APRIL 1952

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1'6

Introducing our Baby

THE NEW E.D.·46

In answer to the great public demand we introduce the " BABY " of the E.D. family and coming from a good stock, although it will always remain the smallest, it has all the good qualities of its relations plus added experience in refinements.

Unlike a human family, more's the pity, the youngsters of the E.D. family start their lives in the New Year of 1952 with the knowledge and experience of years already installed in their systems.

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SPECIFICATION

Bore : 5/16 in. R.P.M. : 9,000–12,000. Height : 1 15/16 in. Stroke : ⅜ in. cu. capacity 0·46 c.c. (0·028 cu. in.). B.H.P. : 0·04. Weight : 1·4 oz. with tank. Length : 2⅜ in. Width : 1¼ in. Type : Diesel. Induction : Rotary valve (crankshaft). Connecting Rod : Steel. Compression : Variable. Exhaust : Porting 360 degrees. Transfer : Porting 360 degrees. Compression Ratio : Variable. Hole Centre : 1 in. (two slots, 3/32 in. - 3/16 in. instead of four holes). Rotation : Anti-clockwise. Running Position : Upright inverted or side winder. Fuel Control placed at 30 degrees for easy access. Fuel Container : Plastic. Mounting : Beam and special bracket for Radial (an extra). Fuel : E.D. Standard.

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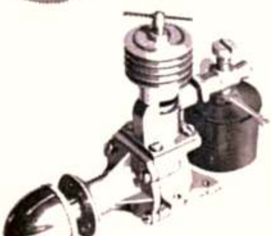

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Ideal for control-line, stunt and speed competitions. Height 3 in., width 1⅞ in., length 4 in., weight 5¼ oz.

Price **£3 . 5 . 0**

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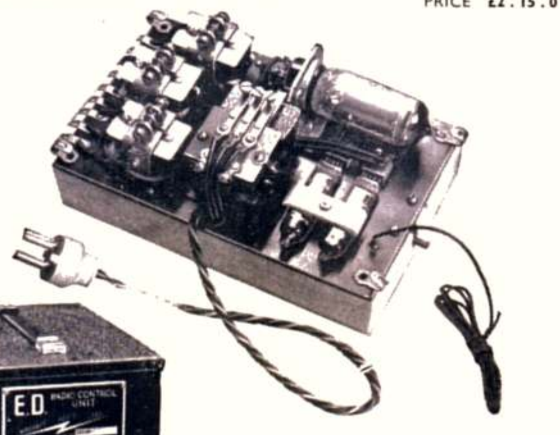

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Convincing proof of its stability and reliability was given when used in the recent Cross-Channel success of 9 hours' duration under extremely adverse conditions.

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Unit complete	£25 . 0 . 0
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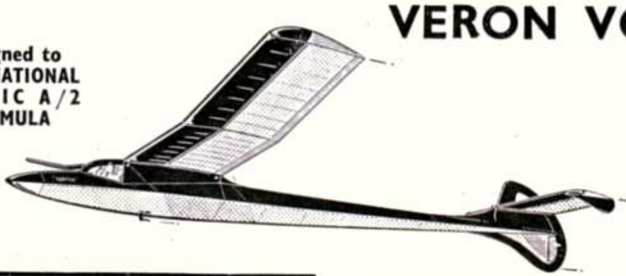


VERON VORTEX

The "VORTEX" represents the culmination of over 12 months intensive research by Veron designer Phil Smith. It is simple, rugged, and combines a stressed structure with absolute maximum performance—and positive tow-line stability. It's the year's winning kit design.

All strip, sheet, spars, sectional trailing edge, celluloid, etc., supplied. Details for auto-rudder and "tip-up" tail dethermalizer.

Specifications :—Span, 66 ins. Length, 38 ins. Total surface area, 508·75 sq. ins. N.A.C.A. 6412 Aerofoil. Minimum ballasted weight, 14·5 ozs.

Kit, (inc. P.T.). **22/7**

Here are some of our Veron Kits from which to choose

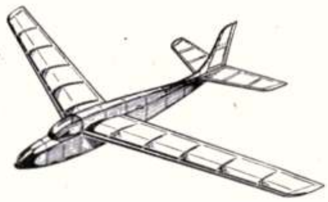
Rubber Duration		Control Line	
Goblin	4/7	Nipper	12/10
Rascal	6/8	Bee-Bug	14/8
Skylark	6/1	Speedee	22/7
Snipe	6/8	Stunter	23/10
Fantail	6/8	Sea-Fury	28/8
Spearfish	9/2	Wyvern	28/8
Fledgeling	9/2	Philibuster	28/8
Sentinel	12/10	Minibuster	18/4
Hi-Climber	30/6	Spitfire	33/1
		F.W.190	25/8
Jetex Propelled		Panther	30/6
Min-o-jet	4/3	Midget Mustang	27/6
Air-o-jet	9/2		
Cirro-jet	12/10	**Hand-Throw Gliders**	
Fouga-Cyclone	6/1	Wren	3/8
Sabre	6/8	Tom.tit	1/10
Attacker	6/8	Swift	2/1
Thunder-jet	6/8		
Sea-Hawk	6/8	**Power Duration**	
		Stentorian	84/11
Gliders		Skyskooter	30/6
Buzzard	16/6	Martinet	25/8
Wagtail	6/1	Streaker	24/1

The above prices include Purchase Tax

VEROSONIC 46

A graceful F.A.I. Soaring Sailplane with a supersonic look. Swept wings and empennage give superb appearance and perfect tow-line stability. Complete kit, including moulded cockpit cover.

Span, 46 ins. Can be adapted for "Jetex 200". **12/10** Inc. P.T.



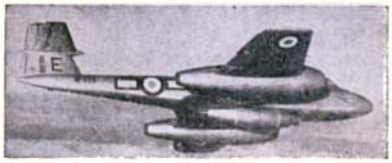
and CORONETTE

A neat little lightweight version the "Verosonic". Of simple design and construction, this is an appealing model, well suited to the newcomer. It's unmatched in its class! Can be adapted for "Jetex 50". Inc. P.T. **4/3**

SOLIDS TOO!

Kits contain a wonderful plan and shaped parts, each one an authentic masterpiece by Veron designer Phil Smith.

Hawker P.1081	2/6
Vickers 510	2/6
Sabre F-86	2/6
MIG 15	3/8
Meteor 8	4/3
Canberra B.1	6/9



VERON

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Latest Kits

GLIDERS

Mercury Martin	8/3
Veron Vortex	22/7

TEAM RACING

Class "B"

Frog Vantage	21/–
K.K. Pacer ...	18/4

Class "A"

Skyleada Hornet	10/5

FREE FLIGHT

Mercury Chrislea Skyjeep ...	29/7
Mercury Aeronca Sedan ...	69/6
Frog Zephyr	12/6

If it's made by Veron, Keil Kraft, Mercury or Frog, we are almost certain to have it in stock.

Engines

	Cash Price
E.D. ·46 ...	55/–
Elfin 0·5 ...	67/6
Allbon Dart ·5 c.c.	65/2
Mills S ·75 c.c.	67/3
Mills P ·75 c.c.	61/2
E.D. Bee 1 c.c.	57/6
Mills 1·3 c.c.	91/8
Allbon Javelin 1·49 c.c. ...	68/3
Elfin 1·49 c.c. ...	59/6
Frog 150 ...	49/6
E.D. Mk. II 2 c.c.	62/5
E.D. 2 c.c. Comp. Spec. ...	65/–
E.D. Mk. III 2·5 c.c. Series II	82/6
E.D. Mk. IV 3·46 c.c.	82/6
D.C. 350 3·5 c.c.	66/–
Frog 250 2·5 c.c.	76/–
Amco 3·5 c.c. (GP)... ...	97/6
Amco ·87 c.c. ...	72/6
Frog 500 ...	78/9
E.T.A. 29 ...	149/5
Yulon 49 (GP)	124/5
Elfin 2·49 ...	70/–

Jetex Uuits

Jetex 50 ...	13/4
Jetex 100 ...	27/5
Jetex 200 ...	38/9
Jetex 350 ...	52/9
Jetex 50 (motor only) ...	9/2

Radio Units

E.D. Mk. I Unit	£17.19.9
E.D. Mk. III Unit	£9.17.11
E.D. Mk. I Transmitter	£6.1.0
E.D. Mk. I Receiver	£9.12.3
E.D. Mk. I Escapement	£2.18.11
E.D. Mk. III Transmitter	£5.14.9
E.D. Mk. III Receiver	£3.14.5
E.D. Mk. III Escapement	£1.2.11
XFG1 Valve	£1.1.4

FREE FLIGHT KITS

Veron Stentorian 72"	84/11
Veron Skyskooter 48"	30/6
Veron Martinet 36"	25/8
Veron Streaker 37"	24/1
Veron Cardinal ...	17/8
Frog Strato D. 42" ...	17/6
Frog Janus 44" ...	17/6
Frog "Powavan" 47"	25/6
Frog Firefly (Biplane) 36"	22/6
E.D. Radio Queen 84"	85/–
Halfax Javelin 50" ...	27/6
K.K. Pirate 34" ...	14/8
K.K. Bandit 44" ...	22/8
K.K. Outlaw 50" ...	27/6
K.K. Slicker Mite 32"	11/7
K.K. Slicker 42"	21/5
K.K. Slicker 50" ...	30/6
K.K. Super Slicker 60"	42/9
K.K. Southerner 60"	48/11
K.K. Southerner Mite	12/10
K.K. Ladybird 41" ...	22/8
K.K. Junior 60, 60"	48/3
K.K. Falcon 96" ...	131/5
Mercury Jnr. Mallard	14/4
Mercury Mallard 48"	22/4
Mercury Chrislea Skyjeep	26/7

1/– postage and packing for all orders under 30/–. Send 3d. for full list.

GENERAL ACCESSORIES

Glow Plugs ...	7/4
Test Bench ...	16/2
Dope Spray ...	3/6
Fuel Filter ...	2/5
U-bolts Amco 3·5... ...	1/6
Wheel Collets	8d.
E.D. Timer ...	12/6
Emdee Timer	7/4
Emdee D/T ...	6/–
Elmic Disel ...	13/5
Elmic D.T. ...	6/9
K.K. Cut-Out	4/4
Undercarriage Box ...	6d.
Undercarriage	2/5
Fuel Funnels	3/3
Alton Fuel Cans	3/–
Dope Brush...	6d.
Finishing Brush	1/–
Fuel Tube ... (all sizes)	6d.

K.K. Spinners (screw-on)—

Standard

1¼", 2/9; 1½", 3/1; 1¾", 3/1; 2", 3/8;

Supersonic

1¼", 3/1; 1½", 3/8; 1¾", 4/–; 2", 4/–.

CONTROL LINE ACCESSORIES

Mercury Adjustalyne Handle	6/8
"Verogrip" C/L Handle ...	4/7
K.K. 150' lines	2/6
Laystrate:	
(Stranded) 100'	6/–
(Stranded) 70'	4/3
Lightweight 100'	4/3
Lightweight 70'	3/–
Pilots for team racing ...	3/1
Large Bellcrank	6d.
Small Bellcrank	4d.
Speed Bellcrank	4d.
Elevator Horn	4½d.
Control Horn	3d.
Tanks (Stunt and T.R.)	
Team Race 30 c.c.	3/8
Team Race 15 c.c.	3/4
Baby Bat ...	6/1
Large Bat ...	7/4
F.G. Stunt—	
Small ...	4/7
Medium ...	5/6
Large ...	6/8
M.S.—	
Large ...	5/–
Small ...	3/6
Mercury Press. Feed	
Large ...	5/6
Medium ...	5/6
Free Flight Tanks	
K.K.	3/1
M.S. (large)...	3/6
M.S. (small)...	2/6

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LEICESTER.

MEMBERSHIP APPLICATION/ RENEWAL FORM

I hereby make application for membership/renewal of membership to the Guild under the section/s noted below and agree to operate my model/s at all times with due care and regard to others.

NGM VOLA CUM CURA

Each one of your models should have affixed to it one of the above forms, on which you should write your name and address, and thus avoid losing your model. These forms cost 1d. each.

Surname..........................Christian Names..........................

Address ....

....

Please use BLOCK Letters

Each one of your models should have affixed to it at least one N.G.M. black and gold transfer, as shown above. There are three sizes of transfers, see section (c) " Sundries" below.

Section A. MEMBERSHIP (Third Party Liability—up to £10,000 any one claim).

Enrolment for Third Party Cover for sailplanes, gliders, model sailing boats, rubber powered model aircraft or boats ; model aircraft, model cars, model boats, model locos and other models driven by mechanical motors, i.e. combustion engines of petrol or diesel types. Also any of the above types of models powered by " Jetex " propulsion units. — **2/6**

Section B. TOTAL LOSS BY OUT-OF-SIGHT FLIGHT (Model Aircraft).

Please insure the model/s listed hereunder for Total Loss by out-of-sight flight. The true value/s of the model/s based on materials cost, plus accessories and components is as folllows :—

	Type	Description	Value	
MODEL No. 1			: :	: :
MODEL No. 2			: :	: :
MODEL No. 3			: :	: :
MODEL No. 4			: :	: :
MODEL No. 5			: :	: :

Total annual premium/s at the rate of 2/6 per £2 value of model/s

Section C. SUNDRIES.

Please supply.........lapel badges @ 1/6 each... ... ...
Please supply.........large transfers ($2\frac{3}{4}$ in. dia.) @ 2d. ... ...
Please supply.........medium Transfers ($1\frac{1}{2}$ in. dia.) @ $1\frac{1}{2}$d. ... ...
Please supply.........small transfers (1 in. dia.) @ 1d. ... ...
Please supply.........address labels @ 1d. each ... ...

I herewith enclose Cheque/Postal Order value **Total** ... ... £ : :

NOTE.—Membership is restricted to persons normally resident in Great Britain, Northern Island, Isle of Man, and the Channel Islands.

ESTABLISHED 1935

AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

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"Covers the World of Aeromodelling"

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FLY WITH CARE

IN the Spring of each year we devote an Editorial to reminding our many thousands of readers of the need to protect themselves against possible third-party claims arising from the flying of their model.

In this "reminder" we are pleased to announce two improvements in the insurance cover now offered by the sponsors, the National Guild of Modellers.

Firstly, in response to the request of many of our readers who operate both rubber and power driven models, these two catagories are now combined one as for the single premium of 2s. 6d.

The second improvement is that the limit of any one claim which is subscribed by the underwriters—a well known London assurance company—is now *increased* from £5,000 to £10,000.

Two years ago the insurance was extended beyond the scope of model aircraft to include other types of models, and how wide is the cover now available is shown by the following paragraph, which is extracted from the Membership Application/Renewal Form :—

Enrolment for Third Party Cover for sailplanes, gliders, model sailing boats, rubber powered model aircraft or boats ; model aircraft, model cars, model boats, model locos and other models driven by mechanical motors, i.e., combustion engines of petrol or diesel types. Also any of the above types of models powered by "Jetex" propulsion units.

We note however, that a large number of aeromodellers throughout the length and breadth of this country *still continue* to fly their models without having availed themselves of N.G.M. third-party insurance. To them we make an especial appeal to avail themselves of this valuable insurance, because however much care they may take in the flying of their models, they cannot guarantee 100 per cent. immunity from accident to third persons or property.

It is interesting to record that during the considerable number of years during which the N.G.M. insurance scheme has operated, there has never once been a claim resisted by the underwriters. We are glad enough to say that not a large number of claims have been made ; yet nevertheless, inevitably each year a number of accidents have occurred, and in every instance they have been promptly and fairly met.

Aeromodellers are not notoriously known for being payers of surtax, and little imagination is required to realise the collapse in a young aeromodeller's finances ; or in an older aeromodeller's whole domestic position, as a result of a claim being made, if the aeromodeller concerned were not insured.

In conclusion, may we emphasize to all aeromodellers that their first duty is to "fly with care". Their second duty is to provide themselves with third party insurance so that, despite their efforts to live up to the N.G.M. code, should the unexpected happens ; fair recompense will be available to make good damage to any person or property, *and avoid financial disaster to the owner of the model responsible for the damage.*

Cover Picture . . . .

When Vic Smeed and the Reverend Callon get together over a model, as they did with the now famous "Tomboy", we expect results. Here is the Reverend Callon with "Madcap", the latest creation from the Smeed stable, a model that we predict will become as popular as its forerunner.

A new system of Timekeeping

AMIDST the miscellany of suggestions and ideas that emanate from a multitude of aeromodelling sources there occasionally arises the odd spot of genius. In particular we refer to the type of idea which engenders the thought "Now why was this not thought of before ?"

Our bouquet this month goes therefore to the Leeds Club who, at a recent Northern Area Meeting, put forward a proposal calculated to overcome the vexed question of time-keeper's eyesight. It is a singularly unhappy fact that in the competition sphere of aeromodelling the timekeeper has adopted rather a Jekyl and Hyde role. He is in the first instance a much sought after and important member of the competition administration, but once his allotted task commences, becomes the absolute villain of the piece.

In all seriousness, it is apparent that the human element in timekeeping must necessarily be a variable factor and that the system of timing should reduce this variable to the smallest possible extent.

We sincerely believe that the proposal from Leeds will do just this. They suggest that all out of sight flights shall be classified o.o.s. and the actual time the model was in sight according to the individual timekeepers, recorded. At the end of the round the average of all o.o.s. flights shall then be calculated, and every competitor classified as o.o.s. shall then be credited with this average time. (We propose to refer to this as the "Average Maximum" from now on, for reasons of clarity.)

Such a system will certainly overcome the differences of timekeeping and does in effect provide a "maximum" for each round, according to the weather conditions prevailing at the time.

One disadvantage of the present 5 minute maximum is the fact that under the weather conditions we so frequently enjoy, models may well and truly o.o.s. long before 5 minutes has elapsed, with the strength of timekeepers' eyesight as the sole criterion of performance.

It has been suggested that the Leeds proposal as it stands at present, would encourage the rule-dodgers to trim their models to fly o.o.s. in the shortest possible time and still be credited with the Average Maximum. This situation can however, be easily overcome by crediting only those o.o.s. flights with the Average Maximum time or above, as maximums. Those flights below the Average Maximum would only be credited with the actual flight time, in spite of being o.o.s. in the first instance.

Basically this system of timing fixes a maximum for each round, this maximum being determined by the average of the flight times of the leading competitors according to the prevailing weather conditions not only on the day but for each round.

For centralised duration events such as the Wakefield and A/2 Finals it is an excellent scheme and worthy of the utmost consideration by the S.M.A.E.

Diesel Appreciation

Our old friend Bill Winter, Editor of "Model Airplane News", has recently dismissed a fictional British claim that the Diesel is easier to start than Glow-plug, as no more than fantasy. Admittedly, he acknowledged a surprising amount of power was to be gleaned from the "old-fashioned stove pipe affair . . . that had held a British speed record", and he put this four-year-old design, which was one of our earliest diesels, to good purpose in an r/c model.

A month after that first review of the "stilty looking two c.c.", the same editor speaks in glowing terms of a British engine which is as recent as late 1950 in its inception, and which he rates high in comparison with its American Glow-plugged equivalents. Someone has expressed the opinion that he (the Editor) should see a real Diesel.

We would be among the last of that Editor's "English cousins" to claim that "Diesels start better than Glow-plug"; but on questions of reliability, economy and power, we uphold the up-to-3·5 c.c. (·21 cu. ins.) diesel as second to none. He already has one of our best miniature engines, why not let him see all of our best, and supply him with correct fuel mixtures! He can then let us know how high he rates the starting and power of our Diesels.

What about it, manufacturers ?

Whilst on the subject of diesels in the New World, we are reminded that we received a letter the other day from Ted Martin, Amco engine designer, who has emigrated to Canada.

Ted has one or two interesting comments to make on the general question of diesel or gloplug. He says that although there are a fair number of the latest British diesels in Canada, there is not the ardent enthusiasm to find out the answers and really make the diesel perform as it is capable of doing. This is because model shops out there do not stock suitable fuels, and because the gloplug engine performs well and is catered for in every way. Spares and service for American engines are good and readily available, whereas the spares and service for British engines is transatlantic and necessarily long-winded, all of which tends to put the diesel at a disadvantage.

Ted himself intends remedying this situation in the very near future when Martin Power Units go into production with their ·049 diesel in June. And just to make sure that the Canadian boys have the right stuff to run the motor on, the same firm will be marketing almost immediately a complete range of high performance diesel fuels based on the latest British formulae.

We feel sure that modellers everywhere join with us in wishing Ted every success in his new venture.

"'Brief Respite is here our portion"

By virtue of aeromodelling's contribution to the H.M. Customs & Excise in the shape of purchase tax, we are now apparently scheduled as an "official channel" for the dissemination of Press Notices. A delightful example of bafflegab, as our American friends call it, has just appeared on the editorial desk: "... girls' briefs with cuffs, bands, frillings or trimmings are being delivered free of tax as girls' panties. Briefs are defined in Notice No. 78A as garments without an inside leg seam and this definition is regarded as including briefs to which cuffs, etc., have been added ..."

At this time of the year we are naturally concerned with formulas and so forth for next season's contests, and our drawing board being handy decided to design a garment or two according to H.M. Formula No. 78A. After some preliminary trouble in laying out an attenuated trouser-like garment which, if memory serves us right, is the general form of a brief, without an inside leg seam—we kept getting a skirt or small kilt—we concluded that a single point of attachment could not be defined as a seam and proceeded on those lines. The model appeared stark and simple in the extreme, so, again using H.M. Customs' helpful hints, we proceeded to add fine scalloped frillings, bands, and other trimmings to taste, but alas, fell down on the insidious item "cuffs" which we naturally believed to be "button four, undo two" as our tailor puts it. The distaff side have proved unhelpful, so that pending further advice we shall confine our designing genius for the immediate future to tissue rather than silk covered frameworks.

Good News for Control-Liners

An F.A.I. Circular dated the 1st February, 1952, indicates that a reasonable system has been devised for the incorporation of Control-line activities into the Merit Certificate requirements.

To quote from the circular :—

Licenses existing at present apply only to the Free-Flight group. Since the growth of Control-line flying the need has been felt to incorporate this group in an extended scheme of Modellers' Licences.
As Control-line flying can be sharply divided into aerobatics and speed sections, which have no real connection, these must both be taken into account.

Consequently, certain minimum performances have been stipulated for both stunt and speed flying, and the S.M.A.E. Council will consider these new recommendations at their meeting on the 16th March, following which full details will be published.

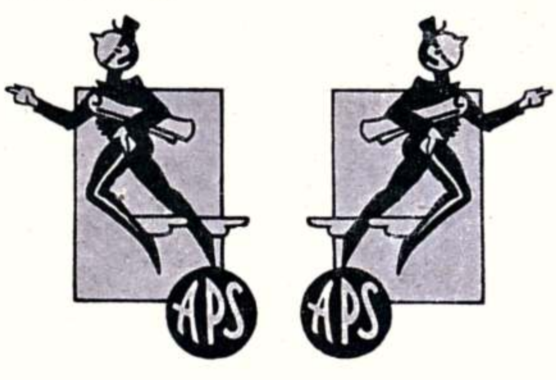
Improved P.A.A. Load Events?

A reader suggests that although the present P.A.A. Load event is praiseworthy in its conception, the models generally used are somewhat lacking in appearance. He suggests a contest on similar lines, but with the rules applicable to the model altered to give a semi-scale appearance with fully cowled motors made compulsory.

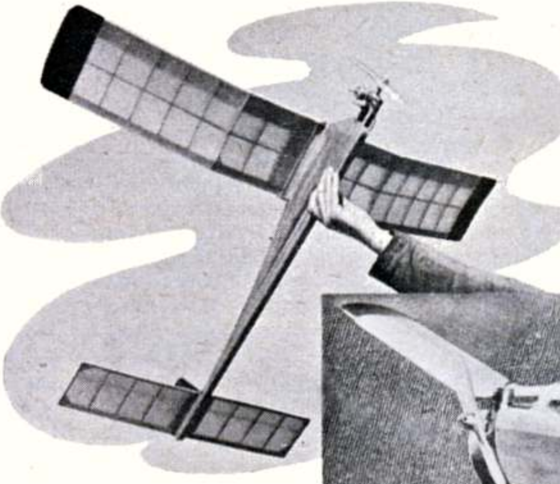
In view of the intention behind the P.A.A. Load rules, that the model should carry a specified load made up as a dummy pilot, we feel that this idea is worthy of consideration. Certainly those P.A.A. Load models that have appeared to date have been anything but pleasing in looks, and by so altering the rules a contest suitable for the very popular semi-scale sport type machine would be created.

The Sign of Service

The familiar little page boy that has long been the trade mark of the AEROMODELLER Plans Service Ltd., has now been incorporated in a series of attractive transfers. They are available in pairs in two sizes, and a pair is given free with every A.P.S. plan. Those of our readers who would like additional copies of this blue and gold motif are advised that they are available at 2d. per pair (small $1\frac{1}{2}'' \times 1''$), and 4d. per pair (large $2\frac{1}{4}'' \times 1\frac{1}{2}''$) from our offices.

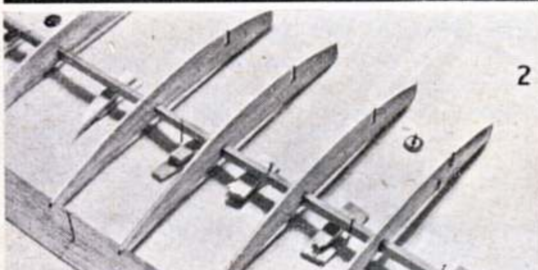


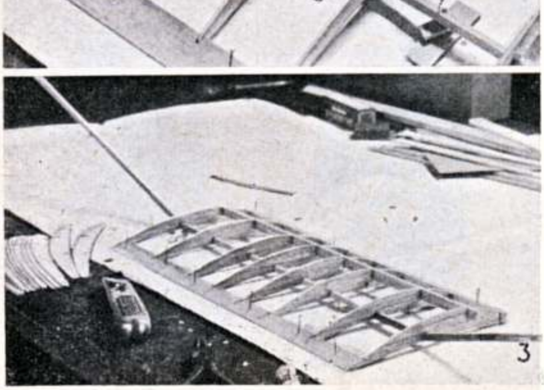
Madcap



A 45½ INCH SPAN DUAL ROLE SPORT MODEL FOR 1 c.c. MOTORS

DESIGNED FOR LONG LIFE AND HARD USAGE BY **VIC SMEED** AND DESCRIBED PICTORIALLY BY THE **REV. F. CALLON**





IT is no exaggeration to say that in designing the " Tomboy " Vic Smeed has already done a signal service to beginners in particular and modellers in general. Here we have a model which (for a power job) is very easy to build, relatively good looking, and so easy to trim and fly that to date nine " Tomboys " have been lost o.o.s. on their maiden flights.

It was this last fact that set me thinking, for " Tomboy " is such a lively little flier that one never knows where the next flight is going to end up. So Vic was approached about a new design, the specifications being for a bigger, heavier model than " Tomboy ", which when slightly underpowered by an E.D. Bee, would have a slow, gradual climb with reasonable hopes of ending up quite close to the take-off point even after a long engine run. And most important of all, the model was to be so strongly built that a " head on " with a brick wall would only necessitate a spot of pointing on the wall by way of repairs !

At last, about six months ago, the plans for " Madcap " arrived and I set to work. It is almost monotonous the way Vic's models behave, for just as with " Tomboy ", the first trial hand glide with " Madcap " was a perfect dream, and in flights under power the model more than lived up to expectations. In fact on the second day out it glided full tilt into the granite wall of a local cottage, and the only damage sustained was the dislodging of two small bits of fairing. I'm afraid I forgot to examine the wall !

Building the Madcap

You will find this a longer and somewhat more difficult job than was the case with the " Tomboy ", but since the present model is calculated to give many seasons of trouble-free sport flying, it is well worth a little extra time and care. The trickiest part of the job is undoubtedly the undercambered sheeted-in wing, so we will deal with that first and in detail.

The Wing

Start by tracing the four dihedral keepers on to plywood and cut them out. Then piece together the $\frac{1}{8} \times \frac{1}{4}$ in. bottom spar, cutting the joints neatly to shape as shown in Fig. 1. Cement the spar into a single unit with the ply keepers across the joints.

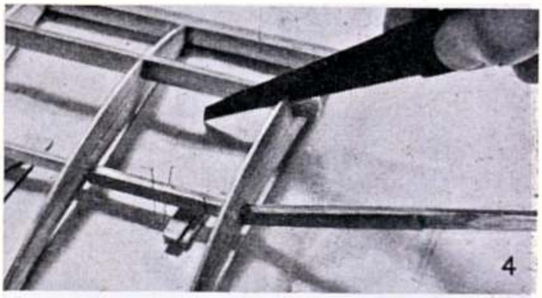
Trace and cut out two key ribs from 1/16 in. ply, and use pins to sandwich 20 rectangles of hard 1/16 in. sheet balsa between them to make the set of ribs. Care should be taken to see that the top of the ribs forward of the upper spar slot is 1/16 in. lower than the rest, so as to leave room for the L.E. sheeting, while the tops of the four central ribs must have 1/16 in. taken off all the way along, for here the sheeting extends all the way from the L.E. to the T.E.

