

by Ray Malmström

THIS MODEL of that immortal British fighter—the Supermarine Spitfire—was designed for flying around a pole indoors, but tests proved that is equally at home flying outdoors (on a calm day of course). So when you have built this little semi-scale job you will possess a two-purpose model. If you are not familiar with indoor round-the-pole flying—not to worry—you will find all the information you need in this feature and on the plan.

A note before starting construction. If you intend to camouflage your model (dark green and brown), colour the various parts flat, *before* assembly. We used the new oil-pastels (small box from any art dealer). Apply the pastel to the balsa sheet and then rub lightly with a soft rag to spread the colour evenly. Simple, no weight—and the effect is excellent.

Construction

Cut a length of $\frac{3}{8}$ in. balsa sheet as shown and soak in warm water for 20 mins. Wipe off excess water and wrap around a suitable broom handle or dowel rod. ($\frac{7}{8}$ in. diam. approx.) Hold in position with thread. Do *NOT* use any cement at this stage, otherwise you will not be able to slide the tube off the handle when dry! When absolutely dry remove the tube from the handle. Cut out the formers F1, 2, 3. Open out the tube as shown, and carefully insert the formers in position cementing well. Run cement along the tube join and close. Hold with sellotape until dry. Then cut out and add the top and bottom fuselage pieces A.B.C.D. down the centre lines of the tube. Before cementing part B in position make sure you have traced the wing rib position on *both* sides of part B. This will help you to line up the wing panels later on. Bore 2 small $\frac{1}{8}$ in. diam. holes for the rear rubber anchorage dowel ($\frac{1}{8}$ in. diam.) Reinforce the holes with small squares of brown paper. Carefully chamfer former F1A and cement to F1 (this is important). Construct the propeller nose block and prop. bearing shaft as shown. You can use a 3 bladed K.K. plastic propeller (from your model shop) or a K.K. 2 bladed propeller (5 in. diam.), the tips being removed to give $4\frac{1}{2}$ in. diameter. The completed propeller assembly when fitted into the front of the model (F1, F1A) **MUST** point **DOWNWARDS** as shown. Cut tailplane and fin from $\frac{1}{2}$ in. sheet. Note reinforcing strips on underside of tailplane. Assemble fin *after* tailplane. Cement engine cylinders and tailwheel in position.

Cut out wing panels ($\frac{1}{2}$ sht) and wing ribs ($\frac{1}{8}$ sht). Curve the wing panels to the shape of the wing ribs and hold in place with pins until cement has set. Look along wings from tip to root to see the wing

SPITFIRE VB FLYING MODEL FOR INDOOR USE!

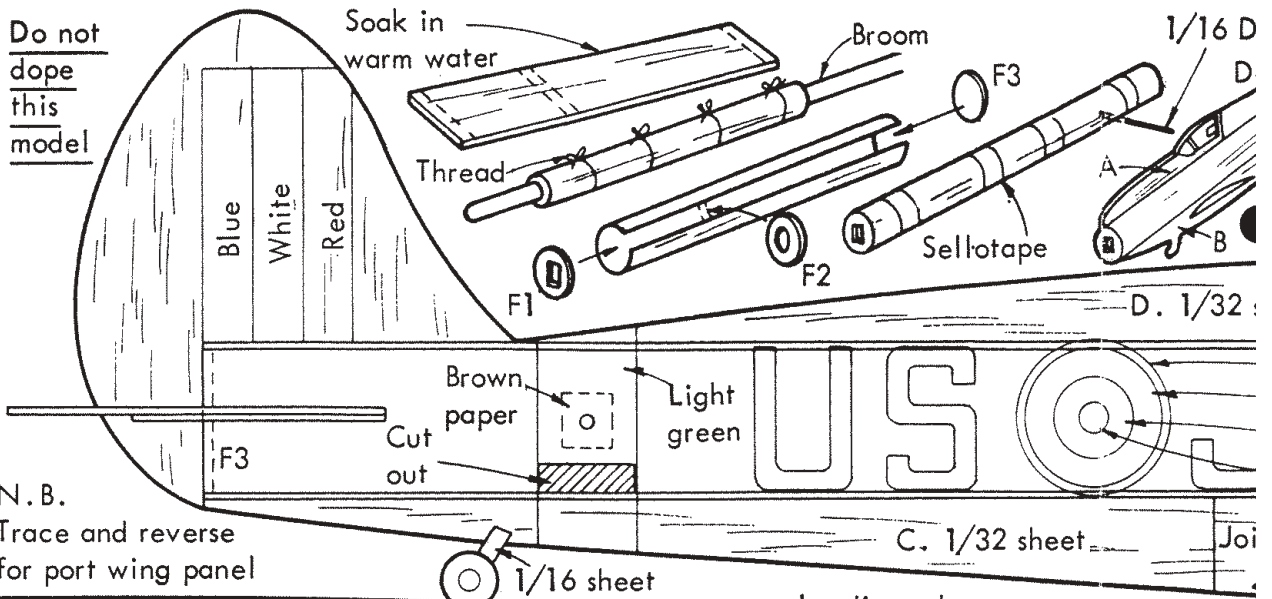
panel is not twisted. If so remove the ribs quickly and start again. Note, especially that the root rib on each wing panel is sloped to make the wings slope upwards to the tip when cemented in position. This is called "wing-dihedral". You should use the root-jig (X) in the way shown in the sketch to get the root rib at the right angle. Take care and it's easy! Bend the undercarriage wire (one for each wing) as shown. Fit the balsa wheels (retain on axles with a small piece of close-fitting electrical tubing or blob of cement) and covers. Cement the undercarriage legs in position, reinforcing with small squares of tissue paper cemented in position. Assemble wing panels to either side of piece B using the traced wing rib position to guide you. Check for *equal* dihedral (tilt) on both panels. This completes your "Spitfire".

