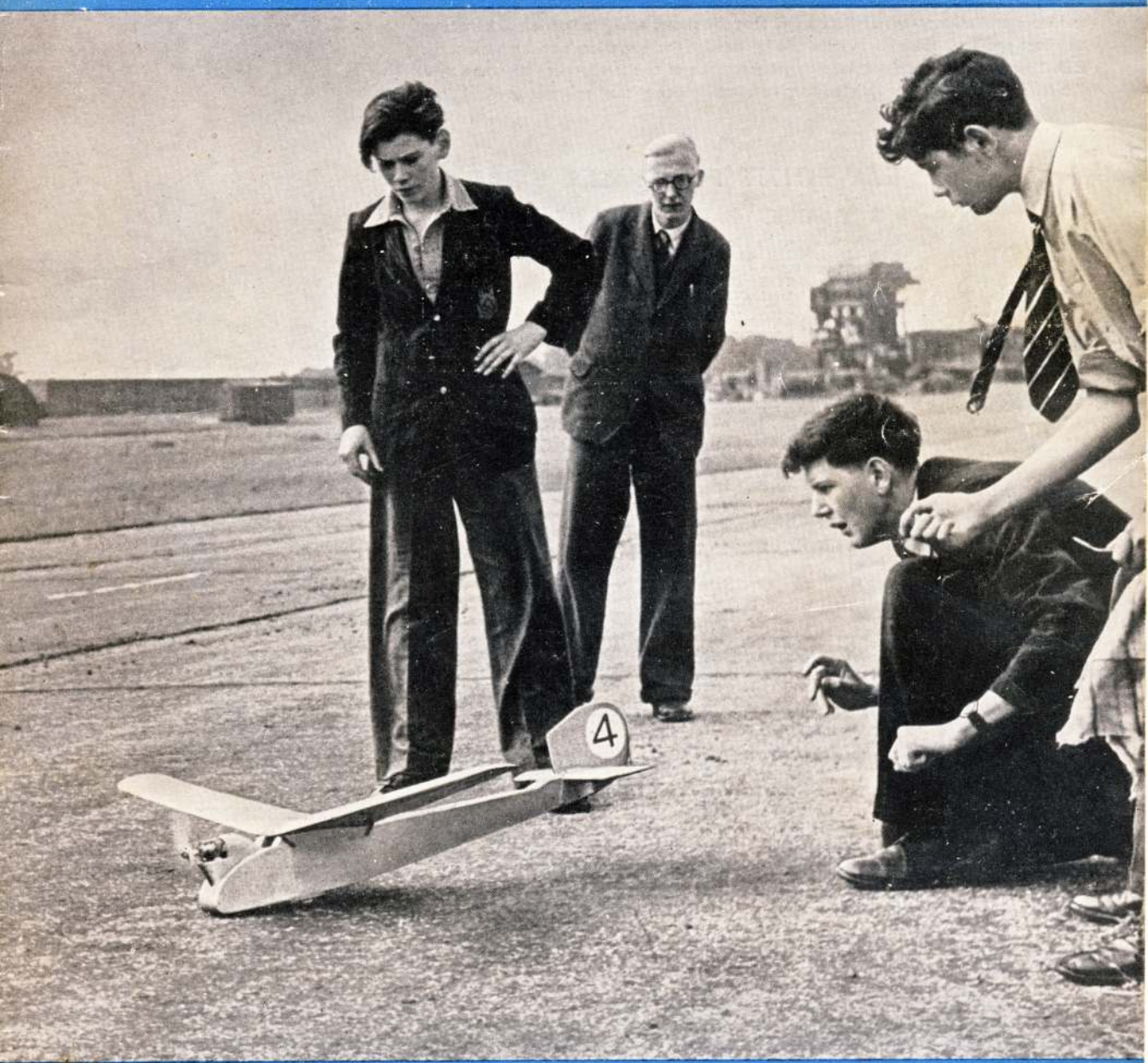
AERO MODELLER

MARCH, 1952



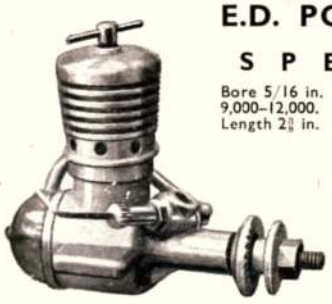
TWO NATIONAL CONTEST WINNERS • BILL HENDERSON'S JETEX 'VINDSKREENVIPER' • PETE WYATT'S F/S 'WREN' PLUS THE A/2 OF THE YEAR, RAY MONK'S 'QUICKIE' • SOLIDS • GEODETICS • NEW CONSTRUCTION FEATURE

1'6

E.D. OFFER YOU THE FINEST RANGE OF DIESELS and introduce..

THE NEW .46 "BABY"

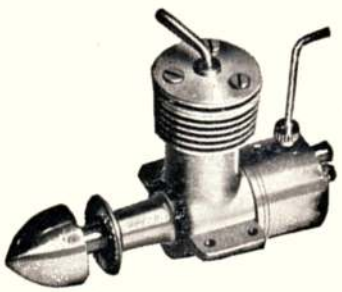
In response to repeated requests we introduce the new " baby " of the E.D. family and from preliminary investigations find that she shows every indication of becoming an infant prodigy. Bearing in mind the knowledge and experience at the back of the E.D. " brood " and the outstanding performance of the family generally, the new " birth " can hardly be expected to give anything other than complete satisfaction.



E.D. POINT FORTY SIX " BABY "

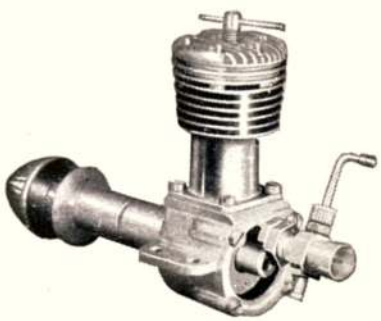
S P E C I F I C A T I O N

Bore 5/16 in. Stroke ⅜ in. Cu. Capacity 0·46 c.c. (·028 cu. in.). R.P.M. 9,000–12,000. B.H.P ·04. Weight 1·4 oz. with tank. Height 1 15/16 in. Length 2⅜ in. Width 1¼ in.
TYPE : Diesel. CRANKSHAFT : Induction. CON ROD : Steel. COMPRESSION : Variable. EXHAUST PORTING : 360°. TRANSFER PORTING : 360°. COMPRESSION RATIO : Variable. HOLE CENTRES : 1 in. 2 slots. ROTATION : Anti-clock. RUNNING POSITION : Upright, inverted or side winder. FUEL CONTROL placed at 30° for easy access. FUEL CONTAINER : Plastic. FUEL : E.D. Standard. Price £2. 15s. 0d.



E.D. 1 c.c. Mark I (BEE)

Size : Height 2¼ in. Length 3 in. The most popular motor of them all. Compact, reliable, weighs only 2¾ oz. yet gives 12 oz. static thrust. Features a disc inlet valve with induction pipe going through centre of fuel tank. Bore 0·437 in., stroke 0·400, r.p.m. 7,000 plus. Price £2. 17s. 6d.



E.D. 3·46 c.c. Mark IV

Size : Height 3 in. Width 1⅞ in. Length 4⅛ in. One of the finest diesels for C/L and stunt flying. At 10,000 r.p.m. it exceeds the static thrust of most 5 c.c. engines. The ideal choice for larger models such as the " Radio Queen ". Incorporates rotary disc induction. Bore 0·656 in. Stroke 0·625 in. Price £4. 2s. 6d.

E.D. 2·46 c.c. Mark III (Series 2)
RACING ENGINES

Size : Height 2¼ in. Length 3¼ in. Width 1⅜ in. Specially designed for use as a diesel, Glo-plug, or spark ignition engine the two-forty-six develops ¼ h.p. at 14,000 r.p.m. plus. It has disc inlet valve induction, two ballrace crankshaft and exhausts as an integral part of the crankcase. Weight 5 oz. Price £4. 2s. 6d.

All prices include Purchase Tax.

E.D. 2 c.c. COMPETITION SPECIAL

Size : Height 3 in. Width 1½ in. Length 4 in. An improved 2 c.c. engine with enhanced performance. This diesel achieved immediate popularity after its brilliant success at the 1949 Nationals. There is no better engine for C/L and stunt flying. Gives 23 oz. static thrust. Weight 5½ oz. Price £3. 5s. 0d.

The majority of Kit Sets manufactured by the Big Four, namely—" Keil Kraft ", " Verons ", " Mercury ", and " Skyleada "— are designed to suit the E.D. Power Unit.

E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD
KINGSTON ON THAMES
DEVELOPMENT ENGINEERS
1223 18, VILLIERS ROAD, KINGSTON-ON-THAMES, SURREY, ENGLAND.

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The VERON Vortex NORDIC

★ A HIGH EFFICIENCY SAILPLANE *designed to* INTERNATIONAL NORDIC A.2. *Formula*

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 destined to be the year's winning kit design.

The kit contains :—Another of Phil Smith's super-detailed plans, showing "stage-by-stage" construction from first-class materials. All strip, sheet, spars and sectional trailing edge, celluloid, etc., supplied. Details are given for "tip-up" tail de-thermalizer and auto-rudder. Also conversion data for "rough" or "fine-weather" models.

PRICE 22/7 incl. Tax

VORTEX SPECIFICATION !

Span, 66 ins.; Length, 38 ins.; Total surface area, 508·75 sq. ins. (mainplane, 426·4 sq. ins.); Aerofoil, NACA 6412; (the "All-weather" section), Cross-sectional area, 6·8 sq ins.; Minimum ballasted weight, 14·5 ozs.

and SOLIDS

ALL 1/72 SCALE

Kits contain detailed plan and ready-cut parts, each one a masterpiece of authenticity by Phil Smith. Meteor and Canberra have ready-turned nacelles, MIG 15 has a ready-shaped fuselage. Plastic wheels, ready-shaped cockpit covers and transfers of insignia are included.

METEOR 8
(Photo by courtesy of "Flight".

VERON POLICE LAUNCH

KIT PRICE **44/-** *(inc. P.T.)*

Length, 26 ins.; Beam, 7¼ ins. A kit suitable for powering with small diesel motors up to 2 c.c., or electric motors. Many pre-cut, pre-fabricated and die-cut parts. No shaft or propeller unit, to enable you to fit the propulsion unit of your choice.

IF YOU CAN'T FLY THIS WINTER Try your hand at 'boat building'

SOLID RANGE

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

All prices include Purchase Tax.

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ESTABLISHED 1935

AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

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"Covers the World of Aeromodelling"

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The £. s. d. of Aeromodelling

INEVITABLY the general rise in the cost of living is bound to affect all hobbies and pursuits, and aeromodelling is no exception. The recent imposition of Purchase Tax on aeromodelling commodities has not helped the situation, and with the general tightening up in spending power the hobby is bound to be affected in some way, however small.

Concurrent with this material cost is the steadily rising budget required for administration, and the S.M.A.E. is at the moment facing a difficult situation in trying to make both ends meet. It is obvious that the present extremely small affiliation fee must be increased if members are to continue to receive any form of service on their behalf, for the postage on circulars alone—to instance but one item—has increased by 50% during the past year, and printing and other costs have risen out of all recognition.

Whilst there may be some merit in the proposals put forward from some quarters to raise the affiliation fee by a large amount, thus bringing it into line with many other Association fees, one must not lose sight of the fact that the affiliation fee to the Society is only a portion of general club fees, and to raise the affiliation fee too high would inevitably mean the dissolution of a number of clubs—or an end to the present full-club affiliation system. We would have in consequence a number of individuals who felt able to pay the high fee joining the Society as country members, and quite frankly the situation would not improve the Society's finances, for it is obviously easier and far more economical to deal with a number of groups than a considerably larger number of individuals.

We understand the Council is to recommend an increase in affiliation fees to 5/- senior and 2/6d. junior, and we have no doubt the more considerate and thinking aeromodellers will approve this recommendation, for where else could you get facilities as offered by the Society at such a small fee? We hope our readers will appreciate the necessity for this general increase in subscriptions, and continue to contribute in making the S.M.A.E. one of the best respected Societies in the Aeromodelling World.

We further commend to our readers the 1952 International Contest Fund, operated with the sole object of financing British teams to the World Championship events, which this year are four in number, i.e., the Wakefield Trophy, Swedish Cup (A/2 Gliders), Control-line at Knocke, and Power in either France or Switzerland. Although it is confidently anticipated that expenses to meet these commitments will not reach last year's figure, it is necessary that money be collected (for it definitely cannot be found from general funds) and we trust that all readers interested in the prestige of British aeromodelling in these important International events will contribute generously to the Fund. Any contributions sent direct to us will be duly acknowledged and passed to the Society, and we sincerely hope that a bumper fund will be made available to enable British teams to participate in these vital contests.

Cover Picture . . . .

Anxious moment for British Champion, Peter Wyatt, and the time-keepers, as his scale English Electric Co. Wren snubs its nose when building up speed for take-off on one of its contest winning flights at Debden, Essex, aerodrome.

A Welcome Change

F.A.I. Information Circular (No. 58), just to hand, lists the following highlights of model aviation achievement, and it will be noted that for the first time for many months the new records do not go to the credit of Soviet Russia !

Using a Glow Plug " Micron 60 " of 9·87 c.c., Gerard Laniot of France set up a new Control-line Class III record of 231·270 km./hr. (143·6 m.p.h). on the 25th October, 1951, this also creating a new absolute World Record for speed on a circular course. Laniot's success with a piston engined model of this category is remarkable, for it has long been the general opinion that jet-propelled models were the fastest machines yet produced, but the recognised International Record for jets shows a speed of only 206·598 km./hr. (128·3 m.p.h.).

A few days earlier, i.e., on October 6th, 1951, William Doonan of America set up a new record in the International field with a jet powered flying wing (control-line). Employing a modified " Dynajet " the model reached 193·352 km./hr. (116·6 m.p.h). Thus, both recognised records for jet-propelled models are now with the U.S.A.

In view of the fact that the British record for such machines has stood at 133·33 m.p.h. since September, 1949, it is surprising that the exponents of this type of machine have not made some effort to bring such important records to this country.

International Contests

Dates for the four International Championship Meetings, to which this country will be sending teams are now confirmed as follows :—

Control Line Championships—
Knokke, Belgium July 4th–7th
Wakefield Contest—
Norrköping, Sweden July 10th–14th
Nordic A/2 Contest—
Graz, Austria August 13th–17th
International Power Duration—September

It will be noted that the date given for the Wakefield Contest is different to the one already published, which would have clashed with the Knokke meeting. A new innovation at Knokke will be the introduction of Team Racing, which should provide interesting competition.

The International Power event is at present intended to be held in France, but in the event of the French being unable to organise it, will then go to Switzerland. A well-run International Power event for free flight models has long been needed, and we sincerely hope that 1952 will see such a contest following the unfortunate mismanagement of last year's event.

1952 S.M.A.E. Comp. programme

Copies of the 1952 programme will be available by the time this issue is published. Clubs should order via their Area Secretaries, and non-members may obtain copies direct from Londonderry House.

As a result of vastly increased production costs the Society has regretfully been forced to increase the price to 2s. and also to restrict the print, which means that copies will be in short supply. Early ordering is therefore advisable.

Prizes Galore

We are pleased to announce that the " Yorkshire Evening News " Second National Model Flying Festival will take place on September 7th, 1952, the venue again being Sherburn-in-Elmet. Full details will be made available at a later date, but we are assured that the prize list will be even bigger than last year, and all the popular " open " events will be held.

Thankful for Small Mercies?

The London Area of the S.M.A.E. seem to be having more than their fair share of troubles these days, for following definite restrictions on their use of Fairlop Aerodrome, they are now faced with a demand for " back rent " to 1950 ! All clubs using this venue are expected to pay £1 per annum for the privilege—a small enough sum, indeed—but it is a bit of a blow to be told on paying a recent demand that the sum collected is regarded as payment of arrears, and that further quidlets are required for the past year—and one more for the coming season ! !

We sincerely trust, for the sake of the many London clubs who find Fairlop the only reasonable space in which to fly, that these Ministerial troubles will soon be smoothed over and that care-free flying can again be enjoyed. For our part we can only thank our lucky stars that, despite the distance travelled to reach our stamping ground, we are not faced upon arrival with hoards

of watch-dogs, earthworks, and sundry impedimenta. (Or is it that we reap what we have sown, and that a modicum of tact and respect for others' property pays dividends in the long run ?)

Felicitations mon ami

Well known in this country as one of the keenest French followers of the aeromodelling hobby, Father (" The Amiable ") Amiard of Flers, Normandy, numbers a large number of Britishers as personal friends.

We are sure they will all join with us in congratulating him on the receipt from the French Government of the Medaille de l'Aeronautique—the highest aviation distinction—for his strenuous work in connection with the furtherance of aeromodelling and International light aviation Rallies.

May we look forward to the day when British aeromodelling is officially recognised in a like manner ?

Airframe Construction

One of the most popular series we have run in recent years has been " It's Designed for You ", a feature covering in a practical way the design of all types of model aircraft. As of most good things it has come to an end, and to succeed it we have " Airframe Construction ".

Like " It's Designed for You ", we intend this new series to provide the answers to a host of problems, this time concerning the actual building of models of all types. To make our coverage of this subject as comprehensive as possible we shall get right down to the basic principles of construction in each article so that anyone who has never built a model before can use this series as a means of starting off on the right foot. At the same time we hope to include quite a number of features which will still be of interest to even the most experienced modellers. The truly experienced modeller is usually the first to admit that " there's always still more to be learnt ". We hope that some of the short cut methods and how-to-do-it tips will fall into that category.

There are, no doubt, particular aspects of construction, covering, etc., that trouble our readers more than others. We invite them to write in and let us know what they are in order that they may be dealt with in the series.

Heads I'm right. Tails you're wrong

Certain officers of the S.M.A.E. South Eastern Area could do with a more careful study of what they say, either in print or public ! At a recent A.G.M. of the Area, Secretary H. Rewell is reported as stating that " the Council's lack of foresight is largely responsible for the present financial position of the Society, and the Area would benefit from economies made at top level ".

Permit us one hearty horse-laugh, for it is largely as a result of this Area's poor business acumen that the Society had to meet debts totalling £160 resulting from the unfortunate Control-line Championships sponsored by this Committee—this sum

being quite a sizeable proportion of the current deficit. Whilst one has every sympathy with the organisers of the meeting for the really shocking weather they experienced one wonders whether the much maligned Society would have benefited from any profit accruing had a fine day been experienced—for there was no hesitation in passing the buck when a substantial loss was incurred !

It is further noticeable that Secretary Rewell has been conspicuous by his absence from Council Meetings from that date—though up to then he had been a regular and somewhat vociferous representative of his Area. Need we comment further ?

The " Bill Sykes Mk. I. "

When nobody is looking it is the Editorial custom to snatch up some luridly jacketed " whodunit " from the local library shelves in place of the more sober tomes our neighbours might expect us to be enjoying. Our catch the other day was a Nigel Morland thriller, featuring the one and only female Asst. Commissioner, Mrs. Pym. To our delight the plot was self-evident from the first few pages—obviously the master criminal was employing radio-control for his fiendish machinations. Surprisingly enough we were right—the mysterious car driven by an ancient Egyptian mummy, in a Bond Street hat and all the most fashionable etceteras, was indeed so controlled. We were disappointed, however, in the denouement, where the hard work of installing the gear was carried out by an unemployed radio mechanic at a cost of " hundreds of pounds ". How much more enjoyable it would have been to employ a wicked aeromodeller, or even a comparatively good one, kidnapped from Fairlop on a Sunday morning and smuggled past the copper at the gate in a model box.

● WINNER OF THE 1951 S.M.A.E. SCALE TROPHY. AN ACCURATE 62 INCH SPAN MODEL OF A FULL-SIZE DURATION DESIGN

THE ENGLISH ELECTRIC CO. Wren

by

BRITISH CHAMPION PETER WYATT

Age 21 . . . currently serving in R.A.F. on National Service . . . Ipswich clubmember . . . has been modelling for eight years and has no other hobby than aeromodelling, though we've seen him running many a cross-country trail.

WHEN the National Scale-Power contest was introduced last year, the rules required a model built to accurate scale, but capable of the greatest possible duration. Such a contest, without points for appearance or realistic flight, appealed to many of our acknowledged power experts, among them the 1951 National Champion, P. B. Wyatt.

Pete selected the production version of the Wren, a famous lightplane designed in 1922, and using a 398 c.c. A.B.C. twin engine. Placing the racing number 4 on the fin, the scale Wren is identified as that used by Sq. Ldr. W. H. Longton when he tied for first place in the £1,000 *Daily Mail* Lightplane contest of 1923. The same machine can still be seen in the Science Museum at South Kensington, and the descriptive label makes a point of mentioning the remarkable powers of duration which enabled it to win the contest. Petrol consumption was as low as 87·5 miles per gallon !

Choosing a winning duration aircraft, with the simplest lines and reasonable proportions for a model duration contest, obviously paid dividends for Pete Wyatt when he won the Scale Power Contest on 2nd September, using only two flights out of a possible three. Average duration is around the two minute mark, using a 30 sec. power run. Proven in over 80 flights, the prototype model has plenty of penetration on power and glide. It has even been flown when the seagulls forsook flying for walking !

Fully detailed instructions for building this interesting scale model are issued with each full size A.P.S. plan. To whet your appetite we reprint Pete Wyatt's own trimming gen, which enabled him to win the S.M.A.E. Scale Trophy.

Trimming. Add weight to the nose until the C.G. is correctly located. The glide is rather fast, so on a hand launch the Wren will appear nose heavy. The engine has 1½° downthrust built in, but if an Elfin 1·49 is used, slightly more may be necessary. The original Wren had a slight tendency to turn to the left on the glide, so the trim tab was moved for more left glide and the engine given 2° right sidethrust. The sidethrust was adjusted until the Wren climbed dead straight with a slight tendency to turn right. If there is a turn when the engine stops, there is hardly any change from power to glide. Power turn in the same direction as the glide should not be used as the tail will tend to rise, causing a spiral dive. Full revs. should be used for test flying with at least 8 sec. runs, because the initial climb is shallow until flying speed is reached and a stall near the ground could be disastrous.

Flying the Wren makes a pleasant change from the usual cabin job, though it's as simple to build and fly, and if a good job is made of the dummy engine, quite a few bods will ask who sells the Javelin twin ! !

A 32" SPAN SCALE POWER DURATION MODEL

ENGLISH ELECTRIC. WREN

DESIGNED BY
P. B. WYATT
6/-

AEROMODELLER PLANS SERVICE

THE AERODROME STANBRIDGE NR LEIGHTON BUZZARD BEDS

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED

-DATA-

SCALE	1 2/3 IN. = 1 FT.
SPAN	62 INS.
WING AREA	396 SQ. INS.
TAIL AREA	58 SQ. INS.
LENGTH	41 INS.
WEIGHT	18 OZS.
POWER	1·5 C.C.

-MATERIALS REQUIRED-

STRIP			
8 STRIPS OF	3/16" x 3/16"	HARD BALSA
8 " "	5/16" x 1"	SOFT "
1 " "	1/8" x 3/8"	" "
SHEET		
3 SHEETS OF	1/32" x 3"	MED. BALSA
2 " "	1/16" x 3"	" "
1 " "	3/32" x 3"	HARD "
1 " "	1/8" x 3"	MED "
1 " "	3/16" x 6"	" "

MISCELLANEOUS.
9" OF 1/16" O/D DURAL TUBE
6" " 3/16" " " ROD
10" " 1/8" DIA. DOWEL
1 PIECE OF PLY 1/16" x 1 1/2" x 3"
1 " " " 1/8" x 2 1/2" x 3"
1 " " THIN CELLULOID
SMALL PIECE 14 S.W.G. WIRE
" " " 16 " "
" " BAMBOO

1/8" DURAL TUBE ENGINE BEARERS, SHOWN TO SUIT ALLBON JAVELIN

1/16" DOWNTHRUST

FUEL TANK

3/16" SHT

1/16" SHT

1/8" HARD SHT

1/16" GUSSETS

1/16" x 3/16" BRACING

FILL SPACES BETWEEN BEARERS WITH 1/8" SHT

1/8" SHT. 2 OFF

USE THIS COMPARTMENT FOR TRIMMING WEIGHT

1/8" HARD SHT. FIT AFTER FIXING BEARERS IN PLACE

HARD BLOCK

3/16" DIA. DURAL ROD FILL IN WITH 1/8" SHT.

FILL WITH 3/32" SHT.

1/8" DOWEL

3/32" SHT ON BOTTOM

3/16" SQ. LONGERONS & SPACERS

TANK FROM CELLULOID. NOTE: BOTTOM PIPE IS AT AN ANGLE FOR CLEARANCE

TO AVOID KINKS IN FUEL TUBE, SOLDER A PIECE OF COPPER TUBE AT RIGHT ANGLES TO INTAKE

TANK IS HELD ON WITH RUBBER BAND AT SIDE OF BEARERS

HOLE FOR FIXING BANDS

1/16" SHT

1/32" SHT

FIN OUTLINE BUILT UP OF 1/8" SHT. COVER WITH 1/32" SHT. ON EACH SIDE.

1/8" SHT. TRIM TAB

PINS FOR FIXING BANDS

1/16" SHEET

1/16" x 1/8" BALSA

16 S.W.G. SKID

16 S.W.G. LOOPED ROUND SKID & SOLDERED

-DUMMY CYLINDER- (ALLBON JAVELIN SHOWN)

RED WITH ADDITION OF SOME SILVER

SILVER

BLACK

BALSA BODY. CARD FINS. ALUM. BASE.

DRILL TO SUIT BEARERS

TOP HALF CEMENTED TO BASE

8 BA. BOLT

1/16" SHT. PLANKING

C.G.

TOP

3/16" SHEET

1/16" DOWEL

1/16" SHEET

BOTTOM

POSITION OF TANK

INSTRUMENT PANEL

SPLIT PLASTIC TUBE

1/32" SHEET ON TOP ONLY

1/16" x 1/16"

L.E. 3/16" x 3/32"

SOFT BLOCK TIPS HOLLOW OUT

T1

T2

POSITION OF ELEVATOR

1/16" SCRAP

1/32" x 3/16" CAP STRIPS ON TOP ONLY

1/16" x 3/16"

T.E. 3/16" x 1/16"

-WING RIBS- ALL RIBS FROM 1/16" SHEET 2 OF EACH OFF

W1

W2

W3

W4

W5

W6

W7

W8

W9

W10

W11

W12

W13

W14

W15

W16

W17

W18

-TAIL RIBS- T1-4 OFF 1/16" SHEET T2-1 " 1/8" "

T1

T2

3/32" DIA. CANE WING TIP SKID

3/16" SHEET TIPS

1/32" SHEET ON TOP ONLY

1 1/2" x 1/8" TAPERED TO 1/16" x 1/8"

L.E. 1/2" x 1/8" TAPERING TO 1/8" x 1/8" AT TIP

1/16" SHEET GRAIN VERTICAL

1/32" x 3/16" CAP STRIPS ON TOP SURFACE ONLY

1/32" SHEET ON TOP & BOTTOM OF CENTRE SECTION

CHAMFERED EDGES

F1

F2

-FUSELAGE FORMERS- F1 FROM 1/8" PLY F2 FROM 1/16" BALSA

6° DIHEDRAL UNDER EACH WING TIP

IMPORTANT - WINGS SHOULD HAVE 6° WASHOUT BETWEEN W11 AND TIP

POSITION OF AILERON

T.E. 1/8" x 3/16" TAPERING TO 3/16" x 3/16"

3/16" x 1/16" TAPERED TO 3/16" x 1/16"

REAR DIHEDRAL BRACE 1/16" PLY 2 OFF

FRONT DIHEDRAL BRACE 1/16" PLY 2 OFF

GRUZE ON EACH SIDE OF JOINT

FSP 466

THIS IS A 1/3 SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 6/- POST FREE FROM THE AEROMODELLER PLANS SERVICE

VINDSKREENVIPER II.