Cut the central portion of the T.E. to length, slot it, and pin down on the plan together with the flat centre-section of the bottom mainspar. This latter must be packed up with pieces of scrap balsa in between the places marked for the ribs to lift it 3/16 in. off the plan, owing to the undercamber of the aerofoil section. The 8 centre ribs are now cemented in place against the T.E. and bottom spar—see Fig. 2. Add the top spar and L.E. for the centre section (see Fig. 3), and trim off their ends accurately. The ply dihedral keepers for the top spar are not added yet, but when the cement has set it is a good idea to make a saw-cut through the end ribs against the rear face of the spar, as shown in Fig. 4, in order to widen the slot where the keeper will later have to be inserted.

Remove the wing from the plan and pin down the starboard section of the bottom spar, packing it up 3/16 in. off the plan with scrap balsa as before. Pin down the T.E. for this section, add the ribs—Fig. 5 shows this stage—then the top spar (Fig. 6), and finally the L.E. The ply keeper is now cemented against the rear face of the top spar across the dihedral joint (Fig. 7) and secured with generous fillets of cement.

Once more remove the wing from the plan, and pin down the port section bottom spar packed up 3/16 in. all the way along. Fig. 8 shows this stage of the operation, where it will be noticed that the rest of the wing, sticking up at an angle from the board, is propped up over a box. The T.E., ribs, top spar and L.E. are added as before in that order, and finally the second dihedral keeper is cemented against the top spar across the joint.

Now sheet in the entire L.E. from the top spar forward with soft 1/16 in. balsa. The four central ribs are also sheeted over from the rear face of the top spar to the T.E. Carve and sand the L.E. to follow the shape of the aerofoil section. All that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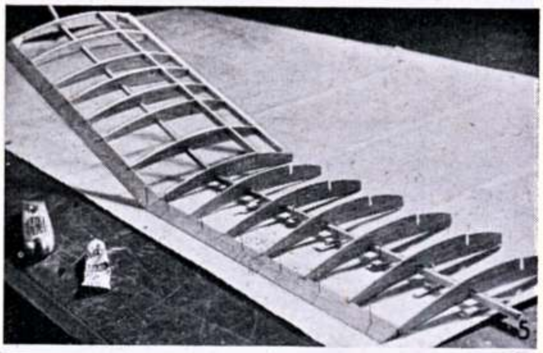
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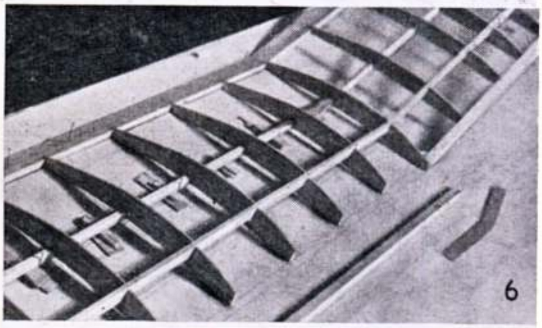
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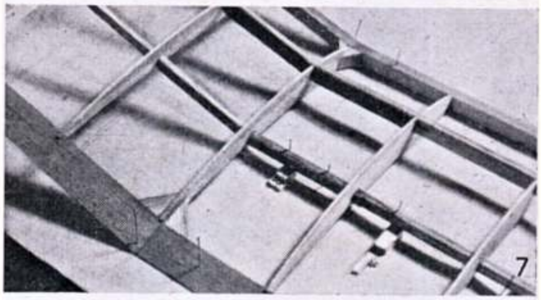
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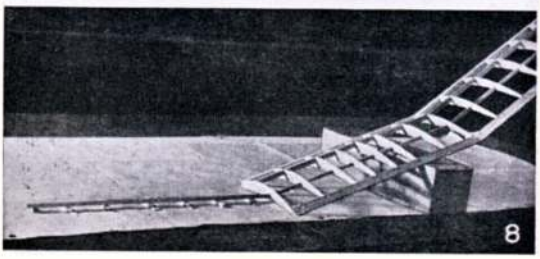
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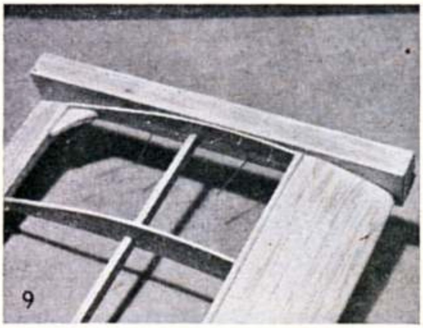
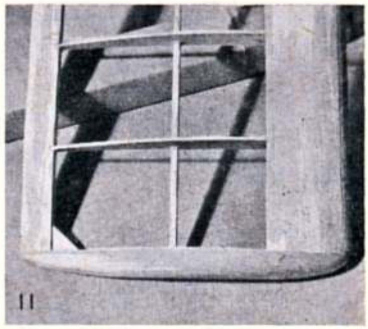
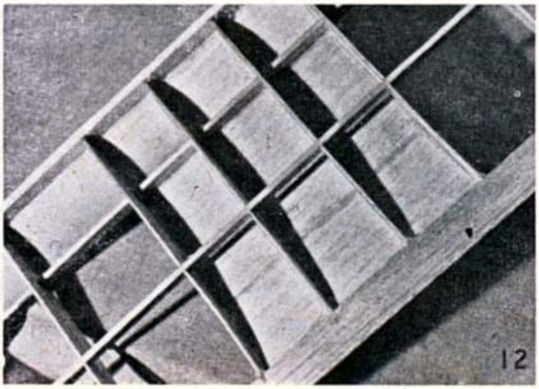
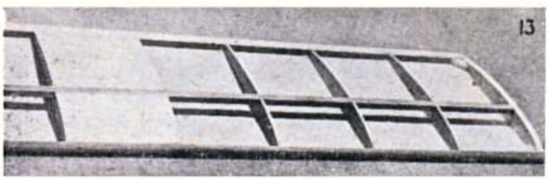






remains now is to reinforce the wing tips. Cut out rectangles of soft $\frac{1}{2}$ in. sheet and cement them firmly against the last rib at either end of the wing, using pins to hold the block in position while the cement dries (see Fig. 9). When this is done, remove the pins and carve the block roughly to the contours of the rib, rounding it off on the outside—see Fig. 10; finish off with rough, then smooth sandpaper, until the tips look something like what is shown in Fig. 11.



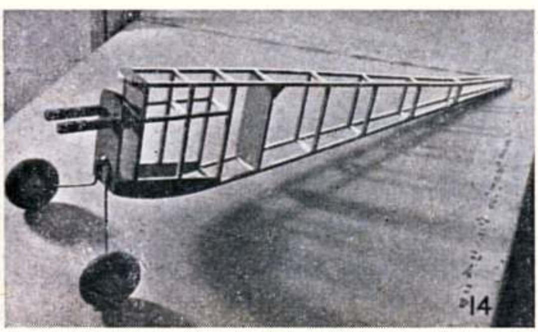


Fig. 12 shows the sheeted-in centre-section seen from below. Finish the job by going over the entire wing with extra fine sandpaper, after which it will be ready for covering.

The Tailplane

As can be seen from Fig. 13, the tailplane is a very simple and straightforward structure. The centre-section is sheeted over with soft 1/16 in. balsa, and a top spar is incorporated to prevent "bowing" when the covering tissue is doped. It should be noted here that since the fin has to be cemented across this sheeted centre-section of the tailplane, it is a good idea not to cover the exact centre line with tissue, so as to leave room for a really strong wood-to-wood joint. The top of the tailplane is therefore covered with two pieces of tissue which leave a space of about $\frac{1}{4}$ in. uncovered between them, from L.E. to T.E. across the middle.

The Fin

Cut out the two parts of the $\frac{1}{8}$ in. sheet fin and cement them together down the vertical joint. Allow to dry thoroughly before cutting out the horizontal rectangle across the joint, and then insert the $\frac{1}{8}$ in. stiffener, grain running lengthwise. Make a check to see that the low edge of the fin is correctly shaped to follow the aerofoil section of the tailplane upper surface, but do not cement in position until both units have been covered. The trim tab should also be cut out and replaced with soft wire hinges before covering.

The Fuselage

As will be seen from the plan, there are two versions of the "Madcap" fuselage; both are entirely covered in soft 1/16 in. sheet balsa, but one is built up on a conventional framework of longerons and spacers, has an undercarriage and underfin, and accommodates the normal E.D. Bee fuel tank, while the other is a profile structure of $\frac{1}{2} \times \frac{1}{8}$ in. sheeted in on both sides, with no undercarriage or underfin, employing a sidemounted engine and "eye-dropper" fuel tank.

The built-up version of the fuselage is quite straightforward, and, as can be seen from the basic structure shown in Fig. 14, it bears a very close resemblance to that of the "Tomboy"; so much so that those who feel the need of special building instructions can be recommended to refer back to the November, 1950, number of the AEROMODELLER, in which the building of the "Tomboy" was fully described.

The profile version of the fuselage is by far the simplest piece of power building I have yet come across. It is also much cheaper to build than the other, but in saving 7/- on wheels, the centre of gravity is pushed well back, and the weight needed at the nose has to be made up by boxing in lead ballast between the engine bearers just aft of the engine itself.

N.B.—Figures 15 *to* 20 *are photographs of an early prototype profile fuselage in which the nose came straight down from the front of the wing mount. The appearance of this part of the final version is somewhat different, since it slopes forward at the nose, but the method of construction remains identical.*

Fig. 15 : Lay out the ½ × ⅛ longerons and spacers over the plan and cement in the pieces of ½ in. sheet.

Fig. 16 : It is most important to cement the first (port) piece of soft 1/16 in. side sheeting over the framework while this is still laid out on the plan. The pins are, of course, removed, but the shape is held because of the slight grip which the cement has on the greaseproof paper. If the sheeting is not added now and the framework removed from the plan, the upper curved longeron will pull the lower one out of shape. Straight pins are a great help when covering a framework with sheet.

Fig. 17 : When the cement has set, the fuselage can be removed from the plan and the sheeting of the port side completed, the excess being trimmed off.

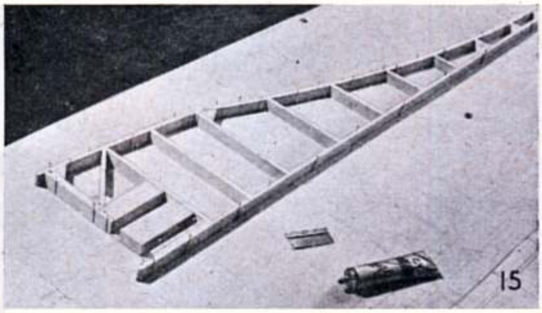
Fig. 18 : Engine bearers and extra ⅛ in. strip packing are now cemented in place. Use " Durofix " for hardwood, not balsa cement.

Fig. 19 : Sheet over the second side of the fuselage, trim off the excess, and sand smoothly all over.

Fig. 20 : The engine is bolted in, sidemounted. First remove the tank by unscrewing the central retaining bolt. Pass a short length of plastic fuel tubing from the feed tube to the narrow end of a glass " eye-dropper ", 4d. from any chemist. Remove the rubber bulb from the thick end of the dropper, and use four pins with their heads bent over, pushed into the side of the fuselage to grip round the glass tube and hold it vertically in position. (Note that on the model photographed the dropper is held vertically against the front of the fuselage with pins and rubber bands, but pins alone are the best solution now that the tank has to be held against the side of the fuselage.)

Covering

Use heavyweight Modelspan for the wing and tailplane, and dope the material on to the fin. The



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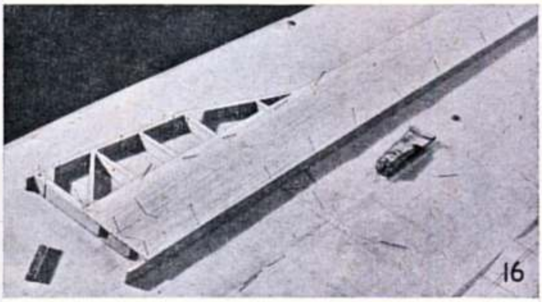

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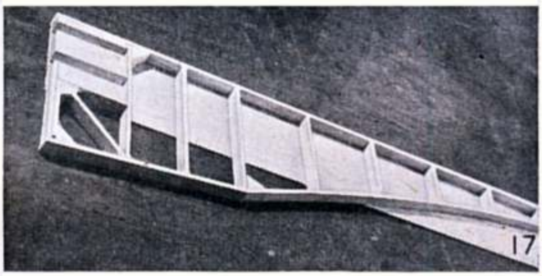

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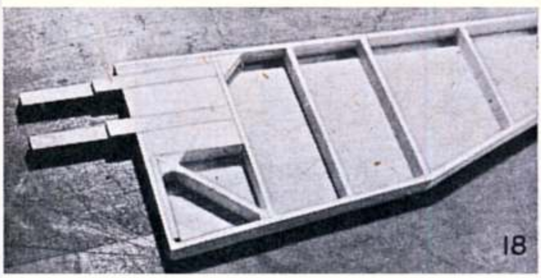

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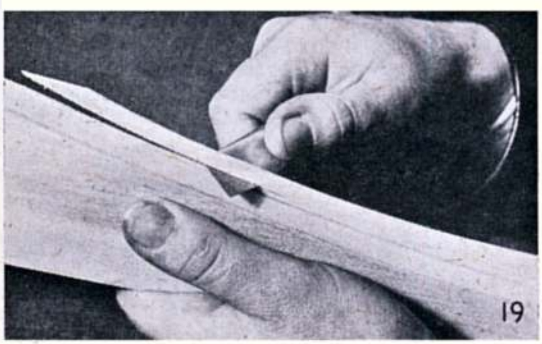

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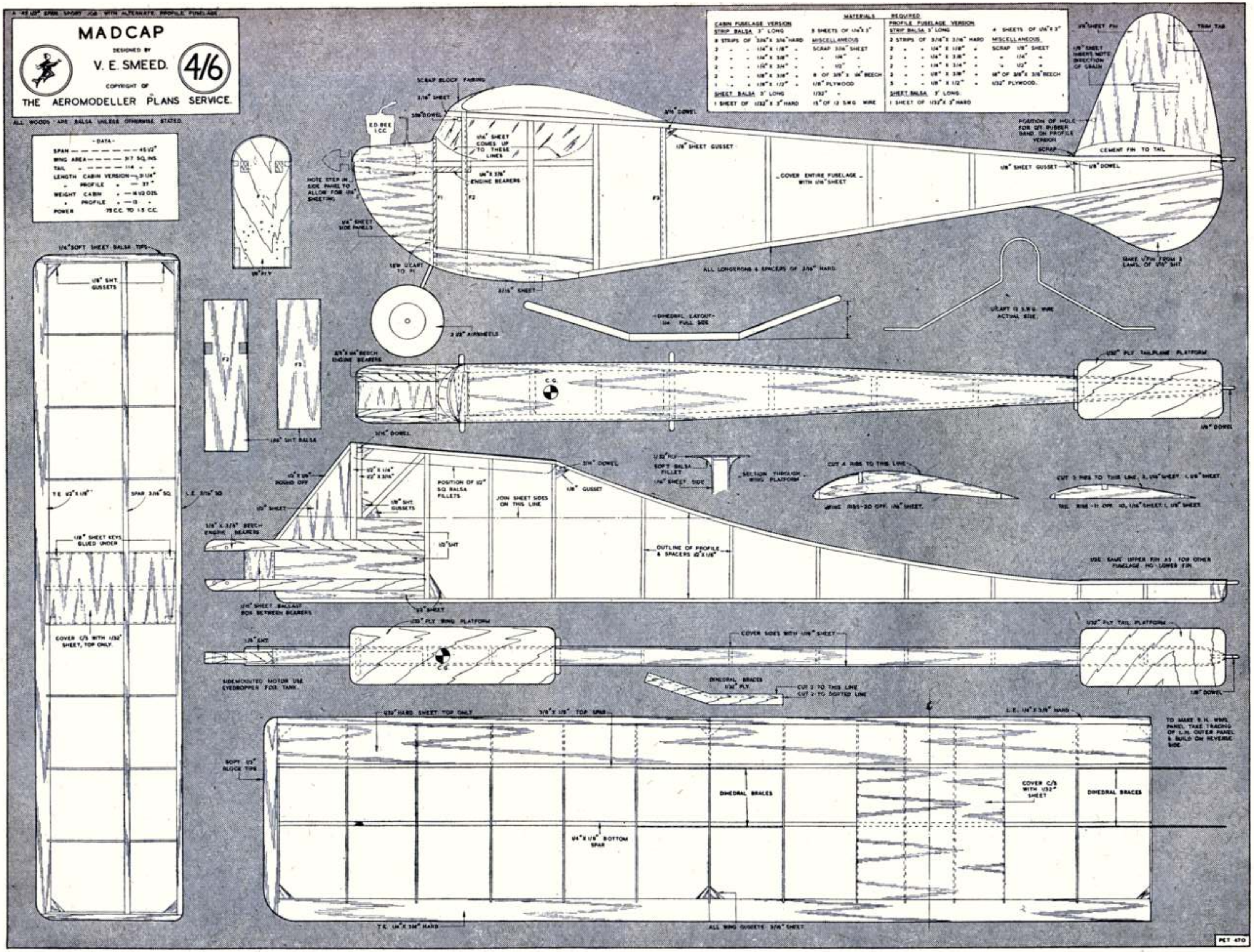

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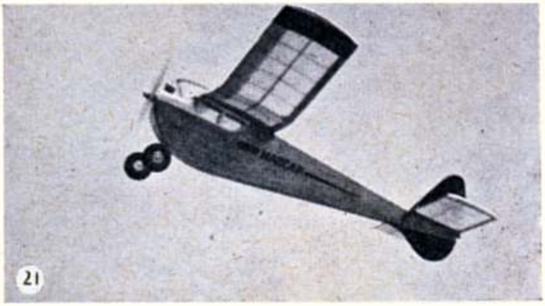


sheeted sides of either fuselage can also be covered with Modelspan if desired, but a very fine finish was obtained in the original by leaving the sheet balsa uncovered and treating it with sanding sealer, a clear varnish which brings out the grain in the wood and gives a high gloss. Three or four coats will be needed, with light sanding after each one but the last. Colouring was kept quite simple on the original: dark blue wing tips, fin and underfin, with a touch of white round the cabin windows, wing centre-section and top of the engine side cowling. And while on the subject of appearance, if you take the trouble to add the fairing shown on the side view of the fuselage (built-up version) between the top of the cabin and the L.E. of the wing, then build it on to the wing rather than the top of the cabin, so that if the wing should ever be knocked forward in a bad landing, the fairing is not dislodged.

Trimming and Flying the Madcap

The built-up version came out at 17 ounces, several ounces heavier than the profile counterpart. It is only to be expected, therefore, that the former's glide is quite fast (though level), while that of the latter is slow and " lifting ". In other respects, too, there are differences, so we will deal with each version separately.

Built-up Version

About 20 degrees of right turn on the trim tab should give a slight right turn on the glide from a hand launch, which is what should be aimed at. Use a hard, white, E.D. $7\frac{3}{4} \times 6$ ins. propeller. Since " Madcap's " climbing angle is quite gentle (see Fig. 21), the prop. can be put on the right way round from the start. If there is any tendency to stall under power, even slightly, add a little downthrust by inserting a couple of washers round the two rear engine bolts between the bearers and the metal lugs. The model should now climb in steady left-hand circles, and glide to the right when the engine cuts.

Profile Version

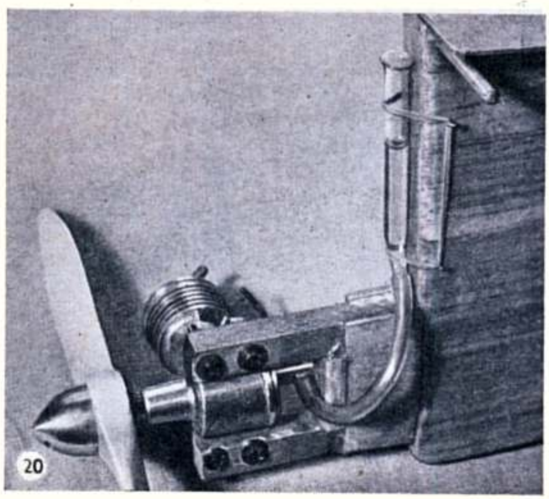
Hand launch the model gently, for it floats like a glider! (Just as well from this point of view that the eye-dropper tank only gives an engine run of some 40 seconds.) The most effective trim has been found to be the exact opposite to the one mentioned above. Bend the trim tab to give a *left-hand* glide—and not too wide if you do not want a long recovery run! The original model had a natural right-hand turn under power, but if necessary this can be achieved by the addition of a small amount of right thrust—washers under the engine lugs round the two front bolts, for the engine is mounted with the cylinder head to the right and the engine lugs also sitting on the right-hand or starboard side of the bearers. But make a trial flight without right thrust to start with. If the model tends to stall under power this may be cured by more right thrust, although there is so much potential " glide " in hand that an excellent performance can still be expected should you prefer to pack up the T.E. of the wing a little.

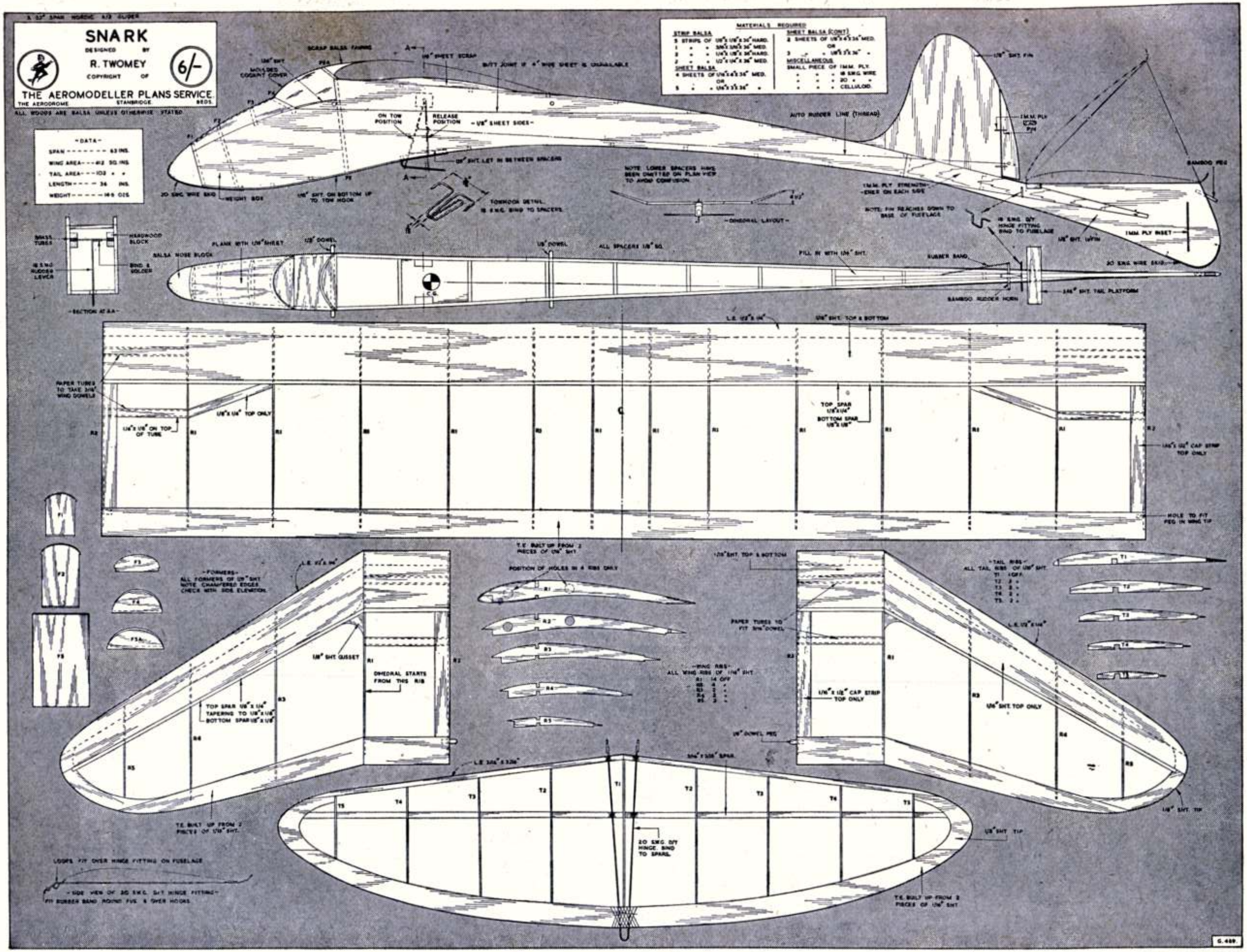
Trimming for either version will not be found very critical, but it is a good idea to anchor the tail units by cementing four small balsa " stops " under the tailplane, two on to the L.E. and two on to the T.E. to fit against either side of the fuselage or tailplane platform, and to act as positioning keys. Trimming alterations are then carried out by the trim tab alone.

Tailpiece

For the last two years or so I have been battling along with you beginners, encouraged from time to time by the occasional bouquet, or spurred on to further efforts by the odd brickbat. One way and another we seem to have covered most of the ground, and it has struck me lately that the time has come for someone else to have a go, otherwise I might start repeating myself, the which would never do. But before signing off (for the present at any rate), I hope it will not be stealing the Editorial thunder to say that I could not hope to hand you over to the care of anyone more capable than Vic Smeed himself. Here's hoping that he gets just as much fun as I did from looking after " Especially for the Beginner ".

Happy Landings!





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Snark

DICK TWOMEY'S LATEST SAILPLANE

With plug-in wingtips, aerofoil fuselage and simple structure

THIS curvacious sailplane to Nordic A/2 specification, has a pedigree that many another towline soarer would envy. Developed from Dick Twomey's *Snoek* design, the Snark is a real thoroughbred with a history.

Its predecessor first flew in a steady downpour of rain; Dick just could not wait for tests, and even though soaked, the *Snoek* maintained an average of just under three minutes. First fair weather tests boosted the average to over four minutes, and the first contest found it third with a maximum of over five minutes on the first and only flight. This A/2 development makes use of the required increase in weight by sheeting the fuselage, thus utilising weight for extra strength.

With less span and greater loading, the Snark has many advantages over the original *Snoek*, not the least being its remarkable consistency, which is shown in last season's results.

4th Thurston Cup— 2 flight aggregate, 6 : 02.
1st Area K. & M.A.A.— 3 flight aggregate, 9 : 43.
1st Whitsun Rally (Welsh Clubs)— 3 flight aggregate, 11 : 40.
2nd R.A.F. F/Tg. Command Trials— 2 flight aggregate, 7 : 27.
5th R.A.F. Championships— 2 flight aggregate, 7 : 20.

For distinctive appearance, both static and airborne, we know of no other comparable design.

CONSTRUCTION

Fuselage. First cut out two fuselage sides from $\frac{1}{8}$ in. sheet, and join with formers A and B. Add $\frac{1}{8}$ in. spacers, nose formers and nose decking in $\frac{1}{4}$ in. wide planks of 1/16 in. sheet. Add fins.

Now bend tow hook, D/T hinge wire, other wire attachments and skids. Add noseblock and shape. Brace the rear end of the fuselage with ply as shown. When cockpit is added, and auto-rudder is hooked up, the fuselage is ready to cover.

Cockpit moulding is very easy. All you have to do is to carve and sand a balsa block to fit as a cockpit itself. Then take a large sheet of thickish celluloid, and stretch over the balsa "mould" in front of an electric fire. In two minutes the job is done, and all that remains is to tidy up the edges of the celluloid with a pair of scissors.

Wings are built in a slightly different way from the normal. The complete wing is composed of three pieces, a 36-in. centre-section, and the two tips, which are dowelled into position and sealed with Sellotape. This makes for great wing strength against towline stresses. The centre-piece is straightforward. A small block is shaped to fit flush with the back of the cockpit. Dowel tubes are fitted in the end ribs.

The tips are best built in two pieces each tip—consisting of the 3 ins. wide flat-panel, and the actual tapered tip. Dihedral ($4\frac{1}{2}$ ins. each side) is built into each tip assembly. Leading edge sheeting on the tips is on top only.

Tailplane is straightforward and is kept as light as possible. Do not forget the wiring for D/T, and make sure the fitting is firm.

Trim. Flying should present no difficulty. Ensure that auto-rudder pulls central, and returns to flight position (left or right turn) when hook is released. When glide is satisfactory, towing adjustments can be made with slight alterations to the "straight" or "towing" position of the auto-rudder. Any prevalent instability on the line will be found to be caused by a too rear-placed C.G. The recommended C.G. position is $3\frac{3}{8}$ ins. back from the L.E.

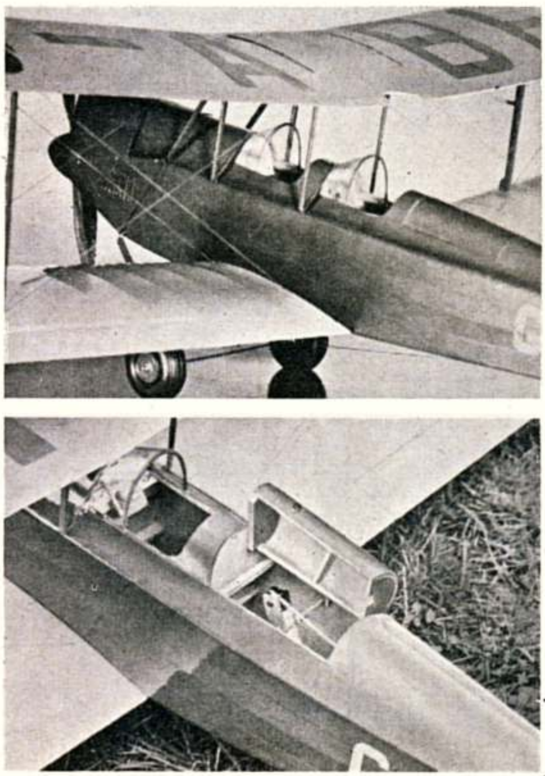
When built, the model may easily be underweight. Note that A/2 minimum is $14\frac{1}{2}$ oz. The recommended method of ballasting is by finishing, polishing and doping the fuselage.

