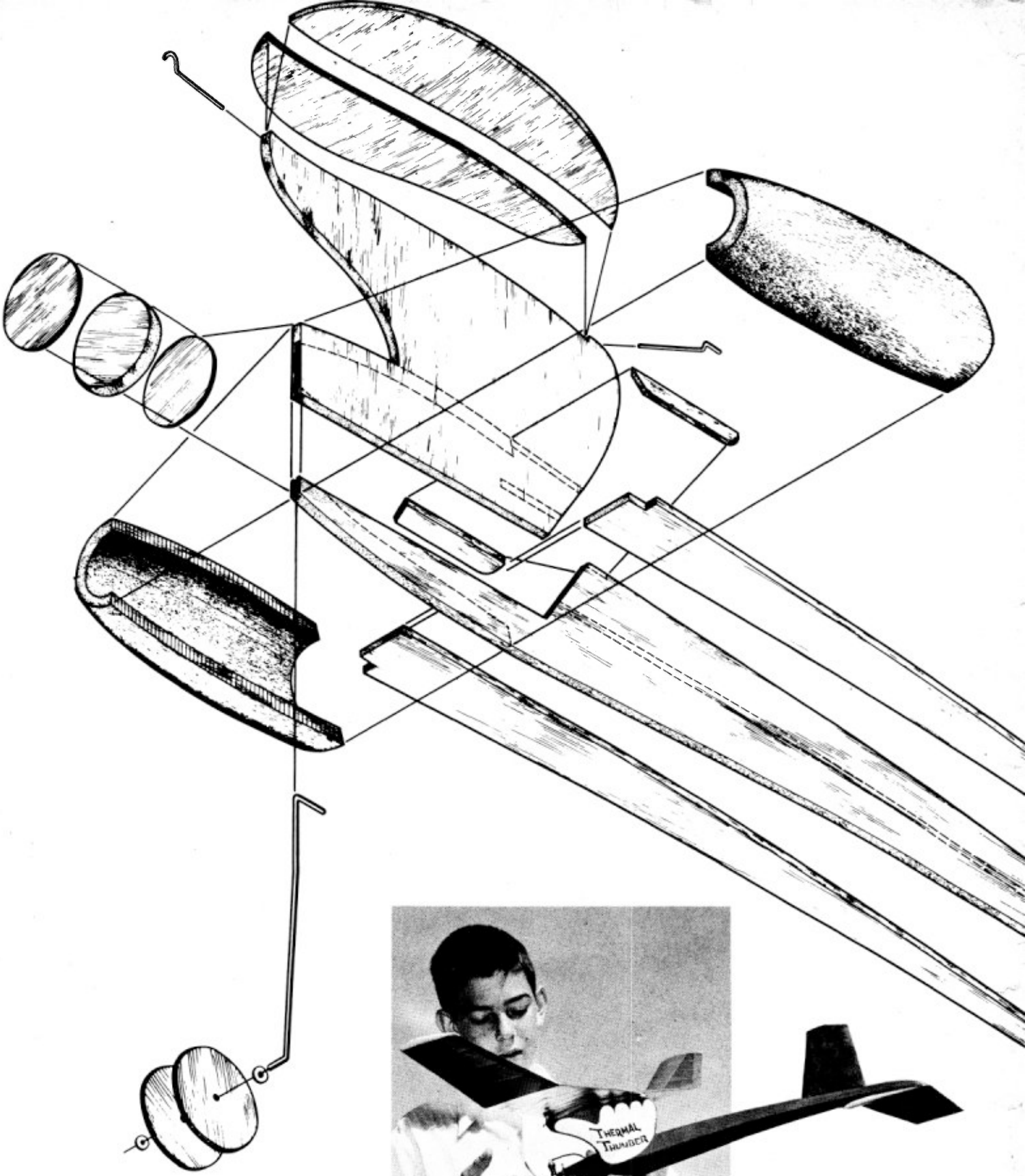
The shape of wing and tail surfaces on this Cox .02, Pee Wee, powered Lilliput is for gaining better directional stability without reducing fine gliding characteristics. Sweepback increases directional stability and forward-placed tips help overcome stalling tendencies before they become severe.

