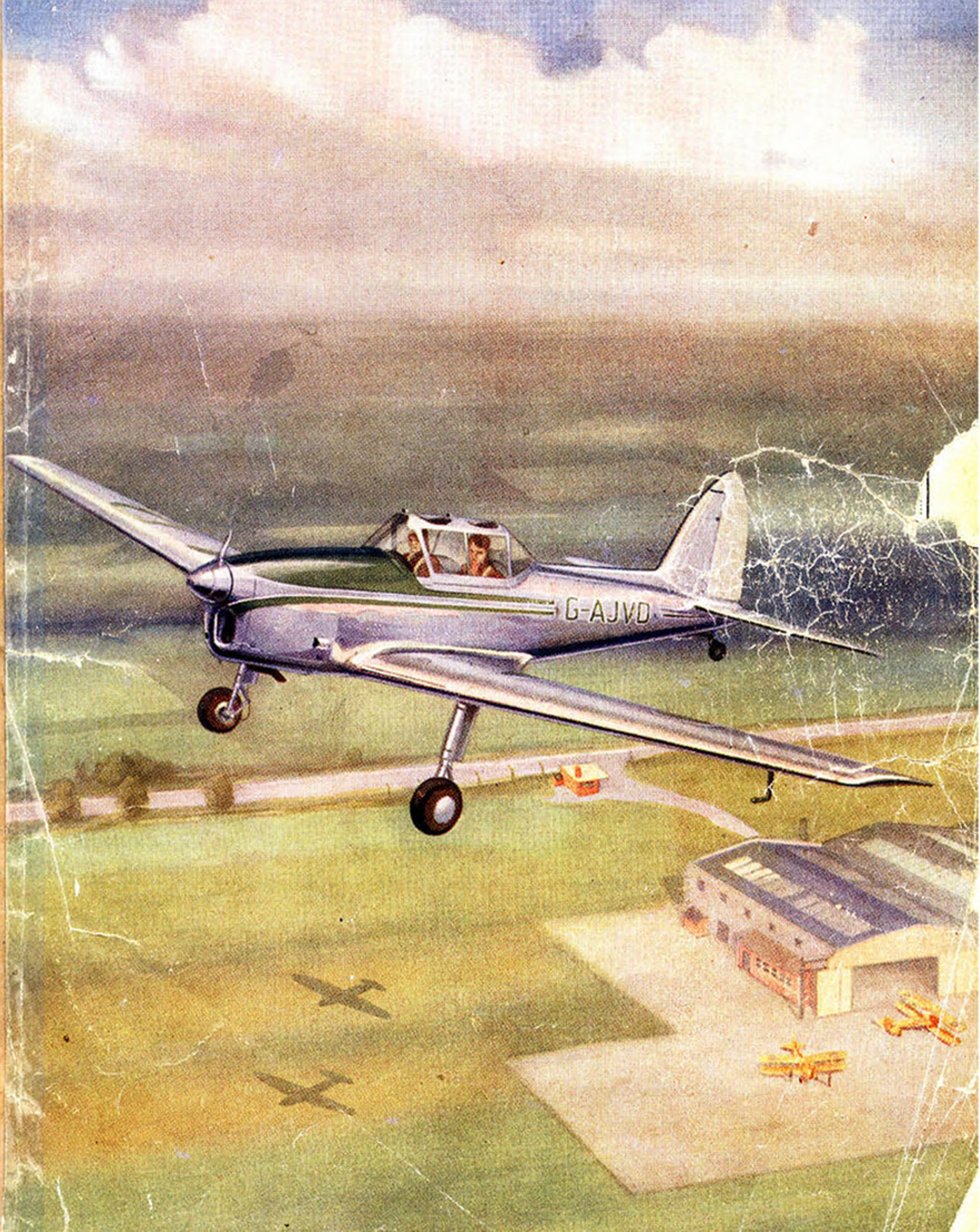
MAY
1948

AEROMODELLER 1/3



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The plans and the articles that exist within, you can find published at full dimensions to build a model at the following websites.

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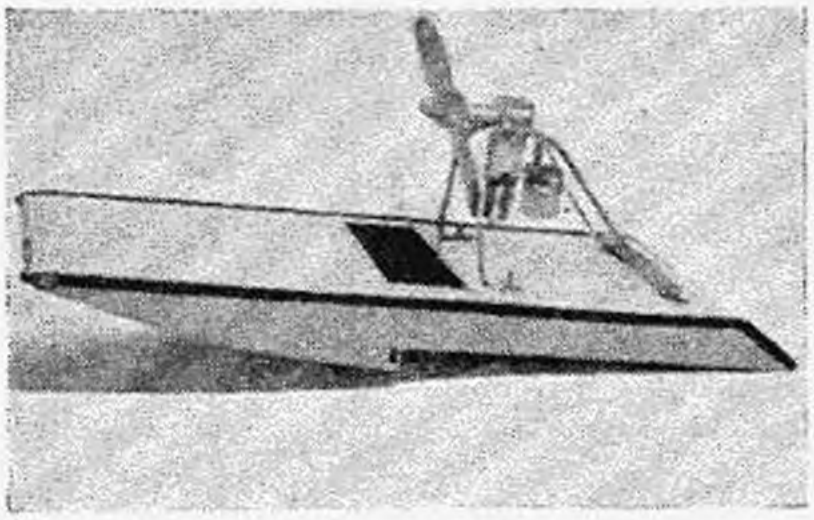

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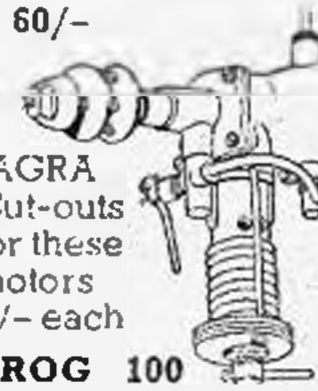

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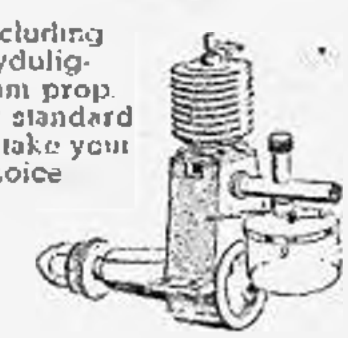

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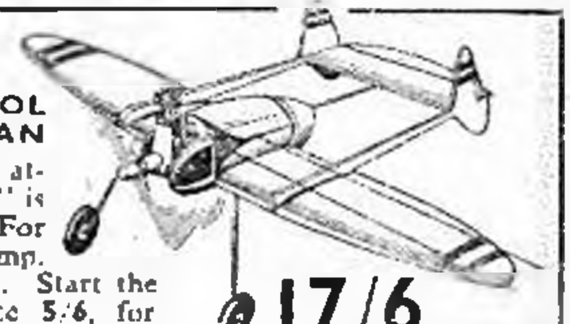

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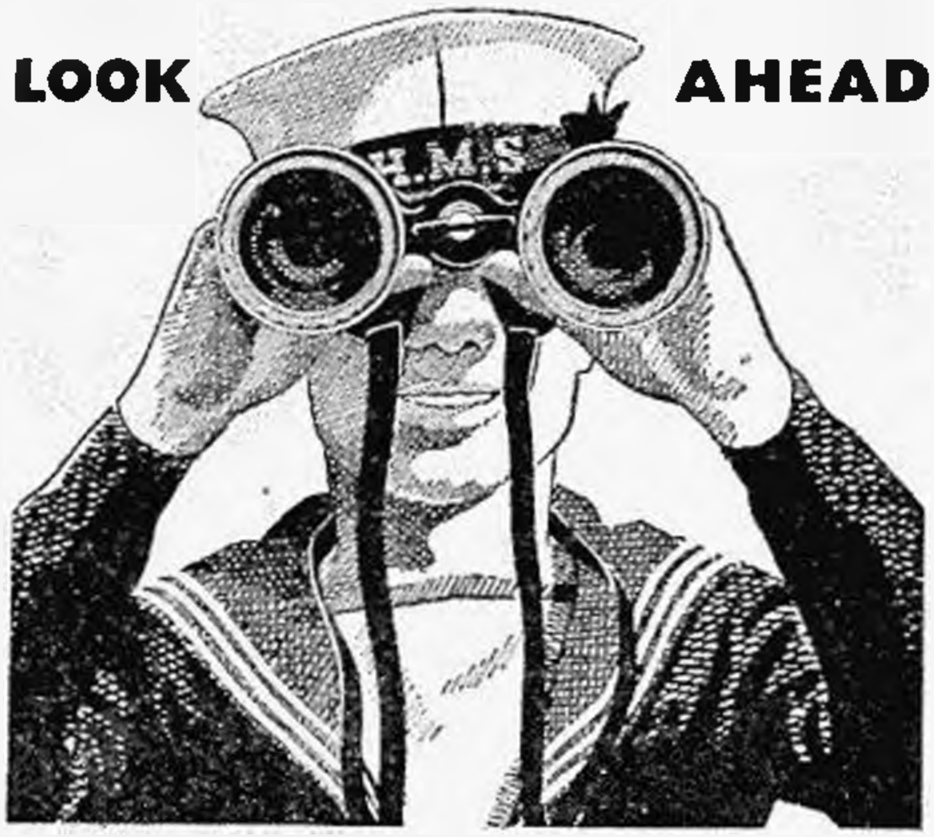

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REALISM. Who would appreciate that this excellent photograph of J. M. Greenland's D.H. Chipmunk was in fact a photograph of a model! *Aeromodeller Photo.*

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EDITORIAL

ROCKETS OR JETS?

NOT so long ago there was a feeling in this country that development in the powered propulsion of model aircraft was at a standstill; and that it was in the Western European countries that developments—in the form of diesel engines—had taken place.

In recent months the pendulum has swung to America where the introduction of the "glow-plug" has been said to have gone one step ahead of the diesel.

However, May, 1948, will, we think, show the pendulum swinging to its "central" position, i.e., this country, on release of information on the latest developments of a new fuel and motor giving an effect of jet propulsion.

Of course, we must not overlook recording the individual researches of Mr. Howard Boys and others in the way of *rocket* propulsion, but despite concentrated efforts it would seem that there is still a fair amount of work to be done to obtain consistency of thrust throughout the duration of the propulsive effort.

Recently, at the invitation of the Explosives Division of Imperial Chemical Industries Ltd., we were privileged in the company of other representatives of the Technical Press, to fly in a specially chartered plane to Prestwick to see a first demonstration of these special propulsion units which during the past few years have been developed for use in model aircraft, model cars and model boats.

The demonstration was most efficiently organised and convincing. We saw tailless model aircraft make powered flights of from twenty to thirty seconds duration and we saw model race cars and model boats perform for similar times.

We also saw practical demonstrations in the laboratory of several sizes of units in which the quite constant thrust output was clearly demonstrated.

We understand that some while ago a firm was incorporated with a view to producing and distributing various sizes of units and the fuel which is used in them, and an announcement will be made in the advertisement pages of our next issue.

In effect our next issue will be something of a special "jet" number for which an appropriate cover design has been executed by Mr. C. Rupert Moore. Plans of special model aircraft which can be powered by these units will also be described. An interesting feature of this development, and one which we feel has considerable possibilities, is that the special fuel (which, incidentally, is in solid cylindrical form and can be cut up into lengths according to the length of flight required) can be used equally as well in compressed air motors as in the units which will be marketed and in which the fuel would normally be consumed.

We shall watch the introduction and future development of this latest invention with great interest, and readers may rest assured that they will be kept right up to date with authentic information in the pages of the AEROMODELLER.

The Customer is Always Right.

We would urge every reader to make a special effort to complete the "likes and dislikes" form on page 335 of this issue. The more completed forms we receive the truer will be the picture of just which features are most popular and *vice versa*. In the past, assistance given by our readers has helped in no small measure to shape our future programme. This is the first post-war survey we have introduced and so much has happened since our last enquiry in 1944 that we are quite ready to be surprised or even shocked by your voting. In the words of a Government spokesman, "It all depends on you!"

Advertising Enterprise.

An interesting innovation is the inclusion in this issue of an eight page catalogue describing the products of one of our associated companies. Limitation of advertising space prevents us from allocating a sequence of pages to any one advertiser, but, by arrangement, our printers are inserting this complete catalogue which will thus reach a wider circle of potential customers than would otherwise be possible. Other advertisers may be impressed by this enterprising move, and we shall be happy to discuss a similar campaign with any firm interested.

BY J. M. GREENLAND

THE idea of building this flying scale Chipmunk was suggested to me in 1947 by Mr. Pat Fillingham who kindly provided the drawings and data, etc. Having toyed with the idea for nearly a year I finally decided to build it to 1½ in. to 1 ft. scale and fit a diesel engine. The factors governing the choice of engine were that it should start easily, since it is totally enclosed, should drive a 9-10 in. propeller and that it should not be too powerful, since the Chipmunk is in the light trainer class. For a model of 4 ft. 3 in. span the 1·3 c.c. Mills diesel fulfilled all these requirements admirably, but any other engine of approximately the same capacity should fly it equally as well.

Fuselage. The fuselage is built up in the monocoque fashion of balsa planking. Commence by cutting out the keel from 1/16 in. sheet, pin it to the plan and add the half formers and ⅛ in. × 1/16 in. balsa planking. When dry turn over and add the other halves of the formers and the rest of the planking. Sand smooth and cut out the cockpit recesses. Next build the tailplane (its construction is clear on the plan) and carve the tail unit fairing blocks to shape, cut a slot in these blocks to take the tailplane mainspars. Glue the block on and fit the tailplane into place, lining it up at 0° incidence with the datum and thrust lines of the fuselage. Sheet cover the tailplane where shown and fair it into the fuselage with 1/32 in. sheet, plastic wood, etc.

Fin and Rudder. The fin is fixed to the fuselage and faired into it with balsa blocks, the rudder is movable being hinged on pins. To make the rudder hinge properly the hinge-pins should be at the centre formed by the semi-circular recesses in the back of the fin ribs and in the same vertical plane as the rear edges of the fin's sheet covering. The leading-edge of

the rudder is made semi-circular in section so that it fits snugly into the fin The actual construction of these two units needs no explanation.

Wings. The wings are built in three sections, centre section and two outer panels. The centre section is fixed to the fuselage at 2° incidence and contains the undercarriage and its stress member and springing.

Construction. The undercarriage stress member is first cut out and the slots, holes, etc., drilled, the position of the undercarriage legs must then be accurately marked on. Next build up the centre section including the undercarriage stress member. Cut slots in the fuselage to take the spars and then glue firmly into place at the correct angle of incidence. N.B. that the trailing edge is ⅜" below the bottom of the fuselage. Connect the trailing edges to the fuselage by ¼ in. × ⅜ in. balsa cut and bent to the shape of the fairing. The fuselage is faired into the wings with 1/32 in. sheet top and bottom carefully steamed to shape.

The outer panels are simple to construct and are plugged into the centre section so that they can knock out in a crash.

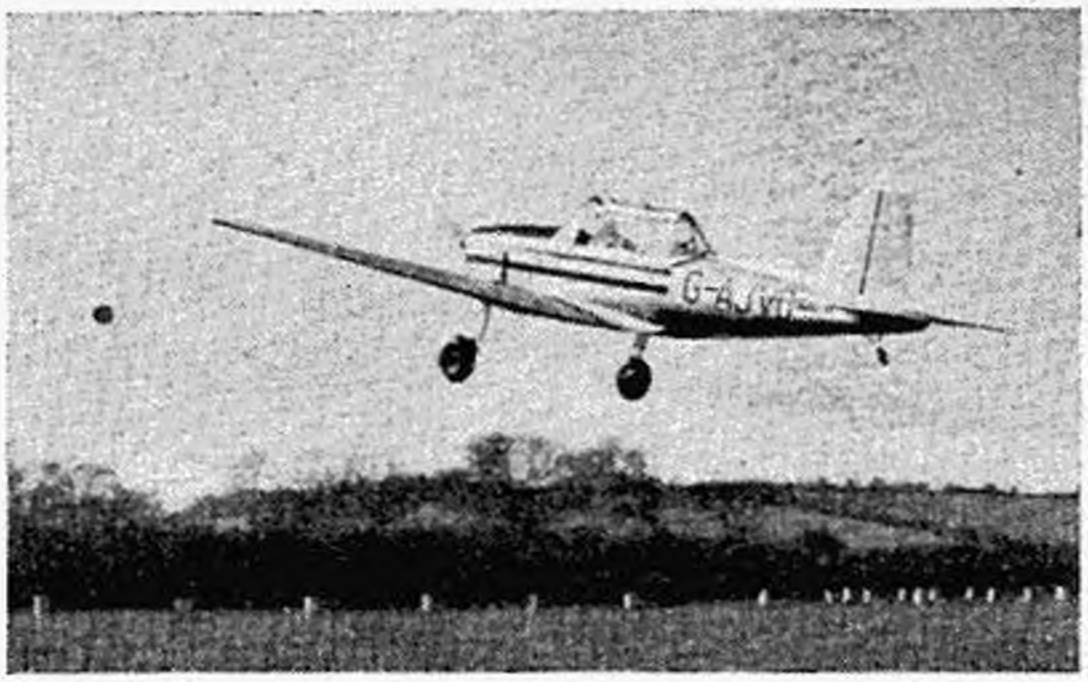
Undercarriage. The undercarriage legs are made of 16 s.w.g. steel wire faired with balsa and paper. They are sprung to the spars with elastic bands so that they can travel backwards, being pivoted in brass tubes which are bolted to the stress member (shown clearly on the plan). "M.S." airwheels are fitted to the model because with a little modification to their hubs they exactly resemble the real thing.

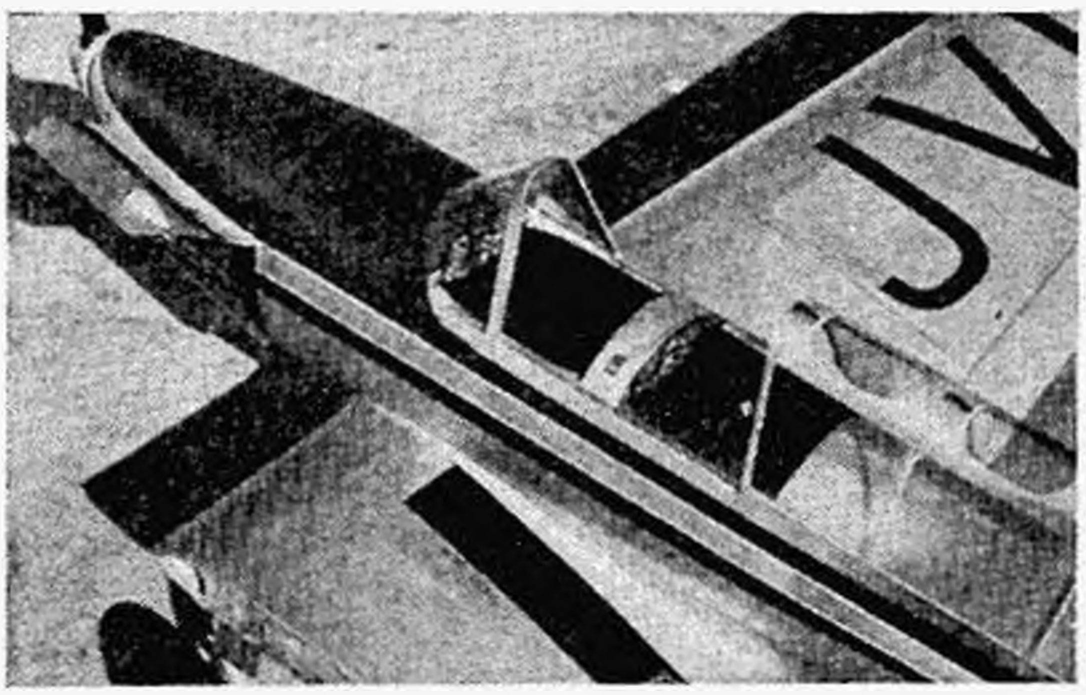
Cockpit Cover. The cockpit cover on the original model is moulded in three pieces from 3/32 in. sheet perspex but it could alternatively be built up with ply and block balsa with celluloid windows. I made the original canopy to slide because the throttle controls were to have been situated in the rear cockpit, but on my Mills the throttle control does not have to be touched so this obviates the necessity. The frames were cut from notepaper and seccotined on to the perspex, afterwards being painted silver. The sliding rails are built of "L" section 1/32 in. sheet balsa with a bamboo runner fixed to the canopy. When moulding the canopy make it a little too narrow so that it has to be slightly sprung into position.

Engine Mounting and Cowling. The original cowling was to have been of beaten aluminium, but since it was not finished in time for publication, a wooden one was built instead with a door on one side. Admittedly the engine is somewhat inaccessible, but if your engine is reliable there is no need to be able to get at anything more than the throttle, tank and compression head. The engine mounting bulkhead is cemented to the front fuselage former so that in the event of a bad "prang" the whole "power egg" will knock off.

Flying. My usual practice when testing prototypes as mentioned in my Bleriot article (Christmas, 1947), is to make sure of the centre of gravity position, check the rigging angles and then give short powered hops with the model under-elevated, gradually increase the elevation until the model just rises off. In this way, little harm can come to the model should it be badly out of trim. The nearer it is to the ground the less hard it can hit it ! !

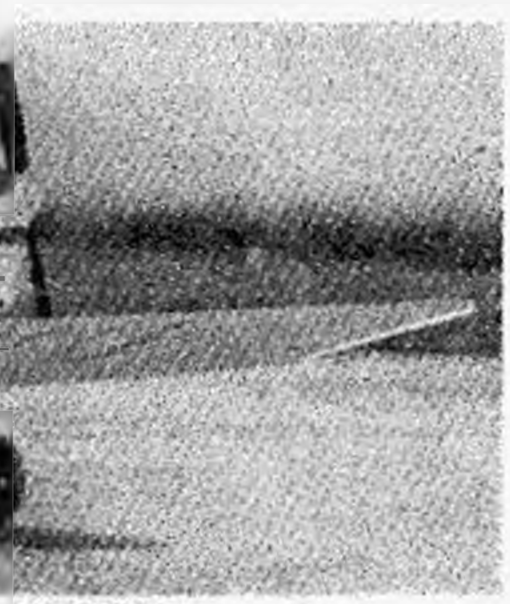
Full-size plans of the model are available, price 5/- post free, from the Aeromodeller Plans Service (see ¼ scale reproduction overleaf).

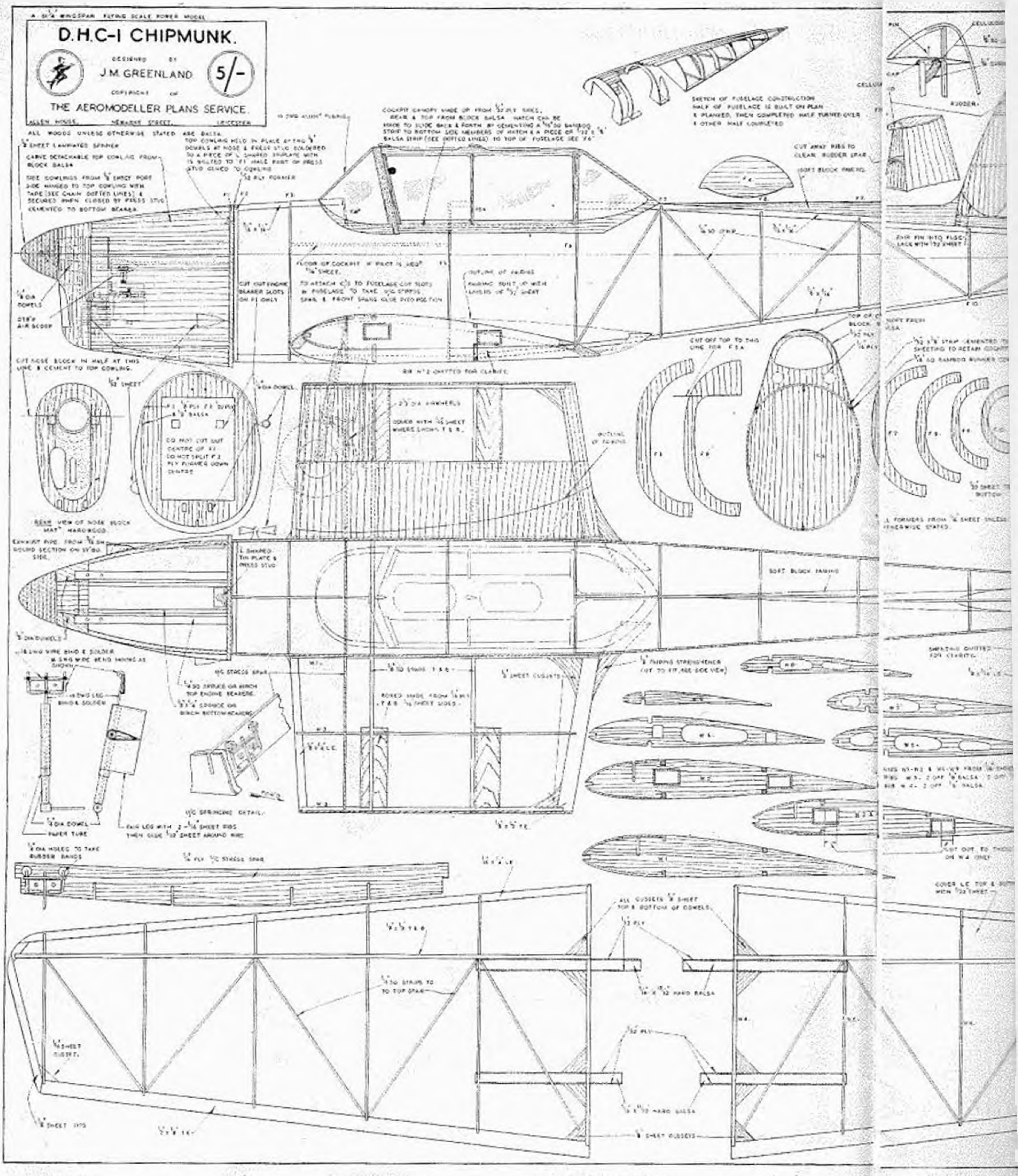




All the photographs on this page are of the model and not the full-size machine as one might imagine. Readers will be interested to know that its young designer is only 16 and there is no doubt that the model is a tribute to his ingenuity and enterprise.

Aeromodeller Photos.




D.H.C-1 CHIPMUNK.
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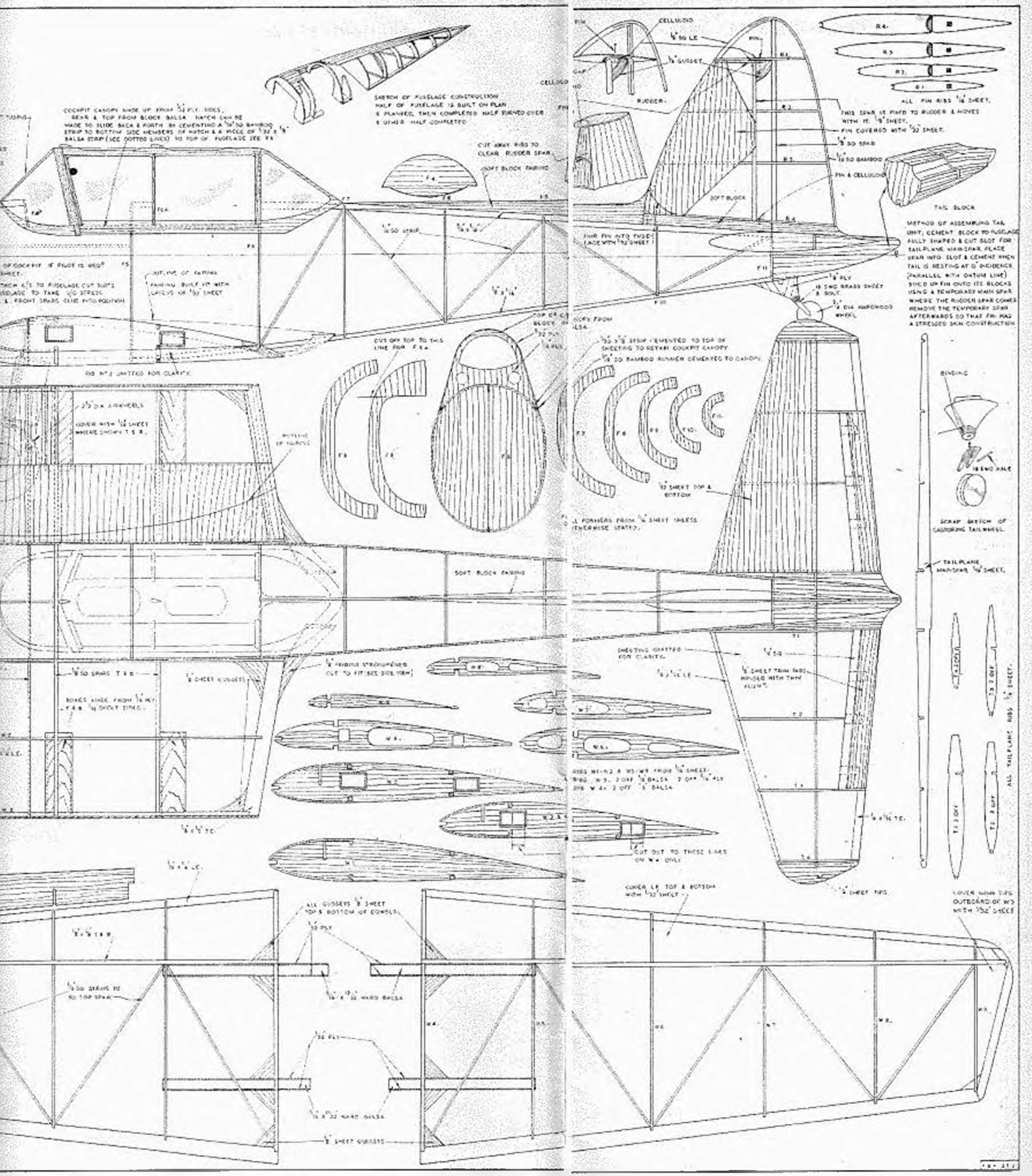
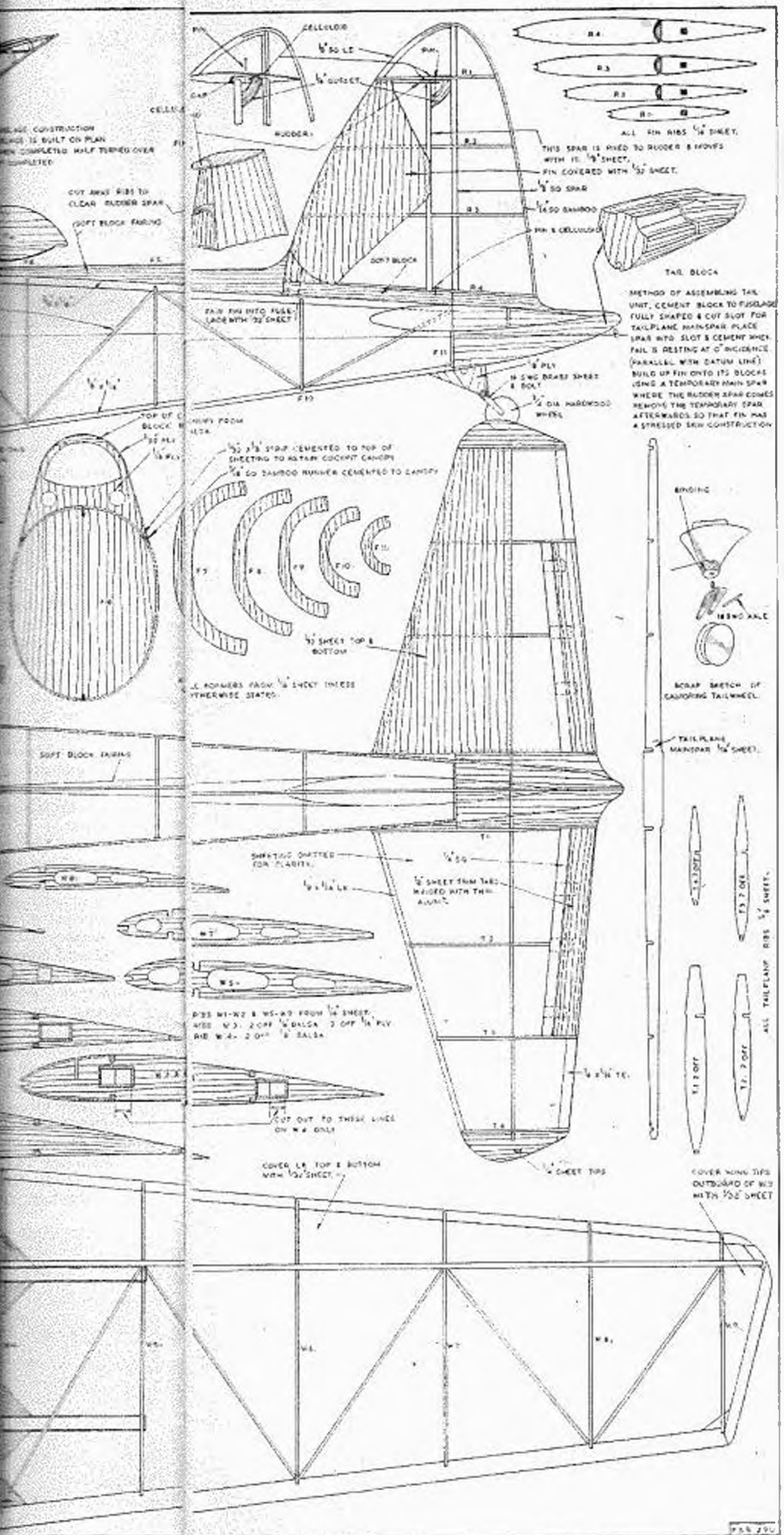