DESIGNED BY
W. HENDERSON
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE.
THE AERODROME STANBRIDGE BEDS

4/6

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED

-DATA-

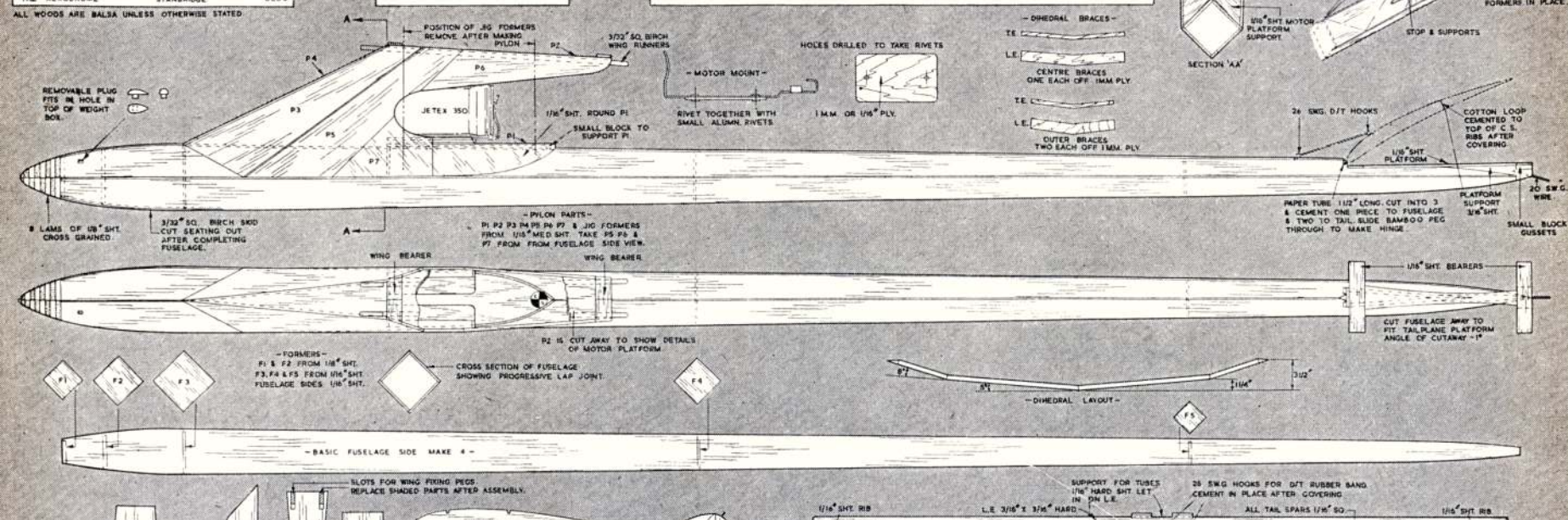
SPAN	38"
WING AREA	206 SQ INS
TAIL AREA	7.5 1/2 " "
LENGTH	37 1/2"
POWER	JETEX 350
WEIGHT	5 OZS APPROX

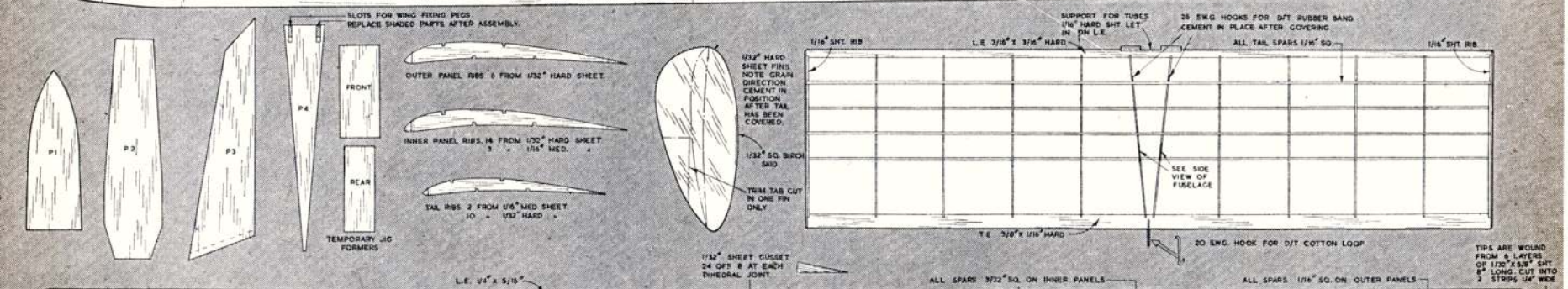
- MATERIALS REQUIRED -

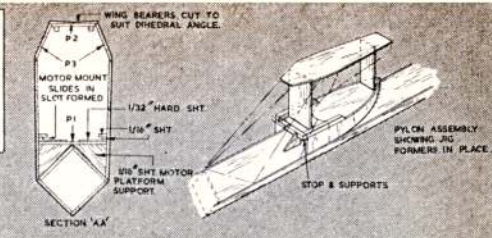
STRIP BALSA:
- 4 STRIPS OF 1/16" x 1/16" MED.
- 4 " " 3/32" x 3/32" "
- 1 " " 3/16" x 3/16" HARD
- 2 " " 5/8" x 3/32" "
- 1 " " 1/4" x 1/16" "
- 2 " " 1/4" x 5/16" MED.

SHEET BALSA:
- 1 SHEET OF 1/32" x 3" MED.
- 1 " " 1/32" x 3" HARD.
- 1 " " 1/16" x 3" "
- 3 " " 1/16" x 3" MED.
- 1 " " 3/32" x 3" "
- 1 " " 1/8" x 3" HARD.

MISCELLANEOUS:
- SMALL PIECE OF 3/32" SQ. BIRCH.
- " " " 1 MM PLY.
- " " " 1/16" DIA BAMBOO.
- 2" OF 20 SWG WIRE.
- 2" x 26 " "







VINDSKREENVIPER

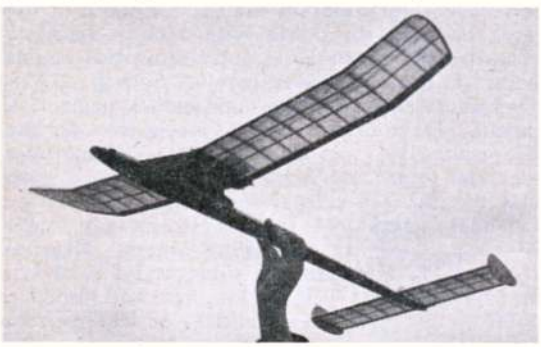
By W. Henderson

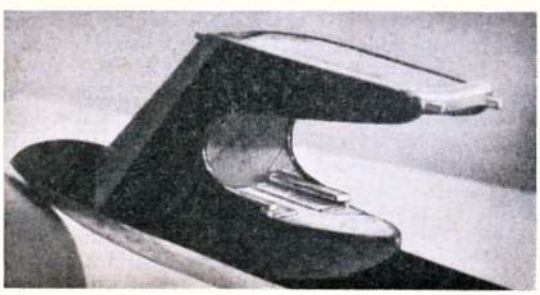
WINNER OF THE 1951 S.M.A.E. JETEX CONTEST. JETEX 350 POWERED, 38 INCH SPAN WAKEFIELD SIZE WING.

About the designer . . . . Age 20 . . . . Eng. Apprentice at RAE . . . . Member Grange, N. Kent and Kentish Nomads . . . . has been modelling 7 years . . . . also keen on weightlifting, cycling, music . . . . and Wakefields.

DEVELOPED as the eighth of a series, known as " Puff-Adders ", this model was designed at the beginning of the 1951 season.

The third in the series had placed third in the 1949 I.C.I. Challenge trophy with 3 mins. 48 secs. on a 28 secs. power run, and the 'viper was created with the object of placing even higher in the same event for 1951. It began life with immediate success in the form of a first place in Concours d'Elegance at the All-Herts. Rally, followed by a qualifying flight of 3 : 20 on a 11 secs. power run.





Next success came with top place in the newly introduced S.M.A.E. Jetex contest on 2nd September, when after two mediocre flights, the 'viper made a 24 : 1 ratio flight to gain an easy first. Unfortunately, the model sustained damage during the S.M.A.E. contest, which affected trim so much that the 'viper's I.C.I. Challenge cup performance was far below par. The normal duration is between 90 and 120 secs. on a single 350 charge.

CONSTRUCTION

Four identical **Fuselage** sides are lap joined, then the motor platform is built up, complete with stop and supports and fitted to the diamond fuselage. The sketch shows how jig formers are used to construct the pylon. P.7 and P.5 are fitted first, then P.3, P.4 and P.6 in that order. The tail position can now be cut away, and platform parts fitted, also the birch skid at the nose.

Wing and Tailplane construction is entirely conventional and needs no explanation. Cover the entire model with Lightweight Modelspan; the original was finished with black fuselage and white surfaces. Total weight should be in the region of five ounces, the C.G. should be at 75 per cent. of the chord from the L.E.

Trim the Vindskreenviper to turn in the same direction for both power and glide. Use extra turn to eliminate any tendency to " stall off the top " and don't forget to use the d/t. For the very best Ratio contest performance, use three 350 charges and allow the first two to burn away before releasing, as the third charge will have the greatest thrust. Happy 'viping . . .

Full-size copies of the ¼ scale plan opposite may be obtained price 4/6 post free from the Aeromodeller Plans Service.

● FULL-SIZE PARTS AND EASY TO FOLLOW DRAWINGS ARE OVERLEAF FOR THIS QUICK TO BUILD, EASY TO FLY, A/2 OF THE YEAR

Quickie

by RAY MONKS

Age 23 . . . Member Birmingham M.A.C. . . . Sheet metal worker . . . single . . . makes all contest models except radio and control-line . . . no other hobbies . . . was top man in the British team for the 1951 A/2 finals, in Yugoslavia.

HERE'S a sailplane that thousands of our readers have been waiting for. You can build it directly "out of the magazine" from full-size parts and dimensions by following the stage by stage instructions. Then, when the "Quickie" is complete and ready for test, you have designer Ray Monk's own trimming hints to help, and what is more, you'll have a duplicate of the A/2 sailplane that only just narrowly missed winning the International event in Yugoslavia last season.

Quickie Number 1 was built in February, 1951, and passed through the first two A/2 eliminators with an average of over three minutes for the five flights registered. Quickie Number 2, with one-piece tissue covered wing, averaged 4:37 to place fourth in the A/2 final trials at Digby. Selected to represent England in the U.K. Challenge match, Quickie Number 2 also gained a third place in the glider section later in the year.

In the meantime, Number 3 had been built especially for the major event, the International A/2 contest at Lesce Bled in Yugoslavia, and with an all-sheet top surface to the wings. After a perfect double-maximum performance in the first two rounds of this important contest, Quickie led the field and was well set for the cup. An unfortunate series of downdraughts reduced the final position to fourth place; but Quickie had already made its name as an A/2 of the highest efficiency. The average attained in this major contest was 4 : 11, bringing the average for the whole season in all kinds of weather, to 3 mins. 20 secs. . . . no mean performance for a job that can be built in a week of evenings!

The version presented here is Ray's latest, the tissue covered two-piece wings braced by a rigid wire strut, are completely shock-proof, and less susceptible to warps than the all-sheet type.

All set to start construction? Here's the material list :—

Two $\frac{1}{8} \times 2 \times 36$ ins.	Medium (Fuselage Bottom & Fin)	Use scrap for Bulkheads
One $\frac{1}{8} \times 2 \times 36$ ins.	Hard (T/Plane T.E.)	
One $\frac{1}{8} \times 3 \times 36$ ins.	Hard (Spars and Gussets)	
Two $\frac{1}{8} \times 3 \times 36$ ins.	Medium (Fuselage sides)	
One $3/32 \times 2 \times 36$ ins.	Medium (Fuselage top)	
One $1/16 \times 3 \times 36$ ins.	Medium/hard (Ribs)	

Six inches $\frac{1}{2} \times \frac{1}{8}$ in. Obechi.
$7 \times 3 \times 1/16$ in. ply. $3 \times 3 \times 1/32$ in. ply. $3 \times 1 \times \frac{1}{4}$ in. ply.
20, 22 and 18 s.w.g. Piano Wire. Thread, 3 tubes Cement, 3 Tissue.

CONSTRUCTION

Fuselage : Transfer the full-size bulkhead shapes on to $\frac{1}{8}$ in. sheet balsa as economically as possible, and cut out Nos. 1-15. Grain direction is not important, except with Nos. 6 and 7, where grain should be vertical. Select two evenly matched $\frac{1}{8}$ in. sheets, and mark one edge of each with the fuselage dimensions. Transfer the nose contour from the full-size plan, using the base line to coincide with the edge of the sheet. For the upper fuselage line, use each bulkhead at its correct station to obtain the correct depth of the side. Connect the points with a curve or piece of hardwood bent to shape, and cut out two similar sides. Cut the tow-hook base 16 from $\frac{1}{4}$ in. ply, bend the 18 s.w.g. tow-hook and bind in place with thread. Make up a Tee of 18 s.w.g. wire for the auto-rudder bar, slip short lengths of tubing over each end to act as a hinge, and fix to the base so that the bar is free to swing in the centre of the tow-hook. Make 17 from 1/16 in. ply, with 20 s.w.g. hooks to take wing braces. Measure $7\frac{1}{2}$ ins. back from nose on sides, and 2 9/16 ins. up from base line, drill 3/16 in. here and also at a point $3\frac{1}{4}$ ins. further aft and 2 15/32 ins. up from the base. These give the true incidence and locate the wing panels. It is advisable to cut out the 1/16 in. ply root ribs now, so that locating holes can be accurately transferred from the sides. These root ribs are complete profiles, without spar slots or L.E. and T.E. cutaways. Join fuselage sides with Nos. 6 and 7, then Nos. 1 and 15, with the remainder added as possible. Cement 16 in place flush with bottom of sides, cut slots so that 17 fits flush on the face of 6 with the loops projecting outside the sides. Cement in place securely. Use scrap $\frac{1}{8}$ in. sheet to build a ballast box above 16, a trap door may be cut in the side

for access. Insert two 3/16 in. dowels so that they project 3/16 in. each side of the fuselage, face around the dowels with 1/32 in. ply to reinforce. Cut two lengths of $\frac{1}{2} \times \frac{1}{2}$ in. obechi and cement across fuselage at L.E. and T.E. positions. Cover the top with 3/32 in. sheet and the bottom with $\frac{1}{8}$ in. Shape an obechi nose block to suit and drill a $\frac{1}{4}$ in. hole in the top between 1 and 2 for lead shot ballast entry. Fit pin at rear and platform 27, then cut slots to take the fin which is cut from $\frac{1}{8}$ in. Hinge the auto-rudder with light linen tape, and the trim tab with 24 s.w.g. aluminium. Sand fin and tabs streamline and insert in fuselage. Sand fuselage smooth, with rounded corner edges.

Wing: Cut 34 1/16 in. ribs, tapering 10 of these to suit the tip portion by cutting away the under surface and leaving the top contour. Spar slots for the tip ribs should be cut slightly deeper to compensate. Cut two 23 and two 23a tip profiles, laminate as drawn full-size. Cut two 21 from 1/16 in. ply and eight No. 22, four No. 18, two 19 and two 20. Bend four hooks 24 from 20 s.w.g. wire and bind to parts 19 and 20. For the starboard wing main panel, draw out a rectangle $21\frac{3}{8} \times 6\frac{1}{2}$ ins. and divide off at each 2 in. point, beginning from the right. This leaves a $1\frac{3}{8}$ in. section for the root, which is actually to be 1 5/16 ins. wide at the L.E. and curves inwards $\frac{1}{8}$ in. at the extreme root, to allow for fuselage shape. Carve L.E. and T.E. to shape, pin in position with 3/32 in. packing under front edge of T.E. Fit ribs in place, arranging the root rib at a slight angle and curved to match fuselage. The rib at the dihedral crank will have spar slots 1/16 in. wider to take 22 and also No. 21 at L.E. Add top spars, root gussets and 19 and 20.

Remove from board, add under-spars, dihedral keepers 22 and 21, and parts 18. Box a small section with scrap 1/16 in. as shown to take brace pin 28 which passes through 18 and must be accessible. Build up front two spars with 1/16 in. sheet to full depth for first three bays and cover root bay with 1/32 in. sheet inlaid between ribs top and bottom. The tip portion is of conventional construction and may be added to the dihedral keepers at the required dihedral, after building flat on the board. Repeat for port wing.

Tailplane: Cut 15 ribs from 1/16 in. sheet, shape the $7/32 \times \frac{1}{8}$ in. L.E. and $9/16 \times \frac{1}{8}$ in. T.E. and pin down, with the 3/32 × in. spar, on a rectangle $24\frac{1}{2} \times 4$ ins. Ribs are spaced $1\frac{3}{4}$ ins. and cemented in place. Sheet tips project $\frac{1}{2}$ in. each side of the basic tail. Add top spar and remove from board. Bend 25 and 26, cement in place and secure with tape.

Covering: Cover with lightweight Modelspan and give two coats of good quality dope. The original had a black fuselage and red and yellow lifting surfaces.

Assembly: Fit wings to fuselage by plugging on to short 3/16 in. dowels and connecting with elastic bands between hooks 24. Use thread to brace wing temporarily between 17 and 18 (Pin 28). Fit tailplane and check that it is at right angles to the fuselage and fin. Invert the model on a flat surface, with the top of the fuselage packed to 5 ins. above surface. Pack tail tips until parallel with surface, now adjust thread braces until the wing tips touch surface. Make 20 s.w.g. braces 29 (which will be determined by the thread length), fit and adjust. The model is now rigged. Connect auto-rudder bar and rudder with nylon thread. Wrap strip solder around the nose until the model balances at the rear dowel. Melt down solder and pour into nose ballast box. Bring total weight up to F.A.I. 14·6 ounces by adding weight to the C.G. ballast box.

FLYING

Hand launch and adjust for a flat glide with packing under tailplane. If more than 3/32 in. positive is needed, move C.G. forward, if more than 3/32 in. negative is required, move C.G. aft. Use nylon tow-line of about 12 lbs. strain for contest work, and test tow on 100 ft. line. If Quickie turns on the line, correct with the bottom tab. Adjust top tab (auto-rudder) for 100-150 ft. diameter circle. This will give a rough trim.

If used for contest flying, some finer trimming is necessary; this takes time so wait for calm evenings. Use carefully measured line, 100 ft. long. Tow up and time flight. Add negative to tailplane in 1/64 in. stages until a stall develops. Time each flight. Return to best time trim (check the times for every flight) Now adjust glide circle from as small as possible to 200 ft. Time each flight again and check for the best time. Check and make sure the performance is not a "fluke". The prototype made best times with large circles.

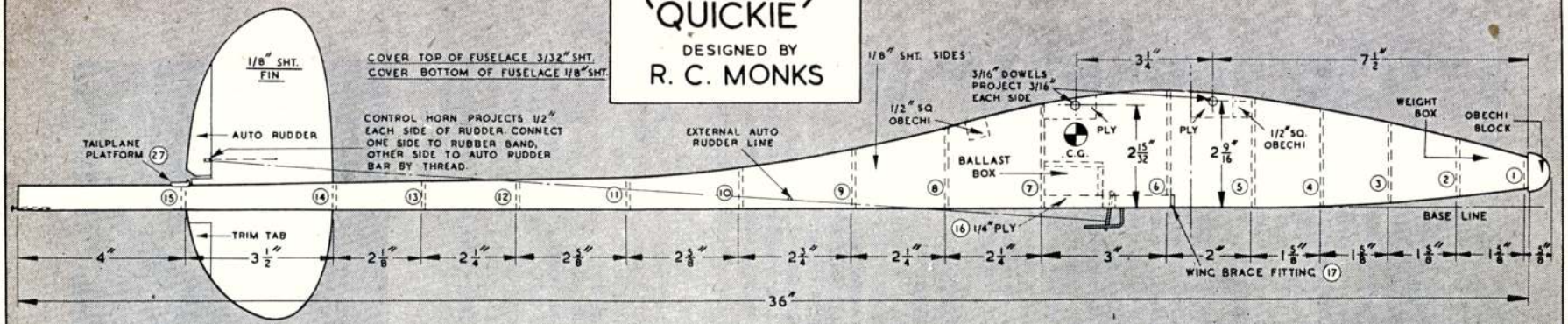
In rough weather keep the circle small and flying speed high, by adding positive incidence to the tailplane.

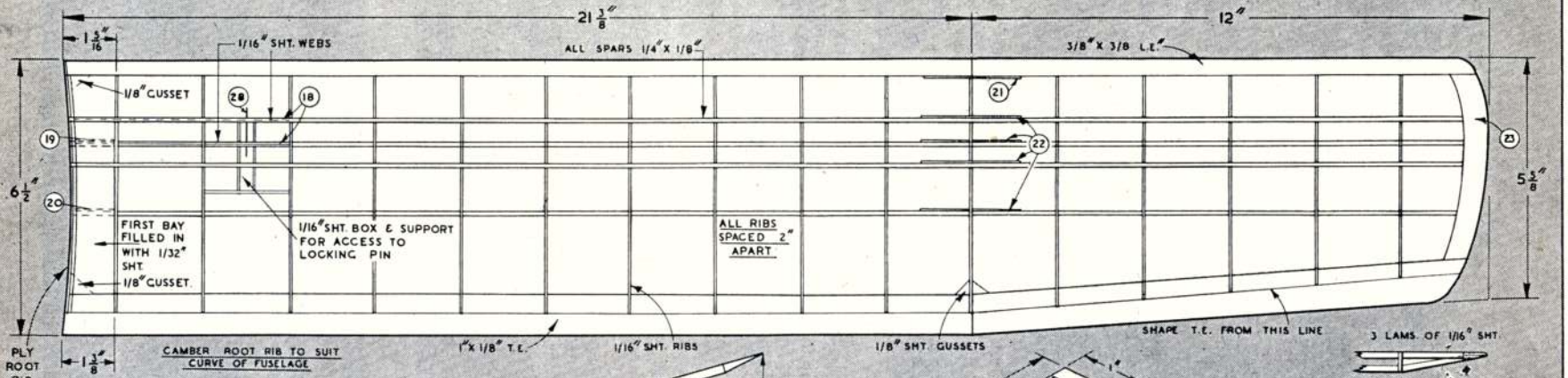
Team manager 'Pop' Gosling holds the sheet wing Quickie whilst team member Peter Holland lights up the d/t fuse for a contest flight at Lesce-Bled.

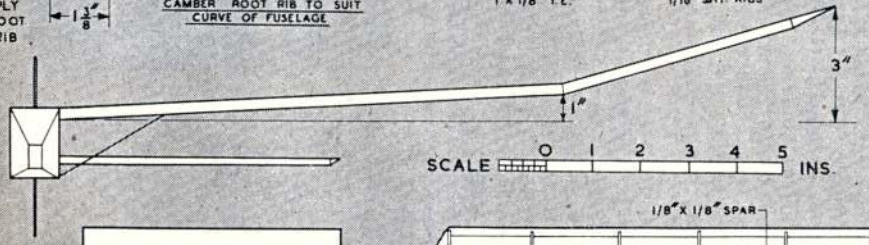
'QUICKIE'

DESIGNED BY

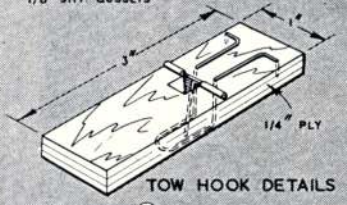
R. C. MONKS







SCALE 0 1 2 3 4 5 INS.



TOW HOOK DETAILS

3 LAMS. OF 1/16" SHT.

CROSS SECTION OF WING TIP.

CROSS SECTION OF TAIL TIP

- DATA -

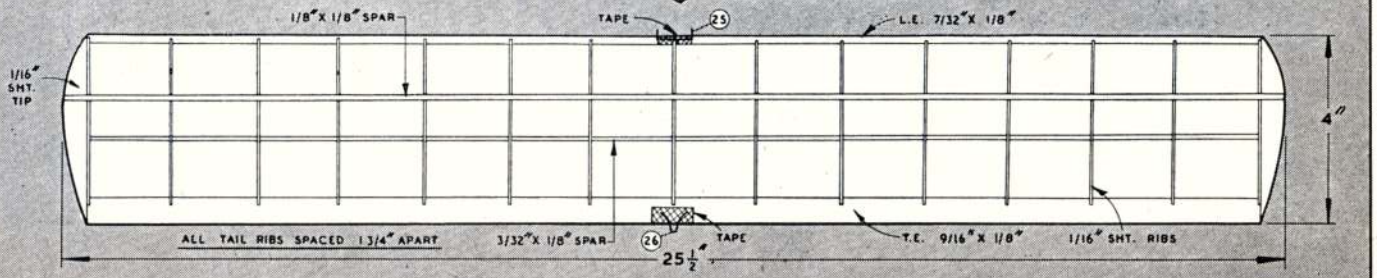
WING SPAN - - - - 66 1/2"

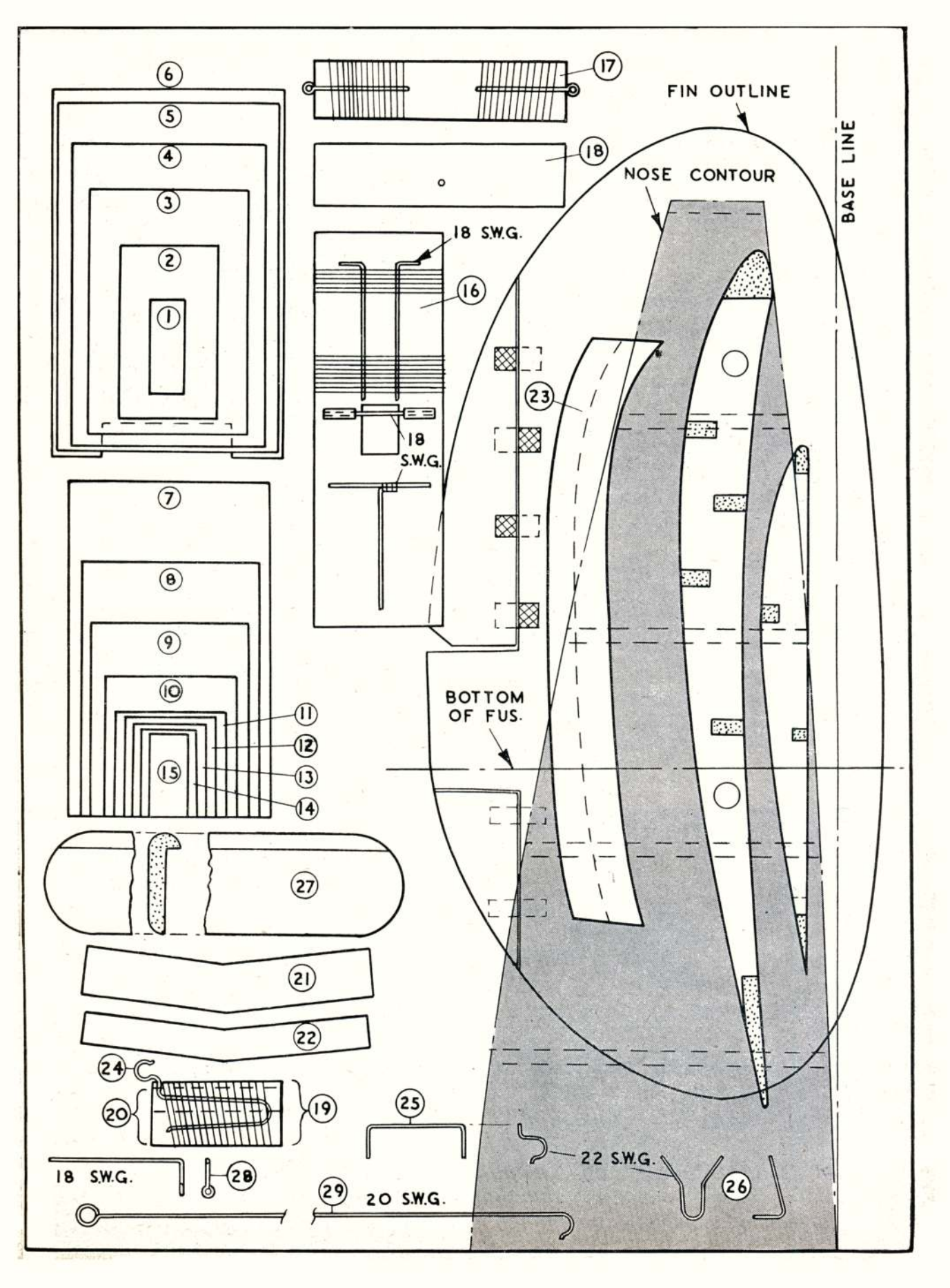
WING AREA - 420 SQ. INS.

TAIL AREA - 100 " "

LENGTH - - - - - 36 1/2"

WEIGHT - - - 14·6 OZS.




FIN OUTLINE
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NOSE CONTOUR
BOTTOM OF FUS.
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18 S.W.G.
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Reactionary Experiments

Four Round-the-pole Speedsters powered by rockets and jets.

THE French, as usual, have a most complete expression to embrace description of these Rocket and Jet experiments, and would label them " Avions á Reaction ". Reaction there certainly is, in these four most interesting scale and semi-scale ultra high speed models. Each is an experiment of the past, so to speak, and we have no doubt that the designers in each case are currently working upon even more advanced lines. To readers who might aspire to enthusiasm for their own rocket powered ventures, we would offer the advice that the handling of explosive mixtures involved is best left to those with the correct specialist knowledge of such dangerous items. And that is a piece of advice we give with our own " shattering " memory of a certain rocket model and its unexpected disintegration !

Aero Enterprise Research

A group of aeromodellers engaged in full-size experiments at R.A.E. Farnborough have been working on high speed research with models using thermal reaction units. Known as Aero Enterprise, this group developed a thermal reaction unit early in 1949, and first flights were made with a special design called the " Excalibur."

