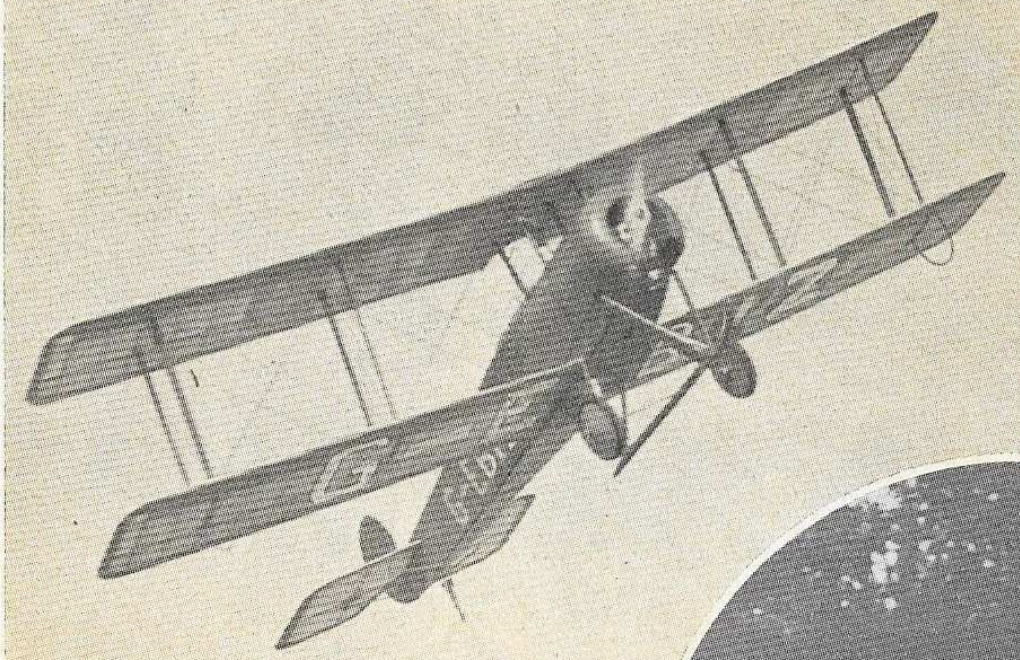
A ONE INCH TO THE FOOT POWERED FLYING SCALE MODEL

AVRO 504K



DESIGNED BY
RAY BOOTH

Ray Booth . . . 30 years of age . . . married . . . one daughter . . . member of the Design Office A. V. Roe & Co., Ltd. . . . ardent aeromodeller 19½ years . . . holder of British Indoor Tailless Record (H.L.) . . . interested in tailless power and flying scale, and parasol types . . . served in Royal Signals in France, Belgium, Algeria, Tunisia and Italy. Member of Manchester M.A.C. & "AVRO" M.A.S.

SURELY no other type of aircraft was so much responsible for the development of "airmindedness" in this country as the AVRO 504 K. Originally produced in 1915 to train pilots for the R.F.C. the 504 appeared in several versions, the "K" type being the most well-known. From 1932 to 1938 dozens of these "Old Avro's"—as they were affectionately known—toured the country giving joyrides at 5/- a flight. Probably more people had their first experience of flying in the 504 K than in any other type of aeroplane up to the end of 1938, at which time these grand old machines were no less than 23 years of age. Our cover painting depicts a typical example formating with other machines of Alan Chobham's famous circus.

It is said that the stability characteristics were of such high order that in the event of difficulties in flight it was only necessary for the pilot to remove his hands and feet from the controls, and the machine would automatically return to straight and level flight. What better machine then could one choose as the subject for a flying scale model?

