

a sort of 'THUN



SOME MODELS need introductions, and others seem to need none. This is definitely in the former category and, in the words of a well known entertainer, "I wanna tell you a story" . . .

It was in the mid 1960s, when a Mr A. S. Jones—known to his workmates as "Airspeed"—gave me a wing from a control-line stunt model. Those of us who came up through the more tricky sides of our hobby, namely free-flight and control-line, might just remember a stunter called *Calamity Jane*; it was 50in. span and powered by a .35 motor. Anyway, Airspeed gave me this wing saying, "It looks a bit *Thunderbolt-ish*". I agreed, and reverently put the wing on the rack in the workshop. A year or so later, I was looking for a model to use for control-line display work, when the idea dawned. I dragged out *Calam's* wing, drew a fuselage on a scrap (and I do mean scrap) of paper, and built a *semi-semi-scale Thunderbolt*.

That model was flown at a number of displays, until one day the engine cut while it was inverted. The "landing" removed the engine and damaged the fuselage, so the model was put in a corner and left to gather dust. A few years went by, during the course of which I moved over to radio control, flying my own-design rudder/elevator models with .049 and .09 engines. Then it came about that I found myself

again looking for a model to progress with—that is, with ailerons.

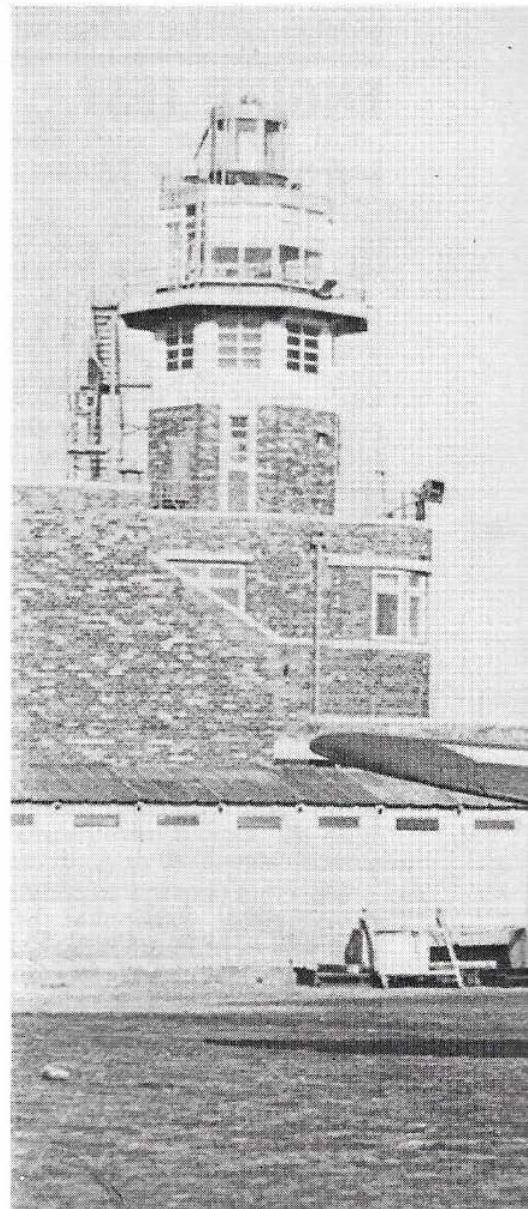
Guess what caught my eye?—yes, the *semi-Thunderbolt*.

The conversion to radio took a couple of evenings, and by the Sunday I had a radio model with ailerons. On the field, the throttle was opened . . . model released . . . lift-off . . . roll . . . *crash!* Luckily only a wing tip was damaged, and soon repaired. The next Sunday there followed exactly the same performance! Undaunted, the following weekend, just after the lift-off stage, it *didn't* roll; it flew straight and, after five minutes of a very shaky flight, a sort of crash-landing saw the model down more or less in one piece.

"It *flew—it flew!*" I exclaimed, delighted.

I learned to fly ailerons on this model over the next few months; not to be recommended, but that was the way it happened. Now, this is the point in the story (saga?) where the actual *Thunderbolt* featured here comes to light . . .