SKETCH OF FUSELAGE CONSTRUCTION HALF OF FUSELAGE IS BUILT ON PLAN & PLANKED, THEN COMPLETED HALF TURNED OVER & OTHER HALF COMPLETED
COCKPIT CANOPY MADE UP FROM 1/32 PLY SIDES. REAR & TOP FROM BLOCK BALSA. HATCH CAN BE MADE TO SLIDE BACK & FORTH BY CEMENTING A 1/16 SQ BAMBOO STRIP TO BOTTOM SIDE MEMBERS OF HATCH & A PIECE OF 1/32 x 1/8 BALSA STRIP (SEE DOTTED LINES) TO TOP OF FUSELAGE SEE F4
CUT AWAY RIBS TO CLEAR RUDDER SPAR
SOFT BLOCK FAIRING
OUTLINE OF FAIRING
FAIRING BUILT UP WITH LAYERS OF 1/32 SHEET
CUT OFF TOP TO THIS LINE FOR F.5A
COVER WITH 1/16 SHEET WHERE SHOWN T & B.
OUTLINE OF FAIRING
ALL FORMERS FROM 1/4 SHEET UNLESS OTHERWISE STATED.
1/32 SHEET TOP & BOTTOM
SOFT BLOCK FAIRING
1/8 SQ SPARS T & B
1/8 SHEET GUSSETS
BOXES MADE FROM 1/16 PLY T & B 1/4 SHEET SIDES.
SHEETING OMITTED FOR CLARITY.
CUT OUT TO THESE LINES ON W.4. ONLY
COVER LE TOP & BOTTOM WITH 1/32 SHEET
ALL GUSSETS 1/8 SHEET TOP & BOTTOM OF DOWELS
1/32 PLY
1/32 PLY
1/8 SHEET GUSSETS
HARD BALSA
CELLULOID
1/8 SQ LE
1/8 GUSSET
RUDDER
ALL FIN RIBS 1/16 SHEET.
THIS SPAR IS FIXED TO RUDDER & MOVES WITH IT. 1/8 SHEET.
FIN COVERED WITH 1/32 SHEET.
1/8 SQ SPAR
1/16 SQ BAMBOO
PIN & CELLULOID
SOFT BLOCK
TAIL BLOCK
METHOD OF ASSEMBLING TAIL UNIT; CEMENT BLOCK TO FUSELAGE FULLY SHAPED & CUT SLOT FOR TAILPLANE MAINSPAR. PLACE SPAR INTO SLOT & CEMENT WHEN TAIL IS RESTING AT 0° INCIDENCE (PARALLEL WITH DATUM LINE) BUILD UP FIN ONTO ITS BLOCKS USING A TEMPORARY MAIN SPAR WHERE THE RUDDER SPAR COMES REMOVE THE TEMPORARY SPAR AFTERWARDS SO THAT FIN HAS A STRESSED SKIN CONSTRUCTION
1/8 PLY
18 SWG BRASS SHEET & BOLT.
DIA HARDWOOD WHEEL
1/16 SQ BAMBOO RUNNER CEMENTED TO CANOPY.
BINDING
18 SWG AXLE
SCRAP SKETCH OF CASTORING TAILWHEEL.
TAILPLANE MAINSPAR 1/8 SHEET.
ALL TAILPLANE RIBS 1/16 SHEET.
1/4 SHEET TIPS
COVER WING TIPS OUTBOARD OF W.5 WITH 1/32 SHEET



MORE ON NYLON

BY V. DUBERRY

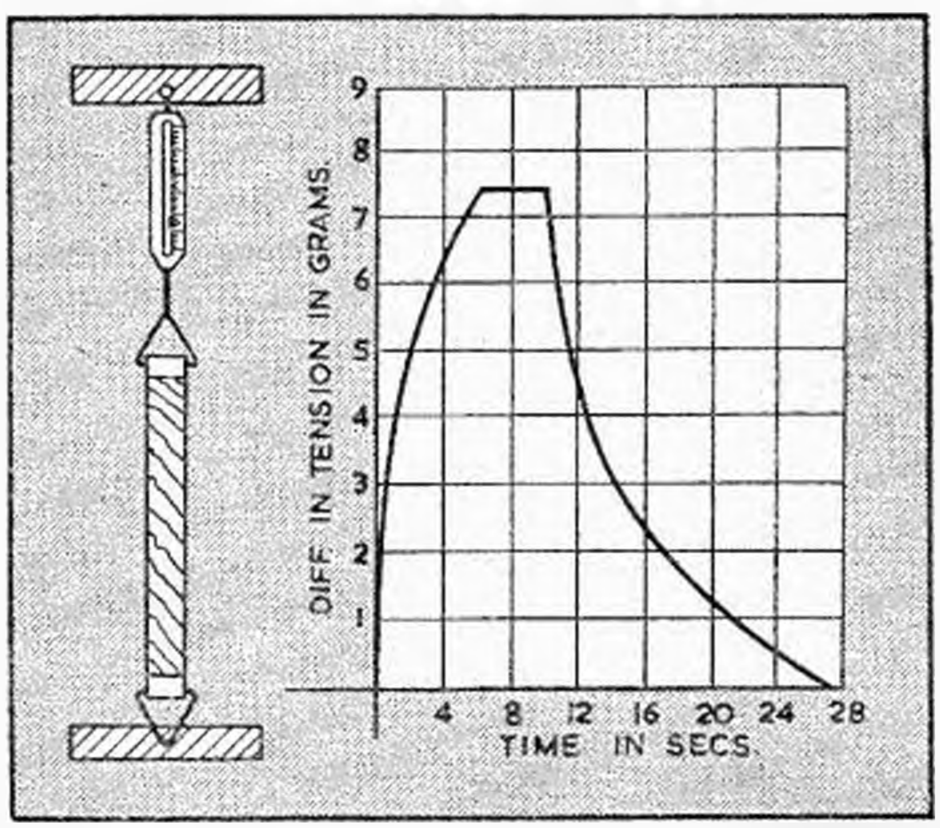
As a result of conflicting opinion on nylon covering here is an account of experiments I have conducted.

I cut a piece of parachute nylon 1½ inches wide and approximately 12 inches long and fastened it to two triangles made of 1/16 inch steel rod. Attachment was by passing the strip through the triangle, using liberal quantities of aero cement to fasten the ends back onto the strip and making sure that the distance between the overlapping portions was exactly 10 inches. I then weighed the nylon and metal triangles, the weight being approximately 16 grms. One end was then suspended by means of a nail and onto the other end a spring balance was attached, the other end of the balance being secured with another nail in such a way that the tension was exactly 40 grms. The nylon was then immersed in water and after the excess of water was shaken off the whole was weighed again. The reason for weighing was only to ensure that the weight of the wet nylon and attachments was less than the applied tension. At various time intervals the tension on the balance was noted, also the temperature. It will be seen from the tables and from the graph that the tension decreased fairly rapidly, showing that the nylon was stretching. After approximately six minutes it had reached it maximum length, where it remained for approximately four minutes after which it began to shrink again, rapidly at first and then more slowly. After 30 minutes it had regained its original size.

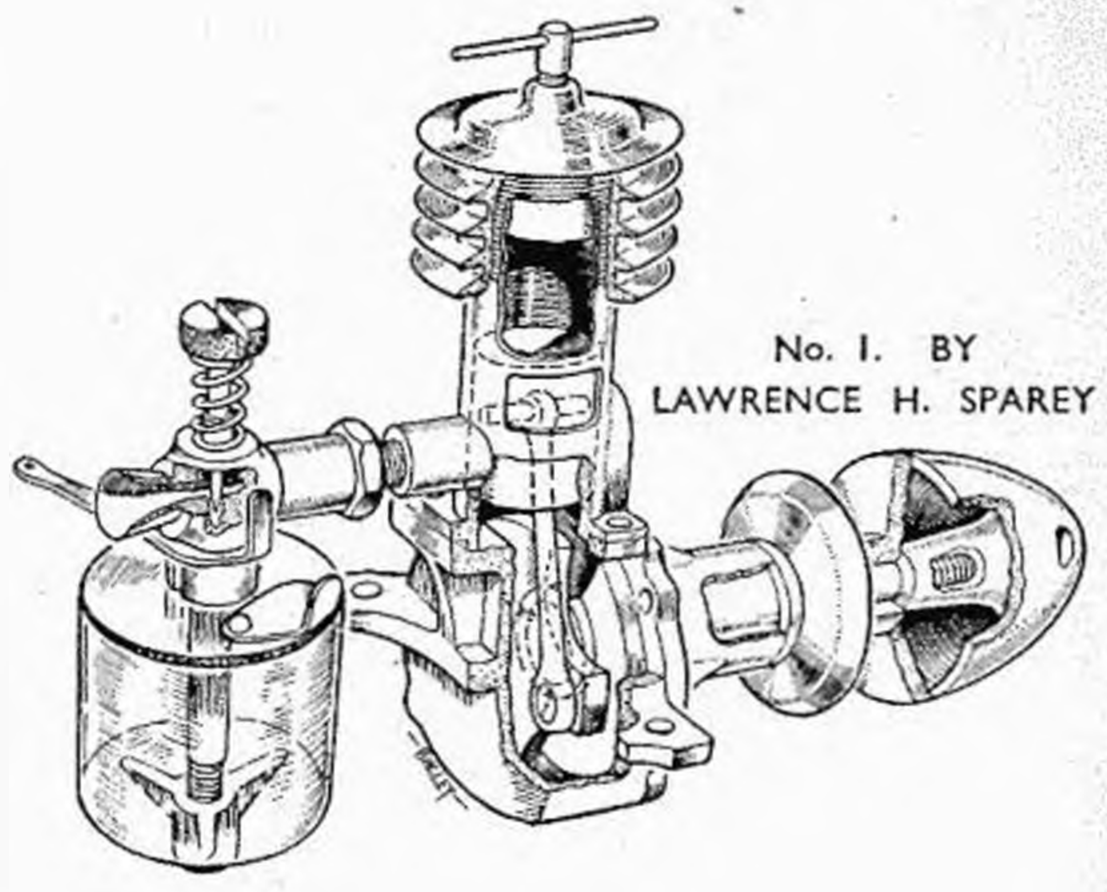
From this experiment we can conclude that the published method of wet covering was quite justifiable and would produce good coverings, because if applied and fixed while in a wet state it would tighten up as it dried off. It will be seen that the maximum difference in the tensions is 7½ grms. which represents a distance of ·15". The amount of shrinkage may be expressed as ·18 inches per ft. this being nearly 3/16".

For the next experiment I doped the strip of nylon using ordinary model dope which however was of quite thick consistency as much of the solvent had evaporated. I found that the nylon did not shrink as the dope dried. When the first coat was dry I applied a second coat of dope and again no shrinkage occurred. I then subjected the doped strip to more intensive heat when a small permanent shrinkage occurred. The balance showed an increase of 2 grms which represents a shrinkage of ·05 inches per foot. I will leave readers to draw their own conclusions from this experiment. I would add that the experiment was carried out twice, the second time as a check, and that both sets of figures agreed. The set of figures I have given in the table and on the graph are those of the second experiment. There is no doubt that nylon is a very satisfactory covering material.

TIME IN SECS.	0	1	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
TENSION IN GRAMS	40·0	36·0	35·0	33·6	32·5	32·5	32·5	35·1	36·6	37·5	38·1	38·6	39·2	39·5	39·8	40·0	40·0
DIFFERENCE	0	4·0	5·0	6·4	7·5	7·5	7·5	4·9	3·4	2·5	1·9	1·4	0·8	0·5	0·2	0	0



Engine Analysis



No. 1. BY LAWRENCE H. SPAREY

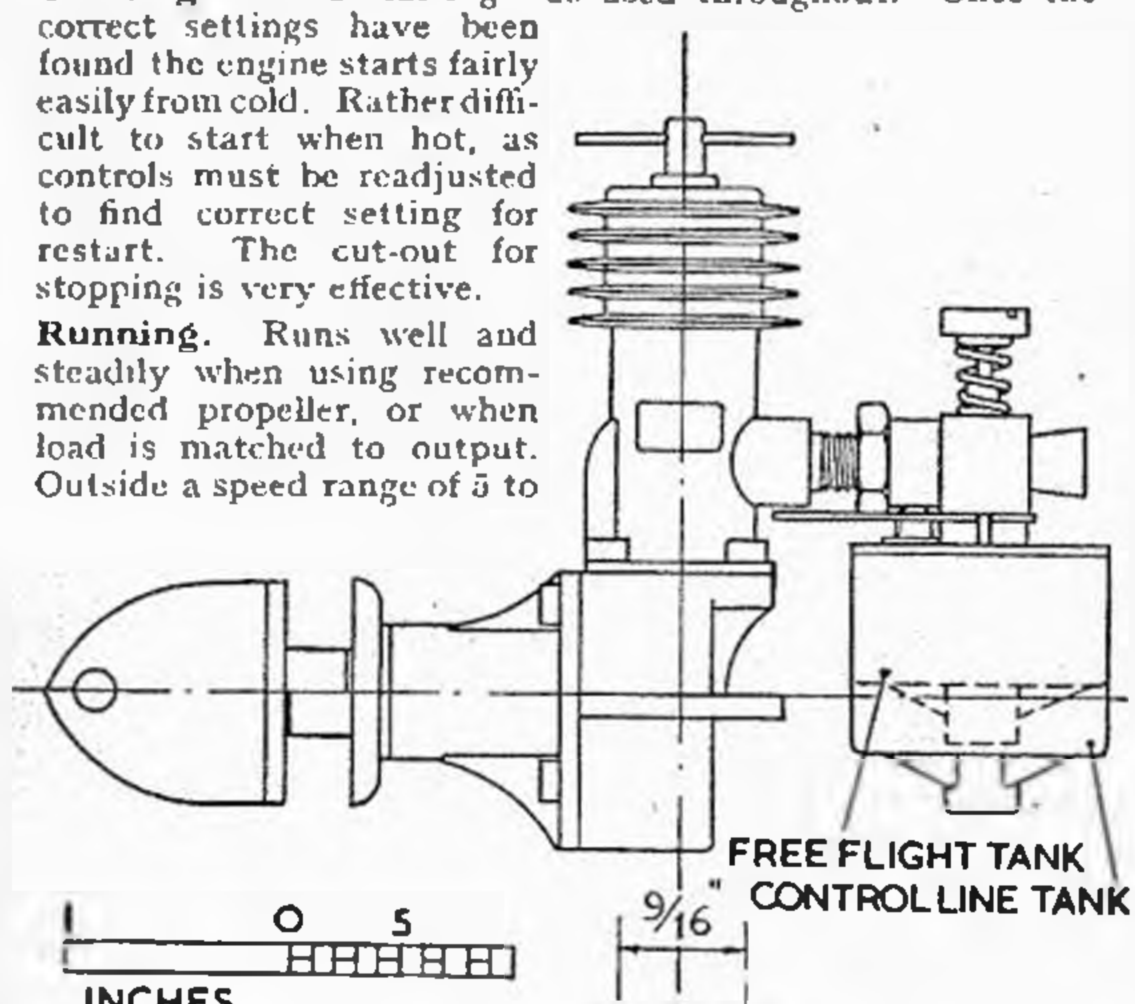
As this is the first of a new series, a few words of introduction would not be out of place. It is our intention to deal in turn with each and every British engine, both petrol and diesel, that is on the market, giving the fullest possible information available. General information is being supplied by the manufacturers and the actual testing carried out by our well-known staff contributor, L. H. Sparey, whose experience of miniature motors and model engineering numbers twenty years or so. In addition to accurate three-view drawings, cut-away perspectives, and performance graphs, details of a specially designed Aeromodeller airscrew will be given for each engine. These airscrews are being designed by P. R. Payne, better known as John Halifax, another well-known contributor of ours, who is working in close co-operation with Mr. Sparey in this respect. Every engine that appears in this series will have been tested on the same equipment thus ensuring comparative results and we would emphasize that considerable care and thought has gone into the test equipment used in order to maintain the highest possible accuracy.

TEST

Fuel. Recommended fuel was used.

Starting. Hand starting was used throughout. Once the correct settings have been found the engine starts fairly easily from cold. Rather difficult to start when hot, as controls must be readjusted to find correct setting for restart. The cut-out for stopping is very effective.

Running. Runs well and steadily when using recommended propeller, or when load is matched to output. Outside a speed range of 5 to 7,000 r.p.m. engine "hunts," and it is almost impossible to maintain a steady speed. This complicated the tests considerably.



B.H.P. As may be seen from the graph, power rises steeply with revs. between 5 and 6,000 r.p.m., after which a gradual flattening takes place culminating in maximum B.H.P. output at 7,000 r.p.m. The considerable figure of ·109 b.h.p. is achieved, which is extremely good for a 2 c.c. engine, and compares well with the few published figures for b.h.p. available for small diesels, which are, in our experience, usually exaggerated. Above 7,000 r.p.m. power falls off to ·08 b.h.p. at 10,000 r.p.m. This was the maximum speed at which engine was tested.

Static Thrust. The graph shows that using the maker's standard propeller, a maximum thrust of 17·6 ozs. was developed at 5,500 r.p.m. The particular engine tested would not run at higher speed with this load. It will be noted that static thrust falls quickly as r.p.m. decrease.

Tests were also made with an Aeromodeller propeller specially designed for this engine. Maximum revs. attainable with this airscrew were 6,500, which reaches very nearly the maximum b.h.p. revs. Static thrust developed at this point is 18·7 ozs. It was not found possible to run the engine consistently at a speed below 5,000 r.p.m. with the Aeromodeller propeller.

GENERAL AND CONSTRUCTIONAL DATA

Name. E.D. Competition Special.

Manufacturers' Name and Address. Electronic Developments (Surrey) Ltd., 18, Villiers Road, Kingston-on-Thames, Surrey. Tel.: Kingston 1223.

Retail Price. £4. 17s. 6d.

Delivery. 7 days.

Spares Service. Complete spares service direct from factory with 14 days delivery.

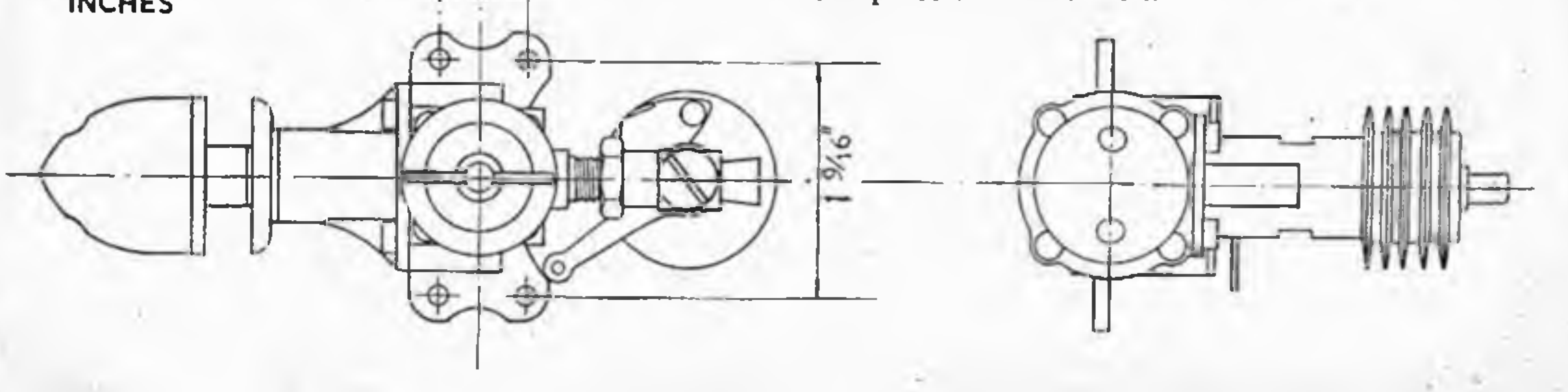
Type. Compression Ignition "Diesel."

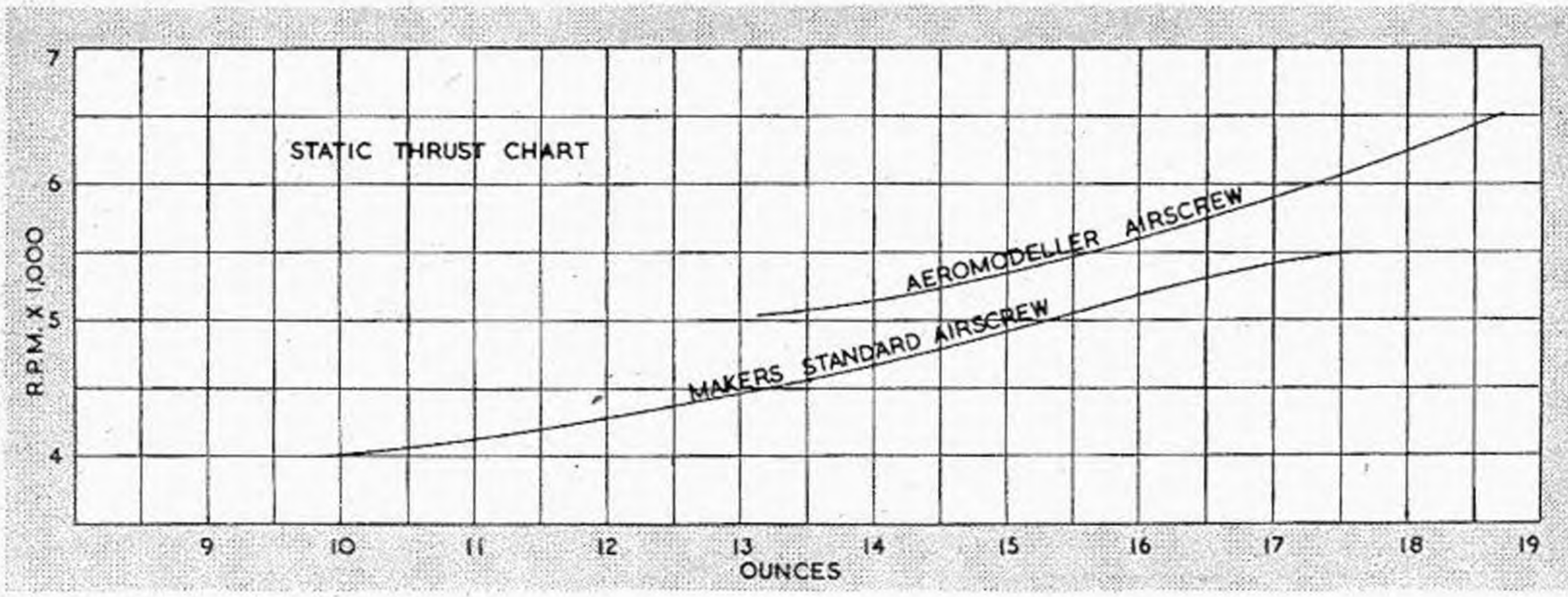
Specified Fuel. 1 part Ether Meth: 1 part Castor Oil: 1 part Paraffin Oil (Burning).

Capacity. 2 cubic centimetres: ·122 cubic inches.

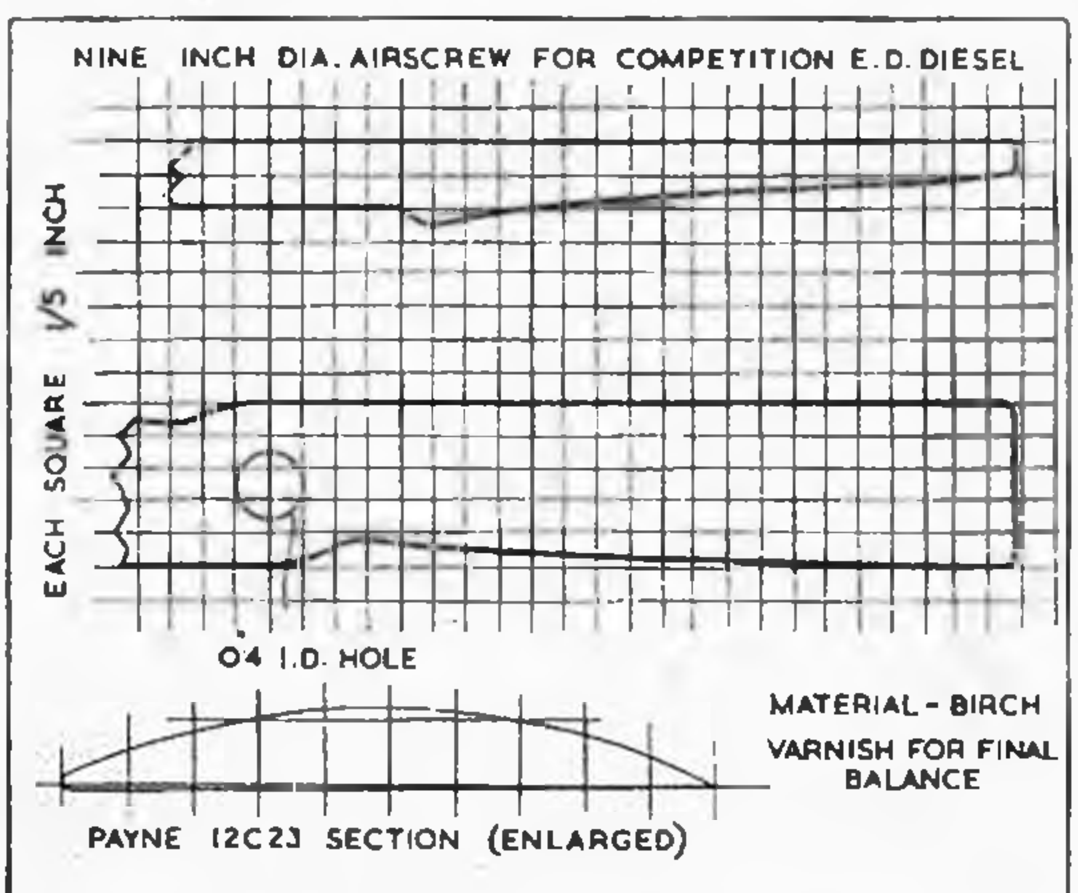
Weight. Bare 6 ozs. With 11 in. prop. 6½ ozs.

Compression Ratio. 16-1.



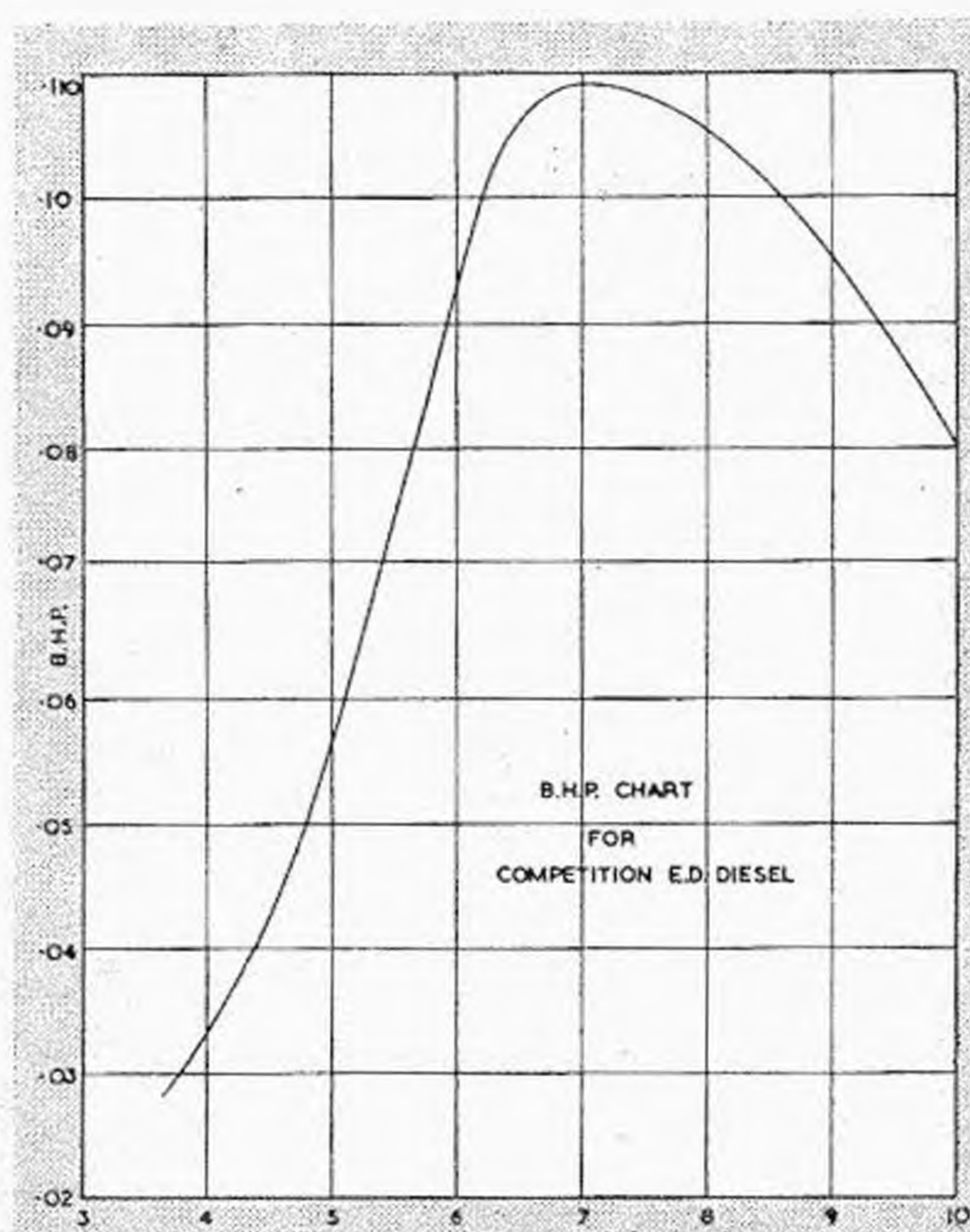


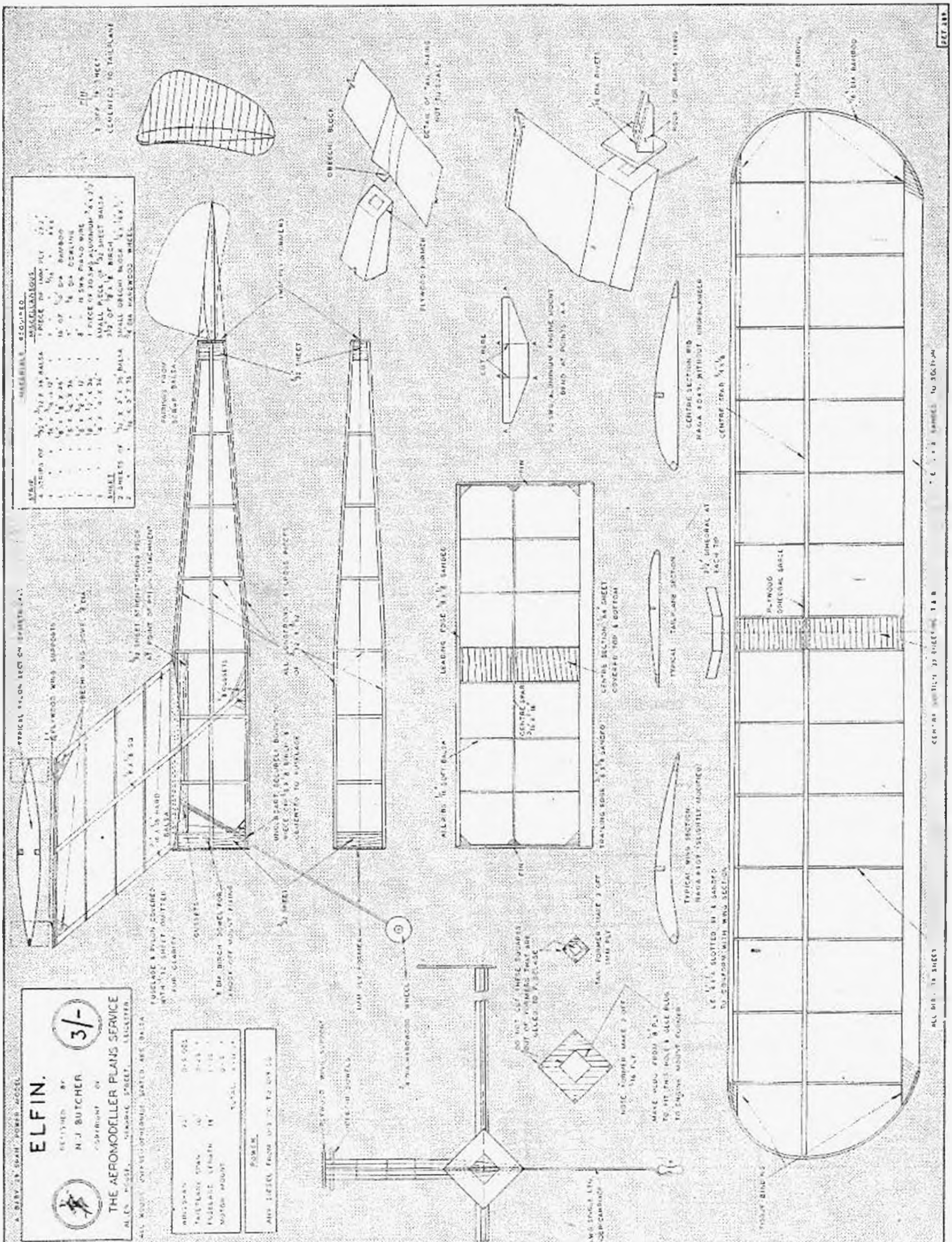
Mounting. Beam. Upright, or inverted.
Recommended Airscrew. Free flight 11 in. dia. 5 in. pitch. Control line 9 in. dia. 11 in. pitch.
Recommended Flywheel. 2 in. dia., weight 4½ ozs. Obtainable from manufacturers price 10s. 6d. with washer and Simmonds nut.
Tank. Plastic, capacity, 4 to 4½ minutes running time.
Bore. ½ in. **Stroke.** ⅝ in.
Cylinder. Hardened steel, ground and honed to accuracy of 0·0001 in. Ports: 2 exhausts, 1 induction, 2 transfer. The induction and transfer ports are soft soldered to the cylinder.
Cylinder Head. Duralumin with 5 cooling fins. Screwed on to cylinder with clearance for contra piston.
Contra Piston. Hardened steel, ground and honed to 0·0001 in. limits, adjusted by means of a Vernier Compression Screw.
Crankcase. L.33 alloy. Pressure die-cast and webbed to give maximum strength.
Piston. Cast iron, ground and honed to 0·0001 in. accuracy. Deflector milled to coincide with transfer port. No rings.
Connecting Rod. Hardened steel, bored and ground to 0·0001 in. limits.
Crankpin Bearing. Plain bearing machined from solid integral with crankshaft.
Crankshaft. Machined from S.14 hardened and ground to 0·0001 in. limits.
Main Bearing. Bearing housing made from L.33 material, pressure diecast, and bushed at each end with cast iron bushes, leaving 1/32 in. clearance between bushes. The bushes are ground to 0·0002 in. limits.
Special Features. Built in cut out: Vernier compression adjustment: Specialised timing giving maximum possible power: Easily converted for inverted running by slackening carburettor locknut and reversing complete carburettor unit: Runs in either direction without affecting efficiency.