AUTHENTIC
& ACCURATE
35½ ins. SPAN
FREE FLIGHT
FOR ·75—1·5 c.c.

Avro Avian

By
RAY
BOOTH

WITH PENDULUM ELEVATOR CONTROL



THE "Avian Sports" was the last of the "Avian" series, the prototype aircraft being originally designed for the Light Aeroplane Trials at Lympne in 1926. Destined to become a serious rival to the De Havilland "Moth", the "Avian" had many fine flights to its credit, one that springs to mind immediately being the late "Bert" Hinkler's record 15½-day trip to Port Darwin during the early part of 1929. The time was cut to ten days by the late Sir Charles Kingsford-Smith in October, 1930—also in an "Avian".

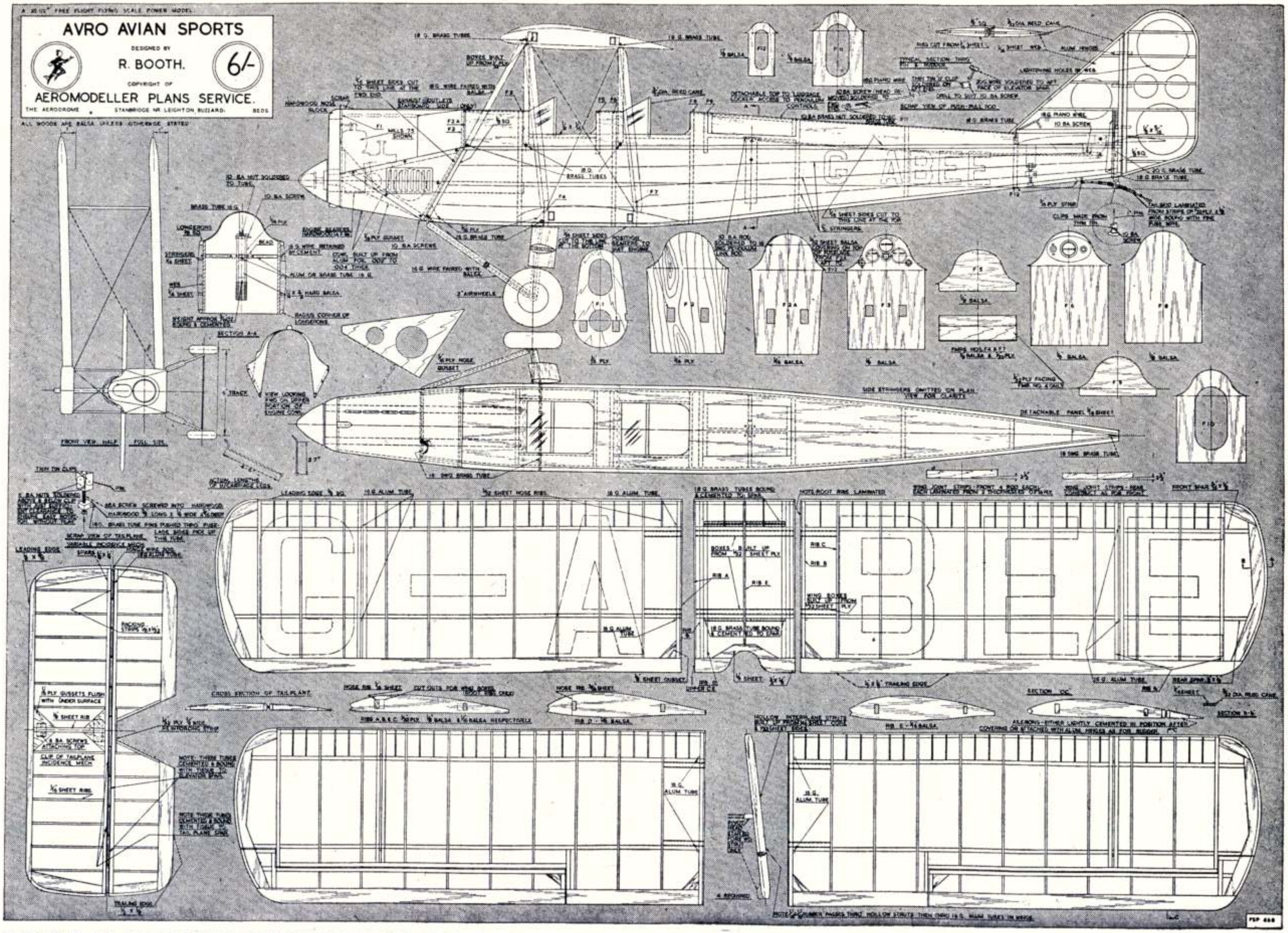
The first machine had a circular rudder and no fin, similar to the 504, "Baby" and "Avis", but later a fin was added. Power was supplied by an Armstrong-Siddeley "Genet" five cylinder radial motor of 75 h.p. Subsequently a four-cylinder "Cirrus" in-line engine was fitted.

Development continued with the "Avian II", which appeared mid-1927. This model introduced a wide track split-triangulated undercarriage and curved wing tips, with a "Cirrus" Mk. II engine. The Mk. III and Mk. IIIa versions followed shortly afterwards, more attention having been paid to streamlining. The original wooden interplane and centre section struts were replaced by tubular steel struts of streamlined section.

The Mk. IV carried further refinements and in 1930 this particular model was produced with a welded steel tubular fuselage with plywood decking and three spruce stringers running down the fuselage sides. Wings and tail surfaces were of wooden construction.

The "Avian Sports", as the Mk. V was known, reverted to the narrow track non-split type of undercarriage. Furthermore, the cross-section of the fuselage decking was changed from semi-circular to a three radii shape which resulted in a reflex curve down each side of the fuselage just above the top longeron.

Large semi-circular windscreens, unusual fuselage decking shape and access to the pendulum are obvious details in these photos of Ray Booth's beautifully made prototype.



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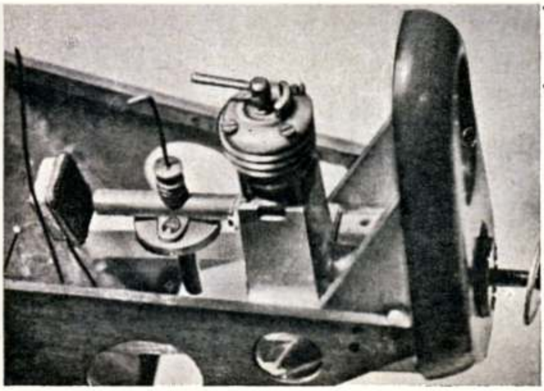


The completely cowled Allouchery 0·7 c.c. diesel is revealed when the aluminium cover is detached. E.D. Bee or Mills ·75 fit equally well with bearer adjustment.

The model is a replica of the " Avian Sports " originally owned by Sir Roy Hardy Dobson, C.B.E., A.F.R.Ae.S., J.P., Managing Director of Messrs. A. V. Roe & Co. Ltd. Readers will be interested to know the " Gabbee "—as G–ABEE is affectionately known—was acquired this year by a syndicate of five people, including Capt. R. E. Gillmore of B.E.A., who is " Gabbee's " pilot. This syndicate had the machine repaired with the aid of parts obtained from an old " Avian " Mk. IV. Consequently, the present-day aircraft has a few details which are not strictly Mk. V version. For example, the fuselage decking is now semi-circular and not the original reflex curve type. Furthermore, when Sir Roy Dobson sold the machine in the early 'thirties to Mr. A. A. Voorsanger, of Bramhall (Cheshire), this latter gentleman had the undercarriage changed from the original narrow track to the standard " Avian " split-triangulated type, which was more suitable for the average grass-covered aerodromes of pre-war days.

Some readers may have observed from articles published in other aviation periodicals that G–ABEE was entered for the King's Cup Air Race which should have been held last year. Several pilots who have flown the machine state that it is more pleasant to fly than the average modern light 'plane, and in some quarters " old Gabbee " was strongly tipped to be in the first three home in the King's Cup. It would have been extremely interesting to see how this twenty-year-old machine performed against its modern counterparts.

The Model

The original " Gabbee " of 1930 was finished in black and silver—fuselage, fin, rudder and undercarriage being black, the remainder of the machine silver. However, modellers will doubtless have their own ideas on colour schemes.

The author's model was powered with the " Allouchery " 0·7 c.c. diesel (long crankshaft version), but with this engine the machine was under-powered. The writer therefore recommends the use of a 1 to 1½ c.c. motor. Irrespective of the power plant fitted, be sure to mount the engine in such a fashion that the thrust line is off-set 2–3 degrees to starboard.

The C.G. should be located 1·10 ins. to 1·40 ins. aft of the leading edge of the lower wing. When the model has been completely assembled, pack up on a table or other large flat surface until the fuselage datum is parallel with the " ground line ". Note that the top longeron of the fuselage is *not*, repeat *not*, parallel with the datum line, and should accordingly be ignored as a rigging reference line. With the fuselage datum line horizontal, adjust tailplane incidence—by means of the screw—until the setting is – 1 to – 1½ degrees. The elevators should now be adjusted until their own particular setting is – 2 to – 2½ degrees to the fuselage datum. Further modifications may be necessary to the above after flight testing, but under no circumstances should the tailplane angle be allowed to exceed ½ degree *positive*, or the elevators to become less than 1½ degrees *negative*. In the event of the model appearing nose light when the above rigging angles have been reached, add ballast inside the cowl in order to achieve the correct trim.

In conclusion the author would like to record his appreciation for the valuable assistance given by Mr. George Rosser, Publicity Dept., A. V. Roe & Co Ltd., who supplied most of the " gen " on the original machine.

Complete building instructions for this interesting replica of an equally interesting veteran aircraft are issued with each full-size plan from the AEROMODELLER Plans Service.

Comparison of finished and uncovered model shows excellent workmanship in construction and decoration by designer Booth. Accuracy of this model is indisputable, every component is reduced to a precise scale without alteration.

NEW ZEALAND NATIONALS

Pete Carter Champion of Champions receives the trophy. On the right is the author.

FRANK BETHWAITE, ***well known New Zealand modeller, gives a most interesting account of their Nationals, admirably illustrating the tremendous enthusiasm for aeromodelling in that part of the world.***

THE fourth National Championships, held at Masterton from December 27th to January 2nd, marked an all time high in New Zealand aeromodelling. Three months of continuous westerly gales eased up for just the right time, and swept in again the day after it was all over. Two hundred-odd modellers, many accompanied by their families, camped in perfect surroundings and, for the most part, used the catering and other facilities laid on by the hard-working organising committee, headed by Mr. Allan Rowe of the Wellington Club. This year, for the first time, an endeavour was made to provide entertainment during the evenings, so that contestants from different ends of the country would stay together and get to know each other. This was outstandingly successful.

For the record, the affiliated strength of the New Zealand Model Aeronautical Association (Inc.) is a little over 1,000. The distance travelled by anybody coming from the northern, or the far southern cities was well over five hundred miles—and the contingents from these far-off places were large. And yet 194 contestants, several officials, and several non-flying helpers all came to Masterton. In view of the population differences it is interesting to compare this number with Australia's 200-odd, Great Britain's 200-odd at Swansea, and the U.S.A.'s 600-odd at Dallas.

The contest procedure for all free flight events was to fly one event each half day. Three flight total decided the winner, and while there was no obligation on the contestant to wait before flying his second or third rounds, it was stipulated that the first round had to be flown before a deadline, likewise the second round. This system worked very well.

Thursday, December 27th saw the majority arrive and register, move into their tents, and get their models processed. A briefing meeting was called after dinner to explain any points, and to get timekeepers' rosters from Club delegates.

Friday morning started the competitions proper with the Towline Glider event (including Nordic). The weather was fine but windy—20 knots with gusts 30 to 35 knots—and most contestants simply could not handle it on tow, with inevitable crashery as a result. Some few outstanding examples of skill won instant high places. The top four Nordic A2's were to become the New Zealand team for 1952, so the pace was kept on to the last, despite conditions. It is most interesting to note that the winner was proxy flown. This completely answers the criticism that a centralised elimination is unfair to those who cannot travel to it.

The first four place winners, who are the New Zealand A/2 Team for 1952, are :—

7 : 21.0	J. R. Penniket (model proxy flown by A. Leong)	
2 : 57.2	R. Johnson	
2 : 54.4	W. Choy	3rd equal
2 : 54.4	J. O'Brien	3rd equal

There were 92 entries. It is interesting to note how the best persist in coming to the top, despite conditions. O'Brien currently holds the New Zealand record with a flight of 41 : 03·6. He took the record from Bob Penniket three months ago, beating the latter's 21 : 53·4.

Friday afternoon the wind moderated somewhat, and the Spar H.L. (virtually F.A.I. Rubber), and the Hand Launched Glider boys fought it out with conditions getting better all the time. The fields were 30 and 64 respectively, and in each class the winner was noted for his development in that particular class over several years. It seemed that experience was really paying off.

That evening was glorious—cool and calm. Modellers covered the field (a large grass aerodrome), just flying for the fun of it. Perhaps the best part of the Nats was the evening flying each day. The Annual General Meeting that night started late and finished even later.

Saturday, fine and almost calm, saw all the control line contests run off. Entries in the three Speed classes, and in Jet Speed, were few, and the speeds realised were far below record standard. Aerobatics, too, saw a small entry of only 26, indicative of its waning popularity. Interesting was the model of Dick Oliver, the winner. It used a curious wing configuration. A biplane centre section merged into monoplane tips at about the semi span point, the whole affair being symmetrical. Or, put another way, a monoplane wing split towards the middle to permit the engine to be installed virtually in a tube. Dick claims that the model doesn't squash. Perhaps it doesn't. He ought to know. He won.

Team Race, with 40 entries, was eliminated two at a time all day, rostered at 20 minute intervals, and with two circles going continuously. Eliminations were completed well within schedule, and the final at 3 o'clock, during which all other flying except aerobatics was stopped, was as thrilling and competent a display as one could wish to see. Three glow ·29's and one large diesel fought it out. The writer timed several refuelling stops at between 11 and 14 seconds, although there were those over the minute too when the —— thing just wouldn't start. Despite these, it was the rule for all four models to be in the air at once, and standards of performance, reliability, team work and flying were high. It is interesting to note that the four finalists came from four widely separated clubs.

Prototype—" A scale model of an existing aircraft or an original design conforming with present-day full-scale practice ", with 57 entries, was one of the highlights of the Nats. All the better models were in fact scale, and no words can do justice to twelve or fifteen detailed scale models. They were required on the line at 9 a.m., and there they stayed while the panel of three judges worked over them until nearly noon. Later, they were flown to qualify and to gain their flight points. Peter Carter won a very close-fought contest with a Spad.

That evening was perfect for flying again, and after dark the whole crowd gathered to see films ranging from various club movies to Pan American films, the Shell aeromodelling film, and the 1950 Wakefield in Finland, kindly loaned by the AEROMODELLER, which has been flown out.

Sunday this year was held as a free day, partly because it was Sunday, partly because we felt that a rest would be a good thing, and mainly in the hope that it would be an opportunity for modellers and their families from all over the country to meet and mix. And to achieve this, it was felt that the running of a contest with a very limited entry would assist. So Radio Control was held Sunday afternoon, and as we had hoped, the world and his brother came along, sat on the grass, talked and watched. Les Wright flew with his usual consistency and skill to win. The contest was for a course defined to be flown out for one minute, turn around and then home along the same line, an overhead 8, and a brief exhibition of control. These manœuvres were worth ten points each. Thereafter, two spot landings gained twenty points each if within ten yards of the mark, graded to nil over 100 yards away. Entries were few, and apart from Wright (who was, incidentally, carrying both rudder and elevator control) the flying was erratic, due in each case to the model and not the radio. One had too much power, one didn't have enough, and one wouldn't go. But it was very pleasant there in the sun.

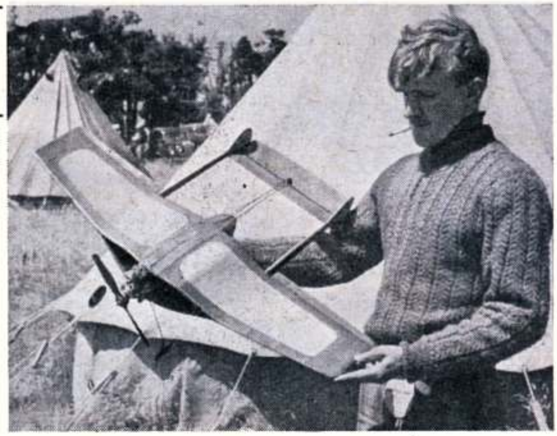
Sunday evening the " Nationals Orchestra " did their hilarious worst, Peter Carter mystified as a most competent magician, and " bull sessions " went into the wee hours.

Monday morning woke to the howl of motors. Payload, an R.O.G. contest wherein each model carried a payload of 5 ounces per c.c. of engine displacement, for a maximum motor run of 30 seconds, was flown in ideal conditions. Wind varied from breathless calm to a fitful ten knots. Drift, aloft, varied constantly in direction and the proportion of woe on take-off was the highest the writer has ever witnessed anywhere, and it was not

A beautifully finished Master III entered in the prototype event. Power unit was an ETA 29.

Beauty and the Beast! Or to be more accurate—the "Bungle-O". Complete even to the "usual offices" which will be noticed half way along the fuselage. And it flies! Sorry fellahs. We don't know her name.

Dick Oliver with his winning aerobatic model. Note the hollow "Custer" channel wing, the flaps and the unusual elevator linkage. Power unit is a Frog 500.



ascribable to simple causes such as faith in one wheel. This is the first year when the weather for this popular event at the Nats has been anything but foul, and much more experimenting in the technique of getting these heavily loaded models airborne is clearly required. The winner averaged 4 : 46·1 over his three flights, and was closely run for several places. There were 63 entries.

Although the surface weather remained balmy, that afternoon showed clear indications of what was soon to come. There is a range of 5,000-foot hills about ten miles to the west of Masterton, and marked standing waves began to form overhead, and the surface drift steadied from the north-west. This had the effect of causing strong thermals over an area of rock and gravel about a mile from the cool grass aerodrome, and large areas of down all around the aerodrome itself. The Power Duration event, run that afternoon, witnessed many beautiful models rocketing upwards, only to be put down within the two minute mark as if a huge hand above was just pushing them down without mercy. About one flight in, say, twenty, did hook a thermal of sorts, about half the rest approximated still air performance, and all the others simply sank. It was really most discouraging, and certainly most unusual in New Zealand. Of 123 entries, not a single maximum was recorded.

That night was New Year's Eve. Further films, including the Cranfield Wakefield, led to a Mock Court, and suitable penalties paid in rockets and the like at midnight. By the way, have you ever seen a jet roaring around, cherry red, at midnight ?

Tuesday morning, the Wakefield, and the New Zealand team for the first six. Weather was ideal for such a selection, fitful to the point of being difficult, without being bad. Drift saw models being timed o.o.s. at the four to five minute mark, and few indeed flew this long, due to the same enormous areas of down that had first shown up the previous afternoon. Forty-five entrants clearly meant business. A glance through the recording sheets indicates virtually no take-off troubles or delayed flights. They wound 'em up and let 'em go, and the times, while certainly low, show consistency. The first six, and the New Zealand team for 1952, in order :—

D. Wilson	...	**3 : 07.0 (average)**
B. Marsh ...	...	**2 : 57.7**
M. Connor	...	**2 : 49.4**
F. Bethwaite	...	**2 : 03.2**
D. Kennedy	...	**2 : 00.0**
A. Macaulay	...	**1 : 45.5**

By noon, the promised westerly had set in in earnest, and the final competition, the Aggregate (wherein as much time airborne is logged, in flights of between 30 seconds and three minutes as is possible during a specified two-hour period) became simply a cross country steeplechase.

A special dinner, the prizegiving, and suitable honours to Peter Carter, the new National Champion, finished the Nationals, and only the memories are left. And in retrospect, some things stand out. First, the fact that an effort was made to entertain during otherwise free time, and the wonderful success of this idea. Everybody came to the hangar at night. I am sure that more modellers met each other this Nats than ever before. Next, the clean, crisp running of the contests, due to most thorough preparation, and the efforts of Walter Read, the C.D., and Les Mayn, his Asst. C.D. Events started right on time, they finished on time, and usually all flying had in fact been completed well before the final deadline, and in this the system of requiring that first and second rounds be completed by certain times, while still permitting the flexibility of "fly when you like", apart from this, helped enormously. Finally, the co-operation and sportsmanship throughout. There was not a single protest in the entire contest programme, and, if the Editor will permit a few more lines, here is an example of sportsmanship that really means something. The writer, who acted as Recording Officer at the Nats, had in the forty hours prior to the first contest, flown from Wellington to Sydney to Auckland, snatched three hours' sleep, and driven 400-odd miles through the night, taking the wheel hour about with Don Wilson. About 3,150 miles in all, and we arrived late. Models sent ahead to be flown proxy if necessary had, for one reason or another, not been put up, and the first round closed as the towline was being run out. Well, that was that, and it was reeled in again in the pious hope of a lull in the next hour. A few minutes later I was informed that a deputation of contestants had requested the C.D. that I be permitted to fly regardless. Whose idea it was, and who did the rounding up and asking, I still don't know. But when contestants will deliberately ask that rules be waived in favour of another contestant, particularly when there is a Star class and a place on the New Zealand team at stake, then there is nothing wrong with the sportsmanship of the movement out here.

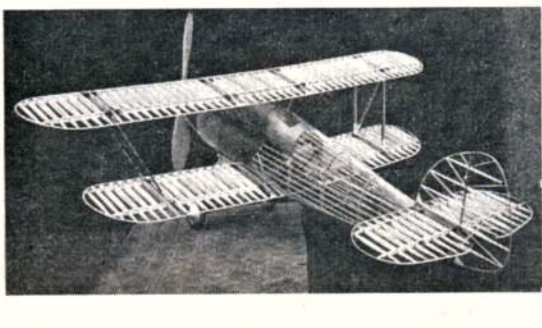
They're all Designed for You!

Our selection of suitable subjects for Flying Scale Free-Flight Power Models

A DISTINCTION of the British aeromodeller is his ability to select any one of a diversity of full size subjects, and make a successful flying scale replica. Most of these scale efforts are entirely free-lance, and even when the selection of one of the more popular subjects is made, the truly individualist British aeromodeller will make sure that his effort is a unique prototype by building to the most awkward of scales! Rather than adhere to the simplest—one inch equals one foot scale—he would rather make his Auster a neat 40 ins. span, and put himself to the bother of calculating each dimension to the scale of 1 1/9 : 1 ft.

Thus we find at each Flying Scale contest or Concours d'Elegance a selection of types ranging from the Rumpler Taube to the Brabazon, the Avro 504 to the Sea Bee, and always a selection of Austers and Piper Cubs with a variance of an inch or two in wing span. Some fly well, some hardly qualify as fliers, and quite a number represent so many hours of patience that the builder's original confidence in the model as a *flying* scale project has given way to pride in an effort of very static beauty. What we hope to do here is to help you select your own choice for scale modelling, and to provide you with a basis upon which to work.

Firstly, why build a scale model at all?



There are many who would stand fast in the claim that the flying scale model is true aeromodelling, that is, the literal interpretation of the name, implying that all models should be models of real aircraft. Whilst our own broad views are not as limited as that, we would readily concede that the realistic flight of a well-finished perfect scale model gives an impression unparalleled in the wide field of aeromodelling. So for appearance alone, the scale job has a great attraction.

Then, to have a given outline already designed for you, with set proportions and details, the "design" part of scale modelling is reduced to construction only. The fitting of the chosen power unit, alteration of the tail area to come nearer to 30–35 per cent. of the wing, choice of wing section, incidence and many other minor problems all go together to make the building enjoyable, with plenty of work for your grey matter. So the building of a scale model is a pleasant constructional exercise.

A third point in favour of the scale job comes in the final finish and decoration. The most colourful real aircraft have a great appeal, and the modeller can get down to work in earnest with the paint brush and colour dope, no matter what his choice may be. Military insignia, civil registration letters and general decoration are the first to catch the eye on any model, so for the colour dope fan, there's special appeal in scale modelling.

Having settled on realism, constructional exercise and finished appearance as three basic reasons for building flying scale, we ought now to start seeking our choice.

Where to start? If you are lucky enough to have all seven volumes of "Aircraft of the Fighting Powers" you have a wonderful selection

***Heading:* Shows Vic Dubery having a re-check on the A/M plans for his Frog 100 powered Sopwith Pup.**
***At left:* An example of pre-war patience in construction, this photo of a rubber driven Hawker Fury was submitted over twelve years ago. Is the interest in fine detail now lost?**

at your finger tips. If not, then we suggest you locate copies in the local Public Reference Library, and whilst there, take a look through all the volumes of "Jane's All the World's Aircraft" that happen to be available. Back numbers of the "Aeroplane" and "Flight" often contain feature articles on suitable types with three-view drawings or silhouettes, while the most helpful source of all is that collector's item, the "Aeroplane Spotter".

Browse through all of them until a photo or drawing catches your eye, then, having made a first choice, check to see if the aircraft is available in the vast range of 1,100 scale drawings in the A.P.S. scale range—a 2½d. stamp will bring you complete lists. If no drawing can be obtained, try the publicity department in the manufacturers' factory; they may be able to provide both drawing and photographs. And if no drawing is available, stop guessing and make another choice.

A lot will depend upon your own preference for free-flight. Whether you like high or low-wings, biplanes or cabin monoplanes, masses of struttery or plain cantilever construction. We remember two such aircraft in that latter class, and only because we are unable to obtain *accurate* details of each are we forced to omit these so obvious choices from our selected eight. They are the Cessna Airmaster and Praga E.214, each with the proportions of an enlarged cabin power model, and the simplest of cowlings around their radial engines. Armed with back numbers of British and foreign aviation journals, practically all of the "Janes" and every other reputable source of suitable subjects for scale, we delved deep to find the selected eight types presented here. For each wing position we have a double choice, and although we know that the selection of the majority is the high wing cabin aircraft, we have no hesitation in recommending any of the other types, and hope that the bias that surrounds the low-wing and biplane scale model will be forgotten when you make your choice.

Biplanes

For the minimum of bother, one could hardly do better than choose to construct the Avro Avian Sports by Ray Booth, which is featured in pages 210–212 of this issue. However, for those who want to build to suit their own motor, the little lightplane bipes, Hawker Cygnet and Austin Whippet are our recommendations.

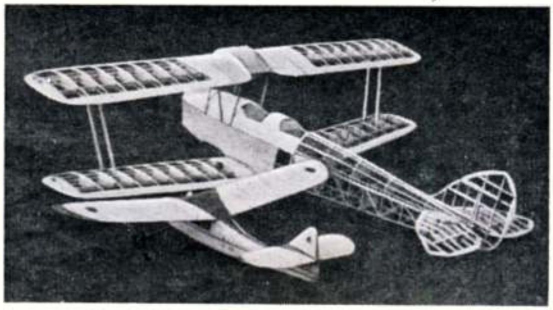
The Hawker Cygnet has a nice slab sided fuselage, with turtle decking set off by stringers, ample tail area if the power is not to be too great, and a delightfully simple interplane strut. The long nose will provide correct balance, and even the engine can be duplicated with a side-mounted diesel and dummy second cylinder. Registration can be G–EBJH or G–EBMB in black, with an extra G on both sides of the tailplane *and* rudder. The whole aircraft was silver.

The Austin Whippet carried the same colour scheme of silver with black lettering, and could be G–EAGS, G–EAPF or G–EAUZ. The extra G was also painted on the tailplane and rudder. With short moment arm and generous tail area, the Whippet could be made into a most stable model. The dihedral angle is sufficient and need not be increased, the nose is long enough for balance, whilst the diagonal rigid struts between lower wing root and upper wing can be put to good use as strengtheners.

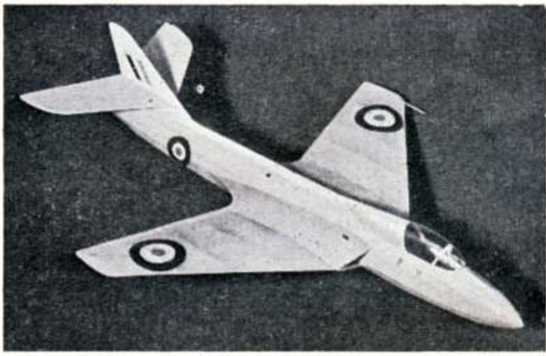
High Wing

Perhaps the most popular choice of all is the Auster V.J-1, and with its ideal proportions it fully deserves first consideration. A one inch: one foot rubber driven version does already exist in A.P.S., plan FSR/195, price 2s. 6d., and this can readily be converted for motors up to ·87 c.c. For larger engines, the simple, almost straight lines are easily scaled from smaller drawings. Production models are finished in a standard all cream colouring, with either maroon or green letters and decoration. A novel, easy to paint registration is G–AIZZ, and another for the Auster V.J-1b Aiglet is G–AMMM.