A new wing was built, nearer to the correct *Thunderbolt* shape, but still at a larger scale than the fuselage. The next stage of the proceedings was to build a better fuselage to go with the good wing. This was flown, with no real problems—and this is the model featured in this article. I did actually try a further mod., in the shape of a

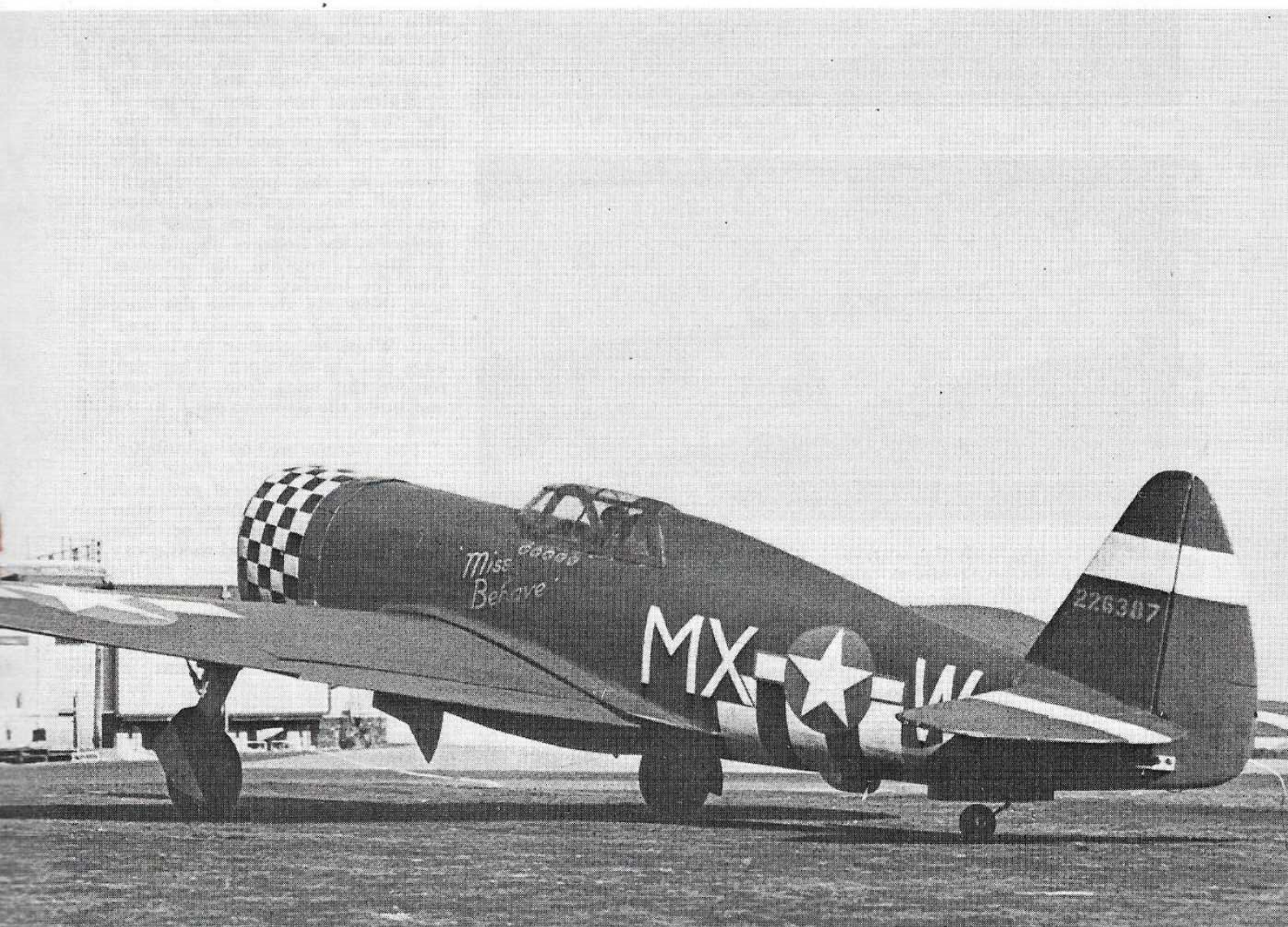


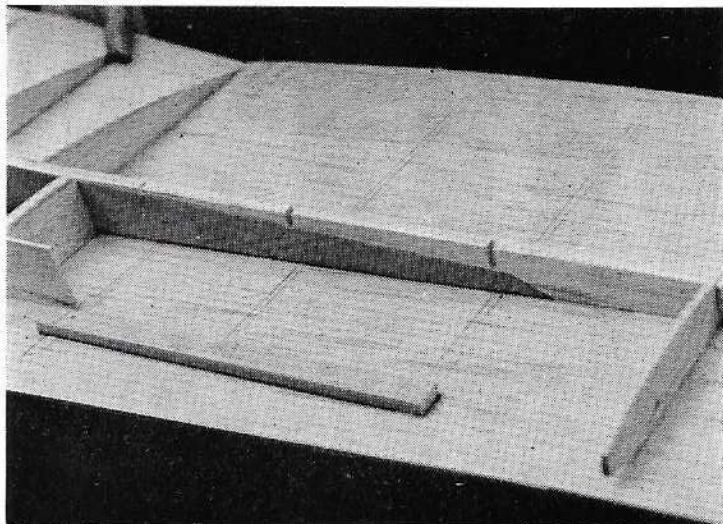
UNDERBOLT

*an attractive and realistic
"semi-scale" of the famous
P47 – the "Jug"*

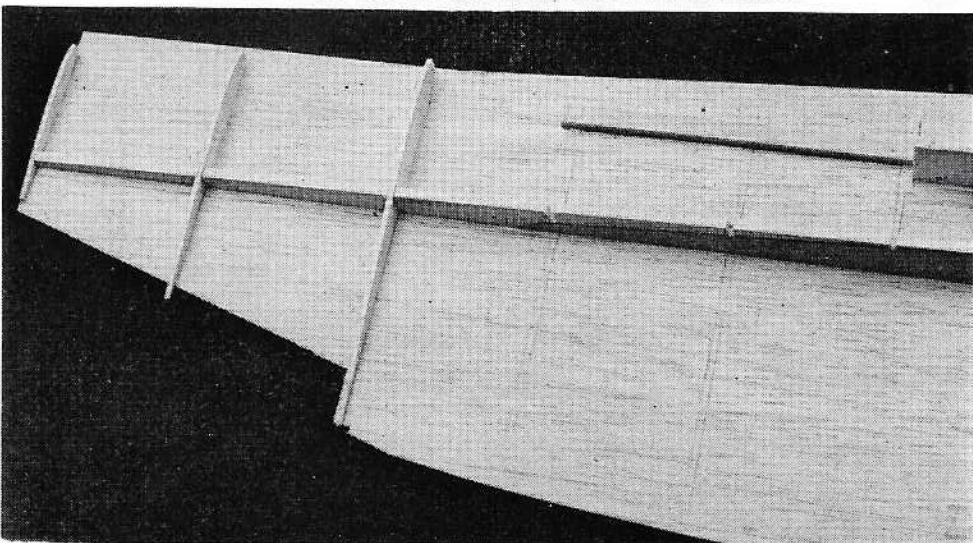
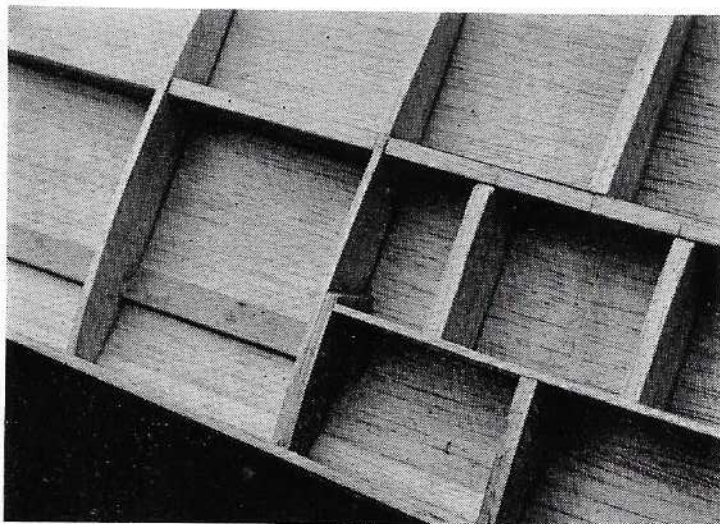
by ERIC ROBINSON

