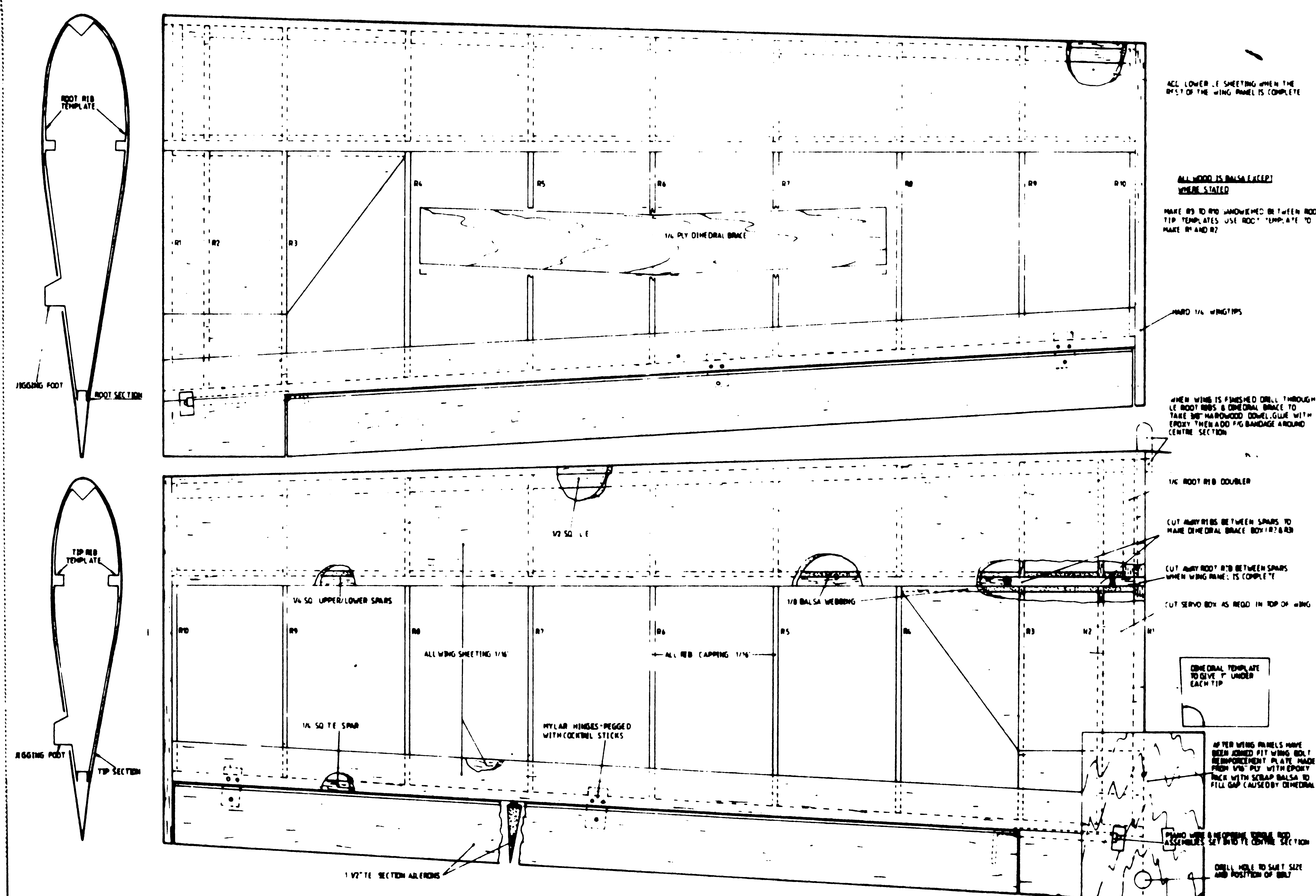
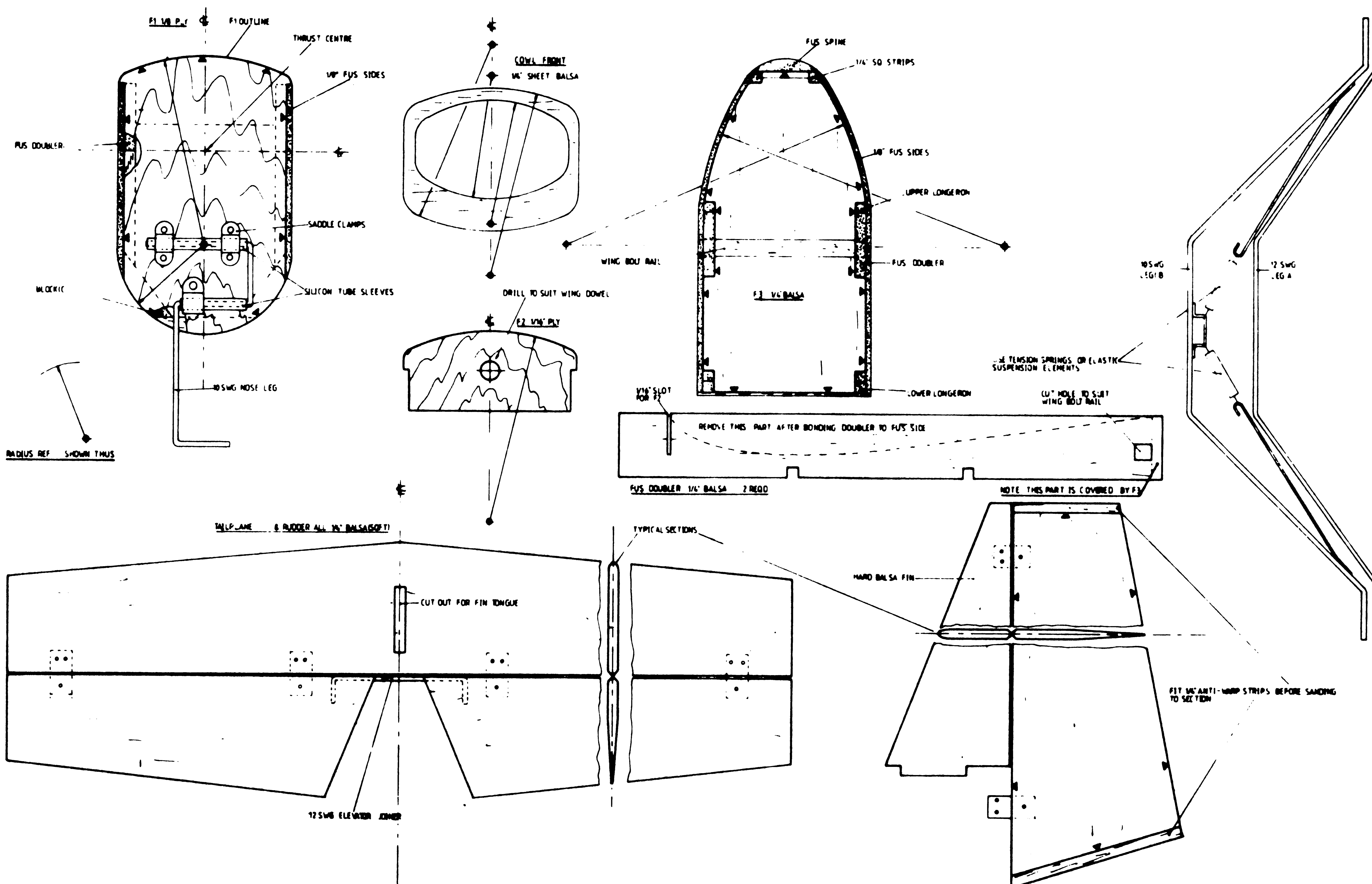