Flying

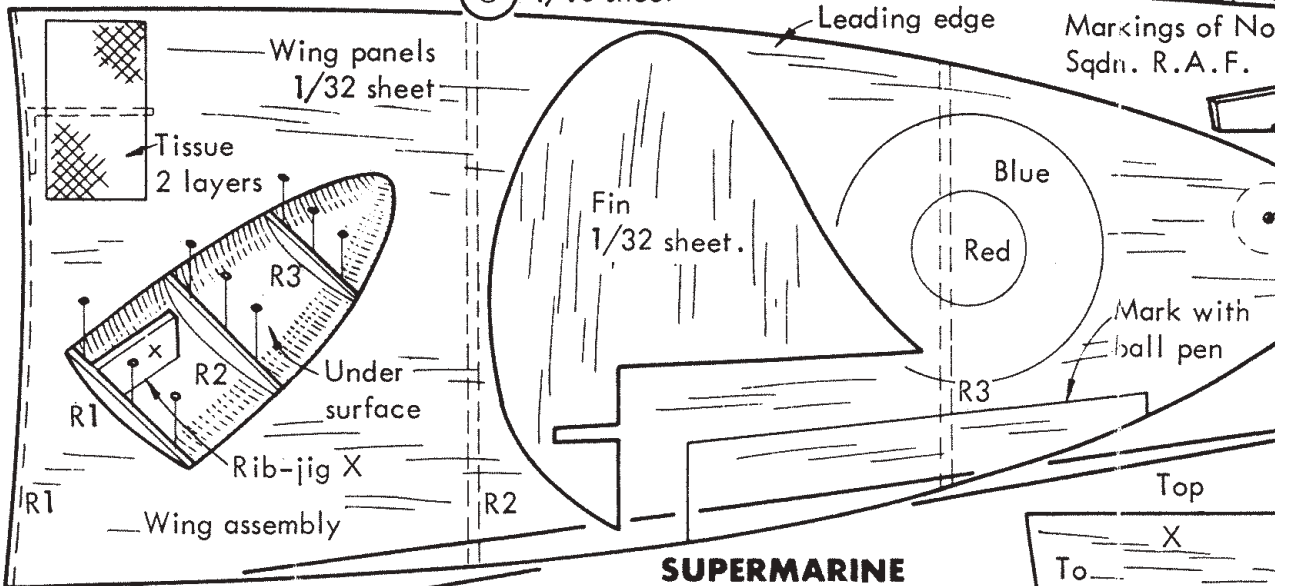
Make up a loop of $\frac{1}{4}$ in. strip rubber 14 in. long and rub on some rubber lubricant (strip rubber and tube of lubricant from your model shop). Install the rubber motor on propeller shaft hook and rear dowel rod. Suspend model from balance point. It must hang *level*. You may need to add a tiny amount of plasticine to either nose or tail. Our original model (the one in the photos) did not need any extra nose or tail weight. This balancing procedure is very important, so do not skip it! Choose a calm day, and long grass for outdoor flight tests. From a gentle shoulder-high launch your model should glide straight and land about 20 ft. away. You can then wind on about 150 turns and try a power-flight. If your model dives, bend up the rear edges of the tailplane about $\frac{1}{8}$ in.- $\frac{1}{4}$ in. If it climbs steeply, and then dives in (stalls) add a $\frac{1}{2}$ - $\frac{1}{4}$ piece of sheet balsa to the top of the noseblock. Turns are corrected by gently warping the rear part of the fin in the *opposite* direction to the turn. No other trimming should be necessary.

For indoor flying (and this is great fun in the winter, or when the weather stops outdoor flying) make up a pole as shown. Possibly you could build one in your woodwork lessons at school. The line length can be anything from about 5-8 ft according to space available. A large room, your youth hut, or best of all, the school hall (with permission of course!) are all suitable. Wind up the model, and then, attach the line hook to the loop on the wing of your model and let go! If the model will not take off bend the rear edges of the tailplane up about $\frac{1}{2}$ - $\frac{1}{4}$ in. If it stalls, add about $\frac{1}{8}$ in. sheet balsa to the top between the prop. block, and F1A.

