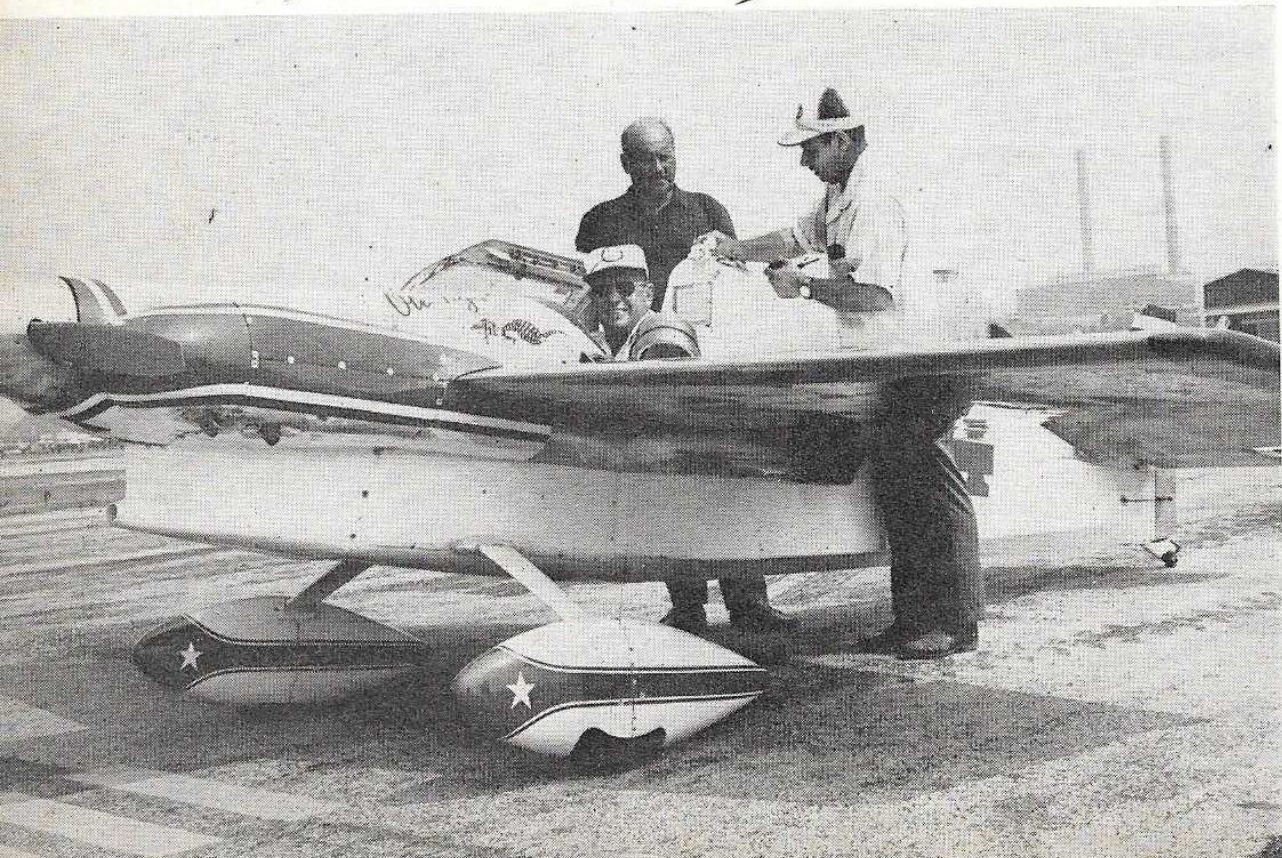




By
ERIC RHODES

FORMULA 1 LIVES!— Despite what the pundits might say, the F.1 class is still very much a part of the pylon racing scene, and here's one of the hottest racers yet.