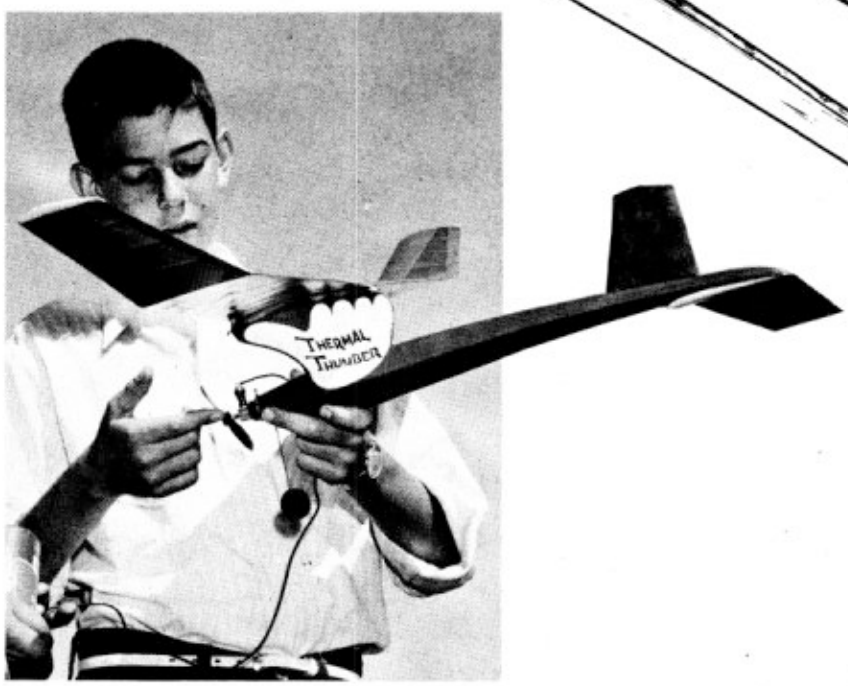
A pylon removes the wing from much of the turbulence of the propeller stream to allow it to do work in relatively undisturbed air flow. Fuselage design provides for smooth contours; near maximum rigidity; and ease of construction.

Fuselage: A three-piece keel is composed of vertical and horizontal members. Trace and cut patterns for the horizontal and vertical keel members from tracing or onion-skin paper. Then, trace them on hard sheet balsa and cut out keel pieces. Cut out pylon piece and cement into place. With pin holes for guides, cement horizontal keel parts to either side of vertical keel. Attach wing mount base and retaining pins. Drill holes for pins.

Form landing gear strut. Notch the front of vertical keel to take strut. Drill hole for upper strut end. Cement strut into place. Cut hole for flight timer in vertical keel. Attach pull-cord to timer and set for ten-second run. This should allow for a 20-second engine run as fuel is emptied from tubing connection from timer to engine. Cement timer into place and attach lengths of plastic tubing fuel line. Plug exposed ends to prevent foreign matter from getting inside. Attach pull-cord guide.