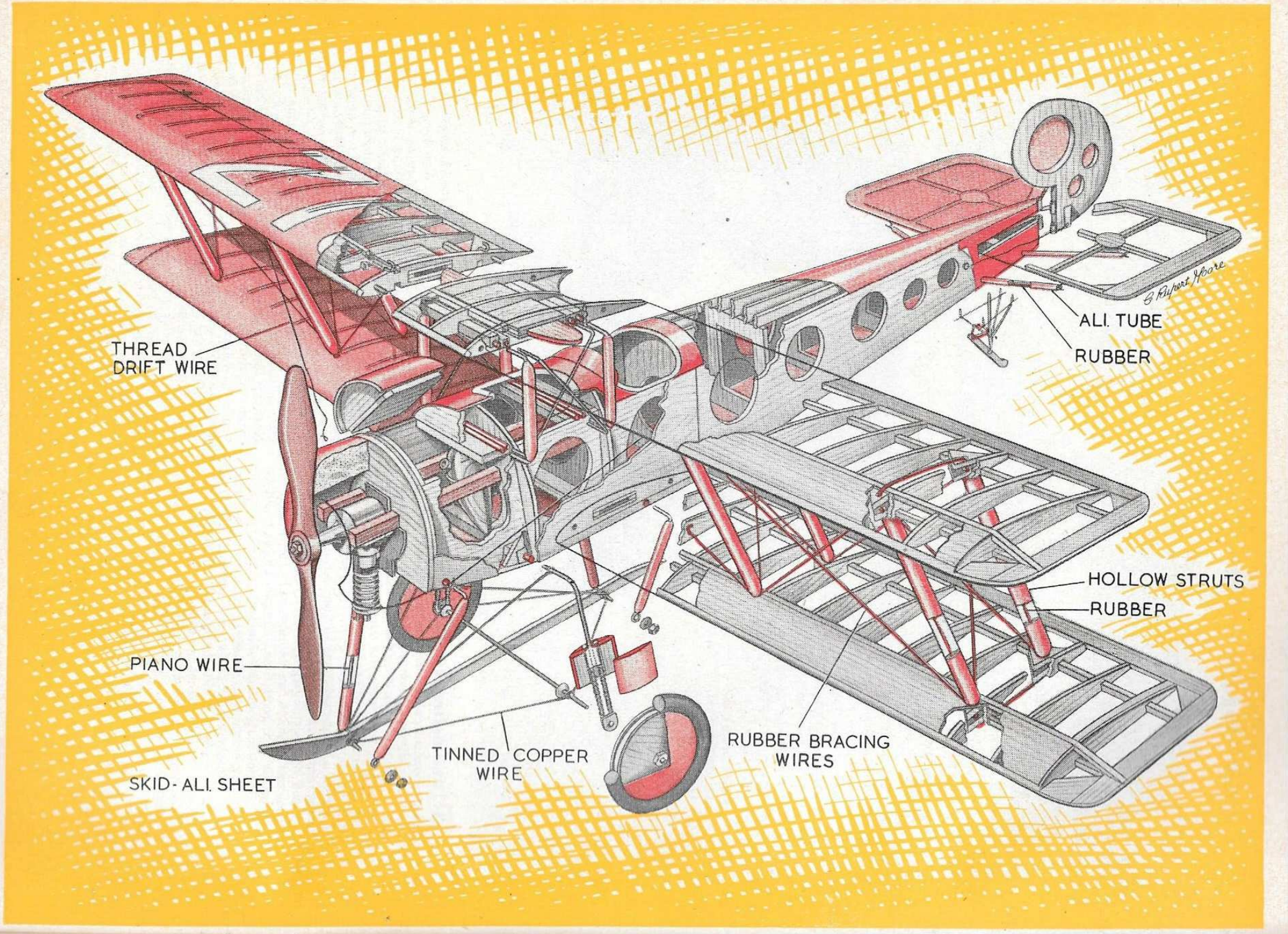
The performance of the model has far exceeded my most conservative estimates, and although it has only been entered in three competitions, this model has so far collected the Aeromodeller Champion of the Exhibition Trophy (Northern Models Exhibition, Manchester), 1st Prize in the Flying Scale Section at the same exhibition; 2nd Prize in the Model Air

craft Section at the Manchester and Districts Society of Model and Experimental Engineers' Exhibition, and finally the beautiful Silver Trophy and Replica presented by the Directors of Messrs. A. V. Roe & Co., Ltd., for the best flying scale model of any Avro aeroplane built by a member of the staff. For this latter competition the machine had to be flown, points being awarded for take-off, stability in flight and landing. The official report on this occasion stated that the model 504 K " was a perfection of both appearance and flying ability ". To date the model has about 20 minutes flying to its credit, including two flights of over 4 minutes.

Although the prototype has always been flown with an " Amco " ·78 c.c. Mk. I, any motor of similar power and weight should be satisfactory. Throughout the design my aim has been strength and durability, and consequently at first glance it may seem rather heavy. Let me hasten to assure readers, however, that the flying and gliding speeds are probably only about half that of normal power duration models of similar span, due to its relatively large wing area. The wings are arranged to knock-off in the event of a crash, all bracing " wires " being 1/32 in. square rubber. The interplane struts are attached to the wings by passing 1/16 in. square rubber through the 18 G. alum. tubes in the wings, then through the hollow built-up struts. The main undercarriage is fully sprung with two shortened cigarette lighter springs on each side of the aircraft. The tail skid is also shock absorbing.

Flying. Extreme caution should be taken until experience has been gained with the model, and under no circumstances should the initial tests be carried out in anything but absolute calm conditions. Check that the complete model balances on its correct C.G. point (shown on the plan) then test glide over long grass if at all possible. If long grass cannot be found, glide as near as possible to the ground. Should the model stall, pack up the leading edge of the tailplane with a strip of 1/32nd sheet balsa ; if it dives pack up the trailing edge of the tailplane similarly. Continue in this way until a fairly flat glide is obtained, bearing in mind, of course, that biplanes will *NOT* glide with the flat angle of a conventional duration monoplane, due to the extra drag of wing struts, bracing wires, etc. Fill the fuel-tank sufficiently full to ensure about 30 secs. motor run, and throttle the engine right back—even at the expense of uneven running ! Let the machine attempt to R.O.G. at these settings. It will, in all probability, only taxi slowly along the ground, so gradually increase the revs of the motor until, after a long run (about 7 to 10 yards) the model just becomes airborne. Observe the turn under power, which, with the rudder set straight and the correct amount of side thrust, should be gently to the right. When the motor cuts out the nose should drop slightly and the machine go into a gentle right hand turn on the glide. Although *NO DOWN THRUST* was ever used on the prototype, should the model glide well but fly tail down under power, pack the engine with washers to give very slight downthrust. Once a good glide has been obtained, *DO NOT* attempt to change the power flight characteristics by changing the flying surfaces. Whilst appreciating the urge to fly a model once completed, I cannot over-emphasize the necessity for extreme patience during the initial trial flights, and strongly recommend that a thorough search be made for LONG grass over which to conduct primary test glides.

These views of the model in full flight will warm the hearts of all those who remember the elegant 504 K, and the occasional misfire of the engine will only add a further touch of realism !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DRIFT WIRE
ALI. TUBE
RUBBER
HOLLOW STRUTS
RUBBER
PIANO WIRE
TINNED COPPER
WIRE
RUBBER BRACING
WIRES
SKID - ALI. SHEET