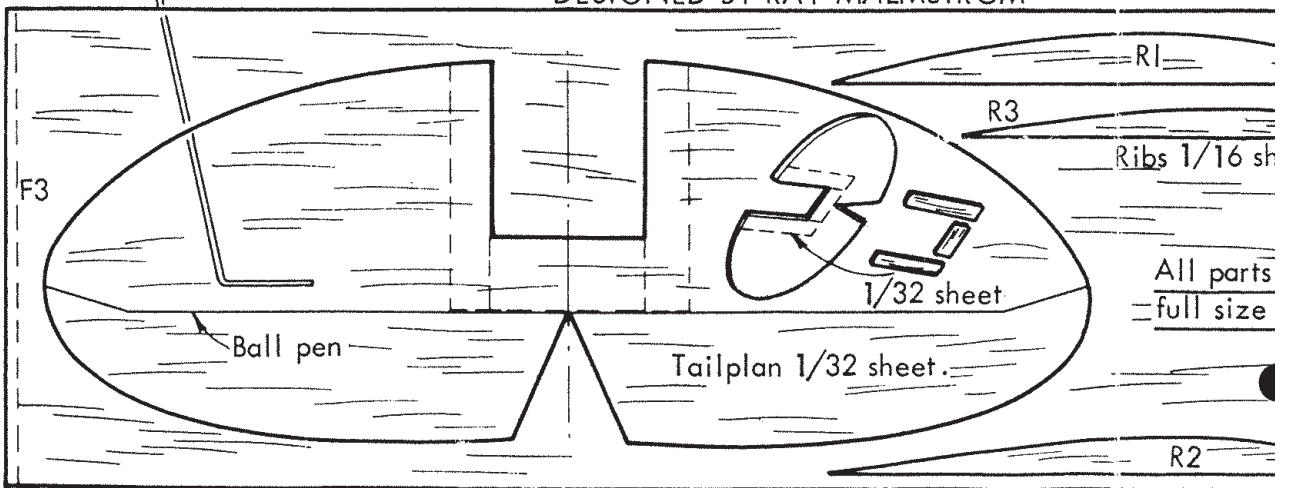
Do not
dope
this
model

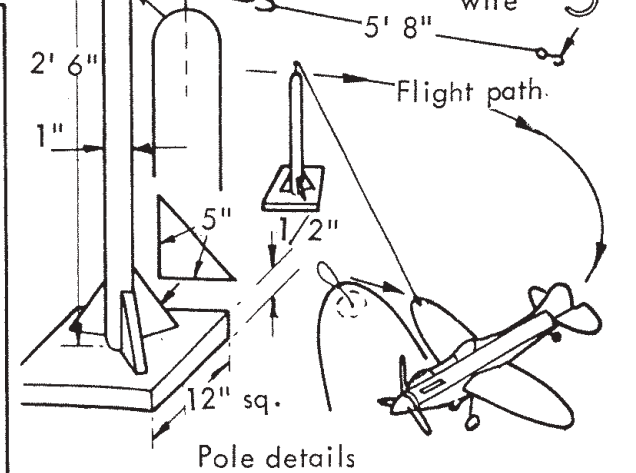
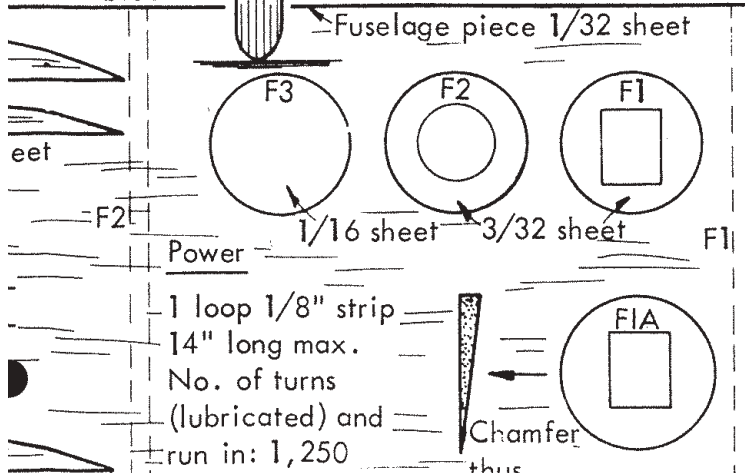
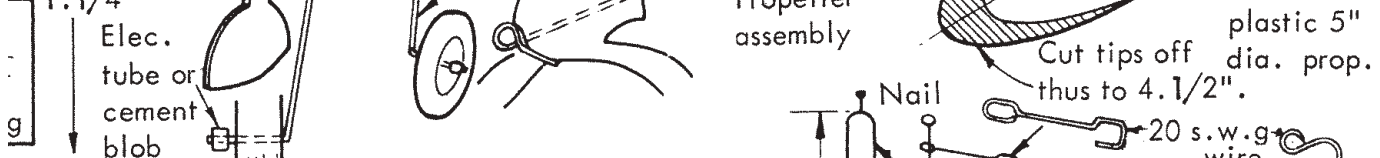
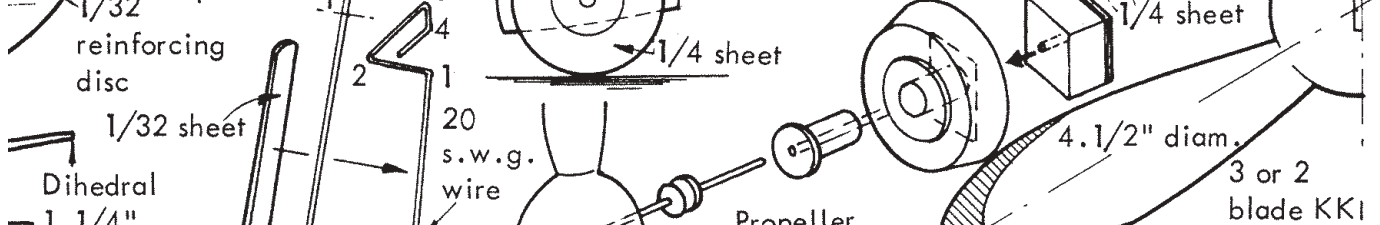
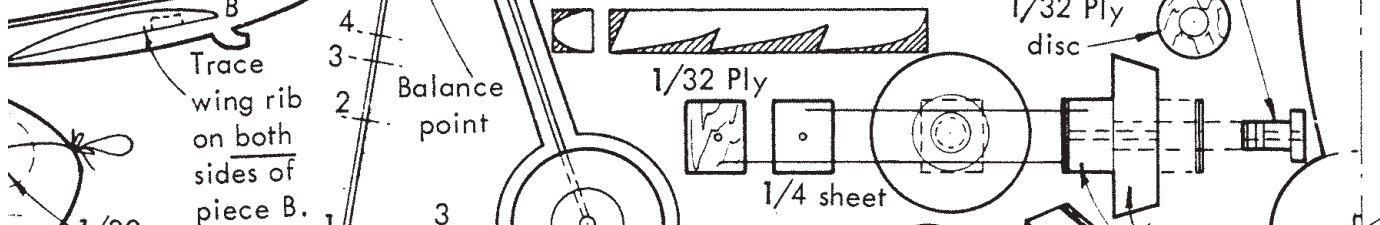
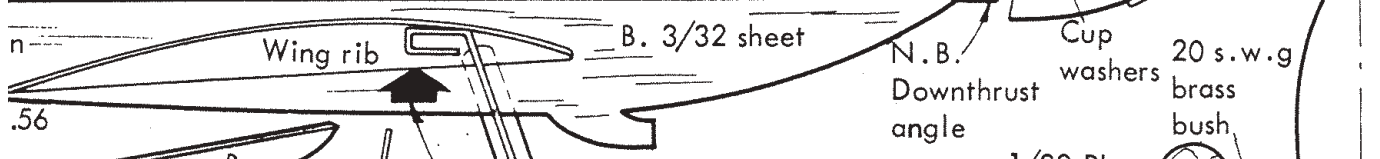
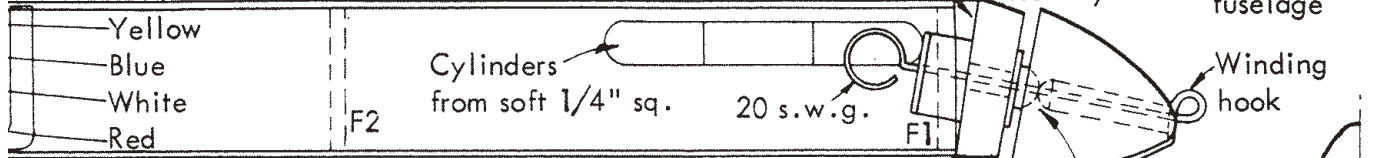
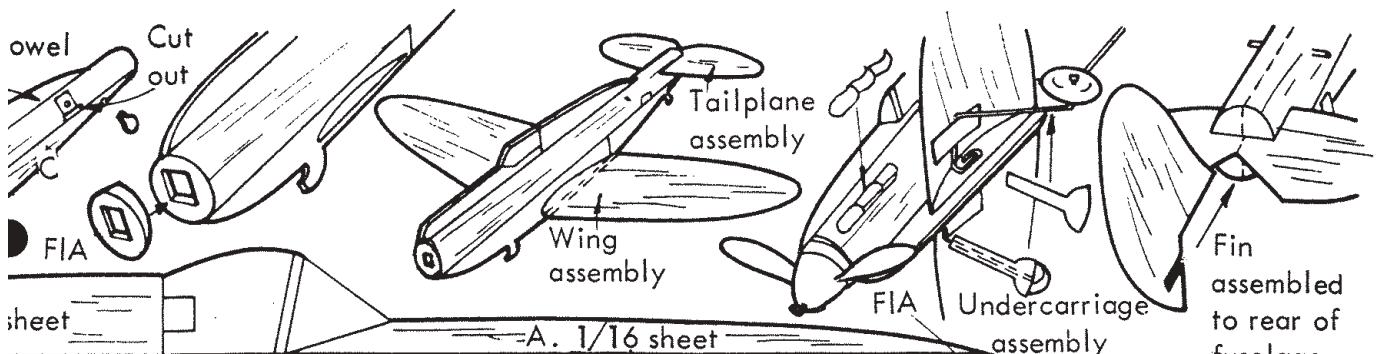