ORDINATES FOR PAYNE 12C23 SECTION

STATION	0	2	5	10	20	30	40	50	60	70	80	90	100
UPPER	0·3	2·1	3·6	5·7	8·5	10·3	11·8	12	11·4	10	8·0	4·9	0
LOWER	0·3	0·7	—	—	—	—	0·42	—	0·28	—	—	—	0

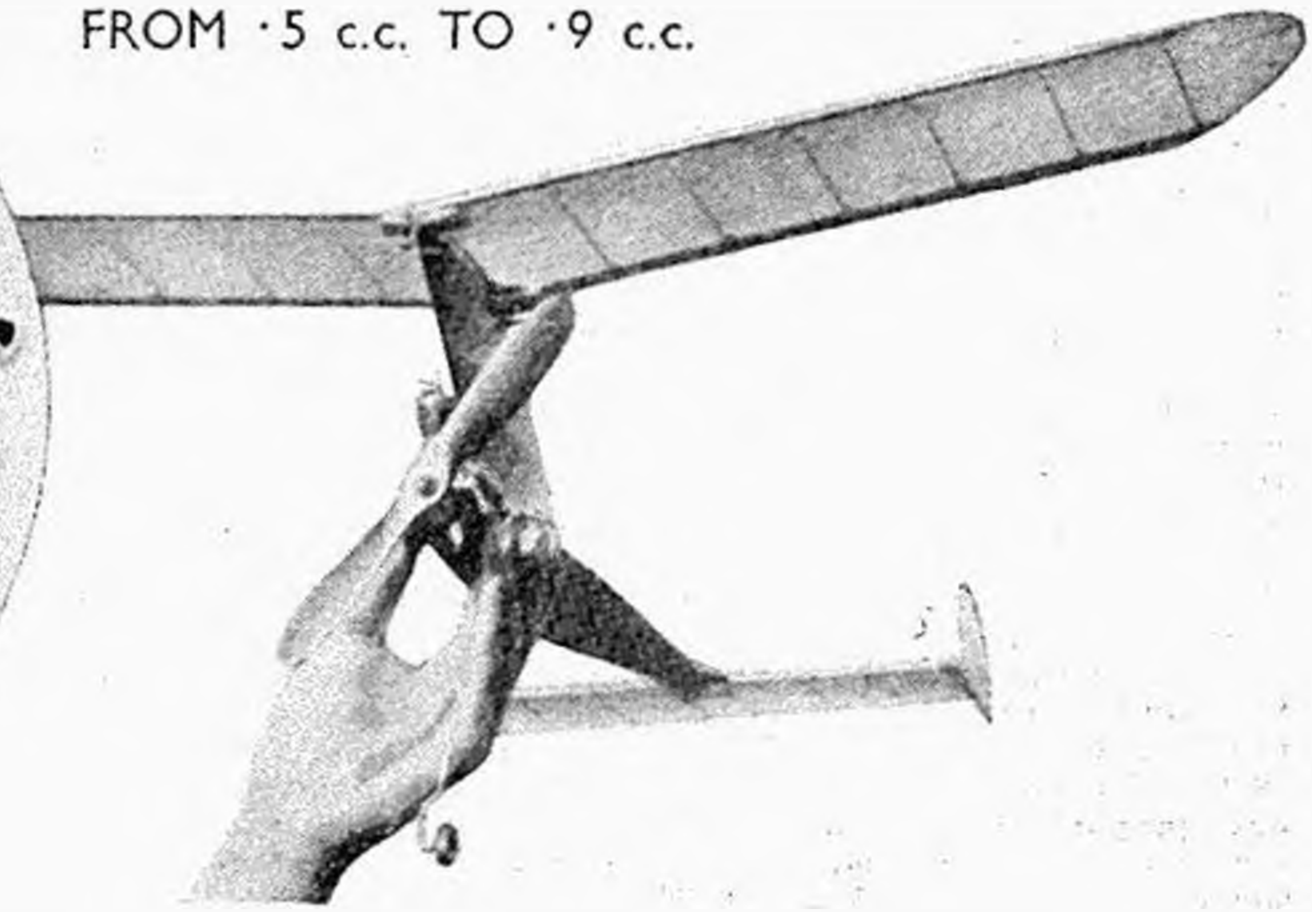



ELFIN.
N. J. BUTCHER
THE AEROMODELLER PLANS SERVICE
3/-

A BABY PYLON MODEL FOR DIESEL MOTORS FROM ·5 c.c. TO ·9 c.c.

Elfin—Mk II

By N. J. BUTCHER



ELFIN was designed for those modellers with baby engines who want a machine which they can not only pleasure fly but also enter for competitions with more than the usual chance of a "baby" of placing. The original has been flown consistently throughout the past season, and in spite of sundry flights into houses, trees, etc., has suffered no damage whatever apart from torn tissue, not even a broken prop.

Fuselage and Pylon. Select 4 good pieces of 3/32 sq. and build in the normal manner; when dry add the plywood formers at each end, it being advisable to shape the blocks for the engine mount and tail fixing before cementing the formers to the fuselage. Cement in the flush 3/32 in. sheeting at the point of pylon attachment and sandpaper the whole smooth. Bind undercart leg to a piece of ⅛ in. sq. birch and cement firmly in the position shown, it will be necessary to cut a piece from the bottom longeron to place the wire central. Sheet cover the top two sides FIRST, leaving the bottom two uncovered. Now build the pylon; the bottom rib is of ¼ in. sq., a Vee being cut in the bottom to fit the fuselage before sanding the rib to section. The pylon is built in the same manner as a symmetrical tailplane, but make sure to leave the ⅛ in. sq. spars projecting at the bottom. Sheetcover the pylon and add the two obechi dowels before cementing it to the fuselage. Now cut two holes in the top of the body to take the pylon spars, slide these through and thoroughly gusset it to the bottom longeron. You can now finish sheeting the fuselage. When dry, sandpaper and cover with tissue banana oiled on. This method of fuselage and pylon construction is one of the lightest and strongest I have yet encountered, the original taking dozens of severe knocks without any damage whatever, it was even entered in a comp after being sat upon *en route* in the car.

The Wings are built as usual, the only point being the flat bottomed centre ribs which make for a rigid wing fixing without shaping the top of the pylon. The tips can be either steamed or bent to shape over a candle flame.

The Tail is perfectly straightforward except for the plug-in part, the tongue being made from ¼ in. sq. obechi firmly cemented through the leading edge of the tailplane. After covering, fair the centre section in to the fuselage contour with scrap sheet.

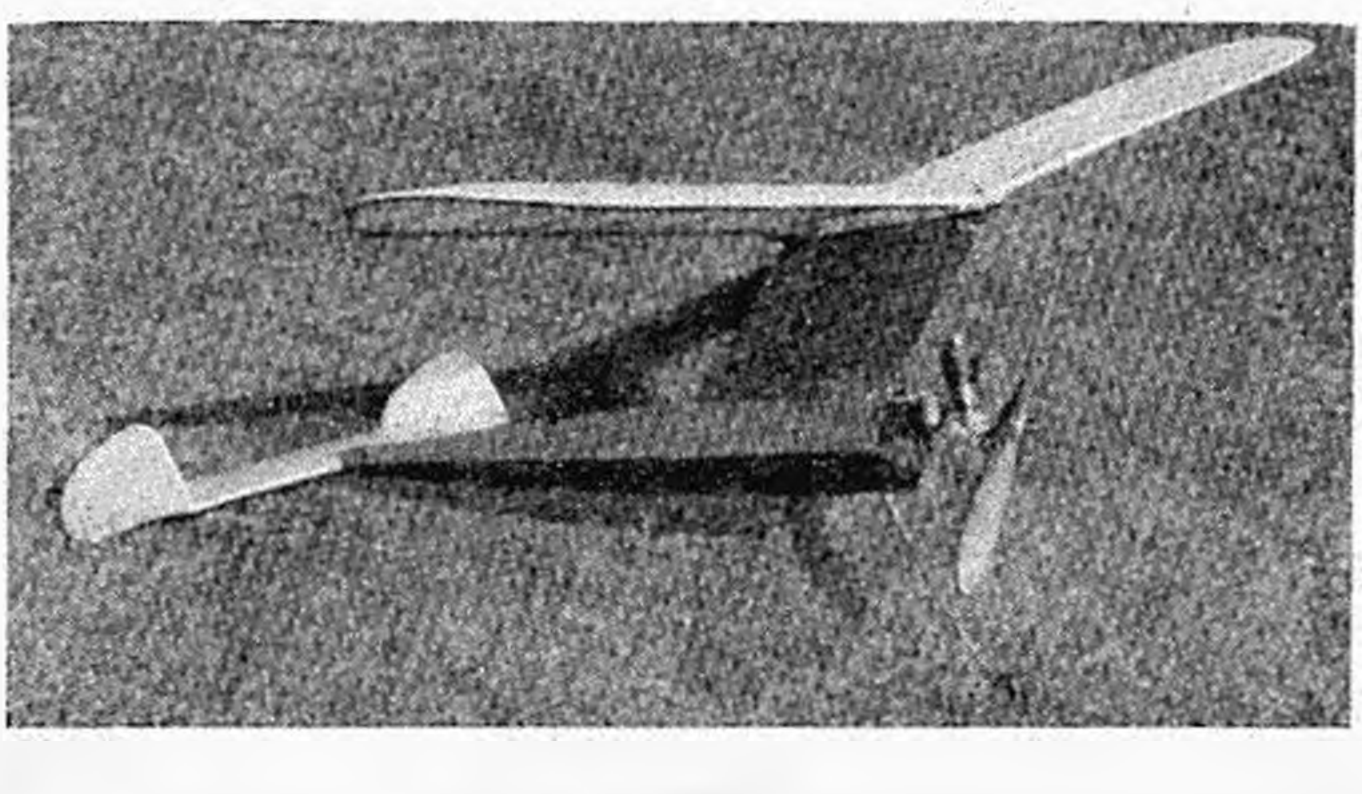
The Fins are cut from 1/16 in. sheet, sanded and covered with tissue banana oiled on.

Covering and Doping: The original was covered with jap tissue, the wings and tail being given one coat of dope, though it is advisable as the tail is in the way of the oil thrown out by the exhaust to give it a coat of banana oil as well.

Power: The original was powered with a Micron 0·8 c.c. but as you may not be able to obtain one of these, and the plane will fly equally well with any other motor of similar capacity, I have purposely omitted the sizes of the engine mount as this will, of course, depend upon whatever motor is used. The mount itself is made from 1/16 in. aluminium sheet bent to the shape shown and firmly bolted to the ply bulkhead.

Incidence: This will of course vary with the weight of the motor, but the model should fly with 1½ positive on the wing and the tail at zero.

Flying: Assemble model and check for warps; there should be no washout or washin on the wings, but the tail should have slight turn to the right. Test glide, if nose heavy do not add negative incidence to the tail but about 1/32 in. under the front of the wing, but if model stalls put 1/32 in. or 1/16 in. under the front of the tail. The first power flights should be made at the lowest possible revs, no indication of the thrust line can be given as this will again depend entirely on the motor. After one or two satisfactory flights have been made it is advisable to cement the tailplane to the fuselage, as this prevents accidental alteration of the trim; before doing this the original spun in several times, but it has not done so since.



Full size plans are available as usual, price 3/–, from the Aeromodeller Plans Service, Ltd., Allen House, Newarke Street, Leicester (see 1/4 scale reproduction opposite)

The FLYING SCALE MODEL Part III

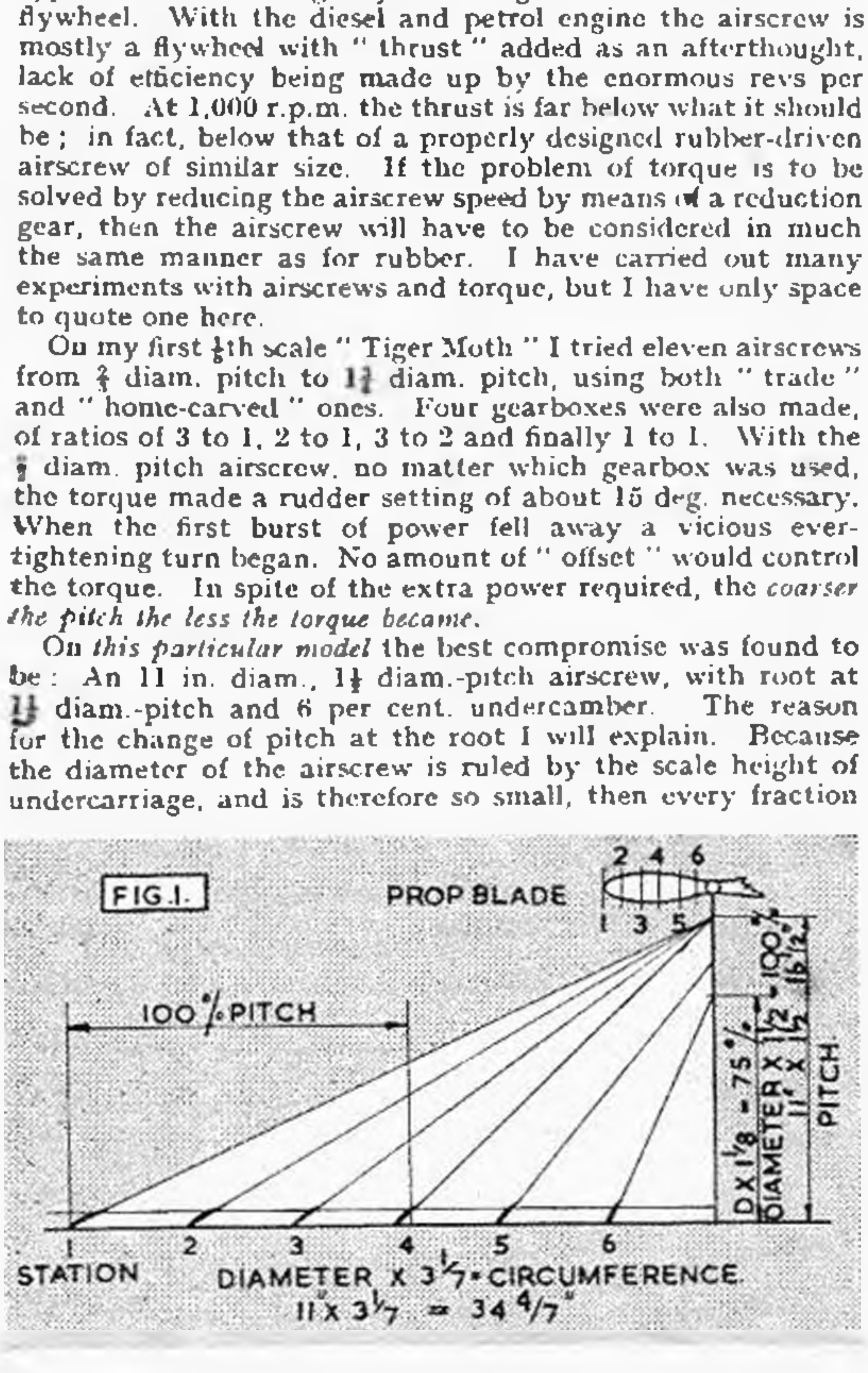
BY C. RUPERT MOORE, A.R.C.A.

LAST month I made it clear that a diesel engine with its concentrated weight, and the Moore Diaphragm, had made the C. of G. problem easy, but before continuing, there are one or two points about the " Diaphragm " which I think should be made clear. As it is not practical to " shorten " the front skein sufficiently by " pre-tensioning " some sort of mechanical tensioner is necessary. Most of the slack is taken up by pre-tensioning, but final adjustment is mechanical. I use the common system of pre-tensioning. I make up a skein of half the number of strands, but twice the desired length. This long skein is given enough turns to make it twist itself into a rope when it is folded double. The ends are brought together on the same hook and the skein allowed to twist. The direction of the pre-tensioning should be such that when the airscrew is wound, at first, the skein unwinds itself, it then crosses over and then winds up. This is important as it evens out the skein every time it crosses over.

In its present form the diesel has left us with a problem which in most cases is more difficult to solve than the C. of G. problem, and that is TORQUE. With airscrew speeds in excess of 1,000 r.p.m., torque becomes the major problem. Most people know that the lift of a wing increases as the square of the speed and torque increases in a somewhat similar manner, so it is clear that the slow speed airscrew is a great advantage *if it has the required thrust*, and here rubber scores. To throttle back an engine to 1,000 r.p.m. means the loss of the majority of its power. The only satisfactory solution is a reduction gear, but I do not believe there is one in existence. It will be no easy task to make a gear of this type work with a single-cylinder engine without the use of a flywheel. With the diesel and petrol engine the airscrew is mostly a flywheel with " thrust " added as an afterthought, lack of efficiency being made up by the enormous revs per second. At 1,000 r.p.m. the thrust is far below what it should be; in fact, below that of a properly designed rubber-driven airscrew of similar size. If the problem of torque is to be solved by reducing the airscrew speed by means of a reduction gear, then the airscrew will have to be considered in much the same manner as for rubber. I have carried out many experiments with airscrews and torque, but I have only space to quote one here.

On my first ⅛th scale " Tiger Moth " I tried eleven airscrews from ¾ diam. pitch to 1¾ diam. pitch, using both " trade " and " home-carved " ones. Four gearboxes were also made, of ratios of 3 to 1, 2 to 1, 3 to 2 and finally 1 to 1. With the ¾ diam. pitch airscrew, no matter which gearbox was used, the torque made a rudder setting of about 15 deg. necessary. When the first burst of power fell away a vicious ever-tightening turn began. No amount of " offset " would control the torque. In spite of the extra power required, the *coarser the pitch the less the torque became.*

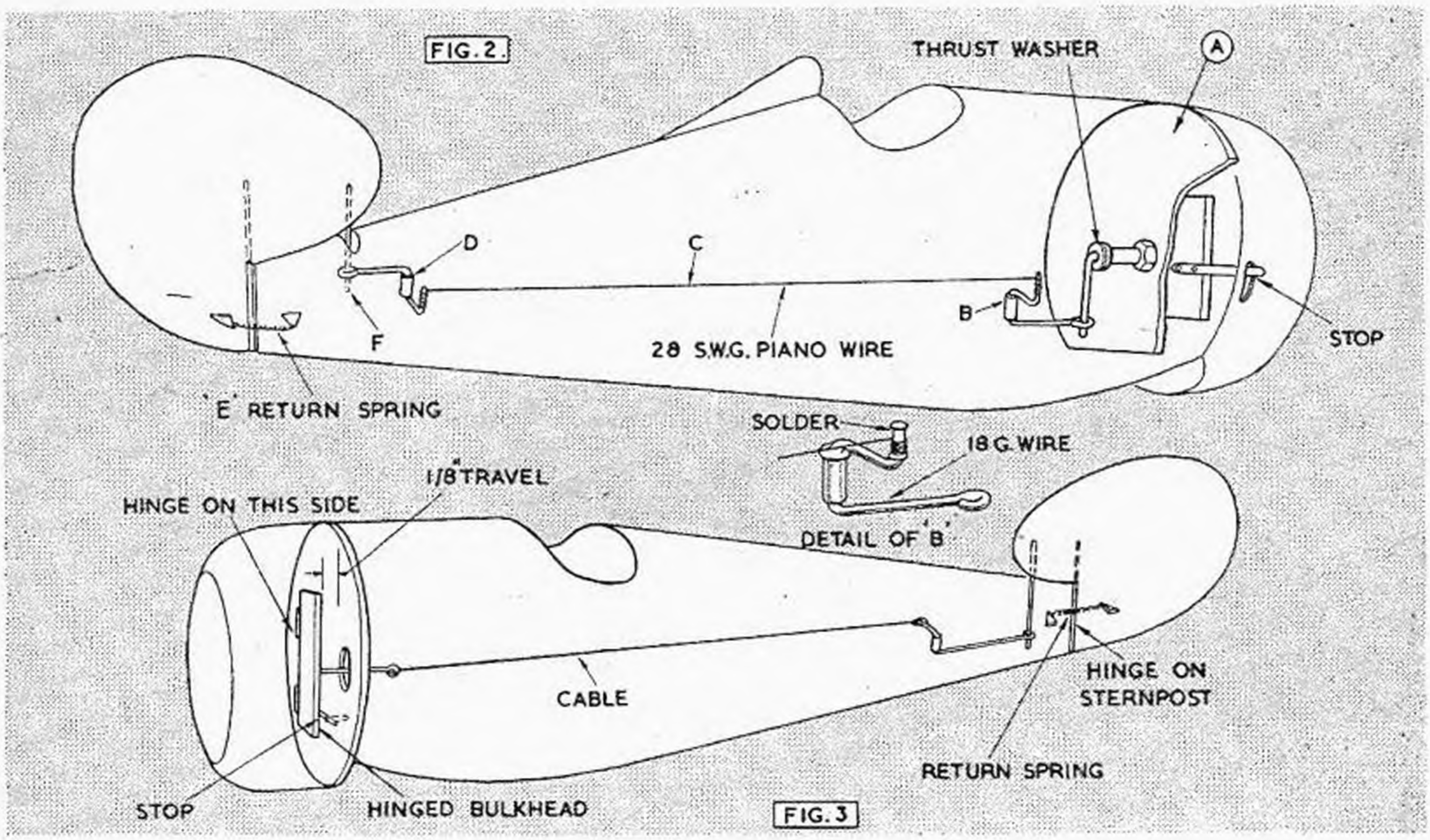
On *this particular model* the best compromise was found to be: An 11 in. diam., 1½ diam.-pitch airscrew, with root at 1⅛ diam.-pitch and 6 per cent. undercamber. The reason for the change of pitch at the root I will explain. Because the diameter of the airscrew is ruled by the scale height of undercarriage, and is therefore so small, then every fraction of the blade must work hard. The tip half of the blade is likely to be the most efficient portion and certainly does most of the work. The theoretical pitch of 1½ diam. we will call 100 per cent.; 25 per cent. slip is an average found by many experiments, leaving an *Effective Pitch* of 75 per cent. If the whole airscrew is slipping to the extent of 25 per cent., then the root is stalled. To overcome this, the root is pitched at the Effective Pitch of 75 per cent. (in this case) of 1½ diams = 1⅛ diam.-pitch (Fig. 1). Thus, stations 1, 2, 3 and 4 are pitched at 100 per cent., 6 at 75 per cent., and 5 halfway between, *i.e.*, 87·5 per cent.



The section of the blade was found to be important, *thin*, moderately undercambered sections proving most efficient. The root should have a thickness-chord ratio of not more than 20 per cent., which rules out balsa as an airscrew material. Undercamber increased all-round efficiency as it was increased, until suddenly when the undercamber reached about 12 per cent., efficiency fell away very rapidly. It was found that a ratio in the region of 6 per cent. undercamber *along the whole blade* gave the best results.

With an airscrew of this type torque is usually controlled easily by giving the propeller shaft up to 3 deg. side thrust. In certain cases where the fin area is very small, side thrust alone will not trim the model, and a spring-loaded tail hook is coupled to the fin in such a way that 2 deg. or 3 deg. offset of the fin is given when wound up. When the tension dies away, the spring-loaded fin returns to the central position for the glide. It is this solution which promises the most for the diesel engine until reduction gears are obtainable. With rubber motors, large changes of fin angle are not possible, as the rapidly falling power allows the fin to take complete charge, but with the diesel, where it is either flat-out or dead, any angle required can be used. The fin position should only be controlled by the engine and on no account by any form of auxiliary timer, otherwise an engine failure would prove disastrous. The two forces which can be used are torque and thrust. Fig. 2 shows a torque reaction control which works well. The engine bearers are fixed to a false bulkhead to the centre of which is fixed an axle. This axle fits through a centrally placed bearing in bulkhead "A". The axle is bent at right-angles to form a lever which engages the loop in bellcrank "B". Cable "C" connects bellcrank "D" to "B" and the loop on "D" engages peg "F" on L.E. of fin. When the engine is started the torque tends to turn the engine bearers and is prevented from doing so by a stop which allows only ¼ in. travel. As the axle lever swings it moves bellcrank "B", etc. When the engine stops, spring "E" pulls the fin back to neutral. I should like to re-emphasize here that refinement of design is the secret of successful gadgetry. On no account should the right-angle bend on the axle be relied upon to form a thrust bearing. A proper washer should be soldered in place. In a similar manner, washers should be soldered on bellcranks where required. *Cable "C" should be made of* 28 *s.w.g. piano wire* as nothing else retains a constant length. The angle of the fin is limited by the length of the slot in the decking through which peg "F" fits, and packing is cemented in place for adjustment. Many variations of control by thrust can be used, one of the easiest being to hinge the false bulkhead at the bottom and allow the top to have ⅛ in. forward travel. This is spring-loaded so that with power on, the engine assumes a position of about 2 deg. down-thrust; when it stops it returns to level. This slight movement is coupled to the same type of control as in Fig. 2. Like on the torque reaction control, Fig. 2, the stop limiting the travel of the false bulkhead should protrude beyond the cowling so that it can be held (or wedged) while starting the engine, otherwise the trimming mechanism is likely to be damaged. Where more suitable, this hinging method can be modified in such a way that the false bulkhead is hinged at one side in order that the engine has *side thrust while running*. Care of course should be taken to make sure that the offsetting is in the direction to correct torque.

This last method is possibly the simplest as only one bellcrank is required. One point should be made clear: that is, that the ⅛ in. travel of the false bulkhead is magnified by



making one arm of the bellcrank much longer than the other. The magnification being as the ratio of the short arm is to that of the long arm. Fig. 3.

Any of these three trimming devices can be coupled to the ailerons alone, or be in conjunction with the rudder, but it was found that the ailerons were liable to constant strain through bad landing and also it was difficult to arrange for knock-off wings.

Before finishing with problems related to the motive power and airscrews, I would mention free-wheeling

The first aspect of the problem is the aerodynamic. I refer you to my article entitled " Airscrew Drag " in the July, 1938, issue of the AEROMODELLER and also the graph, Fig. 4, in this article, which is taken from that experiment. It will be remembered that I made a copy of a well-tried wooden airscrew in soft aluminium sheet. I bent this to the same pitch as the wood airscrew, and then by means of a crude home-made wind tunnel tested the resistance in both locked and free-wheeling states, in a wind of approximately 8½ m.p.h. Having found the results sufficiently similar, I proceeded to carefully pitch this aluminium airscrew from half a diameter pitch by stages up to 3 diam. pitch, taking locked and free-wheeling tests at each stage.

Thus I demonstrated that this airscrew at ⅔ diam. pitch offered the same resistance locked as freewheeling. Below this pitch the airscrew offered greater resistance when free-wheeling. Above ⅔ diam. pitch an airscrew offered less resistance when freewheeling. At 1 diam. pitch the free-wheeling advantage is 2 to 1, and at 2 diam. pitch 3 to 1. The fine pitched diesel or petrol airscrews are settled at once. It would be a decided aerodynamic disadvantage for them to freewheel, even if the mechanical difficulties could be solved. One must not forget that a loose airscrew alone stops an engine! With the rubber-driven airscrew using a pitch between 1 to 1½ diam. the advantage (as an individual unit) is definitely for freewheeling, but there is another problem which comes into all this. In " Airscrew Drag " I described an experiment where some attempt had been made to find if there was a critical airscrew size where the resistance, whether freewheeling or locked (whichever was the greater) was sufficiently great to destroy the glide. I found there definitely was, but this size was about half the span and therefore only of academic interest as not even Wakefield models use airscrews of this size. The airscrew was whittled away ⅛ in. at a time and the glide appeared suddenly when the airscrew reached a little below this size. It was like taking the brake off. The glide improved rapidly for each extra ⅛ in. immediately below this size until the airscrew reached two-fifths of the span. Below this size the glide showed no marked improvement with reduction.

With a scale airscrew of one-quarter (or less) of the span, the advantage of a freewheel is very doubtful. I have tried to measure the difference in performance but have failed. I therefore decide for or against freewheeling solely on whether I wish to lock the airscrew horizontally out of the way, as on " Viper II " and my " Tiger Moth." If self-locking is not desired, I fit a freewheel for appearance's sake. Where the airscrew or airscrews cover more than two-fifths of the span I fit freewheels as an aerodynamic advantage.