— 51" SPAN for .25 – .40 POWER

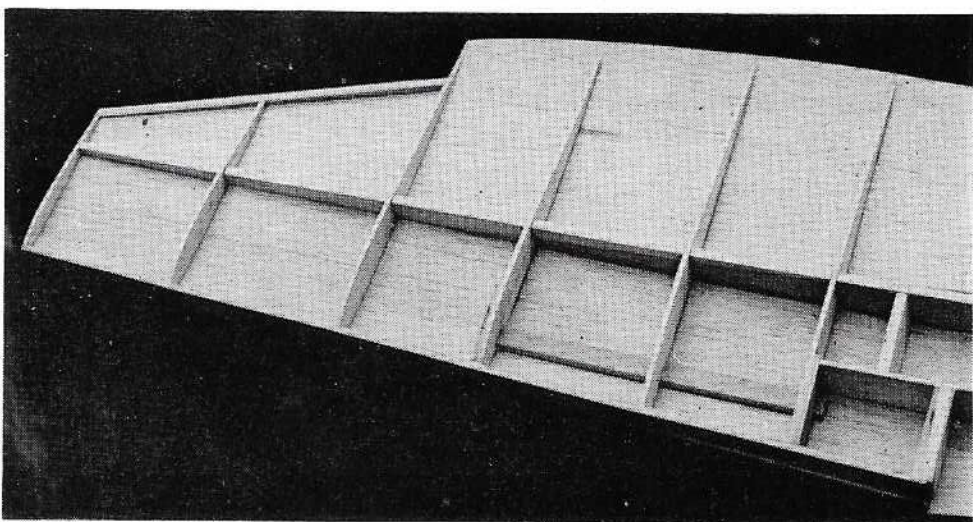




Balsa "skins" are made first, then structure built onto them.



Positions of spars and ribs first marked out on skins, then spars and pre-cut ribs glued in place, "eggbox" fashion. Note aileron cutaway reinforcement.



nearer-scale wing, with the correct dihedral, but for some reason this arrangement simply did not *look* right. (That set-up was flown, but found to be very touchy—possibly due to the wing being only 48in. span, and especially if full control movements were applied.) I therefore reverted to the larger wing, as depicted here, and the model in this configuration is a steady performer and a delight to fly.

CONSTRUCTION

The structure is of standard type, so if you have built a couple of sheeted models before, no problems should arise. Here, then, is a quick run through. The main spar is shown on the plan with two dihedral angles. The alternative one is scale, but that shown in full, with less dihedral—as stated in the introduction—looks better than the correct version and is recommended.

So take your pick—they both fly equally well. Build the wing first, completely, as this allows it to be mated up to the fuselage—a simple progression as you build the fuselage.

Wings

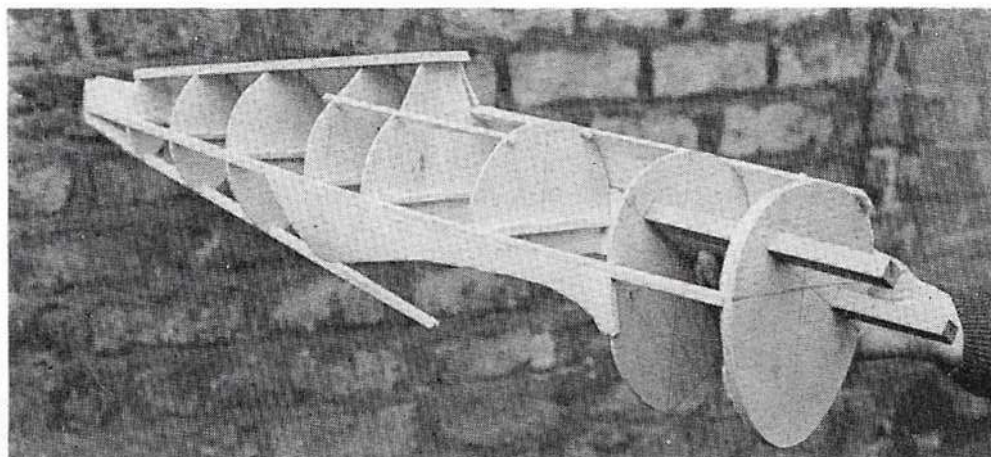
First cut the lower skins from medium grade $\frac{1}{8}$ in. sheet and join them to make two plan forms—port and starboard—and, while these are setting, the remaining wing parts may be cut out.