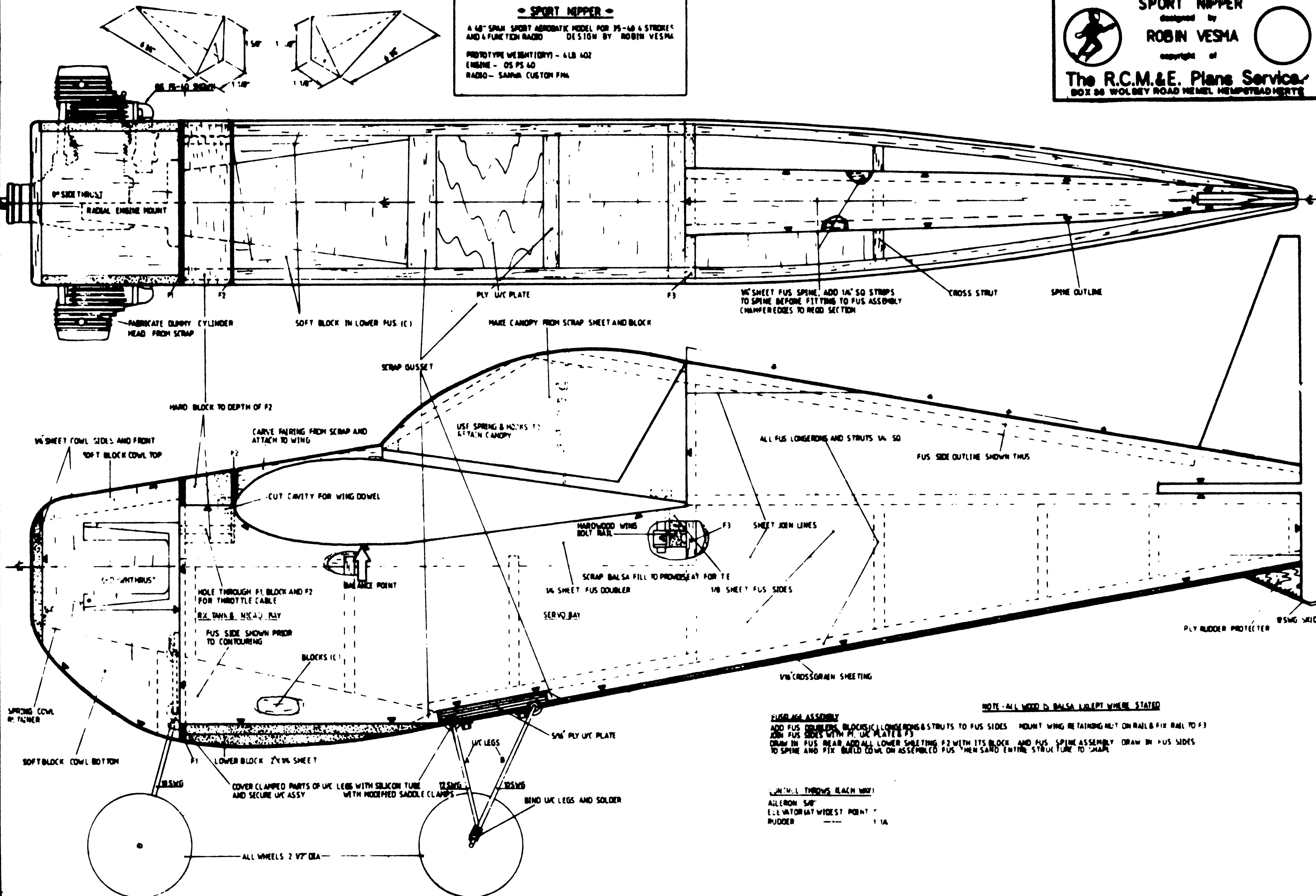