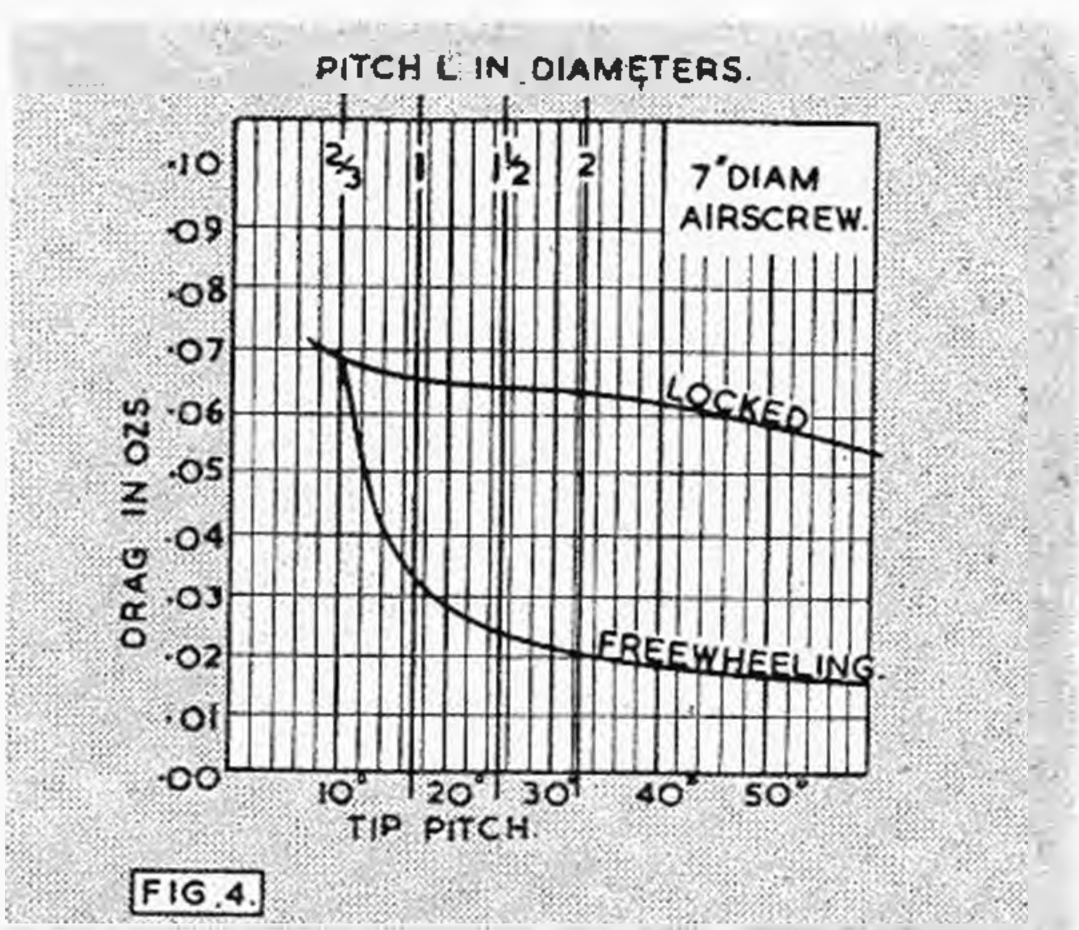


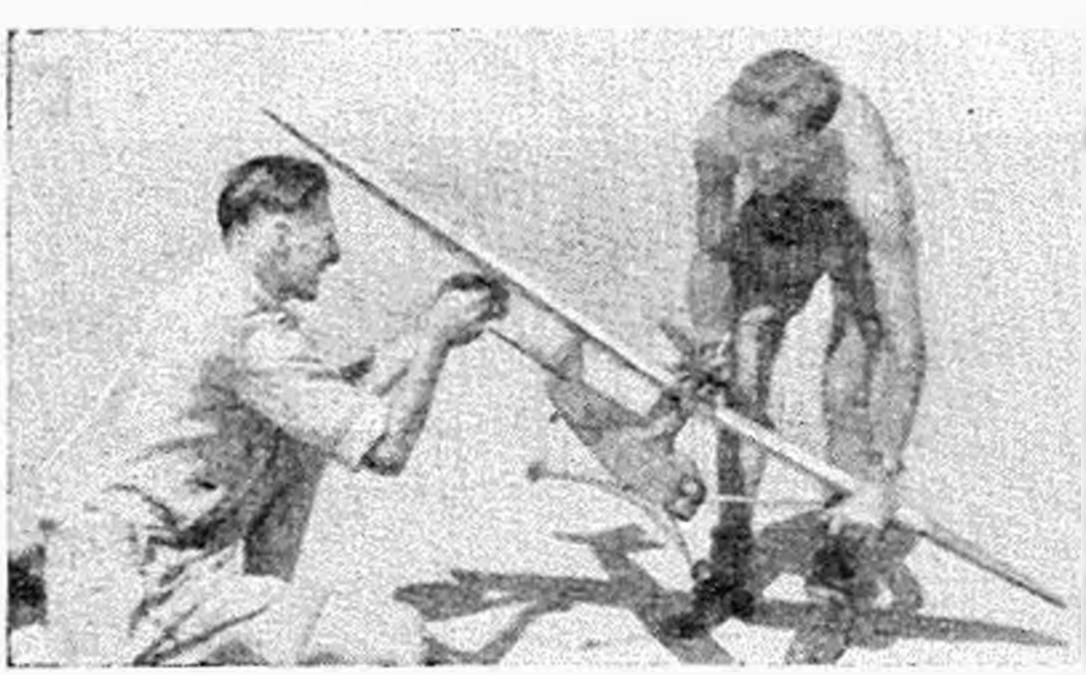
FIG. 4.

Aeromodelling in Mauripur

BY D · HEBDEN

MAURIPUR Modelling Club differed from most others in that we rarely indulged in competition flying. There were no outside clubs to compete with, and also there were scarcely two people in the club who favoured the same type of model. Models were all sizes, from 7 ft. gliders to small indoor jobs of a few inches span, and all methods of propulsion were tried except compressed air. Diesel, petrol, rubber and rockets were tried, and even bird power on occasions! The only specialist we had was the Club secretary who used to swing props. Being the first member to own an engine, he developed the appropriate muscles first.

The bird-power flying was perhaps the most unusual method of propulsion, and it is hardly likely to be known to most English modellers. The essential kit consists of: one solid glider of about 12 in. span (the stronger the better), 15 feet of thread, complete with towing hook, one large smelly rissole (or similar cookhouse delicacy), and last, but not least, a flight of pariah kites: this being a large hawk-like bird, the scavenger of the East, and usually referred to in a far more vulgar manner. The procedure to follow is simple. Lay out the line with the glider on one end and the rissole on the other, retire into the shade and await developments. Before long the kites appear and swoop on the bait, thus giving the glider a high-speed snatch take-off. On occasions the glider falls to pieces due to the acceleration, but usually it gets released from a good height due to the hawk's erratic flying.



Another creature that came into our plans was a small and inoffensive mouse who lived in a corner of the club room. It narrowly escaped being fitted with a parachute and sent up in a glider equipped with a pilot-ejection seat. Unfortunately a well-aimed boot put an end to our plans.

The outdoor flying season lasted from about September to April, and at other times high winds forced us to concentrate on R.T.P. work. Although the flying field was almost unlimited, the desert was a hard taskmaster and glide testing was rarely possible.

During the close season one or two new ideas were tried out in R.T.P. work, and dog fighting with scale model fighters provided the most thrills (and also the most repair work). These fighters were usually to a scale of 1/18 and they were released two at a time on the same pole in the same direction. Most of them were grossly over-powered and were capable of bursts of great speed. Construction was as strong as possible, consisting of a slab-sided box of ⅛ in. square balsa with 1/16 in. formers added, and stringers of ⅛ in. × 1/32 in. The latter were found to be very strong when slotted edge-on into the formers, and rarely broke. Props usually suffered most damage, and all noseblocks were made the same size so that they could be interchanged in case of need.

The other variation of R.T.P. work consisted of deck landing trials with a scale Sea Fury equipped with an arrestor hook hanging from the rear motor peg. A sheet of ply with three or four arrestors made of strands of 1/16 in. square rubber was used, and some good landings were accomplished.

For outdoor work we were blessed with an abundance of thermals, and o.o.s. flights were the rule rather than the exception. Flocks of circling pariah kites indicated their position, and consequently it was possible to tow gliders up into them as they came across the desert. Occasionally models were attacked by the birds, but they usually contented themselves with dummy runs.

Thanks to the size of the flying ground we were also able to fly power models with a full tank, or on what was left after the ritual of starting. Most power flights ended with the owner dashing over the horizon at high speed in pursuit of a fast-disappearing model, to return dusty but triumphant after everyone else had returned to the club room. Our biggest shock came when we experimented with a "slow-flying" wing section. The model whistled erratically off at tremendous speed after a climb that resembled a drunkard going up an escalator. It was not until we got the model back to the club, complete with a broken prop shaft, that we discovered that the tailplane should have been mounted on top of the fin, as the new section blanketed it very successfully. No more experiments were made with the club engine without reading up *all* the gen on a new section first.

Rockets were also used to tow gliders off, and these were quite successful, but it is essential to launch the rocket vertically, otherwise it curves neatly earthwards, dragging the glider with it.

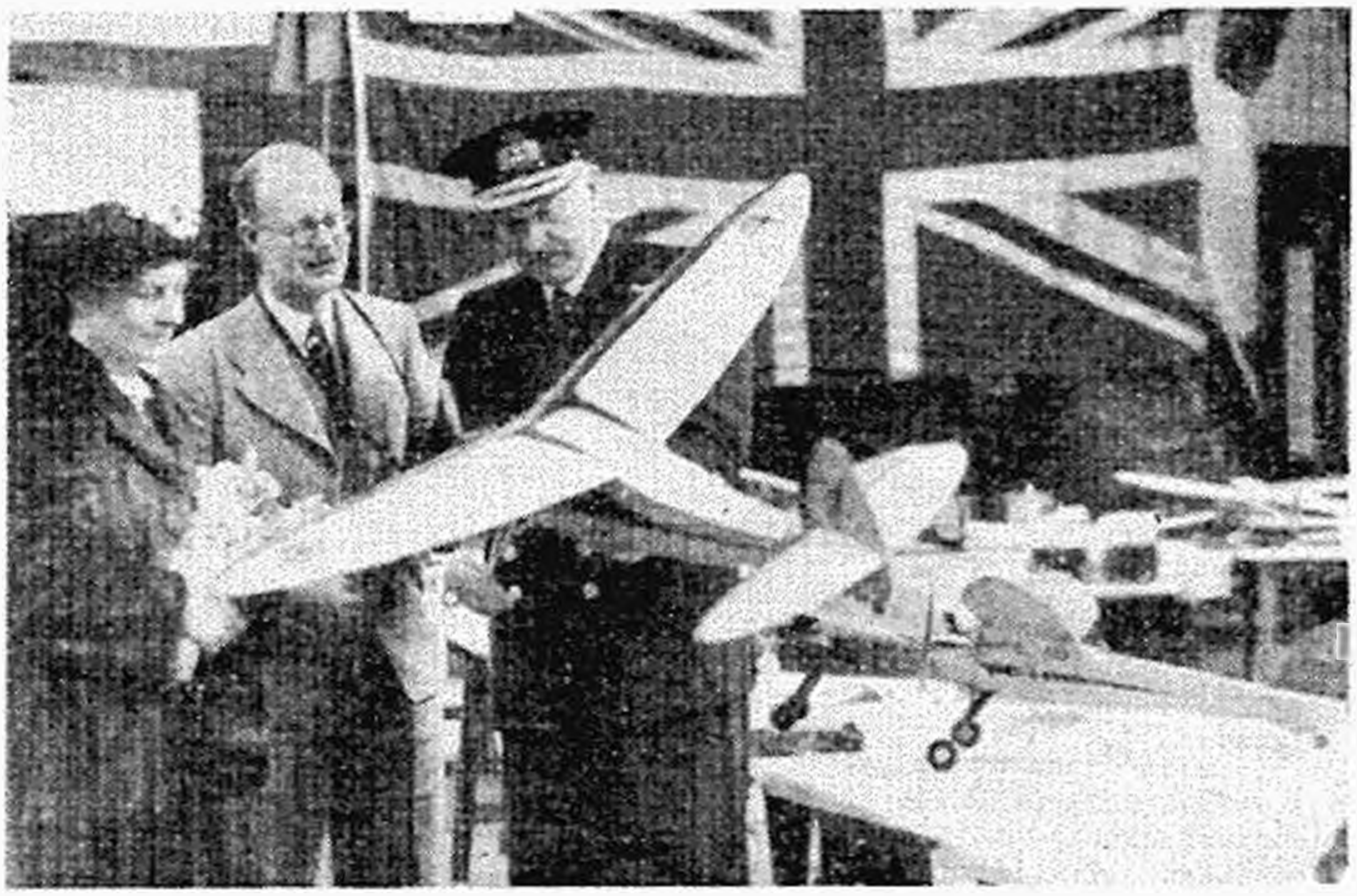
Apart from our large flying field, we were also blessed with a considerable expanse of shallow water, which enabled us to indulge in quite a bit of seaplane and flying boat work. A 36 in. span Auster fitted with twin floats was the first successful seaplane, and "Webby," a small semi-scale flying boat of American design performed consistently until a wind sock pylon sliced one wing off. A 52 in. span BV 138, a Kingfisher, and various assorted three-float duration models were also flown. A modified Zeke regularly demonstrated Kamikaze tendencies at high speed, on one occasion narrowly missing a club photographer who was attempting to snap it in the act.

On the whole, caution was not practised in the club, and often the most amazing contraptions were hurled into the air without even the preliminaries of test gliding. Results often justified the builder's hopes, and the club motto, "Anything (even a brick) will fly if you trim it right," was proved again and again.

Heading photo shows members cramming turns on the Zeke. Note the cigarettes at 10 for 6d. Left, Mongoose, a 6 ft. span model fitted with a 3 c.c. diesel engine that unfortunately did not provide enough power to get it airborne.

ENTERPRISE SCOTLAND!

By D · J · LAIDLAW-DICKSON



Rear Admiral Sir John Bedale, K.B.E., C.B., with Lady Bedale and Mr. D. J. Laidlaw-Dickson of the "Aeromodeller", inspecting one of the many superb models at Scotland's biggest aeromodelling Exhibition at Arbroath.

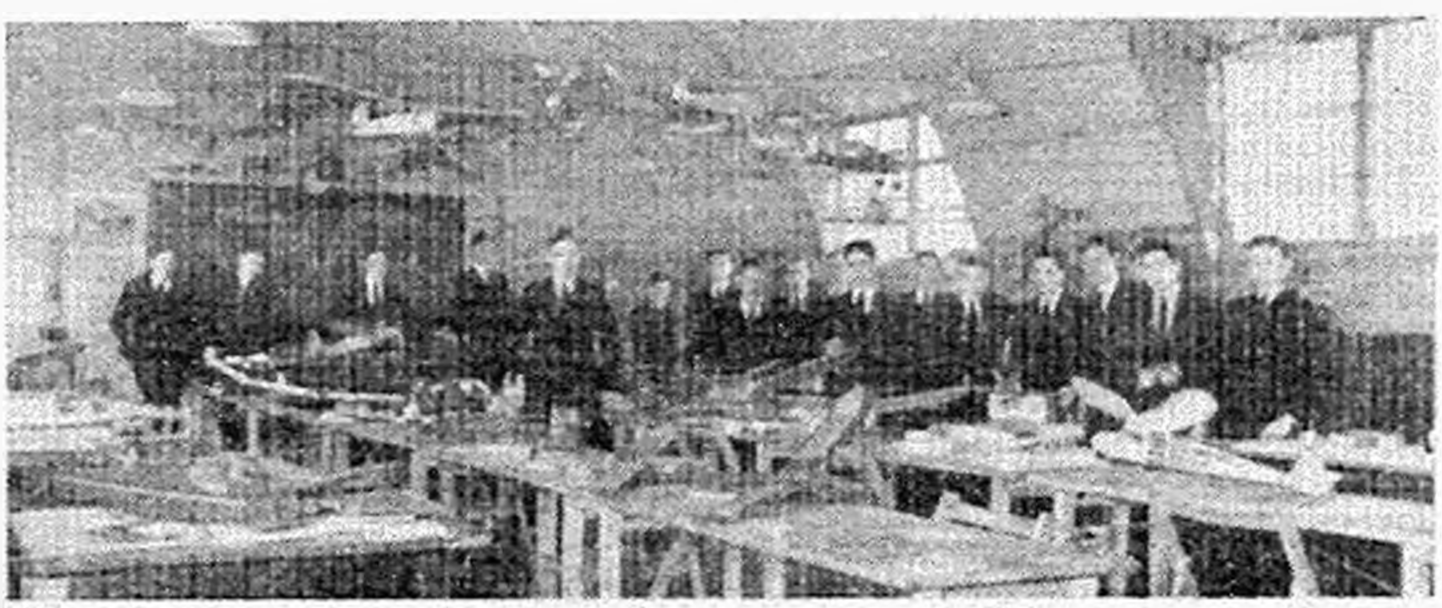
FLYING over Scotland it is easy to appreciate that conditions north of the Tweed are very different from those enjoyed by aeromodellers in the milder south. Apart from the wilder more exposed country, frequent hills, and all the attendant problems of flying conditions, towns are scattered and opportunities for well attended meetings strictly limited by infrequent local trains. In Glasgow, for example, only one established and two struggling clubs are in existence, compared with say, Birmingham, where over twenty clubs provide adequate local competition. All the more credit is due therefore to the recently formed Angus and District Aeromodelling League for their enterprise in staging an ambitious exhibition to inaugurate their foundation. The league comprises six clubs, Condor M.A.C. and Arbroath M.A.C. from Arbroath, Dundee M.A.C., Montrose M.A.C., Monifieth M.A.C., and Perth M.A.C. It was not possible to include neighbouring clubs in Fife, who would have been happy to join, because in no part of their area could a meeting have been held on Sunday unless visitors stayed overnight, thanks to transport limitations!

The exhibition organisers, headed by Messrs. Edward and Inglis of Arbroath and Dundee respectively, had done splendid work with preliminary publicity, for on arriving in the town on the Friday night before, attractive showcards were displayed in the main shops, advertisers had donated free publicity in the local papers, and news of the show was volunteered in the hotel without any prompting or knowledge of our identity. On arrival at the Drill Hall, a spate of press photographers were in evidence, while notices of the opening appeared in the evening paper before the exhibition had closed that evening. Altogether we would commend the thorough-going way in which the League organised its *first* exhibition and offer it as an example to other clubs and areas as what can be done by a young and inexperienced body with confidence and push. The result was a financial success, and an aeromodelling-minded town, 2,000 of whose 20,000 inhabitants paid for admission during its six and a half hours of opening. On the same percentage three-quarters of a million should attend a London show!

Promptly to time at 2.30 p.m., Rear Admiral Sir John Bedale, K.B.E., C.B., supported by Lady Bedale, formally declared the Exhibition open. We then proceeded with Sir John on a tour of the exhibits to select the class winners. Some two hundred models were on show, of which over half were power machines. As might be expected of a comparatively recent group of clubs, standard kit designs were largely in evidence, with a preponderance of 1-2 c.c. sizes. Prizewinners, however, were of a standard that would have disgraced no exhibition. Particularly worthy of note was Sub/Lt. McNaughton's free-lance semi-scale high-wing model "Pip," powered with an E.D. So realistic was this that we had several misgivings as to whether it might not be a scale version of some aircraft unknown to us! Another that would have been amongst the prizewinners anywhere was W. N. Guild's Flamingo III, a cabin Wakefield of beautiful workmanship and elegant lines, shown with a companion Flamingo Mk. II, in uncovered state. Novelties included several helicopters, some of which were withdrawn later in the afternoon to show their paces in the free flying arena.

As befitted a seaport town, the safety fence consisted of trawler nets stretched across the hall which provided adequate protection without obscuring the view or limiting the size of the flying area. Here a constant stream of models were in flight, including rubber R.T.P. models, free flight aerobatic rubber models, an excellent "mike" Copland Thistledown, and a galaxy of control line models. In the latter class all the popular kit designs were in evidence with Mills or E.D. engines, as well as a number of "own designs," and even a highly successful version of Assistant Editor Hundleby's infamous "Kipper." Stunting was somewhat limited by the presence of chandeliers, but this did not deter one enthusiast, who picked off a light with great accuracy. His calm was worthy of the best Scottish traditions, for he flew again at once and picked off the next light. Wiser counsels then prevailed and his impromptu blitz was stopped.

On the Sunday following, our hosts arranged a visit to the R.N.A.S. Training Station H.M.S. Condor, one of the northern stations under the command of Rear Admiral Sir John Bedale. Here we were able to see the very practical encouragement he has given units under him, by the provision of the excellent club room pictured below. The Condor M.A.C. numbers some forty members mainly apprentice artificers.

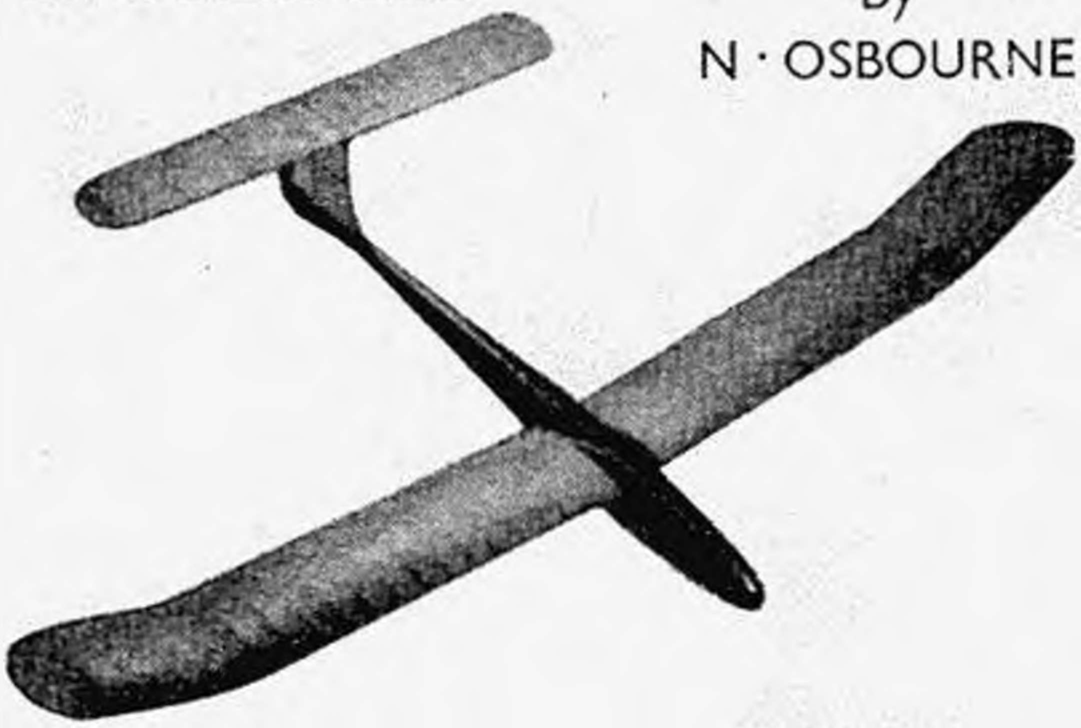


Arrangements are already on foot for bigger and better shows in the future at the main centres of the League, and we can only wish the very best of luck to a venture that is entirely self-contained and owes nothing to any outside help.

DUMPIE

By

N · OSBOURNE



THIS model comes up to international specifications with a wing loading of 5¼ ozs. per sq. foot. It holds several club records and can be depended on as a consistent performer.

Fuselage. Cut formers from ⅛ in. sheet, and arrange on ¾ in sq. hardwood jig at stations given on plan. F1 is cut from ⅛ in. sheet as before; later the hole for the nose plug is cut out (after planking is complete) and F1 faced with 1/16 in. ply. The ¼ in.×⅛ in. supports for the wing fastening are inserted in the notches in F4–F6. Between these is securely cemented a platform of ⅛ in. play to which is screwed 1/16 in. duralumin wing tongue. The fuselage is now planked with ¼ in.×⅛ in. balsa strips, the tow hook being firmly bound below F4 to the bottom strip. Before the planking is complete the holes in F2 and F3 are enlarged after removal of the jig to allow movement of the trim weight and the support for the rod is inserted on F4. The solid balsa tail block is now cemented to F11 and the whole fuselage well sanded. The nose block is now cut to rough shape, temporarily cemented to F1 and sanded to final shape. It is now removed and ⅛ in. ply plug (which should be a tight fit in F1) is cemented to it. The ⅛ in. screwed brass rod is then inserted into a hole bored in the nose and securely cemented.

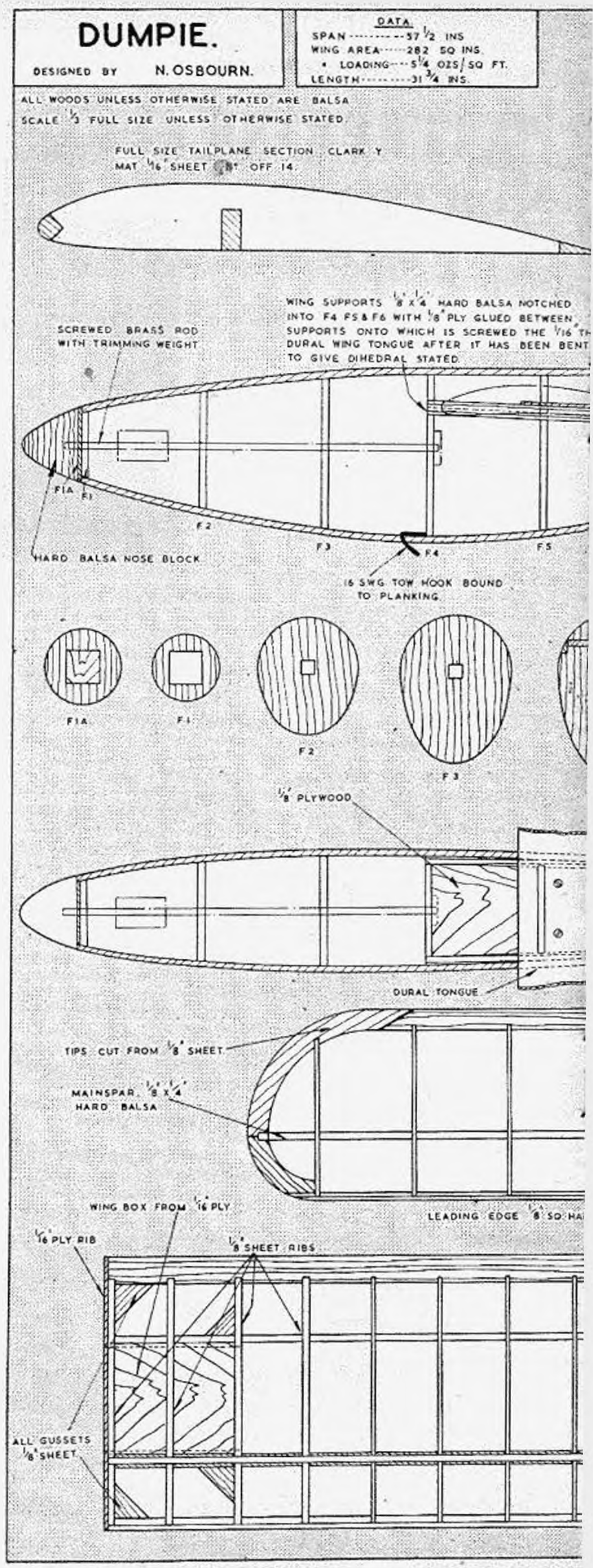
The Fin. The fin is built according to plan with L.E. cut from ⅛ in. sheet. The ribs are streamlined sectioned and cut from 1/16 in. balsa sheet, with two ⅛ in. sq. spars on either side. The T.E. is cut from ⅛ in. sheet, as is the under fin. The tailplane platform is made of two crossed-grained pieces of 1/16 in. sheet, 1½ in.×3½ in., and cemented in position.

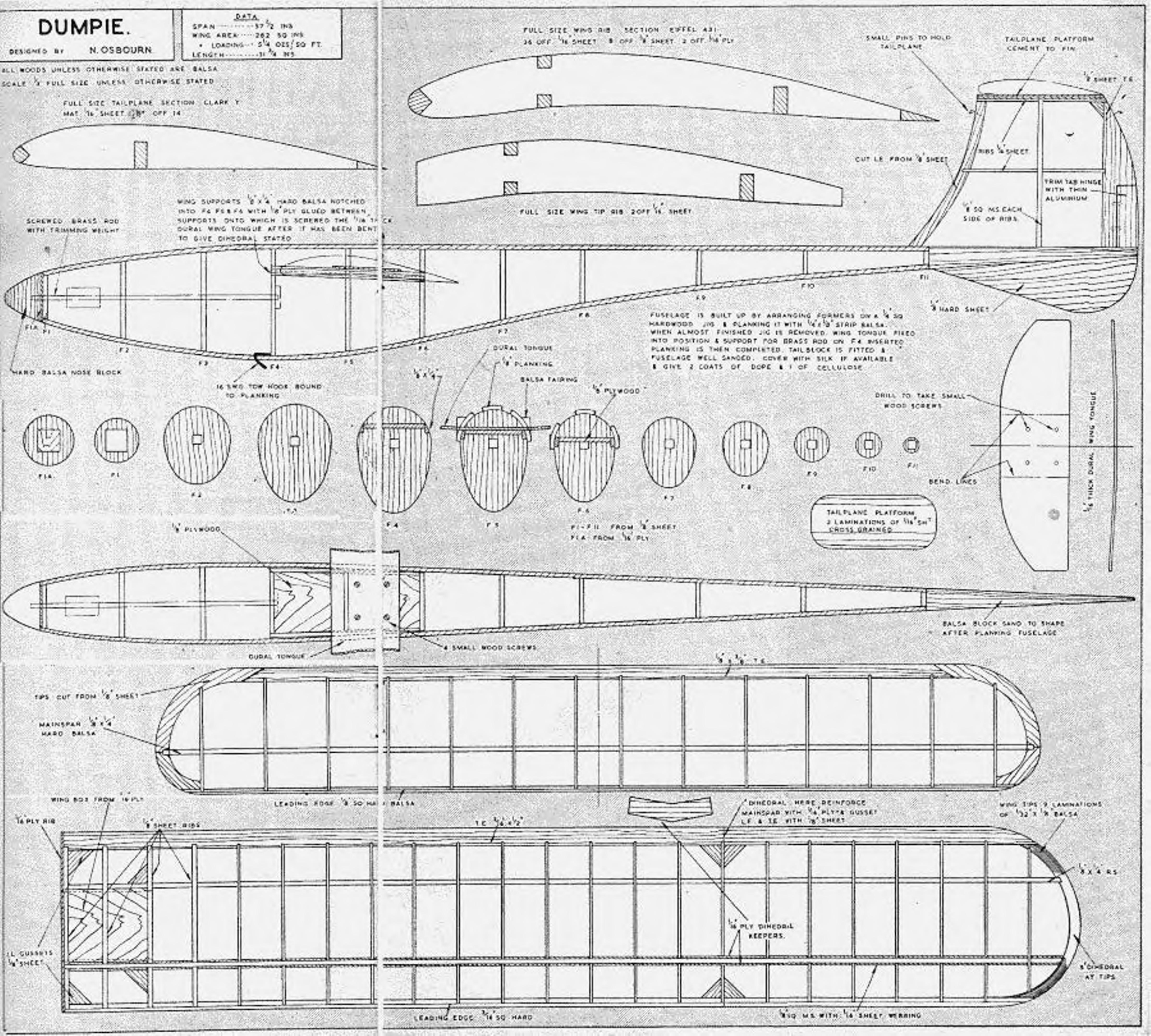
Tailplane. Cut fourteen Clarke-Y section ribs from 1/16 in. sheet. The main spar is ¼ in.×⅛ in. hard balsa, the L.E. is ⅛ in. sq. balsa and the T.E. is ⅜ in.×⅛ in. balsa. The tips are cut from ⅛ in. sheet.

The Wing. Cut thirty-eight Eiffel 431 section ribs from 1/16 in. sheet and eight from ⅛ in. sheet. The L.E. is 3/16 in. sq. hard balsa. The main spar consists of two ⅛ in. sq. spars top and bottom with webs of 1/16 in. sheet between. The rear spar is ¼ in.×⅛ in. balsa. T.E. is 3/16 in.×¾ in. The tips are made from nine laminations of ⅛ in.×1/32 in. balsa built upon a thick cardboard former.

