AERO MODELLER

JULY, 1952

IN THIS ISSUE ● D.H. 108 SWALLOW FOR JETEX 100 ● LIL ABNER STUNT MODEL ● SULTAN, MID-WING SPORTSTER ● ELECTRONIC REV COUNTER ● AEROMODELLER No. 1 TRANSMITTER ● FULL-SIZE PLANS FOR ·5 c.c. POWER

1/6

Digital Edition Magazines.

This issue magazine after the initial original scanning, has been digitally processing for better results and lower capacity Pdf file from me.

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

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

http://www.rcgroups.com/forums/member.php?u=107085

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

Hip Pocket Aeronautics Gallery Free Plans.

http://www.hippocketaeronautics.com/hpa_plans/index.php

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30 inches long. 9 inch beam (built as illustration)

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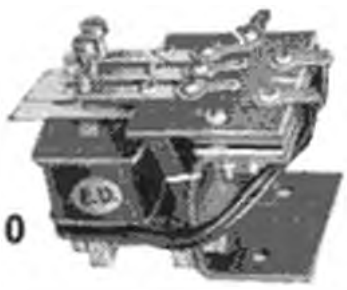

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64 ins. wing-span, suitable for R/C. 1·5–2·5 diesels.
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65½ ins. wing-span, true to scale. Suitable for R/C. For 1·5–2·5 diesels
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● **MALLARD**
48 ins. contest model and many times winner (2·5 diesels).
18/3 + 4/1

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An out-and-out contest design, 65 ins. span. May be flown A.2 or to F.A.I. standards. If you have already built other Mercury Sailplanes, you will particularly like this job. **14/6 + 3/3**

Look how Mercury cater for all classes of Modellers

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An even better version of Mercury classic record smashing C/L design (2–3·5 diesels). **19/3 + 4/6**

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★ **TWO IMPORTANT PUBLICATIONS**
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Orders over £1 post free in U.K. Minimum postal and packing charge 9d. Retail Model Shops abroad are invited to appoint me as their buyer. Details on request.

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The NEW and SENSATIONAL

Lavochkin 17

The plane with the new and amazing "IMP" propulsion . . .

The appearance of this new model has received enthusiastic approval. It is something REALLY new. Phil Smith, Veron's designer, spent over eighteen months perfecting "IMP"—a ducted impeller. The Lavochkin La 17 is an exact replica of one of the world's most up-to-date fighters. This famous Russian plane has been chosen because its form allows for ease and lightness of construction, coupled with inherent stability of a high order. It's a sheer joy to watch it fly!

DATA:

Span 37 ins., length 34 ins. Designed for use with Diesel or Glow Plug motors from .5 c.c. up to .87 c.c., such as the Allbon "Dart" .5 c.c., Frog 50, Elfin 5, Mills .75 and the Amco .87. The complete kit contains stage by stage plan, READY MADE IMPELLER and STARTING PULLEY. Graded strip and sheet, quality printed woods, and all the materials including moulded cockpit cover, as well as a wonderful photographically illustrated instruction leaflet showing every stage of construction, also hints and tips on starting and flying.

KIT PRICE **30/6** Inc. P.T.

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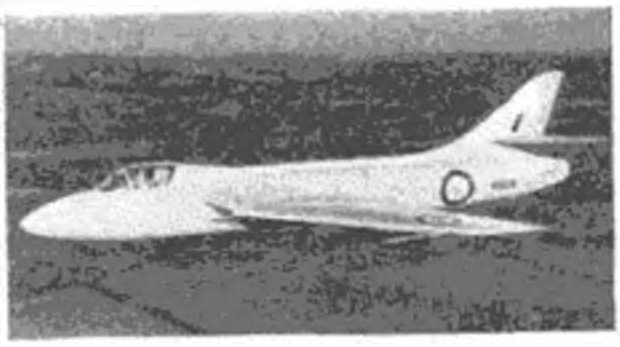

1067-HUNTER

Here's the latest additions to the range:—**Supermarine 508**, "Butterfly" tailed Naval prototype. **Hawker Hunter** (formerly known as 1067), latest fighter ordered for the R.A.F., and **Venom**, one of Britain's "all-weather" fighters; also **B.P 111** Delta 2/6. **Cutlas F7U-1** America's 40,000 ft. in 4 mins. shipboard interceptor, and the Russian escort fighter **LA 17**. Every kit contains completely detailed plan, a masterpiece of authenticity by Phil Smith. Ready-cut parts, ready-shaped cockpit covers, plastic wheels, transfers of insignia—all are included—everything to make a realistic model.