This all-balsa 13 in. span model achieved speeds exceeding 80 m.p.h. on its many flights, each lasting between 20 and 30 seconds. Flown R.T.P. fashion on the end of a single strand steel wire eight feet long, the Excalibur trials were most useful for subsequent free flight designs.

One such development, which was scheduled for free-flight, but actually flew as a control-line model, was the scale Bell XS-1. Fitted with thermal reaction unit and capable of flying faster than 100 m.p.h. the span of this model was 18 ins., and length 20 ins., which would indicate that a larger propulsion unit was used, than that fitted to Excalibur.

Fleet Air Arm Experiment

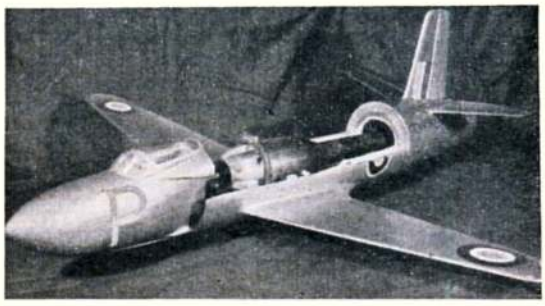
Largest and latest of our " Avions á Reaction " is the semi-scale supersonic fighter by Leading Air Mechanic E. Stanley Lee, stationed at R.N.A.S. St. Merryn. His 31 ins. span project is a rocket unit powered control-liner with sprung oleo-type undercarriage and futuristic lines. Stabilisers on the tailplane are pre-set to ensure line tension and an aileron type trimmer is fitted to compensate for the weight of the lines. Air is taken in through side intakes for cooling the outside of the re-chargeable and detachable rocket, and the whole nose can easily be removed for maintenance.

Aero Enterprise's " Excalibur " is seen at bottom left. Although designed and flown in early 1949, the configuration of this Thermal Reaction-powered R.T.P experiment is remarkably up-to-date. Jet orifice is below the fuselage at the wing root, the unit being in the bottom half. Above: The scale Bell XS-1 was larger and capped 100 m.p.h. Dolly undercarriage detaches on take-off.

To assist take-off, RATOG was considered with smaller units at the wing roots, hence the high mounted tailplane. The problem of additional weight has ruled the RATOG idea out ; but a Jetex 50 unit is clipped under the fuselage and with suitable length of fuse, it is intended to maintain a thrust assisted landing after the main rocket is expired.

Some difficulty has been found with the ignition of the powerful Mechanite explosive used in L/A.M.E. Lee's rockets, electrical firing being a natural choice, but not altogether practical. Jetex fuses have proven quite successful in this application and have been used for two rocket tests. It would be as well to recount as a warning that the first rocket changed the colour of its steel tube with the terrific heat developed, and the second, in a Keil Kraft Competitor, distributed said airframe over a range of two hundred yards in an unexpected explosion !

The third, and we trust, successful rocket, will be tested before fitting to the interesting model shown here. Perhaps at some future date we shall be able to announce its ultimate speed.

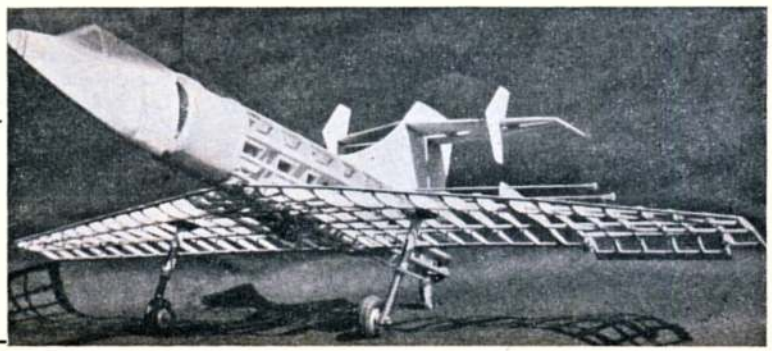


Made early in 1949, the Juggernaut-powered Supermarine Attacker by Chris Wallis and Peter Camp is an impressive application of the widely abused pulse jet. The view at right shows how the jet is retained by a Jubilee clip in the fuselage lower half.

Jet Attacker

The only jet reaction model in this collection is the scale model of the prototype Supermarine Attacker by Chris Wallis and Peter Camp, who were serving in the R.A.F. together at a station in Scotland. Strictly an R.T.P. model, the single wire attachment is to a point amidships, with a stabilising wire fitted " yoke " fashion between wingtip and tail.

Insulated with asbestos sheeting, the hollow hardwood and balsa planked fuselage hides a Juggernaut pulse jet, which is readily accessible when the upper fuselage section is removed. The nose is utilised to house plywood and celluloid lined fuel tanks and the actual fuel level may easily be observed through the moulded perspex canopy. Unfortunately we are unable to give any performance details of this interesting model, which should in theory, at any rate, have established a scale round-the-pole speed record for pulse jets.



Heading photo and this view of L/A.M. Lee's rocket fighter show constructional details. Cooling ducts take in air at the sides and the hot air passes out of an exhaust tube at the tail. To absorb some of the heat, the rocket unit is wrapped with asbestos string. Actual jet orifice is above the hot air outlet tube.

WORLD NEWS

Mexican 1/2A Contest, l. to r. holding cups and models: Jorge Romo, Mario Ramirez, Arq. Carlos Gonzalez de Cosio, Guillermo Arnaiz, Miguel Dario Rodriguez and Enrique Pots Jnr.

Mexico. The AEROMODELLER representative in Mexico, Sr. Jesus Salazar Gonzalez, has sent us news of the 1/2A Power Contest (·050 cu. ins. max., 100 ozs./cu. in. displacement), organised and sponsored by *Motor y Alas*, Sr. Salazar's aeromodelling journal.

Held on the Military Airfield at Balbuena, on September 30th last, the event was graced with the best day of the flying season. During the preceding and succeeding weeks the coasts of the Gulf of Mexico were ravaged by serious storms, and the central plateau, on which are Mexico City and Balbuena Field, suffered torrential rains. However, on that particular Sunday morning, crowds of enthusiasts were able to make an early start and fifty eight models were entered for two groups—Junior, up to twenty years old, and Senior.

The general standard of flying throughout the Contest was high and sponsors and entrants were well pleased with the results. In the Senior Group, Arq. Carlos Gonzalez de Cosio gained first place with a Wasp ·049 powered Baby Phoenix. His three-flight total was 768 seconds. Second was Sr. Guillermo Arnaiz, with the same type of model and motor and a total of 733 secs. Third was also taken by de Cosio, whose Civvy Boy, also Wasp powered, collected 648 secs. in two flights.

In the Junior Group, Mario Ramirez, flying a Lift Master with the same motor so favoured by the Seniors, put up a three-flight total of 408 secs. Second was Enrique Pots Jnr., Spitzy ·045 powered Fu Bar, with 132 secs., and third, Jorge Romo with Diseño (Baby Spitfire), 84 secs.

British West Africa. On the opposite page is a photograph of P. Craddock-Randell of the Forest Department, Southern Nigeria, with his ex-Free Flight Radio Control model of 9 ft. span. His story is told so entertainingly that we make no apology for quoting from his letter.

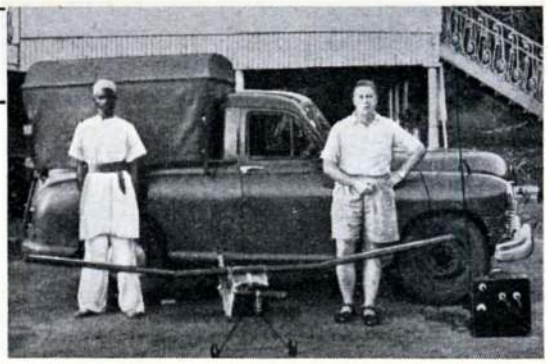
" . . . The plane started off as an American kit of the 9 ft. Taylorcraft (and American kits are not a patch on British) and flew as such Free Flight last tour ending in a spectacular prang.

Rebuilt this tour and fitted with radio. Longer nose and larger tail surfaces, different wings. Home-made radio—Tx push-pull using 6V6's driven off the inevitable car battery, about 7·5 watts (the P.M.G. here is not fussy ! ! !). Dead on frequency as checked by my crystal standard. Rx a Hivac single valve. Results seem to be pretty fair. I haven't been able to test for full range as here I am enclosed in a plantation, but I am certain of 200 yards even through trees, so it ought to be all right on the open field.

I have tested action at a good distance from the Tx with the engine going full bore and got reliable working, so I have hopes that when I finally let the beastie go free it may even come to land in one piece. Der Tag—I hope and D.V.—will be December 1st. I have friends who " want to see it fly "—meaning they don't want to miss the prang if there is one ! . . . "

Our correspondent was awaiting transfer to Enugu, where there is an airport and, by now, " the beastie " will have been launched on that initial flight. Perhaps we will receive a note in the near future telling us what did happen on

The Prime Minister of India, Sri Jawaharlal Nehru is interested in the R/C model demonstrated by Messrs. K. L. Roy and B. Banerji of the All India Aeromodellers Association. Picture taken at the National Air Rally, 1951, organised by the Aero Club of India.



P. Craddock-Randell of the Forest Dept., Southern Nigeria, with 9 ft. R/C model, transmitter and "boy". He has overcome climate difficulties to obtain successful radio operation.

December 1st! In any event, Mr. Craddock-Randell rates a bouquet for overcoming problems which were not of his creation and for keeping the aeromodelling flag flying in adversity (and in Nigeria, of course). Even in the "temperate" climate of "the Old Country" Radio Control has its troubles. In Nigeria one adds Nature's contributions and anything can happen!

Israel. Arthur Guttman, whose name has appeared in these columns on previous occasions and who still continues his enforced stay in Switzerland, wrote recently enclosing photos of his latest creation, a C/L Miles M.20. We were pleased to see that he is no longer confined to his bed, and reproduce a picture of him with the new model. He must have been pleased to be able to tackle something larger than the Jetex-powered scale jobs to which his bed limited him. We wish him a speedy recovery and early return home.

A point of general interest in his letter, which we would quote, concerns glo-plugs: "You may be interested to know that we have found that glo-plugs operate just as well on A.C. as on D.C. We now use a 2-volt output electric railway transformer for all bench running of glo-motors." That was a new one on us, anyhow.

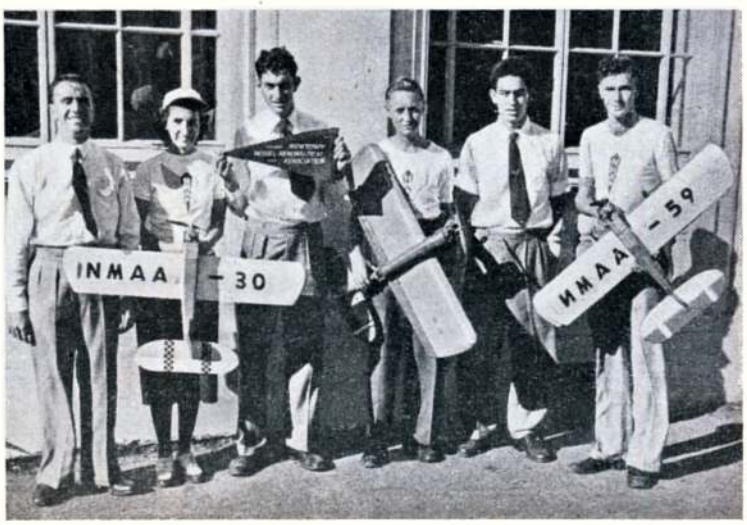
Western Australia. Arthur Gorrie, Queensland Model Shop proprietor and Hon. Secretary of the Newtown Model Aeronautical Association, South Brisbane, sent along an interesting collection of material—photos, newspaper cuttings, contest reports, a club bulletin and a snappy badge. It will take more than "one bite at the cherry" to do justice to this material, but we reproduce a picture and give some basic details of this live organisation and the rapid progress which it has made since its inception in July, 1950.

Formed by a group of active aeromodellers who were not members of any club, its first meeting was attended by fifteen enthusiasts. By the end of 1951 there were 150 names on the books and all members who are Power modellers are covered by Third Party insurance; the first available in Queensland.

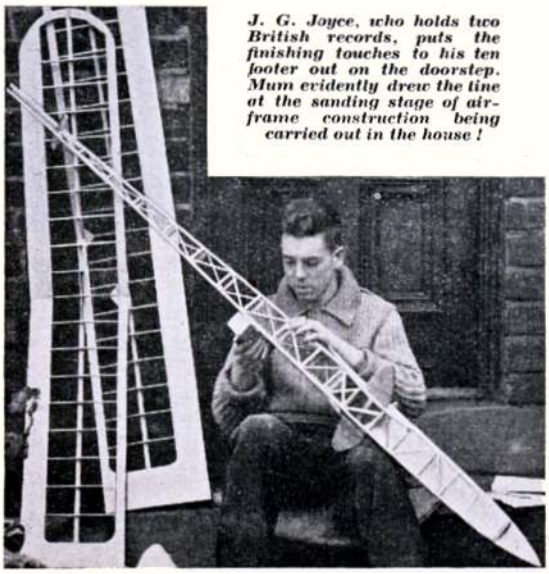
In the 1950 State Championships many N.M.A.A. members gained places in all classes, including two firsts, two seconds and a third, and the runner-up for the Champion of Champions.

A great deal of hard work has been carried out by the officers and members, enthusiastically and ably led by Mr. Gorrie, and good results have been obtained. The organisation alone justifies further mention in these columns and it is our intention to give the N.M.A.A. more space in the near future. Clubs in all parts of the world will be able to derive some benefit from the developments in South Brisbane during the past twenty months.

Left, Arthur Guttman, Israeli aeromodeller. Right, Arthur Gorrie, Mrs. Marjorie Gorrie, Bob Turner, Bruce McWatters, Bob Reddiex and Keith Muhling of the Newtown Model Aeronautical Association, Queensland.



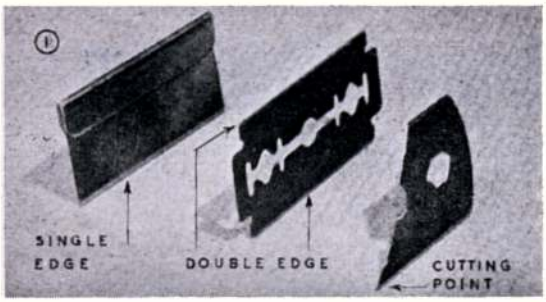
AIRFRAME CONSTRUCTION



J. G. Joyce, who holds two British records, puts the finishing touches to his ten footer out on the doorstep. Mum evidently drew the line at the sanding stage of airframe construction being carried out in the house!

Part I Tools & Materials

AEROMODELLING has often been called "razor blade carpentry", and there is a certain amount of truth in the claim that almost any type of model can be built with no more tools than a razor blade and a small pair of pliers. However, the wise model builder acquires a selection of specialized modelling tools which, in the long run, save him endless time, money and patience. Your complete tool kit need not be an elaborate one, and certainly not expensive, but having the right tool for the job just when it is needed is a great help.



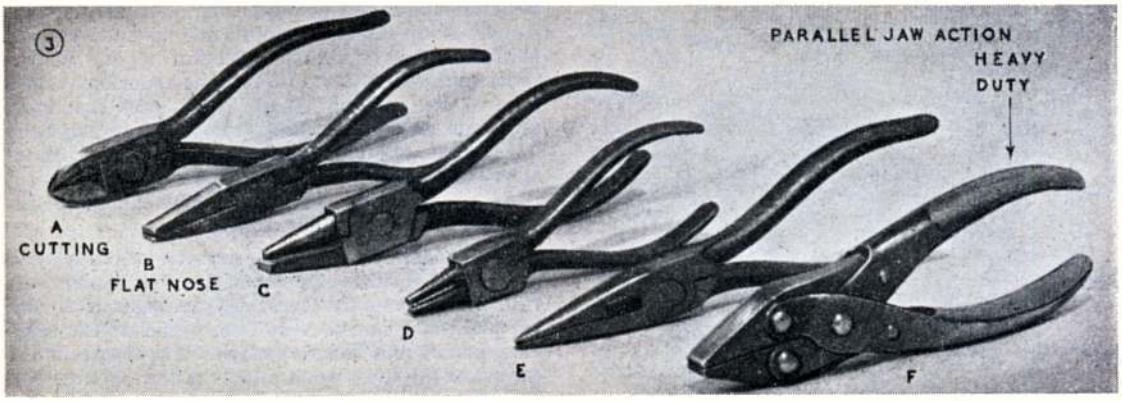
First, cutting tools. The razor blade is still the one indispensable tool of the whole lot. Even here, however, personal tastes vary. Some builders prefer the heavier, single edge type which has a protective backing—Fig. 1. Others like the flexibility of the double-edged blade. Still more use the double-edged type, but break it, as shown, before using it for cutting. There are no general rules as to which is best. The first type is safer; the other two give greater flexibility for trimming or cutting curves.

For most cutting work, however, modellers now usually prefer to use a balsa knife. One knife with a number of interchangeable blades will cover a whole variety of needs and there are several suitable commercial types to choose from. The two blade shapes sketched in Fig. 2 cover most needs.

A range of pliers is also most useful, although by no means indispensable. Of the recommended selection shown in Fig. 3, type C *can* cover most small wire-bending needs. A larger pair with parallel jaw action (type F) will be very useful for heavier work, whilst the cutters and other pliers can be added later. Cutting pliers are, in fact, of doubtful value where steel wire is concerned. They are usually relatively useless for cutting wire of greater than 16 s.w.g. thickness and even in this size the cutting edges are soon damaged. A small file is generally best for cutting steel wire. If a certain amount of metal working is anticipated, as in motor mounts, etc., build up a collection of about half a dozen small files of various descriptions. For slotting leading and trailing edges, small flat "warding" files are extremely useful. These can be obtained in thicknesses corresponding to normal rib thicknesses in model construction—Fig. 4.

A small hand drill will also be indispensable, together with a range of drills from 1/16 in. diameter up. Make sure that you have drills corresponding to hole sizes you are likely to require, such as 7/64 in. (6 B.A. clearance for motor mounting bolts), 1/16 in. for 16 s.w.g. wire size, and so on. A pin vice for handling drills of 1/16 in. diameter and smaller is also very useful—Fig. 5.

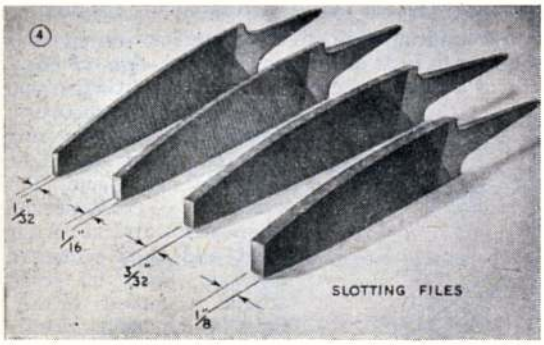
If, now, you want to elaborate on your basic tool set, invest in a small modelling plane and a set of saws of various kinds—Fig. 6. These will all come in very useful. A number of miscellaneous tools which will also make for easier working can be produced from scrap at little or no cost, and

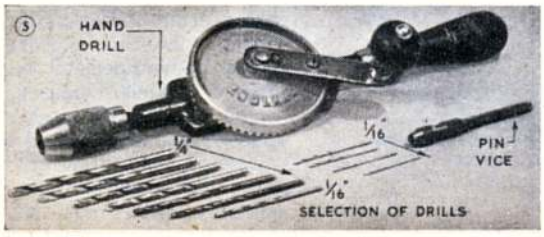


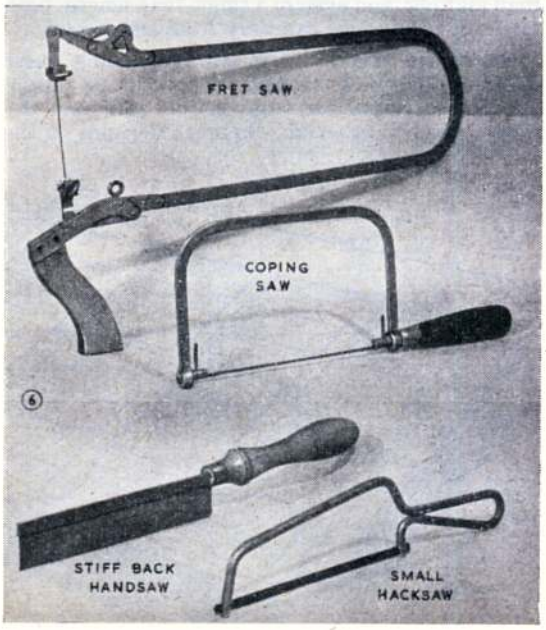
take very little time. A number of suggested items are sketched in Fig. 7. A special sandpaper block seems an unnecessary luxury. The same job can be done quite well with a piece of scrap $\frac{1}{4}$ in. sheet balsa, simply holding the sandpaper in place, or pinning with drawing pins. Other material scraps such as dowel, and so on, will suggest themselves as additional sanding blocks. Some of the most useful " tools " in the modeller's workshop are, in fact, produced by a little ingenuity from the scrap box !

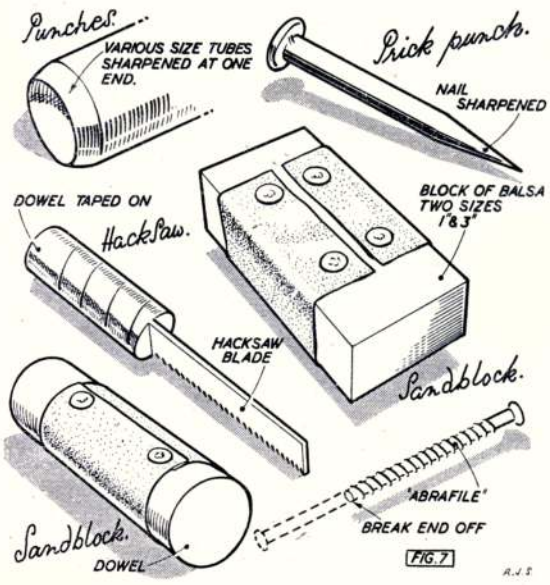
The rest of the tool kit we will leave to your imagination. A rubber modeller will want a sharp knife for carving propellers. One or two screwdrivers will be essential to the power modeller, together with box spanners in appropriate sizes. Most modellers, too, will want a soldering iron, and so on. Then *all* modellers will also want one item we have not mentioned so far—a building board.

A good building board is very important. One which is true and flat and large enough to take all the work likely to be undertaken. A large drawing board is undoubtedly the best type of building board, although these rank as rather expensive items. A good building board *is* worth the money spent on it, but it is readily possible to *make* a satisfactory board from $\frac{1}{4}$ in. balsa sheet, as in Fig. 8, for a cost of something like ten shillings. Choose hard or medium sheet and make the glue joints accurately. Ordinary wood glue can be used, being considerably cheaper than balsa cement. Such a board will have one very desirable feature of a good building board—that the material is not so hard that pins cannot be pushed in with the fingers. Since most building operations call for pinning out wood strips over a plan, ease of pinning is important. If each individual pin has to be hammered in, the work is much more tedious.









Selection of Wood

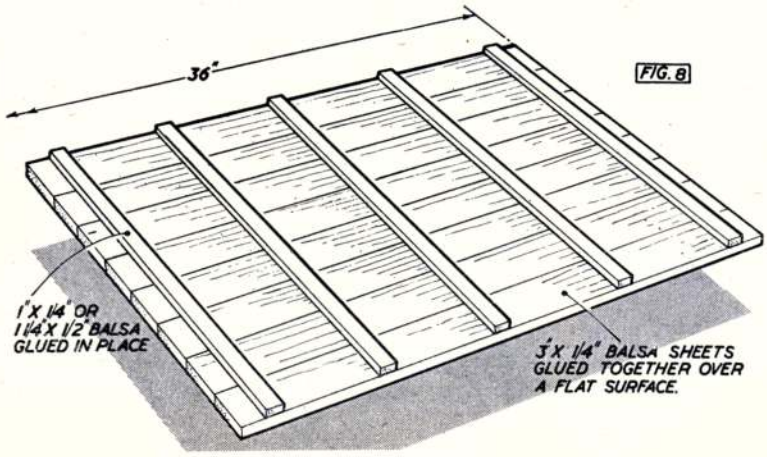
Now to materials. Balsa wood is the universal airframe material and it is as well to know something of the properties of balsa wood before using it. Its most important characteristic is its extreme lightness for a quite remarkable strength. No other material compares with it in this respect. At the same time, balsa wood as a whole has one great defect—it is not homogeneous. That is, it is not *consistent* in quality or characteristics. In a single sheet one part is likely to be stronger and heavier than another, and even in a single *strip* length, both strength and weight can vary from end to end.

There are several ways of overcoming these defects. The best method is by careful initial selection of wood for a given job and then the proper *use* of that wood. So much depends on the type of model you are building. Where airframe weight is of extreme importance, as in a contest Wakefield model, wood selection is one of the most important items of the construction. On a control line model, where wood sizes are more generous and weight less critical, it is generally sufficient to use hard or medium hard balsa without worrying unduly about the quality. In every type of model, however, to build the *best* airframe, the best available wood is required.

The weight, or rather the density, of balsa wood alone is no accurate guide to strength. As a rough rule the heavier the balsa the stronger it is, but certain wood can be very heavy and at the same time brittle and lacks strength. Experience is the only true guide to wood selection and, lacking this experience, the best plan *is* to get an experienced modeller to go along with you and help you with your purchases. Or you can rely on the retailer to help you with your selection. Many retail shops make a point of such service. The first step to becoming a good model builder is not to just buy " sheet and strip " but purchase *selected* sheet and strip. It can make a lot of difference both to the finished model and in making the actual building easier.

As far as sheet wood is concerned, here is a rough guide for selection. The usual type of cut is with the grain of the wood running from end to end and the best wood is generally that which has a uniform appearance as regards both colour and grain. When sheet has been well cut it is impossible to see saw marks, but if the saw was blunt, or a tooth was out of line at the time of cutting, this will be reproduced as a series of sweeping lines across the sheet, as in Fig. 9. This is undesirable, but not sufficient cause on its own for rejecting such a sheet unless it was intended for stripping up into spars. More important is the manner in which the sheet responds to bending.

For leading edge covering, and so on, sheet is required which will bend readily edge to edge. If it is stiff in this direction it may split when you try to apply it to the work. For leading edge covering work the sheet should be fairly stiff end to end. For laminated construction, where strips are cut off the sheet and then cemented together, layer on layer, around a curved former, sheet which bends readily end to end is required, with a certain stiffness edge to edge. Laminated work is mostly confined to the smaller models, such as rubber and glider models up to Wakefield and Nordic size, respectively, when the strips for lamination are generally cut from 1/32



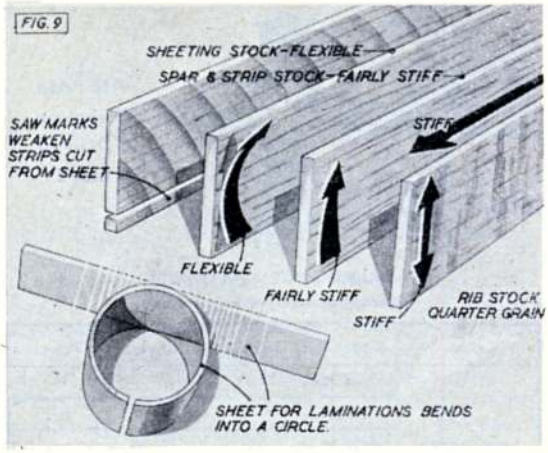
sheet. Suitable sheet for lamination should readily be capable of being bent round into a perfect circle when, stripped down to $\frac{1}{8} \times \frac{1}{32}$ in. strips these can be bent "dry" through a one inch radius without splitting.

The ideal sheet wood for cutting ribs is of quite different appearance. It is known as quarter grain, representing a slightly different cut of the original lumber. The surface is speckled in appearance and the sheet is very stiff and rigid in both directions. Quarter grain stock is easily recognisable by appearance but, on average, forms only a small proportion of the normal supplies which reach the retail shops. A common fault with quarter grain stock is that it is on the heavy side, so this is a point to be watched where airframe weight is critical. As a guide, a sheet of 1/32 balsa for Wakefield ribs should, ideally, weigh just under $\frac{1}{4}$ oz., and at the same time have the necessary rigidity and strength. Such wood can actually be stronger, and very much lighter, than 1/16 in. sheet, or even thicker, in the wrong *type* of sheet.

For estimating the *strength* of sheet and strip wood some modellers make an impression with their thumb nail and judge the strength from the resistance felt. Whilst, with practice, this can give excellent and quite reliable results, few retailers will take kindly to having their wood stocks treated in this way.

There is one tip about the packaging of sheet and strip wood which is worth remembering. In the original packaging, as a general rule adjacent sheets (or strips) have been cut from the same piece of lumber. If one piece appears very satisfactory, adjacent pieces on either side are usually very similar. Knowing this can speed selection quite a lot. Bear in mind, however, that the original sequence will probably be destroyed after the stock has been sorted over a number of times. Few retailers *mind* customers sorting over their sheet and strip stock, provided the customers know what they are doing and do not abuse that privilege.