Make the spars from $\frac{3}{16}$ in. balsa, with 1mm ply dihedral braces, front and back. Lay the lower skins flat on the board and build the undercarriage beams and the structure straight onto them. When all the ribs are fitted, attach the false leading edge and ease the lower skin up to the ribs, to form the lower curve. At this point (preferably before!) the control linkage system has to be decided on (mine uses 'snakes'); the linkages should now be fitted, removing the structure from the building board, if necessary. Now lay the wing flat once more and stick the top skin in position. When set, glue on the leading edge and the tip block. When dry, remove this wing from the board and build the opposite panel in the same way.

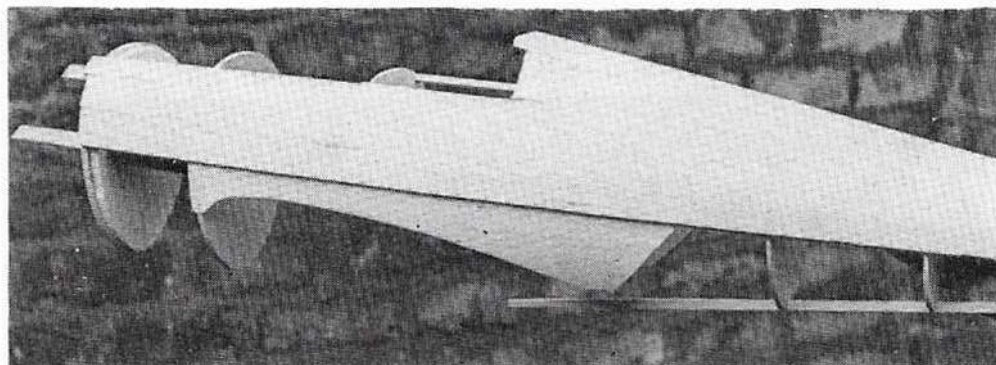
The ailerons are shown built up, on the plan, but may be made from $\frac{1}{8}$ in. sheet balsa (soft) if preferred. Hinge them in whatever your favourite way happens to be. Now make the servo box, and then epoxy some medical bandage—or similar material—around the wing centre, to strengthen the joint. Finally, carve and sand the whole assembly to shape.

Fuselage

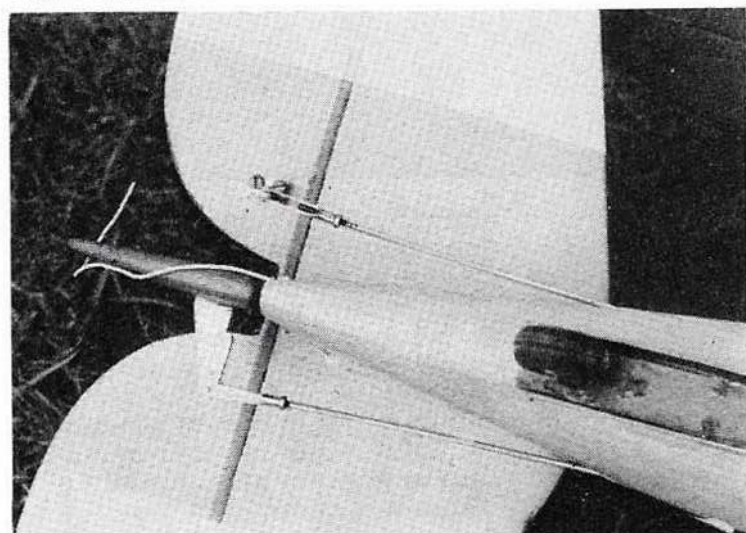
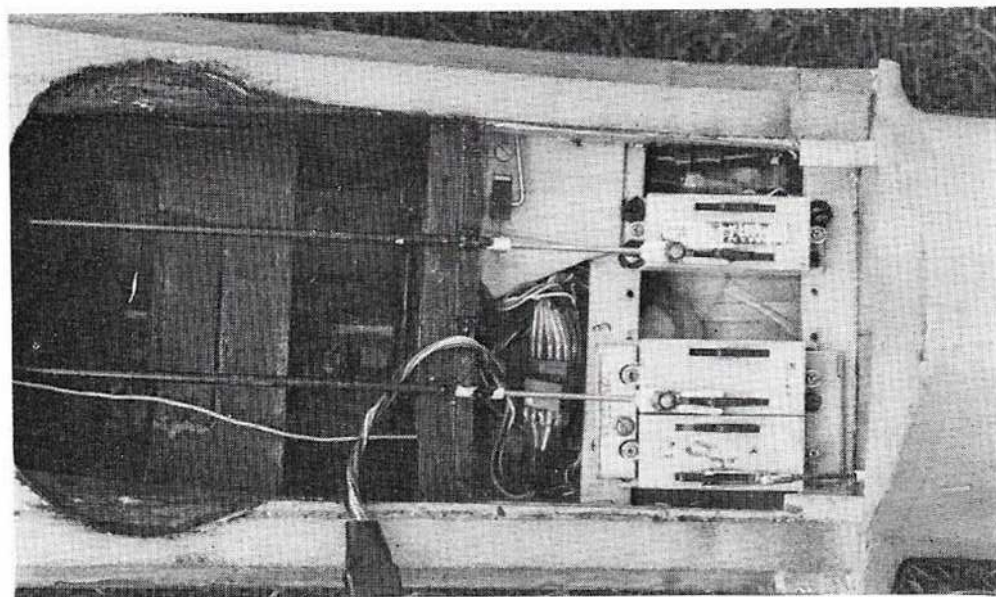
First cut out all the formers and other bits and pieces. Now make up a $\frac{3}{4}$ in.sq. balsa crutch on the plan, and build up the top half of the