Parasol wing fixing presents the only problem to modellers of the well-proportioned Westland Widgeon Mk. I. A lightplane of the 1924 era, the Widgeon was left in natural clear doped finish, a light buff in colour, and with a number 6 on the sides just aft of the rear cockpit and also on the rudder.



***Top photo:** An outsize in free-flight scale is the massive 16 lb. Tiger Moth by A. Manley of Dover. The 7 ft. Eros looks small by comparison!*
***Right:** V. Mills scaled up his Keilkraft kit to 48" span for his Elfin 2·49 Fokker D.VIII. The axle 'wing' was removed after being damaged.*



This Hawker 1067 was built from a standard Keilkraft 3/8d. kit by D. J. Cole of Reading. For further 'gen' on Jetex subjects we thoroughly recommend study of the excellent article by Phil Smith on this special subject, which appeared in the 1951 "Aeromodeller Annual".

On the full-size aircraft, the full span ailerons also acted as flaps by a patent camber-changing device—a feature that might appeal to the pendulum control fan.

Shoulder Wings

More "model" lines are found in the Beardmore Wee-Bee, another 1924 light plane with rectangular fuselage and simple lines. The scallops can be made with specially shaped trailing edge as did Peter Wyatt with his Wren (March issue), and the long span wing is amply supported by the short struts. Though the undercarriage would be strictly for landings only when larger diameter props are used, a 36-in. version could easily be powered with a ·5 c.c. diesel using a 5-in. prop. and still be capable of rising off ground.

The original had a dark, probably red or blue fuselage, with silver nose, wings and tail. On the rudder was a large black 4, and under the front cockpit on the side was the name "Wee Bee I" in white.

A more well-known subject with shoulder wing and high mounted engine driving a pusher prop is the B.A.C. Super Drone. Ballast will have to be added to the nose to counteract the rearward motor position, but a dummy pilot carved from hardwood could provide a most effective answer to the problem. G–ADPJ is still in the civil aircraft register and is finished with a natural varnished fuselage and clear doped wings, the lettering being dark brown.

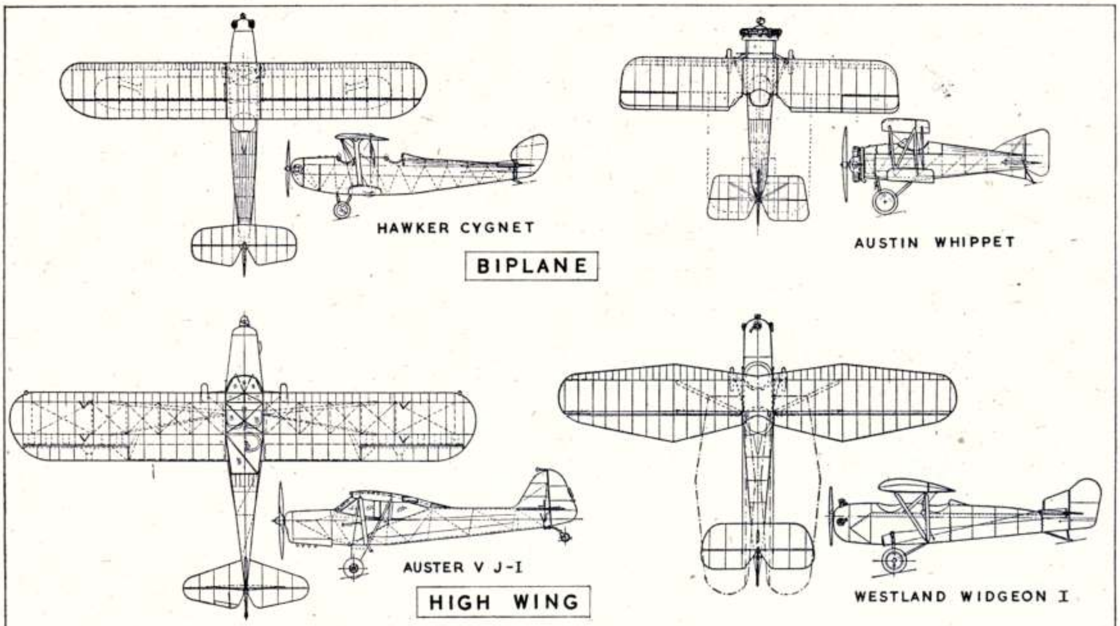
Low Wings

The prejudice against the low-wing free-flight model is not entirely substantiated, and we hope that the low-wing type will eventually receive the same development as its high wing equivalent. The first full size aircraft to catch our eye was the angular B.A. Swallow II. Its lengthy nose, large tail area, rectangular fuselage and sturdy undercarriage make it an excellent choice. We would increase the dihedral slightly, and also fit a pendulum rudder, whilst the Cirrus Minor in-line version would give a simpler cowling. There are several B.A. Swallows still on the Civil Register, a Pobjoy version, G–AEZM, being active through the war in dark green and earth camouflage with the lettering underlined by red, white and blue horizontal lines. G–AFHH is the registration of an active Cirrus version. A.P.S. Plan FSR/110 gives a 30-in. rubber model for 2s. 6d.

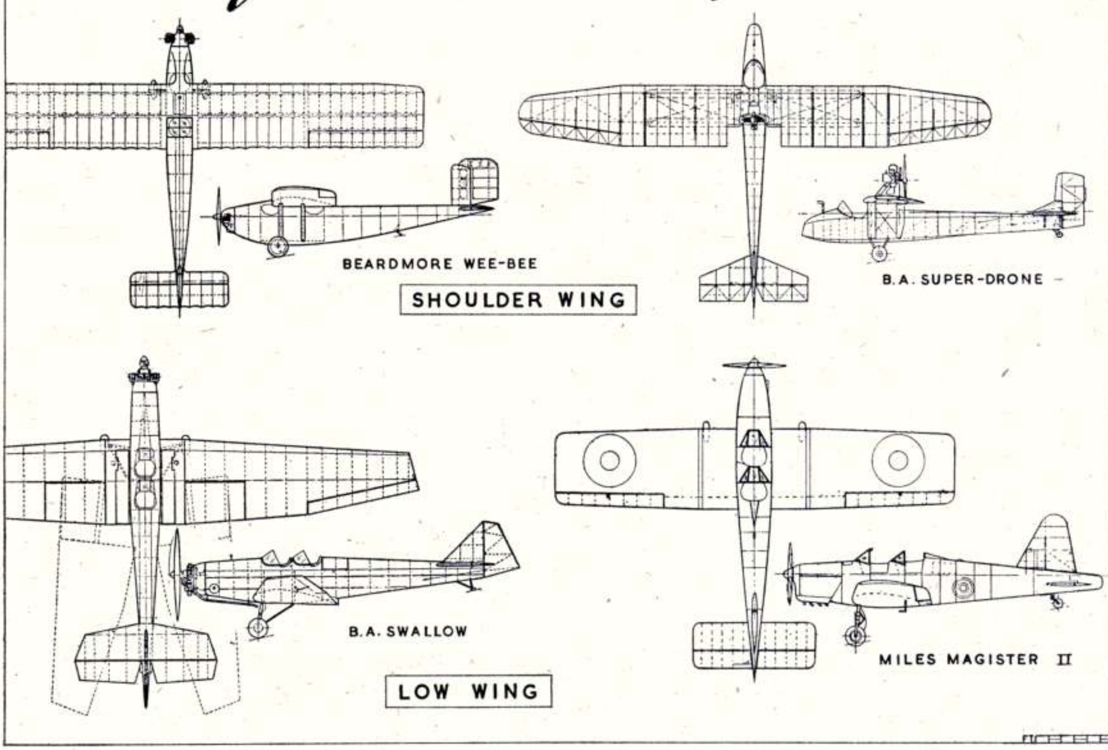
Designed to replace the Magister I, the M.18 Magister Mk. II is an entirely different design to the original Magister, and is far more suitable for modelling. The low aspect ratio wings, large tail, simple undercarriage and general proportions make it an excellent choice. As with the Swallow, we would add more dihedral, and also fit a pendulum rudder. Colour should be wartime camouflage of dark earth and dark green, with trainer yellow undersides. Red, white, blue, and yellow roundels on the sides, red, white and blue fin flash, and underneath roundels; and red and blue top roundels are correct markings. One M.18 was registered HM545 and bore this number in black letters one foot high on the rear fuselage and three feet high on the underside of each wing.

Those are our eight selections, now wipe the dust off your drawing board or kitchen table and get busy at enlarging the plans to suit your engine, and remember, the S.M.A.E. scale contest takes place on June 2nd, calling for precision and *not* duration this year.

Below, left: Finished in correct colouring of cream and green and using the builder's initials for registration ('DTW is not registered) the Auster V uses a Mills ·75 and was built from an Aeromodels kit by D. J. Webb of Beckenham. Right: M. Garnett has already selected the pert little Austin Whippet for his Mills. Many flight tests have shown an inexplicable tendency to stall-turn, but this will be cured with pendulum operated elevators.



8 Subjects for Free Flight Scale



1/72nd scale drawings of each of these aircraft, with the exception of the Auster V J-1, are obtainable price 2d. plus 1½d. postage. 1/36th scale drawings for the Cygnet, Whippet, Wee-Bee and Swallow are 2/- each, and 1/48th scale drawings of the Auster and Widgeon 1/-, from the Aeromodeller Plans Service

Les Hayward presents HYPERION

A "CLASS A" TEAM RACER that combines good looks with first-class performance.

The designer . . . member Chingford M.A.C. . . . a draughtsman . . . aeromodelling since 1938 . . . builds all types . . . keen cyclist and camper . . . was one of the hardest working demonstrators at the Festival of Britain South Bank site.

FULL-SIZE plans are fast becoming a most popular feature, and this month we present the first Class A racer to grace our columns. It's a racer with speed and realism, tried and proven through months of practice, and featuring an unusual all-metal cowling. Helping to dissipate the heat of the engine, this aluminium cowl is surprisingly easy to make and attractive.

CONSTRUCTION

Wing. Butt join sheets of 1/16 × 3 in. medium balsa and cut to wing outline. Use as a template to make upper wing surfaces allowing ½ ir. extra on the leading edge for camber. Lower surface is then pinned down and ribs cut and cemented in place. A strip of ⅛ in. square is sanded to section and cemented 1/16 in. back from the leading edge.

Attach bellcrank to a piece of ⅛ in. ply by a 6 B.A. bolt. Lead out wires and push rods are fitted and secured, then cement the plywood bellcrank mount in place. Small brass tubes should be fitted round the wires in the wing tips.

The upper surface of the *port* wing can be steamed to shape and cemented in place. When thoroughly dry the lower surface of the wing should be scored along the centre line of the fuselage and one inch packing placed under the port wing tip. The upper fuselage of the starboard wing can then be completed in a similar manner and the whole wing trimmed and sanded. Care should be taken not to restrict the bellcrank movement.

Fuselage. Build a crutch using 3/16 in. square longerons and 3/16 × ⅛ in. cross members. Nos. 6, 7 and 8 cross members are set above longerons. Formers are then cut and fitted. Bearers are made from ⅜ × ¼ in. ash and fitted to formers Nos. 1 and 2. ⅛ in. square longerons are then fitted. Two pieces of 1/16 in. sheet should be steamed, attached to longerons, wrapped round formers and glued in place. The wing can then be fitted, ensuring that the movement of the push rod is not restricted. The elevator horn is cut from 18g brass and soldered to a piece of 18g wire shaped as shown.

The Tailplane is formed by sandwiching a linen hinge, together with the elevator horn wire, between two thicknesses of 1/16 in. hard sheet cemented and clamped together. When dry, sand to section and attach to fuselage, and push rod, allowing for 20° up and 10° down movement on elevators.

The Fin is formed by wrapping two pieces of 1/16 in. sheet, cut to shape, around a 1/16 × ¼ in. square spar. Bend a piece of 18g wire to shape of tail skid, bind and cement to a strip of hard wood as shown.

Undercarriage. Cut and bend a piece of 16g Dural to shape shown on plans, file to aerofoil section and polish with "Bluebell." 1½ in. diameter wheels are attached by 6 B.A. bolts; last thread of which should be burred over to prevent nuts from unscrewing. The undercarriage is attached to bearers by four 8 B.A. bolts.

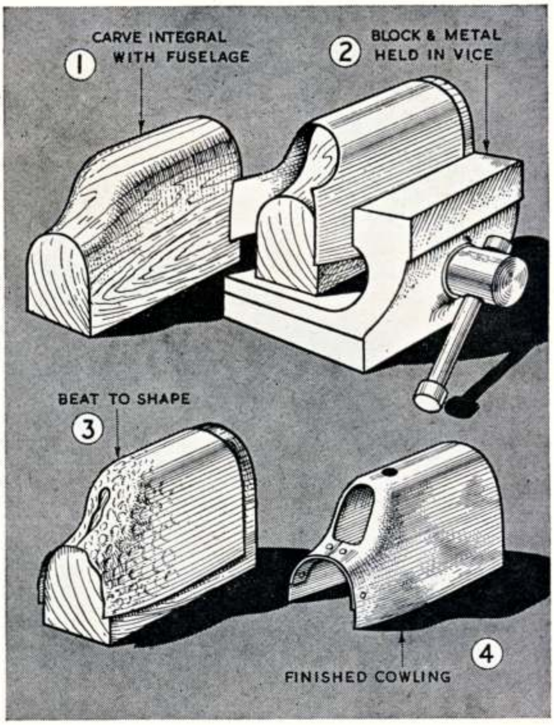
Both filler and vent tubes of the 15 c.c. shim brass tank are bent forward into the slipstream to prevent the fuel from being siphoned out. Add further block to complete fuselage, fit pilot, cockpit canopy and cooling ducts.

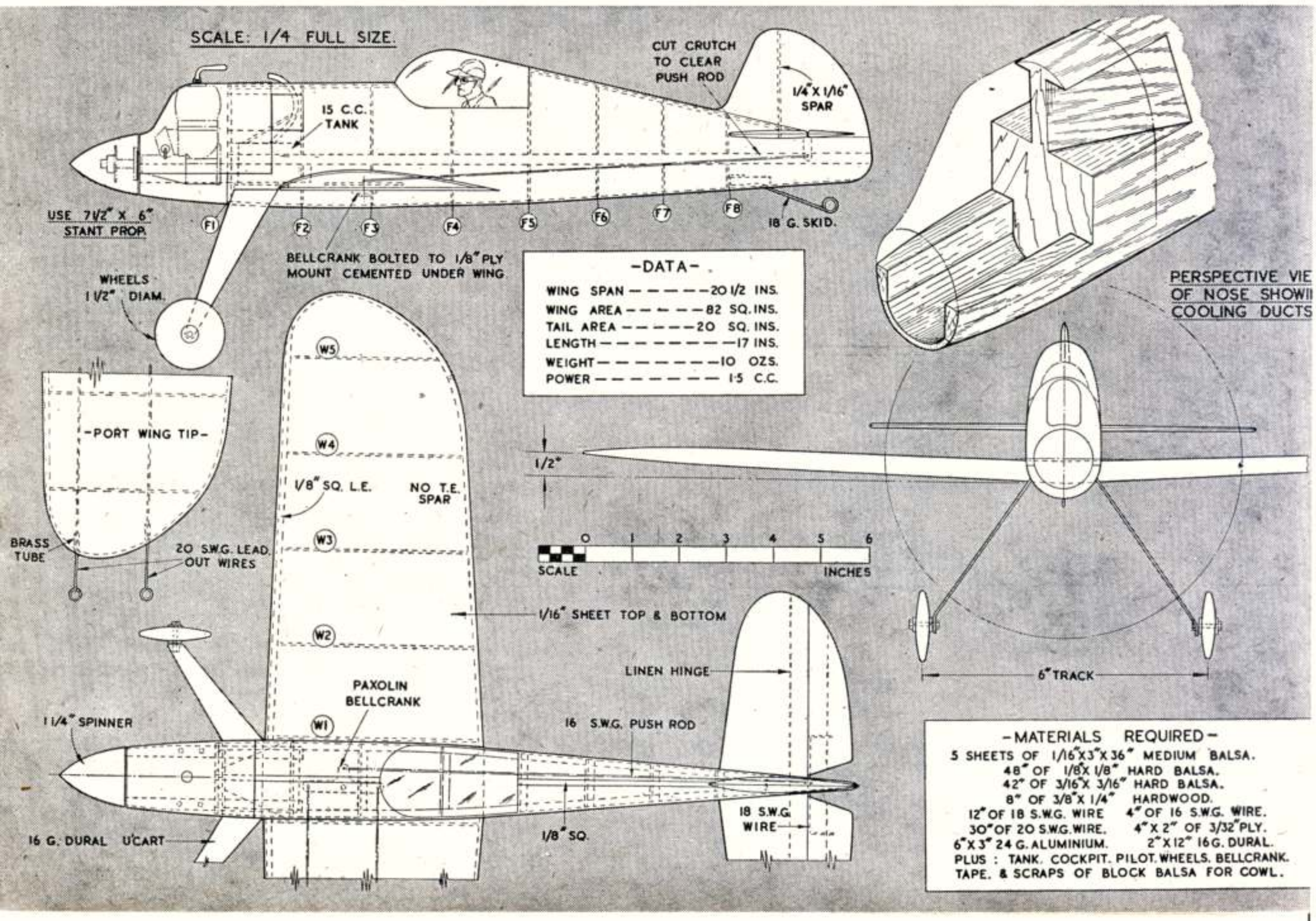
The entire structure is now sanded and covered with lightweight Modelspan. To obtain a good finish about six coats of sanding sealer should be applied with a soft hair brush or spray.

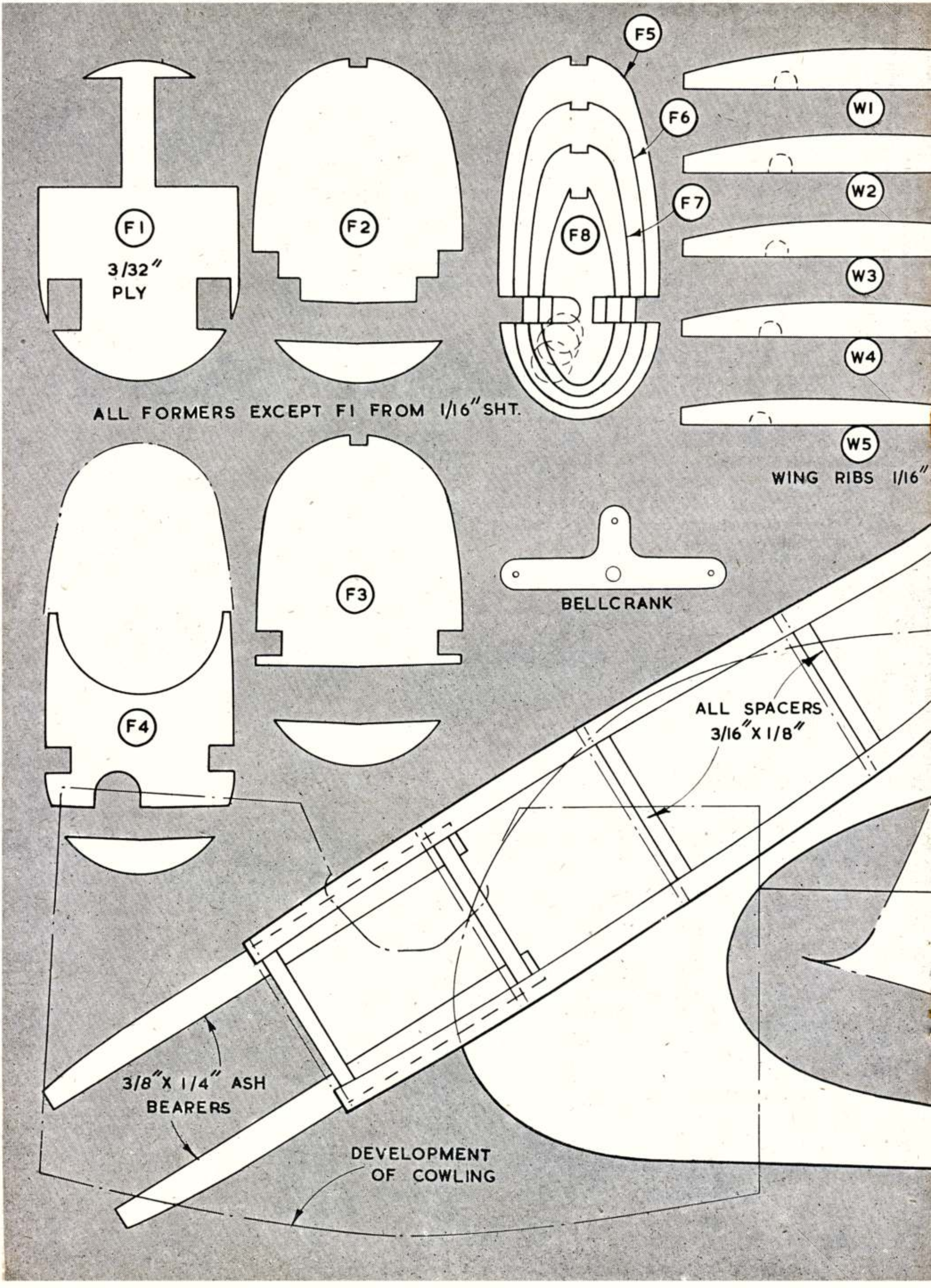
The Cowling. This is formed by wrapping a piece of 24g aluminium over a block carved integral with fuselage. Aluminium and block are clamped into a vice ensuring that metal is in contact with wood as far as possible. A leather headed hammer is then used to beat aluminium over the block. This is done very gradually by tapping lightly and frequently; commencing where the metal is hard on the block and working forward. When shape starts to develop the alloy is slid forward about 1/16 in. on the block and this is repeated until required shape is achieved.

Connect front sides of cowling by riveting in a strip of 18g aluminium and filing to shape. Dents can be removed with a file and emery cloth. Finally polish with "Bluebell." Drill necessary holes for compression lever and needle valve and attach to fuselage with four ¼ in. long wood screws.

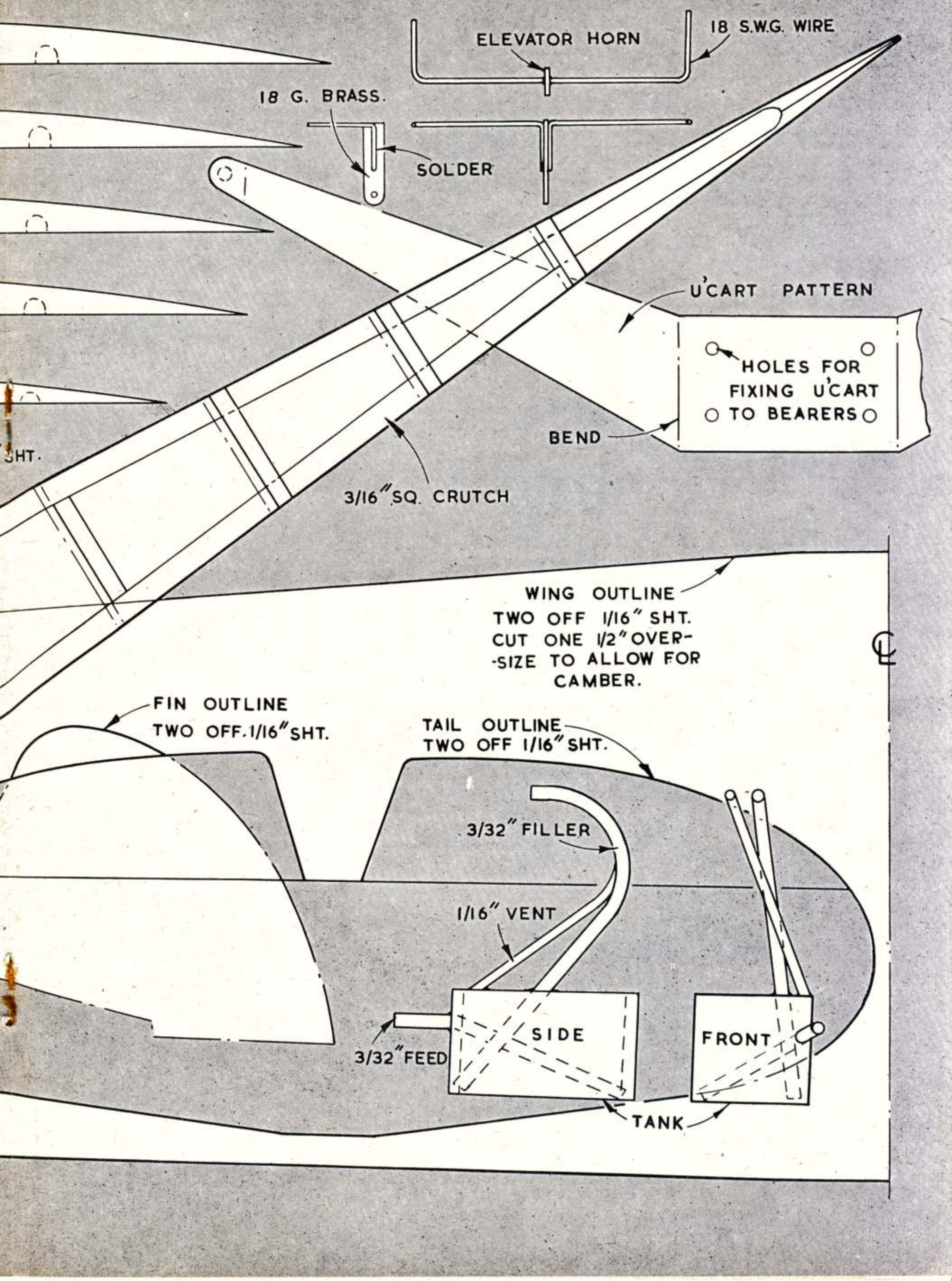
To beat a cowling of this nature, the main point to remember is to keep the metal close to the block and never to allow a gap of more than 1/32 in. in any place. Try it, you'll find the panel beating very easy with thin aluminium and the results are very satisfying, as the photos show.







F5
F6
F7
F8
F1
3/32" PLY
F2
W1
W2
W3
W4
W5
WING RIBS 1/16"
ALL FORMERS EXCEPT F1 FROM 1/16" SHT.
F3
F4
BELLCRANK
ALL SPACERS 3/16" X 1/8"
3/8" X 1/4" ASH BEARERS
DEVELOPMENT OF COWLING



ELEVATOR HORN
18 S.W.G. WIRE
18 G. BRASS.
SOLDER
U'CART PATTERN
HOLES FOR FIXING U'CART TO BEARERS
BEND
SHT.
3/16" SQ. CRUTCH
WING OUTLINE
TWO OFF 1/16" SHT.
CUT ONE 1/2" OVER-
-SIZE TO ALLOW FOR
CAMBER.
FIN OUTLINE
TWO OFF. 1/16" SHT.
TAIL OUTLINE
TWO OFF 1/16" SHT.
3/32" FILLER
1/16" VENT
SIDE
FRONT
3/32" FEED
TANK

Model of the Month


2


3

4

★ MODEL NEWS ★

ANALYSIS of your returned AEROMODELLER Questionaire Forms has shown this regular photo feature to be popular with all readers from six to sixty. But among the many additional letters of recommendation and notes of criticism that accompanied so many of the returned forms were a few isolated pleas for less of the " FP " brand of humour. Ready as we are at any time to down tools for any reason, we allowed our Critical Cuthbert friend (?) to take Poor Phil's chair, as you will see in artist Malmström's sketch. The buck-toothed genius who knows all, lasted for a few hours of brief glory as he ranted in the maestro's chair and then with a final change of tone he doffed his crown to the reinstated scribe. Is this the death-knell for your old friend Phil ? Or is this Critical Cuthbert a lone dissenter ?

Choice of the month is a beautifully constructed model of a model by D. J. Cole of Reading. Remember the 40-inch Sopwith Pup featured in the December, 1948, issue ? We printed a one-quarter scale miniature of the full size plan as is our usual custom, and Mr. Cole decided to make a rubber job exactly to the smaller drawing. Here is the finished product, complete with normal size matchbox for comparison.

A diversion from the usual run of control-liners was caught by the ever active Ed Stoffel and his camera when D. Pyner tried his A.P.S. Lockheed Sirius (No. 2). Fitted with a Frog 500 glow plug engine, this 32-inch seaplane is a very safe proposition with its large floats. We trust the pilots, both in the plane and on the handle will continue to operate in the dry state !

Another catch by the Stoffel camera comes in No. 3, which was taken at Fairlop. Scaled up from the plans in the 1951 AEROMODELLER ANNUAL, this Tigercat is by Jim Rough of Battersea and uses two Frog 500's. Weighing 2½ lbs. for its 31-inch wingspan, this twin-engined fighter made its maiden flight on one engine only and clocked a creditable 64 m.p.h.

From Canada comes another enlargement of AEROMODELLER plans, in G. H. Berry's De.H.53


5

Humming Bird (No. 4). With Mills ·75 c.c. diesel and weighing only 12 ounces, this 42-inch model is constructed rib for rib and spacer for spacer, exactly like the full size craft.

Large stunt models, were, we thought, rather out of vogue: but P. Barlow of Nantwich in Cheshire displays his model for '52 in picture 5, and revives our own weakness for outsize control-liners. Boasting a Jim Walker pressure tank, Atwood Champion engine and the latest in American wing sections, this very clean job shows definite trans-Atlantic influence.