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Hawker P1081	2/6	Cutlass F7U-1 ...	2/6
Vickers 510	2/6	Boulton-Paul P111	2/6
Sabre F-86	2/6	MIG 15 ...	3/6
Supermarine 508	2/6	LA 17 ...	3/6
Venom ...	2/6	Meteor 8 ...	4/3
Hawker Hunter (1067)	2/6	Canberra B.1 ...	6/8

Photographs by courtesy of 'Flight'.

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Applicants from British Isles only.

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58 Plans of FREE FLIGHT POWER designs; 45 Plans of CONTROL LINE Models, including Scale, Semi-scale and functional designs, Team Racers, Speed Models and Beginners' Planes; 27 Plans of POWER FLYING SCALE and 42 Plans of RUBBER DRIVEN FLYING SCALE; 68 Plans of RUBBER POWERED Designs, including Semi-scale, Wakefield, Biplanes, Beginners' Models and Experimental Types; 8 Plans of WATERPLANES—record-breaking Seaplanes, Flying Boats, etc.; 39 Plans of GLIDERS with models in all sizes, contest, pleasure and scale or semi-scale; 20 INDOOR MODEL designs; 5 RADIO CONTROL Models; 7 JETEX and ROCKET Plans 20 UNORTHODOX designs.

OVER 300 of these designs are illustrated with photographic half-tones of the actual models, and in all cases span is given, together with suitable power unit and brief description of the model depicted.

IN ADDITION our unexampled range of AIRFOIL SECTION SHEETS covering 48 of the most suitable model sections are listed with full description.

THIS 56-PAGE CATALOGUE can be your guide to better and more satisfying flying—do not delay in sending off for your copy. Fill in coupon below and send with 6d. Postal Order (or stamps) THIS VERY MOMENT!

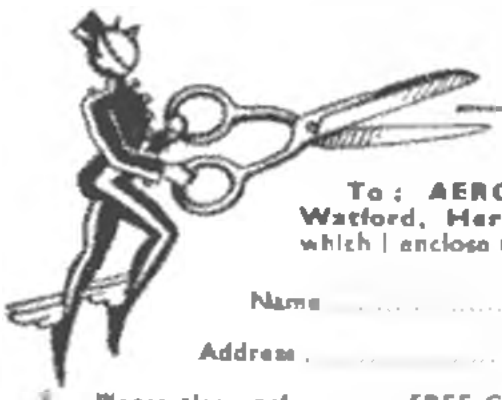
FREE TRANSFERS. Every plan now sent out contains a pair of blue and gold slide transfers of the A.P.S. Flying Planboy to decorate your finished model.

OVER a half a million flying model plans have been sent to aeromodellers all over the world—who have built and flown in full confidence that AEROMODELLER PLANS SERVICE drawings presented the finest models, by the most expert designers, painstakingly set out for exact reproduction by comparatively inexpert builders; or in the case of more complicated designs calling for the more skilful enthusiast, accompanied by detailed instruction sheets in all cases of difficulty.

From a mere leaflet our Plans Catalogue has grown to nearly booksize with its 56-pages packed with illustrations of the most extensive range of flying model plans available in the world. For the convenience of would-be builders designs have been grouped into sections; Power models for example are in no less than six sub-divisions covering both engine sizes and purpose, with further sections dealing with scale models. Each section is treated in the same helpful way, while a list of recommended designs suitable for the newcomer or the not so expert is included.