"Ole Tiger"



I FIRST decided to build a formula one pylon racer, when I heard that my own club, Bradford Aeromodellers and the Harrogate club, were going to hold a pylon race at R.A.F. Topcliffe in April last year. Previously, I had only flown in open pylon events. This was to be my first attempt at Goodyear (Formula I), and all the other chaps in the club were building *Midget Mustangs* from the one and only plan we had, so I decided to design my own.

On looking through some back numbers of *R.C.M.&E.* I came across the general arrangement drawing of '*Ole Tiger*'. I was at once impressed by this unusual, compact looking little racer.

So, with the aid of a pair of dividers, I enlarged the drawing 13 times, to give a fuselage depth of 7 ins. The enlarged profile still looked good so I pressed on drawing up the wing and tail.

The wing had to be stretched considerably to bring it within F.1 specs. As for the tail unit, I sketched various sizes until I thought it looked right. The elevator still looked a bit on the small side, so I made a note to

give plenty of movement for the first flight. My fears in this respect proved to be just the opposite.

The wing section was next, so digging out more mags I searched through the plan pages until I came across the *Rivets* from the "other" R/C Mag. (*There is no other R/C mag - Ed!*). Selecting number three rib, this was used for the root, a tip rib was also taken, both were cut from 1/16 in. ply and the rest of the ribs formed sandwich fashion. These have now been drawn on the plan. (*Ed's note - Ain't this fella scientific!*)

The plan view was drawn next, and it was at this moment I realised that the enormous cheek cowls would have to be reduced considerably if the model was not to be flown backwards by its own prop.

These were cut down to take the *K & B 40* head, but not so much as to lose scale effect. The formers, wing fixing method etc., were sorted out as the model took shape, so having decided on zero incidences all round including thrust lines, I was ready to start.

Construction

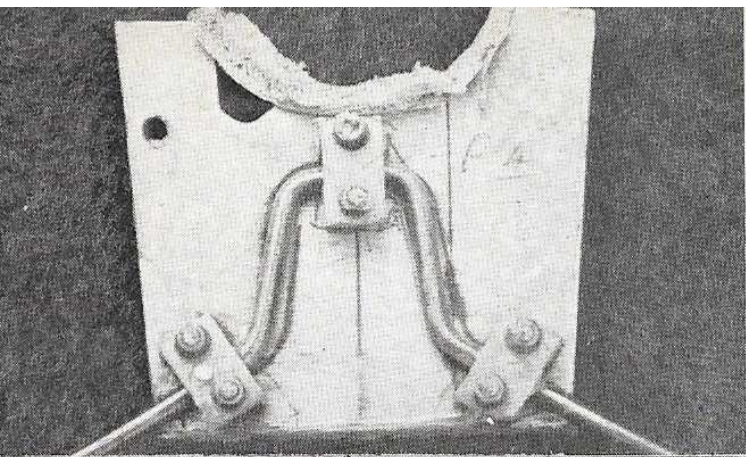
Wing

As I don't like building wings, especially thin section types, this component was built first, which is a good idea anyway, because the fuselage top decking is built onto the wing and so speeds up construction.

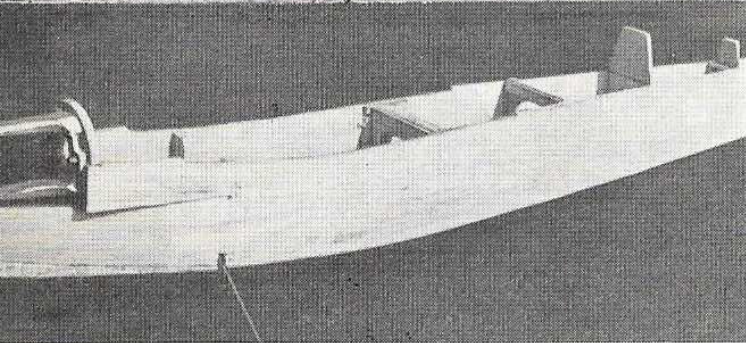
First job is to join the wing sheeting and sand the top surface, also cut four spars to length and glue on the doublers. The wing is built in one piece, so a hinged board is a useful item when jiggling the wing up for final sheeting. It is also built inverted for dihedral effect with double thickness spars around the centre section to make up for the strength lost in the tank cut-out.