A 48" SPAN SPORT AERODYNAMIC MODEL FOR PS-40 4 STROKE  
AND 6 FUNCTION RADIO DESIGN BY ROBIN VESPA

PROTOTYPE WEIGHT(DRY) - 4 LB 4 OZ  
ENGINE - OS PS 40  
RADIO - SABAIR CUSTOM FMA



"THAT'S RATHER NICE, what is it?" A great compliment but the "what is it?" bit took me by surprise. Can the *Tipsy Nipper* be that little known? Shortly afterwards another friend enquired "Flown the 'Nipper' yet?" When asked who told him it was a 'Nipper,' he replied, "I recognised it," looking distinctly hurt and insulted. I'm sorry that I doubted his ability to recognise aircraft but I was, at that point, somewhat concerned at the thought of having modelled a prototype that few would know. But on reflection the shoulder wing layout, bubble canopy, trike U/C and tubby fuselage make the 'Nipper' quite unmistakable to those who have seen one before, and hopefully, pleasing and interesting to those who have not.

### Taking liberties

I've found, to my cost, that it is all too easy to commit aesthetic murder by taking too many liberties with a scale outline in an attempt to create a practical sports model. However the 'Nipper' proved quite resilient to the ravages of pencil and rubber and

managed to retain its uniquely distinctive shape.