N. B.
Trace and reverse
for port wing panel



**SUPERMARINE
SPITFIRE V B**
DESIGNED BY RAY MALMSTRÖM







Maestro Malmström strikes again!

Ray produces another sparkling sport design in this profile control-line model of

OLE TIGER

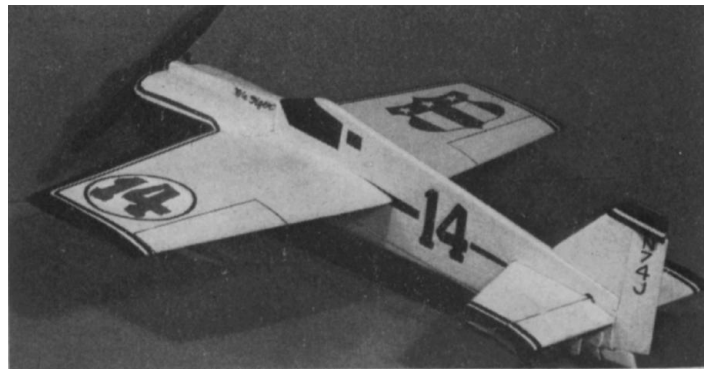
for .049 (.8 c.c.)-.06 (1 c.c.) engines

'Go to it - Lad' designer Ray Malmström urges a young modeller to check his Li'l Midget racer. Real bird is at bottom of page opposite - get off that tender fin, you burly Cop! Teeny, isn't it?

AMERICAN MIDGET RACING aircraft have always been popular subjects for aeromodellers - Art Chester's *Goon* and *Jeep*, Bill Falck's *Rivets*, Steve Wittman's *Bonzo*, have all appeared in model form. Now we proudly present, simplified to profile type, a model of perhaps the sleekest, and certainly one of the four fastest midgets ever built - Bob Downey's *Ole Tiger*. In its colour scheme of white with red and blue trim the model is a real eye-catcher, and if you follow carefully the instructions and building sketches you should have no difficulty in building and flying this fascinating little job. (See also, this month's *R.C.M.&E.*)

Start by cutting the basic fuselage shape (A) from medium $\frac{1}{4}$ in. sheet. Cut out the engine/undercarriage mounting piece (B) from $\frac{1}{4}$ in. ply. Bend the undercarriage wire to shape using a vice, insert into the slot in piece B and firmly bind with thread and cement. Assemble piece B to the fuselage shape A. Cut out two side pieces (C) from $\frac{1}{16}$ in. ply and cement firmly both sides of the nose. Drill holes to suit the engine you intend to use. You may have to enlarge the cut-out for some engines. You can do this with a fretsaw or file. The plan shows the Cox .049 Medallion installation. This particular engine is most suitable, both from the power and easy-starting points of view. Performance will obviously be 'pepped-up' by motors of 1 c.c. Araldite a 'KK' $7\frac{1}{2}$ c.c. team race tank in the position shown on the starboard side.