With the aid of this detailed catalogue that not only illustrates over three hundred of the better known designs, but gives wing spans, and other informative particulars, any aeromodeller, no matter how distant he may be, can order in comfort and confidence by post with the assurance of prompt service. Those happily situated near a model shop can equally order through their usual dealer, and make use of the detailed materials list that appears on most of the larger drawings to order their wants in that direction over the counter.

Our first announcement of the new list last month brought an avalanche of requests; if you have not sent off 6d. for yours, write to-day while our first print is still available—a coupon is included below for your convenience.



To: AEROMODELLER PLANS SERVICE, 38 Clarendon Road, Watford, Herts. Please send me a copy of your New Plans Catalogue, for which I enclose 6d. (in stamps/postal order).

Name .....

Address .....

Please also enclose your FREE Catalogue of Model Boats, Model Cars and other model plans. (*Delete if not required*).

ALL REQUESTS for our catalogue sent in answer to our June issue announcement have now been filled. The catalogue proved to be even larger—56 pages instead of 48— than we had reckoned, hence the slight delay in receiving our supplies from the printers, which in turn held up initial despatches to our readers.

AEROMODELLER PLANS SERVICE

38, CLARENDON ROAD, WATFORD, HERTS.

ESTABLISHED 1935

AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

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"Covers the World of Aeromodelling"

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Contents

Editorial and Advertisement Offices: 38, CLARENDON ROAD, WATFORD, HERTS. Tel.: 5445

PATIENCE REWARDED

IT is only natural for every hobbyist to regard his particular interest as terribly important to both himself and others, and it is a continual source of annoyance when onlookers do not evince the degree of enthusiasm that he considers due to his particular craft. We confess to being decided culprits in this respect ourselves, for it continually passes our comprehension when individuals closely connected with aeronautics display a complete lack of interest in—or appreciation of—the value of aeromodelling, either as an engrossing hobby or a training ground for the Aircraft Industry.

Therefore, it comes as a refreshing breath of fresh air to learn that a major decision taken at the recent F.A.I. Conference in Madrid will in effect make aeromodelling Number One priority on the Federation's agendas for the coming year. The delegates were in unanimous agreement that it is from the ranks of the world's aeromodellers that the best material will be found to man the ever increasing demands of aviation, and whilst this is merely confirmation of an obvious fact to us (who are naturally biased) it is a pleasant thought that at long last the Industry is recognising the undoubted value of encouraging individuals with aeromodelling experience into the realms of advanced aeronautics.

Equally pleasant to our personal ear is the information that the F.A.I. is now seriously considering the holding of a "centralised" type of meeting for the annual World Championship contests. As far back as 1950 your Editor submitted a series of proposals to the S.M.A.E. for consideration, the broad scheme being that all the Championship affairs be held at one venue annually, thus securing a better meeting, and easing the troubles of transport and expense. Though exact details of the scheme now under consideration are not available, we understand that the basic principles are the same and we can now look forward to a grand annual meeting at which all the various World class Championships will be decided.

It is not clear in which manner the annual venue will be selected, but we maintain that a calendar of nations able and willing to hold such meetings could be drawn up, thus duplicating in some manner the system under which the athletic Olympics are conducted. The advantages of knowing beforehand in which country the Championships will take place in any given year are obvious, and will allow for adequate planning by the host country, and those intending to be represented. Under the present system, a number of meetings in various countries have to be organised, and it is not until a particular contest is decided that one knows where the following meeting will take place, and the very necessary preliminaries relative to collecting of funds, etc., can be properly undertaken.

Cover Picture . . . .

Built to maximum F.A.I. size of 16·1 sq. ft. lifting area, this 144-in. span sailplane by D. J. F. Edwards of St. Albans M.A.C. was flown at the Croydon Gala. Pensive launcher is C. Brown, whilst the anxious fuse-lighter is another D. Edwards—all of the St. Albans Club.