If you must test strip wood on the spot—and for your own satisfaction you should do—then any length selected should pass the simple test illustrated in Fig. 10. This is, hold the strip at



one end and wave the other end up and down gently. Cross grained or weak strip will snap. Faulty wood will crack. Sound wood will whip with a nice springy feeling. Even 1/16 in. square stock should be capable of passing this test. But ask your retailer's permission to do so first!

We shall be dealing further with wood selection when we come on to describing the building of the actual components, as the requirements for spar stock are very different for leading edge stock, for example, in wing construction, whilst different

WEIGHT OF BALSA SHEET (ounces)

3 ft. Sheet Lengths

Wood Density lb./cu. ft.	1/32"	1/16"	3/32"	1/8"	3/16"	1/4"
6	0·1875	0·375	0·5625	0·75	1·125	1·5
8	0·25	0·5	0·75	1·0	1·5	2·0
10	0·3125	0·625	0·9375	1·25	1·875	2·5
12	0·375	0·75	1·125	1·5	2·25	3·0
14	0·4375	0·875	1·3125	1·75	2·625	3·5
16	0·5	1·0	1·5	2·0	3·0	4·0

BALSA SHEET SELECTION

(Recommended wood density)

Use	Size (in.)	Rubber	Glider	Power
Ribs	1/32	6–8	10–12	—
(Quarter Grain)	1/16	8	10–12	10–12
	3/32	—	10	10–12
	1/8	—	8–10	10
	3/16	—	—	8–10
Ribs	1/32	10	12	—
(Straight Grain)	1/16	8–10	12	12–14
	3/32	8–10	10–12	12–14
	1/8	—	8–10	12
	3/16	—	—	10–12
Wing Sheeting	1/32	6–8	8–10	—
	1/16	6	8	10–12
Wing Tips, etc.	1/16	12	12–14	—
	3/32	10–12	12	12–14
	1/8	10	10–12	12
	3/16	—	—	10–12
Formers ...	1/16	12	14	—
	3/32	10–12	12–14	12–14
	1/8	10–12	12	12
	3/16	—	10–12	10–12

"Is dat Diesel or Gloplug Massa?"

BALSA STRIP SELECTION
(Recommended Wood Density)

Use	Size (in.)	Rubber	Glider	Power
Longerons ...	3/32 sq.	12–14	—	—
	1/8 sq.	10–12	12–14	—
	5/32 sq.	10	12–14	—
	3/16 sq.	8–10	12	12–14
	1/4 sq.	—	10–12	12
Spacers ...	3/32 sq.	10–12	—	—
	1/8 × 1/16	10–12	—	—
	1/8 sq.	8–10	10–12	—
	5/32 sq.	8–10	10–12	—
	3/16 sq.	8	10	10–12
	1/4 sq.	—	10	10
Mainspars ...	...	12–14	14	12–16
Leading Edge	...	6–10	8–10	10–12
Trailing Edge	...	10–12	10–12	12–14

wood is often used for longerons and spacers in a simple box fuselage. This emphasis on wood selection may seem unnecessarily complicated, but it is not. It makes the job easier to build and produces a stronger overall result.

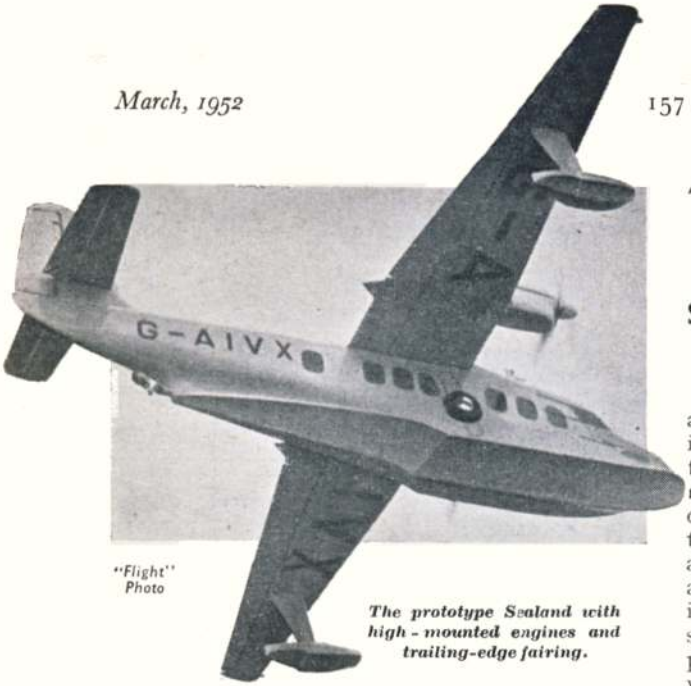
Even kit models are not necessarily excused this preliminary constructional stage. It will readily be appreciated that when a kit model is produced in its thousands close control over the quality of all the balsa wood in any individual kit is quite out of the question. Manufacturers generally combat this in two ways. Initially wood is selected according to requirements—certain lumber for sheet parts, certain stock for stripwood. Almost invariably, too, the design of the model itself allows for considerable variation in the strength of individual wood parts. The overall result is generally quite satisfactory, but that is not to say that any model built from an individual kit could not, perhaps, be improved by replacing certain kit parts with individually selected sheet or strip stock.

The serious model builder, in the long run, becomes very "weight conscious". Just as the full size aircraft designer is continually fighting a battle against increasing weight as greater strengths are required of his airframes, so the model builder sets out to reduce the weights of his structures without reducing their strength. This does not just apply to competition models. Given two identical models, equal in strength, if one is lighter than the other it will be that much less likely to suffer damage. And from any given plan it is quite possible to build two models, both using the same (specified) wood sizes and have one come out twice the weight of the other. If that saving in weight has been brought about by correct wood selection, then that is really excellent building. On the other hand, if the weight saving is the result of using light, weak wood, that is fool-hardiness in the extreme!

Quality of wood is the first requirement and once it passes these tests you can begin a further selection on weight. The appended tables give an overall guide on this latter factor.

WEIGHT OF BALSA STRIP
(Weight in ounces of number of strip lengths specified in lower line)
3 ft. Strip Lengths

Wood Density lb./cu. ft.	1/16 sq.	3/32 sq.	1/8 sq.	1/8 × 1/16 sq.	3/16 sq.	1/4 sq.	1/4 × 1/8	1/4 × 1/4	1/2 × 1/4	1 × 1/2
6	0·125	0·14	0·125	0·0625	0·281	0·5	0·25	0·25	0·25	0·5
8	0·17	0·1875	0·17	0·085	0·375	0·67	0·33	0·33	0·33	0·67
10	0·208	0·234	0·208	0·104	0·47	0·83	0·42	0·42	0·42	0·83
12	0·25	0·281	0·25	0·125	0·56	1·0	0·5	0·5	0·5	1·0
14	0·292	0·328	0·292	0·146	0·66	1·17	0·58	0·58	0·58	1·17
16	0·33	0·375	0·33	0·167	0·75	1·33	0·66	0·66	0·66	1·33
No. of Strips ...	16	8	4	4	4	4	4	2	1	1



"Flight" Photo

The prototype Sealand with high-mounted engines and trailing-edge fairing.

AIRCRAFT DESCRIBED No. 48

By G. A. CULL

The SHORT S.A.6. SEALAND

IN a class by itself among British post-war civil aeroplanes, the amphibious Sealand has now been flying for four years. With a crew of two the Sealand can accommodate seven or eight passengers in two cabins separated by the wells into which the main undercarriage retracts. Alternatively, freight may be carried, to which end the entrance hatch on the starboard side has an extra sliding panel to enable loading of bulky goods such as would be carried when operating over remote and undeveloped territory, where the Sealand has proved to be in its element.

During the past year a Sealand operated by the Christian Missionary Alliance has flown regularly from a narrow winding river in a deep valley in Borneo's jungle, and is the first aircraft to do this. One-engine performance is good, and unusually docile flying qualities have won acclaim, while manœuvrability on the water is outstanding by virtue of the reversible pitch propellers fitted to the 330 h.p. D.H. Gipsy Queen 70 engines.

The prototype Sealand was registered G–AIVX and differed noticeably from the following machines in having the engines set high on the wings with fairings projecting beyond the trailing edge. As a result of test flying, all later Sealands have engines considerably lowered, the areas of rudder and trim-tab and elevator and trim-tab have been increased, and the front triangular window of the prototype's aft cabin has been deleted. Extended wingtips were introduced a year ago and hull re-design has saved some 550 lbs. which will improve future Sealands' performance. Projected versions are the Mk. 2 with Alvis Leonides radials and the Mk. 3 which will be a ten-seater pure flying boat without the 650 lb. land undercarriage, possibly for inter-island use in the Pacific by Trans Oceanic Airways.

Two foreign companies now operating the Sealand are West Norway Airlines, whose machine flies from that country's fjords, and Jugoslovenski Aerotransport, which has Sealands YU-CFJ and YU-CFIK. These Sealands were previously registered G–AKLR and G–AKLS in this country. Registrations allotted to other Sealands are G–AKLN, 'LO, 'LP, 'LV, 'LW, 'LY, 'LZ and G–AKMA. Of these, G–AKLP made a very extensive demonstration tour of Canada and South American countries last year, and acted as a "Festival of Britain" herald as well. Nearly 50,000 miles were flown, including crossing the Andes, and so impressed were a group of farmers in Chile that they plan to jointly buy one for themselves!

Colour. G–AKLV is ivory all over with blue letters and trimmings. G–AKLO is in light blue and medium blue grey with thin white separating line. Letters in opposite shades of blue.

Construction. All metal stressed skin construction. Hull has normal bulkheads and stringers with single faired step. Tail section and stub fin built separately. Wings have two spars with fabric covered allerons and plain flaps. Two 60 gall. tanks in centre section. Tail unit has metal skinned controls with ply tabs. Main u/c retracts into hull sides with wheels standing slightly proud. Tailwheel assembly rotates to starboard about shock strut.

Specification. Span: 61 ft. 6 ins., (square tips: 59 ft.) Length: 42 ft. 7 ins. Height: 14 ft. 1 in. Weight Empty: 7,065 lbs. Weight Loaded: 9,100 lbs. Max. Speed: 185 m.p.h. Cruising Speed: 176 m.p.h. Range: 471 miles at 161 m.p.h. Water take-off run: 1,030 yds. to clear 50 ft.

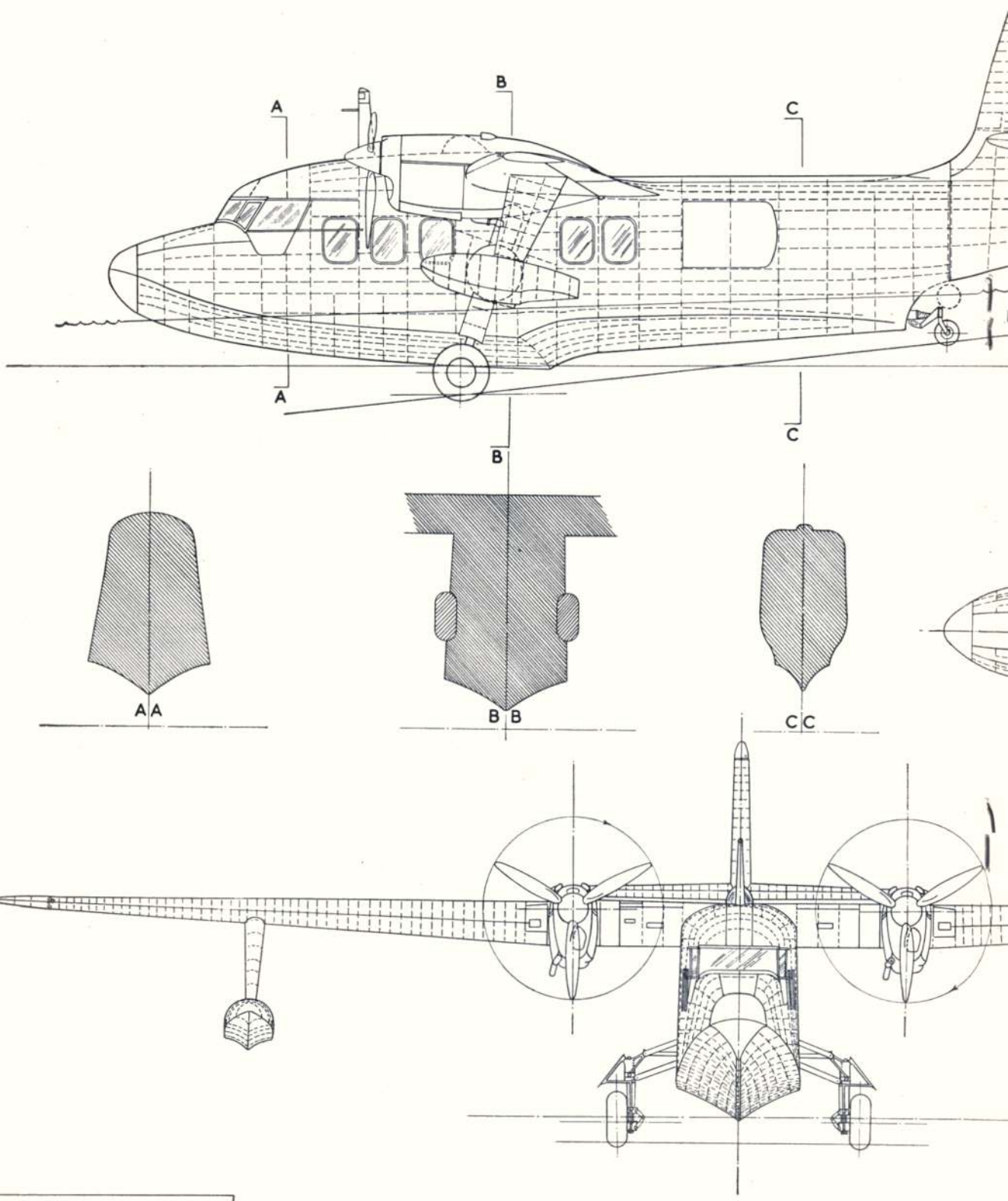
Courtesy Short Bros. & Harland.

G-AKLO, above, with undercarriage neatly stowed is owned by the parent company.

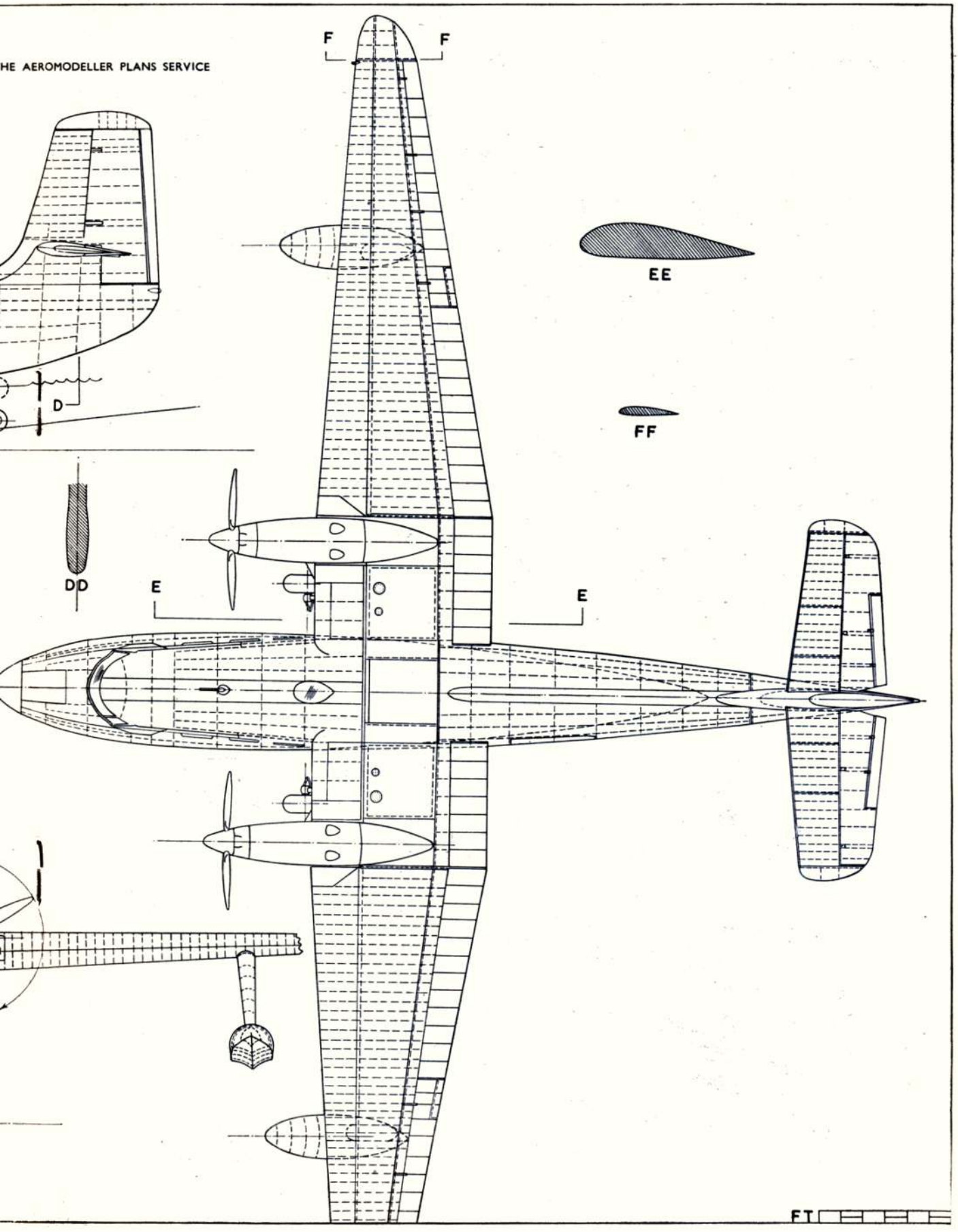
Right, the personal aircraft of Admiral Sir P. Brind, C. in C. Northern Europe, who chose the Sealand for use in Norway.

"Flight" Photo

THIS IS A 1/72nd SCALE REPRODUCTION OF THE 1/48th SCALE DRAWING WHICH IS AVAILABLE PRICE 1/6 POST FREE FROM THE AERO



SHORT S.A. 6. SEALAND.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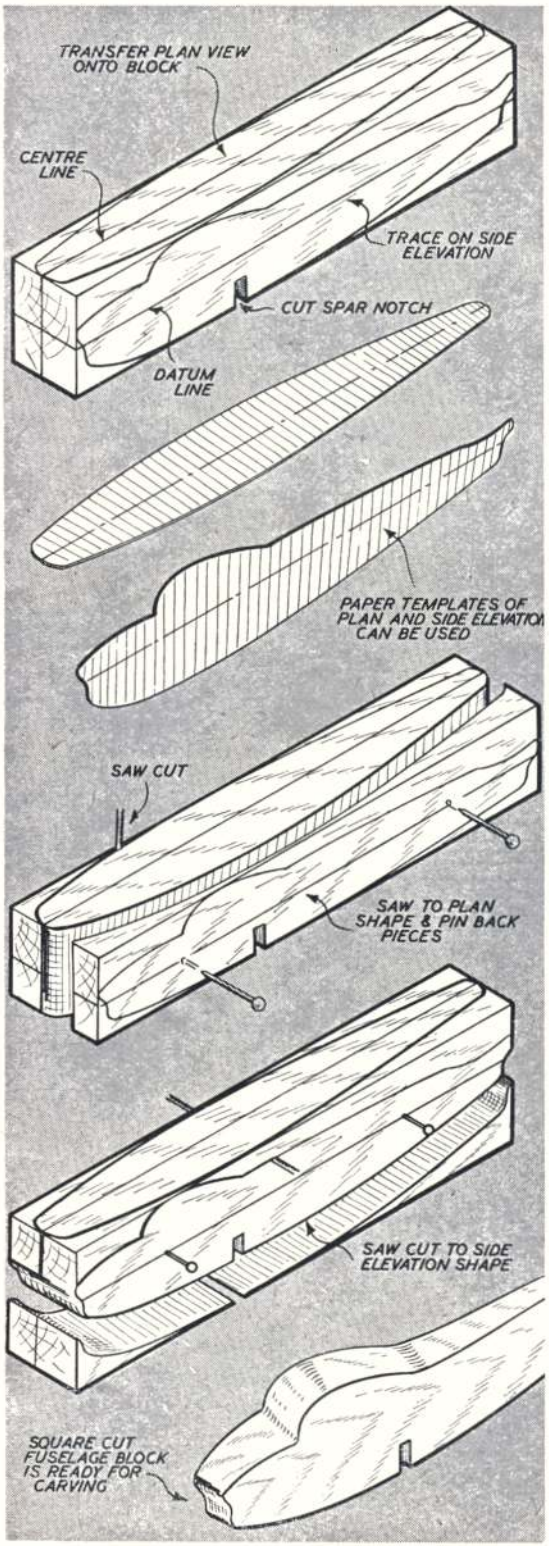


SIMPLIFIED SOLIDS

Another article

Especially for the Beginner

THERE are few enthusiastic aeromodellers who have not, at one time or another, made a solid scale model, or at least had a very strong desire to construct a " solid " of a particularly attractive full size prototype. Part of the trouble is that, starting with a three-view drawing, it is not easy to visualise how to make a satisfactory model.

However, solid models *are* quite easy, and very satisfying to construct, provided you tackle the job in the right way. There are really two " standard " methods of assembly which possess the desirable features of accuracy and robustness—the first using one piece wings cracked and re-cemented to correct dihedral and let into the fuselage ; and the other using separate wings joined to the fuselage by means of a stub spar. The latter is, we feel, the simplest and best.

Then again there is also a simple way of marking out the fuselage block ; cutting the wings to taper and carving to section, and so on. In fact, the whole solid model, tackled step-by-step in the right manner, is quite a simple and straightforward job. Since pictures tell a story better than words in this case we have detailed the whole process in a series of four strips, whilst the remainder of the article merely elaborates on the various points at issue.

Starting with the fuselage, we have two fuselage " shapes " to transfer to a rectangular block of wood, these " shapes " being obtained directly off the plan. One represents a true plan view of the fuselage and the other a side elevation. The completed fuselage, however, is almost invariably of some rounded section, in addition. The process is to cut a squared fuselage block down to the two correct outline shapes and then carve to the required section.

Having marked a centre line on the top of the fuselage block and a datum line on one side it should then be quite simple to trace the plan and side elevation of the fuselage on to the block. You can, if you wish, make a paper template of these shapes and paste or pin in place on the block. These templates can be cut directly from the plan, to save tracing.

You will also notice that the drawings show a notch or slot in the fuselage block for the stub spar. The significance of this will be explained later. At this stage it is sufficient to note that it is easier to cut this notch before the fuselage block is sawn to shape. The position of this slot is determined by the placing of the wing stub spar, which lies at right angles to the fuselage and should coincide with the one-third chord position wing root.

Follow this article and produce a well finished model like this 1/24th scale F86 Sabre by reader A. H. Butler.

At this stage, too, a word about materials. Whilst balsa is very easy to cut and work it has certain disadvantages for a good solid model. It is often difficult to get a really good finish on small balsa models, and balsa itself is readily dented or damaged. A somewhat harder wood, but still soft enough to be carved easily, is to be preferred for all the solid model parts. Best woods are white pine, yellow pine, whitewood, ash, gum, poplar or similar hardwoods, straight grained, well-seasoned and free from knots, splits or similar defects. Of course, you can still use balsa, and some excellent solids have been produced in this material.

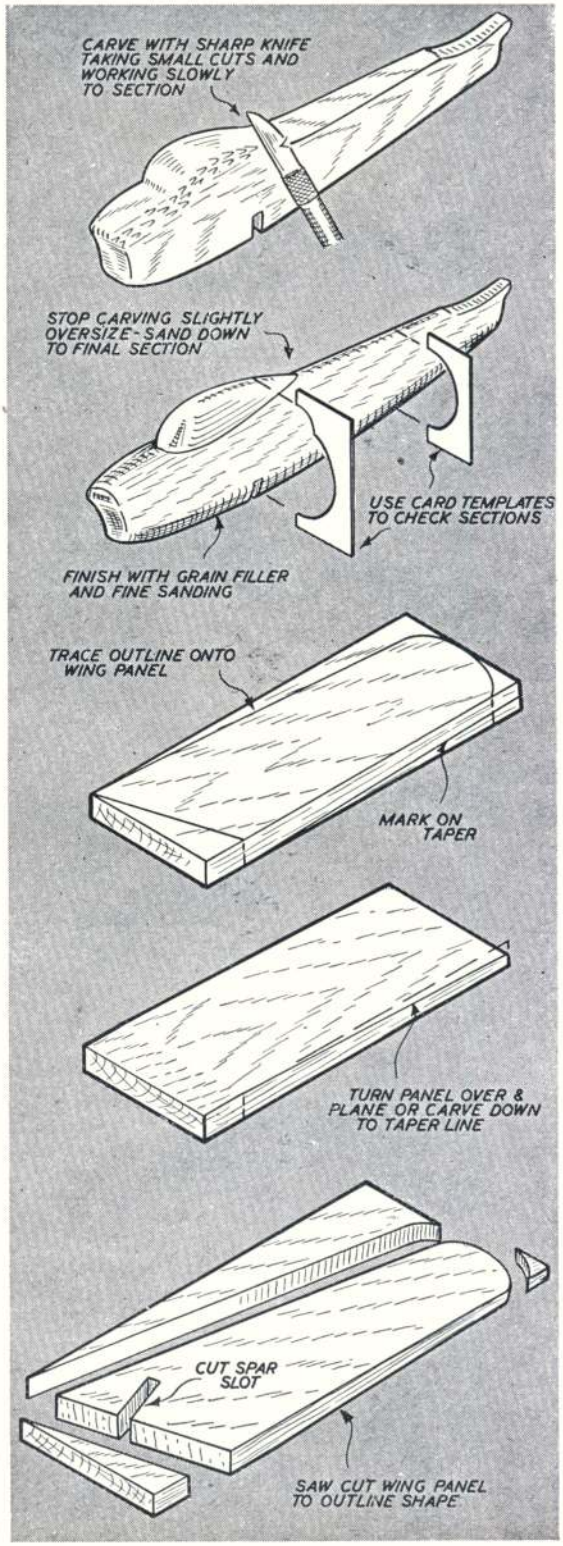
Once your fuselage block has been marked out, the next step is to saw cut it to plan shape, using a fretsaw or a coping saw. Make sure that you hold the saw vertically, so that the cut is square and true. The fuselage block should invariably be wider than the outline shape so that you can remove the two side pieces intact.

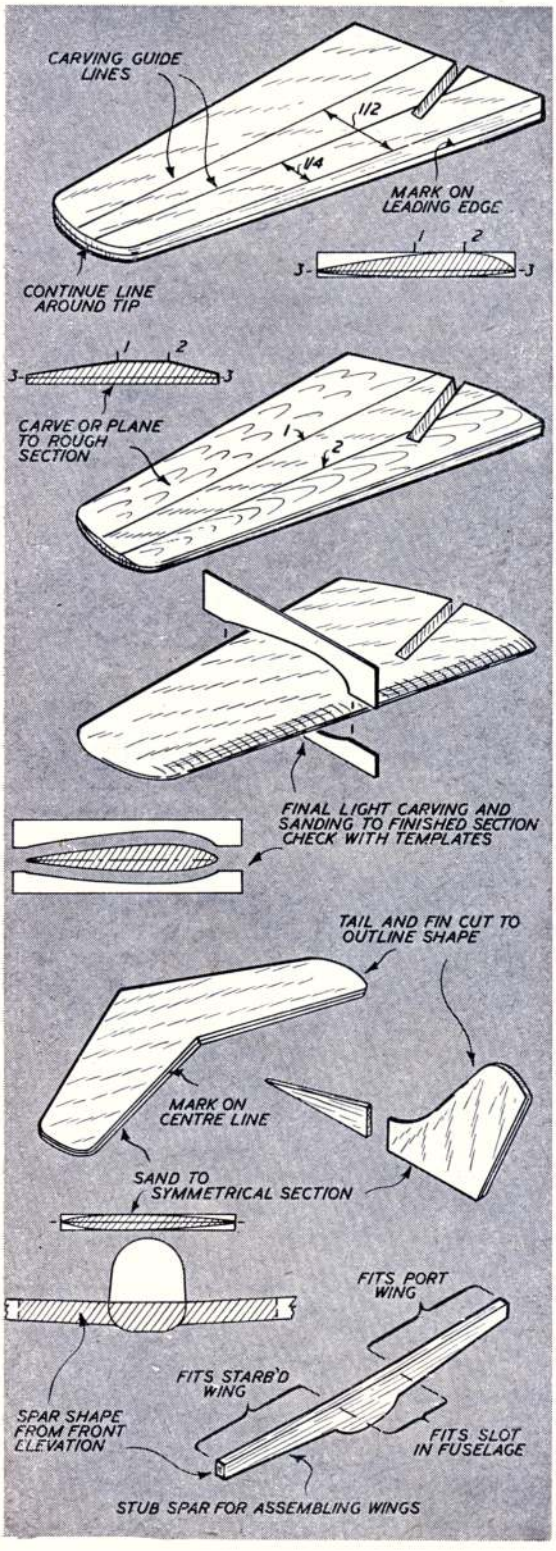
After you have sawn the block to side elevation shape, remove all the scrap pieces and you have the fuselage *blank* cut to squared outline shape and ready for carving. If you have done your cutting accurately this will be truly rectangular in section throughout.