Now is the best time to construct the wheel fairings. Start by bending a 20 s.w.g. piece of wire to the shape shown, then bind with fuse wire and solder to the undercarriage leg. Bind and cement two balsa blocks to the ends of this wire. Wheel fairing piece D from $\frac{1}{4}$ in. sheet fits over these blocks and is firmly cemented to them. A 'KK' $1\frac{1}{2}$ in. diam. plastic wheel is then slipped on the axle and retained with a small soldered washer. Fairing pieces E are then cemented either side of piece D. Carefully carve and sandpaper the fairing to shape. Repeat for opposite leg. We have slightly modified the fairings to give more wheel clearance for take-offs from short grass. You can use smaller diameter wheels and add to the scale appearance if you intend to operate from tarmac. Construct the tailplane and elevator from the plan, using tape, nylon or silk for the hinges. Give the tailplane two coats of clear dope, sanding between coats and pinning flat on a board while the dope dries. Make sure the two parts of the elevator move freely before cementing the completed tailplane firmly into the tailplane slot. Add the filler piece. Cut the fin from $\frac{1}{4}$ in. sheet and give two coats of clear dope. Note the rear portion of the fin is cut away and re-cemented at an angle, offsetting it $\frac{1}{4}$ in. to the right. (Model viewed from the rear.) Cement fin to fuselage. Check that tailplane and fin are at right angles. Construct tail-wheel as shown and insert dowel rod firmly into a $\frac{1}{8}$ in. diam. hole drilled in the lower rear end of the



fuselage. Cement and add tailwheel fairing pieces **H** and **J**. Give fuselage and wheel fairings two coats of clear dope. The engine should now be bolted in position. Two 1/16 in. thick metal or plywood washers should be placed between the engine lugs and fuselage on the front mounting bolts as shown. This points the centre line of the engine slightly to the right (model viewed from the rear), and when flying, this adjustment helps to maintain line-tension. Connect engine to fuel tank with a length of neoprene tubing. Cut the wing from 1/4 in. sheet. (The wing chord requires two pieces of 1/4 in. sheet be joined spanwise, unless you are using 6 in. wide 1/4 in. sheet, which is fairly costly!) Sandpaper the wing to correct section. Cut out the recess for bellcrank mounting piece **F**. Cut bellcrank from 1/16 in. ply, drill and attach the control rod (18 s.w.g.) and two lead-out wires (22 s.w.g.), but do not bend the ends of these wires at this stage. Assemble the bellcrank and control-wires to piece **F** as shown. Note carefully the distance washer between wing and bellcrank, and do make sure that the bolt holding the bellcrank is screwed *tightly* into the ply piece **F**. This is most important. The wing may now be pushed through the fuselage wing slot and firmly cemented in place. Add starboard wing-tip weight. Check that wing is at right angles to the fuselage, using a set-square. Cement the 1/16 in. ply control horn into the small slot cut in the left-hand elevator. Further secure the control horn by a small nylon, silk or tape patch as shown. With pins, lock the bellcrank at neutral and bend the end of the control rod and insert it into the hole in the control horn, checking that the elevator is also at neutral. Secure the control rod with a small soldered washer. Make the lead-out wire guide from 1/4 in. sheet and 1/32 in. ply. Drill, and slip on to the lead-out wires. Cement guide on port wing tip. With the bellcrank and elevator still locked at neutral, form the hooks on the end of the lead-out wires. Remove pins locking bellcrank.

The 'cheek' cowlings are made up from 1/4 in. sheet and block as shown. Carve, and sandpaper carefully to shape. Note that the port cowling has a drain hole cut in the undersurface. The sketch of the starboard cowling shows the cut-outs and recesses to fit the Cox 049 Medallion, to afford access to the controls and cylinder head for battery clip connection and priming. These will differ slightly for variant engines. Incidentally, if you are *really* in a hurry to



get your 'Ole Tiger' airborne you can omit these cowlings, but as they are so characteristic of this type of aeroplane they are well worth the little extra time and trouble. It is up to you! Complete the cowlings by adding front pieces **G** and sanding to shape. Give cowlings two coats of clear dope, and cement in position, sliding them onto the wing leading edge and flush with the fuselage. The propeller spinner is made from 1/4 in. sheet (pieces **K**), 1/32 in. ply (disc **L**) and block (piece **M**). Assemble, carve to shape shown, sandpaper and give three coats of clear dope. Now bolt the propeller onto the engine drive shaft. Fit the spinner over the front of the propeller using an impact adhesive, such as Evo-Stik or Humbrol Universal adhesive. *Ole Tiger* is now ready for painting and trimming. We used Humbrol enamel in the handy tinlets. This does not require additional fuel-proofing. The colour scheme, trim and insignia are detailed on the plan. *Ole Tiger* is then complete.