On the root rib a centre line is drawn and this is then pinned and glued to the spar and packed up so that the centre line on the L.E. and T.E. of the rib are equi-distant from the board. This is repeated with the tip ribs.

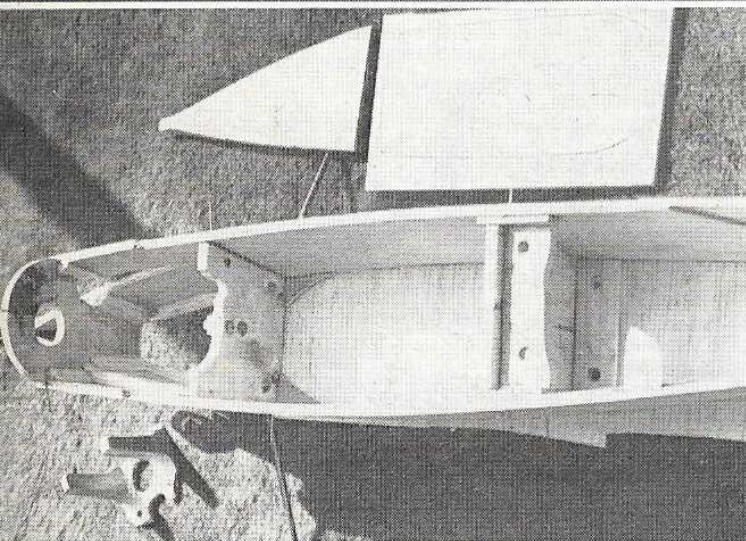
Next, select two pieces of straight $\frac{1}{2}$ in. sq. Taper to match root and tip ribs L.E. and glue to same. Check



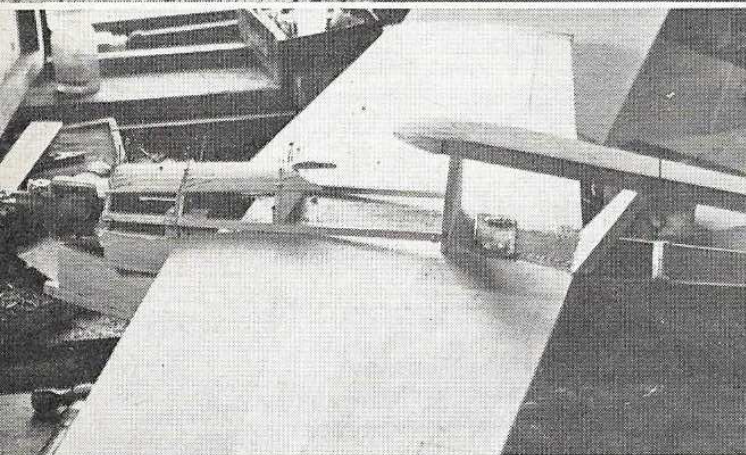
Former F.4 showing undercarriage legs clamped in place. Note foam rubber seating for fuel tank.



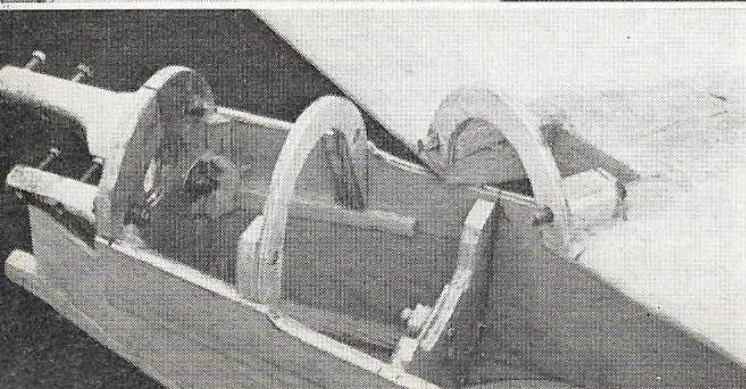
Basic fuselage structure showing lower part of side fronts drawn together, and cast motor mount in place.