Deviations from scale in the 'Sports Nipper' are many, some being blatantly obvious, others less so. The wing saw most change. Firstly, strip ailerons replace inset type and secondly, a well rounded semi-symmetrical section of approximately 20 per cent thickness was incorporated for a good range of airspeed and modest stall characteristics. The fuselage saw a 2in. increase in moment arm and a rudder/fin arrangement replaces the original all flying type. The engine cheek cowl was omitted for convenience but may be reinstated for greater authenticity. The 48in. span 'Sport Nipper' is strictly (or loosely!) semiscale but when given a comparative size just tips the ratio scales at 1/5th full size thus demonstrating the diminutive 19ft 8in. (six metre) span of the real machine.

To change tack completely, I must admit that building a model 'Nipper' has been an objective of mine since slaughtering my first piece of balsa some \*\* years ago. Strangely enough, it was only last year at Headcorn

Aerodrome near my home in Kent that I saw my first real life flying example. Now it was this sighting that moved me to get off my 'arris and turn a dream into reality.

### On your marks . . .

Before eclipsing yourself in a cloud of dust and shavings I would wish to say, at the risk of boring everybody to death, please do make every attempt to build light. A tip that will enable you to achieve lighter models is simply choose your wood by weight as well as grain, etc. I chose the wood for the 'Nipper' twice, once manually estimating weight and once using scales. The net result was the scale weighed pack was around 75 per cent the weight of the manually chosen pack, the effect on a 2lb airframe needs no explanation!

### Go!

Cut the fuselage sides from butt joined 1/8th balsa sheet and add all longerons, struts, blocks 'c' and fuselage doublers. Make F1, F2, F3 and the undercarriage plate.

# TIPSY NIPPER

A delightful sport scale model for 0.40cu. in. 4-strokes.  
Designed by Robin Vesma



Secure the wing bolt nut to the hardwood rail then epoxy the rail to F3. Join the fuselage sides with F1, F3 and the undercarriage plate using epoxy, holding the assembly square while the adhesive cures. Fit F2 and the interposing block, the lower fuselage blocks and forward lower sheeting to F3. When dry, draw in the fuselage rear and glue, if snakes are to be used they should be fitted at this point in the proceedings. Cut the fuselage spine from 1/4in. sheet and add the 1/4in. square strips, then fit the completed spine onto the fuselage assembly.

Chamfer the spine sides as required then draw in the upper fuselage sides and glue to the spine. Make the engine cowl and temporarily tack it to F1. Now shave and sand the completed fuselage assembly to shape, when done, separate the cowl from the fuselage. Note: Make the canopy and the fairing after the wing has been completed.

### The wing . . .

First off make the tip and root rib templates from aluminium or Formica. Cut eight rib blanks, sandwich them between the two templates and make ribs R3 to R10. When the rib pack is split up simply remove, by sanding, all chamfered edges which will leave the ribs perfectly formed. Easy, what? Now cut R1 and R2 using the root template. This does however make R2 slightly over-size but it may be trimmed when installed in the structure. Repeat this process for the other rib set. I was so carried away with checking the weight of each sheet of balsa that I ended up with a mix of 1/8in. and 3mm wood. I suffered further misfortune by making one set of ribs from 1/8in. and the other from 3mm material which manifested itself in the form of one wing panel being

*Left: very few liberties were taken with the well known Topsy Nipper outlines to turn it into a practical sport scale model. Many examples around to give a wide choice of scale colour schemes.*