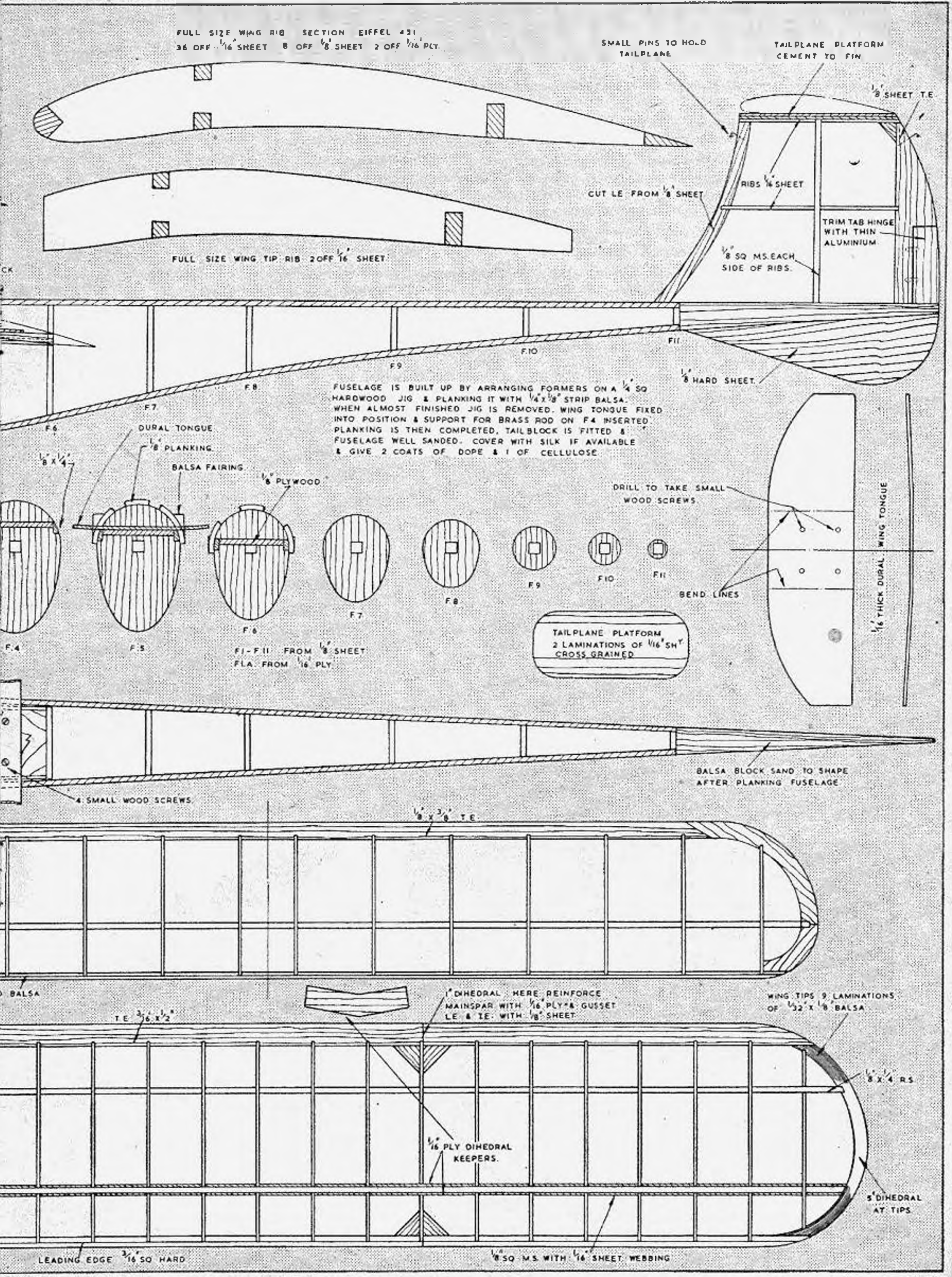
Wing Box. The wing boxes are made of 1/16 in. ply, bound with silk and inserted into the first three ribs, which are made from ⅛ in. sheet. ⅛ in. sheet gussets are added in positions indicated for strength and 1/16 in. ply dihedral-keeper is used on either side of the main spar at the last dihedral break. The first wing rib is faced with 1/16 in. ply which has 1/16 in. slot cut in it to receive the duralumin wing tongue.

Covering. Wings and tailplane are covered with super light bamboo paper and double-doped. A coat of banana oil is also given. The fuselage is covered with silk, if available, double doped and cellulosed. The fin is also covered with bamboo paper. A trim weight is positioned on the ⅛ in. screwed brass rod so that the model balances 33⅓ per cent. of the cord, when the trim weight is between F2 and F3. Flying adjustments of the trim weight are made till the maximum duration of glide from hand-launch is obtained.





DUMPIE.
DESIGNED BY N. OSBOURN.
DATA
SPAN 57 1/2 INS
WING AREA 262 SQ INS
LOADING 5 1/4 OZS/SQ FT.
LENGTH 31 3/4 INS
ALL WOODS UNLESS OTHERWISE STATED ARE BALSA
SCALE 1/4 FULL SIZE UNLESS OTHERWISE STATED
FULL SIZE TAILPLANE SECTION CLARK Y
FULL SIZE WING RIB SECTION EIFFEL 431
FULL SIZE WING TIP RIB
SMALL PINS TO HOLD TAILPLANE
TAILPLANE PLATFORM CEMENT TO FIN
CUT LE FROM 1/8" SHEET
RIBS 1/4" SHEET
TRIM TAB HINGE WITH THIN ALUMINIUM
SIDE OF RIBS
SCREWED BRASS ROD WITH TRIMMING WEIGHT
TO GIVE DIHEDRAL STATED
1/8" HARD SHEET
FUSELAGE IS BUILT UP BY ARRANGING FORMERS ON A 1/4" SQ HARDWOOD JIG & PLANKING IT WITH 1/4"x1/8" STRIP BALSA. WHEN ALMOST FINISHED JIG IS REMOVED, WING TONGUE FIXED INTO POSITION & SUPPORT FOR BRASS ROD ON F4 INSERTED. PLANKING IS THEN COMPLETED. TAILBLOCK IS FITTED & FUSELAGE WELL SANDED. COVER WITH SILK IF AVAILABLE & GIVE 2 COATS OF DOPE & 1 OF CELLULOSE
HARD BALSA NOSE BLOCK
16 SWG TOW HOOK BOUND TO PLANKING
DURAL TONGUE
1/8" PLANKING
BALSA FAIRING
1/8" PLYWOOD
DRILL TO TAKE SMALL WOOD SCREWS
BEND LINES
F1A F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11
F1 - F11 FROM 1/8" SHEET
F1A FROM 1/16" PLY
TAILPLANE PLATFORM 2 LAMINATIONS OF 1/16" SHT CROSS GRAINED
BALSA BLOCK SAND TO SHAPE AFTER PLANKING FUSELAGE
4 SMALL WOOD SCREWS
TIPS CUT FROM 1/8" SHEET
MAINSPAR 1/8" x 1/4" HARD BALSA
LEADING EDGE 1/8" SQ HARD BALSA
WING BOX FROM 1/16" PLY
1/16" PLY RIB
1/8" SHEET RIBS
DIHEDRAL HERE REINFORCE MAINSPAR WITH 1/4" PLY & GUSSET LE & TE WITH 1/8" SHEET
WING TIPS 9 LAMINATIONS OF 1/32" x 1/8" BALSA
1/16" PLY DIHEDRAL KEEPERS.
5° DIHEDRAL AT TIPS
LEADING EDGE 3/16 SQ HARD
1/8" SQ M.S. WITH 1/16" SHEET WEBBING


FULL SIZE WING RIB SECTION EIFFEL 431
36 OFF 1/16" SHEET 8 OFF 1/8" SHEET 2 OFF 1/16" PLY.
SMALL PINS TO HOLD TAILPLANE
TAILPLANE PLATFORM CEMENT TO FIN
1/8" SHEET T.E.
RIBS 1/16" SHEET
CUT LE FROM 1/8" SHEET
TRIM TAB HINGE WITH THIN ALUMINIUM
1/8" SQ MS. EACH SIDE OF RIBS.
FULL SIZE WING TIP RIB 2 OFF 1/16" SHEET
F.11
F.10
F.9
F.8
F.7
F.6
1/8" HARD SHEET.
FUSELAGE IS BUILT UP BY ARRANGING FORMERS ON A 1/4" SQ HARDWOOD JIG & PLANKING IT WITH 1/4" x 1/8" STRIP BALSA. WHEN ALMOST FINISHED JIG IS REMOVED. WING TONGUE FIXED INTO POSITION & SUPPORT FOR BRASS ROD ON F4 INSERTED. PLANKING IS THEN COMPLETED, TAILBLOCK IS FITTED & FUSELAGE WELL SANDED. COVER WITH SILK IF AVAILABLE & GIVE 2 COATS OF DOPE & 1 OF CELLULOSE.
DURAL TONGUE
1/8" PLANKING.
BALSA FAIRING.
1/8" PLYWOOD
1/8" x 1/4"
DRILL TO TAKE SMALL WOOD SCREWS.
BEND LINES
1/16" THICK DURAL WING TONGUE
F.4
F.5
F.6
F.7
F.8
F.9
F.10
F.11
F1 - F11 FROM 1/8" SHEET
F1A. FROM 1/16" PLY
TAILPLANE PLATFORM
2 LAMINATIONS OF 1/16" SH^{T} CROSS GRAINED
4 SMALL WOOD SCREWS.
BALSA BLOCK SAND TO SHAPE AFTER PLANKING FUSELAGE
1/8" x 3/8" T.E.
BALSA
1" DIHEDRAL HERE REINFORCE MAINSPAR WITH 1/16" PLY & GUSSET LE & TE WITH 1/8" SHEET
WING TIPS 9 LAMINATIONS OF 1/32" x 1/8" BALSA.
T.E. 3/16" x 1/2"
1/8" x 1/4" R.S.
1/16" PLY DIHEDRAL KEEPERS.
5" DIHEDRAL AT TIPS.
LEADING EDGE 3/16" SQ HARD
1/8" SQ M.S. WITH 1/16" SHEET WEBBING

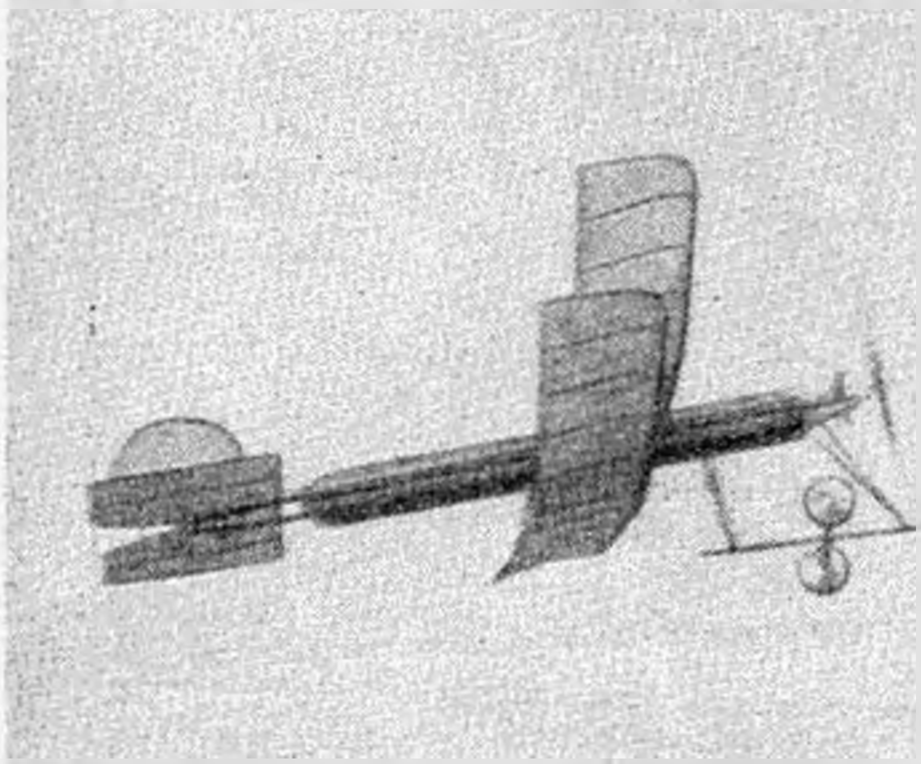
WELL, apparently all the birdies in the trees do it, so why shouldn't Fliar Phil ? He has to admit, though, that their landings seem rather more organised than most of his own . . .

Model of the Month is a classic replica of a classic machine. This 1/48th scale solid built by G. Adcock, of Ipswich, is a minutely detailed model of over 125 hours' constructional work, including around 130 soldered joints ! In fact, the wire work is so intricate that if the model is put down a trifle heavily it twangs like a grand piano ! The photo by E. J. Riding speaks for itself.

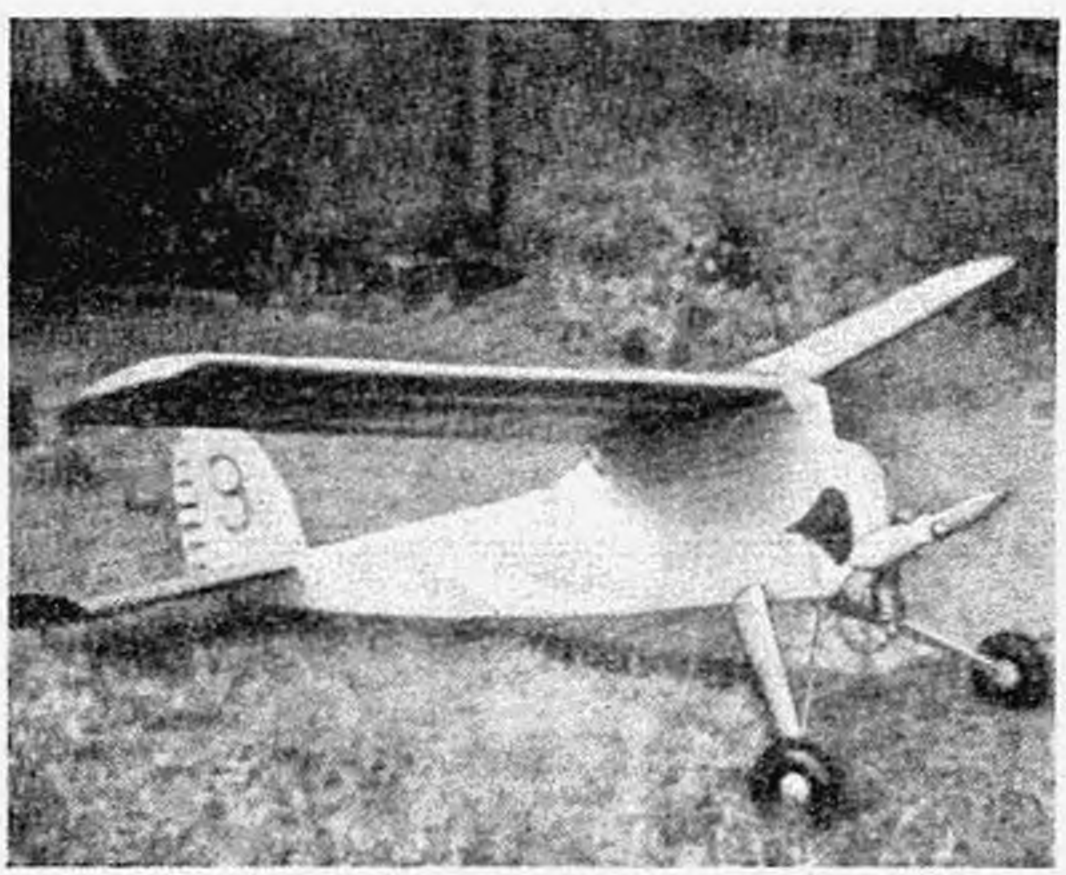
Top left, another classic of the same decade. This compressed air veteran, still in existence, is a near-scale Avro Scout built by L. G. Tucker of Epsom, then a fellow member of the Wimbledon Club with D. A. Paveley.

Top right, another superlative claimant—this time as the smallest flying model in the world. The claim seems fair enough—it weighs 1/530th of an ounce, is made from elderberry pith, with a rubber motor from a strand of golf ball elastic ! It flies across a medium size room and its builder, S. D. Whitworth of Colchester, challenges any engineer to build and fly a smaller. Any offers ?

Something out of the ordinary in pylon models, this Baby Cyclone-engined job by Major C. L. Bagley.



Model of the Month



Model of the Month

F.F.A.S., F.F.S.(Eng.), M.Inst.B.E., of Portsmouth, won the Power Class in the recent Southern Cross Exhibition at Brighton. Around five feet in span, it has a very satisfactory performance.

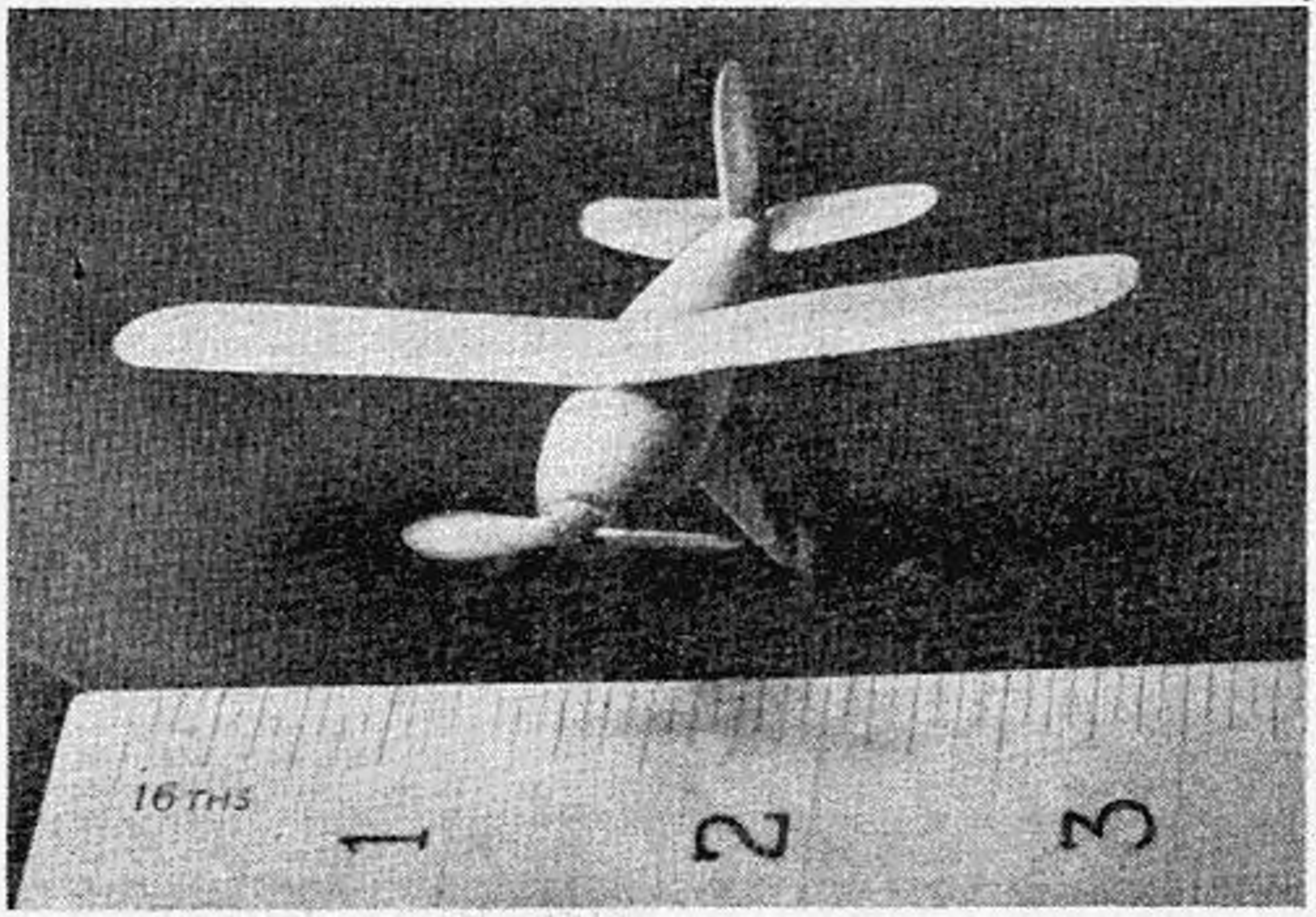
Centre left, two photos from Italy earlier in the year, showing two power duration models built by members of the British Forces in Rome. Top is 50 in. span, 2 c.c. Movo-powered ; the lower is 40 in. span, 2 c.c. Delta-powered. Despite the lack of resources at the time there was a flourishing modelling movement amongst our fellows out there, often in friendly competition with the Italians.

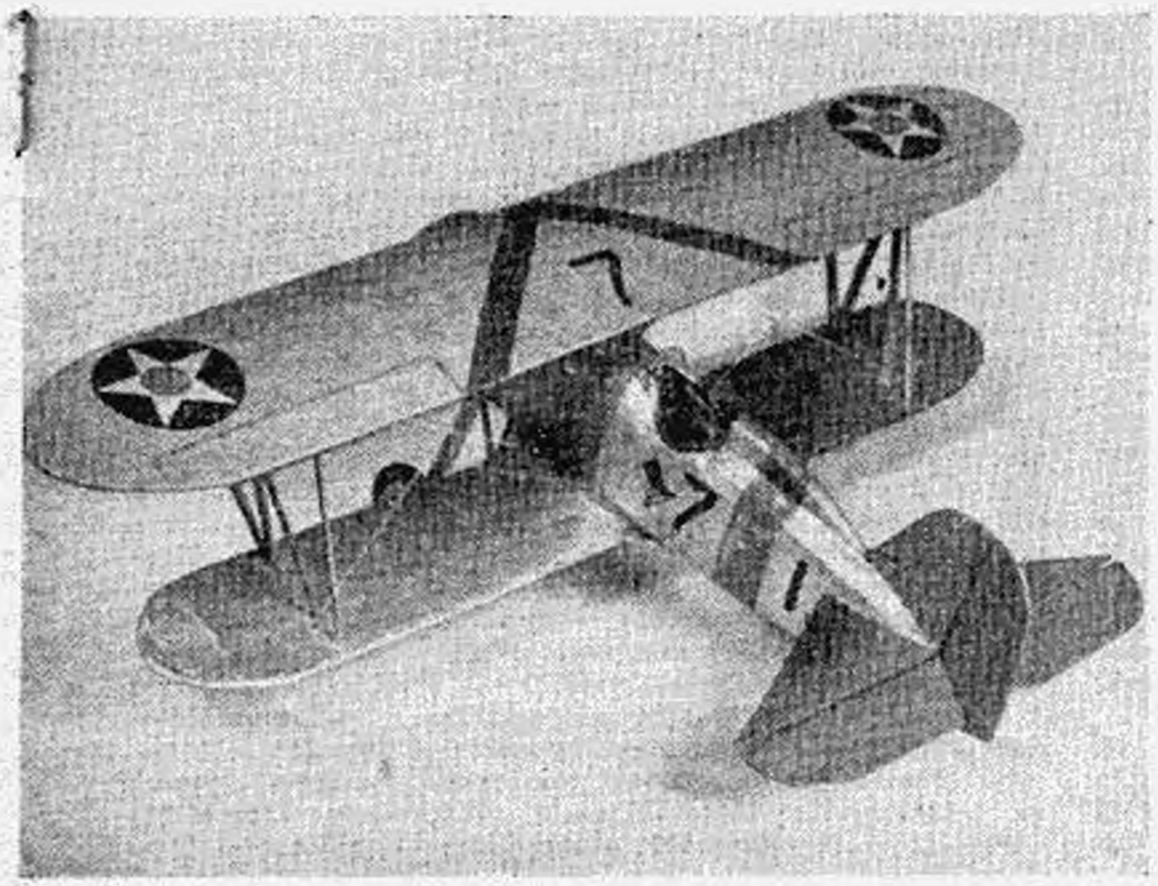
Another intriguing scale model is R. A. Adams' Boeing F.4.B.4, centre right. Built up throughout with movable controls and fully detailed cockpit, its span is 20 ins. The builder made the model in 1938.

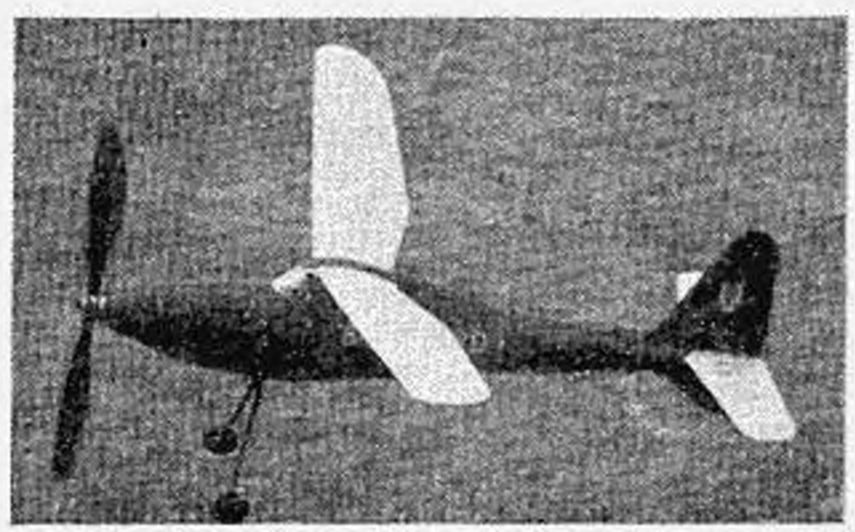
Bottom right are two more winners—top, Traugott Haslach, Swiss designer and world glider record holder, with another winning model of his design—no three-footers for this gentleman—and below, a most attractive Wakefield model designed and built by up-and-coming Dennis Lees, following in the footsteps of his father, Norman Lees, one of the stalwarts of the movement and a pioneer Northern aeromodeller.

Till next month Fliar Phil gets off his perch and quietly flaps away . . .

Month

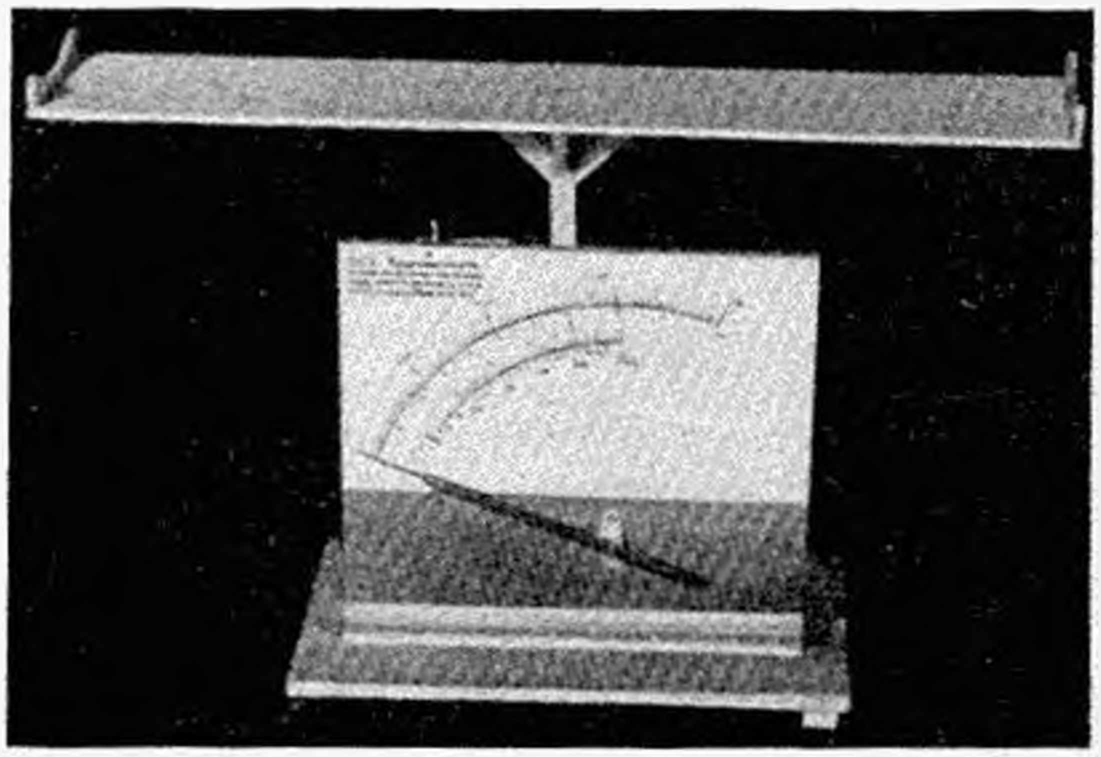






A USEFUL SET OF SCALES

BY CHAS. SHERRATT



HOW many aeromodellers have a really decent set of scales on which they can check the progress of their work? A visit to the kitchen gives you some satisfaction if you are lucky enough to find the ¼ or ½ oz. weight. I never was, and having suffered this inconvenience for so long, decided to end it all by devising a set of scales which would give me reasonable accuracy to ·005 of an ounce and at the same time weigh models up to 1½ lb. in weight.

Begin with base of ¼ in. plywood, 8½ in. × 5½ in., cut 3 legs each ½ in. long from ⅜ in. × ¼ in. hardwood, stick and nail one in each corner of the left side and one in the centre of the right side. The front panel, 6½ in. × 7½ in. plywood ¼ in. thick, is now glued and nailed into position 2 in. back on base, and the king post of ¼ in. sq. 6 1/12 in. long glued and screwed into position on the back 2 in. from the right, making sure it is perpendicular. Cut 7½ in. from ¼ in. sq. hardwood and round off one edge, then glue this to the base and the front panel securing with two ½ in. screws from underneath.

Now from 3/16 in. ply cut 1 in. × 1½ in., mark a centre ¾ in. along and ½ in. back from right-hand nearest corner, sink in and retain with durofix the nut off a brass bush firstly making the hole for the bush to go through. Glue and nail on top of the king post and to the front panel. This is the set screw for weights up to 1 oz. From the same 3/16 in. ply cut a piece 1 in. × 1½ in. and 5/16 in. from the front left corner and 5/16 in. back, bore as before and set in the nut and brass bush. This is the setscrew for weights up to 1½ lb. and should be firmly fixed 1½ in. from the top on the left and supported underneath by a block 1 in. × ½ in. × ½ in., screwed and glued to the front panel. The spring attachment lever is cut from ¼ in. × ¼ in. hardwood, is 1½ in. long rounded at one end with a hole bored to receive the spring and is pivoted ½ in. from the end, secured by a ½ in. panel pin on which is a cup washer to hold it off. This lever should move freely up and down. The other spring lever for lighter weights is cut from the same wood but is 2 in. long and cut to shape then drilled ¾ in. along, swivelling on a panel pin and small cup washer as before, a panel pin being driven into the end for spring attachment.

Movement.