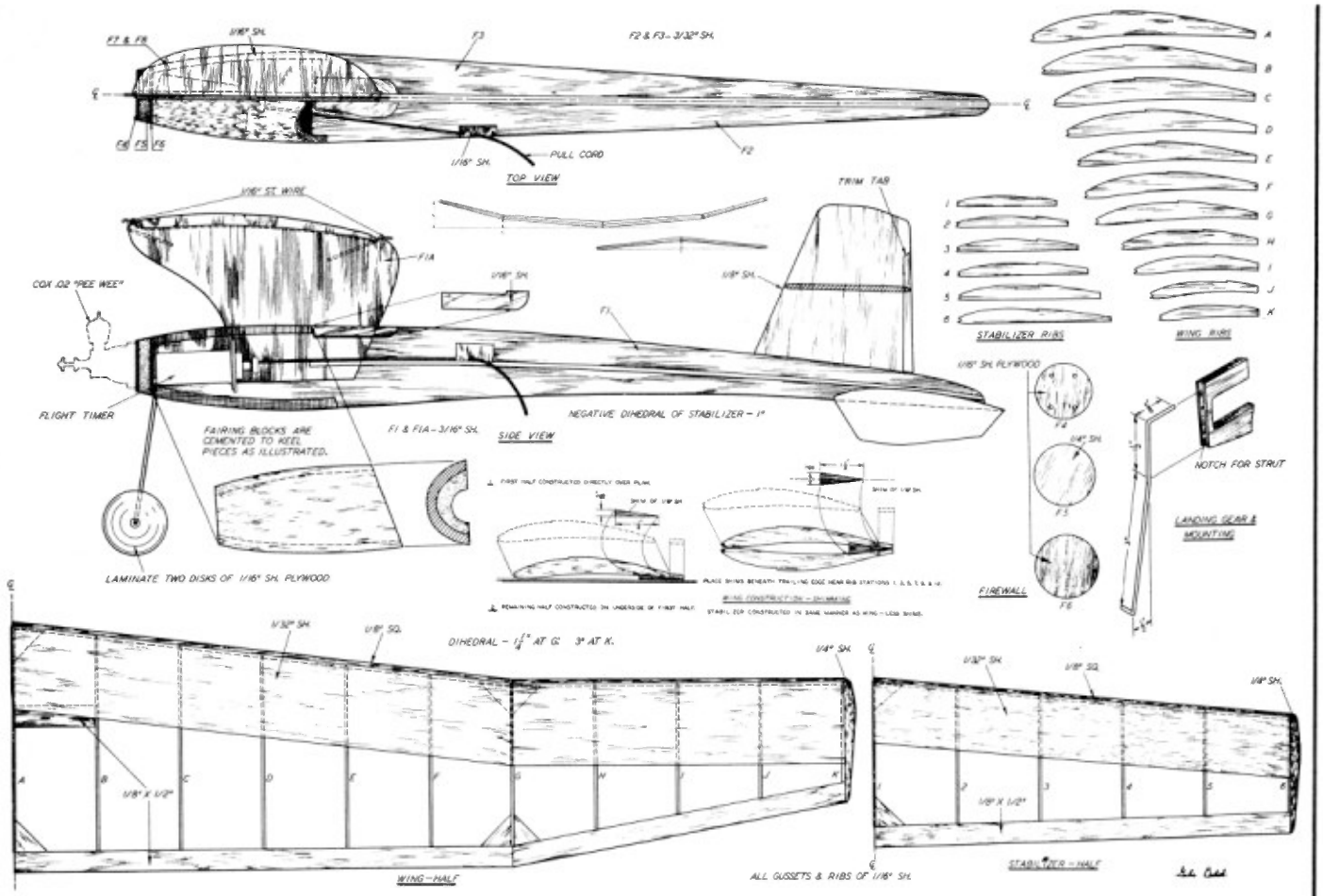
Carve or rasp fairing blocks to shape from medium-soft balsa and cement them to keel pieces. Firewall is put together with hard sheet balsa sandwiched between plywood. Drill holes for engine mounting and insert mounting bolts through them. Turn nuts and lock washers into a tightened position

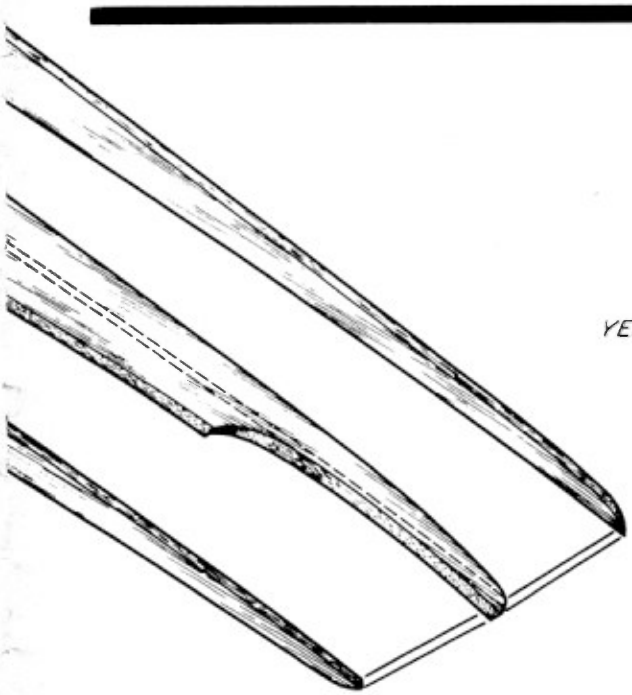


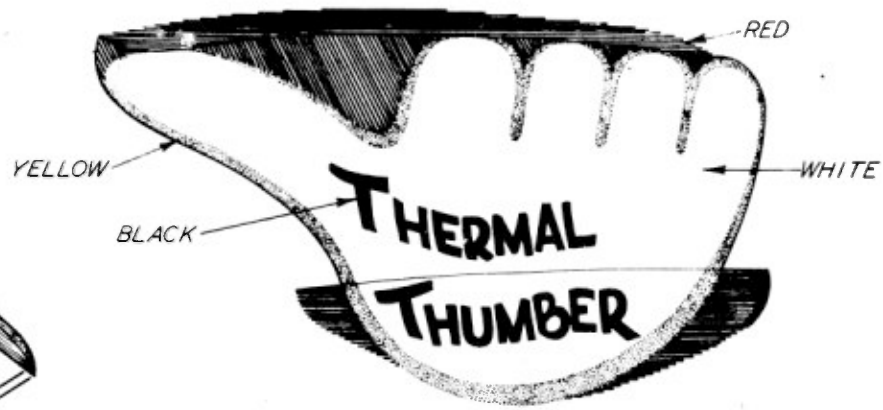


Though the Pee Wee is a powerhouse for its size, ship is not overpowered, therefore easy-to-handle. Exploded drawing, right makes it doubly easy to read the plans.