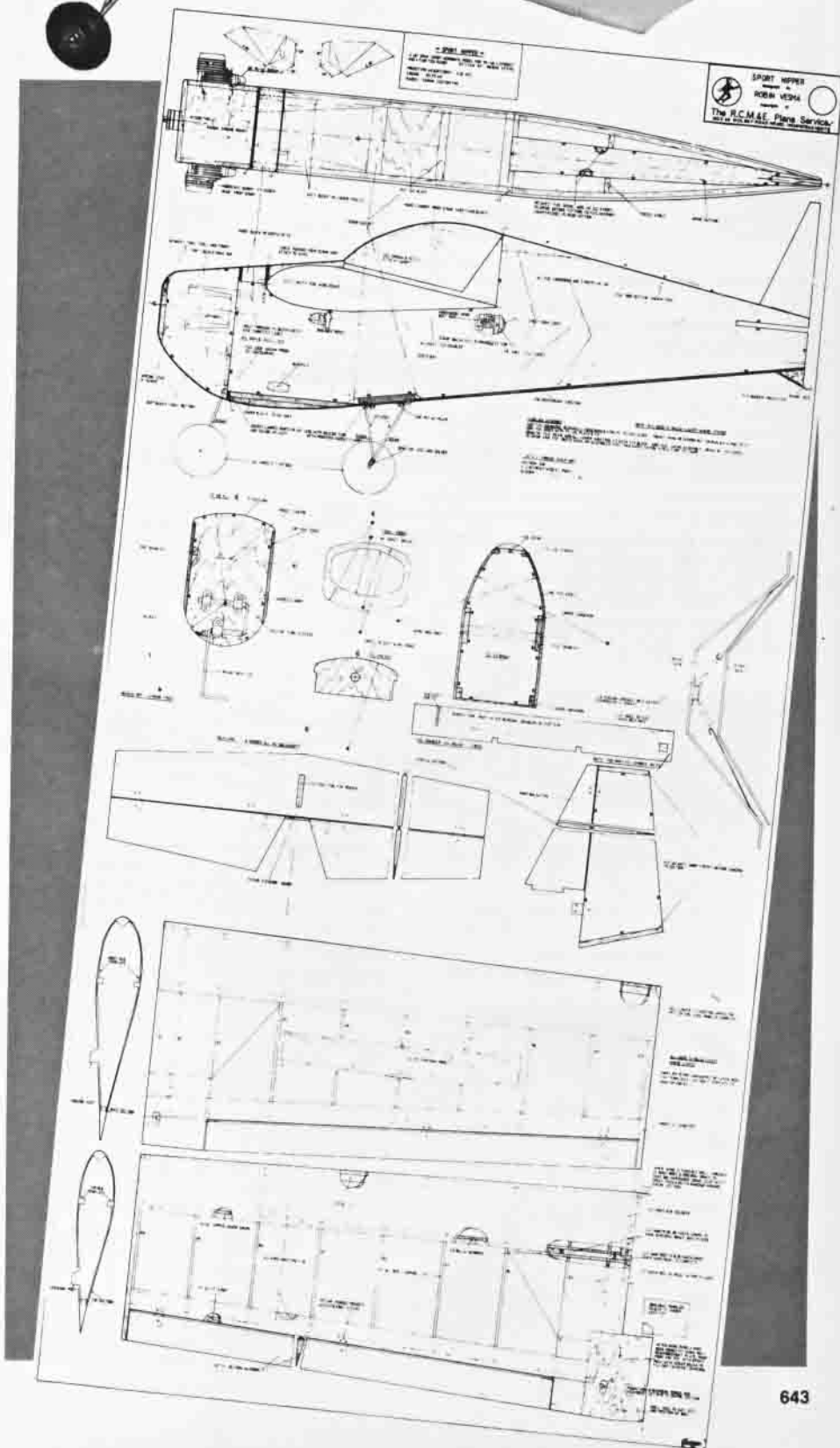


Full-size copies of the plan shown here at 1/8 scale are available as Plan No. RC 1494 price £4.80 plus 50p postage and packing from RCM&E Plans Service, PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS.

1/8 in. shorter than the other! SO BEWARE.

Make four dihedral templates, two for each root rib, and lay the lower spars. Fit R1 with dihedral templates and start installing ribs at R4 (we'll come back to R2 and 3 in a while). Having fitted R4 fit a piece of 1/8th webbing, then R5 and another piece of webbing and so on to R10. I recommend this particular method because it encourages properly glued joints throughout the wing and adds great strength. Get hold of R2 and 3 and remove the bit that falls between the spars. Now install R2 and R3 half ribs and the root rib doublers but with webbing on both sides of the spar. Fit the LE, upper spar, TE and trim R2 to size. Now add all upper sheeting and leave to dry. Add all lower sheeting and remove the bit of wood between the spars on the root rib to reveal a perfectly formed box for the dihedral brace. Hew the dihedral brace from 1/4 ply, by all means perforate same with lightening holes if you wish to add less weight, and join the wing panels with the aid of some epoxy resin. Sand the LE to shape, drill through the LE, root ribs and dihedral brace and fit the wing dowel.