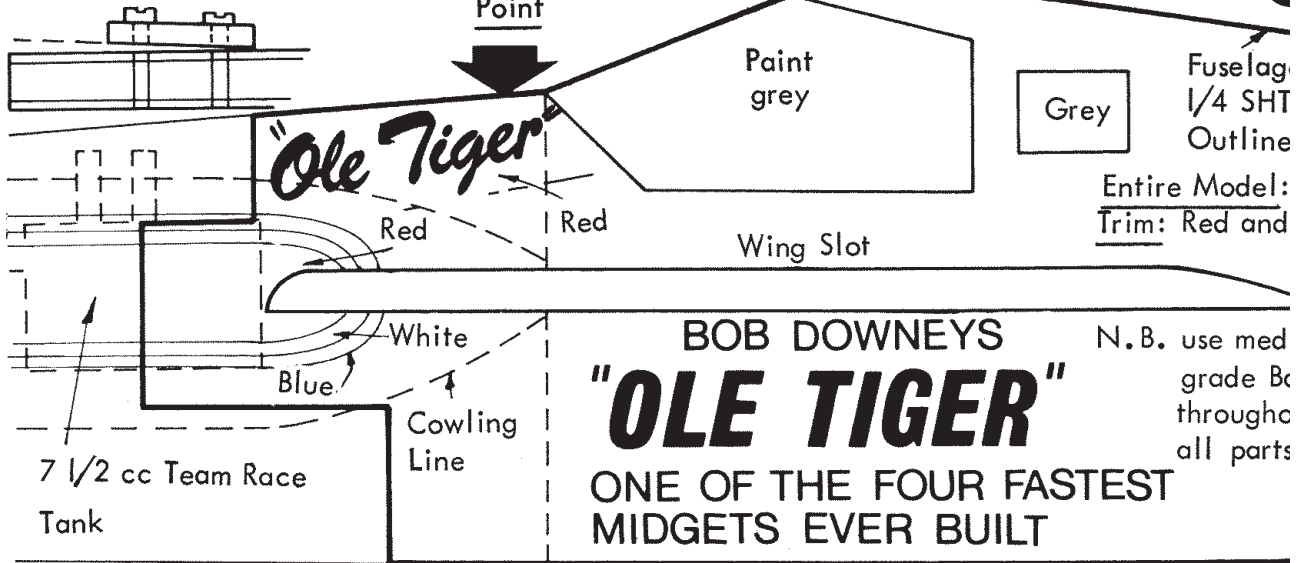
Before flying, balance your model by suspending from a length of thread tied to a pin, which is firmly pushed into the top of the fuselage at the indicated Balance Point. The model should hang level. A small amount of tail weight will probably be needed and the position of this weight is shown on the plan. Sheet lead is ideal and must be firmly attached with impact adhesive. A slight nose-down trim is O.K. but avoid any tendency to tail heaviness. With the balance correct, you are all ready for the first exciting test flight. Choose a calm day, operate preferably over grass, and fly on 30 ft. thin steel or nylon lines. We know you'll find your *Ole Tiger* a thrilling and colourful little job to fly—so we'll be seeing you at the Air Races!

FULL SIZE PLANS 



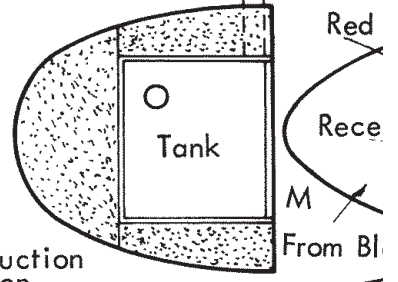
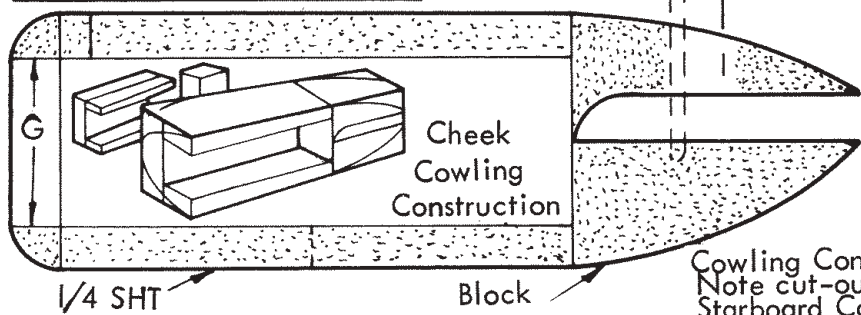
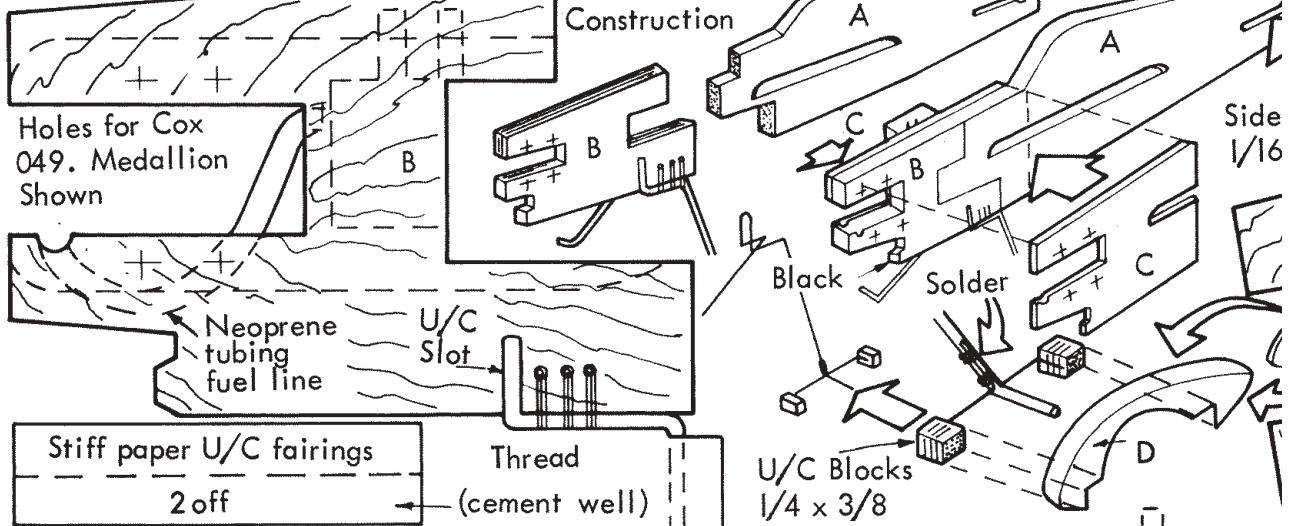
Engine Offset: 1/16" Right