Carving the blank to the proper cross section is easy, if you take care over the job, work slowly and do not remove too much wood at a time. A small, sharp knife is best for this job, whittling away gradually, starting at the edges and working the blank down to the required rounded cross section. Cardboard templates indicating what the fuselage cross section actually is at various stations will help a lot here. Offer up these templates to the fuselage at appropriate stations and see how much more wood is to be removed.

Your carving should be such that you leave no deep knife marks to be sanded out. Quite a light sanding over the fuselage should smooth the surface down. Stop carving entirely whilst the fuselage is still a little oversize and work down to the final section with sandpaper alone. Wrap the sandpaper around a flat strip of wood instead of using a sandpaper block, or a round dowel to reach into convex curves. Patience at this stage is an invaluable asset. Once you are satisfied with the fuselage give it a coat of sanding sealer (grain filler) and leave to dry whilst you get on with the wings.

The wings have three "shapes" to bother about—the outline, a tapering thickness from root to tip (generally) and the actual aerofoil section. The outline shape you can get from a plan view of





the model; the taper shape from a front elevation. Typical aerofoil sections are also usually given on the plan.

There is now a very effective method of carving wings to aerofoil section, using pencil guide lines. On the top of the panel draw line (1) at half chord width (root to tip) and line (2) midway between this and the leading edge (i.e., at $\frac{1}{4}$ chord width). Then around the edge of the block run a pencil line (3) representing the position of the actual leading edge, carrying this around the tip and back along the trailing edge.

The next step consists of planing or carving the wing panels in two " flats " to the section shown on the drawings. The upper surface between lines (1) and (2) is left untouched, but between line (1) and the trailing edge and line (2) and the leading edge a triangular section of wood is removed. It should then be quite easy, with a little final carving and judicious sandpapering to finish off the wing to the required aerofoil section. After carving the " flats ", as a matter of fact, it is usually possible to finish off the whole wing by sandpapering. Again, of course, use templates to check the actual section at various points along the span.

The tail unit generally represents a much simpler problem. Usually the tailplane and fin have quite a thin section and these can be cut to outline shape from this sheet. If necessary you can work with thicker sheet and taper down as indicated on the plan, just as you prepared the wings. Tail sections are different from the wing sections in one respect. Invariably they are symmetrical and, in view of the thin section, are usually best finished to section by sandpapering alone.

The one part remaining to complete the basic components is the wing stub spar. This is prepared from a front elevation of the model and, besides holding the wings in place, does, if accurately made, also line up the wings at the correct dihedral angle. The best fore and aft position of this spar is at the thickest section of the wing at the wing root—usually one third of the root chord, although a more rearward position may be desirable on wings having sharp sweepback, such as typified by modern jet fighters. This spar position needs to be decided *before* commencing to build the model so that the fuselage and wing slots can be laid out accurately.

The method of assembling the basic model should now be obvious. The stub spar is cemented in the slot in the fuselage and, being shaped to conform to the fuselage section, should blend in with it. Any irregularities must be sanded out. The wing panels can then be offered up in turn and the wing roots trimmed, as necessary, to fit flush against the side of the fuselage, when they can be cemented in place. Check that the wings are properly square with the fuselage before allowing to set.

The components of the tail unit are then simply cemented to the rear of the fuselage. In the case

of some models where the fin is large and also carries the tailplane it may be an advantage to slot the fin into the fuselage to give a stronger joint. With an orthodox tail unit, however, simply cementing the various parts directly to the fuselage is generally quite strong enough.

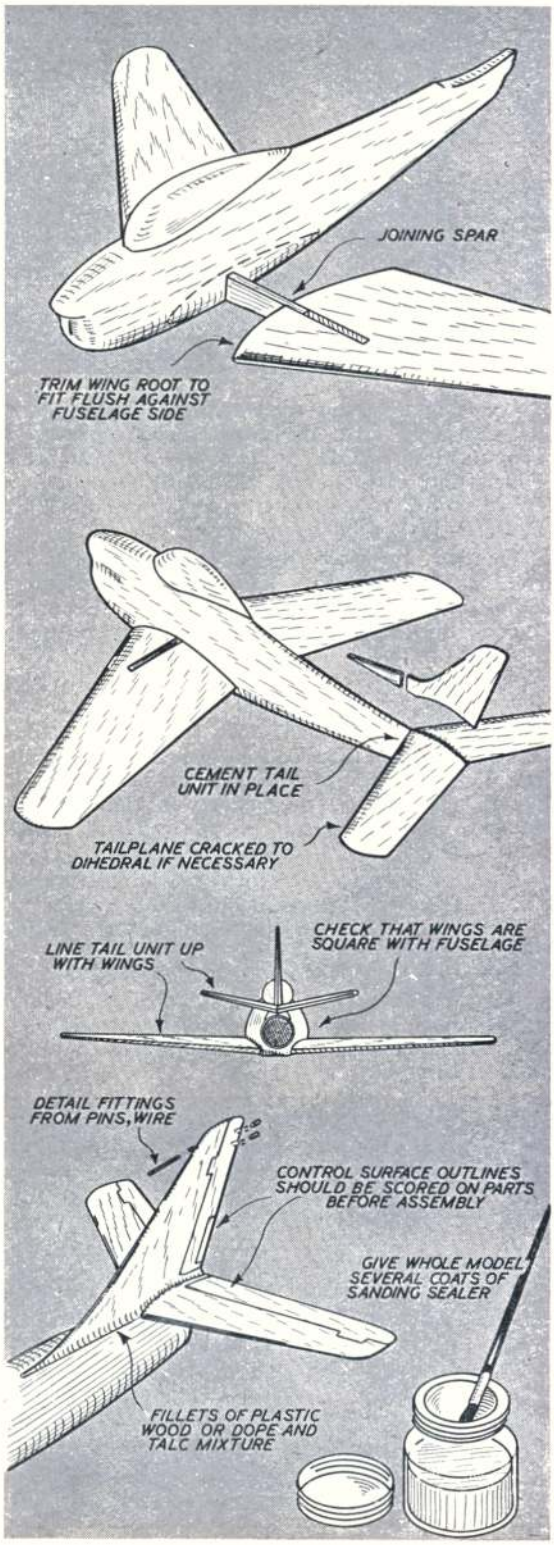
Most modern aircraft, too, call for fillets between the wing root and fuselage, and often between fin and tailplane and the fuselage. A soft fillet, which is readily worked when dry, can be made from a thick paste of talc mixed with ordinary clear dope. Leave to dry and set thoroughly before attempting to trim or sand to final shape.

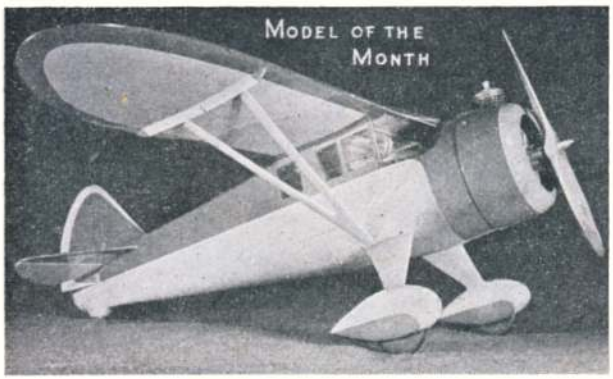
Basic detail fittings which have the same colouring as the complete model should be added before painting. Pins, wire, small carved fairings, and so on, can be pushed and cemented in place. Fittings which have a different colour should be added after the main colouring, and painted separately before securing in place.

Cockpits present something of a problem on solid models. A satisfactory method where extreme realism is not the main requirement is simply to carve the whole cockpit assembly integral with the fuselage block and then paint matt black, picking out the frame of the hood in silver or light grey. Alternatively, the whole cockpit can be cut off, the cockpit itself hollowed out and painted—and fitted with interior detail, if desired—and a transparent canopy cemented back in place. A number of commercial plastic canopies are available, but at the time of writing these are not of sufficient variety to meet all needs. A better proposition in such cases is to mould the canopy oneself, using the cut-off part of the fuselage as the mould, reducing it in thickness according to the thickness of the plastic sheet used.

Plastic moulding of this type is not easy. The main thing is to get the right material for a start—" Cellomould ", for example, rather than pure celluloid or cellulose acetate sheet, although the latter can give satisfactory results with practice. The heated plastic sheet is drawn over the mould, re-heating and repeating the process as necessary to produce the final shape. Any ridges or defects in the finished canopy can be polished out with metal polish—a lengthy job, but one which does give satisfactory results.

Just how much detail is added to your final model is a matter of personal choice. If you imagine the full size aeroplane scaled down to the size of the model and viewed from a " scale " distance, much of the smaller detail would, probably, be entirely lost. The common error is to include *too much* fine detail on a small solid, which has the effect of caricaturing the scale rather than producing true scale effect. Control surface hinge lines, for example, which may be a fraction of an inch on the full size machine are frequently scribed, or drawn, in a scale thickness corresponding to several inches in the full size machine—and look just that much out of place ! " If in doubt, leave it out " is a very good motto.





MODEL NEWS

SELECTED ITEMS BY FLIAR PHIL

IN this modern age of prefabrication, it is not surprising that the craze should spread to aeromodelling. Take a look at this month's Malmström cartoon and see what happened to Fliar Phil when he decided to try a pre-fabbed kit and was trapped in the process !

Number one choice of the month travelled all the way from New York to grace our columns. Three times a first place winner in " Beauty " events, this blue and orange scale version of the Howard DGA-11 is the work of Marty Lihl. Weighing 3 lbs. and powered by a 10 c.c. Super Cyclone the controliner is 39 ins. span.

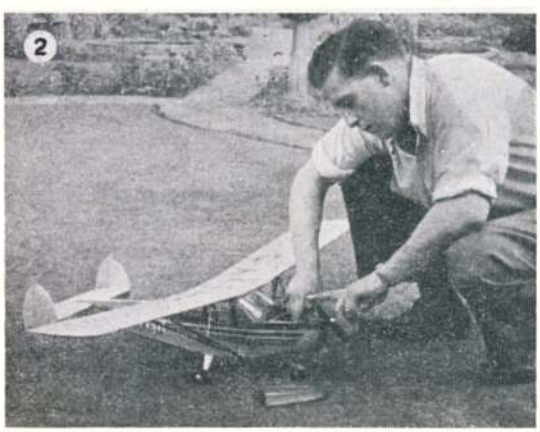
Another scale model, this time the popular A.P.S. free-flight Chrislea Ace, appears as No. two. Mr. R. C. Brown of Uxbridge made this a self portrait by using a delayed-action timer on his camera, and the result is an excellent photo worthy of a well-built model.

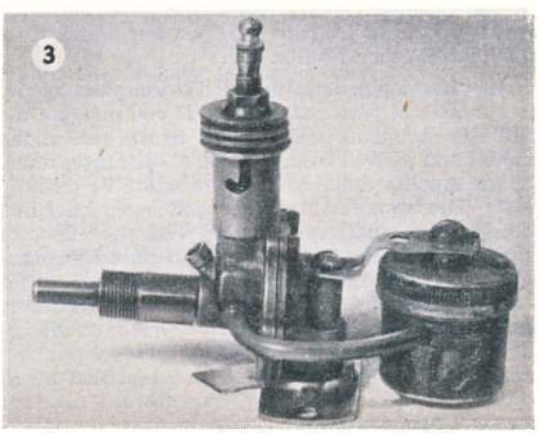
Take a large pinch of salt with number three, which is the creation of Salford Club Secretary : E. J. Teece. Known as the U/Flickit Mk. 1, this pseudo racing engine is what happens when a car dipper switch, bulb holder, windscreen wiper and sundry odd washers are thrown into a heap, the result being a no-stroke of incredible performance ! The designer assures us that this engine is guaranteed to drive anyone " Cuckoo ".

The class A team racer in number four, and appropriately bearing a number four on its fuselage side, is Dumpy, winner of the R.A.F. team race Championships at Coningsby last September. To be precise, the actual winner sported an inverted motor mounting and cowling, whereas neat side jowls cover an earlier sidewinder Elfin 1·8 c.c. mounting in this picture. The average lappage of this racer is between 28 and 30 laps per tankful, using an 8 × 8 in. Truflex prop. Span is 20 ins., weight 14 ounces, and the designer is A. E. " Demon King " Burch of R.A.F. West Malling Model Club.

Seen at last season's speed events was W. Goodwin's (Victoria Group) unusually tipped McCoy 49 design, based on the American A.M.A. winner " Screamliner ". Wingtip vortices can play a big part on the drag side of speed performance, as reference to the article on page 178 of this issue will show. This speed enthusiast's idea follows a full-size principle of fitting overload long range fuel tanks in a position where they are most beneficial to the aircraft, which is usually at the tip. Just what difference this has made to W. Goodwin's model is not known ; but the appearance is certainly topical.

What's so unusual about number six ? Well this is no ordinary Black Magic, for not only is it



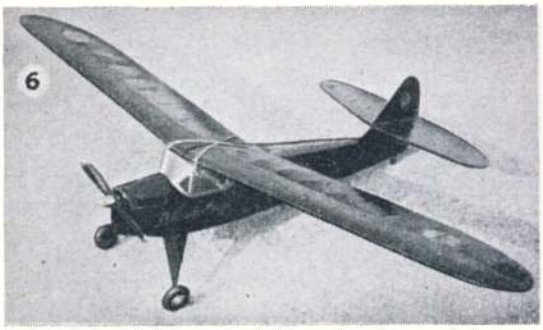


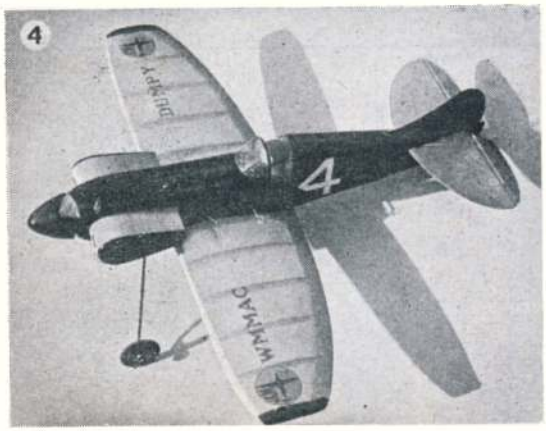
the second Black Magic she has made, but the finish of this model by Mrs. Wells of Colerne would also put many a masculine effort to shame. Coloured glossy black, with gold decoration, the only part of the model which Mrs. Wells cannot claim to have made is the soldered undercarriage unit. A fine effort Madam, keep up the good work!

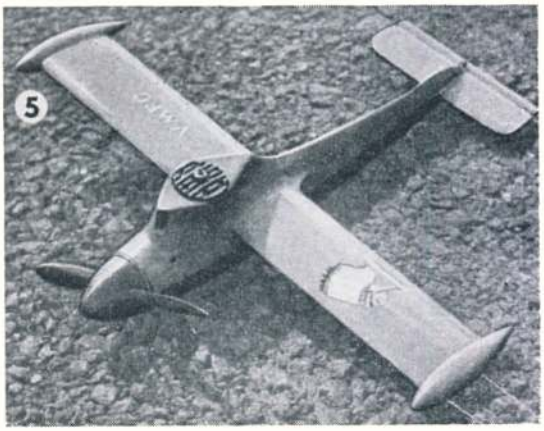
The latest line in lengthy fuselages appeared on the occasion of the Bill White cup, when several members of the Luton club arrived with Wakefield entries over 6 ft. in length! P. H. Gilder the "Thermals" author (July, '51), was caught by Ed. Stoffel's camera with his entry, which we understand is most impressive in the air. (Number seven.) That prop. is 20 ins. diameter, to give some comparison in size!

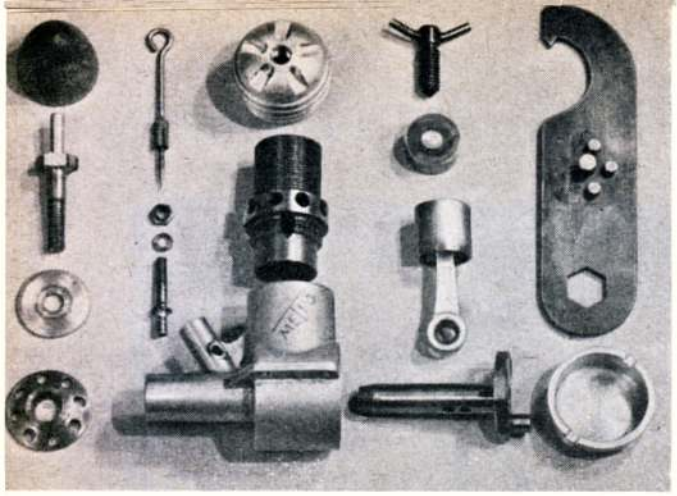
And so to the twins in number eight, the creditable efforts of J. M. Hoaly and J. G. Clapham of Stockport. Hawker Furies both; each with Elfin 1·8 c.c. diesel and spanning 25 ins., the twins can go through all control-line manœuvres except the square loop. Each model weighs 14 ounces. As a pair for formation flying or combat with trailing streamers, these would be very hard to beat. How about more control-line fighter pairs like these?

At which plea, friend F. P. drops the quill and awaits your latest photos . . . Glossy please!









OUR FIRST ENGINE FOR ANALYSIS FROM GERMANY

The

METRO 52

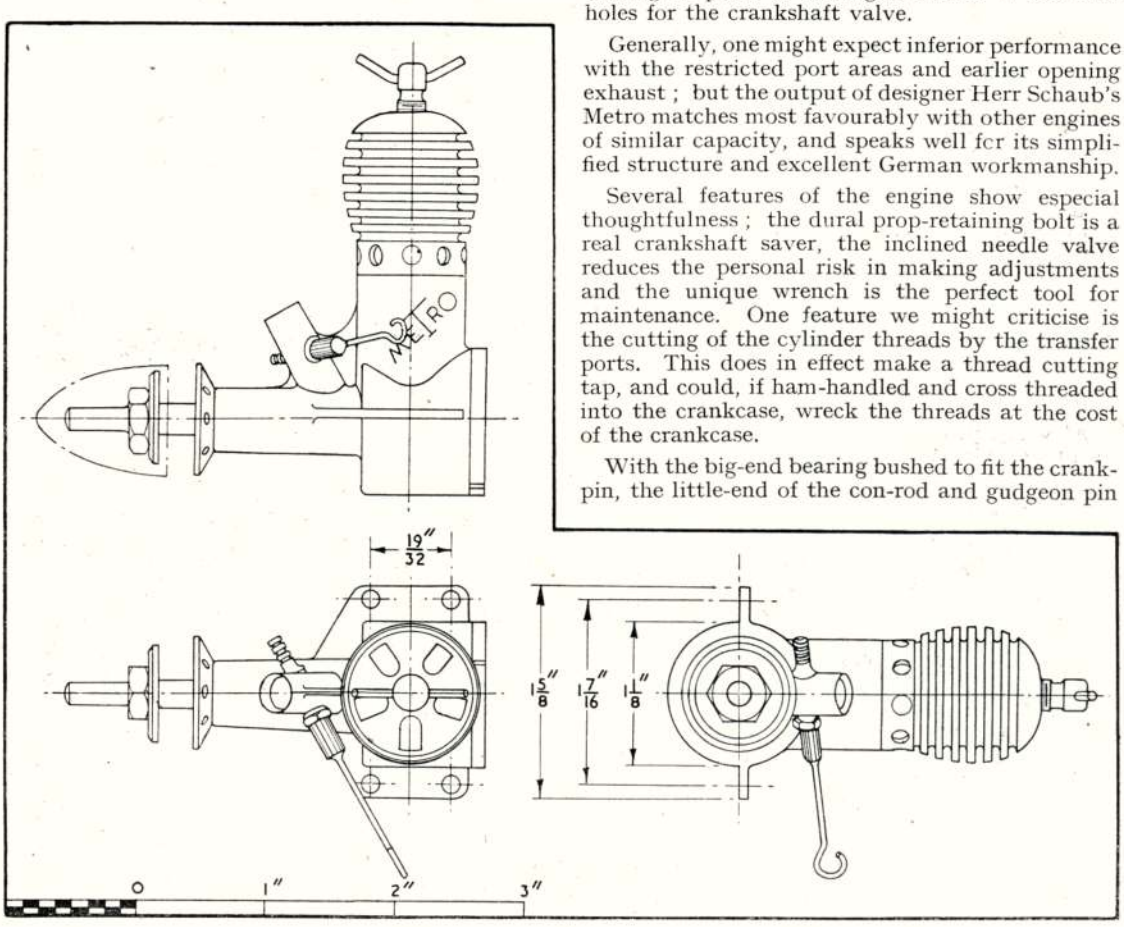
THE porting system introduced to model two-stroke engines by Ray Arden in the U.S.A. has been so widely copied in every country where model engines are made that it is only natural that this latest product from Germany should have 360 degs. porting and multiple transfer ports, coupled with crankshaft induction.

The Metro 52 is, however, very different in construction from the usual trend. Where other 2·5 c.c. engines of similar design employ milled ports to obtain larger exhaust areas for the desired timing, the Metro has a number of drilled exhaust and transfer ports. It also employs a flat-topped piston, and further evidence of the preference for drilling in place of milling is shown in the twin holes for the crankshaft valve.

Generally, one might expect inferior performance with the restricted port areas and earlier opening exhaust ; but the output of designer Herr Schaub's Metro matches most favourably with other engines of similar capacity, and speaks well for its simplified structure and excellent German workmanship.

Several features of the engine show especial thoughtfulness ; the dural prop-retaining bolt is a real crankshaft saver, the inclined needle valve reduces the personal risk in making adjustments and the unique wrench is the perfect tool for maintenance. One feature we might criticise is the cutting of the cylinder threads by the transfer ports. This does in effect make a thread cutting tap, and could, if ham-handled and cross threaded into the crankcase, wreck the threads at the cost of the crankcase.

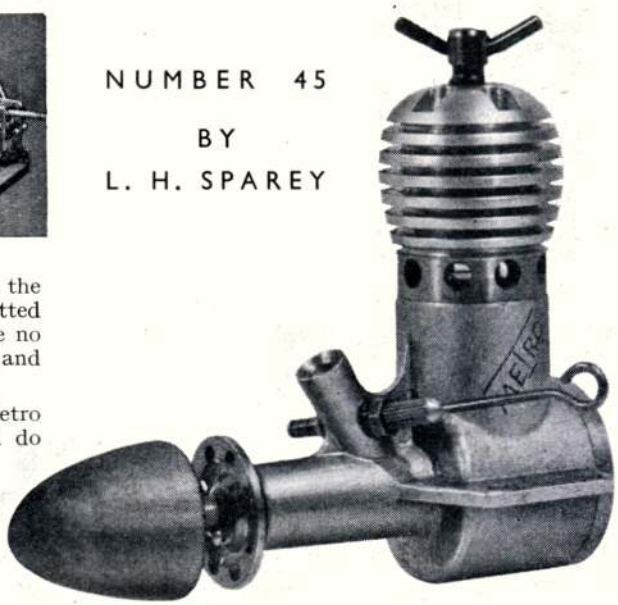
With the big-end bearing bushed to fit the crank-pin, the little-end of the con-rod and gudgeon pin



NUMBER 45

BY

L. H. SPAREY



are seated in an alloy sub-piston. This fills the cast iron piston interior and is apparently rivetted securely to the piston crown. Thus there are no gudgeon pin bearing holes in the piston itself, and a possible source of leakage is eliminated.

As the latest German model engine, the Metro is a credit to its manufacturers and should do much to advance the standard of power flying in that country.

TEST

Engine : Metro 52 Diesel, 2·47 c.c.
Fuel : Equal parts, paraffin oil, ether, castor oil (maker's recommended fuel). To bring the test in line with that of other engines run on "pepped-up" fuel, I added 2 per cent. Amyl Nitrate.

Starting : Good, but did not conform to maker's settings, due, probably to the added Amyl Nitrate.

Running : Good at all tested speeds.

B.H.P. : As shown by the graph, this engine conforms to the average performance of modern 2·5 c.c. class, except that the output is rather low at the lowest speeds. At 5,000 r.p.m. the b.h.p. is only ·045, but rises well with speed increase until a maximum of ·225 b.h.p was recorded at 12,600 r.p.m. The top of the curve is remarkably flat, so that there is little variation in power between about 11,000 and 13,200 r.p.m.

Checked Weight : 3·95 ozs. (This is as stated by makers.)

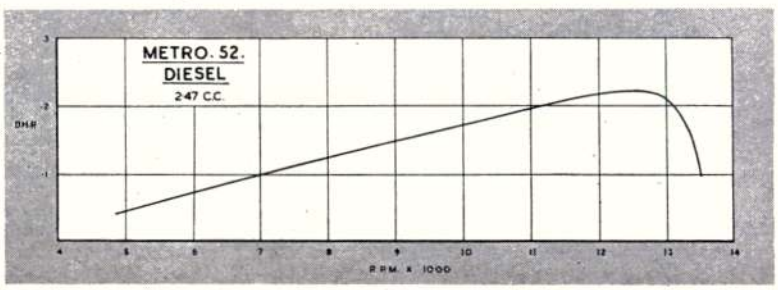
Power/Weight Ratio : ·92 b.h.p./lb.

Remarks : The engine showed leakage between piston and cylinder, and this probably accounted for the low output at the lower speeds. Leakage usually affects performance at the higher speeds to a less extent, so that maximum performance is very good. The engine is of extremely clean design and light weight, which reflects in the high power/weight ratio.

CONSTRUCTION DATA

Manufacturers : W. Mayer & Sohn, Metallwarenfabrik, (13a) Rothenbrug ob der Tauber, Hessingstrasse 8 (U.S. Zone, Germany).
Retail Price: DM 50 (£4. 5s. 2d.).
Delivery : Ex stock.
Spares : Ex stock.

Type : Compression Ignition.
Specified Fuel : 34 per cent. Paraffin, 33 per cent. Ether, 33 per cent. Castor Oil.
Capacity : 2·47 c.c., ·150 cu. ins.
Weight (advertised) : 112 grammes, 3·95 ozs.
Mounting : Beam.
Recommended Airscrews : 11×4¾ ins. for Free Flight; 8×8 ins. for Control Line.
Flywheel : 2·36 ins. dia., 2·47 oz. weight.
Bore : 15 mm., ·590 ins.
Stroke : 14 mm., ·551 ins.
Cylinder : Cast iron. Screw fit into crankcase.
Cylinder Head : Light alloy. Screw fit over cylinder.
Crankcase : Diecast light alloy.
Piston : Cast iron.
Connecting Rod : Light alloy.
Crankshaft : Steel.
Crankpin Bearing : Special alloy bearing material.
Induction : Crankshaft rotary valve.
Special Features : Dural propeller retaining bolt eliminates all risk of crankshaft bending. A unique wrench for dismantling is supplied with each engine. Boxwood Spinner supplied.



GADGET REVIEW

TEN more brainwaves to aid you in your aeromodelling are presented in this month's miscellany of ideas. There's something of everything from drawing to engine control, so waken up the memory cells and take note for future reference.

First we have something that needs no sketch to illustrate the principle. Just a little of your imagination, and you have the idea. Did you ever find colour dope seeping under the masking tape when decorating a model? M. Gough, Secretary of Chipperfield Modellers had this trouble and finally settled for plain strips of paper, with a thin smear of vaseline on one side. Thus, the greasy surface has two purposes; it adheres the mask firmly to the subject, and any dope that happens to pass beneath the mask cannot dry properly because of the grease. Try it; we did—and it really works; but the mask must be placed in position accurately straightaway. Any movement will spoil the whole idea.

If " Consus " had as many shillings as ideas for fuel tanks, he could stock the workshop with enough balsa to last a lifetime. The latest, simplest, and one of the most practical, is (**A**), a plain common or garden pencil lead glass container. Keep the cork, bore it out so that plastic fuel tubing will pass through with a good fit, and cut a small notch in the side so that air can get past and into the " tank ". Hold the glass " tank " against the fuselage with rubber bands so that it can easily be slipped off the cork for re-filling, and there's a quickly detachable tank with just the right capacity for small engines. And where should such a money-saving idea come from? Why, Scotland, of course—T. Menzies, of Troon.

Also from across the border, Sandyhills, Glasgow, to be exact, is gimmick (**B**), for control-line tailplane/elevator hinges. Not really a new idea; but certainly one that is not widely appreciated is this use of a " sandwich " constructed tail. Cut a linen profile of the whole tail and sandwich between the four pieces of balsa as shown. The surfaces in contact are amply cemented and then left to dry under pressure. Then sand off to the desired streamline section, and you have a completely hidden hinge, full-span and as tough as could possibly be.