No! that wing is *not* fitted back-to-front in No. 6! It's a tail-first or Canard model by A. G. Overfield-Collins of Carshalton Club, held by the designer's wife. Designed in 1950 and tested last year, the 66-inch free-flighter uses a K Vulture diesel and weighs 3¼ lb. First flights were somewhat trying, we understand; but now the elusive C.G. is correctly located, the Canard is a stable, consistent flier.

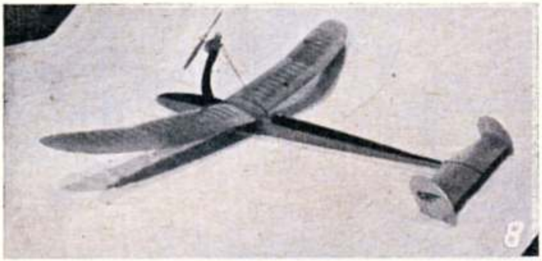
All the way from Amsterdam, and bearing his own country's insignia, is Ralph van Steenwyk's Spitfire 22, in picture 7. Fitted with a Buzz B 4·6 c.c. glow plug motor which apparently is none too easy to operate, this is one of several scale models in the Steenwyk collection, and boasts complete cockpit details.

From even farther distant shores, we have the latest N.Z. idea from Auckland's Frank Bethwaite. For P.A.A. load contests, his powered sailplane (No. 8), is one answer. Total weight of the model is but 16 ounces, and the disposable load is another 16 ounces of lead. As the picture shows, the thrust of the power unit swings the motor mount forwards, then when the motor stops, the mount swings back and becomes a streamline fairing over the wing. Very neat eh? And a possible thought for power ratio contests too.

To round off our miscellany this month we give a flashback to the past, provided by one of those intrepid "lighter than air" enthusiasts, R. Moore of Potter Heigham, Norfolk. Built in 1936, the SS.T.2 shown posed in No. 9, was no midget, with its length of 8 ft. 3 ins., and diameter of 2 ft. An electric motor drove the two propellers.


6


7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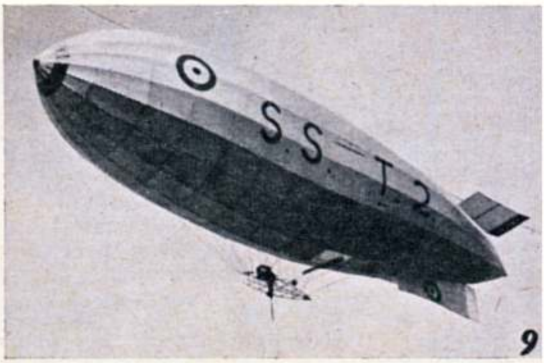

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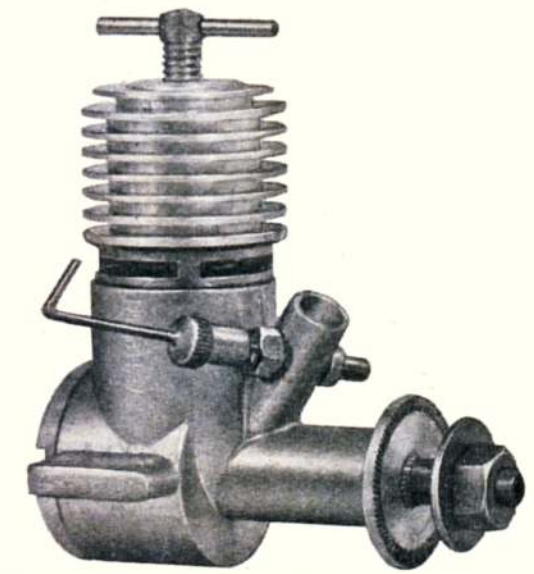
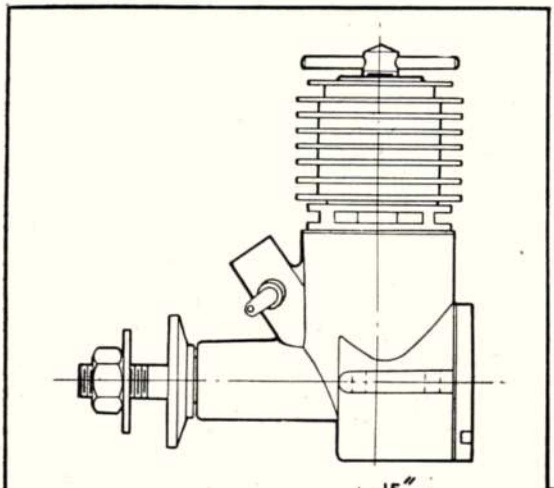


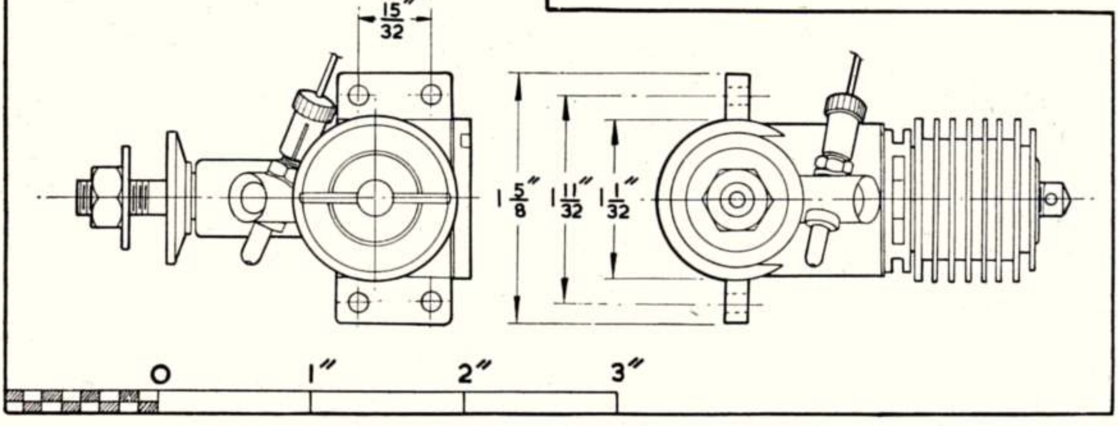
"TYPHOON-DIESEL 2·47"

YET another 2·5 c.c. diesel is the subject for analysis this month, but this latest example for the "International" power class is unusual in that it is the first engine we have received from Holland. It comes from a family of "Typhoon" engines, the others being a Mark IV, 4·5 c.c. and a Super-Typhoon, 10 c.c., both of which are disc valve glow-plug racing engines, and of which we hope to give further details in a later issue.

The 2·5 c.c. Typhoon diesel incorporates all the well-known features now common to its class. Four large exhaust ports and a similar number of transfer holes from the annular collecting recess, which is fed by two channels in the crankcase, ensure a combination of maximum port areas for highest efficiency. The power curve shows a maximum power output not far short of the highest we have extracted from any of the 2·5 c.c. engines, and this in itself, indicates a good standard of design and workmanship.

In one feature, this engine retains what was once common to all miniature engines, and which is omitted from the majority of current productions. That is the special bronze bearing insert for the main bearing, a point which is very much in favour of long wearing qualities with little risk of a loss in crankcase compression through a leaky shaft bearing. And whilst talking of the shaft, here is the only criticism of this excellent motor, the threaded portion of the shaft is not sufficiently long to take the usual high pitch prop thickness. In fact the thickest boss that will comfortably fit the shaft is 5/16 ins. and this thickness usually indicates a 4 inch pitch or thereabouts. The advised control-line propellers would certainly have to be

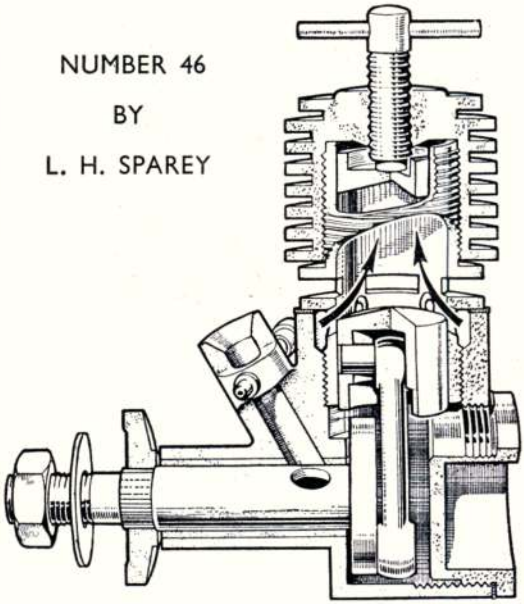




NUMBER 46

BY

L. H. SPAREY



carved away to fit with security.

Bodily, this is the smallest 2·5 c.c. diesel we have seen, its overall height in particular is considerably less than its nearest counterpart.

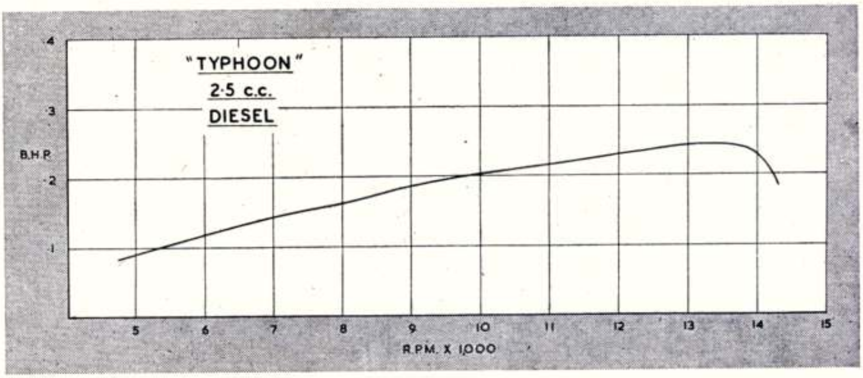
TEST

Engine : " Typhoon Diesel " 2·5 c.c.
Fuel : Mercury No. " 8 ". **Starting :** Excellent.
Running : This engine runs extremely well at all tested speeds, but seems happier at those above 10,000 r.p.m. The offset control needle is a good feature which keeps the fingers away from the spinning propeller.
B.H.P.: This engine has a very good performance, and a maximum output of ·241 b.h.p. was reached at 13,500 r.p.m. without undue trouble. Power fall-off is rapid after this point, although, like most modern engines of good design, the curve is remarkably flat. Thus, it may be seen that between 10,000 and 14,200 r.p.m. the output is ·200 b.h.p. and over. This gives a wide scope for misadjustment without seriously affecting the performance. For general flying (i.e. not competition) it may be found convenient to run the engine at around 12,000 r.p.m., as this speed would be economical in both engine wear and fuel consumption, without sacrificing much performance.
Checked Weight : 3·9 ozs. (less tank).
Power/Weight Ratio : ·987 b.h.p./lb.
Remarks : The compact design and porting arrangements—which follow closely standard practice—are reflected in the high power/weight ratio of this engine. Compression is remarkably good, and remained so throughout the tests.

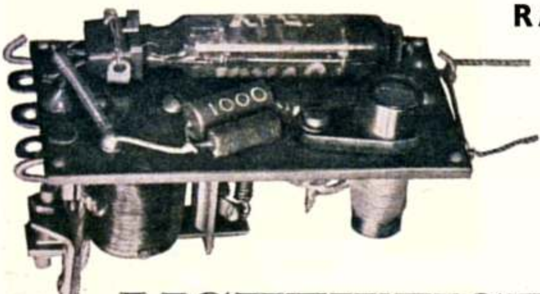
GENERAL CONSTRUCTION DATA

Manufacturers : Miniatuurmotorenfabriek "Typhoon" Amsterdam, Keizersgracht 372.
Retail Price : DFL. 39·50. (Approx. £4.)
Delivery : Ex-stock.
Spares : Ex-stock.
Type : Compression ignition.
Specified Fuel : 1 part Castor Oil, 1 part Paraffin. 1 part Ether, plus 2 per cent Amyl Nitrate.

Capacity : 2·47 c.c., ·150 cu. ins.
Weight (advertised) : 110 grammes, 3·88 oz.
Mounting : Beam.
Recommended Airscrews : Free-flight 10 in. × 4 in., Control-line 8 in. × 8 in. or 7½ in. × 10 in.
Flywheel : 120 grammes, 4·5 oz.
Bore : 15 mm., ·590 in.
Stroke : 14 mm., ·551 in.
Cylinder : Nickel Chrome Steel, screwed in crankcase.
Cylinder Head : Light Alloy, screwed on liner.
Crankcase : Pressure die cast light alloy.
Piston : Plain, with conical deflector head.
Connecting Rod : Duralumin, turned.
Crankshaft : Nickel Chrome Steel, case hardened.
Main Bearing : Special Bronze.
Induction : Crankshaft rotary valve.
Special Features : Designed for flexible running and easy operation, with strong construction and small stature. Prop driving washer is splined onto crankshaft.



RADIO CONTROL NOTES



Geof Pike describes his

LIGHTWEIGHT EQUIPMENT

Reproduced* actual size *in the above photograph, Geof Pike's successful minature receiver has been put to good purpose in the Amco ·87 powered model he is seen holding, at right.

ABOUT eighteen months ago the writer felt the desire to build a small R/C model with a really light wingloading which could stand many knocks without damage, as in the case of a normal low-powered freeflighter. So a midget receiver was developed and built, which apart from being the most stable and reliable single valve receiver the writer has ever used, it weighs only 1⅛ oz. and has a ground range of well over one mile, when using the original E.D. modulated carrier transmitter with the modulation valve removed and an input of less than 2 watts.

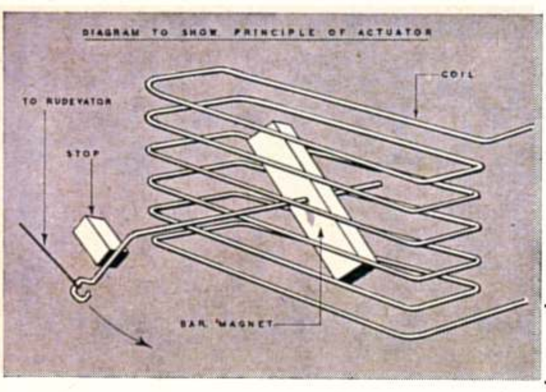
The model has made 118 flights to date, of approx. 3 mins. each with the receiver shown here.

The actuator used weighs ½ oz. and is simply an alnico bar magnet rotating through 160° in a winding, and this movement pulls on a nylon thread, which is attached to a small pivoted stop in the tail, which stops the rotating rudder in the following way :—No signal gives left rudder, signal on gives right rudder and, if required, a steady pulsing of about 5 per sec. will give straight rudder effect as the stop would be midway between left and right rudder positions and allow the rudder to rotate freely. It is not necessary, however, to bother with the pulsing, as the writer finds that the simple " press right and release left " allows the model to be flown within inches of objects in calm weather and a straight course across wind is only possible by constantly using the rudder in any case. There is no sequence to remember with the above system, and it consumes only 50 m.a. at 1½ volts.

In the above-mentioned model the batteries for the actuator and the low tension are half a No. 8 each : they are mounted where they put no strain on the fuselage in a crash and can both be changed in less than 10 secs. The card tubes from two No. 8 batteries are cut to length and inserted through each fuselage side, one above the other, and the positive connection is made by a wire soldered to a drawing pin sandwiched between balsa discs which are cemented an appropriate distance down each tube, thus leaving the bottom of each battery flush with the fuselage sides. The other connections which also hold the batteries in the tubes are tinned 16 s.w.g. piano wire running in hard plastic tubes through the engine mounts. The actuator battery clip is also used as a switch whilst tuning.

Some considerable weight and expense is saved in the variable resistance used for the receiver by cutting a suitable section out of an old burnt-out potentiometer and using a 16 s.w.g. tinned copper clip which may be slid along to adjust the receiver's standing current. Any small saving in weight is well worth considering in the small R/C model.

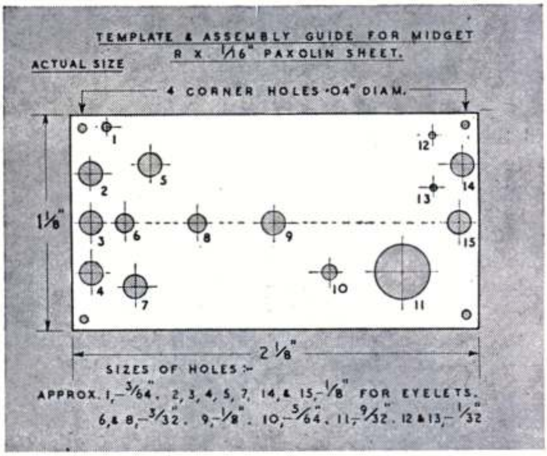
The complete model ready to fly weighs just 16 oz. and has an unusually light wing loading of 7⅞ oz. per sq. ft.

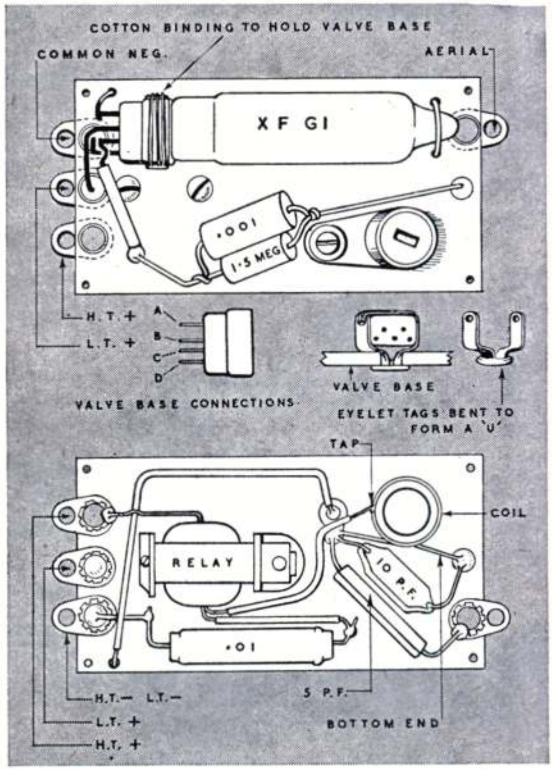


Diagrammatic sketch, left, shows the principle of Geof Pike's lightweight actuator unit. A car ammeter works in much the same way.

Building the Receiver

If any reader should wish to make the smaller receiver used in this model, step by step details are given here including a drilling template, which may be pricked straight on to the paxolin base with a scriber; this will be a great help in the component spacing, which has a definite effect on the performance of the receiver and will add speed to its assembly.





The valve socket should first be mounted, using a small eyelet. Then cut the dust-iron cored tuning coil former to 13/16 in. overall length, remove one lug and mount with 10 B.A. screw and nut, also clamping a small soldering tag underneath, bent at right angles and facing inwards. Now add eyelets at holes 7 and 15 and fix the 4 cut-down soldering tags beneath the panel at holes 2, 3, 4, and 14 with eyelets. The relay may now be added and is held by two screws at holes 6 and 8 with tension adjustment through No. 9. This is an E.C.C. type and, in the writer's case, was a faulty one, in which the coil was rewound to 3,000 ohms with No. 47 s.w.g. enamelled copper wire.

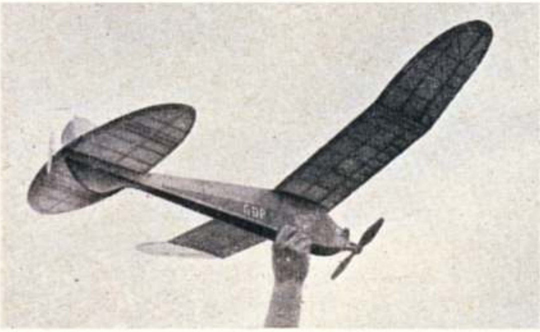
Incidentally, this can sometimes save a damaged relay from the scrap heap, and is quite easily done, if the bobbin is mounted on a small electric motor, with a rheostat controlled by the left hand, while the wire is fed through a small wad of cotton wool held in the right hand. The relay resistance can be anywhere between 3,000 and 6,000 ohms. If much higher than this, although more sensitivity is possible, the H.T. battery will have to be discarded at a higher voltage. Valve base connection D is soldered directly to eyelet 2, a short length of wire connects B to eyelet 3, and another short length connects C to eyelet 7. From A, an insulated wire runs through hole I and under panel to tag at hole 10.

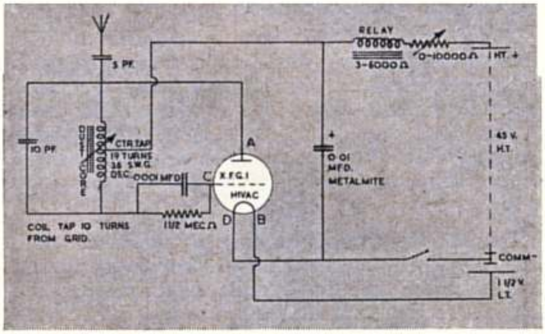
The 5 pf. aerial condenser is soldered between eyelet 14 and tag at 10, leaving a short vertical protrusion after soldering through the tag. The ·0001 Mfd. grid leak condenser should now be soldered across the 1½ megohm resister, as shown, and then the pair should be soldered between eyelets 7 and 15, but allowing the wire to protrude about an ⅛ in. through eyelet 15. Now for the tuning coil. Solder one end of a length of 36 s.w.g. silk covered copper wire around the last mentioned protrusion, and leaving a small clearance at the bottom, wind on 10 closely spaced turns; form a loose loop at this 10th turn, and twist up just to the right of tag at 10. Now wind another 9 turns, keeping it tight and neat, and solder the end to the protrusion at tag 10. The 10 pf. condenser is now soldered across the coil as shown. A wire should connect the coil tapping to the relay coil terminal nearest to the valve. The ·01 Mfd. decoupling condenser runs from this point to eyelet 2. Connect other wire of relay coil to eyelet 4.

Thin sleeving may be used where there is a danger of wires touching. Four bent pins should now be inserted at each corner for the rubber band mounting. Incidentally, a loose loop of thread with each band will help to prevent damage to receiver in a crash, without stiffening the suspension. A thin piano wire clip pushed into holes 12 and 13 will keep valve firmly in place, and this completes the receiver.

A few fibres of cotton wool are placed in the coil former threads to prevent the tuning from moving due to vibration.

Operation is quite straightforward, and the current change in the writer's receiver is from





Left: The 43 in. model, which weighs only 16 ounces, and right: the Pike receiver circuit diagram.

2·0 m.a. to 0·2 m.a. at 500 yds. and using a 48-in. trailing aerial, but the aerial length is not critical. On the fourth flight of the writer's model the aerial was accidentally pulled off 4 ins. from the set as the model was launched, yet the control was not impaired in any way! In case 2 m.a. standing current sounds a little high for this valve, it might be mentioned that the writer has obtained over 6 hour's operation to date, using 2 m.a. standing current on this receiver, and it is still giving excellent results.

NOTE:

When using only two of the relay contacts the operating point should be about ⅓ of the way down the current change scale, for maximum contact pressure, and about ½ way when making use of all three contacts.

Here's wishing success to anyone who builds this receiver, and may be have many happy hours "under control".

ADDITIONAL NOTES BY HOWARD BOYS:

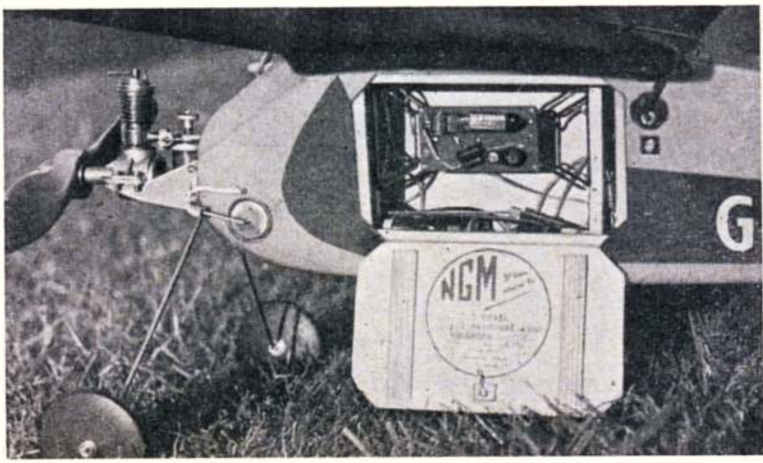
The actuator is perhaps not easy to understand but the diagram will help. A car ammeter works in much the same way.

A receiver has been built to check the instructions, and it seems necessary to adjust the tuning capacity according to the valve. For instance the valve currently in use would not work until the capacity had been doubled, and one particular new one did not function until the tuning capacity had been removed altogether. However, a modern new valve should not give much trouble.

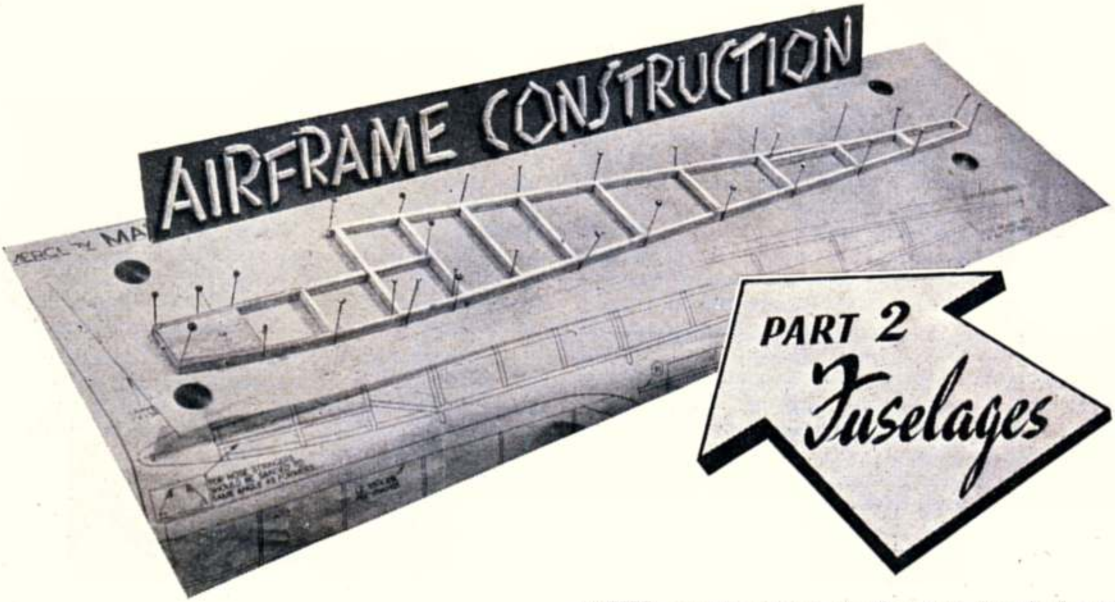
The battery mounting is very neat and convenient, and can be seen in the photos just behind the engine mounting bulkhead. The base of the cell looks very much like a fuel tank in that position, and the leads look like fuel pipes. The H.T. battery is mounted on the floor of the fuselage.

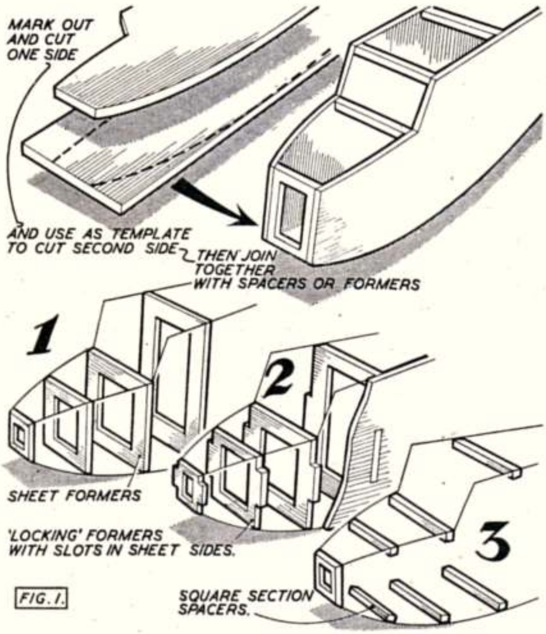
Just a reminder about the single acting Ruddevator. Doug. Bolton was using this when he came second in the Taplin contest with a fairly small model in a high wind. (Description in Aug., 1951, "Notes".)

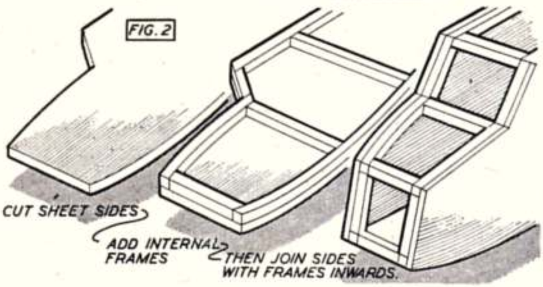
Talking of Doug. Bolton, the writer has had another of his No. 1 receivers on test again recently and it was giving a full milliamp drop which was maintained up to the limit of its range, and sensitivity was high enough to put it in the top class. This is the only hard valve receiver the writer has found that behaves in this way. Range is usually limited by the reduction of current change to an unworkable value. New readers refer to May, 1951, "Notes" for details of this receiver. One of these receivers used with 60 volts H.T. is giving a current drop at long range of 1·2 m.a.—that is from 3·2 down to 2 m.a.