Balance Point

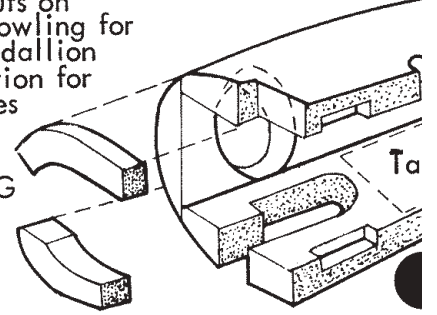
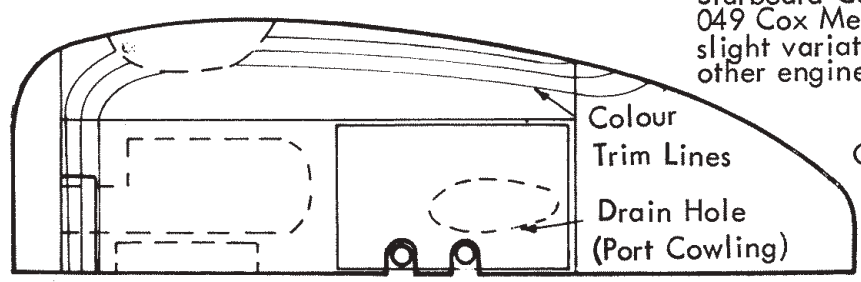


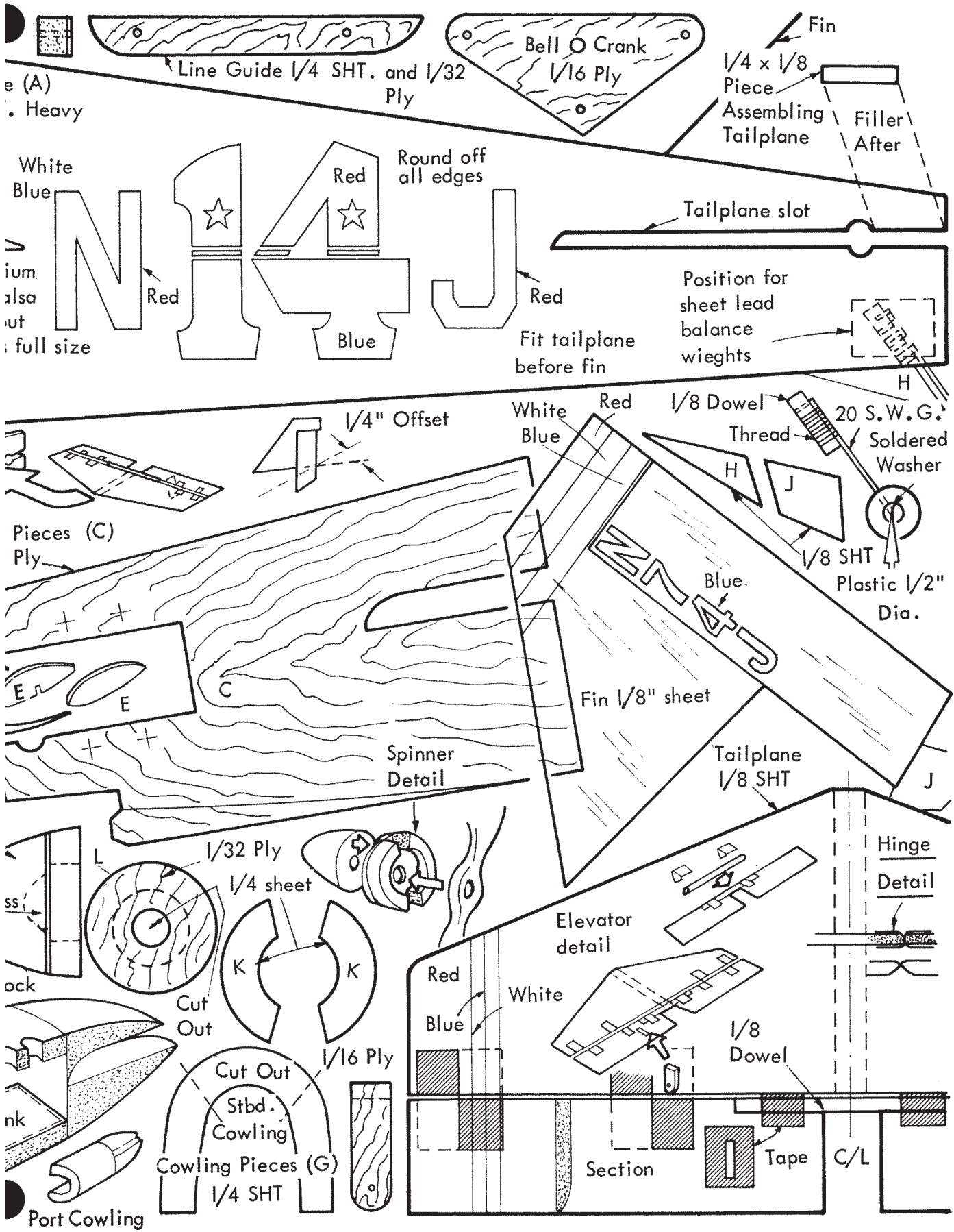
1/4 Ply. Engine Mount (B)

Fuselage Construction



Cowling Construction Note cut-outs on Starboard Cowling for 049 Cox Medallion slight variation for other engines





FOR THE BEST FLIGHTS - BUILD LIGHT!