(**C**) is something that all twin-engined free-flight fans can use as a safety measure, and can equally well be applied to touchy single-engined models too. It's from J. Bridgewood of Doncaster, who has been using this pendulum carburettor choke system on his twin E.D. Bee powered Bristol Bombay. Dural tube slides over the intake tube, and when the plane is flying straight and level the airflow into the carb. passes through a hole, which is 3/32 in. diameter in the case of the " Bee ". Should the model enter a spin or steep turn, the motor is choked and the reduced power acts as an automatic stabiliser. For twin-engines, if the pendulums are allowed to swing inwards only, the higher engine is affected only, and the model automatically turns back on course.

Wasting fuel? Everybody does when topping up the tank, and at the rate of two to four bob a bottle the fuel wastage can add up to quite a sum in a busy flying season. Reader J. F. Kealy, of Castleknock, Co. Dublin, has a couple of ideas, (**D**) and (**E**), which can make the fuel bill much less per annum. His first method applies to the widely used Wesco oil can, used by many modellers as a fuel pump. Drill a hole in the screw top of the pump to take a piece of flexible fuel tubing; connect this to the overflow on the tank when pumping fresh fuel into the filler vent—and all the excess fuel is returned to the tank. If you are thinking of balance of pressures and all that, just as we did, rest assured that the AEROMODELLER test department has already made this modification to the workshop Wesco, and it passed all tests satisfactorily. The alternative salt-cellar idea (**E**) can be used if you do not want to drill the pump, or are using the Valvespout filler.

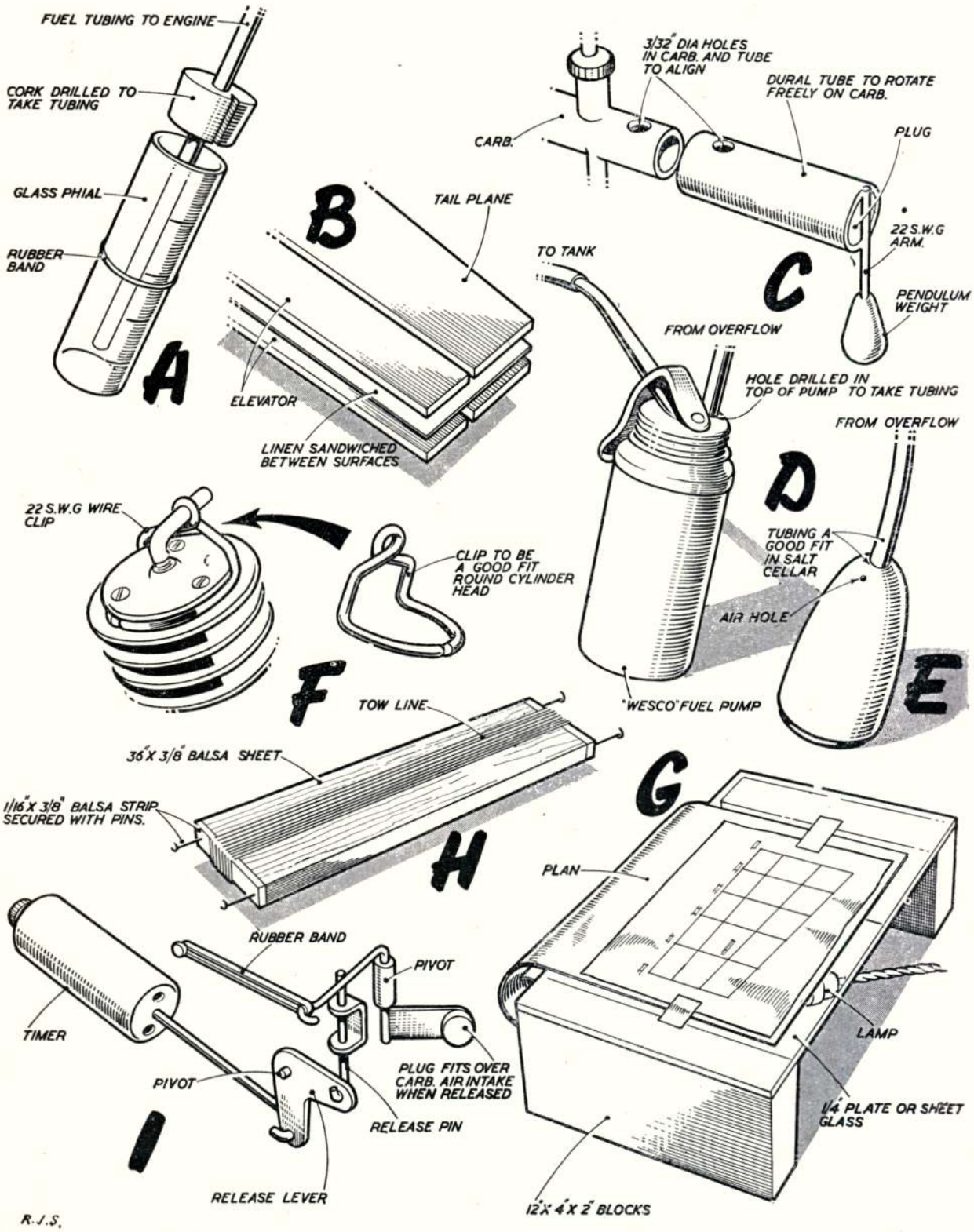
The compression screw clip (**F**) by C. D. Dulling, of Plymouth, is the answer to an obvious problem. Loose compression screws can be the bane of an aeromod's life; but this 22 s.w.g. clip, which is but the work of a moment, will hold any adjustment firm against vibration.

An odd piece of salvaged glass, a bulb, and two blocks of wood as shown in (**G**), can provide the means for any kind of tracing, says A. D. Walter, of Bristol. Where only one half of a wing is shown on a plan, the light can be used to project the drawing in reverse, and a quick tracing made. There's no limit to the uses of this system, and the surface of the glass is handy for checking warps.

How to measure that 328 ft. F.A.I. official towline within the bounds of the workshop is solved by (**H**), another idea from J. Bridgewood. Fifty-four times around the all-balsa measure and you have 328 ft. 6 ins., allowing an odd six inches for tying on to the winch.

And so to B. B. Hope's snappy shut-off device, (**I**), which he has been using for free-flight. The timer arm withdraws a piano wire trip, and elastic band tension on the clapper pad does the rest. The plug is made of rubber and must completely shut the carburettor tube, or it will not be completely effective.

At which Consus " snaps-off " for another month and awaits more of your brainwaves for easier modelling, to be tested for future publication.


FUEL TUBING TO ENGINE
CORK DRILLED TO TAKE TUBING
GLASS PHIAL
RUBBER BAND
A
B
TAIL PLANE
ELEVATOR
LINEN SANDWICHED BETWEEN SURFACES
3/32" DIA HOLES IN CARB. AND TUBE TO ALIGN
DURAL TUBE TO ROTATE FREELY ON CARB.
CARB.
PLUG
22 S.W.G ARM.
PENDULUM WEIGHT
C
TO TANK
FROM OVERFLOW
HOLE DRILLED IN TOP OF PUMP TO TAKE TUBING
FROM OVERFLOW
D
TUBING A GOOD FIT IN SALT CELLAR
AIR HOLE
"WESCO" FUEL PUMP
E
22 S.W.G WIRE CLIP
CLIP TO BE A GOOD FIT ROUND CYLINDER HEAD
F
TOW LINE
36"X 3/8" BALSA SHEET
1/16"X 3/8" BALSA STRIP SECURED WITH PINS.
H
G
PLAN
LAMP
1/4 PLATE OR SHEET GLASS
12"X 4"X 2" BLOCKS
RUBBER BAND
PIVOT
TIMER
PIVOT
PLUG FITS OVER CARB. AIR INTAKE WHEN RELEASED
RELEASE PIN
I
RELEASE LEVER
R.J.S.

GEODETIC CONSTRUCTION

RON WARRING gives advice, born out by practical experiments, on this novel form of construction.

GEODETIC construction, as applied to model aircraft, is by no means new. Carl Goldberg's first power model—the giant " Valkyrie "—used a multi-cellular form of wing construction which would come under the general heading of " geodetic " (and there were over two thousand individual pieces in this wing, incidentally) ; and from time to time plans of models have appeared with " geodetic " wings and tails. As far as contest models are concerned, however, no serious attempts appear to have been made to use this form of construction, until comparatively recently.

In one way this is surprising, for one of the chief characteristics of a " geodetic " structure is its rigidity. In other words, it is exceptionally warp-resistant.

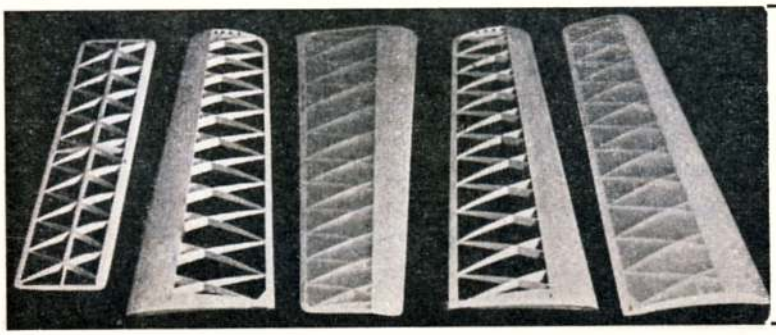
The use of the term " geodetic " to describe structures with crossing members is not strictly correct. A true geodetic frame has separate upper and lower members as in Fig. 1a, whilst in model practice these individual members are almost invariably solid—Fig. 1b. The principle, however, is basically the same and so " geodetic structures " they are popularly called.

Fig. 2 shows how such structures derive their warp-resistant properties. The main members cross one another, so that whichever way the structure is twisted, one of a pair of members is put into compression, and thus strongly resist displacement. In the case of a wing or a tailplane, for example, this means that a geodetic arrangement of the ribs will strongly resist any tendency to twist, either wash-in or wash-out. It is, in fact, readily possible to cover a *light* geodetic tailplane, waterspray and dope several times without pinning down and with the tailplane still coming out perfectly flat.

However, there is one point to be borne in mind here. Although strongly resistant to twisting, the geodetic structure has little, if any, more resistance to *bending* than a conventional structure. In other words, it will readily bow upwards unless the longitudinal members, the spars, are strong enough to resist bending.

During the winter of 1950–51 the writer developed what, he hoped, would be a highly warp-resistant tailplane of Wakefield size. The outline was laminated from $\frac{1}{8} \times 1/32$ balsa, of blunt elliptic outline and the ribs were arranged geodetic fashion—Fig. 3. Bending strength was given by top and bottom spars of $\frac{1}{8} \times 1/32$ balsa, which again resist bending by being put into compression—Fig. 4. To prevent these spars buckling or collapsing under load vertical webs were added between the ribs. One of the main objects was to work to the minimum spar sizes possible so that the weight would compare with that of an orthodox Wakefield tailplane of similar area.

This design of tailplane has proved perfectly satisfactory over a year of contest flying. Several



Left, are various geodetic wings, and right an assortment of tailplanes, all built by the author. His latest experiment is shown in the heading photograph. It is a Wakefield fuselage, fully geodetic, and is shown in the special jig used for its construction. The top of the jig has been removed prior to removal of the fuselage. It will be noted that the longerons are taped to the inside edges of the jig, thus enabling the cross members to be inserted with all four longerons firmly held in their correct position and to the correct shape.

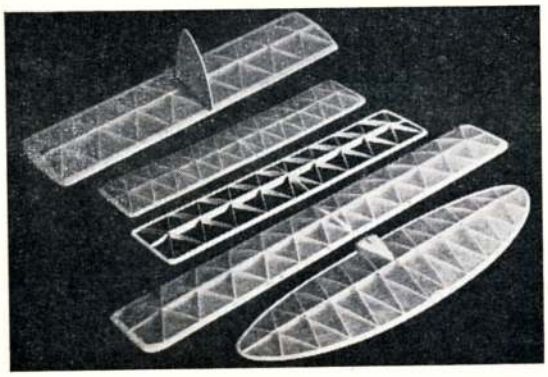
were built for different models and all retained the same degree of " flatness " as when originally finished throughout twelve months. " Flatness " is used here instead of " remaining perfectly true " for not all were true. They were perfectly free from any *twist*, but before the full significance of the design of the mainspar(s) was fully realised some slight dihedral was built in, unintentionally, in one or two examples. The main thing, however, was that all the tailplanes stayed *true as built*.

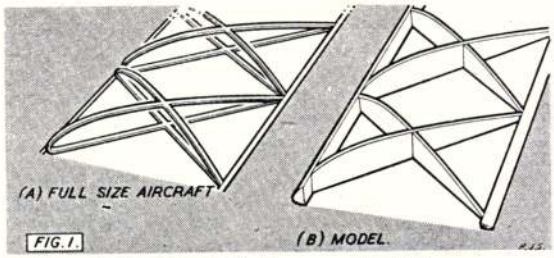
What was equally satisfactory was that the weight of these tailplanes was actually *less* than the accepted standard for conventional structures. Although there is more volume of wood used for the ribs, the volume of the spars and edges could be cut down and it was possible to use a lighter grade of wood throughout. This fact remains substantially true for other geodetic structures. As applied to wings, again a slight weight *saving* is possible, or at least no weight increase is *necessary* and extended to fuselages about equivalent weights can be realised. We have, therefore, the possibility of developing warp-resistant structures at no gain in weight.

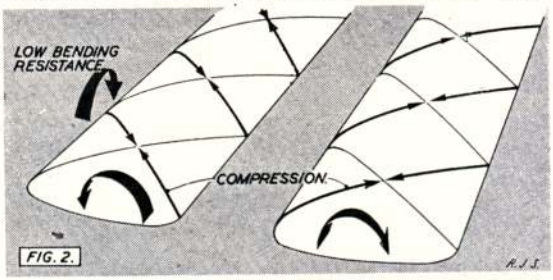
As far as construction goes, several methods were tried, mainly with a view to finding the simplest building procedure which gave satisfactory results. When this was established, geodetic construction of wings and tailplanes took very little longer than orthodox construction. The basic method is summarised in Fig. 5, taking a parallel chord tailplane, for simplicity.

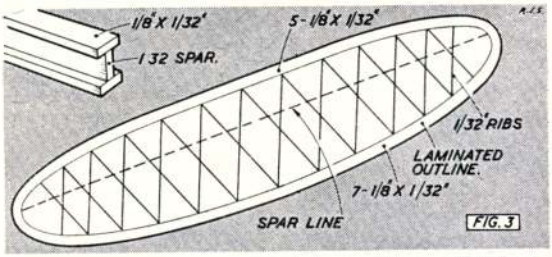
All the ribs in this case are identical. Leading and trailing edge spars are laid down in the uusal manner—and it is an advantage to *slightly* notch these spars at the rib positions—and full ribs cemented in place, as shown. The centre crossing ribs are half-jointed, as indicated. The full ribs chosen are those which would be in *compression* if the trailing edge tried to warp upwards. All the other ribs are then cemented in place, one by one, cutting in half where they cross the full ribs and trimming off the rear half of the rib to correct length.

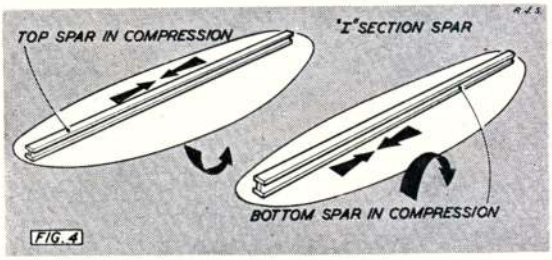
This method is now applied to both wings and tailplane structures, parallel chord or tapered, and is certainly the quickest and easiest.

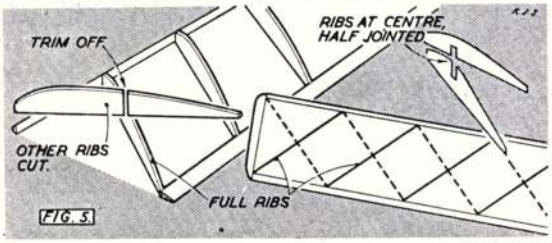


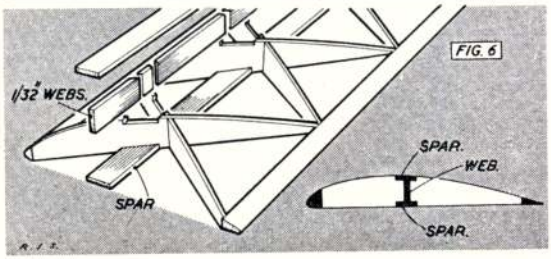






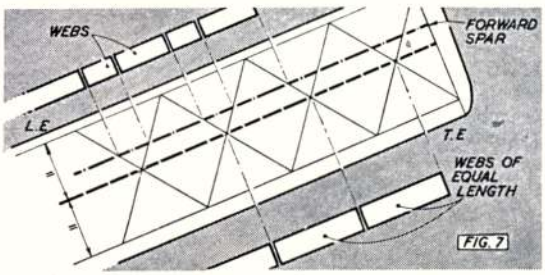


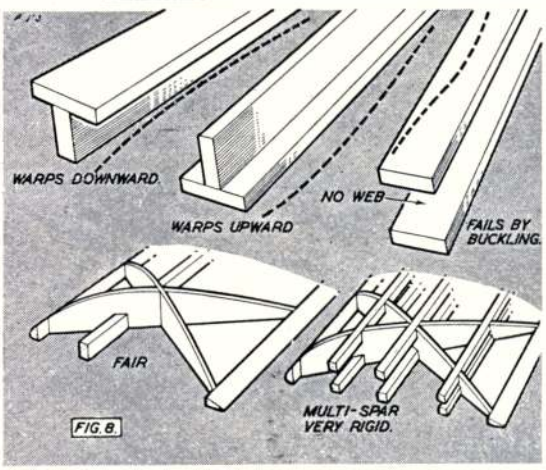


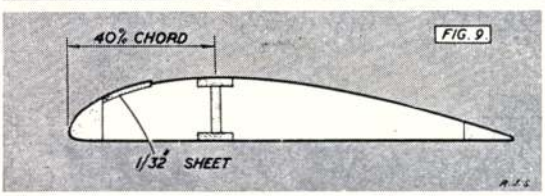


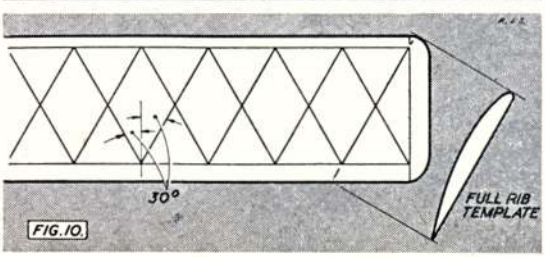
The structure shown in the diagram, however, is incomplete, for it has no mainspar to resist bending. The built-up I-beam used on the original tailplane is excellent and does not unduly complicate the work. There are, however, alternative forms which are better in the case of wings.

Dealing with tailplane design first, the I-beam is quite satisfactory. The method is detailed in Fig. 6. The full ribs are laid down as before over a bottom spar and the other ribs added. The full depth between the ribs (up to the bottom of the top spar notch) is then filled with individual webs of stiff sheet balsa, after which the top spar is cemented in place. Unless this spar is located at roughly fifty per cent. chord it will not come on the crossing point of the ribs—Fig. 7—and so a relatively large number of small webs will be required. This is quite a satisfactory arrangement.









Types of spar forms to avoid are those which are unbalanced, or unsupported. T-section, as shown in Fig. 8, will have a tendency to warp either up or down. Spars without webs will tend to buckle and fail under compression. A solid spar would be simple and strong, and fairly satisfactory, or for maximum rigidity, multi-spar arrangement could be used. The major difficulty with the two latter is that they complicate building somewhat since each rib has to be notched accurately. Multi-spar structures, too, have poor local strength.

For Wakefields, the ribs are 1/32 sheet and the spar sizes $\frac{1}{8} \times 1/32$. These are amply strong enough with stiff webs. The covered and doped weight of a complete tailplane of 75 sq. in. can be as low as 3/16 ounce and need never exceed $\frac{1}{4}$ ounce. Parallel chord tailplanes of similar area can be built down to $\frac{1}{8}$ ounce, complete.

The laminated elliptic outline seems quite unnecessary. A plain rectangular form is much simpler to build and considerably easier to lay out. This holds true for any type of model, the only modification suggested to larger tailplanes being a small strip of sheeting backing up the leading edge —Fig. 9. Leading and trailing edge members can both be smaller than usual and this sheeting adds a little extra strength.

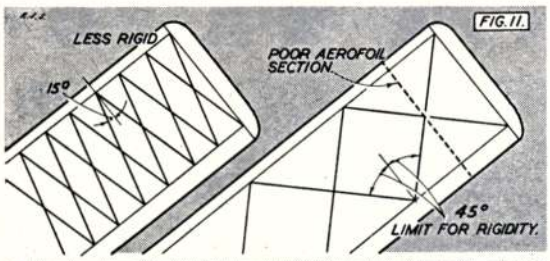
Some rather interesting facts have emerged with regard to the spacing of geodetic ribs. The most efficient structure appears to result when the pitch angle of the ribs is 30 degrees—Fig. 10. Design is then quite simple, merely drawing in the rib positions at this angle between the *inside* of the leading edge and the *inside* of the trailing edge. The outline proportions must, of course, be adjusted to give a complete number of bays, tip to tip.

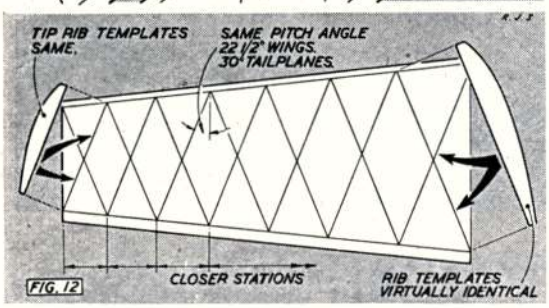
Closer rib spacing tried produced a less rigid structure—Fig. 11—although a better aerofoil section. At the upper limit, a 45 degree pitch angle gave excellent rigidity, but beyond that became progressively weaker.

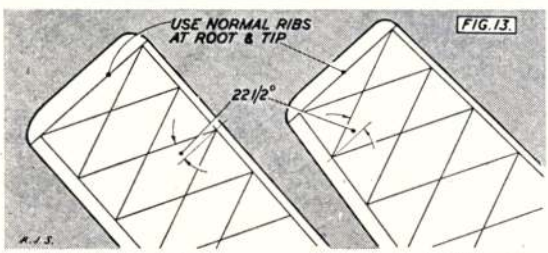
With a tapered outline, design is not complicated a great deal. Again the ribs are laid out at a fixed pitch angle and the necessary ribs can be cut by the " sandwich " method from two end templates. Two individual sets of ribs will be required for each wing and on most layouts, for all practical purposes, the same two templates can be used.

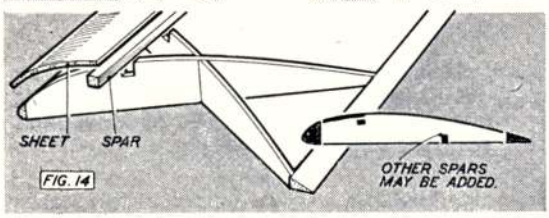
It will be noticed that with a tapered planform and fixed rib pitch angles the spacing of the geodetic bays will decrease towards the tip. This, in itself, is an advantage as far as rigidity is concerned and there seems no point in complicating the design by insisting on a fixed rib *spacing*, which can only be achieved by a varying pitch *angle*.

In the case of wings a closer rib spacing (i.e., a lower rib pitch angle) is recommended to preserve the correct aerofoil section as far as possible. An









optimum figure appears to be 22½ degrees—Fig. 13. This applies to both parallel chord and tapered wings. Since, almost invariably, we shall now be dealing with ribs with undercamber, a different mainspar arrangement is preferable. As far as possible we still want to cement the ribs in place between the outline spars in the simple manner of Fig. 5 and work from there.

A satisfactory solution for Wakefield wings—and one which appears just as suited to power model and glider wings—is shown in Fig. 14. Here the mainspar is slotted into the ribs after they have been assembled and then capped with 1/32 sheet between this spar and the leading edge. When removed from the board, incidentally, this structure is quite rigid enough to slot in any additional spars into the undersurface of the ribs, should this be considered necessary, without inducing any warps.

The extreme rigidity of the resulting structure brings up one point and that is if washout is required on the wing tips, this must be built in originally, i.e., when laying down the trailing edge and before cementing the ribs in place.

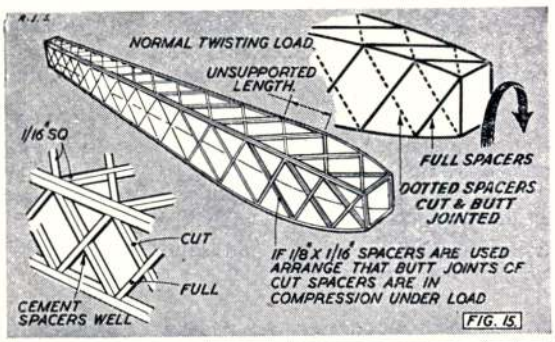
To complete the picture, Fig. 15 details how geodetic construction may be applied to a fuselage. The advantages are, overall rigidity (which is particularly desirable in a Wakefield fuselage using a return-gear system) and relatively small areas of unsupporting tissue covering (reducing the likelihood of split tissue). Points against are, in this case, the undoubtedly more complicated structure and increased building time and the necessarily low pitch angle of the spacers to avoid long lengths of longeron unsupported.

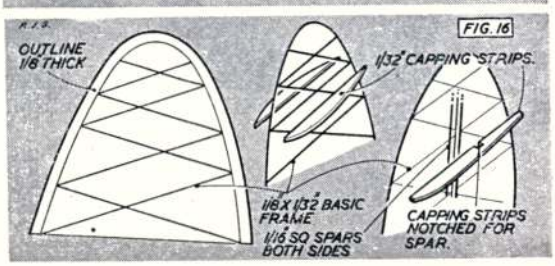
Unless the builder is a particularly accurate workman, too, it would seem advisable to build up each individual spacer from two pieces of 1/16 square—rather than attempt half-jointing $\frac{1}{8} \times 1/16$.

The other component usually associated with the fuselage—the fin—lends itself very readily to geodetic construction and the method shown in Fig. 16 has been used with success by the writer for some twelve months. Simplicity of construction was the main aim and such structures are generally lighter than their orthodox counterparts—and very much more warp-resistant.

In the case of a Wakefield fin the first stage consists of building up a geodetic frame of $\frac{1}{8} \times 1/32$ strips inside the outline of the fin. On this frame is then superimposed the rib strips, one each side. Where the basic frame members themselves are cut and butt-jointed, the corresponding capping or rib strip is full length, this giving a very sound overall joint.

The only failing with a fin of this type is that it has no bending strength and unless the outline itself is rigid enough to take care of this, some simple form of fin spar is advised.





KIT REVIEW

For multiple reasons, not the least being the large number of kits submitted for our test, and the appalling weather, we are unable to give a complete review of each kit. None of the models have been submitted to our customary flight check, and we hope that we shall be able to offer our observations on the performance of the models in the April issue. In the meantime, the building reviews will certainly be of interest.

For ·5 c.c. fans, there is additional good news from the manufacturers of the **Allbon Dart.** Production has been stepped up to meet the demand for this increasingly popular motor, and it is soon hoped that supply will be 'ex-stock'.

Mercury Monocoupe 40. 26/7 (inc. P.T.)

Wingspan 40 ins., length 26 ins., wing area 208 sq. ins. Uncovered airframe weight, less motor, 8½ ozs.

Packaging. Usual stout Mercury box with model illustrated on label, and capable of withstanding postal abuse.

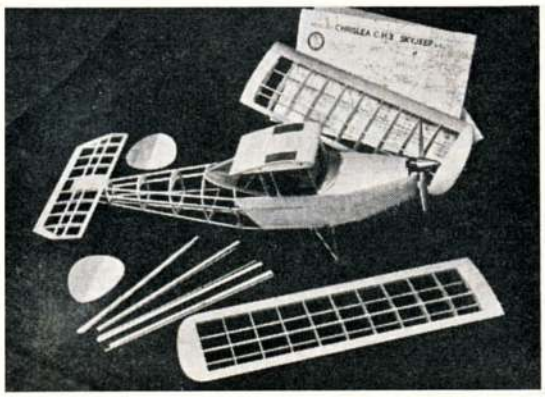
Quality of Contents was of the highest order. All parts are clearly printed on the best grade of balsa, with spats and cowling parts pre-cut.

Completeness. There is nothing short or missing from this kit, which is of the "dry" type. There is ample material for the sheeting (a point we found short in the Voyager, and now corrected), and with bearer positions for the Mills ·75 and Amco ·87 as alternatives to the Allbon Dart, the plans enjoy equal completeness with the kit.