Close-up of the receiver compartment showing the H.T. batteries mounted on the floor, and L.T. cells in a tube just behind the undercarriage. Comparison for size may be made with the 2 in. wheels.







THIS month we are starting our description of airframe construction with that part of the model which almost every builder tackles first—the fuselage. Since there are many different ways of making fuselages, and we want to cover our subject as completely as possible, it will be necessary to divide this into two parts. The simpler types of fuselages will be described this month and some of the more complex structures in the next issue.

The simplest of all built-up fuselages is where the two sides are cut from sheet balsa and then joined together either with a number of formers or spacers to complete the assembly—Fig. 1. The side elevation of the fuselage is traced or drawn out on to a suitable sheet of wood, which is then carefully cut to shape. This first side can then be pinned over a second piece of sheet and used as a template for cutting an identical second side.

The main alternative methods of joining these two sides are also shown in the diagram. The simplest is probably using sheet formers. The depth and width of each former can be measured off the plan and the former positions carefully marked on the inside of each side. Starting with the widest formers, sides and formers are cemented together, using pins to hold in place and checking that the assembly is true and square. The other formers can then be cemented in one by one, also holding with pins, if necessary. The basic fuselage is now complete and requires merely the addition of the various detail fittings. For example, a thin ply nose former—or a balsa former, may be necessary, also local reinforcement of the sheet sides at the rear where the rubber peg is to be fitted on a rubber model, and so on. With a rubber model, of course, the formers will have been cut out previously to provide clearance for the motor.

An alternative method with formers—and one which is very popular with small American kit models—is to key each former in place. This means more work in cutting out the parts, for each former is cut with a tongue which engages with a corresponding slot cut in the fuselage side at each former station, as shown in the diagram. It does, however, make for easier and more accurate assembly once the parts have been properly cut. In the kit models mentioned all the sheet parts are, in fact, already die-cut to shape. A few British kit models have also contained similar features, and more can be expected in the future.

The third alternative—using spacers cut to correct length from square strip to join the sides—is lighter, leaves more internal clearance for rubber motors and is generally stronger. It is a little more difficult to construct accurately, however, since each individual spacer has to be positioned carefully. Again, pins pushed through the sheet sides into the ends of the spacers will help.

The main point to watch in all these fuselages is that the assembly remains symmetrical in plan view and is not twisted out of line in any way. You should be able to check for symmetry by laying the completed fuselage out on top of the plan view of your drawing.

Now this type of fuselage is really best suited to small free flight models where performance is of no great importance—rubber-driven flying scale models, for example. It suffers from the great disadvantage of being heavy. It can, however, be used with success on larger models where fuselage weight is not so important, instead of the normal " built-up " box construction.

Normally we would reckon that this type of fuselage construction is too heavy for rubber models more than about twenty to twenty-four inches wingspan. There is no reason why it should not be used on gliders up to " Nordic " size, or even larger, but if you build a big fuselage in this fashion you will find that it can be quite costly. To get a proper strength distribution, too, without excessive weight, the sheet wood used for the sides needs to be selected carefully. Stiff but light sheet is required, and so quarter-grain stock would probably be best. The significance of this type of sheet was described in the first article in this series.

To avoid buckling of the sides, too, 1/16 in. sheet thickness is about the minimum which can be used. Very tiny models of around 12 in. wingspan and under could use 1/32 sheet sides, but all larger models would require the thicker size.

As the fuselage size goes on increasing there will come a point where even 1/16 sheet is no longer strong enough on its own. To use thicker sheet would be adding a lot of unnecessary weight and the best solution is to brace the sides with an internal frame of stripwood. Your final fuselage will then really be like a built-up box fuselage with sheet-covered sides. Almost any sheet-sided fuselage above about 15 ins. in length requires some form of internal bracing like this.

Figure 2 indicates how this internal bracing can be added, cemented directly onto each side before assembly. This is quite a straightforward method which should present no difficulties. Make sure, however, that you cement the frames on to what will become the inside of each side. Final assembly can then be like the other sheet-sided fuselage. If formers are used these will have to be notched at the corners to fit the frames. Each former position should be backed with a vertical frame member which will assist accurate alignment of the formers and make for a stronger assembly.

Numerous other applications could be mentioned and some have a certain popularity amongst A.2 glider designers. However, construction is generally so obvious that further description is not necessary, and so we have merely sketched a few typical examples in Fig. 3. Where relatively large fuselages are sheet covered, except in gliders, it is more usual to find the fuselage built up by other methods and the sheet covering added as a final skin, rather than using the sheet as a basic part of the construction.

By far the most popular type of fuselage for general use is the simply built-up box, comprised of four main fore and aft members (usually of

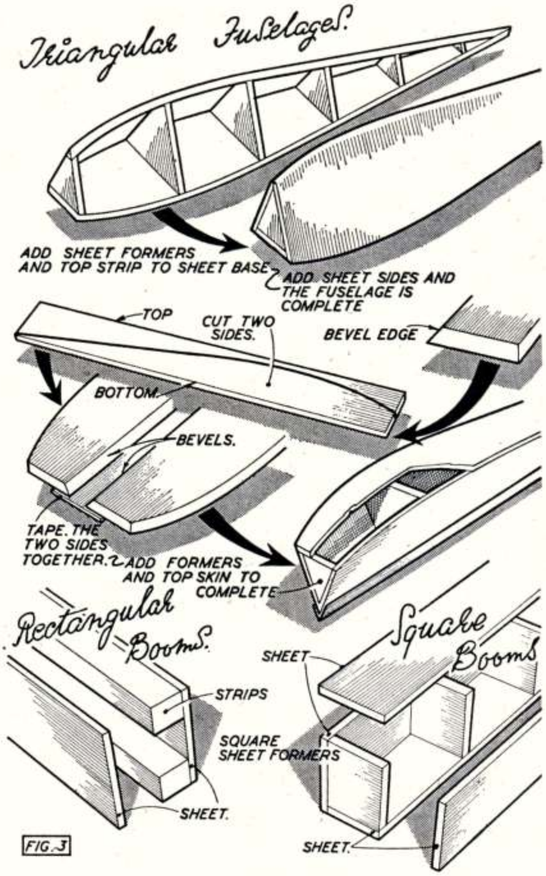
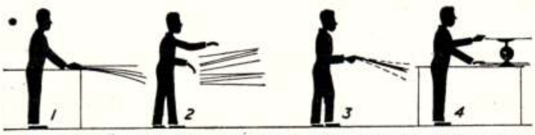


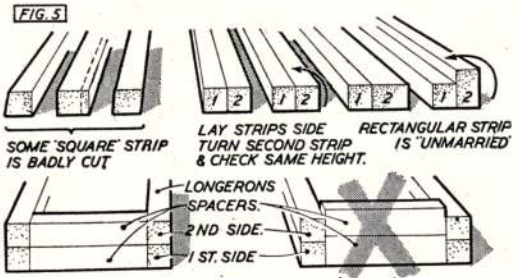
FIG. 3



1. A BUNDLE OF STRIPS SUPPORTED OVER EDGE OF TABLE, THE LIGHTEST WEAKEST STRIPS BEND FIRST. CHOOSE FOUR STRIPS OF THOSE REMAINING STRAIGHT.
2. A BUNDLE OF STRIPS DROPPED, THE HEAVIEST STRIPS REACH THE FLOOR FIRST.
3. WHIP FOUR OR MORE STRIPS TOGETHER. MATCHED STRIPS WHIP THE SAME AMOUNT.
4. FINALLY, CHECK THE WEIGHT OF STRIPS.

FIG. 4.

FIG. 5



Section through sides when building.

square section) called the longerons, joined with both vertical and cross (horizontal) spacers. There are many variations on this simple theme. Numerous outlines can be accommodated with simple box frame, whilst the modern trend, particularly with rubber model fuselages of

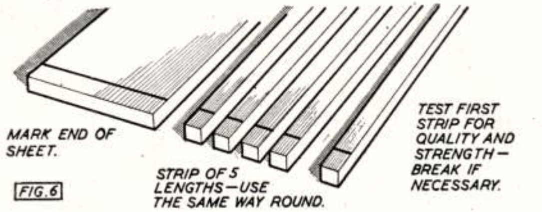
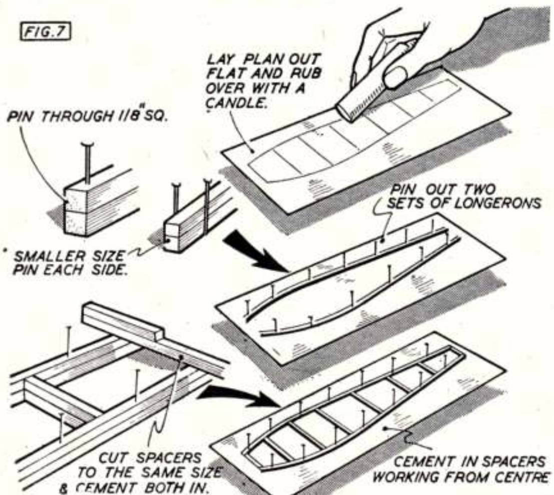


FIG. 6

FIG. 7



Wakefield size, is to locate the longerons diagonally, using rectangular section material, for improved strength, weight ratio, and so on. The more important of these variations will be described, but first let us deal with the simplest type of box. Here we will assume that the fuselage outline is a simple one without breaks or sharp curves and all the wood stock—longerons and spacers—is of square cross section.

The first main job is the select the wood carefully. It is important, for example, that the four longerons be matched, otherwise, if one is more springy than the others, it may well pull the whole fuselage out of shape when it comes to assembling the two sides. Spacer stock is not so important, but to save weight this can be lighter than the longeron material.

Select the longeron wood first. Pick out four pieces of wood which seem nice and hard and springy and look alike. Check that the grain in them is true and running from end to end—not across the strip—and the whole length is free from imperfections. A worm hole, for example, along the length of the strip will make is useless for longeron stock. Try the simple whipping test mentioned in the previous article and aim to get, as near as possible, four identical lengths of wood from what stock is available—whether from the contents of a kit or from a retailer's stock. A summary of suitable tests is given in Fig. 4—the final test being a check on weight. Matched strips should each weigh the same and in a contest rubber model the total weight of the four longerons is also important. Four Wakefield longerons, for example, should not exceed $\frac{1}{4}$ ounce for a normal fuselage length.

Weighing will also show up another interesting point. Some lightweight models call for "hard 1/16 sq." longerons. Check weighing, you may find that four 3/32 square strips of roughly the same overall strength may weigh less than four hard 1/16 square strips. The larger section stock would then make the better fuselage.

Your fuselage will look much neater, too, if you make sure that the stock you have chosen is true in section and of the right dimension. A lot of "square" stock is often rectangular in actual fact, so that using spacer material the other way round to the longeron material could lead to the effect shown in Fig. 5 when the two sides are built on top of one another. This is exaggerated to emphasise the point, but even a small error in size like this can be annoying, and weaken the fuselage frame. Matched longerons, in fact, mean longerons equal in strength, weight and dimension. Spacer wood is not so critical, but this again should be of "matched" dimension.

Some modellers take this question of matching longeron wood so seriously that they prefer to strip their longerons from sheet wood. This, in fact, is undoubtedly the best method, if you have a good wood stripper and can use it properly.

Until you can strip wood *accurately*, however, it would be better to stick to selected machine cut strip from your local model shop.

Preparing longerons from sheet, the sheet itself would first be selected for quality and uniformity and one end clearly marked—Fig. 6. The four longerons are then cut off as adjacent strips and used the same way round in building, *i.e.*, all the marked ends at one end of the fuselage. This ensures close matching of the four strips, but even then the strips can be subject to variations. Another point, too, is that it is virtually impossible to tell whether such strip is suitable for longerons until a test strip has been cut and tried for strength.

Accurate work is possible, however, with proper handling of the stripper. With the stripper set at the same dimension spacer stock can be cut exactly to correct width.

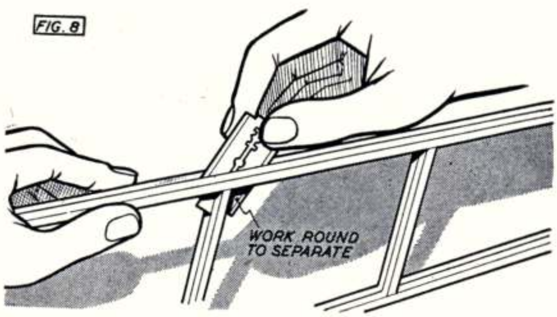
Once your longeron and spacer wood has been stripped or selected, one thing remains to do before starting building. Smooth each strip down *lightly* with very fine sandpaper on all four faces to remove any roughness or knife or saw marks. Use a sandpaper block, hold one end of the strip and rub the sandpaper along to the other end on one sweeping motion. Do not attempt to sand backwards and forwards or you will almost certainly break the strip.

Most box fuselages are made by building two side frames and then joining with spacers. The frames are built directly over the plan and should be identical. The best method of ensuring this is to build the two sides together, one on top of the other, laying down the longerons first and then cutting the individual vertical spacers to length and cementing in place. The logical steps are: lay out the plan flat on a suitable building board; protect the surface of the plan (either by covering with waxed paper, or, more simply rubbing over the plan with a candle); pin out the longerons directly over the plan, in pairs; then cut the spacers to length, again in pairs, and cement in place. These steps are illustrated in Fig. 7.

Authorities differ as to how to pin down the longerons. The method usually recommended is to locate pins on either side of the longerons to hold them to the required curve. It should be possible to bend the longerons to the required curve without having to steam them. If not, then either the fuselage plan calls for too sharp a curve for good design practice or the longeron wood you are using is too brittle.

It is important that each pair of longerons should assume an identical curve. They will naturally tend to do this if the wood is properly matched, but may also require quite a lot of pins to hold down properly. Contrary to commonly held opinion, it is quite alright to pin right through the longerons at intervals, provided these are at least ⅛ in. square in section and the pins used are thin ones. This will make it much easier to hold them in position. Smaller section longerons should *not* be pinned through.

FIG. 8



With the longerons pinned out satisfactorily, the two sets of spacers are then cut and cemented in place. A good plan is to start with the middle spacers, and then work to each end in turn. Take the first spacer point, offer up a length of strip, mark the exact length required and cut off. Check for size and then cut another spacer of identical length for the second side. Cement these spacers in before going on to cut the second pair of spacers, and so on. This is more accurate, and gives stronger joints, than cutting a complete set of spacers and then cementing in place, followed by a repeat process for the other side.

If there are any sharp curves in the longerons, wood stresses in these regions can be relieved by painting with hot water, *after* the frame is complete. Normally this should not be necessary. The two sides should then be left pinned down for several hours to allow all cement joints to set thoroughly.

When removed from the plan the two sides will by stuck together, but can be separated readily by slipping a razor blade between them and running round the outline—Fig. 8—working carefully over each spacer joint. Final assembly of the two sides can then be attempted.

There are several methods which can be adopted for joining the sides. The simplest is shown in Fig. 9. Spacers corresponding to the mid section of the fuselage are cut exactly to length and the two sides joined with these, using pins to hold until

FIG. 9

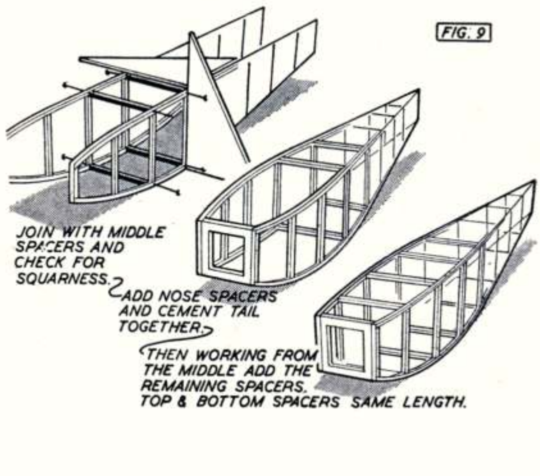
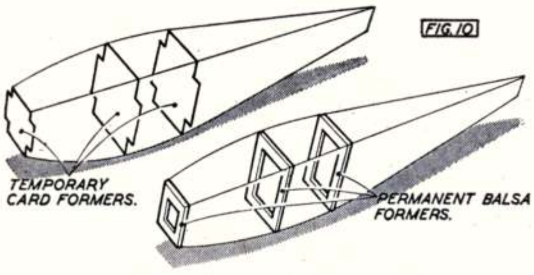


FIG. 10



the cement has set. The assembly is checked for squareness. With small section longerons, rubber bands can be used to hold the sides instead of pins.

The next stage consists of pulling the two rear ends of the fuselage together, trimming as necessary, and cementing, followed by the nose spacers, holding with pins. When these have set, all the remaining spacers can be cut to size and cemented in their respective positions—either

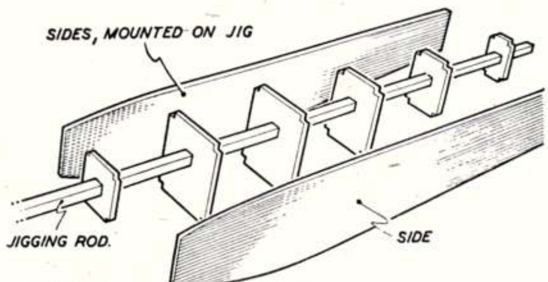


FIG. 11

FIG 12

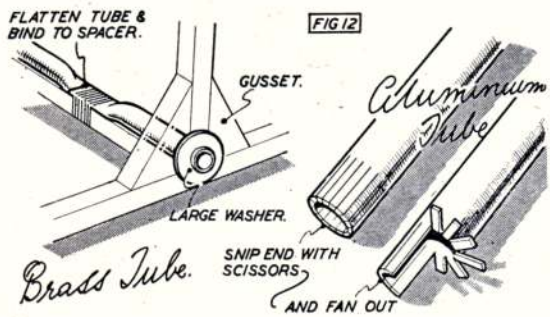
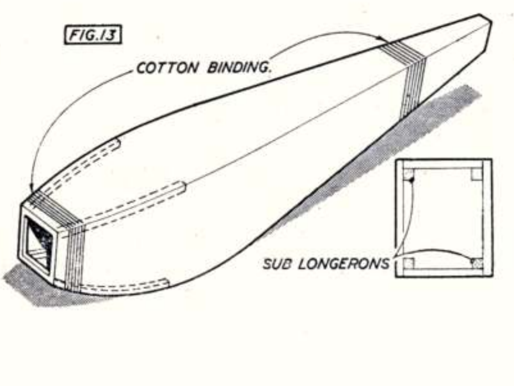


FIG. 13



cutting these to length from the plan or against the actual assembly, working from the widest section forward and aft and cementing in each pair of spacers as cut and before measuring off the length of the next. Either way demands constant checking by eye and " sighting " against a possible twist or distortion of the frame setting in. Whilst not, perhaps, the ideal method of assembly, this method can give quite accurate results.

Other methods demand the use of formers—either false formers of card which hold the two sides whilst the spacers are located and are then removed; or sheet formers which become an integral part of the structure—Fig. 10. An extension of the former method is shown in Fig. 11, favoured by some Wakefield builders, where the false formers are mounted on a stout jigging rod which does ensure a really accurate line-up.

We do not propose to describe the further constructional details to be added to complete the final fuselage. These consist, in the main, of such items as gussets to increase local strength, rear motor peg anchorage on rubber models, undercarriage fittings, and so on. Generally, these are quite obvious and straightforward. There are, however, a number of constructional tips which are worth passing on.

The first concerns what is known as " double-cementing ". This consists of pre-coating all joint faces with cement, allowing to dry and then re-cementing the parts to be joined and locating in place. A double-cemented joint is very much stronger than an ordinary straightforward cement joint and certainly does pay on most fuselages. However, quite a number of well-known, and successful, modellers never bother to employ it and so the choice is quite an open one. There is nothing to lose—only time—in making double-cement joints.

Then there is the fitting of wire tubes in fuselages, such as employed for undercarriage fittings. Unless these tubes are anchored at each end they will almost certainly push sideways. A cement joint coupled with thread binding is no safeguard. Brass tubes should have washers soldered to each end, bearing against sheet gussets in the fuselage—Fig. 12. Aluminium tube can be cut with a small pair of scissors and fanned out, as shown. Kinking the tube in the middle and binding tightly to the spaces will also help.

Another point where thread or cotton binding can usefully be employed is around the nose and rear of the fuselage, just in front of the tailplane—Fig. 13. A binding of cotton, cemented over, has amazing strength and will protect the fuselage from splitting, as well as making it more rigid at these highly stressed points. If you want to further strengthen the forebody of the fuselage—and it is the nose section which usually takes most of the hard knocks—then 1/16 sq. sub-longerons cemented inside the main longerons, as shown, will be very effective, without adding much extra weight.

FIG. 1.

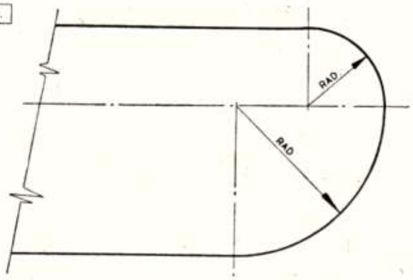


FIG. 2

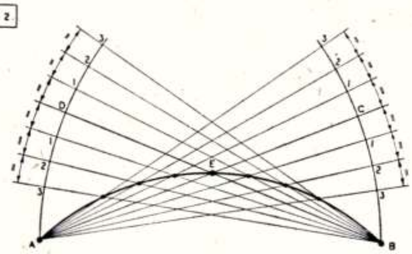


FIG. 3.

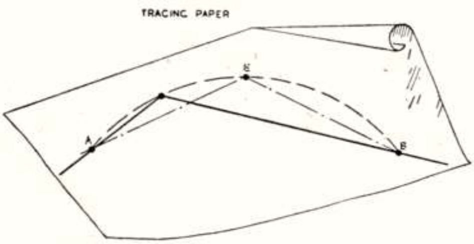


FIG. 4.

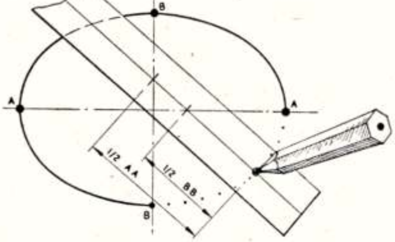
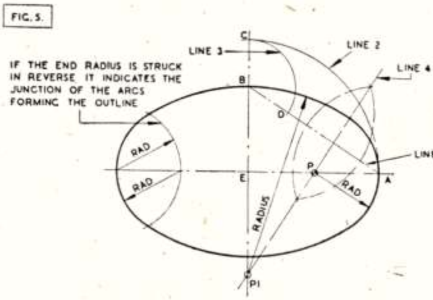


FIG. 5.



JOHN BARKER describes

Curves for the Aeromodeller

CURVES, both practical and mathematical, are of wide use to the aeromodeller. Their application has aerodynamic and aesthetic advantages, and in many cases structural advantages.

The Circle. A typical example of the use of part circles for outlines is the pleasing wing tip shape in Fig. 1 using two quarter circles.

Occasionally the arc of a circle of very large radius is required as in the case of an airfoil with a circular arc centre line. If the compasses will not conveniently manage this radius, the construction shown in Fig. **2** may be used. From A and B, the ends of the arc required, short arcs are struck as shown with radius AB. Lines AEC and BED are drawn through top of required arc E. From C and D equal spaces are stepped round these arcs. Lines are drawn as indicated. Intersections of like numbered lines above C and below D and vice versa give points on the curve.

A much simpler construction of this, based on the same principles is shewn in Fig. **3**. Points A, B and E are marked on the paper and a piece of tracing paper placed over them. Lines are drawn on the tracing paper from E to A and E to B and produced a short distance past A and B respectively. The tracing paper is then moved so that line EA is always on point A and line EB on point B. Points on the curve are then pricked through from point E.

FIG. 6.

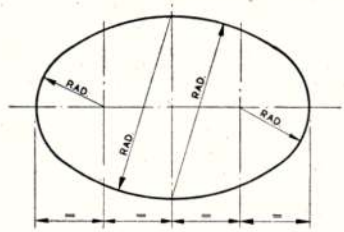
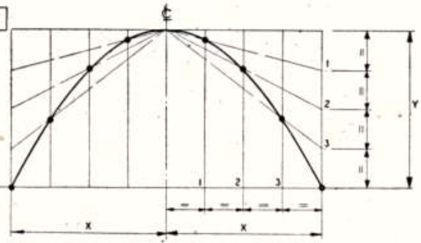
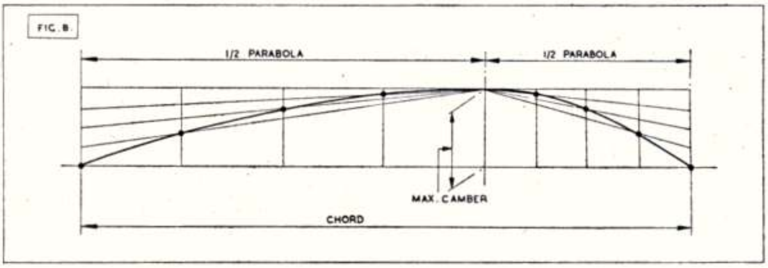


FIG. 7.



The Ellipse. There are many ways of drawing a true ellipse, but the best one is the trammel method shewn in the August, 1951, issue of the AEROMODELLER. Rule a line on a strip of transparent or translucent material (such as tracing cloth) and make a small hole in one end. Points on the ellipse are spotted through this hole—Fig. 4.



In many cases a true ellipse will not be required, in which case the method of drawing an approximate ellipse with four arcs as shewn in Fig. 5 should be used. Join the ends of major and minor axis A and B with line 1. With compass points on centre E draw arc AC (line 2) to cut minor axis extended at C. With compass point on B draw arc CD (line 3) to cut line 1 at D. Bisect AD at right angles with line 4 and then points P and P1 give the centres for the arcs to complete the ellipse.

One special case of an approximate ellipse is interesting. This is when the major and minor axes are in the ratio of 3 : 2. Construction is as shewn in Fig. 6, and is so simple as to need no further comment.

The Parabola. This is not such a widely used curve but it is extremely valuable for drawing camber lines of airfoil sections. Construction is shewn in Fig. 7. Construction lines are drawn as shewn and the intersection of similarly numbered lines give points on the curve. The application of two half parabolas to give an airfoil camber line is shewn in Fig. 8.

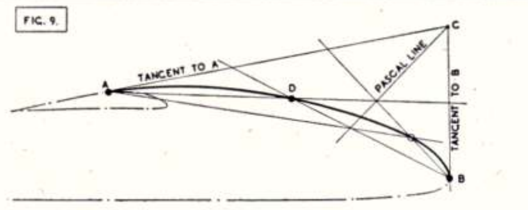
Conic Developments. Curves produced by conic developments are probably the most useful and adaptable curves of all to the aeromodeller—and at the same time they are the least used. This is probable because a completely unwarranted air of mystery seems to surround conic " lofting ".

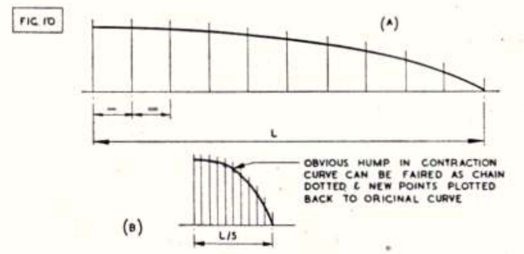
Fig. 9 shows the basic method of drawing a conic curve—any conic curve. In this case as an example the upper nose curve of a glider fuselage has been drawn. The curve is assumed to pass through points A and B. The tangents to the curve at these points are now drawn and produced to meet at C. Note how these tangents are chosen in this example. The one through B is vertical as it is at the extreme nose of the fuselage, and the one at A is chosen so as to fair the fuselage lines into the wing root section.

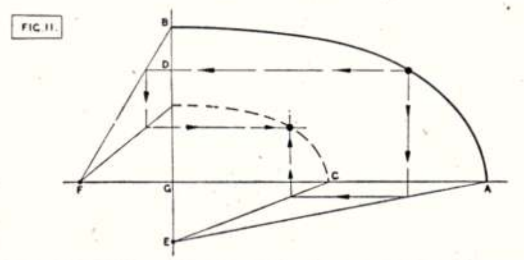
What is known as a " shoulder point " (D) is now drawn. This represents any desired point on the curve. Lines AD and BD are drawn. Any line (termed a " Pascal Line ") is now drawn from C as shown. Where it intersects AD a line is drawn from B, and where it intersects BD a line is drawn from A. The intersection of these last two lines gives a point on the curve. Other points are derived similarly by drawing more " Pascal Lines ".

Contraction of Curves. When a long curve is drawn as in Fig. 10 (*a*) it is often difficult to see if it is a smooth curve or not. A contraction diagram as in Fig. 10 (*b*) is then drawn with length L divided by some suitable figure such as 5. The same number of equal spaces are plotted on this reduced length and the heights of the curve transferred as shown.

Families of Curves. Fig. 11 shows the construction for a family of curves as required in bulkheads, ribs, etc. In the example, curve AB has been drawn and it is desired to draw a " mating " curve between C and D. Any point E is chosen on BG produced and point F on AG produced. Lines AE, CE, BF and DF are drawn. The construction to transfer a point from the known curve AB to the required curve CD is shown. Note that these construction lines are all either horizontal or vertical.