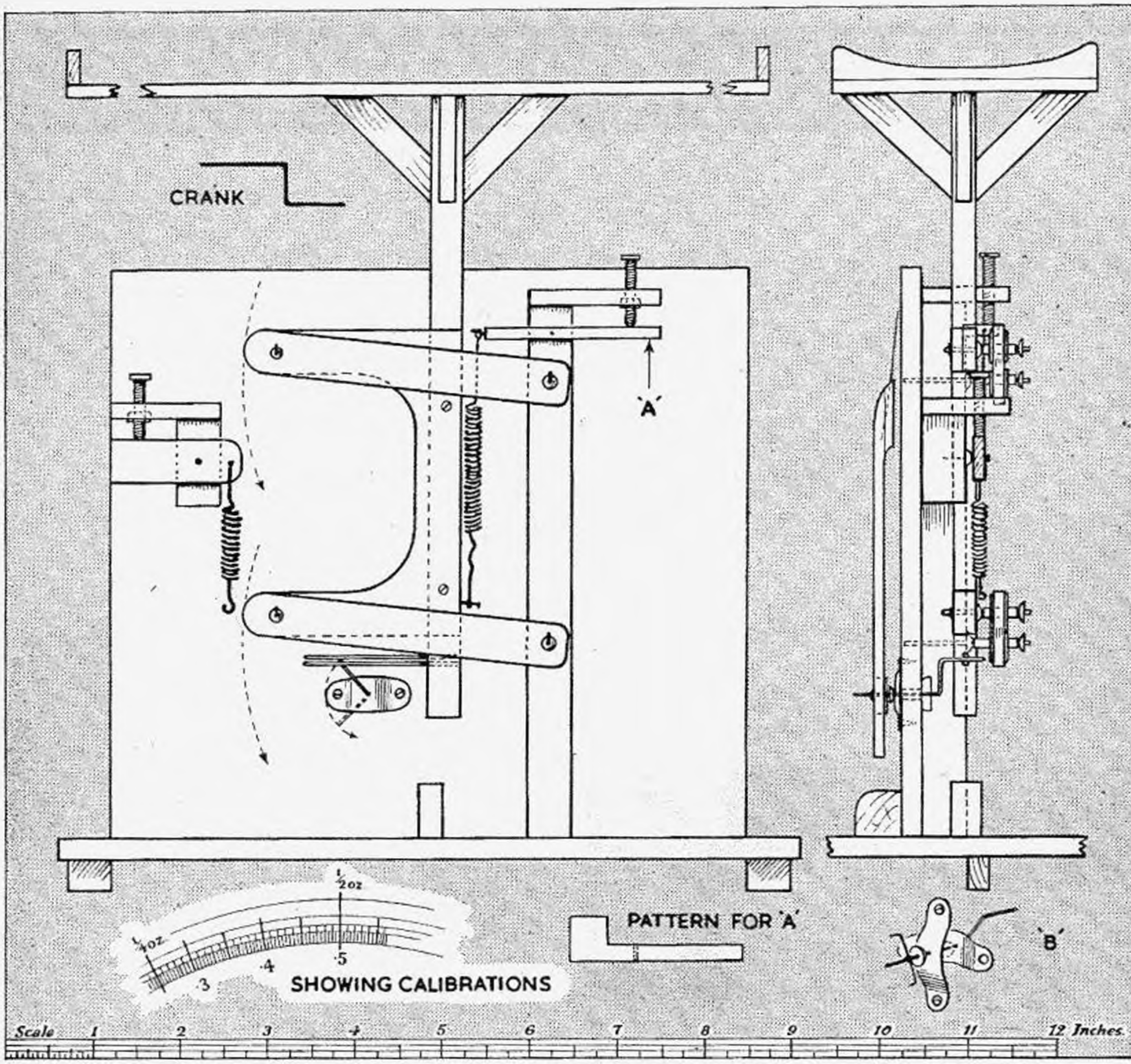
Cut to shape the centre plate of ⅛ ply and sink it flush into a piece of hardwood 7½ in. × ⅜ in. × ¼ in., beginning 1 in. from the bottom, glue and screw together. Reinforce the ends where the bearings come by glueing ¾ in. of ¼ in. × ⅛ in. hardwood behind. ⅜ in. from each end bore a hole and insert a 1½ in. length of 16 gauge wire so that ⅞ in. protrudes forward. Secure with durofix. Now comes a delicate operation requiring a good light, infinite care and skill. Mark up from the bottom in the centre of the upright a point ⅝ in., below this point mark off the width of 16 gauge wire, and above the point mark off the width of 20 gauge, and again above this the width of 16 gauge wire. Now drill 2 holes 16 gauge size and absolutely parallel and insert the wire which should be a tight fit. Secure with durofix. The 20 gauge wire crank should move freely between these two with very little friction and no play. If there is, the pointer may jump as much as ¼ in. and the readings will go haywire. The two connecting arms come next. These are ¼ in. × ⅛ in. hardwood 3½ in. long, with ends rounded reinforcing the bearings with 1 mm. ply each side. Bore these ¾ in. from the left end and ¼ in. from the right making the hole large enough to receive ¾ in. of 16 gauge aluminium tube tightly in the one and ½ in. in the other. The burr caused by cutting wire and tubing should be completely removed before insertion and tubing should have a wire through before forcing into a hole. Insert tubing with equal projection on each side and secure with durofix. The crank on which the pointer is mounted comes next. Two inches from the left on the front panel and 1 11/16 in. up (looking from behind) bore a ⅛ in. hole. Now cut two pieces of tin bent to shape and bore a hole at each end to receive a ½ in. screw and one in the centre just large enough to pass the 20 gauge crank through with no play. Screw the back one into position horizontally right over the centre of the ⅛ in. hole and pass the wire through, then thread the other bearing on to the shaft and screw that into position vertically. This shaft must be absolutely at right angles to the front panel otherwise the pointer may touch at the beginning of its run and be probably ½ in. away at the end. This is easily remedied by bending the tin bearings as required as they carry no load. Solder a cup washer on to the shaft as keeper. The table is 16 in. of ⅛ in. sheet 3 in. wide balsa, with a square hole cut to receive the ¾ in. × ¾ in. upright. The supporting brackets are of ¾ in. × ¼ in. balsa glued into position.

Assembly.

Put the two loose arms over the wires attached to the two fixed arms after first putting on a cup washer to keep the aluminium tubing off the wood. Secure these allowing a fraction of play with a cup washer soldered on to the wire. Now on the king post ⅞ in. from the top bore a hole in the centre right through and almost through the front panel drive in about 1½ in. of 16 gauge wire and thread a cup washer. Do the same exactly 3 in. below, and thread on the two connecting arms and at the same time get the 20 gauge crank between the two 16 gauge wires. Secure the connecting arms on their wire supports by a cup washer as before. The whole of the moving parts should now work freely up and down moving the crank round through an arc of about 90°. Now cut the stopper ⅝ in. long from ⅜ in. × ¼ in., depress the table until the crank is in the position indicated by dotted line then place underneath and glue into position. For the springs, 35 turns of 30 gauge steel wire wound round ⅛ in. dowel for up to the 1 oz., and 18 turns of 22 gauge for the 1½ lb. calibration. The ounce spring is attached and fixed permanently, whilst the 1½ lb. spring hangs loose until required. Now turn the scales round as all the remaining work is on the front. Stick a piece of plain notepaper, 7½ in. × 4 in., on the front panel and on this, scribe 5 arcs in pencil and below, 5 more. The pointer is next being a piece of ⅛ in. sq. balsa ¾ in. longer than the distance from the bottom arc to the hub with an additional piece to shape the tip. ⅞ in. from the bottom bore a fine hole. Now from the top arc about ½ in. from the left draw a line to the hub in pencil and at this angle, solder a piece of 22 gauge wire bent as shown (B) on to the axle, and on to these 3 points you press your pointer and secure it with durofix. The pointer should now lie along your drawn line, and be about ½ in. short of the first arc up. A fine needle is now inserted into the end, so that it just intrudes into the top set of arcs, and painted black. Two thirds way up and about 3/16 in. left of the pointer a ½ in. panel pin is driven in to act as a stopper. Now oil every bearing with light oil not forgetting the crank arm sliding between its two wires (too much oil here retards movement and is worse than none at all.

Calibrating.

Bring the needle right on the pencil line with the set screw and place a 1 oz. weight on the centre of the table. If the table goes right down on to the stopper the spring is too weak; put a kink in the wire to shorten it. Mark the position of the needle at 1 oz.; this should be right over the other side of the



arc, then tap the table to see if it goes back to the same place every time. If not there is a little binding somewhere in the moving parts which should be worked about until completely run in. Now mark off the position of ½ oz., ¾ oz., and ¼ oz. the same way. Next pour on to the bare table exactly ½ oz. of ½" panel pins, tapping the table to get the exact weight, take them off, count them and divide into 5 piles of equal number. You now have your weights of 1/10 oz. to calibrate up to ½ oz., then by using the ½ oz. weight plus the panel pins you can complete the ounce. Now weigh 1/10 oz. of pins, count them and halve them and weigh them and mark the spot, add the ½ oz. weight and this will give you ·55 of an oz., remove the ½ oz. and add 1/10 oz. of pins and this gives you ·15 oz., add the ½ oz. again and this gives you ·65. Carry on until the whole ounce is divided into 1/20 divisions, then divide each of these divisions equally into 5, again giving you ·01 readings, and each of these is now divided into 2 parts giving ·005 readings. Rule these calibrations in indian ink, all radiating from the axle using a longer and heavier line for the 1/10 oz. (·1 onwards) and smaller one for ·05 and finer ones the intermediates, a red line being used for the ¼ oz. Now for the *pounds* side. Make sure the scales are on a flat and level surface, then release the ounce set screw fully. This is important because if you don't your readings will never be true, now join up the stronger spring by hooking it on the aluminium tubing of the nearest bearing, and set with its own set screw on to the first pencil line radiating from the centre. Leave the other set screw entirely alone. Begin by placing a 2 oz. weight centrally on the table, then 4 oz., 6 oz., 8 oz. and so on up to 1¼ lb. Take the weights off each time to see if the needle returns to neutral, and if not, the spring hasn't settled. Depress the table fully several times and then re-set and try again. Now take the 1 oz. weight and go through the odd numbers, which gives you readings of 1 oz. up to 20. You will note that the first few ounces are larger than the rest but they soon settle down to an even space. Now take the ¼ oz. weight and with the addition of the other weights get your ¼ oz. markings. You will note again that the first ¼ oz. is the largest. The ⅛ oz. are obtained by dividing the ¼ oz. into two equal parts. These are ruled in as before only in red with a longer black line for the ½ lb. and a heavier one for the 1 lb. mark. Now you have a delicate instrument, so treat it with respect. Three things to remember: one, release the 1 lb. set screw before disengaging the spring; two, release the ounce set screw fully before engaging the 1 lb. spring; three, oil before use and keep free from dust.

CONTROL LINE COMMENTARY By F. B. THOMAS

We regret to announce that owing to pressure of work, Major Thomas has decided to make this article the last in the present series. Following articles will be by alternating guest experts, commencing with R. H. Warring.

WHEN talking about aerobatic flying in my last article, mention was made of a "wedge" fuel tank. There must be many modellers in this country who do not have access to American Model Aircraft journals, and it occurred to me that a description of some of the types of fuel tanks installed in "stunt" models might be helpful.

The normal tank fitted to most motors maintains a flow of fuel to the needle valve provided the model is not displaced in any axis by more than perhaps 40 degrees. When this kind of tank is used in a U-control model, centrifugal force flings the fuel against the outer wall of the tank, and often causes the motor to splutter or stop when the tank is only half empty. For "sport" flying this defect can be remedied up to a point by rotating the tank outwards through perhaps 40 degrees (Fig. 1). This simple expedient prevents interruption of the fuel flow in flight and permits the tank to empty completely, but the tank cannot be filled completely when the model is on the ground, due to the risk of flooding the intake tube.

One of the earliest aerobatic tanks used in the States was really an extension of this principle. The tank was so fitted that it was free to rotate, with the intake tube, on the engine. Under the influence of centrifugal force the tank swung outward when the model became airborne. When the model was flown inverted, gravity would turn the tank upside down,

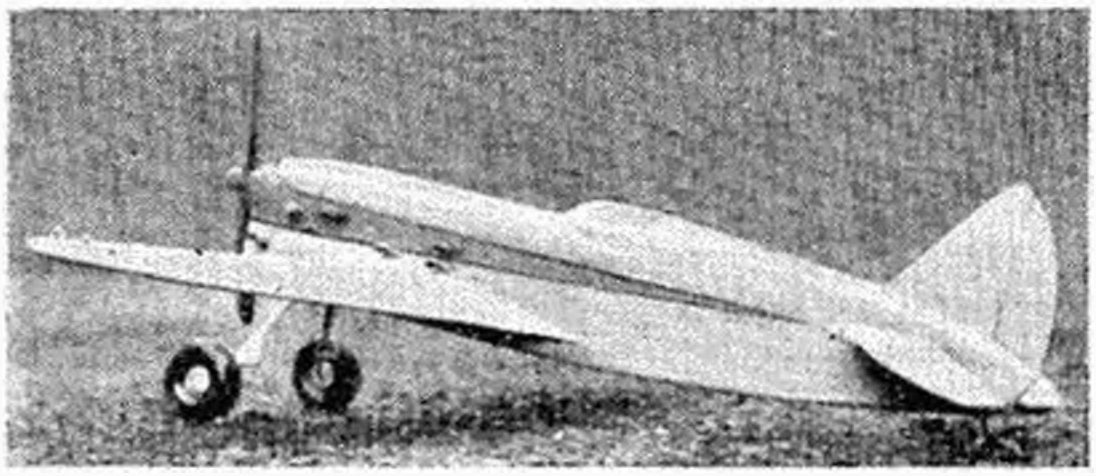
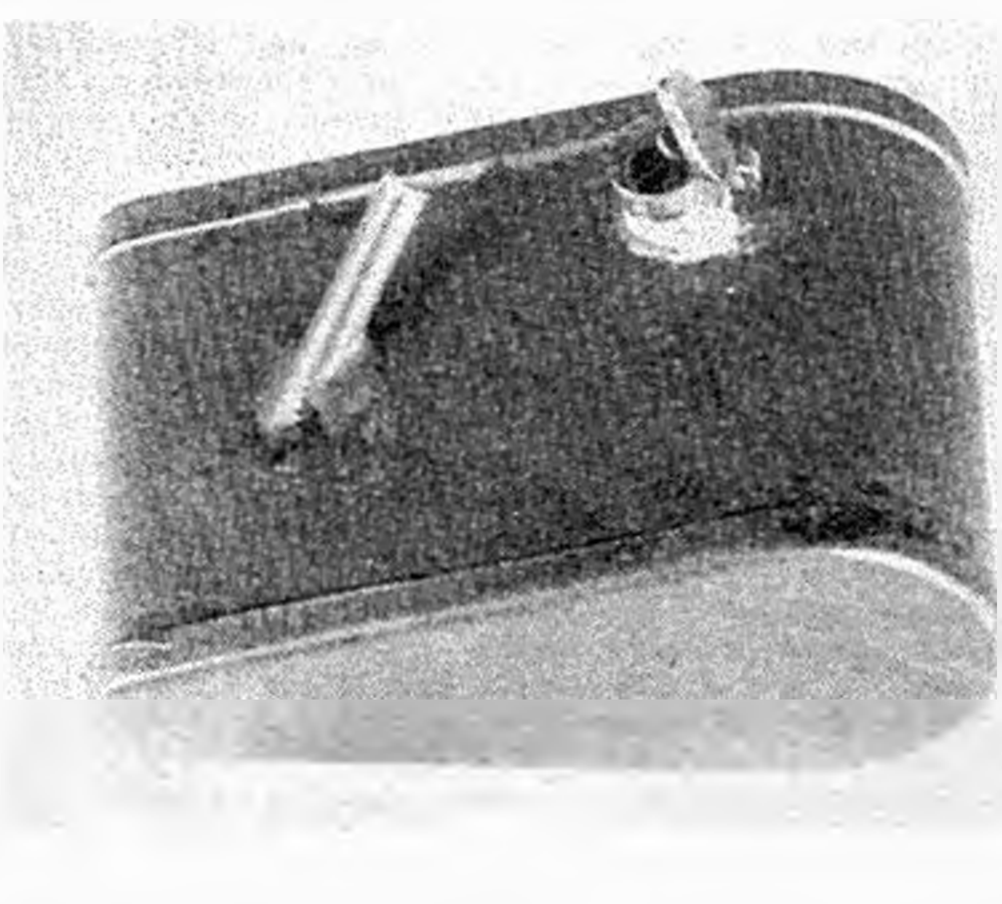


Photo above shows the author's Candy II modified for stunt flying, with revised undercarriage and enlarged elevators. Below shows a new British commercially produced stunt tank of the wedge type. It can be obtained both as a kit merely needing soldering or as a finished tank, and gives constant feed in any position.



assuring a continued flow of fuel. But this method had its snags. A freely movable and airtight joint in the intake tube presented mechanical difficulties, and a large space in the aircraft was required for the rotatable tank. Another device tried out was the use of a flexible length of tube within the tank. To the lower end of the tube was attached a small weight. Whatever the attitude of the aircraft, the flexible tube-cum-weight would find the bottom of the tank. A very small air-vent was used, to minimise fuel spillage when inverted. This system was not reliable, chiefly on account of the difficulty in finding a sufficiently flexible tube which was also impervious to the action of petrol, oil and ether (natural rubber is useless, and synthetic tends to be too rigid).

Finally the "wedge" tank was evolved, and this is now used in all aerobatic models. Though there are many types in use, the principles underlying their construction are the same. A glance at Fig. 2 should make the details clear. The feed pipe is connected to the needle-valve tube by a length of thermo-plastic (polyvinyl chloride) tubing, and the tank is installed so that its highest point is level with the jet on the engine. In flight the fuel is flung outwards by centrifugal force into the apex of the wedge, and a constant flow of fuel occurs into the feed pipe.

These tanks can easily be made up out of tinplate and brass tubing, the whole being soldered. For small diesels I have made them of celluloid and red plastic tubing. Balsa wood cement is used to stick the seams and the pipes, and they work quite satisfactorily. Cement is used to anchor the tank in the model (Fig. 3).

Recently I have modified a normal (celluloid) tank on one of my diesel motors (Majesco 2 c.c.) in such a way that it functions as a wedge tank. Fig. 4 shows the set-up. The normal filler opening and the air vent must be sealed up, and the top of the tank is made fuel-tight by liberal application of cement where it is grooved into the metal top plate. This tank must not be filled above jet level, and it will only function inverted when it is fairly full.

So much for fuel tanks, and now a couple of hints to those who, like myself, are interested in building scale model control-liners.

Eighteen months ago, when I was building my scale model "Typhoon" I wrote to the Editor of the AEROMODELLER, asking for advice on how to mould transparent celluloid cockpit canopies. Here is the recipe he sent me.

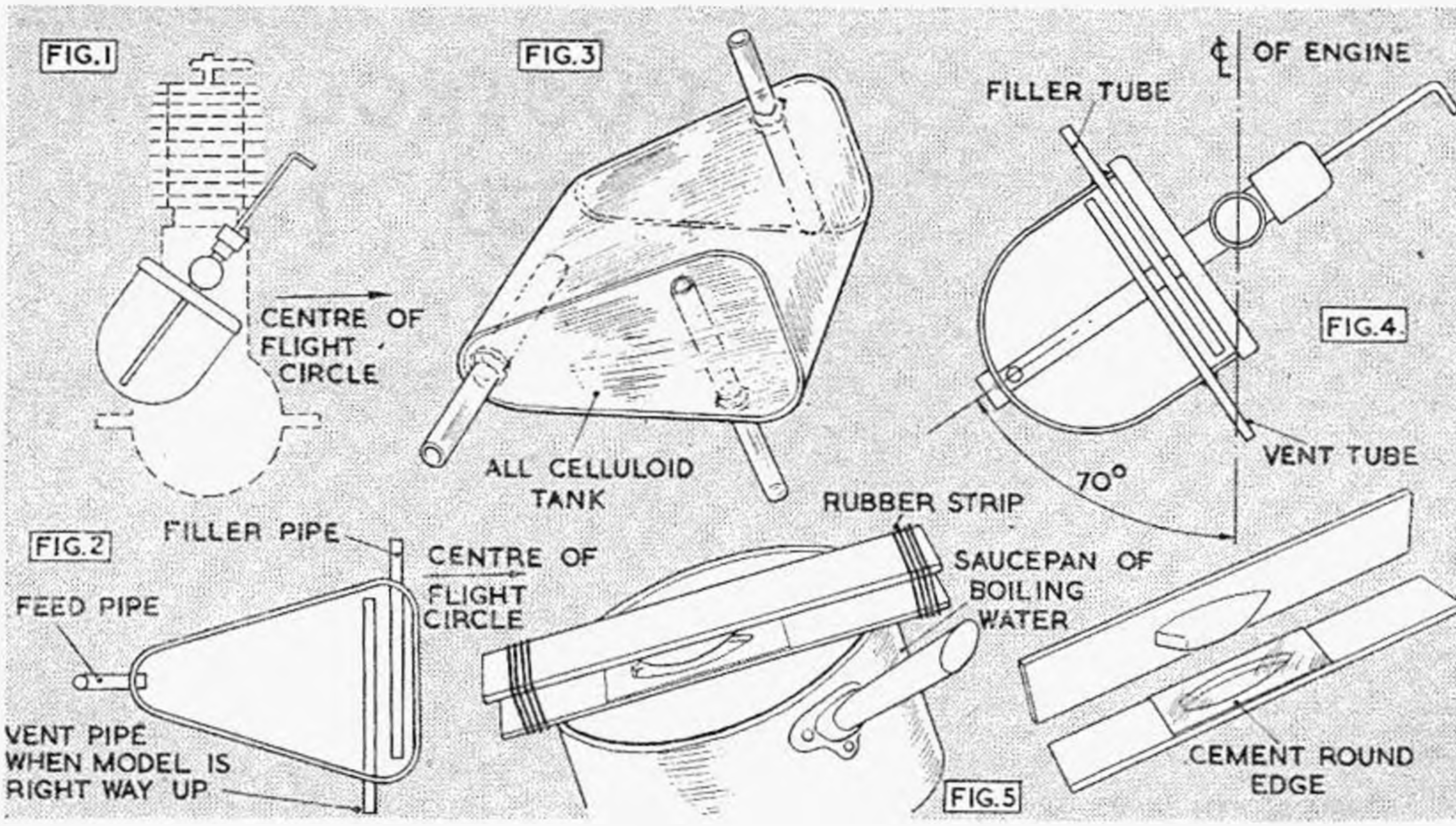
(*a*) A wooden mould is made to the shape required, slightly undersized to allow for the thickness of celluloid.

(*b*) A hinged double board is prepared and a hole cut in one side to allow the mould to protrude.

(*c*) A sheet of thin celluloid is pinned across this opening.

(*d*) The whole is then plunged into boiling water and the two ends of the boards brought together, thus forcing the celluloid over the shaped former. All that is then required is for the shaped celluloid to be trimmed up when cool. The method works excellently, but it needs a very deep pot or bucket of boiling water. I have since modified the idea, and produced a number of canopies with the minimum of trouble.

The former is fashioned from balsa block ⅛ in. deeper than required for the finished canopy. The former given several coats of clear dope to harden it, sanded to a smooth finish, and cemented to a length of ¼ in. board. A second similar piece of board is cut, and a hole fretsawn out of its centre to the shape of the base of the canopy, and 1/16 in. larger all round. The sheet of celluloid is cemented round its margin to the underside of this board. When this cement is thoroughly dry the former is lightly vaselined, and the celluloid-carrying board is laid over the former. The two ends of the boards are lashed with strip elastic and the whole issue is laid upside down on the top of a saucepan half filled with water which is boiling vigorously. A piece of cloth is laid over the top of this stew to contain the steam and its heat,



and the recipe allowed to cook for perhaps half a minute or more. As the celluloid becomes plastic, the elastic will squeeze the two boards together and your cockpit canopy moulds itself. When the boards have come together, the whole affair is taken from the saucepan, cooled under a tap, and the former removed from the mould. The " flash " is trimmed with scissors from the skirt of the canopy, and the job is finished. This method could be used for making engine cowlings for small diesels, the two lateral halves of the cowlings being moulded separately on two formers (Fig. 5).

And now a tip for those who find difficulty in painting freehand a clean straight line on models for finishing purposes. I used the method on " Candy II," whose photograph heads this article. " Cellotape," which can be bought in any stationers, is stuck along either side of the intended site of the line, and the gap between painted over. When the cellulose paint is almost (but not completely) dry, the " Cellotape " is pulled off, leaving a clean, sharp and straight edge to the painted line. Incidentally, the cockpit canopy on this model was moulded by the method described in the previous paragraph.

As a " lone hand " I've tried out a number of tail-release gadgets. " Candy II," the plans of which were published in the AEROMODELLER last October, contained a built-in device to help the pilot who lacks any ground-staff.

Mr. J. M. Bayne of Ayr, Scotland has sent me a sketch of a very ingenious and practical tail-release device (Fig. 6) which he fitted to his " Phantom " The motor is started with the elevators locked in the " down " position. On picking up the control grip a full backward movement is made, and this operates the tail-release. A glance at the sketch should make the method of operation clear.

In conclusion here is a letter I have received from Mr. Bill Dean containing some practical suggestions for judging aerobatic competitions

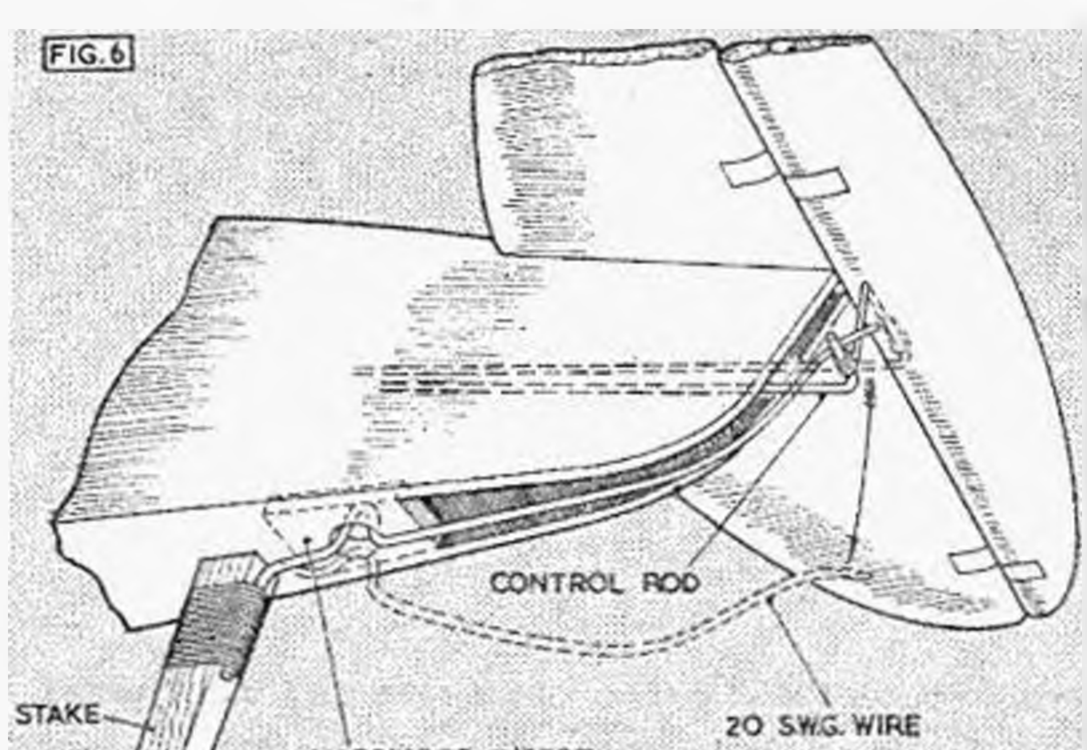
Dear Mr. Thomas,

In the December AEROMODELLER *you asked for details of looping control-line models. Well, some fine flying was put on at the Inter-Club Control Line Contest between St. Alban's Club and the North London Control Line Club—at Alexandra Palace on Sunday, December 14th. Two modellers succeeded in looping—Ted Buxton and Ron Moulton. Ted turned in five consecutive loops on two occasions. His model was about 40 in. span, lightly loaded and powered with a Super Tiger G.16r.*

The shortest line length for successful stunting appears to be 50 feet. Lightly loaded models are essential for a tight looping radius. Ron Moulton's loops were the prettiest to watch, but too big to have enough height left for consecutive looping. Don Brockman and myself had the pleasure of judging the contest. We pass on our method as it may be of interest to other clubs. Things happen very fast, so work out a pattern with marks for good, medium and bad execution. At present, the following flight pattern will satisfy most cases. (1) Take off. (2) Two laps of straight and level. (3) Vertical climb. (4) Vertical dive. (5) Wing-over (6) Loops (up to five consecutive ones).

Award points as follows. (1) (Good), (2) (Medium), (3) (Bad) for each section attempted. Final points can be calculated after the flight. Stunts like loops and wing-overs carry most points, of course.

Incidentally, up to Christmas, Bill hadn't looped either, though it seems unlikely that this state of affairs was going to last !



CONTROL - LINE SPEED TABLES

BY R · H · WARRING

FOR all speed record attempts the model has to be timed over a minimum distance—usually one-quarter mile. Standard line lengths are then laid down for different classes, so arranged that each lap completed is a definite fraction of a mile.

S.M.A.E. standard line lengths are as under :—

Class I—motors 0–1·5 c.c.—26¼ ft. 32 laps per mile.
Class II—motors over 1·5–2·5 c.c.—35 ft. 24 laps per mile.
Class III—motors over 2·5–5·0 c.c.—52½ ft. 16 laps per mile.
Class IV—motors over 5–10 c.c.—70 ft. 12 laps per mile.

Record distances are therefore :—

Class I—8 laps. Class II—6 laps. Class III—4 laps. Class IV—3 laps.

Table I is calculated for quarter mile distance, any line length, number of laps as above.

The standard line lengths do not give absolutely correct figures—for example, quarter mile in Class III is actually 4·0018 laps—but the error is of the order of 0·05 per cent. maximum and can safely be ignored. Particularly is this true since it is virtually impossible to time accurately with stop-watches to within 1/10 second.

Tables II, III, IV and V give speeds for one lap timing on different line lengths. Timing over one lap is liable to considerable error and cannot be used for contest or record work. These tables are, however, extremely useful for a quick check-up on performance where absolute accuracy is not required. Replicas, printed on a handy cardboard pocket reference card, may be obtained from Allen House, Newarke St., Leicester, for 6d. post free.

TABLE I. SPEED CHART—¼ MILE DISTANCE.

Time secs.	Speed m.p.h.	Time secs.	Speed m.p.h.	Time secs.	Speed m.p.h.	Time secs.	Speed m.p.h.	Time secs.	Speed m.p.h.
6·0	150·0	11·0	81·83	16·0	56·25	21·0	42·86	26·0	34·61
6·1	147·5	11·1	81·09	16·1	55·89	21·1	42·66	26·1	34·48
6·2	145·1	11·2	80·36	16·2	55·56	21·2	42·45	26·2	34·35
6·3	142·9	11·3	79·65	16·3	55·22	21·3	42·25	26·3	34·22
6·4	140·6	11·4	78·94	16·4	54·88	21·4	42·05	26·4	34·10
6·5	138·5	11·5	78·24	16·5	54·54	21·5	41·86	26·5	33·96
6·6	136·3	11·6	77·56	16·6	54·22	21·6	41·67	26·6	33·83
6·7	134·3	11·7	76·92	16·7	53·88	21·7	41·47	26·7	33·70
6·8	132·4	11·8	76·28	16·8	53·57	21·8	41·29	26·8	33·58
6·9	130·4	11·9	75·64	16·9	53·26	21·9	41·09	26·9	33·46
7·0	128·6	12·0	75·00	17·0	52·94	22·0	40·90	27·0	33·33
7·1	126·8	12·1	74·41	17·1	52·61	22·1	40·72	27·1	33·21
7·2	125·0	12·2	73·77	17·2	52·33	22·2	40·53	27·2	33·09
7·3	123·3	12·3	73·17	17·3	52·04	22·3	40·36	27·3	32·97
7·4	121·7	12·4	72·57	17·4	51·72	22·4	40·17	27·4	32·85
7·5	120·0	12·5	72·00	17·5	51·43	22·5	40·00	27·5	32·73
7·6	118·4	12·6	71·43	17·6	51·13	22·6	39·82	27·6	32·61
7·7	116·9	12·7	70·92	17·7	50·85	22·7	39·65	27·7	32·48
7·8	115·4	12·8	70·31	17·8	50·56	22·8	39·48	27·8	32·37
7·9	113·9	12·9	69·77	17·9	50·27	22·9	39·30	27·9	32·26
8·0	112·5	13·0	69·23	18·0	50·00	23·0	39·13	28·0	32·14
8·1	111·1	13·1	68·71	18·1	49·73	23·1	38·96	28·1	32·03
8·2	109·8	13·2	68·17	18·2	49·44	23·2	38·79	28·2	31·92
8·3	108·5	13·3	67·66	18·3	49·18	23·3	38·62	28·3	31·81
8·4	107·2	13·4	67·15	18·4	48·91	23·4	38·46	28·4	31·70
8·5	105·9	13·5	66·67	18·5	48·65	23·5	38·30	28·5	31·58
8·6	104·6	13·6	66·19	18·6	48·38	23·6	38·14	28·6	31·47
8·7	103·4	13·7	65·70	18·7	48·13	23·7	37·98	28·7	31·36
8·8	102·3	13·8	65·22	18·8	47·87	23·8	37·82	28·8	31·25
8·9	101·1	13·9	64·78	18·9	47·62	23·9	37·67	28·9	31·14
9·0	100·0	14·0	64·29	19·0	47·37	24·0	37·60	29·0	31·04
9·1	98·91	14·1	63·82	19·1	47·12	24·1	37·34	29·1	30·93
9·2	97·84	14·2	63·37	19·2	46·87	24·2	37·18	29·2	30·82
9·3	96·79	14·3	62·92	19·3	46·61	24·3	37·04	29·3	30·72
9·4	95·75	14·4	62·50	19·4	46·39	24·4	36·89	29·4	30·62
9·5	94·74	14·5	62·07	19·5	46·16	24·5	36·73	29·5	30·51
9·6	93·72	14·6	61·65	19·6	45·91	24·6	36·59	29·6	30·40
9·7	92·75	14·7	61·23	19·7	45·67	24·7	36·45	29·7	30·30
9·8	91·78	14·8	60·82	19·8	45·45	24·8	36·29	29·8	30·20
9·9	90·91	14·9	60·41	19·9	45·22	24·9	36·14	29·9	30·10
10·0	90·00	15·0	60·00	20·0	45·00	25·0	36·00	30·0	30·00
10·1	89·14	15·1	59·61	20·1	44·78	25·1	35·83	30·1	29·90
10·2	88·25	15·2	59·20	20·2	44·56	25·2	35·71	30·2	29·80
10·3	87·39	15·3	58·82	20·3	44·33	25·3	35·58	30·3	29·70
10·4	86·54	15·4	58·45	20·4	44·11	25·4	35·44	30·4	29·60
10·5	85·71	15·5	58·07	20·5	43·89	25·5	35·30	30·5	29·51
10·6	84·87	15·6	57·69	20·6	43·68	25·6	35·16	30·6	29·41
10·7	84·08	15·7	57·31	20·7	43·48	25·7	35·02	30·7	29·32
10·8	83·33	15·8	56·96	20·8	43·27	25·8	34·89	30·8	29·22
10·9	82·57	15·9	56·60	20·9	43·06	25·9	34·74	30·9	29·12

8 laps-26½ ft. lines (Class I standard). 6 laps-35 ft. lines (Class II standard).
5 laps-42 ft. Lines.
4 laps-52½ ft. lines (Class III standard). 3 laps-70 ft. lines (Class IV standard).