Ease of Assembly. No difficulty whatsoever was encountered in the sequence of construction, thanks to the excellent printed folder of instructions. We did find slight discrepancy in the wing-tips, and the fuselage side sheeting does need some coercion to follow the desired curve; but these are small points that any modeller with the slightest commonsense would readily excuse. Strut fittings and the undercarriage springing are most practical, as is also the method of fitting all windows behind sheet frames. A full-size template of the wind-screen would have been helpful, to cut short the trial and error fitting with paper. Building time is just over 30 hours.

Value at 26/7 is excellent, and if the Monocoupe 40 flies as well as the test Voyager we will be more than satisfied. Flight tests appear next month.

★ ★ TRADE



Mercury Chrislea C.H.3. Skyjeep 26/7 (inc. P.T.)

Wingspan 45 ins., length 26 ins., wing area 237 sq. ins. Uncovered airframe weight, with Mills ·75 and airwheels, 13 ozs.

For **Packing and Quality** the Skyjeep matches the high grade rating of its stablemates, the Voyager and Monocoupe 40. We would have preferred better quality dowelling, and slightly longer cowling blocks to allow for shaping; but these points should be no deterrent to the purchaser who will be amply gratified with the general high quality.

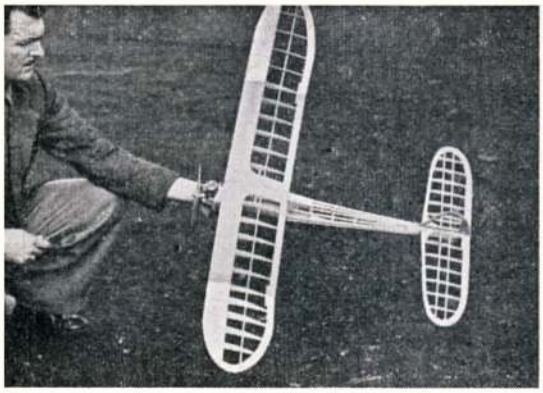
Completeness. This is a dry kit, needing no additional wood, wire or tissue and giving details on the printed wood for Mills ·75, Amco ·87 and E.D. Bee mounting as alternatives to the Allbon Dart.

Ease of Assembly is as simple as the other Mercury kits in this range, thanks again to the excellent printed folder of instructions. A template for the celluloid cabin windows would have been helpful, and slight confusion can arise from the two differently sized drawings of the main under-carriage legs. There is definitely more work in this model than the other two in the range, and the Skyjeep is both larger and heavier than its brothers. Solid tips, though hollowed out, are still quite "weighty" if the wood happens to be hard; but the appearance and durability in case of cartwheel landings will repay this concession.

The pleasing appearance of this bulky model and its practical construction, will have a special appeal for radio control fans who are looking for just such a model for the latest miniature radio units. We will not be at all surprised to see many Bee powered radio control versions in action later this year. Building time is approximately 35 hours.

Value at 26/7 is, if anything, even better than the Voyager and Monocoupe.

REVIEW ★ ★



Frog Cirrus 25/6 (inc. P.T.)

Wingspan 48 ins., length 31½ ins., wing area 320 sq. ins. Weight, with Frog 250 diesel, 17 ozs.

Packaging. The usual thin card Frog printed carton type box is packed chock-a-block with the hundreds of parts that go to make this model.

Quality of Contents leaves little to be desired. Pre-shaped parts are accurately die-cut and most strip wood is tough, though some of the sheet could be less " furry " and harder.

Completeness extends to the neat plastic wheels for the normal undercarriage, though the design calls for a retracting single wheel. As with all Frog kits previously reviewed, we found the waste-bin full of as much wood as we needed to make the kit, the excess being from die-cut sheet.

Ease of Assembly. Following the leaflet of stage-by-stage instructions and Frog numbered parts system on the plan enabled us to complete the airframe in just under 27 hours. The pylon gave some trouble, both with wing seating and the curvature of the sheet on either side. Engine cowling, too, had to be " carved to infinity " to go around the 250 motor. The retracting under-carriage works well and is a functional feature of this very attractive contest model.

Value at 25/6 is very good, especially when we reflect on the spare wood left over!

Keilkraft Plastic Cowls

A prominent feature of the K.K. Super-scale series is the provision of a ready moulded plastic cowling for the flat-four type of engine used in the full-size Cessna 170, Silvaire and Piper Super-Cruiser. These handy cowls are suitable for any scale or semi-scale model of about 40 ins. span and can now be obtained in the three different shapes, price 1/- each plus 3d. P.T. Our special advice is to roughen the plastic thoroughly wherever it is to be cemented to the model.

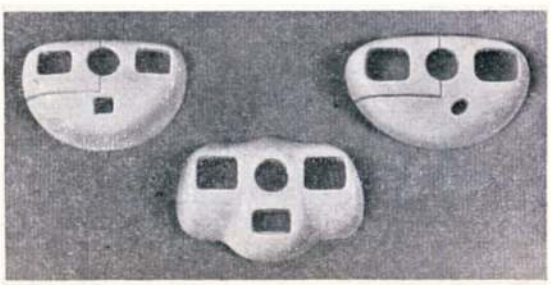
Venner Lightweight Accumulators

More ideal accumulators from an aeromodeller's point of view would be difficult to find. They are practically indestructible, small in size, and, as the name implies, extremely light in weight.

They fulfil many aeromodelling requirements, being eminently suitable for radio control work and also for use as starter or booster batteries. We ourselves have used, over a period of several months, three examples of the smaller sizes. The two smallest, i.e., types " C " and " D ", have been used as low tension accumulators in radio control models and have proved most satisfactory. They can be charged in the normal way, or by connecting them across one cell of a car battery in the field ; this being a real boon when out for a day's radio flying, as can be imagined.

Furthermore, they can be left for prolonged periods in either a discharged, half-charged or fully charged condition without suffering in any way.

There are four different voltage types in each capacity range. For instance, the Type " C " 0·5 amp/hrs. is available at 1·5 volts, 3 volts, 6 volts and 12 volts, as is also Type " D ", and so on. As a basis of comparison, the size of the 1½ volts Type " C " is 9/16×1½×1⅛ ins.; the weight ⅝ oz., and the price £1 . 2 . 6. Full details of the range, if not available from your local dealer, may be obtained direct from the manufacturers, Messrs. Venner Accumulators Ltd., Kingston By-Pass Road, New Malden, Surrey.



Joy-Plane Products

The familiar yellow and black Joy-plane cement tubes that have appeared on model shop counters for many a year are well known to all aeromodellers. How many of them, we wonder, appreciate that this well-known cement is available in three different varieties of tube. There is the normal nozzle for ordinary work ; the long nozzle for those awkward corners ; and for the occasional user, the screw cap tube which keeps the cement airtight over long periods. We have used this cement since we were knee high to a chuck glider and have stuck to it ever since. (*Saints preserve us !*—Ed.)

Balsa cement is, however, but one item in the comprehensive range of Joy-plane products made by the Turnbridge Mfg. & Supply Co. Ltd. They produce Dope in all colours including gold and silver ; Fuelproofer, Banana Oil, Grain Filler, Tissue Paste, Plastic Wood and Rubber Lubricant ; in fact, every accessory in the model finishing line that a modeller is likely to require.

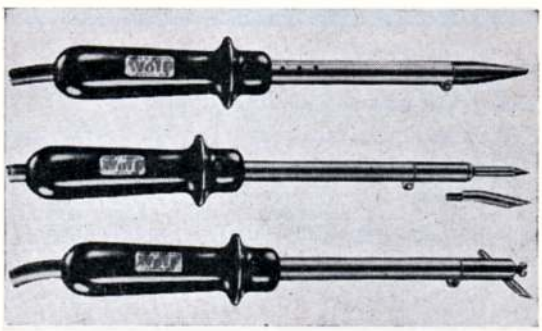
We are particularly fond of their Flamboyant Finishes, which are available in all colours and impart that metallic sheen so popular in this modern age. These colours can be fuelproofed when dry. Mentioning Fuelproofer reminds us that this item can also be obtained in various colours, and samples we tested dried satisfactorily and definitely were fuel-proof. For those non-power modellers who like a shiny finish, which is a deterrent to sagging tissue under damp conditions, we recommend Joy-plane Waterproof Finish, which would also come in handy for hulls and floats in the waterplane sphere.

Dopes, etc., are available in 2½ oz., 5 oz. and ½ pint tins at moderate prices, with the gold and silver varieties coming in either jars or tins. We used the gold dope for a job and found its covering qualities remarkable, and when we came to remove the cork from the jar at a later date, found its adhesive qualities even more remarkable. Nothing would budge the cork which, even under our skilful handling of a corkscrew, eventually broke away. All of which goes to prove, as our old Petticoat Lane friend would say, " All good stuff ! No rubbish ! "

Wolf Solder Guns & Soldering Irons

Messrs. Wolf Electric Tools Ltd., manufacturers of the well-known Wolf Tool have recently added to their range of soldering equipment with the three straight handled irons illustrated below. Bits are detachable and various alternative shapes can be fitted to suit all needs and tastes.

The heating elements are designed to concentrate heat on the working point, providing a rapid and constant heat. Prices are moderate, ranging from £1. 2s. 6d., while spare elements and bits can be obtained at from 5s. 6d. and 1s. 6d. respectively.

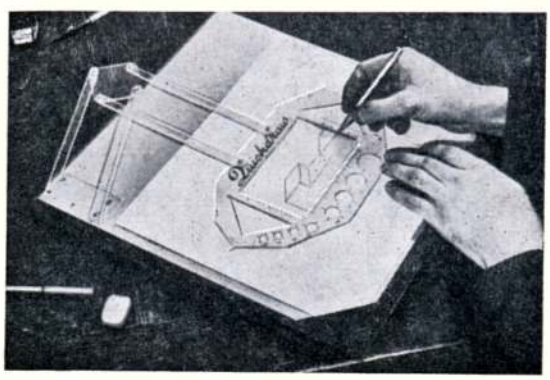


The QUICKDRAW drawing device

The Quickdraw is an item that can help many a modeller to sketch detail design or produce scale drawings of proposed designs.

A light rigid board, contained in a rexine folder 14 ins. square, is fitted with a transparent plastic pantograph. Templates so shaped that lines can be ruled at any angle and circles from 1/16 in. to 1 in. diameter drawn without the need for compasses, are included in the pantograph, which can be swung to cover any part of the board.

The price is 63/– complete, including post and packing, from the Quickdraw Company, 127, Gunnersbury Avenue, London, W.3.



Readers' Letters

The "I's" have it!

DEAR SIR,

On looking at the cover picture of the January issue of the AEROMODELLER I notice that the word "EXHIBITION" has been spelt less the "I" between the "B" and the "T". I am most interested to learn if this was a genuine error or if it was meant.

Why are there no more "Tall Stories" published?

Staffs. D. C. JOBERNS.

No, believe it or not, the Epsom Club actually displayed the poster in question. Another reader wrote, "Only people have two eyes: Exhibition has three!".

As for "Tall Stories", our readers seem to have exhausted their stocks, which we can hardly believe of aeromodellers. We are in any event open to receiving more and mention that each one published brings the sender a year's free subscription.

Wrong Firm

DEAR SIR,

I was very surprised to see an error in your Christmas issue.

On page 751, "Aristocrats of Aeromodelling", you refer to photo No. 10 as a "Grumman Seabee"! Please! The correct name is "Republic Seabee". Forgive me if I am mistaken.

Malaya. N. D. PRICE.

Reader Price is not mistaken, and we have had a duplicate of the Epsom & D.M.A.C. cap placed on a certain editorial desk!

F.A.I. Rules

DEAR SIR,

You invite readers' criticisms of your comments on the F.A.I. report, with respect to the "unfairness" of timing a glider flight when the line is broken, and allowing a second chance to a power modeller who exceeds a 20-sec. power run.

Well, no power modeller will deliberately attempt to exceed 20 sec. with his timer—though this unit may fail when *beyond his control—but*—a glider can deliberately cut, or break, a towline by violent mishandling when he sees the launch going wrong—and thus by unfair means *within his control*, ask for a second attempt, if this is allowed.

Braintree. P. HEWITT.

Team Race Rules

DEAR SIR,

In my opinion team racing is not what was originally intended. The models just comply with the rules (if that) and some have no resemblance to scale models whatsoever. I would like to see a tightening of the rule "Scale or Semiscale", as I have seen very few scale models, and the semi-scale models can hardly be called such; or failing that, split the races into scale and semiscale. I would also like to see rules for "bipes" which would be definitely more scale. The wing area could be reduced by 10 per cent. to account for the loss of speed. The line length could be longer in Class A as it is nearly a race for the pilots with the present length.

I would like to see other people's opinions.

Sidcup Aeronauts. M. SEMPLEMAN.

We agree that many present-day team racers should be disqualified on appearance well before the start of the race. A tightening up by the judges would be the answer here. Yet another team race rule amendment comes from reader Chessell, who writes;

... I think the time has come when some revision might be made in the existing rules. As the Class A ruling stands the 1·5 c.c. engine stands little chance of winning any race in which 2·49 c.c. jobs are entered. Notably the E.D. 2·46 and Elfin 2·49 powered racers are certainly getting too fast for the 42-foot lines. If the Class A ruling of line length were increased, as was recently suggested, it is doubtful if the smaller racer could fly without an element of danger to the other contestants.

N. Kent. K. J. CHESSELL.

The Junior Question

DEAR SIR,

I was very interested in the article "The Junior Question" in the 1951 Christmas issue.

I know the problem quite well, but I know it the other way round, too! Unlike the case in Great Britain, the overwhelming majority (over 90 per cent.) of Israeli modellers are juniors of 13–17 years. Nevertheless, the question as presented by the writer of the above article has nor arisen here, perhaps partly because we did not recognize it as a problem.

I wonder how the older modellers behaved as juniors (including the above-mentioned writer, if ever he *was* a junior) did they quietly do as they were told by their aeromodelling betters? "Boys will be boys". If they are keen, they will improve, like certain beverages, with time and age. If not—they'll drop. Nevertheless I agree that something must—and can—be done. But firstly please don't patronise the youngsters! They won't appreciate it.

Secondly the Editor is quite right in advocating separate Junior Nights. By the way, with us it's separate Senior Nights, and any junior making a nuisance of himself is unceremoniously kicked out by the s.o.h.p.; neither are disturbing seniors welcomed by the juniors.

Thirdly, try to announce special nights "only

continued on page 179

TIP TALK

By K. Rutter

A VISIT to any free-flight model contest will reveal that there are two separate schools of thought about the shape wing and tail tips ought to be. You may see an exponent of the " square tips and no nonsense " fraternity who has cut his wing off short at its allotted span, probably with a ¼ in. sheet rib sanded a bit. If you ask him if he finds induced drag troublesome he will probably reply : " Induced drag ? That's theory isn't it ? I don't go in for that stuff "—and score a maximum before your very eyes.

Or you may see a young man with a somewhat strained expression, and very likely long hair and sandals, who has evidently taken great pains to produce beautifully tapered and rounded wingtips. If you ask him why, he will briskly say : " Induced drag, old chap, cuts it down ". If he's honest he will probably add : " Besides, it looks better ".

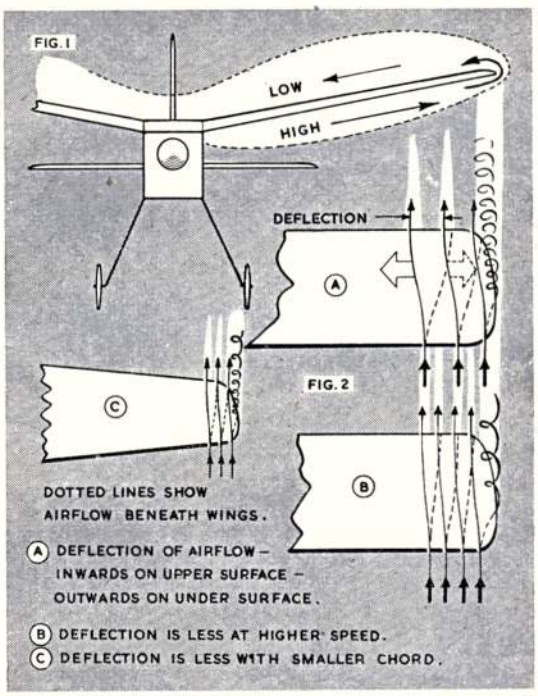
To determine whether it is better to have square cut or rounded tips is quite difficult and our leading designers are at loggerheads on the point. One will say round tips ought always to be used. Another will say square tips are the thing. A third will come second in the Wakefield Trophy Contest with an aeroplane whose wingtips are partly rounded and partly square cut. You just can't go by the experts.

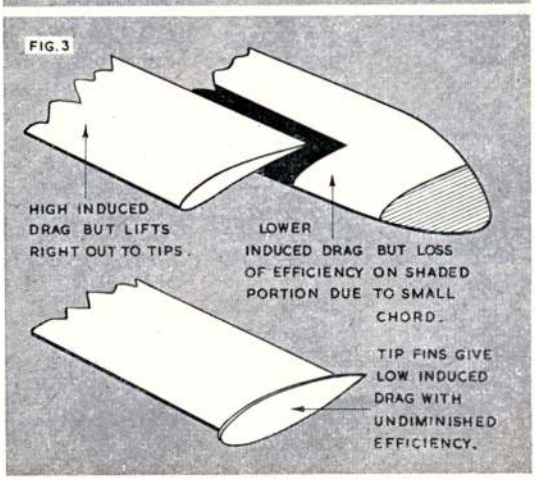
Recourse to Theory of Flight, which has been worked out to explain the phenomena associated with full-size aeroplanes, and may or may not be true for models, is depressing.

It appears that above the wing in flight there is an area of low pressure air. Nature, it is said, abhors vacuums, and although this area of low pressure is certainly no vacuum, the principle is there, and air tends to flow inwards from all sides to even out the low pressure. The forward and backward flow (chordwise) tend to cancel each other out and we are left with a movement inwards along the span from the tips towards the centre-section, which deflects the airflow over the wing, inwards (Fig. 1).

The opposite happens underneath the wing, where there is relatively high pressure. The air there tends to spread outwards towards the tip, deflecting the airflow outwards. This deflection of airflow over and under the wing, tends to impart a circular twisting motion to the air at the trailing edge. Naturally the sideways movement of the air, and the deflection of the airflow, are greatest at the tip, and here there is even a tendency for the higher pressure air under the wing to roll round the tip into the lower pressure air on top.

All this builds up into a spiral or vortex of air which streams back from the region of the wingtip. It requires some force to make the air twist round over itself like this and the only force we have available in flight comes from the motor. Thus we





are using some of our motor thrust indirectly to produce a perfectly useless spiral of air, which is most unsatisfactory.

The fierceness of this vortex depends in the first place upon the amount of deflection imparted to the airflow under and over the wing. The deflection is the resultant of the sideways motion of the air due to pressure distribution, and the airflow over the wing which is dependent on the speed of the aircraft. The sideways motion can be considered as more or less constant, and so the faster the airflow, the less deflection there will be. In this respect, induced drag is different from all other drag as it decreases with increased speed.

The deflection is also dependent on the size of the chord. The larger the chord, the more deflection of the airflow there will be at the trailing edge. This means of course that for a given area, the higher the aspect ratio the better.

The overall picture then is that to combat induced drag we need a high flying speed and a high aspect ratio. It is well-known that from other points of view duration models prosper best when flown as slowly as possible, and that the smaller an airfoil is made, the lower becomes its efficiency. This sort of thing is an example of why serious aeromodellers occasionally jump in rivers.

So we are now back where we started. Induced drag occurs mainly at the tips of the wing or tail, and the theory is that if you reduce the chord at the tip by using taper and making the tip round or oval so that the deflection of the airflow is smaller, you will cut down the size of the vortices. This can be indicated to some extent in wind tunnels.

The big snag is that by reducing the chord at the tip the efficiency of the airfoil is reduced. Below about 3 or 3½ ins. normal-shaped airfoils have a very poor efficiency indeed and this lowers their stalling angle. Unless washout is used, therefore, the tips will stall before the rest of the wing, which is poor as far as stability goes. In addition, the loss of efficiency at the tips means, in effect, less wing area or a higher wing loading.

Possibly the happy characters who never bother about theoretical considerations, have got something after all. They have a parallel-chord. Square-tipped wing with two whacking great spirals streaming back from it, but at least their wing is lifting right out to the tips. Two years ago when an incident with a sabotaged winder compelled the writer to build a Wakefield wing rather quickly just before a contest, a square-tipped parallel-chord one was built because it was easier than the round-tipped tapered original, and performance was improved slightly under evening air conditions.

Probably the best way of stopping higher pressure air from rolling round the tip to the top surface of the wing is to build a fence in the form of a wingtip fin. These were very common two or three years ago but are rarely seen now except on tails, in England at least. Some well-known Scandinavian modellers still use them (Fig. 3). In this connection it is interesting to note that the Lockheed firm reported a slight increase in top speed when their Shooting Star jet fighter was equipped with long range tanks—large streamlined objects stuck on the tips of the wing.

To sum up then, you can deal with induced drag in three ways. You can use taper and round off your wing tips, but you will suffer an effective increase in wing loading thereby, because of reduced efficiency at the tips. You can ignore induced drag altogether, and build a square-tipped wing, which will at least be efficient along its whole span. Or you can revert to the fashion of two or three years ago, and use tip fins. Take your pick.

READERS' LETTERS (*Continued from page* 177)

for serious modellers ". This will boost attendance.

Fourthly, arrange junior comps. which will free them from the apprehension engendered by the too experienced seniors.

Then there are the preventive measures—limiting membership to those which have built at least so many models during the season. But here's a word of warning in this connection : there exist members who are simply not so much interested in building and flying, but rather in theory, yet can make valuable club members if properly taken in hand.

Give the juniors certain responsibilities—as club storekeepers, flight assistants for glider or rubber, or even power flying, etc.

Here in Israel we have a most excellent bait which in the majority of cases converts an unruly junior into quite a serious fanatic : we simply take our Nord " Norecrin " four-seater or one of the club's Piper Super Cubs and give the whole bunch of juniors of any branch of the club a flip from the nearest airfield. First they behave well in anticipation, and after the flight they are converts in the fullest sense of the word.

On the whole I must give our juniors the credit of being interested in almost anything an older modeller can teach them (though of course the way of its being taught is most important). If the standard of model flying in this country is not yet high enough, it is because the seniors able to teach the juniors are very few, as aeromodelling is quite new in this country, which itself is only three and a half years old !

Israel Aero Club. N. KADMON.

CLUB NEWS

Dave Hughes took this picture of Doug Marsh's Mills ·75 powered Hawker Hind being judged at the Merseyside Exhibition on Jan. 7–12th.

COMMENCING this month, Club News takes on a slightly different format, and in future club reports will—as far as possible—be grouped into sections headed by Area Reports, where such are forthcoming. In this way the activities in various sections can be better estimated, and individual reports will be easier to find by reference to the bold type Area headings.

Scottish clubs are invited to forward news for inclusion in a separate " North of the Border " page, which we hope to introduce in our next issue. For the time being our Irish friends must continue to be accommodated in the Club News columns, but at such time as their numbers produce sufficient reports, an Irish Page will be introduced on similar lines to that contemplated for our keen Scottish readers.

Before commencing the current batch of reports, however, may I remind readers that Messrs. P. E. Gregory & Son (Alton) Ltd., 9, Anstey Road, Alton, Hants, are still holding a power model that was apparently lost at the rally held at Odiham last year. It's time the owner claimed his property !

South Midland Area

The Area Secretary apologises to the Chorleywood Club for announcing a premature disbanding—the cry of " Good old Chorley " will still ring out from time to time ! A welcome addition to the S.M. Area is the Wayfarers Club, who have transferred to their rightful sphere of activities from the overcrowded London section. (This also ensured continuing service of Treasurer Johnny Lamble !) The Area awaits the stepping forward of a public spirited type to undertake the onerous duties of Comp. Sec. The former bod says he is going to do a spot of flying this season, which is fair enough, and it's time some of the flying-time-hogs came forward and did a bit towards general organising.

Four members of the **HENLEY M.C.** made the 120-mile round trip to Fairlop for the " Bill White Memorial " comp. and the accompanying glider contest. This is the first time the club has been represented at this event, and though they didn't top the list, good performances were secured. J. G. Waldron and A. W. M. Cooke entered the glider comp. and returned times of 6 : 23 and 5 : 26 aggregate respectively, flying own design A/2 models that reached full line height with fast, straight tows, but in common with many others, all their flights were o.o.s. in the prevailing mist. Cooke also flew his Wakefield in the " White " event and scored 5 : 31 for the three flights.

To counter falling membership, the **ABINGDON & D.M.F.C.** have mapped out a programme of various attractions in order to recruit new members. Most important of these is a display of numerous models in the window of a local model shop—all provided by the seven stalwart founder members. This display will be followed in March with a Control-line exhibition in the Market Square (!)—team-racing and stunt only, they cannot get permission for speed ! ! Their radio control " expert " built both his transmitter and receiver, and weighed them both. Result—the transmitter, complete with batteries, weighs 2 ounces less than the complete receiver and relay. What a geezer !

Ireland

The annual Club Precision Contest of the **BELFAST M.F.C.** was held on Boxing Day at Sydenham Aerodrome, when a record number of both competitors and spectators attended. It was a fine but misty day with little wind, and afforded almost ideal conditions. R. Armstrong of the Belfast Club proved winner, with his clubmate Gordon Drew second, Smith of North Down placing third. The Belfast Club are co-operating with the R.A.F. group in organising a control-line meeting at Aldergrove on the first or second Sunday in March. Those interested should contact R. McIvor at 52, Cedar Avenue, Belfast.

South Wales Area

The **CARDIFF M.A.C.** held a free-for-all scramble open to all types (I presume both models and modellers!) at St. Athans on the 6th January last. A 20-second minimum and 3-minute maximum were imposed, the winner proving to be a new junior member, Brian Holeman, who flew a tailless glider for a total of 13 flights and recorded a flight total of 5 : 56 in the allotted half hour. P. North was second with 5 : 46 for three flights with his notorious " Zebra " pylon model. Luckiest man in the club is J. L. Webber. His " Southerner " was lost last June, and remained treed until the 20th December, when the job was retrieved. His engine started almost immediately, and only a few tissue patches were necessary to make the job flyable ! S/Ldr. Verney is doing some fine R/C work lately, using a " Junior 60 " with B.B. Amco aboard. With the St. Athan airfield now available, the club has hopes for a really successful contest season. Fairwood was rather a long trip for test flying ! !

Midland Area

Negotiations are under way to fix various venues for the all-important Area contests, and due consideration is given to the distances some have to travel. A Winter Knock-out Contest is in operation, and it is

S. A. Watts, Secretary of the Northampton M.A.C. collects a trophy from Mrs. Houlberg at the Club dinner. Looking on are, left, Clubman himself, and right, Alec Houlberg, Chairman of the S.M.A.E.

hoped to report progress in the next issue—also news of the Boxing Day Glider Rally staged by the Solihull boys.

LEICESTER M.A.C. have an ambitious winter programme in full swing, with meetings every Wednesday night. One interesting event is the construction of a simple commercial rubber kit, which will be judged in three stages : uncovered, covered and painted, and finally flying. Points will be awarded at each stage, and separate classes operate for seniors and juniors. Kits are purchased in bulk by the club, and can be paid for in instalments if required.

The **FORESTERS (Nottingham) M.F.C.** winter C/L contests are now complete, with Duggie Bolton winning the speed event and both team races, " mechanised " by Jimmie Weston. Mike Crawforth had bad luck in the Class A event, breaking his tailplane on the way to the field, and despite—or perhaps because of—hasty repairs, it gave up the ghost when he was easily winning. There is a glut of " Ambassadors " in the club, and Dick Noble won the stunt event with his version. The club building hut has at last materialised, even though the R.A.F. have recently moved into Tollerton aerodrome.

A club not often heard from is the **BELPER & D.M.A. & E.C.,** who have had quite a good 1951 season, flying against a number of near local clubs. R.T.P. flying is gaining in popularity, but free flight indoors is out of the question owing to lack of space.

SMALL HEATH M.A.C.—who have yet to make their mark in National comps.—have one of the best equipped clubrooms that an aerobod could wish for. Meeting every Friday at an Educational Institute, where they run a modelling class, they have at their disposal a fully equipped woodworking shop, also a metal and machine shop containing lathes, welding, drilling and polishing machines. First multi-engined job to be built in the club is a scale C/L " Lightning " of 36 ins. span, and sporting two opposed E.D. Comps. Constructor is R. Lidger, who made many a hair-raising flight with the job on 50 ft. lines before disposing of the model to acquire a Yulon 49. Small Heath have a good reputation for control-line demonstrations, " anywhere, any time " being their motto.

Southern Area

For the second year in succession, Bill Childs of the **WINCHESTER M.A.S.** won the club championship, he and Peter Ivory having a good scrap which was enjoyed by both of them. (There is no truth in the rumour that in the event of a tie they were going to fight it out with steel pointed chuck gliders at 20 ft. !) This championship is conducted on a points system throughout the season, and takes some consistent flying to get to the top. This club still continues to have great fun flying miniature free flight all-balsa jobs indoors, and models are now limited to scale types with a maximum span of 7 ins. The comp. sec. is busy thinking up impossible evolutions to be performed—though some seem to be able to cope without any bother ! !