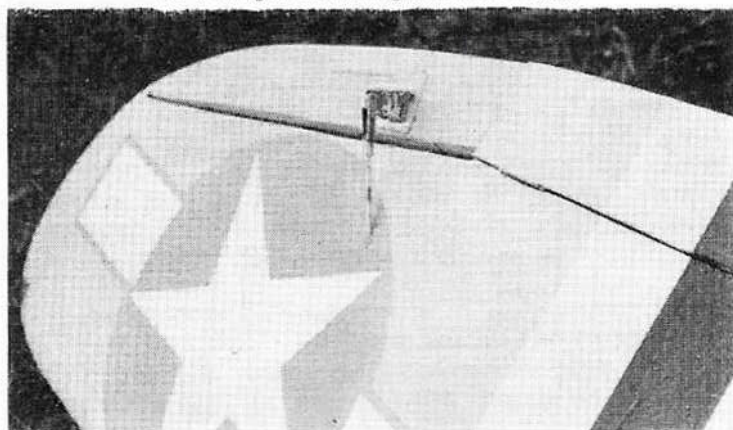
Basic fuselage construction. Below, part skinning added. Note angled bearers.



Below is a close-up of the radio installation in the designer's prototype. Three DigiMax linear servos are fitted side-by-side—with bags of room to spare. Switch mounted on ply panel, receiver 'under' servos.



Some further close-ups, of the finished model, show the rudder and elevator push-rods and horns, and—below—the aileron linkage. A 14g. wire yoke or joiner is used for the elevators—tail unit components are all from $\frac{1}{8}$ in. medium grade sheet balsa.



fuselage on this, to the stage shown on the drawing. When dry, remove the assembly from the building board, and build formers F1 and F2, plus bearers, onto the front end.

The fuel tank should be fitted at this stage—unless an access hatch is made for fitting and removal, if necessary. The one in my prototype is a fixture, and has given no problems at all (famous last words!). Fit former F8, which has the tailwheel bracket bound to it with thread, and then follow by fitting the remaining lower former portions. The assembly is now ready for its sheet covering. Sheet with medium-soft $\frac{1}{8}$ in. balsa, taking your time, and making sure everything is symmetrical. Check that the wing fits snugly into the recess, and make the wing seats from 1mm or $\frac{1}{16}$ in. ply. After these have been attached to the fuselage, fillets are fabricated from scrap balsa, as shown.

Now attach the wing and make the under-wing fuselage shell.

Odds—and ends

The tail unit components are made from $\frac{1}{8}$ in. medium grade sheet balsa, sanded to section. Plywood control seats are inserted into the control surfaces to prevent the horns pulling out. Use a 14g yoke type elevator joiner, epoxied into the elevators, making quite certain that they are flat and true while setting.