TABLE II.—CLASS I.

ONE LAP ON 26¼ FT. LINES.

Time (secs.)	Speed (m.p.h.)	Time (secs.)	Speed (m.p.h.)	Time (secs.)	Speed (m.p.h.)
1·5	75·00	2·1	53·57	2·7	41·67
1·6	70·31	2·2	51·13	2·8	40·17
1·7	66·19	2·3	48·91	2·9	38·79
1·8	62·50	2·4	46·87	3·0	37·50
1·9	59·20	2·5	45·00	3·1	36·29
2·0	56·25	2·6	43·27	3·2	35·16

TABLE III.—CLASS II.

ONE LAP ON 35 FT. LINES.

Time (secs.)	Speed (m.p.h.)	Time (secs.)	Speed (m.p.h.)	Time (secs.)	Speed (m.p.h.)
1·5	100·00	2·3	65·22	3·1	48·38
1·6	93·73	2·4	62·50	3·2	46·87
1·7	88·25	2·5	60·00	3·3	45·45
1·8	83·33	2·6	57·69	3·4	44·11
1·9	78·94	2·7	55·56	3·5	42·86
2·0	75·00	2·8	53·57	3·6	41·67
2·1	71·43	2·9	51·72	3·7	40·53
2·2	68·17	3·0	50·00	3·8	39·48

TABLE IV.—CLASS III.

ONE LAP ON 52½ FT. LINES.

Time (secs.)	Speed (m.p.h.)	Time (secs.)	Speed (m.p.h.)	Time (secs.)	Speed (m.p.h.)
1·5	150·0	2·4	93·73	3·3	68·17
1·6	140·6	2·5	90·00	3·4	66·19
1·7	132·4	2·6	86·54	3·5	64·29
1·8	125·0	2·7	83·33	3·6	62·50
1·9	118·4	2·8	80·36	3·7	60·82
2·0	112·5	2·9	77·56	3·8	59·20
2·1	107·2	3·0	75·00	3·9	57·69
2·2	102·3	3·1	72·57	4·0	56·25
2·3	97·84	3·2	70·31	4·1	54·88

TABLE V.—CLASS IV.

ONE LAP ON 70 FT. LINES

Time (secs.)	Speed (m.p.h.)	Time (secs.)	Speed (m.p.h.)	Time (secs.)	Speed (m.p.h.)
2·0	150·0	3·0	100·0	4·0	75·00
2·1	142·9	3·1	96·79	4·1	73·17
2·2	136·3	3·2	93·73	4·2	71·43
2·3	130·4	3·3	90·91	4·3	69·77
2·4	125·0	3·4	88·25	4·4	68·17
2·5	120·0	3·5	85·71	4·5	66·67
2·6	115·4	3·6	83·33	4·6	65·22
2·7	111·1	3·7	81·09	4·7	63·82
2·8	107·2	3·8	78·94	4·8	62·50
2·9	103·4	3·9	76·92	4·9	61·23

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

DEAR SIR,

I have read with interest the article by Col. C. E. Bowden on jet propulsion in the March issue of the AEROMODELLER and in reference to this article I should like to point out a few inaccuracies.

Firstly it would seem that Col. Bowden is under the impression that a jet unit is propelled by the force of the jet at rear of the unit. This is not so, as a jet engine will run and give thrust in a partial vacuum and where there is hardly any air to push against.

In this article, Col. Bowden says that the restricted exhaust raises the pressure of the outgoing gases. This is incorrect, as the pressure decreases (*e.g.* a venturi tube in a carburettor) and the velocity increases This speeding up is beneficial due to the fact that pressure generated inside the unit acts in all directions, but because of the jet orifice at the rear, there is a difference in pressure between the front and the rear of the combustion chamber and the unit is propelled forward *internally*. By restricting the exhaust and therefore decreasing the pressure a greater difference of internal pressure is obtained and the unit gives more thrust. This also explains why the unit operates most efficiently in a vacuum.

De Havilland Model Engineering Society, Edgware, Middlesex. G. SWEETAPLE.

DEAR SIR,

The review in the AEROMODELLER April 1948 of my book "Model Diesel Engines," gives me the opportunity to express my sincere regrets that no mention appeared in the book of the kind permission Mr. Russell gave me to republish certain photographs that had appeared in my articles in the AEROMODELLER, also of two diesel cars from "The Model Mechanic" and "Model Cars."

Through a most unfortunate error the publishers of the book omitted my foreword of acknowledgments and incidentally the index, and through unforeseen circumstances I did not see the final set up of the book, which if I had, would have brought to light the omission. This will be rectified in the second print shortly going to press, and I want to take this opportunity to thank Mr. Russell and the journals concerned for their kind help.

Whilst writing may I also make another "explanation." In the diagram of a Ram-Jet (my "Petrol Vapour," AEROMODELLER March 1948) the words "Restricted exhaust raises pressure" are misleading as denoting a rise in pressure at the tail which is not so. Will readers substitute the following more descriptive words, "converging outlet further increases the velocity of the burning gas, adding power to the propulsive jet." A jet engine does not of course push itself along by gases hitting the air at the tail. The push is by reaction.

Bournemouth. C. E. BOWDEN.

DEAR SIR,

Just a line from one of your readers from "way down under." I have just read the February issue and took notice of Stanhope Kenny's and B. Fairey's letters, not too good this dollar shortage, is it. But are the British motors as bad as all that. I thought Britain was coming along all right in the model business, anyway they should growl, out here there is only *one* motor built—a diesel ·12 c. in. displacement and no cut-out, but a good job at £8. 5s. 0d., and a few Canadian "Hurricane" and "Merlin" at £7. 12s. 6d., if you're lucky. So I guess the two writers could be worse off! I wouldn't mind an "E.D." at £4. 4s. 0d. even if the prop. doesn't fly around like an "Arden." But the main reason for my letter is I would like to correspond with a modeller in England. I am 31 years of age, married with four children, doing sailplane, rubber, etc., haven't done any gas job stuff since before the war but hope to later and I am nowhere near the "Copland" class, so hoping you can do something for me.

View Road, Te Kuiti, New Zealand. AUBREY HAINES.

DEAR SIR,

Mr. Halifax's "Factualities" series has, to quote a high authority "filled a long felt want" and has been of great value to the less mathematically trained "Fliars."

However, in his latest effort, Part Five, appear statements which we cannot agree are facts.

His statement referring to the superiority of flat plates under certain conditions does, we feel, need definite qualification, as it stands we contend that though it may be so, it is not necessarily true. We feel that he should have stressed that aerodynamic efficiencies only were being considered, for when one considers the overall, structural, aerodynamic, and shall one say "maintenance" efficiencies, a very different conclusion is arrived at.

It is felt necessary to point out that the separation point is called the separation point and not the transition point, the latter being the "point" where a boundary layer changes from laminar flow to partially turbulent flow.

The remark that only the part of the wing forward of the separation point is generating any lift surely needs expansion.

As it stands it would appear to be rather vague and meaningless. If pressure variation along the upper surface be considered then surely the pressure generally decreases to a minimum, increases slightly up to the separation point and thereafter remains fairly constant at a value not much above the minimum?

In connection with Part 16 of "Aerodynamic Design" we feel that although only Static Stability was being discussed the fact was not given sufficient emphasis, an emphasis we consider necessary in model work because possession, by a model aircraft of static longitudinal stability is not always sufficient to ensure dynamic stability.

We would suggest, in passing, that assumptions generally made in the theory of dynamic stability are not always justified when such theory is applied to model aircraft.

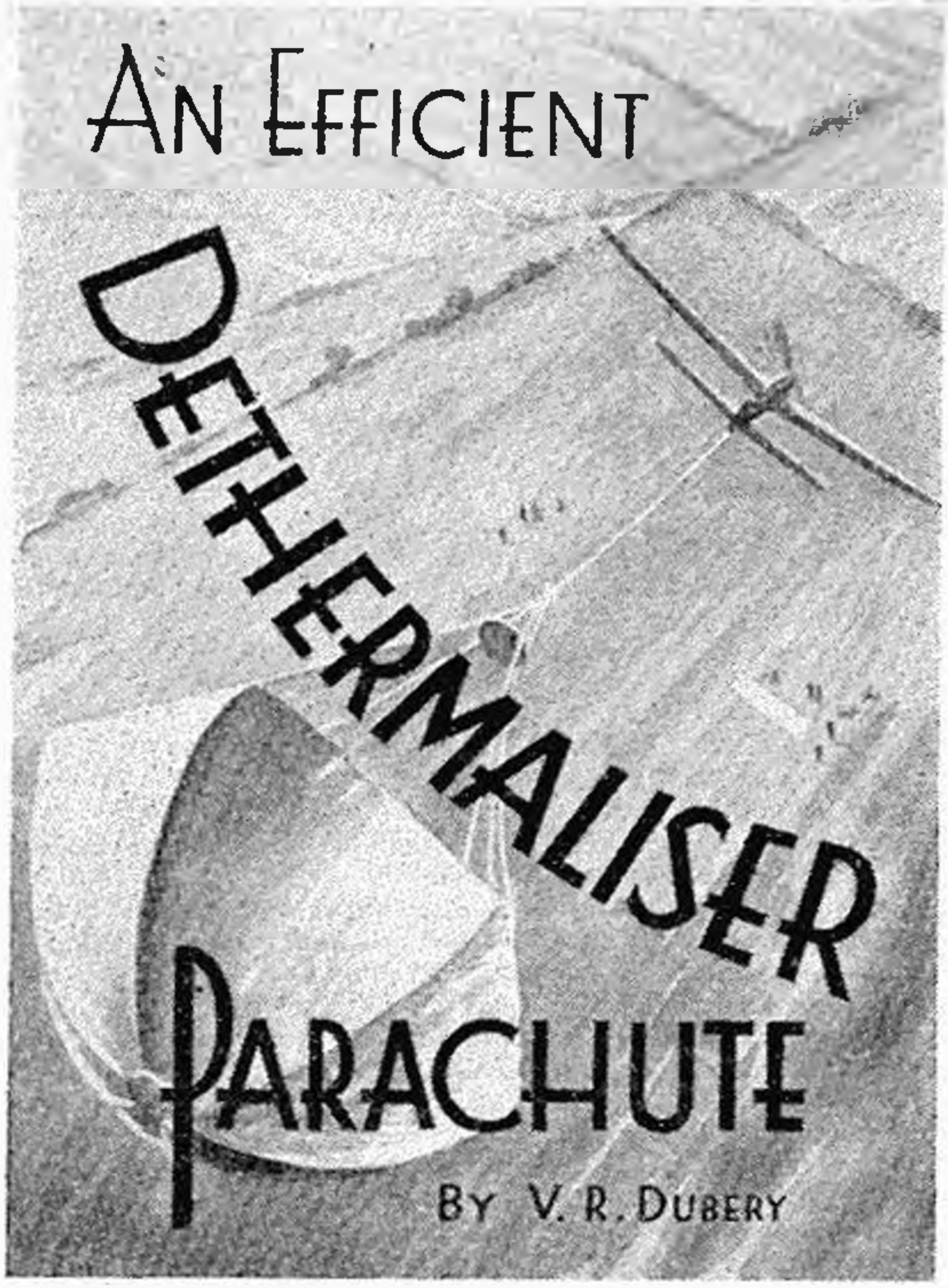
We should like to know Mr. Halifax's reasons for stating that "For good stability the C.G. should be near the wing quarter chord"; as we see it the farther forward the C.G., the higher the degree of Static Stability, the limitation on forward positioning being dictated by performance considerations, which would indicate a position coincident with the centre of pressure of wing, body and airscrew.

We consider it, sir, rather unfortunate that the nomogram published, with the object of enabling one to estimate an undefined tailplane efficiency, was not so framed as to include the ratio of the two dimensional lift slopes of wing and tailplane as a further independent variable. This would then have shown up the advantages of tailplanes with thin symmetrical aerofoils.

It may be felt that our remarks are somewhat trivial. We feel, however, that one cannot be too careful in qualifying all one's statements where necessary when presenting technical information to the average aeromodeller.

Queen Mary College, University of London. J. C. GIBBINGS. D. E. CHANDLER BRIAN H. WAGER.

An Efficient Dethermaliser Parachute



By V. R. Dubery

CUT six panels to the shape shown in the diagram for each parachute you wish to make. The material used depends on what weight you are prepared to tolerate. Japanese or lightweight bamboo tissue is suitable if you want extreme lightness. Ordinary wrapping tissue of the good quality non-glazed type such as is used to wrap dresses, suits, etc., is very good and is recommended. You must be prepared to treat paper parachutes as consumable, however, and have a few spares. The grain of the tissue should be parallel to the straight edge of the panel. Japanese silk, silkspan, or nylon makes a heavier but more durable parachute, and an old flour bag has even been used successfully after a thorough washing and ironing. In cases of woven materials the weave should run diagonally, *i.e.*, at 45 degrees to the straight edge, adjacent panels having opposite diagonals.

Use white office paste or any similar variety that is suitable for tissue as long as it is not too watery. Take one panel and lay it down with the edge to be folded to the *right*. Now take a second panel with folding edge to the *left* and paste a ¼ in. wide strip along its right edge. Place this on top of the other, leaving the first panel's folding edge visible. Paste lightly on tissue but more generously on other materials. Fold the underneath strip over and press down on to the pasted edge. Now paste the right-hand side of another panel laid with its folding edge to the left, turn over the two joined ones so that the overlapping piece is underneath, place the new piece on top to coincide with the first panel, with the newly pasted edge adjacent to the overlapping strip, and fold over as before. Repeat this pasting, folding and turning process until all six panels are joined. Open out to make sure it will not stick in unwanted places and leave to dry for a few moments—the time taken to prepare a second one is long enough.

Now juggle the two end panels on top of each other with the remaining folding edge overlapping, inner faces of the panels touching, paste, and fold as before. The whole can then be opened out carefully to a hemispherical shape and left to dry.

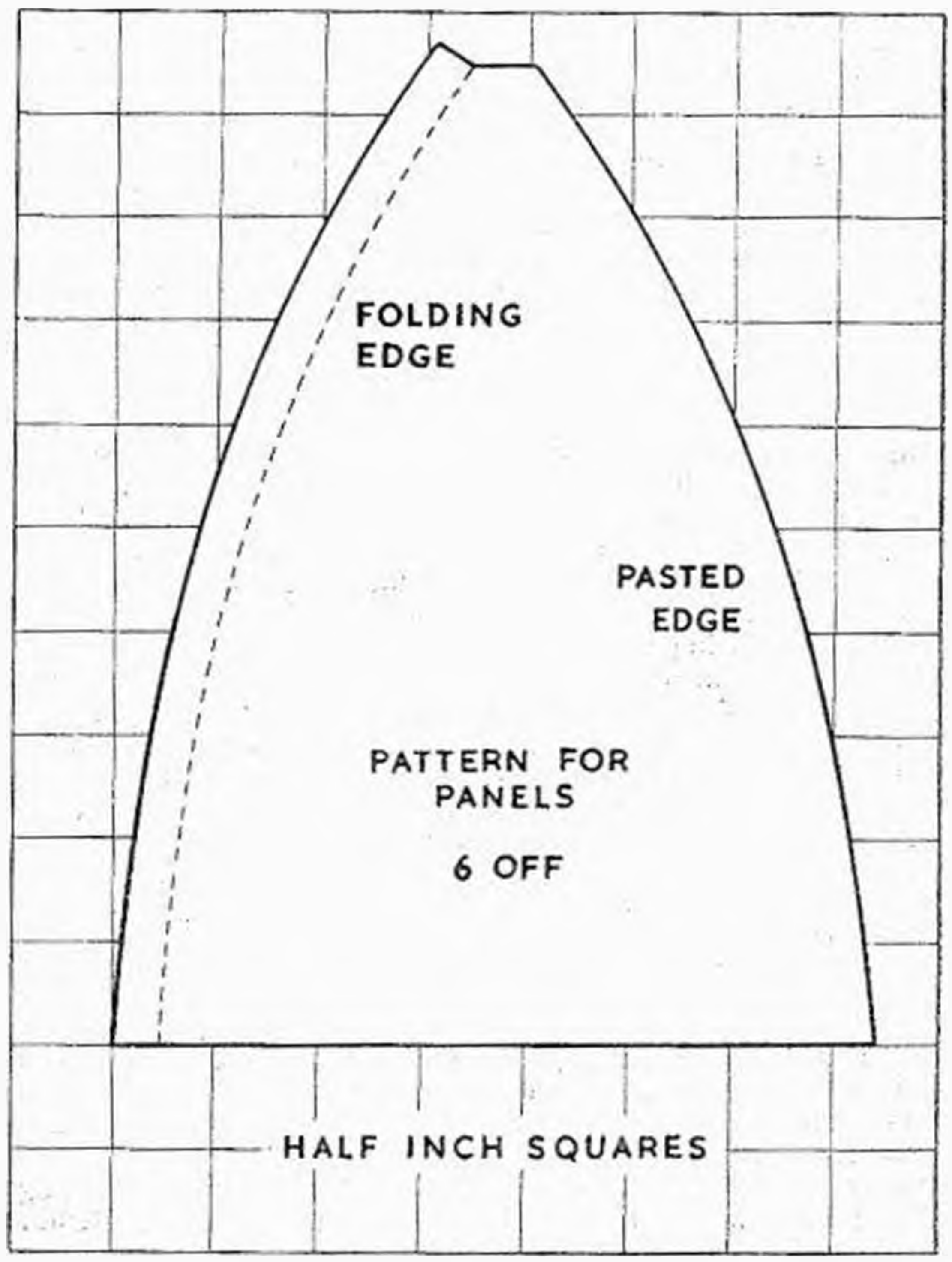
When dry, take a pin and pierce each seam about ¼ in. from the bottom. Prepare 12 pieces of transparent or other light sticky tape ¼ in. × ¼ in. in size for use with paper parachutes. Now six 8 in. lengths of light thread are cut and each is threaded through a hole and folded back along the seam on the other side. For fabric parachutes it is sufficient to tie the thread and apply a blob of cement. For paper ones stick on piece of sticky tape to each side to secure the thread, finally tying all six shroud lines together in a knot at the bottom, making sure they are all the same length.

A spreader made of 1/16 in. sheet balsa is secured 1 in. from the knot. This is made by describing a circle of radius ¼ in. on balsa and marking off the circumference into six with the compasses. 1/16 in. deep cuts are made at these points to receive the threads.

To prepare the parachute for stowage, take the seams and fold them back in the way they were originally made, bringing them together one by one with a neat inward fold in the middle of each panel, rather like folding an umbrella. The remaining panel is then doubled round. Now fold the 'chute in two, with the top underneath and, holding the knotted end of the shroud lines, double them back and forth on top of it, keeping them flat with the fingers, finally laying the spreader flat; you will find that a paper parachute will go into a very small space. Stow it away in its box or nacelle with lines outermost.

This size will be suitable for models from about 4 to 10 ozs. weight. To adjust the rate of descent the hole in the top is enlarged (without the hole the 'chute will whip viciously from side to side and may tear). Remember when enlarging the hole that there may come a point when the drag becomes too little actually to spoil the flight and the model does not parachute down but begins to fly with a steep glide. Under these conditions it may not have sufficient sinking speed to bring it out of the thermal.

Finally, to avoid any possibility of the shroud lines tearing away in a violent opening, a length of rubber should be included in the securing line.



Transport Command.

Under the provisions of the recent Air Estimates, squadrons of Transport Command of the R.A.F. are to commence re-equipment as soon as possible with the Handley Page Hastings and the Vickers Valetta.

During the interim period, Transport Command will continue to use the Avro York, which ceased production earlier in the year, and the Douglas Dakota, of which well over 150 remain in regular service with the R.A.F.

The Douglas Dakota equips three squadrons of the R.A.F. at home, including Nos. 46, 77 and 238 Squadrons, and two transport flights, Nos. 1381 and 1382.

The majority of R.A.F. Dakotas are now stripped of their camouflage paint and operate in natural aluminium finish. Serial numbers of the Dakotas include the following: KG 631, 643 and 732; KJ 810, 861, 865, 866, 876, 878, 907, 952, 961, 972, 975, 977, 983, 994 and 995; KK 128, 129, 131, 133, 138, 141, 151, 193, 194, 197, 198, 200, 209, 212, and 213; KP 208, 214, 217, 220, 223, 231, 248, 251, 258, 276, 279 and 347; FD 892; FL 510; KN 231, 238, 241, 250 and 252.

Polar Lancasters.

The seven Avro Lancasters of the Empire Air Navigation School at Shawbury, which recently completed a training flight to Gibraltar, Iceland and the Arctic Circle were camouflaged in the wartime "Far East" pattern, with white camouflage on the upper surfaces and sides, and black camouflage underneath. The serial numbers appeared as usual in white beneath the wings and in black on the rear fuselage. The code letters of the Empire Air Navigation School, "FGG", appeared on the fuselage aft of the roundel, and the individual aircraft letter on the nose, behind the front turret.

Naiad-Lincoln.

Now undergoing air tests at Luton Airport is the Napier-Naiad, axial-flow airscrew-turbine unit. The Naiad is mounted in the nose of an Avro Lincoln, serially numbered RF 402 and is camouflaged on the upper surfaces, but of natural metal finish on the lower surface.

Rhodesian Trainers.

Following the Avro Anson XIX transport on the production line is the Anson XX navigation trainer, intended for service with the R.A.F. "all-through" flying schools in Southern Rhodesia. The Anson 21 is a similar aircraft intended for service as a navigational trainer in the United Kingdom, and the Anson 22 is a radio trainer.

The Anson XX trainer features the new all-metal wing, as fitted to the Anson XIX, and is powered by two 420 h.p. Armstrong Siddeley Cheetah XV radial motors. No performance details are yet available. The Anson XXs are doped aluminium with a yellow band encircling the rear fuselage and the wings bear the serial numbers VS 505, VS 506, VS 507, etc., which appear on black beneath the wings and on the fuselage.

Devons for India.

Following the cancellation of the R.A.F. contract for the D.H. Devon military version of the Dove, deliveries of the type are now proceeding to the Indian Air Force.

The Indian Air Force Devons are aluminium with a broad dark blue trim along the centre of the fuselage, terminated by the serial number, which appears in large characters on the rear fuselage and on the wings. The horizontal fin flash is displayed, the colours being orange, white and green from top to bottom, with the small central crest in blue. No markings other than the registration number appear on the wings and fuselage. The first three Devons delivered to India have the registration numbers HW 202, HW 203 and HW 204. On the wings, the registration appears with the index letters on the port side and the numerals on the starboard side.

Dutch Firefly Trainers.

In addition to a further contract for the Firefly IV two-seat fighter, the Fairey Aviation Co. Ltd. is now supplying a series of Firefly dual-control advanced trainers to the Royal Netherlands Navy. The Firefly Trainer was described and illustrated in the issue of October, 1947.

The Netherlands Navy Firefly Trainers are painted entirely training yellow and display the normal Dutch insignia on the wings and fuselage and the horizontal fin flash. "K.D.N. Marine" appears in small capitals on the rear fuselage.

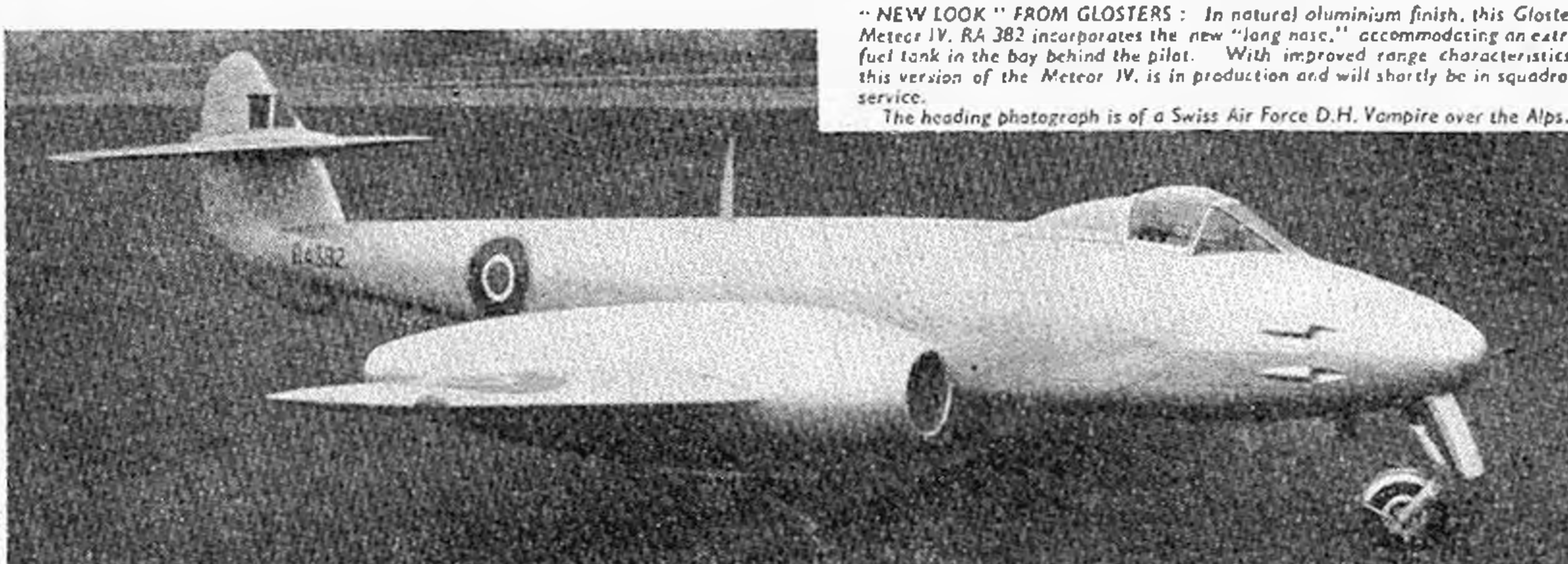
Royal Naval Air Stations.

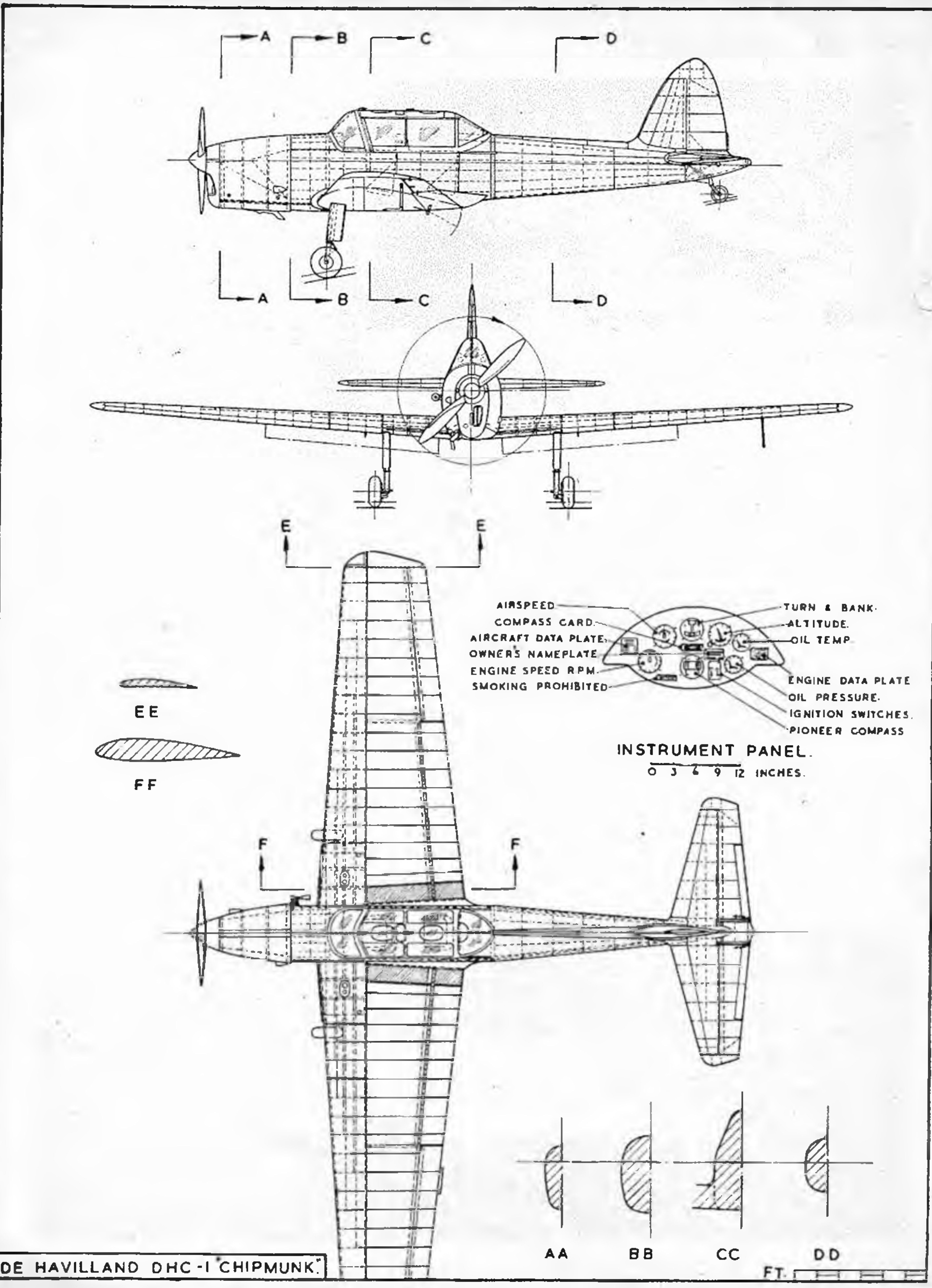
Aircraft of British Naval Aviation are now carrying two code letters on the fin indicative of their home station. These letters appear in a convenient position adjacent to the fin flash and were to be observed in the photograph of the Seafire trainer which was published in "Monthly Memoranda" for January, 1948. The letters "LP" on the Seafire indicated the base as Lee-on-Solent.

Other examples of Naval Air Stations base code letters include "FD" (Ford, Sussex); "GP" (Gosport, Hants) and "ST" (Stretton, near Warrington).

"NEW LOOK" FROM GLOSTERS: In natural aluminium finish, this Gloster Meteor IV, RA 382 incorporates the new "long nose," accommodating an extra fuel tank in the bay behind the pilot. With improved range characteristics, this version of the Meteor IV, is in production and will shortly be in squadron service.

The heading photograph is of a Swiss Air Force D.H. Vampire over the Alps.





DE HAVILLAND DHC-1 "CHIPMUNK"

THE DE HAVILLAND D. H. C. I.

AIRCRAFT DESCRIBED No. 7. BY E · J · RIDING

IN their latest product, the Chipmunk, D.H's. have a worthy successor to the evergreen Tiger Moth both as a basic trainer in the R.A.F. and for club instruction and school work. Its metal construction is likely to appeal to buyers all over the world, and by the time that production is under way at the Hawarden factory near Chester, D.H's. backlog of orders for all types of aircraft, large and small, military and civil, is likely to be increased by substantial orders for Chipmunks from countries that have relied on D.H. products for nearly a quarter of a century.

At a first glance one can see traces of previous D.H designs in the Chipmunk—the Moth Minor in general layout, and the Mosquito in the outline shape of the rudder and fin and the method of tailplane attachment. The all-metal construction in a lightplane is a departure from normal D.H. practice — there has usually been some wood employed somewhere!

Designed in 1945 at the Toronto factory of the De Havilland Aircraft Co. Ltd., of Canada, the prototype CF-DIO:X was flight tested by Mr. W. P. Fillingham on May 22nd, 1946. No major design alterations were found necessary, and deliveries of demonstration models to overseas buyers commenced in the December of the same year.