Cyano the aileron torque rod assemblies to the TE, cut two pieces of 1 1/2 in. TE section into which carve appropriate recesses for the torque rods and epoxy them into place. Cut and equip a servo box in the top of the wing and make a hole in the bottom through which the lead will pass. Bandage the wing panel join with fibre glass cloth, fashion the wing bolt reinforcement plate and fit with



## Data Panel

### 'Topsy Nipper'

Wingspan: 48 in

Weight: 68 oz

Control requirements: 4 function —  
ailerons, elevator, throttle and rudder

Engine size: 0.40 cu in 4-stroke 0.25 cu  
in 2-stroke

the canopy retaining hook using yet more epoxy resin! Make the ailerons from 1½in TE section and pin into place while the hard ¼in sheet wingtips are fitted and shaped. Note that you should relax your quest for the lightest balsa when it comes to selecting TE material for the ailerons. These should be selected for straightness and rigidity. Finally add the rib capping to complete the structure.

### The tail . . .

Cut all of the tail components from soft ⅛in sheet except the fin which should be made from the hardest and strongest balsa available. Glue the fin to the stabiliser and hold it square while the glue cures. Link the elevators with a staple shaped 12 SWG joiner, install ply reinforcement to these and the rudder onto which the control horns will be mounted. Mylar hinges were used throughout the prototype but use whichever type you feel most comfortable with. Due to the broadness of the rudder, coupled with the use of soft balsa, I found it necessary to include anti-warp/stiffener strips to the upper and lower edges as the first one made suffered from the old BR sandwich syndrome!

### The undercarriage . . .

Hardly worth a heading really but there is just one point I would draw your attention to. I don't know about you but my landings seem to suffer from excessive gravitational effects, either that or the earth jumps up at a crucial moment and smacks my model.

Generally speaking I'm a placid sort of bloke and I can live with these problems, but heavy landings do tend to damage the fuselage at the undercarriage mount. The end result being a definite lack of fuel proof finish and an excess of oil and fuel merrily soaking its way into the wood. So rather than learn to land properly I've insulated the U/C from the fuselage with silicon tubing and it works! Now Terra Firma can jump about as much as it likes.

### Finishing . . .

Personally I prefer to finish my models with coloured tissue and dope, and because of this I call myself a Traditionalist. Despite my deep rooted preference for this type of finish I feel certain that heat shrink type finishes will be quite suitable for the 'Sport Nipper', but I fear that nylon or heavily painted finishes would prove too much. If you are going to use tissues then cover wet, stick with tissue paste and follow with three coats of 50/50 dope/thinners. Humbrol one part fuel proofer is my favourite and this I

generally apply hot. Heating the proofer makes it less viscous and, when applied with a piece of very soft sponge in long even strokes, it flows to a mark free gloss finish. Lovely.

Just a cautionary word in your ear though. *Do not heat fuel proofer on the cooker.* Not only will your wife or partner bend various parts of your person but there is a considerable risk of an "ongoing thermal aggravation situation." By far the least damaging method is to nick a bowl from the kitchen (pinch the cocktail sticks for pegging the hinges while you're in there), place said proofer can in the bowl (lid off), then pour boiling water into the bowl and leave to warm through. While warming you might think up an excuse to explain the appearance of best china in the workshop (often referred to as "That room" by non modellers).

### Radio and tank . . .

Using a four stroke engine compensates for the relatively short nose of the 'Sport Nipper' thus making the radio installation quite flexible. The fuselage cavity is approximately 11in long, 4in wide and 4in deep, room enough I believe! In the prototype the receiver, 500mA Ni-Cad and a 4oz tank are mounted as far forward as possible while the servos are mounted in a rearmost position to achieve perfect balance. It is, however, advisable to plan the installation beforehand to give snake/pushrod routes that will best suit your gear. When installing the tank secure the tubing to the tank pipes with just a dash of cyano. This is a lesson that I learnt through bitter experience, for while rushing to get the machine in the air, I pulled the filler pipe off the tank and squirted the odd pint or two of fuel into the fuselage. This accident caused a barrage of abuse which included words like "Oh blast!" and "Deary me!" to be issued with considerable freedom and volume!

### Flying the 'Sport Nipper'

The very effective rudder and short wheelbase combine to obviate the need for a steerable nosewheel, just remember to hold in full up and use the throttle to keep the 'Nipper' rolling at a reasonable pace. To take off follow the ground handling procedure then as speed builds up return the elevator to neutral. Keep the model straight with the rudder, gently ease in some up and the 'Nipper' will unstick. Holding full up throughout the takeoff run will result in one of two things. Firstly, the model will refuse to leave the ground due to excess drag on the U/C. Secondly assuming a smooth takeoff area, the 'Nipper' will suddenly bound into

the air and if you survive the stall you may have to contend with involuntarily evacuated bowels!