GADGET REVIEW

SEVEN widely varied brainwaves covering everything from team racing to radio control, have been selected for your digestion and future use. Take note aeromods, and remember these gadgets, for there's bound to be some opportunity in the future for you to make use of these ideas.

First of our selection is gadget **A**, which comes from John Glen of Edinburgh, and it is a novel form of springing for a power job's nosewheel. John makes no claim for originality in the principle of operation, for the basic idea is to be seen on any motor-cycle with girder forks ; but applied to three models, from a 3-lb. Southerner to an 8-lb. monster, this " parallel " springing is highly practical.

Wire is graded according to the weight of the model, the heavier the load, then quite naturally the heavier the wire to be used. The two main legs are soldered to the wheel axle by means of tin bearers and are joined by the two brass pivot tubes as per sketch. Two other tubes of the same length are affixed to the bulkhead, and joined to the main leg tubes by four wire links. The bulkhead should be inclined to provide a forward trail on the legs. All that remains is to fit the required springs, such as can be obtained from any Terry agent, and lo ! you have the perfect nosewheel unit, especially if you can conceal the spring end inside a cowling, when the outfit takes an oleo leg appearance.

Simple but most effective is idea **B** by J. Edwards of Preston. It's a pinch from the rubber boys, adopted to suit a glider fan, and it is so simple we wonder why we have not seen the gadget before. Take one detachable nose-block *à la* rubber model and apply same to a glider. Fix a rubber anchor hook or dowel at the first bulkhead and join with another hook on the block by elastic band, " wind " it up for tension. Friction, plus the elastic pull, will hold the nose firmly in place. Now you have a detachable nose with a suitable compartment blank and empty, just waiting for the ballast weight. It's neat, Q.D. (quickly detachable), and gives plenty of access to the ballast department.

We always make it a practice to doff our oily caps to gentlemen who are diligent enough to respect our worthy selves, and right now we acknowledge an automatic device for genteel team racers, which comes as **C**, from a certain Club news sheet, the editors of which have seen fit to rival these columns. So, exercising our journalistic licence, we lift unashamedly Pongo Pete, the polite pilot ! He arises from recent news of the fair sex entering team race affrays, and he is well trained to raise his headware as, on application of " up " elevator, he passes his feminine rival. Should the enemy be a common male type, P.P., the P.P., ducks down in front of the rival's nose with a touch of " down " elevator and lifts the two fingers of scorn in true-to-type derision !

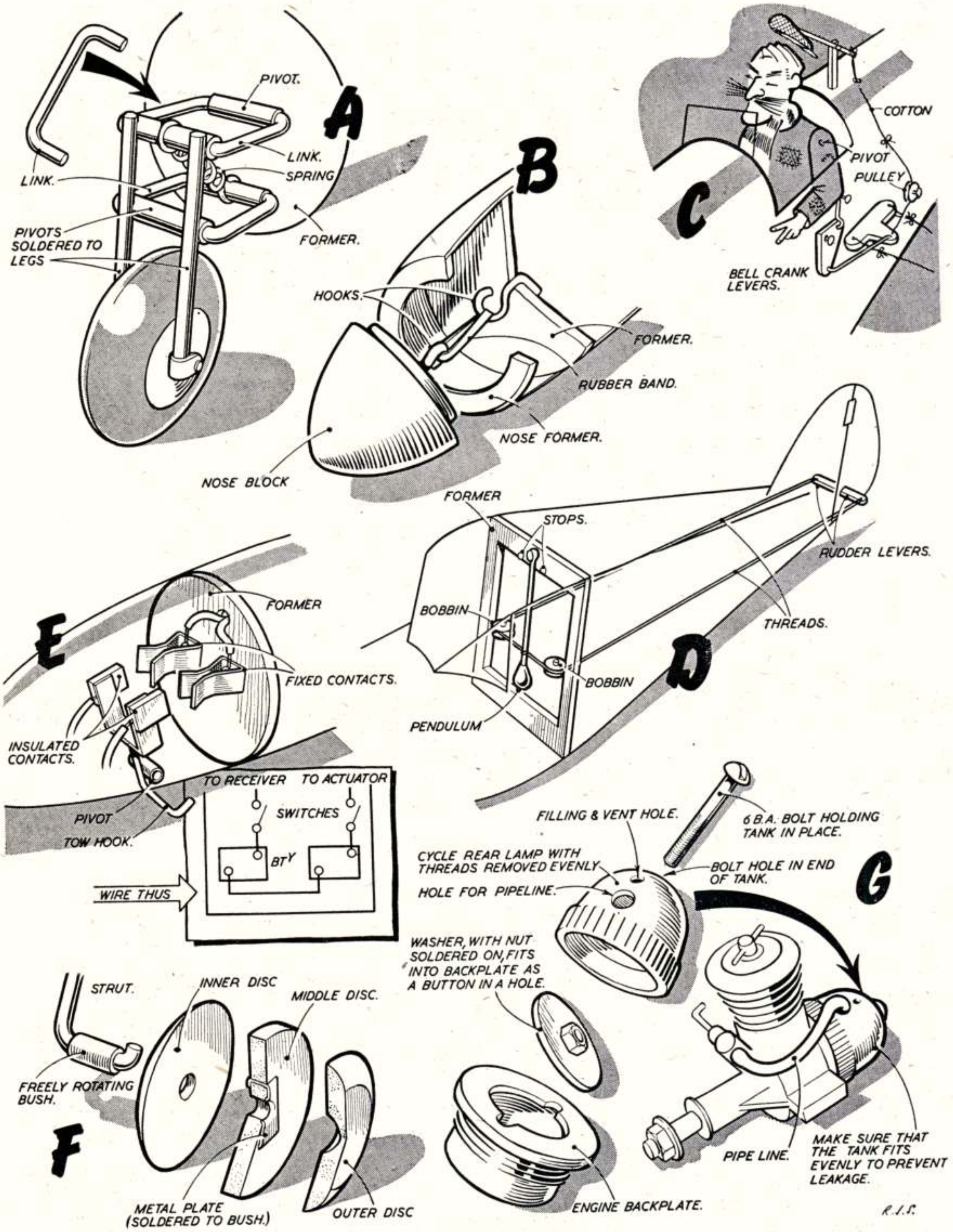
When fuselages are too slim for a pendulum at the tail, or the weight of the pendulum needs to be near to the centre of gravity, then gimmick **D** by F. A. Pettit of Ruislip is the answer. The drawing makes this pendulum control self explanatory ; but on one point, we would advise you to mount the bobbins higher in the fuselage to make better use of the pendulum leverage.

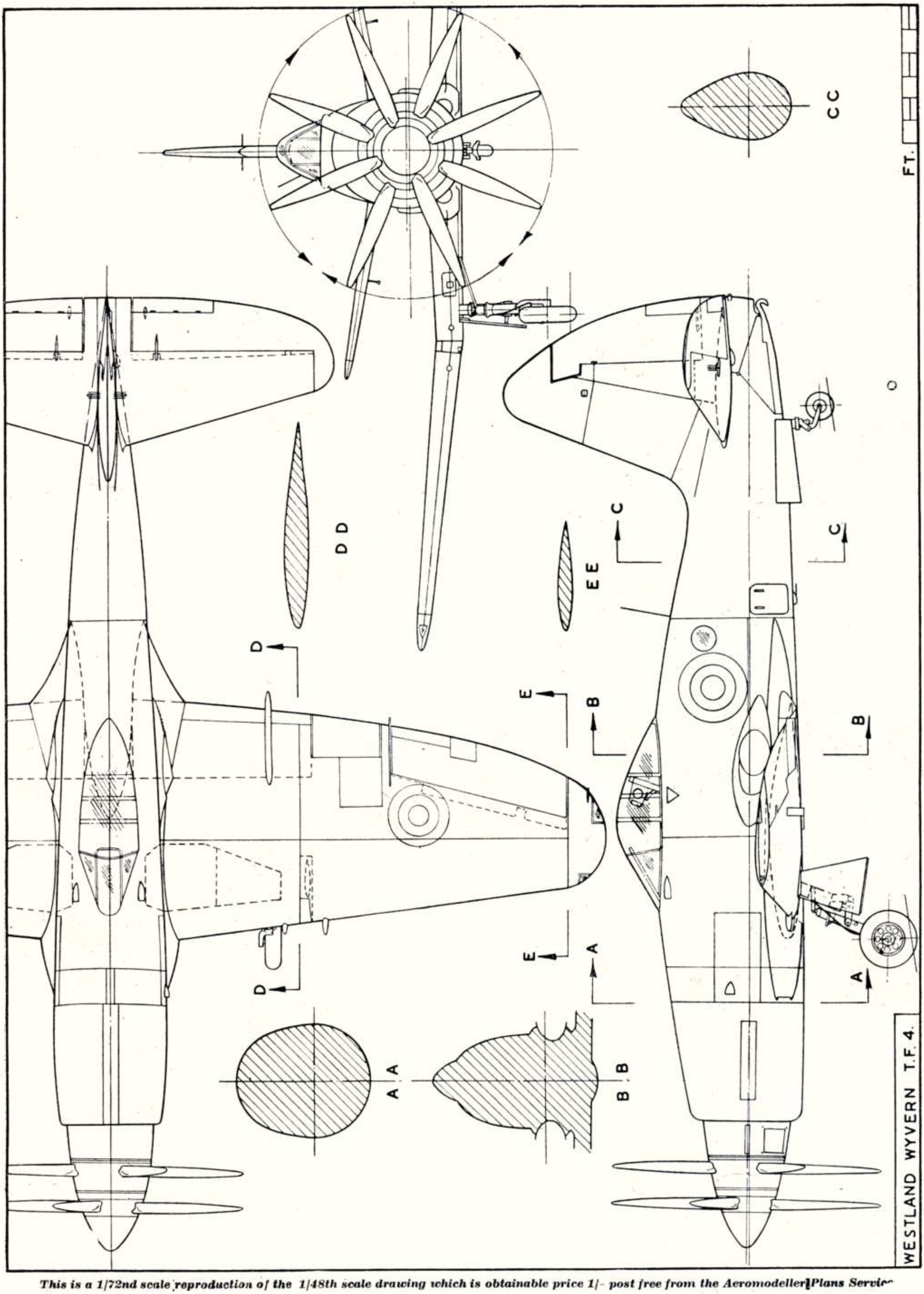
E is for radio controllers, and especially for radio controlled sailplane fans, though the idea can easily be adopted for a power model. It comes from D. Bolton of West Bridgeford, Notts, and readers familiar with that name through contributor Howard Boys' columns can thus take it that this is a " gen " idea. The tow hook is virtually a switch. It has contacts on its pivoting end, and these are connected as in the diagram to the main L.T. batteries for the actuator and the receiver. So when the model skids to a landing, it automatically switches off the juice and so saves plenty of heartburn and many a delicate valve. How many times have we replaced the valve after a lost model has been recovered? We've lost count, but this idea will prevent it happening in the future. For power models, a longer switch rod can be arranged to disconnect the batteries on touchdown. It would mean that all flights would have to be hand launched ; but as this appears to be the order of the day for all radio jobs, this would be a minor inconvenience.

For stretch and wind boys, the followers of rubber power, there is a streamline wheel, shown in **F**, by G. F. Woolls of Bristol.

Combining the advantages of a wheel close to the leg and without an ugly external washer, the Woolls wheel is a lamination of three discs. The tube bearing is placed on the axle, and the latter is bent over, then cut short. An odd piece of cocoa tin is used to face the middle disc, and the tin is pierced to suit the tubing. Then slip the inner disc in place, add the middle disc, and solder the tinplate to the tube, with the wheel running true of course. Cement the outers to the inner—and you have a " hubless " wheel to stir the envy of your clubmates.

And so to **G**, our fuel tank of the month. Seems we just *must* have a fuel tank each Gadget Review ! This one hails from E. Grunes of Liverpool the home of the Elfins, and the tank is particularly applicable to that marque of motor. Take a rear light bowl (from your own velocipede, of course !) and trim off the threads before facing up. Drill the holes for filling, the feed-pipe and the 6 B.A. bolt and then cut a disc that will just fit buttonwise in the engine backplate. Drill it in the centre, solder on a 6 B.A. nut, and fit the smart red transparent tank as per sketch.


A
PIVOT.
LINK.
LINK.
SPRING
PIVOTS SOLDERED TO LEGS
FORMER.
B
HOOKS.
FORMER.
RUBBER BAND.
NOSE FORMER.
NOSE BLOCK
C
COTTON
PIVOT
PULLEY
BELL CRANK LEVERS.
FORMER
STOPS.
RUDDER LEVERS.
BOBBIN
THREADS.
BOBBIN
PENDULUM
D
E
FORMER
FIXED CONTACTS.
INSULATED CONTACTS.
PIVOT
TOW HOOK.
TO RECEIVER
TO ACTUATOR
SWITCHES
BTY
WIRE THUS
FILLING & VENT HOLE.
6 B.A. BOLT HOLDING TANK IN PLACE.
CYCLE REAR LAMP WITH THREADS REMOVED EVENLY
BOLT HOLE IN END OF TANK.
HOLE FOR PIPELINE.
G
WASHER, WITH NUT SOLDERED ON, FITS INTO BACKPLATE AS A BUTTON IN A HOLE.
STRUT.
INNER DISC
MIDDLE DISC.
FREELY ROTATING BUSH.
F
METAL PLATE (SOLDERED TO BUSH.)
OUTER DISC
ENGINE BACKPLATE.
PIPE LINE.
MAKE SURE THAT THE TANK FITS EVENLY TO PREVENT LEAKAGE.



This is a 1/72nd scale reproduction of the 1/48th scale drawing which is obtainable price 1/- post free from the Aeromodeller Plans Service

AEROPLANES IN OUTLINE
NUMBER 2

By G. A. CULL

The Westland WYVERN

SINCE the Wyvern Mk. I first flew five years ago, this naval torpedo fighter has undergone changes so radical that it is now virtually a new aircraft. A basic Mk. I airframe was first modified to take a R.R. "Clyde" turbine with a six-bladed contra-prop, but little else was altered.

The Mk. 2, however, was thoroughly revised with an A.S. "Python" prop-jet and embodied many airframe modifications. A canopy with a curved windscreen before the flat bullet-proof panel was employed, and a new fin and rudder of striking size appeared along with many lesser alterations to wing tips and controls. The two-seater Mk. 3 was built for training and eventually sported a periscope to improve rear-seat vision. The first Mk. 2's had flat tailplanes, but on later machines a ten degree dihedral angle was incorporated and from the fifteenth machine onwards, additional improvements were introduced—all subsequent machines becoming Mk. 4's.

These have cartridge starters and the annular intake cowling has been cut back for easy reloading of the breeches, and also improves accessibility of the "Python" 3 engine which delivers 3,670 h.p. plus 1,150 lbs. thrust. Other refinements of the Mk. 4 are: rearranged aileron tabs, a horn-balanced rudder, trailing edge airflow fences, propeller parking brake and the latest production machines have new tapered prop. blades.

The wings mount four 20 m.m. cannon and fold hydraulically upwards from the dihedral break, and the tips also fold if necessary. Sixteen rockets may be carried and, at the time of writing, the Wyvern Mk. 4 is about to replace the Navy's Firebrands.

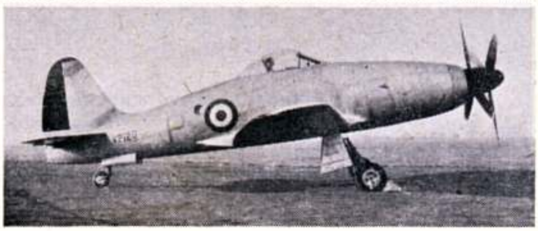
Construction.—All stressed skin with transport joint aft of wing.

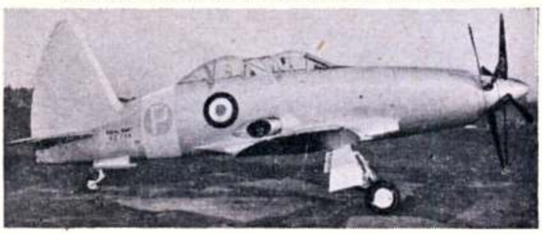
Specification. Span: 44 ft. Length: 42 ft. Height, folded: 15 ft. 5½ ins. Tips, not folded: 19 ft. 1½ ins. Folded width: 18 ft. Performance not released.

Notes for Modellers. There is a short central section on tailplane trailing edge without dihedral. Inner U/C doors are closed when U/C is down and there is slight undercamber on underside of flaps. Roundels under wing same size and position as top.

Colour. Dark sea grey, and "sky" glossy camouflage. Black serial numbers and black patch forward of windscreen. Cockpit interior is black. Typical serial numbers for production Mk. 4's are VZ 745, 6, 7, 8.

PHOTOS (*Top of page to bottom*) **Top.** ***A Wyvern 2 prototype with long cowling.*** **(Photo, courtesy "*The Aeroplane*"). Next.** ***VW 870 with torpedo and drop tanks is a Mk. 2 modified up to Mk. 4 Standard*** **(Photo, courtesy "*Flight*"). Above.** ***A production Mk. 4 VW.881 with tapered prop blades, fin aerials and carrying bomb.*** **Below. Left.** ***The experimental "Clyde" powered prototype and*** **Right** ***the Mk. 3 trainer.***





ESPECIALLY FOR THE BEGINNER Part XXIV

Whys . . . . and Wherefores

VIC SMEED *takes over from the Rev. Callon with this easy to read introduction to simplified aerodynamics*

IT'S obvious, when you come to think of it, that the chap who knows what makes things tick gets the better results. Take driving a car—the driver who knows what's going on under the bonnet gets more m.p.h., more m.p.g., and fewer breakdowns, just as the yachtsman who understands what is happening to his sails gets the extra knots and the better position when he's racing. In every sphere, in every way, the man who gets the best results is the man who knows every angle of his subject, inside and out, practically and theoretically, and this state of affairs is especially true in the world of aeromodelling. Practical know-how comes from experience and seeing the other fellows' efforts ; theoretical knowledge can either be forced on you by a long string of crashes, mistakes, etc., or you can " force " it on yourself by reading. Of the two, the second way is the cheaper, and, really, the easier. Unfortunately, though, most articles on theory plunge in half-way through, as it were, and are so detailed and filled with formulæ a yard square that the beginner gets an inferiority complex just by looking at them.

Now, a lot of published theory is written for the benefit of those aeromodellers who delight in weird squiggles, Greek letters, and other foo-foraws, and it is not at all essential to the successful designing and flying of a good model. There is, of course, a certain minimum which every modeller should know, and in this and subsequent articles we hope to present this minimum in a concise, easily understood form, from basic principles, through special requirements for models and structures, to actual design procedure, in which we will design a simple model step by step.

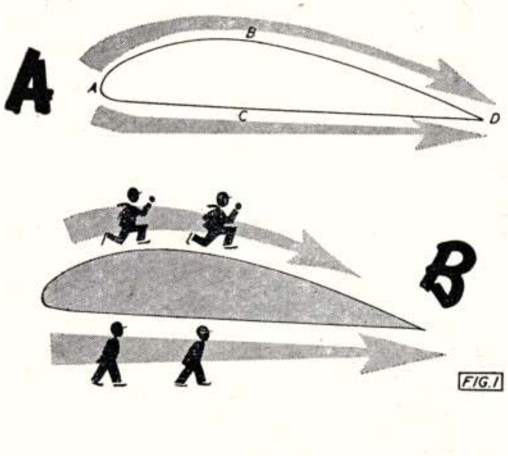


FIG. 1

Why an Aircraft Flies

Naturally, since LIFT is the most important thing about an aeroplane, the " hows " of this phenomenon come first. We might slip in here the fact that in the study of aerodynamics it is usual to think of the aeroplane (or part thereof) as stationary, with the air moving over it. The effect is the same, but observations or measurements are easier. Well, now, what is it that keeps an aircraft up ? Oddly enough, the explanation was thought up a couple of hundred years before anyone applied it to flight, by a character named Bernoulli, a member of a famous mathematical family of around the 1700 mark. This gentleman propounded and proved a point in connection with the various forms of energy, and by so doing achieved immortality in the now well-known " Bernoulli's Law ". Put in nursery language—as simple as possible, that is, without too much loss of accuracy—this law states that :—

Energy of pressure + energy of movement + energy of weight = a constant.

(We could, of course, use words like " kinetic ", " potential ", etc., but we would only confuse ourselves). Now, let us look at a simple, rather exaggerated AEROFOIL (which is just a cross-section of the wing)—Fig. 1a. A is the point where the airflow is at right-angles to the surface of the leading edge and obviously it is further from A to D via B than it is via C, isn't it ? So that if air, moving at a steady speed, has to pass round this shape, the air underneath, having a shorter distance to cover, will arrive at D before the top lot of air. This appears to leave rather an awkward gap (Fig. 1b). Since nature abhors a vacuum, something will have to fill that space, and as air, like any other fluid, resists sudden changes of direction, the obvious thing is for air already heading that way to speed up slightly. So, the " top " stream moves slightly faster than the bottom, and both arrive at the trailing edge more or less together.

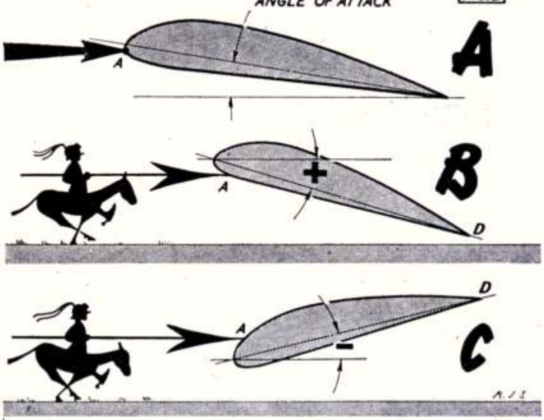
Everything thus far is under control. But what has friend Bernoulli to say about it ? If part of the air speeds up, we have an increase in the energy of movement, which means that something else has to decrease in order that the Law may still obtain. It is fair to assume that the energy of "weight" will remain pretty steady, so that pressure is the obvious candidate for a decrease. (If this isn't clear, work it out on the $3+4+5=12$ basis.) We arrive at the conclusion that since the air moving over the top of the aerofoil speeds up, the pressure on the top decreases. It is from this simple state of affairs that we get most of our lift. In point of fact, the air beneath the wing contributes a small share of lift due to a slight slowing of movement (and consequent increase in pressure) which comes from the impact of the slightly inclined undersurface of the wing at the angle at which it normally flies. A similar idea can be seen in the sport of water-skiing. Thus, with slightly decreased pressure above and slightly increased pressure below, the aerofoil tends to rise. It may be of interest to mention, in passing, that the difference in pressure in, say, a Spitfire flying at 100 m.p.h. at its most efficient *angle of attack*, is only about ·3 lb. per sq. in., and it is very considerably less in a model.

The Angle of Attack

The last sentence gives rise to a new expression—the ANGLE OF ATTACK—which is simply the angular setting of the aerofoil to the airstream. This angle is useful in the theoretical study of flight, but a more important reference for the builder is the ANGLE OF INCIDENCE, which is the angle at which the aerofoil (now the wing) is set to the datum line of the aeroplane. The DATUM LINE, by the way, is simply a straight line (usually through the centre of the fuselage) from which all measurements are made. Incidence can easily be measured and varied with relation to the rest of the aircraft. Of course, if the datum line is parallel with the airflow, the angles of attack and incidence are the same, but since we can never be certain of the airflow to within a degree or two, we must rely on what we can actually measure, *i.e.*, incidence. For the time being, however, we will keep to theory and examine the angle of attack.

In Fig. 2a, an aerofoil is shown at a normal angle of attack, Figs. 2b and 2c show the same aerofoil at, respectively, increased and decreased angles. It will be clear that point A tends to move round the leading edge with differing angles, and there must come a time when the distance from A and D is the same along the top or the bottom. This condition will obviously give no lift, and gives rise to the term "ANGLE OF ZERO LIFT". This angle normally averages about -4 degrees. Increasing the angle of attack increases the lift (and also the drag, of which more later) and also changes the shape of the pressure areas (Fig. 3). This arises from the fact that the speed of the airflow varies across the aerofoil, depending, broadly, on the amount of curve. Now, if you lift an iron bar, there is one point at which it will balance, and you can lift it with one hand, although the weight is still distributed along the length of the bar, of course. Exactly the same thing happens with an aerofoil—the lift "balances" at one point, which is called the Centre of Lift, or, more often, the

FIG. 2



CENTRE OF PRESSURE. Roughly, a line drawn through the centres of the upper and lower pressure areas will show this centre, where it intersects the GEOMETRIC CHORD of the aerofoil, (Fig. 3a). The geometric chord is merely a line drawn through the aerofoil equi-distant from the top and bottom. Fig. 3a shows the C.P. (centre of pressure) about a third of the chord back from the leading edge—the average position at small angles of attack. When the angle of attack is varied and the shapes of the pressure areas change, the position of the C.P. moves, normally forward with increased angles and rearward with any decrease (Figs. 3b, 3c).

The Function of the Tailplane

The foregoing movement of the C.P.—known as CENTRE OF PRESSURE TRAVEL—is where the tailplane comes in. It is, in fact, the sole reason why we have to bother with a tailplane. Consider Fig. 4—the weight of the structure is acting through one point (like our iron bar) which is termed the CENTRE OF GRAVITY, or C.G. for short. The C.G. in our illustration is arranged to be directly below the C.P. In normal flight, (*i.e.*, at the angle of attack shown), the aerofoil will be balanced and will remain steady. However, immediately a slight change of attitude takes place, the angle of attack will alter and the C.P. will move. The C.G., however, is fixed, and so the

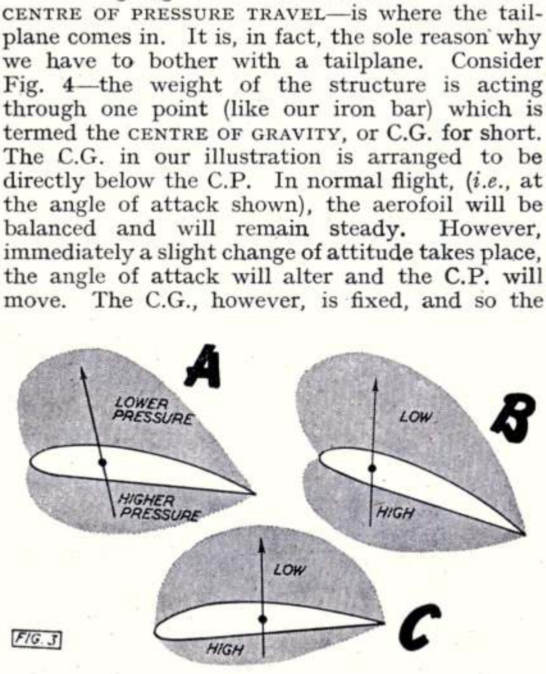
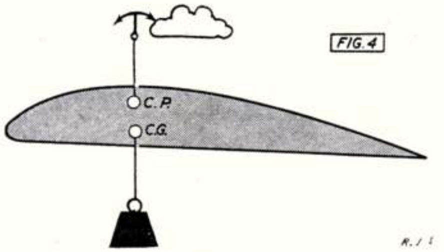
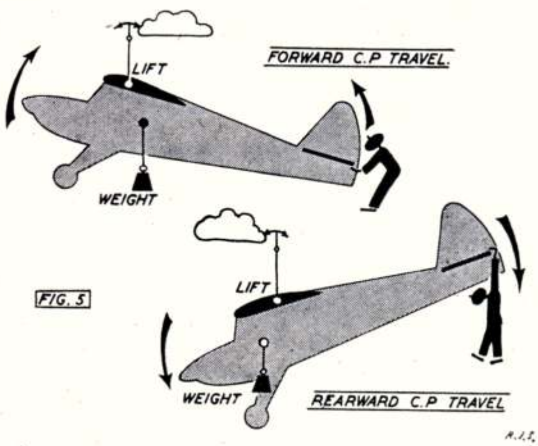


FIG. 3



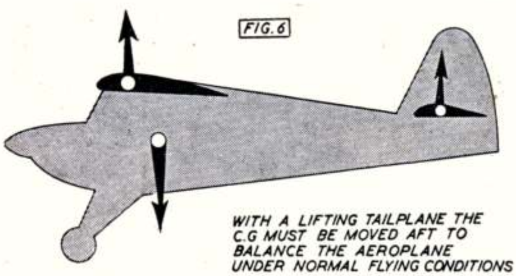
whole set-up is thrown out of balance. In the case of increased angle, the C.P. moves forward and, lifting in front of the C.G., tends to increase the angle, which moves the C.P. again, etc. (One or two rare aerofoils are characterised by rearward movement of the C.P. with increased angle, but the effect is equally disturbing.) Similarly, rearward travel of the C.P. and decrease in angle of attack produces an unstable arrangement. This "vicious circle" is the reason for the rotation of a strip of paper (or a sheet of balsa) when falling. To prevent these occurrences, a stabiliser—known in this country as a tailplane—is used, and functions as shown in Fig. 5. Under normal flying conditions, the simplest form of tailplane is at its angle of zero lift and has no loads acting upon it.