A new club, the **FARNBOROUGH S.M.E.,** will be holding an exhibition in the Old British Restaurant, Clock Tower, on February 23/24th from 11 a.m. to 9 p.m. daily. The society has a small but growing aeromodelling section, and new members will be welcome.

Good and continued progress is reported from the **WEST HANTS A. ASSOC.,** and I congratulate the " culprits " responsible for a very well produced and interesting club mag. Membership is maintained at a healthy level, and the standards of both flying and construction have greatly improved in the past year. Though not a contest-minded club, a good attendance has been available for many local rallies, and one or two prizes were collected. This club has a strong junior section, one of these being G. Nicol, who won both the junior and general contests for the club season.

Scotland

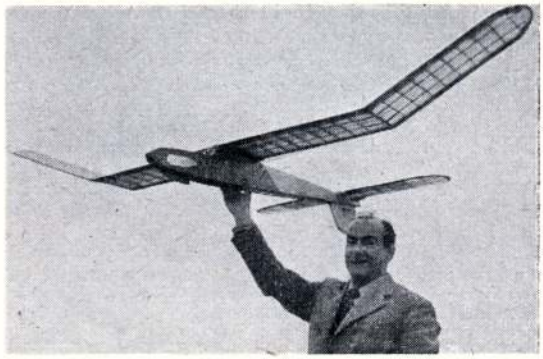
The U.K. Challenge Match has certainly stimulated interest in Scotland for the " centralised " class of contest, and we hear of suggestions for further grouping of various contests on a more general basis than exists at present. We shall publish full details of the scheme at such time as the various bugs have been ironed out, but pledge our full support now for any scheme that will increase the ability for the scattered clubs to get together on a full group system.

WEST OF SCOTLAND AREA report good progress, and a deficit in funds of £4 was turned into a profit of £19 as a result of the above-mentioned contest —and they were worth it, too, in view of the amount of work that had gone into the meeting. The Area has unfortunately lost two of its most ardent officers in the shape of Mr. Simpson (comp. sec.) who is going abroad, and their former Treasurer, Bob Burns, whose continuing bad health compels him to hand over to a new man. Glasgow Barnstormers were the eventual winners of the 1951 Team Racing League with 3 wins and 1 loser, Glasgow M.A.C. being runners-up.

The A.G.M. of the **INVERNESS & D.S.M.E.** took place on the 14th January, when good progress and financial stability was reported. Future meetings of the group include : 11th February, " Photography and Models ", 10th March, " Naval Architecture ", and 14th April, " Radio Control of Model Aircraft ". All meetings take place in the Royal Hotel, Inverness, commencing at 7.30 p.m.

Western Area

Indoor flying is finding support with the **BRISTOL & WEST M.A.C.** Small outdoor machines wend their way r.t.p., and Jetex 50 scale jobs cavort like flying fish, adding both interest (and smell) to the proceedings. A twin rotor helicopter driven through bevel gears by a rubber motor shows signs of becoming airborne ! A. V. Coles has been trying out a system of control from outside the circle which may well mean



Left, M. Green (Men of Kent), winner of the Bill White Cup, with his 45 inch long Wakefield. Below, S. Davis, President of the Croydon Club, with the sailplane that gained him a first in the Blackheath glider event. Model is 8 ft. span, uses a Got. 301 section and a symmetrical tailplane.

the rebirth of serious r.t.p. flying.

London Area

The Area has been having some hard knocks lately, what with restrictions at Fairlop, and reluctance of individuals to accept office. Congrats. therefore to Malcolm Young who has stepped in and undertaken the difficult duties of Secretary to this important section. Ken Brett continues as Chairman, and D. Hewitt of Blackheath takes over (probably) the worst job of all as Comp. Sec. We learn that Green of Men of Kent won the " Bill White Memorial Cup ", with Ron Warring and Johnny Gorham chasing him closely.

The **CROYDON & D.M.A.C.** Annual Gala will take place this year on Sunday, April 13th, at Fairlop, and a cordial invitation is extended to all clubs to attend. Contests will be for Rubber, Glider and Power, and full details may be obtained from H. E. Setterfield, 61, Brighton Road, Croydon—but send a S.A.E., please.

Members of the **REGENTS PARK M.F.C.** had a most enjoyable evening at their recent dinner-cum-social, when cups and other prizes were presented by the Presidents, Councillor and Mrs. Gore. Miss Young —only lady member of the club—received a presentation from the club for the good work she has carried out. Members who attended the White Cup contest are quite satisfied with their start to the 1952 season.

The **DAGENHAM M.A.C.** postponed their team-racing comp. from Boxing Day to January 6th, when the finals proved most exciting with all models lapping at over 65 m.p.h. As none had previously experienced flying four in the ring, they had some hectic moments, but nevertheless managed to cover the 10 miles with only one crash. R. Stubbs was the winner with a modified stunt machine of 250 sq. ins. area and powered with an Elfin 2·49. John Meningham has been experimenting with rubber powered helicopters, and has already managed a flight of 35·4 seconds.

Now about 30 strong, the **THAMES VALLEY M.A.C.** has been airing quite a few new models, and still more are promised. Some twelve members turned up for the White Cup, and gained a third, and—subject to settlement due to a timekeeping mistake—a Junior first in the Glider event. Biggest laugh is the fellow who sat up till after 11 p.m. the night before to complete a new Nordic, turned out with three models, and then decided it was too cold to fly !

Membership in the **WEST MIDDLESEX M.A.C.** has changed quite a lot in recent months, but a marked settling down is noted, and the new season is eagerly anticipated. As a novelty, jack-pot contests are organised weekly, entry fee of 6d. for three flights with any type of model—winner takes the kitty.

East Midland Area

The **HOGSTHORPE, SKEGNESS & D.M.A.C.** has entered on its most active part of the year, for most of the senior members are unable to do much during the summer owing to seasonal work. Younger members kept things going well last year, gaining two places in the Trials and one in the Championships, finishing the season well when K. Horry and M. Stow took second and third place to Gorham in the rubber event at the Cranwell Gala.

Northern Area

To ease the " panic " at the start of Area meetings, pre-entry is now insisted upon, with late entries paying an additional fee. This system is a great help to the organisers, who only know by this means what they have to deal with at any particular meeting. Congratulations to Pete Stringer and Sylvia Bell on their recent marriage—though there is some speculation on how long the Area Sec. will be allowed to strew the new home with balsa chippings ! It is possible that all the Area contests will take place at Rufforth.

DARLINGTON M.A.C. announce the acquisition of new clubrooms, which are a great improvement on previous premises, both from the point of accessibility and a smaller rent. The club is open Monday to Saturday from 7 to 10 p.m. (except Wednesday), and new members will be very welcome.

Started last November with a membership of five, the **CAER URFA M.A.C.** has increased its numbers to 19, and an ambitious programme is already under way for the 1952 season. One club member can already boast of two o.o.s. flights with his " Southerner ", but fortunately the model has been found undamaged.

Scale fan J. Bridgewood of the **WOODLANDS M.F.C.** is experimenting with a scale auto-gyro, and also has a three-engined Northrop Raider on hand—both of which we look forward to seeing during the year. The club held the last of its annual contests concurrent with a Control-line display they had been asked to put on by the Council. Standard of flying was excellent in view of a high wind, winner being D. Threlfall.

The past month has seen great activity in the **STOCKTON & D.M.F.C.**, with an A/2 contest

followed by an indoor event. The glider event was held on Boxing Day, when C. R. Plant scored 7 : 07 for three flights, followed by E. A. Harrison, 4 : 02, and C. Hall, 0 : 56. Harrison had the bad luck to have his model drop into a stream whilst trying to recover it from an overhanging tree. The indoor contest was decided on a six flight aggregate of three flights each in r.t.p. and free flight, and times were good considering the cold, draughty conditions. T. B. Chambers proved best man with a total of 12 : 58, made up of 9 : 27 r.t.p. and 3 : 31 f/f, this chap also gaining both his " A " and " B " Merit Certificates with this class of flying.

Another club working hard on the Merit Cert. angle is the **BARNSLEY & D.M.A.C.**, and I congratulate them on a really amusing Xmas issue of the club mag. They have a good cartoonist whose work considerably enlivens the paper. Unfortunately, I just haven't the time to sort out individual items from club mags, so will club P.R.O's please keep this in mind ?

Trevor London has taken over secretaryship of the **BRADFORD M.A.C.**, and the club are hoping to once again regain their former prestige on the contest field. Silvio Lanfranchi and Collinson have produced a really consistent model, which has caused such good comment that it will be adopted as the club model for open contests. The Lees family have also been putting in a lot of time on a new Wakefield, and it is hoped to also adopt this for club use.

East Anglian Area

On December 30th, in a high wind and drizzle, seven clubs competed for the Area Challenge Trophy (team) and the Joan Hooper Trophy (individual). The majority of aircraft were gliders, surprisingly including a number of 11 footers. Individual winner was R. Gould (Southend Senior), flying his own design A/2 " Adastra " for two flights of 2 : 32 and 4 : 04, with Ipswich the team winners with a total aggregate of 11 : 20. Everyone was glad to see George Foden out, about, and flying again after his long spell of indisposition.

North Western Area

The A.G.M. of the Area held on November 11th, saw the resignation of Barry Haisman, Gordon Sleigh and Jack Lowe from office—the main complaint expressed being that they have left their successors an impossibly high standard to work to ! ! Ernis Currington has now arrived in Canada and is already a member of the Montreal Sleepless Knights club. He informs us that the Canadian equivalent of the S.M.A.E. did not know about their " Nationals " until a fortnight after they took place ! ! And we thought we were bad !

The Area Committee wish to make it quite clear that the proposed Radio Control contest to be organised by the International Radio Control Society will form no part of the *Daily Dispatch Rally*, and will in fact be an entirely separate affair at another venue. The Area Championships will take place on the 20th July, winners and runners-up qualifying to represent the Area at the 1952 British Championships.

The Winter Rally staged on Sealand Flats was very successful in spite of unco-operative weather, there being 101 competitors for the Glider event, 88 for Power, and 33 for Rubber. A couple of Midland Area fliers invaded the latter event and took top honours, the full results being :—

Glider :	**R. Askew**	**Whitefield**	**8 : 38**
	D. Bennett	**Whitefield**	**7 : 44**
	G. Evans	**Cheadle**	**6 : 48**
Power :	**J. Hawkes**	**North Wirrall**	**6 : 46**
	C. Calkin	**Wallasey**	**6 : 43**
	J. Bickerstaffe	**Accrington**	**6 : 43**
	G. McGhee	**Aintree**	**5 : 29**
Rubber :	**G. Jackson**	**Littleover**	**7 : 08**
	J. O'Donnell	**Whitefield**	**5 : 59**
	T. B. Faulkner	**Cheadle**	**5 : 47**

All events were based on aggregate of two flights. and no less than four 5 minute maximums were scored in spite of the conditions.

The first year of operation of the **TAME M.A.C.** was successful as far as flying is concerned, though lacking in major contest successes. The club has been presented with a large silver trophy, won for the first occasion by W. Delaney Junior, with a 9–1 power ratio.

Main activity in the past month with the **WHITEFIELD M.A.C.** was the flying off of three club comps. using a 3 minute maximum for the contests, and any fly-offs necessary. First event was a rubber class which resulted in a win for J. O'Donnell (two max's and 2 : 58), closely followed by A. D. Bennett (two max's and 2:40). Both were flying long-prop-run Wakefields, and the only reason for dropping below the maximum mark was poor visibility and fast rate of drift. Next came the Power Ratio contest, which combined drizzle with haze and a high drift rate. Winner was Bob Woodhouse flying an o.d. Elfin 1·49 lightweight that managed a three flight aggregate ratio of 29 : 68. Next—and unluckiest—was Bennett with 24 : 3 for a two flight effort. Last came the FAI Glider event which produced some remarkably consistent flying. Four competitors recorded three maximums and took part in the fly-off. J. O'Donnell won with 5 max's and 2 :18, followed by R. Askew (5 max's plus 2 : 05). By the time the contest finished darkness had cut the visibility of a 9 ft. glider to two minutes odd.

The **MERSEYSIDE REGIONAL COUNCIL OF M.A.C.'s** held their 4th exhibition during the week 7th–12th January, chief credit for its success going to hard working Dave Hughes of Wallasey, who put in a great deal of his own time, and used much ingenuity to make up for the inexperience of most of the remainder. Judging was left in the hands of Bob Gosling and Gordon Pearson, with the following results :—

Sailplanes	**R. A. Alexander**	**(Wallasey)**
Rubber	**D. R. Hughes**	**(Wallasey)**
Power	**H. Hughes**	**(Wavertree)**
Scale	**S. Rymill**	**(Wavertree)**
C/Line	**J. Eastwood**	**(Wavertree)**

Three members of the **ST. HELENS M.A.C.** took 13 models to the above exhibition, travelling the 12 miles to Liverpool in an ancient Morris 8—without damage ! Senior champ. for the past season is J. Turner, with D. Rigby taking junior honours.

South Eastern Area

HASTINGS & D.M.A.C. announce a social and dance to be held on February 16th, though I trust this announcement is not an invitation to gate grashers ! Top men for the past season were M. Kenwood (glider), T. A. Skinner (rubber), J. Tucknot (power) and D. K. Webb (C/line).

The current news sheet from the **SOUTHERN CROSS A.C.** lists a whole string of club records, top duration being in the towline glider class, where Bill Gravett's time of 29:20 looks like standing for some time.

And so, that's the lot for this month, with the exception of a request from Sr. Jesus Salazar G. of Sabino 142–2, Mexico D.F., editor of the local model mag. " Motor y Alas ", who wishes to correspond with British aeromodellers to exchange photos and ideas.

Finally, will all club P.R.O.'s please indicate which Area they operate under when sending in future reports, for I dread the day I " credit " an Area with a good report that should have been placed in another section !

The CLUBMAN.

"TIME MARCHES ON"

The 1952 Gamage Cup will be flown at the end of March. Choose YOUR entry here —

D/416 HEREWARD. 42" span Wakefield by Norman Marcus. This model has done well in contests during two seasons. **3/6**

D/420 TOPSY by Norman Osbourn. Successful Irish Wakefield of 44" span. A streamlined slabsider. **5/6**

D/430 TRUMP CARD. A lightweight contest model of 30" span by F. G. Draper and A. R. McClean with a good record. **4/–**

D/378 THERMAL QUEEN by Ray Jessop. 54" span Queen's Cup design of 295 sq. ins. area. Pylon-mounted wing. **5/6**

D/382 TALISMAN MK. II. High performance F.A.I. model of 37" span by L. W. V. Turner. Pylon wing and twin fins. **3/6**

D/348 BAZOOKA. N. G. Marcus' winning F.A.I. model with consistently high times. 29½" span. **3/6**

D/253 RAFF V by Norman Marcus. An early successful light-weight by this established designer. 32" span. **3/–**

D/371 WITCH MK. I. Wakefield of high average duration by George Woolls. 45" span, of robust construction. **3/6**

D/234 ROCKETEER. R. A. Parker's parasol wing performer with the lifting fuselage. 36" span. **3/–**

D/233 DUSTY MK. VIII. Of simple construction, R. J. Miller's model has a fine contest record. 38½" span. **3/–**

D/294 LIGHTWEIGHT by Ron Warring. 38½" shoulder-wing model in the Warring manner. Simple construction. **3/6**

D/463 FLIP-FLOP. Ron Warring's latest lightweight. A 36" span model which will make its mark this year. **4/–**

D/220 HOPPITY II. 30" span ultra-lightweight. Loses nothing in performance by inexpensive construction. **1/9**

D/227 MICK FARTHING'S LIGHTWEIGHT. An old favourite with a well-established performance. 34" span. **2/6**

D/311 ARISTOCRAT by Ed. Stoffel. Good looks and winning ways are combined in this 43¾" Wakefield design. **3/6**

D/257 FILIBUSTER. This medium weight contest model was the outcome of four years' development. 30" span, by Ted Buxton. **2/6**

AEROMODELLER PLANS SERVICE

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CLASSIFIED ADVERTISEMENTS

PRESS DATE for April, 1952 issue, March 20th, 1952.

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FOR SALE

Ohlsson 23 with electrics, as new, 85/–; Elfin 2·49, not run in, 65/–; Frog 500, 45/–; E.D. Mk. III, new cylinder and piston, 37/6; E.D. Comp. Special, new cylinder and piston, 35/–; Elfin 1·8, 45/–; Mills 1·3, 35/–; Mills 1·3, new cylinder and piston, 40/–. Pidgen, "Beanlands," North Thoresby, Grimsby, Lincolnshire.

E.T.A. 29, 95/–; Arden ·099, 50/–; Rawlings 30, 80/–; O.K. Co2, 45/–; all in perfect condition, not run in. Webley Mk. 1 pistol, near perfect, 65/–. Steele, 98, Fidlas Road, Llanishen, Cardiff.

Complete set "Aircraft of Fighting Powers," as new, cost £8. Offers over £3. 10s. 0d. Powell, 852, High Road, Tottenham, N.17.

Elfin 1·8 diesel, 30/–; Yulon 30, Glowplug, £2. Both good running order. Offers considered. Rooney, 90, Sycamore Road, Smethwick, Staffs.

AEROMODELLERS, March, 1945–April, 1950, complete, plans, nine books, two 15 in. airscrews. Good condition, value £6. Nearest £3 secures. Mottershead, 8, Hawthorn Walk, Wilmslow, Cheshire.

New E.C.C. 950A Receiver with spare valve, 60/–. Unused E.D. 3·46, 50/–. Box. No. 352.

Vols. I–V and VII A.F.P., "The Book of Westland Models" (Stubbs), "Practical Design" (Mawby), "Aircraft of the Air" (Eric Sargent), "Aircraft of the United States" (Savile Sneath), £7. 10s. 0d. the lot, or sold separately. Box No. 350.

AEROMODELLERS, May, 1945–July, 1950, 61 numbers, new condition, 30/– or offer. Ashmole, 13, Wentworth Drive, Dartford.

Frog "45" fitted 1·49 Elfin, £3. 5s. 0d.; Veron "Cardinal" fitted E.D. Bee, £3. 0s. 0d. Both new. Bradley-Watson, Windmill Cottage, Aythorpe Roding, Dunmow, Essex.

Radio control KK Falcon (uncovered), E.D. 3-channel, set, S. Cyclone engine, air wheels. Nordec powered Goshawk, E.D. powered Magnette. Fuels and accessories, Offers? Would prefer to sell complete lot. (Note, R/C or model not used). P. J. Fletcher, "Denaryn," Raleigh Hill, Bideford.

Icarus with McCoy 60 series 20, £8. 10s. 0d. Junior Monitor with Elfin 1·8, 65/–. Musketeer with E.D. 3·46, 90/–. Slicker 60 with Frog 500 G.P., 60/–. Interested in Movie Projector, 9·5 mm. Green, 42, Chinnor Road, Thame, Oxon.

Dooling 29, Fox 35, Fox 29—£9 each. McCoy 60 Series 20, £12. Box No. 354.

Two Amco 3·5 Glos, 50/– each. Frog 160, 25/–. Arden 199 B.B., 70/–. All as new. Hirst, 48, Church Street, Gawber, nr. Barnsley.

Allbon Arrow 1·49 c.c., excellent condition. 40/–. Jetex "50" Unit complete, 9/–. D. Barnes, Main Road, Challow Station, Faringdon, Berks.

"Aeroplane Spotter" complete (but no index to Vol. VIII), good condition. Offer to Cameron, Burnt Chimney Farm, Telham, Battle, Sussex.

Krystal Kleer Canopies for your models. Accurate, perfectly moulded, crystal clear. From 9d. for 1/72nd scale Sabre. Whatever you need, we can supply. S.A.E. please Box 355.

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New, or near new, Glowplug McCoy 60 Series 20. Replies to R. Applin, 240, Hall, Road, Norwich.

Jetex 350. Please state price and condition. Box 351.

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Have you tried Ray's Model Stores, run exclusively by modellers? All leading makes stocked—prompt service whether you call or write, at 157, Infirmary Road, Sheffield, 3.

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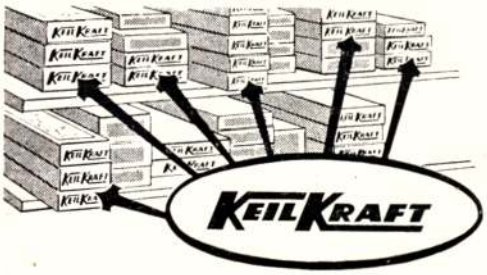

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NEW! Class B TEAM RACER

Pacer

18/4 INC. TAX

Wingspan - - 30 ins.
Wing Area 126 sq. ins.
Length - - - - 20 ins.
Weight - - - - 16 ozs.

Designed by Bill Dean

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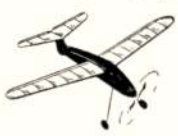

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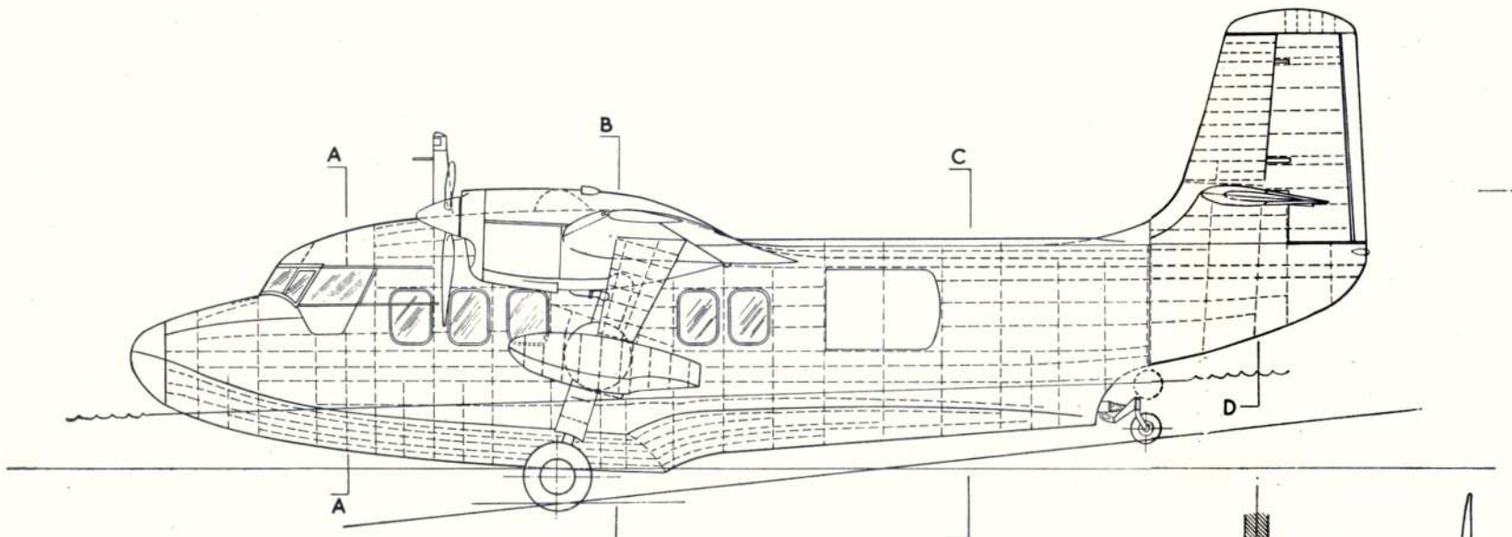

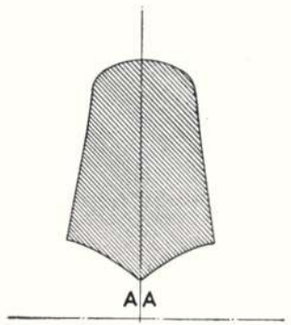

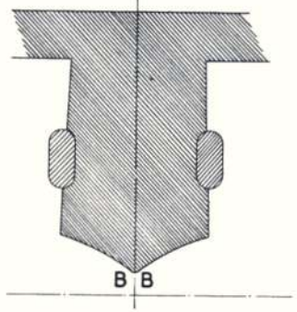

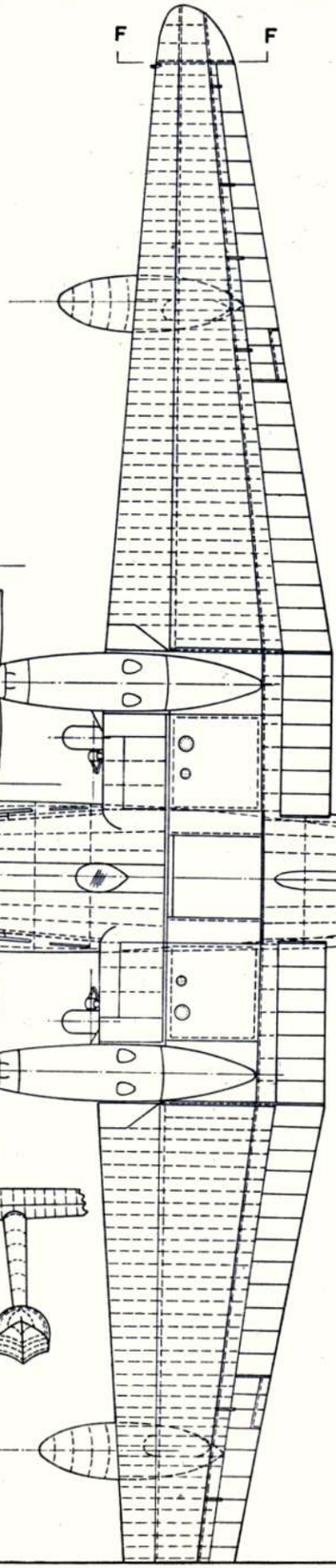

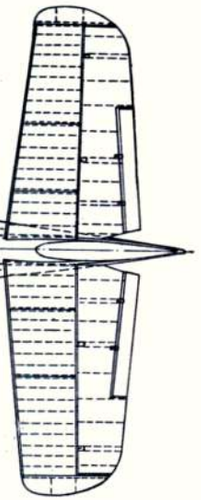

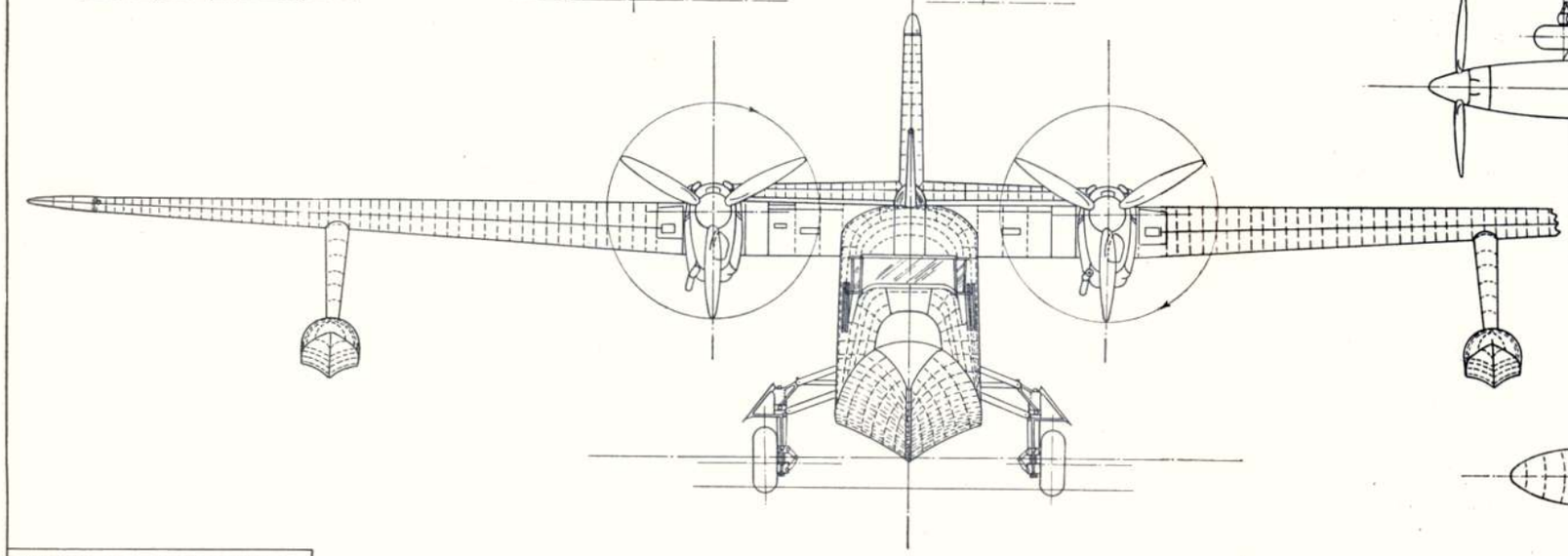

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