The engine is shown on the plan side-mounted, as this allows for easier operation. Mine is inverted only because I am used to this set-up. The cowl may be made from fibreglass, aluminium pea pan, kettle or—as mine is—beaten from aluminium sheet! (It can be done, all that's required being a small amount of time and a bit of concentrated effort).

The undercarriage is formed from 10g piano wire and clamped to the u/c beams with saddle clamps,

screwed in place, which allows some flexibility. On my original, I have the u/c just a little too far back, which tends to make the model nose over, but the correct position is shown on the plan. Leg fairings are made from $\frac{1}{16}$ in. ply, or thin aluminium sheet.

Finishing

Cover the whole model first with tissue. This makes any repairs easier to carry out, whereas fabric covering can result in a "bag of bits" after a thump, in my experience. Two or three coats of sanding sealer, on top of the dope used for dopping on the tissue, and rubbed down between coats, sees the air-frame ready for colouring, to your chosen scheme. A coat of clear polyurethane overall, to fuel proof, and you are ready for the flying field (after a decent interval for the paints to harden, of course).

Detailed information on the *Thunderbolt*, with some mouth-watering colour schemes, may be found in Profile Publication No. 7.

Flying

Most of the original's flying has been done with an OS.35 turning an 11 x 6 prop. The latest flights, however, have been with an OS 40. I would, as a result, recommend a 40, to give that desirable reserve of power—though I fancy a 60 would be a bit powerful; some people will undoubtedly fit one, notwithstanding!

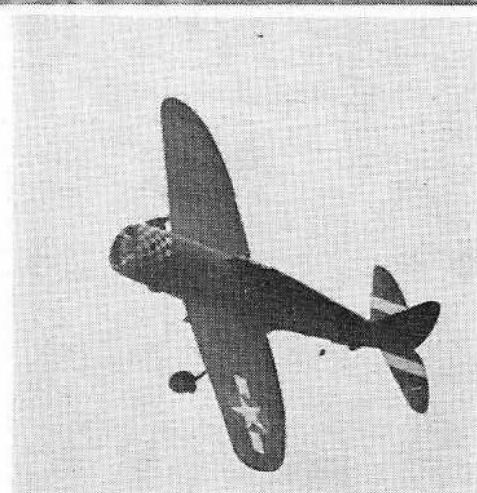
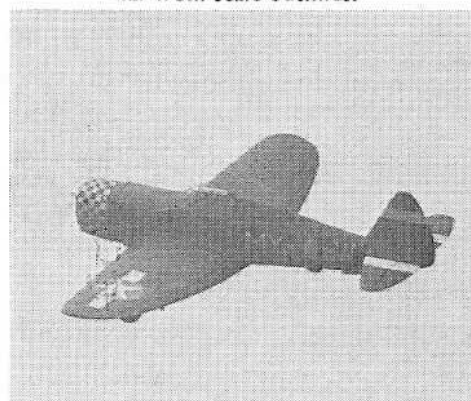
Set everything at neutral (except throttle, of course!), keeping the actual elevator movement down—certainly no more than shown on the plan—to begin with at least. Fire up . . . and away we go . . .

A dab of right rudder to hold her straight . . . on grass, full up-elevator, but on concrete, just enough elevator to prevent her nosing over. Once speed has been attained, neutralise the elevator to prevent the machine from lifting off too early, then just ease back gently and she will lift off smoothly.

Flying is steady; tight turns can be flown—but be careful! Loops can be made smallish without problems, however. Rolls are barrelly, requiring quite a fair amount of down-elevator during the inverted part. The model has a good glide,



These in-flight photos, taken in evening light, give a good impression of the model's not-so-far-from-scale outlines.



Designer Eric Robinson poses with his "sort of *Thunderbolt*" (looks OK to us) at the local flying field. (Hurry up—you've got the peg!)

you will find, and landings are easy enough.

That, then, is the story and build-up of my *Thunderbolt*. Not scale, of course, by today's standards but, with a good paint job, would make an excellent model for flying displays. And it is a nice model to fly,

in its own right, for the average club flyer, provided the recommended throws and c.g. position are adhered to.

Finally—remember: "fly smooth, fly scale." The full-size machine did not zip around on a "dime".