Front close-up of basic fuselage showing building-in of formers and wing retainers.



The fuselage progresses. Here the cockpit decking is built on to the basic structure.



Below left: another close-up showing front wing location. Below and right, the completed fuselage before finishing.

again for straightening and add packing if needed. Now glue remaining ribs in position and check along T.E. with straight edge for alignment, drop in the top spar, "really the bottom spar" and cement. Fit the 1/16 in. sheet webbing and glue on the ready shaped T.E. Next fit bell cranks, remembering to install them inverted. Next wrap with fuse wire and solder a piece of piano wire onto aileron push rod for servo linkage. Fit riblets in tank cut-out, also the piece of hard balsa between spars at the centre section. When all has firmly set, unpin from board and shape L.E. with razor plane. Jig wing up again, this time top side up (this is where a hinged building board comes in useful) and sheet top of wing. I use *Evo-Stik* contact, as this saves time and there's no pins to bother with. The wing can now be lifted from the board and pinned down inverted again, by the L.E.

A straight length of hard balsa or hardboard is placed under the T.E. of one wing panel and the centre section at the T.E. is packed up 2 ins., the tip rib is lifted 1 3/8 in., this forms the washout. This is repeated with the other wing panel, with blocks fitted under the spar to prevent bowing. Having jiggged up the wing satisfactorily (and it pays to double check), mark and cut away ribs for the 3/16 in. sheet aileron spars, fit spars and riblets, ply horn mount and 1/8 in. sheet hinge doublers to top sheeting, not forgetting to cut through top sheeting in places to mark aileron outline.

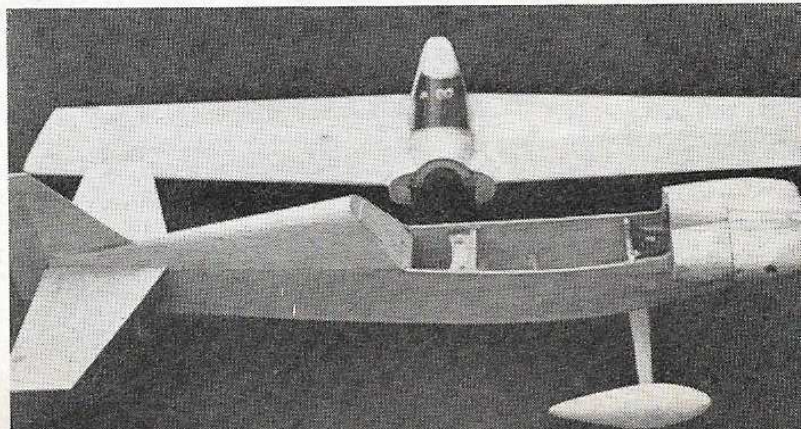
Now fit blocks at centre section for wing bolts. The bottom sheeting is then stuck on, after cutting holes for the aileron control wires. Remove wing from board, cut out the tank bay and glue on tips. The ailerons I cut out later in order to let the wing 'age' in one piece as long as possible.

I take it you will have guessed by now that I'm trying to build a warp-free wing!

Fuselage

The fuselage is pretty straightforward, apart from the tapering formers and a sawcut halfway along the nose.

Having joined fuselage sides and pulled in at nose and tail, not for-



getting to fit U.C., glue on the bottom sheeting and lower nose pieces. At this stage of construction it looks anything but an F.1 racer, in fact, club mate Dave Hardaker popped in while I was building and asked if I had taken up boats. He has since changed his opinion.