FULL SIZE PLANS AVAILABLE. SEE PAGE 60







and cement them down with several coats. Notch vertical keel for mounting of the negative dihedral of stabilizer.

Wing: Construction has ample strength as well as lightness. Sheeting aids in preserving airfoil contours.

Begin building wing half over plan by shimming front of hard balsa trailing edge 1/16 in. Allow ⅛ in. for tip wash-out. Attach ribs of medium grade sheet and leading edge of hard balsa for one-half of panel. After unit has thoroughly dried, remove panel from plan and construct remaining sections directly on underside of half you have been putting together. Double height of shim for trailing edge of portion to be built.

Next, separate panels and cut them apart at indicated places in preparation for joining the four sections together with polyhedral placed into the wing. Cement sheet balsa gussets at each dihedral break as shown. Attach medium grade sheet balsa planking to each section. Cement tips into place. Give all joints another coating of cement. Trim trailing edge and round leading edge to conform to airfoil outline. Round leading (*Continued on page* 48)

Thermal Thumber

(*Continued from page* 10)

edge as well as tips. Cut out portion of ribs to allow for inset of wing mount strip.

Tail Surfaces: The rudder has been placed forward to provide increased stability to model in turns and climb. Stabilizer is 40% of wing area, with a lifting type airfoil. Negative dihedral removes need for sub-rudder and holds Thermal Thumber upright for ROG flights. Medium grade balsa is used throughout.

Trace rudder template from plan. Cut out rudder from sheet balsa and carve to match crossection illustrated on plan. Stabilizer construction is done in same manner outlined for wing.

Covering: Sandpaper until smooth all surfaces which will be in contact with covering. Do not round edges of fuselage keel pieces. In applying covering material, run grain of tissue lengthwise of object to which it is applied. Apply shiny side to outside. Covering is held to framework with clear dope.

Open areas of fuselage are covered with Silkspan GM—applying covering to one-quarter at a time. Adhere small sections of Silkspan to exposed portions with clear dope, also. Dope red Japanese tissue to rudder.

In covering wing and stabilizer, set tissue first at center rib and move towards tip. Cover only one section between dihedral breaks at a time. Stick tissue to the underside of each wing rib. Trim off excess tissue with fine sandpaper. Water-shrink covering and allow it to dry out thoroughly in a cool place. By doing this, covering will not be as apt to loosen when the model is in a cool place following doping. Dope in cool place, also.

Butyrate dope should be used otherwise a fuel-proofer.

Two coats of clear dope followed with two coats of red dope are used on fuselage and rudder. Wing and stabilizer receive three coats of clear dope. Check for warping before putting on final coat. Construction is solid enough so that none should be present. However, if they are, pin down the warped section; apply final coat; and leave until the dope has thoroughly dried.

Dope wheel, wing, and stabilizer tips three coats. Wheel is red and others are wnite. The Thermal Thumber design is traced from plan. Apply to fuselage with aid of carbon paper. The tracing paper may be turned over to shorten placing of a transfer to the opposite side.

Assembly: Wheel is held in place by soldering washers to either side. Cement rudder and stabilizer into place with wing attached and model resting upright to assist in insuring alignment. Mount your .02 and connect fuel lines.

Flying: Patience applies here. Select a calm day for test-flying. A field clear of obstructions with knee-high grass is best. Check model for warps and alignment.

At a brisk trot, release Thermal Thumber with about the speed of a slow pitch. Aim the nose at a point on the ground about 30 feet ahead. If any breeze is present, head model directly into it. Adjust angle of incidence of wing to compensate for strong winds.

After a smooth, level, and fairly straight glide path is consistent, powered flight can be begun. With the engine idling where it will barely pull model away, and an engine run of ten seconds remaining, launch model level and gently into any breeze. Notice any deviation from a shallow climb and turn to the left. Trim rudder if adjustment is needed. On mine, rudder is trimmed left 3/32 in. Thermal Thumber has plenty of wing area for sport flying with the powerplant running below top rpm.

In gliding after power cut-off, the model should turn left in circles of approximately 70-feet diameter. Following half-dozen flights with the model performing well, increase power output to maximum and be on your toes. The climb will be flat at about 80 degrees with a roll-out to the left for glide. Name and address should be placed on the model where they will be plainly visible.