With the OS FS40 at "full grunt" driving a Robbe 12 x 6in propeller the 'Nipper' displays a healthy turn of speed and will perform most aerobatic manoeuvres expected of modern day sports models. The prototype 'Nipper' requires just a dash of down to maintain level inverted flight however with one third throttle, for some slow inverted fly-by's, the 'Nipper' 'felt' slightly unstable. Almost as if it was balancing on a ball bearing. Roll and pitch controls are very precise but not over sensitive thus allowing their use in generous quantities without making the flight pattern look untidy.

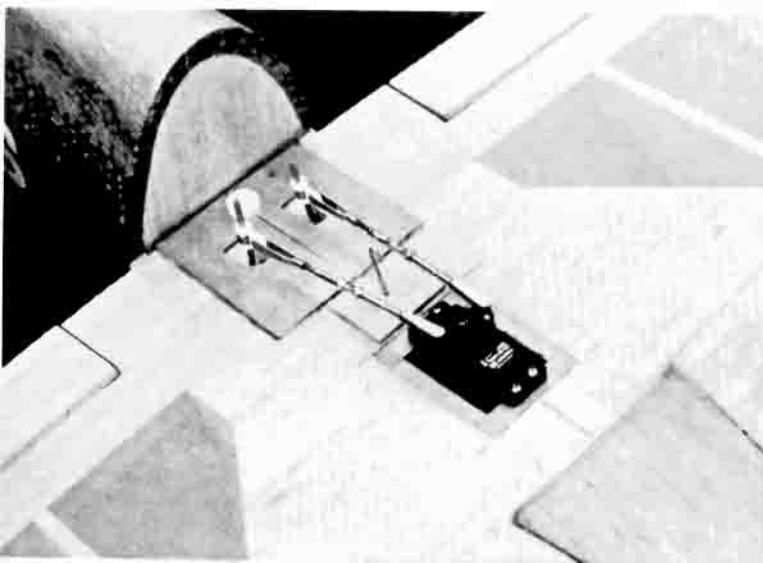
The yaw control also has considerable power but does induce a certain amount of roll and nose down pitch which makes knife edge flight tricky to say the least! Exaggerated side slips, however, are very much easier but a measure of up and opposite aileron is required to counter the effect of the rudder. With a large amount of daylight beneath the wheels try a power off stall by chopping the throttle and gradually feeding in up elevator. The lightness of your 'Nipper' will dictate what happens next but the prototype showed almost an unwillingness to go over. When the stall eventually occurred the nose 'fopped' forward followed quite quickly by the port wing and developed into a slow spin. Recovery from the spin was promptly effected by neutralising all control surfaces. When you have acquired reasonable confidence try a slow, low pass by setting quarter throttle on the down wind leg at about 30 feet and turn into wind using aileron coupled with a touch of rudder. Adjust your height to about 10 feet and as the model goes past open to full throttle and execute a climbing turn, level out and try again. This exercise will give you a feel for the landing approach, some ideas of how slowly the 'Nipper' will fly and the effectiveness of the controls at low speeds. High undercarriage drag makes touch and goes difficult so the decision "to go round again" should come at the earliest possible moment (Either that or fit much larger wheels!). So, having made the final turn into the approach, keep the nose down and pointing at the patch, flare out at about 2 or 3 feet and touch down. As the wheels touch, assuming a grass surface, counter the strong braking effect of the undercarriage with full up and a burst of power. One final point that I would mention is that the deep fuselage profile can cause slight 'weather-cocking' so if you don't line up into wind then it might!

The gentle popping sound of a four stroke, the modestly proportioned airframe and economic running costs all combine to make flying the 'Sports Nipper' pure delight. So do build one, you'll enjoy it!

### Acknowledgements

I am deeply indebted to the following for their assistance during the creation of 'Sport Nipper'.

- (1) Mr Alan Ayles of Nipper Kits and Components Limited for generously supplying articles, test reports, leaflets and drawings of the Topsy Nipper.
- (2) EM Models of Tunbridge Wells.
- (3) Last, but by no means least, my wife Alison and the children for their understanding and tolerating my month long absence from family life.



Wing centre section shown aileron servo mounted on wing top surface with clevis connections is the strip aileron control horns.