Glue two pieces of $\frac{1}{8}$ in. ply flush with wing seating behind F6. Lay wing accurately on fuselage, glue F3 to fuselage, making a good joint because the model literally hangs from this former. Next glue F3a onto wing flush with F3. Also fit the $\frac{1}{16}$ in. ply wing dowel supports behind the L.E. When dry, remove wing and fit the $\frac{3}{16}$ in. dowels in F3a. Mark dowel positions on F3 and drill, now fit wing $\frac{1}{4}$ in. ply mount for wing bolts. Bolt wing to fuselage, check there is no slop. There was in mine so I shimmed up the wing seating with veneer. Now glue on F5-6 and the two F7s. Fit the $\frac{1}{2}$ in. top fuse, spine marking the joint of F7s for sewing through later.

Fit engine mount. The RI mount will have to be cut down slightly to fit F2. Next glue tailplane and nose planking, not forgetting to mark joint between F3-3a as you plank, and the rear decking. Now fit engine along with former one and cowling blocks.

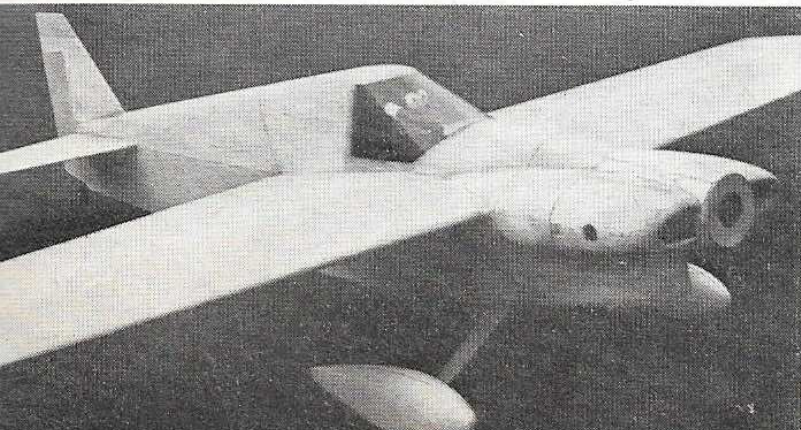
Carve and sand everything smooth, now using a razor saw carefully cut through nose planking at F3-3a taking care not to cut into the wing dowels. Now cut through rear decking, unscrew the wing bolts and if you have not splashed the glue around too much, a few light thumps under the wing should remove it from the fuselage.

Having got that over with, bolt the wing back on. Carve and fit cheek cowl, fairing into wing and fuse with a mixture of balsa dust, talcum powder and dope.

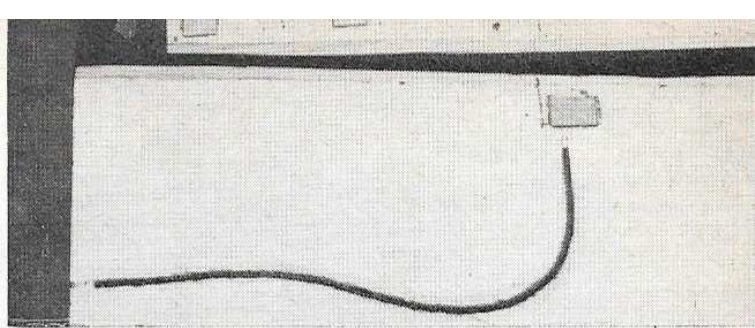
When dry, cut through cheek cowl, remove wing and cut out engine hatch, after which you also add fin, fairings, etc.