"CANARD-AIR"

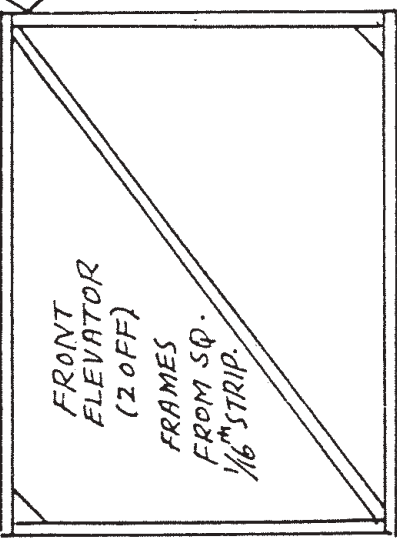
A 'CANARD' TYPE INDOOR MODEL.

USE 4 1/8" DIA. PACIFIC "SKEETER" PROP ASSEMBLY

PACKING PIECE FROM 1/8 SHT.

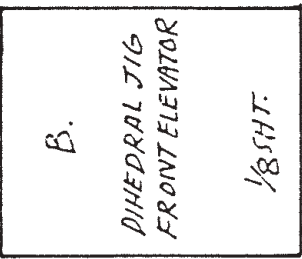


ALTERNATIVE PROP. ASSEMBLY SHOWN BELOW.

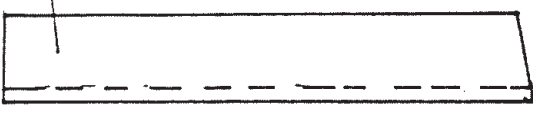


FRONT ELEVATOR FRAMES (2 OFF) FROM SQ. 1/16" STRIP.

BEVEL SLIGHTLY FOR DIHEDRAL.

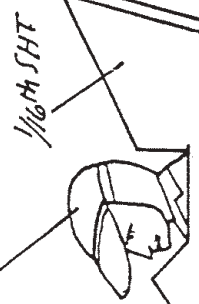


B. DIHEDRAL JIG FRONT ELEVATOR 1/8 SHT.



FIN TRIM TAB FROM NOTEPAPER.

PAPER PILOT (OPTIONAL!) 1/16" SHT.



FIN FRAME 1/16" SQ STRIP.



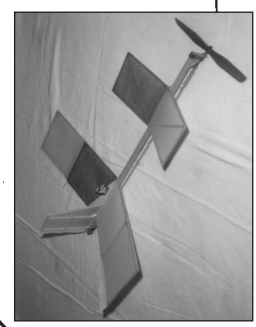
BEARING BLOCK (NOTE DOWNTHRUST) NYLON BEARING.

FRONT ELEVATOR INCIDENCE BLOCK. 1/8 SHT. PLEASE CUT ACCURATELY.

FUSELAGE 1/4" x 1/8" (MEDIUM HARD Balsa)

ORIGINAL MODEL NEEDED SMALL AMOUNT OF WEIGHT HERE TO OBTAIN CORRECT BALANCE

WING FRAMES 2 (OFF) FROM 1/16" SQ. STRIP.

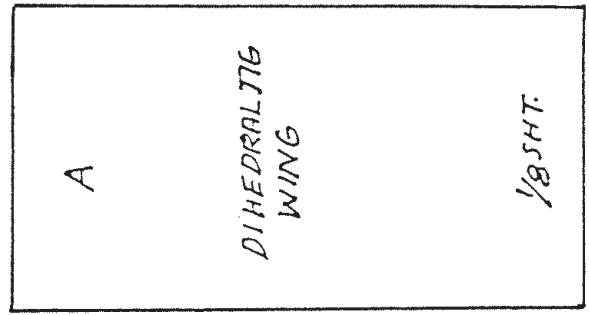


COVER ALL FRAMES WITH LIGHT WEIGHT TISSUE OR CONDENSER PAPER, ONE SIDE ONLY. (DO NOT DOPE)

FRONT ELEVATOR

TINY PIECE OF LEAD OR FOLDED CEMENT TUBE PIECE. USE EVO-STICK.

22 SWG BIND AND FIN CEMENT



A. DIHEDRAL JIG WING 1/8 SHT.

FRONT ELEVATOR (INCIDENCE BLOCK).

FUSELAGE.

NYLON BEARING.

BEARING BLOCK IF ALTERNATIVE PROP. ASSEMBLY IS USED

USE OF WING DIHEDRAL JIG A. REPEAT FOR FRONT ELEVATOR USING JIG B.

ABOUT 2/16-1/4". SOME WING WARRING MAY ALSO BE NEEDED. USE FIN ADJUSTMENT SPRING.

N.B. TRIMMING A CANARD DIFFERS SLIGHTLY FROM A CONVENTIONAL LAY-OUT. ON THE ORIGINAL MODEL THE WING TABS WERE BENT UP

WING TRIM TABS FROM NOTEPAPER. (BOTH WING TIPS)