Should the wing angle of attack increase, the tailplane, being rigidly fixed with relation to the wing, immediately presents itself to the airstream at an angle corresponding to the increase in the wing angle of attack; as it now has its own angle of attack, it produces lift which, being an upload on the tail, restores the machine to a normal flying attitude. Similarly, decrease in the wing angle of attack results in "downward lift" (or download) on the tail, forcing it back to its proper attitude. The lift (up or down) generated by the tailplane must provide a tail-up or tail-down force greater than the highest opposing force likely to be created by the C.P./C.G. couple, in order that the aircraft will always automatically return to normal flight; in a model, where no pilot is present to assist return (by the use of the elevators) this is achieved by using a relatively large tailplane and a fair amount of "leverage". The leverage is obtained by employing a long MOMENT ARM—strictly speaking, this is the distance from the aircraft's centre of gravity to the centre of pressure of the tailplane, but in recent months a tendency to use the distance from the trailing edge to the tailplane leading edge has become apparent in the model world. This moment arm is normally conveniently expressed as a number of MEAN CHORDS of the wing. (The mean chord is the average width of a wing or tail). It will easily be seen that with an identical wing (say, mean chord 5 ins.), a long moment arm (say, 4 chords, = 20 ins.), with a smallish tailplane (50 sq. ins.), will give the same corrective force as a short moment arm (2 chords) and a larger tailplane (100 sq. ins.). Each of these examples, when multiplied out, gives 1,000 in./ozs. These figures are hypothetical, of course, but illustrate that a large tailplane is needed on a short fuselage, and a smaller one can be used on a long body. Areas, for tailplane comparison, are usually quoted as a percentage of the wing area, varying with normal models from 25 per cent. to 40 per cent. The average, safe figure is 33 per cent.

Frequently, one encounters a model with a so-called "lifting tail". We know, of course, that all tailplanes lift under some conditions, but in this expression a tail which contributes lift under normal flying conditions is meant. This is achieved by rigging the tailplane so that it has an angle of attack greater than its angle of zero lift, and the aerofoil section of the tail is usually more like a thinned wing section than the symmetrical and flat plate aerofoils normally employed by "non-lifting" tails. The main advantage of the lifting tail is that it contributes to the support of the aircraft all the time instead of only being useful when the flight attitude is upset. However, it can add difficulty to the final trimming of the model because another force is being applied to the extreme end of the model. Since this force is lift, it follows that the model's C.G. must be moved aft in order that it may "balance" the two separate C.P.'s. Fig. 6 shows this.

Next month we will be discussing the differences between various groups of aerofoils, the stall, and the aircraft designer's arch-enemy, drag. Questions are invited, and if of general interest, will be answered in these columns.



CLUB NEWS

"Squib" Clarke, a member of the Sutton By-Pass Modellers, "sells" aeromodelling by demonstrating at a recent Rotary Club Exhibition.

WELL, I suppose it takes time to get things moving—or sink in ! !—but the response to our last month's offer to provide a special page for Scottish news has not exactly set the Border on fire, and it is therefore necessary again to include the single report from that end of the island in the general columns. Much the same thing could be said for some of the Areas themselves, for it is an unfortunate fact that many such important Committees do not publicise their activities.

However, we are still in the winter doldrums as this is written, so we may see a resurgence of spirit when the sun makes more than its once-a-week appearance.

Eire

The **MODEL AERONAUTICS COUNCIL OF IRELAND** report the acquisition of permanent headquarters at the Aer Rianta Educational Service, 9, Lower Abbey St., Dublin. Two major contests will be staged during the coming season, the Irish Nationals on July 5/6th with events for Wakefield, Glider, F/F Power and C/Line, and an International Contest for Wakefield and Power models with a 2·5 c.c. max. engine capacity. The date of the latter event is 23/24th August, with the probable venue at Baldonnell. A President has been elected in the person of Capt. J. C. Kelly-Rogers, O.B.E., a former pilot to Mr. Churchill during the last war.

Formed last August, the **DROGHEDA M.F.C.** is making steady progress, membership having reached 16. Good relations with local landowners and sportsmen have resulted in ground facilities being placed at their disposal, and a good crowd witnessed a special display on the local football ground when, despite a cross wind and severe cold, J. Thompson of Dublin scored 168 points to win from fellow clubmembers R. N. Deale and J. J. Carroll. The novices' event was won by P. Maguire, a member of the promoting club.

Scotland

Preparatory to the contest season, the **EDINBURGH M.F.C.** is being organised on " team " lines, each specialised group developing models of a standard layout, a system that worked very well last year. Each modeller incorporates features to his own liking, with the result that variety of design occurs with consistency of performance. A/2's are proving most popular, with performance improving to such an extent that the ground is proving rather constricted, and the full length line is seldom used. Little power flying has been indulged in mainly due to the cold weather! There seems to be a lack of originality of design in this particular field, probably because most members are concentrating on Nordics. Scale and semi-scale are most popular. Junior G. Blair was the first member to gain a Merit Certificate, his o/d Nordic clocking 2 : 56, 2 : 56 and 4 : 06, whilst U. Wannop (a visitor from the Bucksburn group) also qualified, flying in fog that caused most models to go o.o.s. in under two minutes.

A full-size " Leprechaun " has been built and undergoing test before the installation of radio equipment, both model and radio being constructed by J. Jameson. Most interesting team-racer to date is a delta-wing model built by J. Gibson, power being a 3·46 E.D.

Northern Area

Although participation in National contests by the **HULL PEGASUS M.F.C.** has been small, members have obtained eight Merit Certificates (A) and one B. A trophy has been donated by Mr. G. Harrison, and members have been piling up points throughout the year—a most encouraging sign being that a new junior member is well in the running for the cup. A well planned winter programme received only moderate support, the best attendance being at Leconfield on the 20th January in biting cold and high winds! Several R/C models are on the go, interest having been stimulated by the success of K. Zythes, whose Ivy equipped " White Wings " has been turning in excellent flights. Not much has been seen of team-racers yet, but judging by the number of models under construction it will make a good showing later in the year.

Members of the **SHEFFIELD S.A.M.** are busy turning out new models for their annual Exhibition, which is being held this year from April 16th to 19th. Anyone interested in exhibiting should contact Mr. Gordon, 28, Church Lane, Dore, nr. Sheffield, for full particulars and entry forms.

HALIFAX M.A.C. report the usual close season activities taking place, E. North producing one or two nice models as well as a " long fuselage " Wakefield that looks as though it had flown straight from a science fiction story.

To try and make their monthly meeting more attractive, the **BRADFORD M.A.C.** has evolved a scheme whereby each month a Committee member is responsible for organising the proceedings after the normal business items have been dealt with. A welcome visitor was Henry Tubbs who gave the club an account of his experiences in Finland and Heathfield for the U.K. Challenge Match. The club Dinner, held on the 26th January, was an enjoyable affair, the President, Mr. S. Lanfranchi recalling the start of the club. Apparently a full size glider was built, and it was during the making of this that he first met Mr. Gosling. It seems that, after his first flight when he tried to land the glider on Bob's neck, he decided instead to take up model flying!

It is with regret that the **ROTHERHAM & D.M.F.C.** announce the closing down of the club owing to loss of membership and lack of finance.

South Western Area

The A.G.M. of the Area was held at Torquay on the 20th January, when the retiring Secretary regretted that the preceding season had not been a happy one, mainly due to the difficulties and complications arising from the lack of a suitable venue for Area facilities. He hoped that this snag would be overcome so that the Area could once again become the thriving organisation it had been in the past. Following suitable reports from the Treasurer and Comp. Sec., it was proposed that the Winkleigh Airfield be adopted for Area rallies, this suggestion being unanimously adopted, subject of course to permission being obtained from the appropriate authorities. This is an ideal venue, being centrally situated, and some good flying is anticipated. The Area Secretary for the coming year is Mr. H. Stillings, 6, Alpha St., Exeter.

Formed only two years ago, the **SALCOMBE M.A.C.**, a club in South Devon, has now 20 members. Keen interest is shown by members in the winter programme of lectures, debates, film shows, and building instruction for new members. Last summer the chaps gave four displays which were greatly appreciated, and it is anticipated that many more shows will be staged during the coming summer.

1952 CONTEST CALENDAR

Mar.	23rd.	**GAMAGE CUP.** Unr. Rubber. (Decentralised.) **PILCHER CUP.** Unr. Glider. (Decentralised.)
	30th.	**Surbiton Glider Gala.** (Epsom Downs.)
Apr.	6th.	**HALFAX TROPHY.** Int. Power Elim. (Area.) **S.M.A.E. CUP.** A/2 Glider Elim. (Area.)
	13th.	**Croydon D.M.A.C. Gala.** (Fairlop, 10.30 a.m.)
	14th.	**Battersea & D.M.A.C. T-R. Rally** (Fairlop 11 a.m.)
	20th.	**WESTON CUP.** Wakefield Elim. (Area.) **ASTRAL TROPHY.** Int. Power Elim. (Area.)
May	4th.	**KEIL TROPHY.** Unr. Power Ratio. (Decentralised.) **LADY SHELLEY CUP.** Tailless. (Decentralised.)
	11th.	**GUTTERIDGE TROPHY.** Wakefield Elim. (Area.) **K. &. M.A.A. CUP.** A/2 Glider Elim. (Area.)
June	1/2.	Centralised. **INT. POWER TRIALS.** Power Trials. **AEROMODELLER R/C.** Radio Control. **C/LINE SPEED & STUNT.** Int. C/L Elim. **SHORT BROS. CUP.** P.A.A. Load Power. **SUPER SCALE TROPHY.** Scale Power.
	7/8.	**WAKEFIELD TRIALS.** **A/2 GLIDER TRIALS.** (Centralised.)
	15th.	**West Essex Gala.** (Fairlop.)
	22nd.	**FLIGHT CUP.** Unr. Rubber. (Decentralised.) **C.M.A. CUP.** Unr. Glider. (Decentralised.) **Butlin's Contests.** All Classes. (Filey, Skegness, Ayr and Pwllheli.)
July	6th.	**HAMLEY TROPHY.** Unr. Power Duration **FROG JUNIOR CUP.** Unr. Rubber/Glider. (Decentralised.)
	20th.	**JETEX CHALLENGE CUP.** Jetex. **FARROW SHIELD.** Team Unr. Rubber. **WOMEN'S CHALLENGE CUP.** Unr. Rubber/Glider. (Area.)
Aug.	3/4.	NATIONALS. **THURSTON CUP.** Unr. Glider. **MODEL AIRCRAFT TROPHY.** Unr. Rubber. **"GOLD" TROPHY.** C/Line Stunt. **CONTROL LINE (SPEED).** All Speed Classes. **S.M.A.E. R/C TROPHY.** Radio Control. **SIR JOHN SHELLEY TROPHY.** Unr. Power.
	17th.	**INDOOR NATIONALS.** (Centralised.)
	31st.	Centralised. **BRITISH CHAMPS.** Rubber/Glider/Power. **TAPLIN TROPHY.** Radio Control.
Sept.	7th.	**Yorkshire Evening News Rally.** (Sherburn in Elmet.)
	14th.	**U.K. CHALLENGE MATCH.** (Centralised.)
	21st.	**Butlin's Contests.** All classes. Filey, Skegness, Ayr and Pwllheli.
	28th.	**FROG SENIOR CUP.** Power. (Area.) **MODEL ENGINEER CUP.** Glider. (Area.) **South Midland Area Rally.** (R.A.F. Halton.)
Oct.	12th.	Centralised. **DAVIES TROPHY.** A and B Team Race. **RIPMAX TROPHY.** Radio Control. **C/L SPEED.** All Speed Classes.

Clubs are invited to send in details of Special Galas or Open Days for inclusion in this regular Calendar.

London Area

The serious state of the Area finances is causing concern, and member clubs are asked to donate to a fund that will bring book entries out of the red. As is natural, strong feeling is evident at the Ministry attitude towards the use of Fairlop (as reported in last month's issue), but confidence is very evident in the persons now handling this tricky business on behalf of the members. (In our opinion the whole affair would have been handled far better by the Area from the start, and we deprecate the position that has arisen from bungling at other levels before a very sticky buck was passed on.)

A fund has been opened for the purchase of a Radio Control Trophy in memory of "Funf" Taylor, the contest probably being held at the West Essex Gala.

REGENT'S PARK M.F.C. are being hard hit by members going away for their National Service, no less than 6 bods being currently on the "inactive" list. A new member has however been enrolled, his engrossment in a snowstorm being a puzzler until it was learned that he had lived all his life in India, and had never seen the stuff before!

Club membership of the **WILLESDEN & D.M.A.C.** is around the thirty mark, fifty-fifty seniors and juniors. The Evening Institute has included the club as a class at night school, and they now meet every Friday at 7 p.m. at Pound Lane School, where all modellers—either sex—are welcome, with no obligation to join. Most Sundays are spent on Hounslow Heath, where C/Line is most popular at present.

North Western Area

CHEADLE & D.M.A.S. are very honoured at the election of member Peter Foulkes to Chairmanship of the Area. The highlight of the club's winter building programme is undoubtedly W. Nield's 10 ft. span o/d glider. We hear that so far 20 large tubes of cement have been devoured in the construction! The club glider "Barn Owl" has been improved with the production of a higher aspect ratio wing, which should result in even more maximums in the future. Several members attended the Winter Rally at Sealand, but were not outstandingly successful this time.

A series of lectures given by members of the **OLDHAM & D.M.A.C.** are proving very worthwhile, those to date being Radio Control Theory (2) by W. Harrington, and Prop Designing and Carving by Ray Musgrove. Jetex r.t.p. speed comps are all the rage at the moment. Models regularly part company with the lines to explode against the wall, or burn off their own tail booms to everyone's amusement. Speeds are good—in the region of 35 m.ph.—and take-offs and landings very realistic.

The **WHITFIELD M.A.C.** attended the Area Winter Rally in force, and were rewarded with five prizes out of nine. After several weeks of club comps, members were well able to cope with the cold, wet and windy weather experienced. Big gliders paid dividends, R. Askew placing first with **8 : 39**, A. D. Bennett second with **7 : 40** and J. O'Donnell fourth with **6 : 46**, all flying **9** ft. span club design models. The first two models were lost, but have since been recovered. E. Stafford won the Junior glider event flying an A/2 to a **5 : 48** aggregate. In the rubber class, J. O'D. took second place with **5 : 59** flying a long prop-run Wakefield for two o.o.s. flights, whilst younger brother Hugh won the junior class with an aggregate of 1·42. The club held an inter-club contest at Affetside on Jan 23rd, when again the weather was bad and results very close.

Midland Area

Held on New Year's Eve, the Glider Rally of the **SOLIHULL M.F.C.** was cursed with rain and strong wind, which put off many would-be competitors. Ten clubs participated, honour for best flight of the day going to W. Eales of Rugby who made a perfect tow in high wind to score **4 : 50**, and to finally prove the winner of the contest, followed by M. L. Hanson (Solihull) and P. Littley (West Bromwich). Three weeks later saw the first round or the Area inter-club knockout event against Birmingham, and great was the jubilation when the club team of Averill, Hanson and Jones (all flying A/2s) put up a total score of **28 : 10** to Birmingham's **22 : 44**, Monks being the only Brum chap to do well. The Solihull boys have found a new wrinkle for winter interest in the form of Indoor Chuck Glider contests. Maximum wing area is limited to **15** sq. ins., and of course it pays to have the jobs as light as possible. The models used to date are mostly built from very light 1/32 in. sheet, with long nose extensions to dispense ballast weight. Hanson won the first event with an aggregate of 25·8 secs. for four flights, best flight 7·5 secs. This doesn't sound much, but try and do better!

The **NORTH BIRMINGHAM M.A.C.** put Small Heath out of the running in the above mentioned inter-club knockout, and have followed up with a further piece of good fortune in the acquisition of clubrooms with the Erdington Y.M.C.A., which includes the use of a hall for indoor flying.

The " one-make " contest held by the **LEICESTER M.A.C.** is progressing well, the final flying meeting to take place on March 23rd. Free flying is looking up and more Merit Certs. have been gained in spite of the snow. Radio control however is almost extinct—a great pity as they were one of the first clubs with successful flights with both commercial and home-made equipment.

After their 1951 successes, the **BIRMINGHAM M.A.C.** boys are out trimming new jobs in Sutton Park, many power jobs being based on the " San de Hogan " designs. Wakefield optimists are seeing who can build the longest fuselage for the lightest weight to hold the most rubber! Johnny Jones is using a McCoy 29 in his 1952 team racer, whilst keeping the old Hurricane powered " Scramble " as a standby. With a Dooling powered " Quest " on the stocks, the team-race pit boys look like having a busy time coping with these thirsty hotrods.

The annual dinner of the **FORRESTERS (Nottingham) M.F.C.** was held on January 26th, when over 50 guests and members saw Mrs. Trapp present the cups for the club Winter contests. Speeches were short and sweet, fun and games being the order of the day. The recent snow did not deter members from flying, and it is a pity that the contest with Chilwell was called off, for a surprising number of bods aired old " Banshees " and the like in readiness rather than use next season's models. Mike Wells claimed the first thermal of the year when his Mills 1·3 c.c. old timer rocketed up into an approaching snowcloud.

The annual prizegiving of the **WEST COVENTRY M.A.C.** was held on February 13th, when a fine assortment of cups and trophies were distributed to the following members :—

Williams Trophy—C/Line	**J. B Beaufoy**
F/F Power—Club Cup	**P. J. Hopkins, Jnr.**
Open Glider—Club Cup	**H. E. Moore**
Junior Shield—Glider	**K. Bayliss, Jnr.**
Junior Trophy—F/F Power	**P. J. Hopkins, Jnr.**
Craig Cup	**P. J. Hopkins, Jnr.**
Beesley Trophy	**K. Bayliss, Jnr.**
Chairman's Trophy—Radio Control	**T. Williams**

The junior members are to be congratulated on their consistent performances. The evening wound-up with an R.T.P. competition, again for juniors only, the result being a win for K. Bayliss, with P. Hopkins second. The winter season has been enlivened by " model quizzes ", when a team of " experts " were put through their paces, and also by talks on radio control, building and equipment by Mr. K. A. Thomas.

South Eastern Area

Tempers are somewhat frayed down Brighton way at the moment, and the current issue of the Area news-sheet " Seadog " has some harsh things to say anent this and that. I am taken to task with others for commenting on their narrow viewpoint, but I maintain that if their previous news-sheet was not explicit enough for me, then it must have been even more so to their non-committee members who are less in the know than yours truly! However, let's hope they sort themselves out, and be a little more reasonable in their published remarks from now on, though we would remind certain editors that views contained in an Area news-sheet must necessarily be those of the Committee—or else some very necessary vetting is lacking.

The **EASTBOURNE M.F.C.** is the latest club to turn up with a published News-Letter, a system we commend as the ideal means of keeping members properly informed. A very successful evening is spent nowadays with r.t.p. flying of small inexpensive kits, initial honours going to Don Panteney with his nicely made " Beechcraft Bonanza."

A formidable list of club records is published by the **SOUTHERN CROSS A.C.,** and these will be supported by a series of annual records this season. The aggregate of three consecutive flights will be used to base these new figures, and I'm all for making record flights on this, or a similar, basis, for the single flight record is largely a matter of luck—as I've said so many times. Grahame Gates' new Halcyon III made its first appearance—and everyone had to go outside the clubroom whilst he assembled it! His new Nordic has 91 ribs, and the span is 90 ins. We learn that a claim for a new Lightweight Hand Launched Glider record of **8 : 45** is coming from this lad.

Influenced by the threat of losing their flying field, members of the **BRIGHTON D.M.A.C.** have been advised as to what the local farm bailiff expects of them! Though the competition section is smaller this year, they are optimistic for the '52 season under the direction of J. F. Minshull.

South Midland Area

At the last Area meeting, H. R. Stevens (Hatfield) and a member of the 1950 Wakefield Team, was elected to the office of Comp. Sec. The Hatfield club, together with Wayfarers, have transferred into the Area from London. The first Area comps. on April 6th will be held at R.A.F. Henlow, and Sgt. Smeed of the station club has undertaken to provide timekeepers, retrievers, etc., a gesture that is much appreciated by the members. Other Area dates are not yet fixed in regard to venues, with the exception of the September meeting, which will be held at Halton, and forms a pukka Area Rally. This Area is another enforcing pre-entry for Area dates, with late entries taken on the field at a special fee.

Members and friends of the **LUTON & D.M.A.S.** had a grand night at the recent club dinner and social. At the "Bill White" contest, Roy Clements' job snagged a towline and wrecked his chances. P. Gilder had his new Wakefield which sports a 6-ft. fuselage. It performed well on test, but a faulty launch spelt disaster for him, and only Chapman secured three flights.

South Wales Area

A new club, known as the **PENTRE M.A.C.**, has been formed with a current membership of fourteen. Meetings are held every Thursday evening at the local junior school, and all branches of the hobby are catered for. C/Line and gliders are the most popular types at present, with four members the proud possessors of radio control jobs.

Western Area

Members of the **SWINDON M.A.C.** and their friends had as their guests at their annual dinner, the Mayor of Marlborough and other notable dignitaries. Junior John Hodey was presented with a certificate of merit, this being the "Flight Championship" award for 1951. Arrangements for the Wiltshire Downs Slope Soaring Contest are already going ahead, and the date will be announced as soon as suitable arrangements have been concluded.

The A.G.M. of the **GLEVUM M.C.** found the club in a sound position, though the lack of a clubroom is still a problem. The "Glevum Glider Trophy" which was inaugurated last year was won by J. Ralph, this chap also placing top in the open rubber section. The experiment of running two teams within the Club proved successful, interest being greatly stimulated by this means. Team racing has a good following, but scale power models are taking a lot of attention, also chuck gliders. Record in the latter class is held by M. Limbrick with a time of 39 seconds.

Two more overseas readers write this month requesting pen-pals, so if any of you care to open up, here are the details :—

Jan Post. Lasarettsgatan 2B, Soderham, Sweden. (17 years old and mainly interested in flying scale.)

Stewart Chester. 627 N. Sycamore, Ottawa, Kansas, U.S.A. (age 33).

By the time I again sit down to sorting out your monthly reports, the contest season will be upon us, and here's hoping for a better deal from the weather man than we had last year.

The CLUBMAN.

NEW CLUBS

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DARWEN A.M.C.
R. Geraghty, 4, Primrose Street, Darwen, Lancs.
TYNEMOUTH M.A.C. (formerly North Shields M.A.C.).
N. G. Peacock, 5, Eastlands, High Heaton, Newcastle-on-Tyne.
FARNBOROUGH S.M.E.
D. L. Jenkins, 16, Hurst Road, Hanley Estate, Farnborough, Hants.
CORK M.A.C.
P. Hartnett, Dunsland Cottage, Glanmire, Cork, Eire.
HOUNSLOW & D.M.A.C.
R. F. Gosden, 20, Tranmere Rd., Whitton, Middx.
PENTRE M.A.C.
Thomas T. Williams, 4, Lleteca Place, Pentre, Rhondda, Glam.

SECRETARIAL CHANGES

WELLINGBOROUGH M.A.C.
R. C. Chapman, 33, Birchfield Rd., Wellingborough.
CENTRAL ESSEX AEROMODELLERS.
R. G. Greygoose, 6, New Rd., Great Baddow, nr. Chelmsford.
REGENT'S PARK M.F.C.
Miss G. E. Young, 5, South Hill Park Gardens, Hampstead, N.W.3.
GILLINGHAM M.F.C.
A. Prince, 105, Grange Rd., Gillingham, Kent.
CAMBRIDGE M.A.C.
M. B. Reynolds, 17, Albion Row, Castle Hill, Cambridge.
YORK M.A.S.
L. B. Cross, 69, Scott St., Scarcroft Rd., York.
WILLESDEN & D.M.A.C.
Marcel G. A. Bol, 126, Ellesmere Rd., Dollis Hill, N.W.10.
CANTERBURY PILGRIMS M.F.C.
C. Ashby, 4, Spring Gardens, Canterbury.
BATH M.A.C.
F. R. Lee, 2, Lower Borough Walls, Bath.
COVENTRY & D.M.A.C.
K. Hall, 30, Beresford Avenue, Foleshill, Coventry.
NEW MILTON M.A.C.
A. C. Gibbons, 76, Ringwood Road, Walkford, Christchurch, Hants.
CHEADLE & D.M.A.S.
C. Gallagher, 42, Saddlewood Avenue, East Didsbury, Manchester.
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M. A. King, 156, Marine Parade, Leigh-on-Sea, Essex.
EVESHAM & D.M.A.C.
Miss G. Drinkwater, 28, Lime Street, Evesham, Worcs.
PARK M.A.L.
R. A. Mount, 127, Merton Mansions, Raynes Park, London, S.W.20.
BUSHY PARK M.F.C.
J. E. Simmons, 63, Shaftesbury Avenue, Manor Estate, Feltham, Middx.
WAVERTREE M.F.C.
H. Hughes, 6, Chalfont Road, Allerton, Liverpool 18.
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HASTINGS & D.M.A.C.
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J. Cochrane Jnr., 14, Morningside Road, West Derby Liverpool 11.
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BELPER & D.M.A. & E.C.
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R. L. Hayes, 288, Holly Lane, Erdington, Birmingham 24.
ASHTON M.A.C.
F. Lees, 9, Derwent Avenue, Ashton-under-Lyne, Lancs.
TAME M.C.
W. Dalaney, 3, Hayfield Street, off Gt. Portwood Street, Stockport, Cheshire.
BROUGHTON & D.M.C.
M. Higginson, 10, Highfield Drive, Fulwood, Preston, Lancs.
CIRENCESTER & D.M.A.C.
A. J. M. Jefferies, 17, Queen Anne's Road, Beeches Estate, Cirencester, Glos.
CHINGFORD M.F.C.
S. E. Cameron, 119, Marmion Avenue, Chingford, E.4.
BRADFORD M.A.C.
J. T. London, 220, Savile Park Road, Halifax, Yorks.
RADLEY COLLEGE M.A.C.
J. C. Gilbert, "Crowsons" Radley College, Abingdon, Berks.
SOUTH BRISTOL M.A.C.
W. D. E. Millman, 26a, Ravenswood Road, Redland, Bristol 6.
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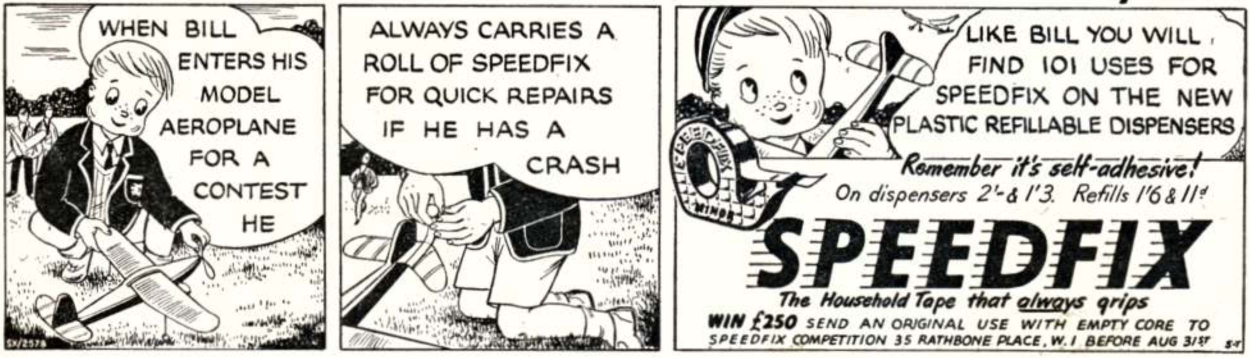

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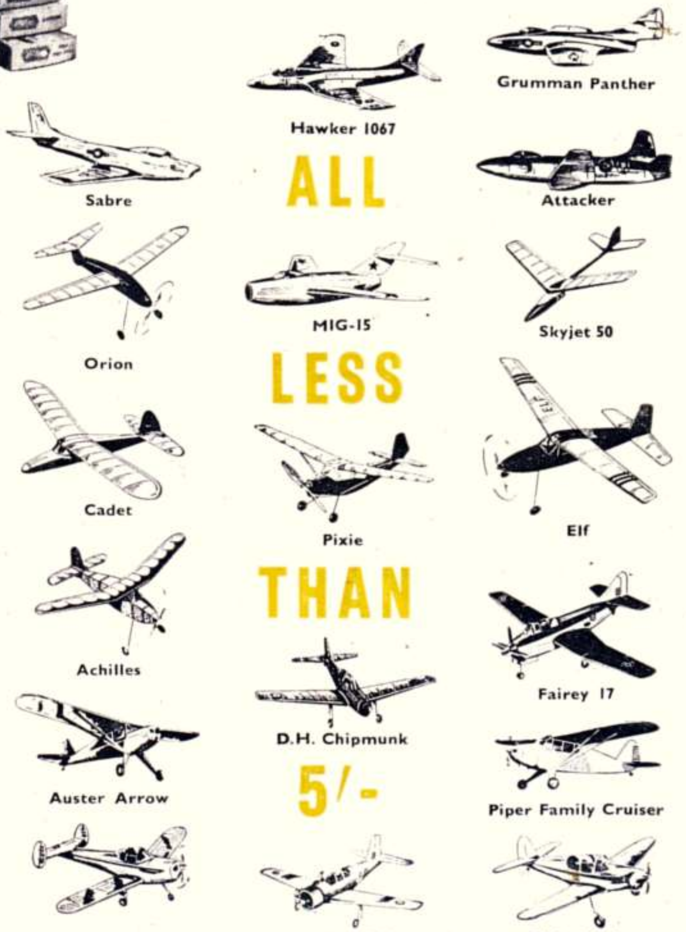

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