Loxham's Air Services Ltd., of Blackpool have shown their faith in the type by taking delivery of G-AKCS early this year, and a fourth machine, G-AKDN, is being fitted out to full R.A.F. requirements with blind flying panels, radio, and manually operated v.p. airscrew. By the time this issue appears in print, 'DN will have gone to Boscombe Down for final acceptance tests.

Construction. All-metal semi-monocoque fuselage made in two sections. Front one containing the two cockpits is of stressed skin construction built around four box section sheet metal longerons. Aft section built up from light alloy hoops and stringers covered with Alclad sheet, is bolted to the front portion at a point a short distance aft of the rear cockpit. The wings are of the "D" nosed, single spar pattern and are attached to the fuselage at three points, one at a false spar situated about 6 ins. from the leading edge, and the other two at the main spar top and bottom booms respectively. The slotted flaps and ailerons are carried on a second false spar running the entire length of the trailing edge. Forward of the spar, the wing is Alclad covered, whilst the section aft of the spar is fabric covered with the exception of the walkways on either side of the fuselage. Tailplane and fin are both metal-covered cantilever structures. The rudder, elevators, ailerons and flaps are fabric-covered aft of the hinge line. Two trim tabs are fitted to the trailing edge of the elevators, the port one being permanently locked in the neutral position.

Sheet metal trim tabs for ground adjustment only are situated at the lower end of the rudder trailing edge and at the inboard end of the port aileron.

Landing shocks are absorbed by rubber blocks under compression enclosed in two cantilever shock legs attached directly to the main spar.

The power plant is a four-cylinder in-line aircooled inverted 140 h.p. D.H. Gipsy Major 1C. 25 gallons of fuel are carried in two flexible tanks situated one in each wing root panel. The two cockpits are provided with identical controls and instruments, and it is estimated that the market price in this country will be in the neighbourhood of £2,000.

Colour. Natural polished Alclad finish. Fuselage decking and flash, registration letters, etc., green outlined with white.

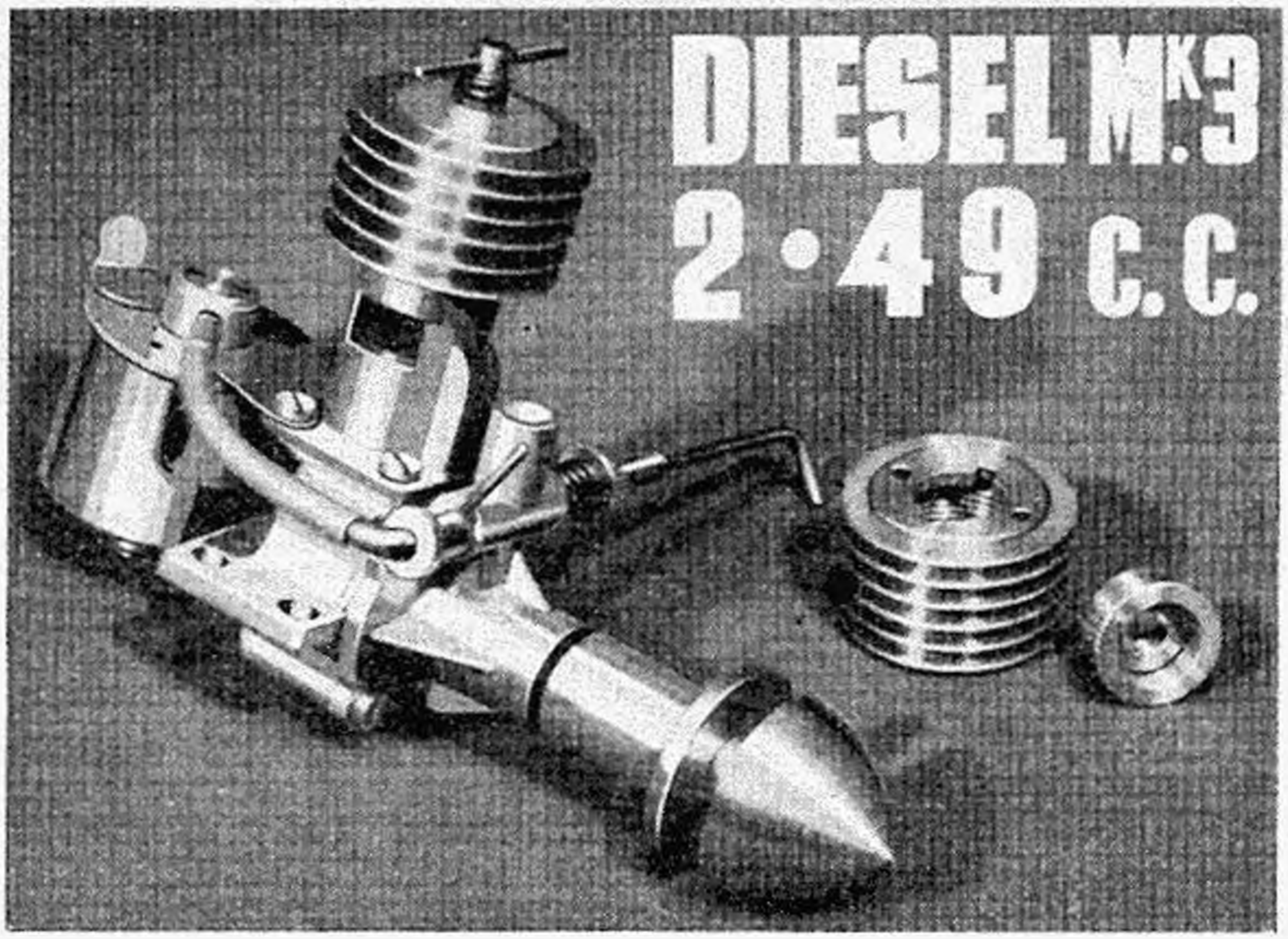
Specification. Length: 25 ft. 8 ins. Span: 34 ft. 4 ins. Height: 7 ft. 0 in. Wing Area: 172·5 sq. ft. Wing Sections: NACA 2415 at root; U.S.A. 35b at tip. Tare Weight: 1,174 lb. Total Loaded Weight: 1,800 lb. Max. Speed (Sea Level): 143 m.p.h. Cruising Speed: 124 m.p.h. Stalling (30° flap): 43 m.p.h. Service Ceiling: 19,000 ft. Range: 485 miles.

¼ in. to 1 ft. reproductions of the G.A. drawing may be obtained price 1/-, from our Leicester Offices. Sets of four photographs, size 6½ ins. × 4¼ ins., price 6/-, from Eaton Bray Studios.

Aeromodeller Photographs.

THE 'HOTTEST' ENGINES OF THEIR CLASS—NOW THE AMAZING E.D.

DIESEL Mk.3 2·49 c.c.



The Race-Car model which won the "M.G." Trophy at Eaton Bray on 28th March, 1948, was powered by the above unit.

SPECIALLY DESIGNED for "C" CLASS RACE-CARS and CONTROL LINE FLYING

Features

Rotary Valve, specially extended Prop-Hub (max. streamlining), additional conversion head for "Glo-Plug," every engine guaranteed. A speed of 41·5 m.p.h. has already been recorded in "C" class Race Car. Flexible throttle control. Double capacity Fuel Tank.

SPECIFICATION

Bore ·550 ins. Stroke ·625 ins.
Hole Centres for engine bearers $\frac{9}{16}$ in. × $1\frac{9}{16}$ in.
Cu. cap. 2·49 c.c. Static Thrust 30 ozs.
R.P.M. 8,500 (under load) Weight 6 ozs.
Height $3\frac{1}{4}$ ins. Width $1\frac{3}{8}$ ins.
Length 5 ins. (with extended prop. hub).
Prop. (U. Control) 9 ins. dia. 11 ins. pitch.
Prop. (Free flight) 11 ins. dia. 5 ins. pitch.
Prop. (Marine) $1\frac{3}{4}$ ins. dia. 5 ins. pitch.
Fuel 2 pts. Ether, 1 pt. Castor Oil,
1 pt. Paraffin Oil.
Compression Ratio Variable to infinity.
Rotation Clockwise and anti-clock.
Running Position Upright or inverted.
Controls, Needle valve & compression vernier.
Flywheel $4\frac{1}{2}$ ozs.
Also conversion Head for Glo-Plug

RECOMMENDED KITS

Keil Krafts—Slicker 42", Scout Bi-plane, etc.
H. J. Nicholls—Mercury Magnette, Alphacon, etc.
Southerns—Dragon, etc.
Dromes Club Kits, etc.
Ward & Wilkinsons—Whirlwind.
Normans—Special Kit, "The Minx."
etc., etc., etc.

PRICE £5.10.0

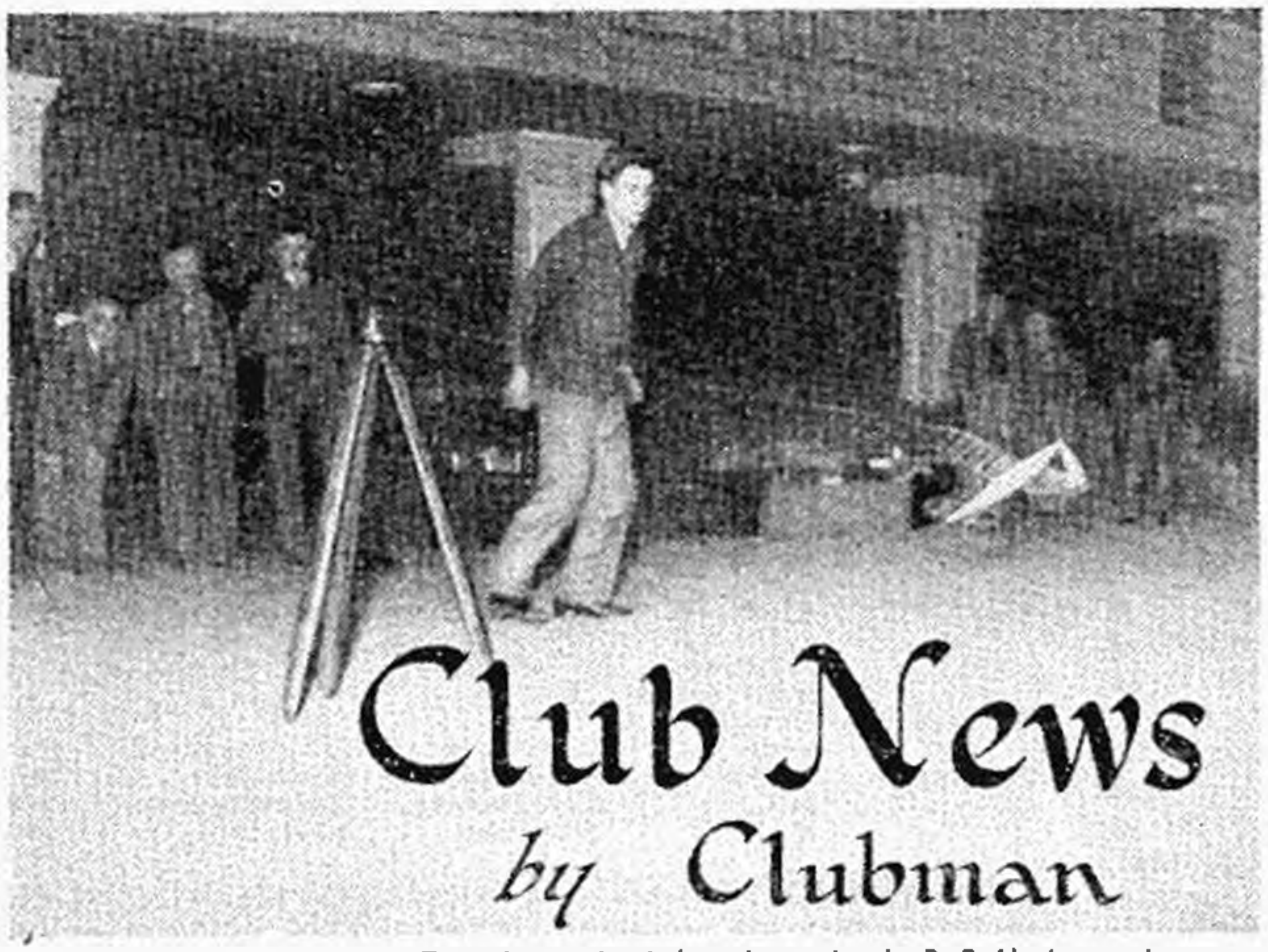
Complete with Conversion Head, at your nearest Model Shop.

E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD.

KINGSTON ON THAMES

DEVELOPMENT ENGINEERS

1223. 18, VILLIERS ROAD, KINGSTON-ON-THAMES, SURREY, ENGLAND.



Club News

by Clubman

These interesting indoor shots taken by D. R. Hughes at the recent Manchester Indoor Meeting show left, Jimmy Wingate of Streatham releasing his model and right, a novel method of holding down the pole!

WE hear that Tempus Fugits, etc. but I've never known time to gallop the way it seems to be doing this past few months. I don't seem to have had time to breathe, and any close study of particular tendencies or happenings is just impossible. However, a general confab. over things in general usually meets with the majority approval, so here goes for a skim over the past month's topics.

Those interested in happenings across the Herring Pond—and who isn't—should know that the American Nationals will be held this year at Olathe in Kansas, from August 3rd to 7th. Runways over a mile in length and 200 ft. wide give plenty of scope for both free flight and c/l models, whilst two large artificial lakes are on the spot for r.o.w. work. Indoor contestants will have the best site they have had for years, the Kansas City Municipal Auditorium having an absolutely unobstructed height of 96 ft (My one ambition is to get over to an American Nationals and see how things tick !)

A happening frequently reported in the American press is now cropping up over here, namely, stolen engines. A. G. Bryer reports that his " Frog 100 " engine (number 2378), was removed from his model box on Epsom Downs on the 28th March, and should anyone see this engine about, they are asked to report the fact immediately (either to the S.M.A.E. or the AEROMODELLER), so that due action can be taken. We want no ' Whipitquicks " on the model fields, and it is up to every keen aeromodeller to keep an eye out for stolen property of this nature.

Congratulations go to the **WORCESTER M.A.C.** for cleaning up the S.M.A.E. Indoor contests staged throughout the winter months. They placed top in October with an aggregate of 675 secs., again in November with 658·6, and put up 636·4 in December. R. T. Parham of the same club took the honours each month for best individual times with 256·2, 259·4 and 230 in the " A " class, and 217·5, 244 and 206 in the " B " class. Support for this type of flying is evidently falling off in most clubs, the only other clubs to send in times being St. Helens, Streatham and Whitefield.

A few notes from Mr. H. R. Turner, Hon Competition Secretary of the S.M.A.E , are worthy of quoting here, touching as he does so many vexed questions on the organising side of the hobby. To quote :—

" *Remember that a contest is arranged for the enjoyment of many—not just a few—and although rules are irksome, they are definitely necessary to maintain a balance. The deliberate breaking, or the supposedly clever circumvention, of a rule is not the act of a sportsman.*"

" *To avoid time wasted in arguments, make yourselves familiar with the rules of the contest in which you have entered, and so avoid the unpleasantness which tended to mar some of last year's contests. Again, should an official (who is a volunteer out for a day's enjoyment) have to penalise you for any reason, remember what your father used to say—' this hurts me more than you '—and you have only got what you deserved* "

And to finish with a few DO's and DON'T's :—

DO know the rules of the contest you have entered for.

DO remember that this is our hobby, and any official is wishing he had a model in his hand instead of a stop-watch.

DO get a copy of the 1948 *Handbook.*

DON'T try to get around the rules.

DON'T forget your co-operation is appreciated and necessary.

DON'T forget to record flights in seconds only.

DON'T forget that pre-entry is required for the Nationals and other centralised events.

DON'T PUSH on take-off.

All the above wants keeping well in mind at the Nationals. Let us make this the best meeting yet held in this country, with no jarring little " incidents " that so mar what should be a day's enjoyment. What we want is keenness not " kattyness "—enthusiasm not antagonism. Anyone who is not prepared to go all out for such ideals might just as well stay away—he will not be missed !

A word about contest technique. At a recent meeting I attended I was forcibly struck by the complete lack of commonsense tactics by the vast majority of contestants—particularly when it came to power models. Some chaps seem to get in such a state of excitement when starting the engine they forget the most elementary rules about launching. I saw one timekeeper nearly decapitated when one enthusiast let the model go straight at the crowd—cross wind—and excited as blazes because his balky engine had at long last fired !

The **NORTHAMPTON M.A.C.** and Sywell Aerodrome Ltd. extend a very hearty welcome to all aeromodellers visiting Sywell for the " Nationals " in May. No effort is being spared to make this meeting the best ever, and here's hoping for a big crowd and a grand time.

BATTERSEA & D.A.M. held a very successful exhibition in March, and membership has gone up in consequence. Well over a hundred models were shown by the original thirty-five members, and efforts have now been furthered with the introduction of a club magazine.

A new club, probably the first of its type, has been formed in Derby, to be known as the **DERBY MODEL RACING CLUB**. With Reg Parnell (the racing motorist) as president, activities are based on control line aircraft, race cars and hydroplanes, and good facilities are available to members.

Members of the **CHELSFIELD M.A.C.** are obtaining good results with the LDC2 section, though it is not stated whether this accounts for the current list of club records, which is H.L. Glider—2 : 27 by D. Stevens, T.L. Glider—2 : 30 by B. Woolard, Open Rubber—1 : 35 by R. Tullet, and Power (12 second motor run) ratio—1·5 by C. Stevens.

The newly formed **BLACK EAGLES M.A.C.** staged a rally that was well supported by the local clubs. In spite of a high wind, the rain held off till the following results had been obtained :—

Rubber duration	R. S. Perry	(Birmingham)	3 : 02·8
	G. Salt	(Birmingham)	2 : 47·7
Glider	A. J. Perry	(Birmingham)	2 : 25·3
	S. Ward	(Wolverhampton)	2 : 24·5
Power	H. N. Pilgrim	(Birmingham)	3 : 00·1
	I. Yile	(South Birmingham)	2 : 44·8

This club is hampered by lack of senior members, and enthusiasts in the district are asked to join up and help. The club meets at Stanville Road School every Tuesday evening, where a room large enough for all classes of indoor flying is available.

Anticipating good weather (!) the first flying meeting of the season in the **YEOVIL & D.S.A.** was held at Westland Aerodrome. The wind however made a mess of things, though some good flying was witnessed. During the morning G. Pepper lost a Mills powered " Slicker " after a flight of over 9 minutes. (Timer trouble !) Mr. Watts had a fine flight with his " Fugitive " sailplane, 7 : 30 o.o.s., the model being recovered some 10 miles away. Comp. results were :—

H.L. Rubber	Mr. Watts	1 : 40
	K. B. Evans	1 : 32·65
	E. Robbins	1 : 02·5
Sailplane	Mr. Watts	7 : 30
	Mr. Rooke	: 42·5

An item from the **BLACKPOOL & FYLDE M.A.S.** club mag. is of interest to all other modellers, and gives thought on what poor types some people can be. To quote :—

" We are disturbed to find that quite a number of lone hands are taking advantage of the Society's privilege of the use of the 'drome on Sundays. Whilst we do not wish to force anyone to join the Society, we do feel that if these fliers are prepared to partake of the Society's benefits they should also be prepared to become members of the club. One of the conditions laid down when use of the 'drome was granted was that we should be responsible for any damage resulting from the flying of model aircraft. Some of these lone hands have been asked to join us—and have refused. Is it fair that we should be held responsible, and stopped from flying on the aerodrome through any damage they might cause."

I appeal to these lone hands (should they be readers of this section) to play the game and join the club. They will benefit all round, for surely the clubs are the backbone of the hobby, and it is only through club life that the hobby can be pursued and enjoyed to its fullest extent.

With the publication of a new set of **SCOTTISH AERO-MODELLERS' ASSOCIATION** competition rules, Scottish records are now restricted to the thirteen classes detailed below. Names of present record holders are shown, and where no name appears, no claim for such record has yet been approved. Record claims for Rubber and Power driven models are recognised for R.O.G. only :—

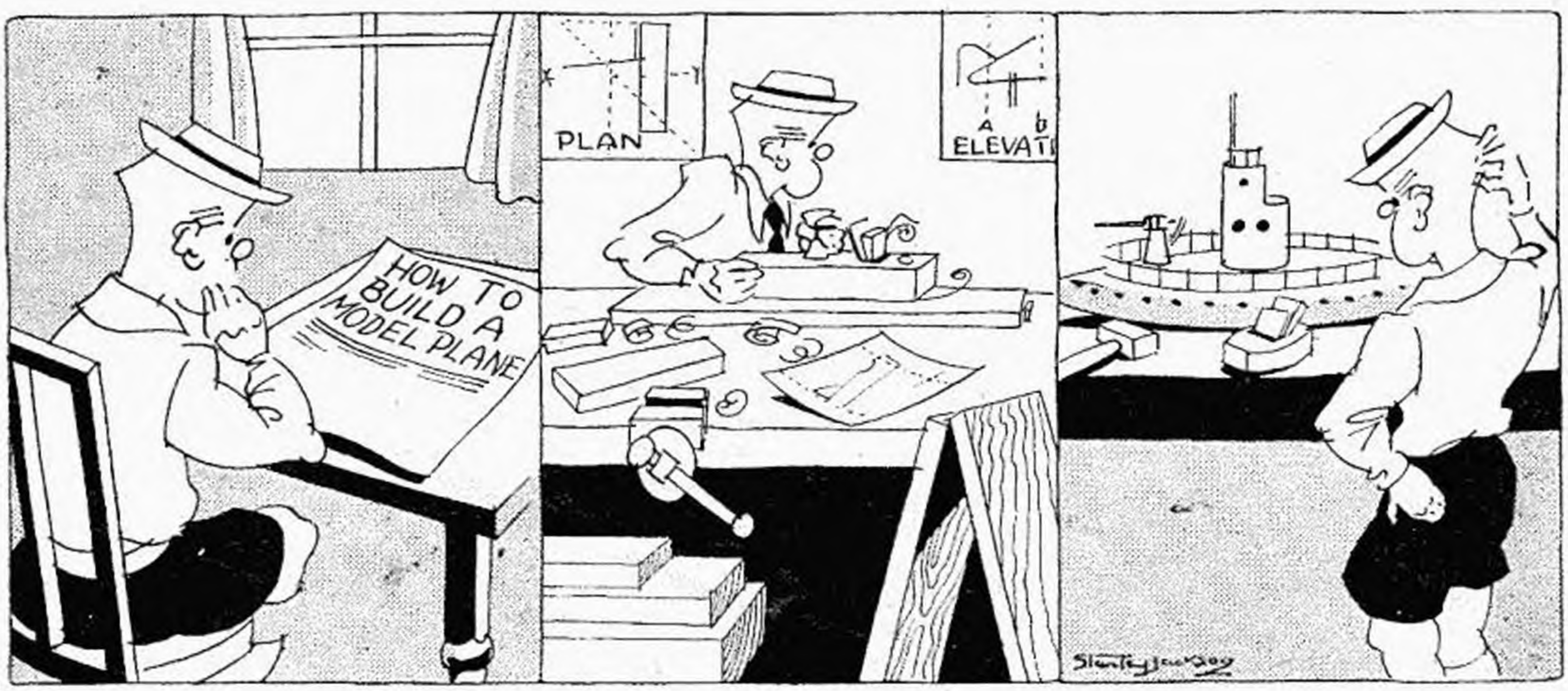
Rubber driven	Wakefield	P. Montgomery	(Kirkcaldy)	7 : 03
	Open	A. Hyndlands	(Glasgow)	6 : 37
	Speed	—		
	Scale	P. Montgomery	(Kirkcaldy)	8 : 54
	R.T.P. " A "	P. Montgomery	(Kirkcaldy)	3 : 39
	R.T.P. " B "	—		
	R.T.P. Scale	—		
	R.T.P. Speed	—		
Power driven	Duration	—		
	Scale	—		
Gliders	Chuck	P. Montgomery	(Kirkcaldy)	: 34
	H.L.	J. McChesney	(Dalmellington)	1 : 20·8
	T.L.	J. Lindsay	(Irvine)	11 : 20

The **WIGAN M.A.C.** have been taking advantage of the good weather by indulging in a spot of outdoor flying. R. Baldwin set up a new tailless record on February 15th, the model being timed for 2 : 52·7 o.o.s.

A few of the pre-war members of the old established **T.M.A.C.** (The Model Aircraft Club) have decided that an effort should be made to get the club going again—it being one of the oldest clubs in the country. All those interested are asked to contact A. A. Judge at the address given under the " new clubs " section at the end of these columns.

Following on recent engine starting events reported in these columns, the **LEICESTER M.A.C.** challenged the Blackheath lads to a match on decentralised lines, with your humble acting as umpire. The results are somewhat startling, the Leicester team again showing their form noted earlier at the Area event, and with one exception (a reserve brought in at the last moment, and thus not fully prepared) produced times that would gladden the heart of any contest director. (Remember the old annoying hold-ups whilst refractory engines were coaxed into life !) Leicester's total time for twenty-four starts (first go from cold) was **1 : 16**, against Blackheath's 5 : 29·1. Best man was D. S. Hall (Leicester) who took 2 seconds to start from cold, and for the rest of his six starts got off first flick every time and totalled 4·5 seconds for six goes ! ! As a result of this interesting contest, the teams have agreed to have another " bash " on the Sunday evening at the British Nationals, which should at least prove interesting and educative !

Egbert . . . . .



BLACKHEATH M.F.C. have had to substitute a contest for Wakefield models for the Power event at their Open Day on July 18th. Reason—power flying is again banned on Epsom Downs.

Members of the **BURY & D.M.A.C.** have been busy getting over twenty power jobs ready for the new season, together with a number of large sailplanes. Pylon types are out of favour with most members as a result of some consistent flying by G. Holt's cabin job.

HAYES & D.M.A.C. had a fighting finish in the last round of the London Area R.T.P. contest, losing to Harrow by 7 seconds. J. Wassell, a services member now in Ireland, collected a first and second place in the first Irish Indoor Nationals.

The **NORTHERN HEIGHTS M.F.C.** are happy to announce that their Annual Gala Day will be held on Sunday, June 20th, at Langley Aerodrome, Near Slough, by the courtesy of the directors of M/s Hawker Aircraft Ltd. Two new contests—the Queen's Cup and a Helicopter Trophy—will be inaugurated, together with popular contests on entirely new lines. Full details and programme (post free 7½d.) are available from Mr. H. R. Turner, 61, Avenell Road, Highbury, N.5.

Control line flying seems to have dwindled lately in the **LEEDS M.F.C.** as members are preparing their free flight jobs for the beginning of the contest season. One interesting model reported is a baby version of the Banshee powered with an Arden ·099. Should go like a rocket!

Much outdoor flying has been enjoyed by the **ENFIELD & D.M.A.C.**, Vic Spence flying his sailplane o.o.s. 4 : 30—the model being safely returned. J. Beer continues to scare the daylight out of spectators with his latest c i stunt biplane " Phew " (20 inches span and E.D. powered), whilst J. Warren consistently clocks around the 2-minute mark from a 15 sec. engine run with his 40 in. span " Frog 100 " diesel job.

The **MIDDLETON & D.M.A.C.** have at last succeeded in getting a clubroom in the Blackley Community Centre, Symond Road, Blackley, where light, heat and use of a small hall for indoor flying is available on Wednesday and Friday evenings at 7.30, or Saturdays at 2 p.m. Experiments in fuel mixtures have resulted in an extra 2,000 r.p.m.'s from a 2 c.c. diesel, whilst a rocket-propelled " Volkjeager " is awaiting test flying, and an autogiro is being built.

The **MANX M.A.C.** (who incidentally are trying to complete arrangements for the inauguration of an annual championships in the Island) had a day out recently, but high winds confined most of the activities to control line work inside a large hangar. The low roof soon collected one or two clinging models, but bags of fun was had by all.

The Irish Indoor Nationals were run in conjunction with an exhibition staged by the **BELFAST M.F.C.**, when three visiting clubs helped put on a very interesting show. Full results were :—

Restricted event	J. Wassell	(Hayes)	5 : 08 agg.
	B. Daulman	(Ulster)	5 : 00 „
	J. Kennett	(Gillingham)	4 : 26 „
Open event	G. W. Drew	(Belfast)	6 : 06 „
	J. Wassell	(Hayes)	5 : 45·5 „
	T. H. Daulman	(Ulster)	4 : 52 „

Ten members of the **KINGSBURY M.F.C.** " with spring in their hearts " took along ten gliders to the Surbiton Glider Gala, and collected first place through G. D. Miles, whose 8 ft. span job turned in flights of 1 : 30, 5 : 00 and 1 : 40. Other members did so well that the club's team aggregate of 1,527 seconds placed the cup in their hands!

As is usual, we report on fellows anxious to get a club started in their districts, and make our usual plea for support from others with like interests in those places. This month's batch consists of P. V. Hewitt of Littleworth, Dinton, near Aylesbury, and E. N. Hill, of 124, London Road, Coalville, Leicester, who would like to combine with the local model engineering society.

Anyone finding a green and white " Hi-Ball " powered with Mills diesel No. 2490 are asked to contact the owner, E.

(Continued overleaf)

READERSHIP SURVEY

In order that we may continue to provide the most palatable fare to the greatest number, readers are again invited to play their part in the production of future issues. This time they are asked to state both their likes and dislikes, chosen from the list below. They should indicate on the coupon the **section** (*which is lettered*) they like best, and the **individual item** (*which is numbered*) they like best; and then do the same for the least liked sections and articles. Finally they are invited to state their favourite author. A last section (G) is also included to cover any special type of article not in the census, but should **only** be used by readers unable to find their choice in the list. Selections may be sent on plain paper by those unwilling to cut their copies.

COUPONS MUST BE SENT IN NOT LATER THAN 20th MAY, 1948 : RESULTS WILL BE PUBLISHED IN THE JULY ISSUE.

Make Your Choice from the list Below :—

A. POWER MODELS
1. Contest
2. Control Line
3. " Control Line Commentary "
4. " Petrol Vapour "
5. Scale " Moderns "
6. Scale " Old Timers "
7. Semi-scale
8. Unorthodox

B. GLIDERS
9. Chuck
10. F.A.I. Formula
11. High Performance
12. Lightweight
13. Simple Duration
14. Unorthodox

C. RUBBER DRIVEN
15. F.A.I. Formula
16. Lightweight
17. Scale
18. Semi-scale
19. Unorthodox
20. Wakefield

D. NON FLYING
21. " Aircraft Described "
22. " Aircraft in Miniature "
23. Models
24. " Monthly Memoranda "

E. TECHNICAL
25. Aerodynamics
26. Constructional
27. " Engine Analysis "
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Wiggins, 28, Woodhouse Street, Warwick. Another case of timer trouble apparently!

Well chaps, don't forget to turn up in force to the Nationals, and let's pray for a couple of really decent days to put the finishing touches to what is definitely a permanent institution in British aeromodelling. See you at Sywell.

The CLUBMAN.

NEW CLUBS.

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3502573 A/C James, G.A., R.A.F., Poling, Nr. Arundel, Sussex.
T.M.A.C.
A. A. Judge, 16, Queens Road, Morden, Surrey.
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A. D. Green, 137, Bellenden Road, Peckham, S.E.15.
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N. G. Taylor, 145, Kingston Road, Wimbledon, S.W.19.
NORTHWICH & D.M.A.C.
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H. F. Dumbleton, 10, Lambourn Road, Rose Hill, Oxford.
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W. Smith, 10, Courtenay Place, Teignmouth, Devon.
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R. A. Yardy, 32, Priory Road, Huntingdon.
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J. A. Bannister, "Hill View," Hillside Gardens, Berkhamsted, Herts.
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M. Bean, The King's School, Peterborough.
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D. Cook, 55, Hambleton View, Sutton Road, Thirsk, Yorks.

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C. M. Christie, 38, Mugiemoss Road, Bucksburn, Aberdeenshire.
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G. Harrison, 15, Rutland Road, Hull, Yorks.
SEVENOAKS & D.M.A.C.
C. W. Artis, 24, Eardley Road, Sevenoaks, Kent.

WAKEFIELD RULES.

A misunderstanding has arisen regarding the eligibility of a peg leg undercart for Wakefield models. The "Wakefield" rules definitely allow this and the S.M.A.E. have confirmed that models so equipped are elegible for the Gutteridge Trophy Contest on May 2nd.

EDITORIAL CHEQUES.

We are holding cheques for the following contributors:—S. G. Wilson, Stanley Jackson and A. A. Gray. These have been returned as "gone away" or "not known" by the postal authorities. Will they kindly notify us of their new or present addresses and their cheques will be forwarded immediately.

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