The paint job

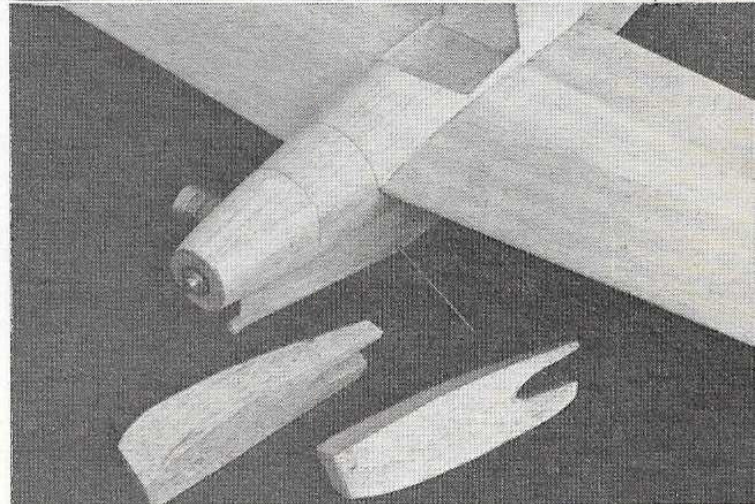
The original was covered in lightweight tissue, given four or five coats of dope and talc, and finished in white car cellulose, sprayed on.



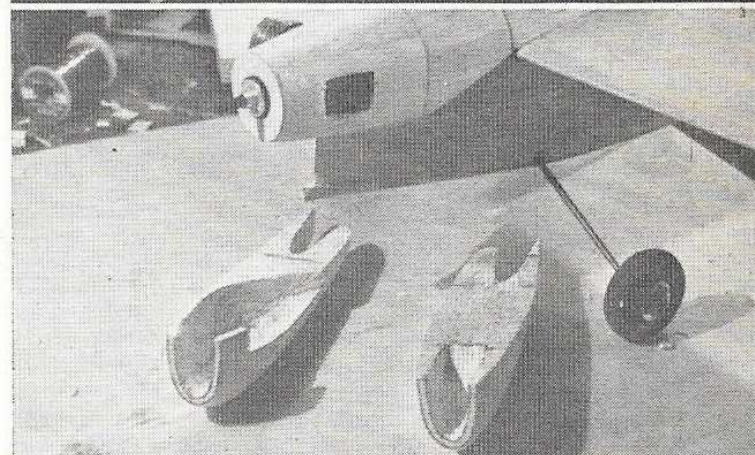
Just in case you fancy a foam wing, here's our author's method of control linkage and hinge support.



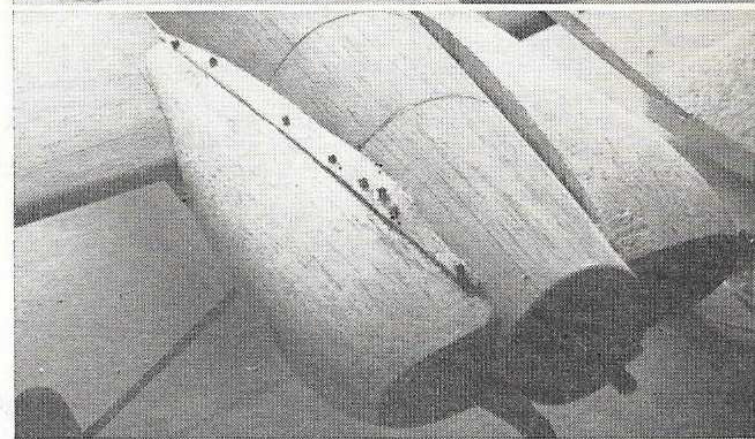
Here we have the basic model structure complete, and ready to take the cheek cowls, seen cut roughly to shape.



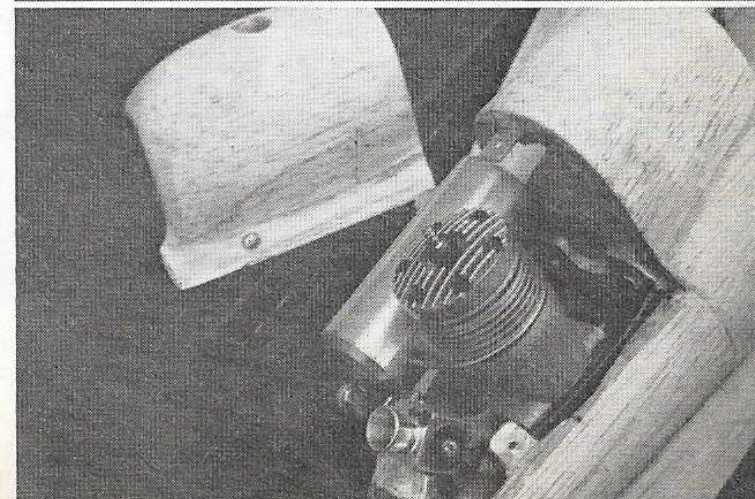
Cheek cowls must be shaped externally and then relieved to take the motor. Channel the inside tightly around cylinder to force air through the fins for effective cooling. Allow generous outlet area.



Cheek cowls in place and tailored into wing root. Note balsa filler added. Cowls cut at wing root afterwards.



Below right: the motor in place, complete with silencer. Powerplant is K&B 40 F.I. Note removable cowl locators.





January '70 R.C.M. & E. carries three view of 'Ole Tiger', showing colour scheme, but if you want to be different, here's the same aircraft in its pre 'Tiger' days as the Miller Little Gem. Colour is black and white. Further details on page 161 of this issue. (Photo from the collection of Russ Brown).

The red trim was Brushing Belco, applied with a soft brush. The black lines were made from plastic stretching tape, stuck to glass and cut into strips with the aid of a straight edge. The numbers and shield were made by the gummed label transfer method in which you paint the gummed side of the label the desired colour, when dry, mark and cut out the number. Soak this in water and, providing you haven't got any paint on the back of the label, the paint transfer will slide off. The whole model was then fuelproofed using H.M.G.

So now you go and use it!

With the radio gear installed as shown, the C.G. came out right, so after engine tests and photographs of various angles, the day of the maiden flight drew near. All day Saturday the DEACs were charged ready for the following Sunday, which turned out wet and windy, so I went slope soaring instead!

The following Tuesday the weather was perfect, if only it would last till evening, it did. So quickly packing the model, fuel, field box, etc., in the car, we steamed off to a deserted airfield near York.

On arrival I had doubts about the elevator movement, remembering about a certain club mate 'who shall be nameless', who wrote off his T Tail Rivets on its first flight through not having enough elevator movement and wrong incidences. So I put the elevator linkage on the outer hole on the servo disc, this gave about twice the movement as shown on the plan.

Having tanked up we were ready to go, the engine started after the third flick, was leaned out and then richened slightly as a lean run with K & B 40's can be expensive! A quick check on the controls and then, holding a little up and a bit of right rudder 'Ole Tiger' was released. She drove down the runway, and with slight back pressure on the stick, we were airborne, flying fast but steady. In fact, she would fly hands off with a very shallow climb and a slight left turn. After nudging in appropriate trims a few manoeuvres were tried.

Two close-ups of full-size 'Ole Tiger'. Continental engine seems as tight a fit here as is a '40' in the model! Note cockpit close-up - cockpit so small that pilot Bob Downey is reputed to fly cross-handed on throttle and stick.

Rolls were quick, which was fine but the elevator was far too sensitive, needing only half stick movement for tight pylon turns.

Landing was fast, partly due to lack of wind and my own fault of not being used to low drag models. A longer approach is the thing to aim for, anyhow, after changing elevator throw to movement shown on plan, we were ready for the races.

A tuned pipe was fitted for the Topcliffe do, and gave me a couple of thousand revs, to make a total of about 14-15000 ground revs, with straight fuel.

Pete Russell asked what props I used, he probably thought I was being a bit evasive as I said I could not remember. I have since checked and they are M.V.V.S. 10 x 8 cut down to 9 x 8 with the tips washed out and thinned.

So there you have it, if you want a fast, steady different looking racer, here it is.

Unfortunately, the prototype is no longer with us after having been more or less vaporised in mid-air in the final at Topcliffe. So it's back to the building board for Ole Tiger the 2nd. Cheers.