The last "Annie"

That dear old docile aeroplane, the faithful Annie of the Air Force, Avro's Anson, has at last been taken off the production line after 17 years on the stocks. Many of our readers will have nostalgic memories of first flights in this historic 'plane of many roles, if only to remember the bind of winding up and down that manually actuated undercarriage, or the clatter of the blister cowled Cheetahs. The 11,020th Anson was delivered to the R.A.F. on May 27th and was handed over by the managing director of A. V. Roe and Co., Sir Roy Dobson, at Woodford aerodrome. Although this will be the last of the line, we can expect to hear Ansons in the air for many seasons to come, reminding us that old soldiers never die, and only fade away when every possible use has been extracted from them.

The Anson started life as Air Ministry specification G 18/35 and went through life as Bomber, Convoy escort, Trainer, V.I.P. Transport and general Taxi-plane in all the Air Forces of the Commonwealth. A number of Marks were made in Canada, and, assembled in Australia, it was known as the A–4. We are sure that by whatever name it was known, aeromodellers the world over will respect the Anson for its magnificent service.

The Postman always knocks Twice

Between one and two thousand eager readers merit our apologies for offering by-return postal service for our new *Aeromodeller Plans Service* Catalogues which will have only come to hand (or so we devoutedly hope) by the time this issue is on sale. We can only say how sorry we are that their enthusiasm should have been so damped and plead our own enthusiasm for the earliest possible circulation of a catalogue which has not been available for so long. Could readers have seen our editorial staff making frantic efforts to get this work to press, with desks and floor covered with two-inch wide illustrations and their hundreds of accompanying descriptions; heard the plaintive cries of "Have you seen the so-and-so picture, it was here a minute ago?"; and, above all, heard the howls of protest as someone left the door open for a breeze to disarrange the tidy piles of sorted items, they would have appreciated our difficulties. Frankly, as a completely revised list, it took far longer than we had expected, or allowed for, and is only now coming along a month late thanks to a lot of overtime and some splendid co-operation by our printers.

However, it is now really ready, and we hope everyone who has not yet got their copy will write in confidently for our boasted prompt service!

News of the Nats.

All events at the Nationals are open to all at the appropriate fees, but entries must be made on the official forms contained in the 1952 Handbooks, reaching Londonderry House no later than July 21st, together with the appropriate fees.

Flying will commence at 11 a.m. on both days, but it is anticipated that operations will cease by 5.30 p.m. on Monday, August 4th. In the Team Racing events, all Class "A" entries will be flown off on August 3rd, and the Class "B" event will be accommodated on the 4th.

Coach and car parks will be available on the 'drome, and catering is by N.A.A.F.I. Those people who will be staying in private accommodation but who require meals during the day are requested to notify the organisers (via the Hon. Sec. "Nationals": C. V. Christoff, 3, The Broadway, Haywards Heath, Sussex) who should also be contacted regarding possible local accommodation. Lists of accommodation can also be obtained from the Town Clerk, Town Hall, Gosport, Hants, but all are reminded that early booking is essential, as the Nationals take place during Navy Week.

Marginal Allowance

Following representations from the S.M.A.E., the F.A.I. Models Commission has agreed that the margin by which a speed record claim must exceed the previous figure be reduced from 10 km./hr. to 5 km./hr. No success, however, resulted from the proposal that the present 10 per cent. margin for Duration, Altitude and Distance be modified, which is a pity. It appears only commonsense that the higher a particular record is the harder it is to better it, and to be further burdened with a tolerance based on a percentage of a high figure is somewhat farcical. It is much easier to raise a low duration record than it is to push a high figure

up by even a few seconds, but the present system demands that a high figure be surpassed by an even greater margin.

Sportsmanship?

The closest team race finish yet seen in Class B racing, occurred in the C/L eliminators for the teams to go to Brussels and Namur, when Claydon of E. London won by a slender few yards over Harper of Outlaws in spite of the latter being ten m.p.h. faster in the air. The reason for this being the shorter range of the faster model and its subsequent extra pit stop.

Not content with the announced result, a section of the Northern visitors who had travelled no little distance to compete, decided to champion the close losers and raised their opinions in no uncertain manner, bringing in that aged " preference for the South " argument through which most sensible aeromodellers have seen daylight. All credit to the officials for not taking up the argument and the teams for taking only an inquisitive interest in the one-sided controversy.

The very closeness of the result augers well for us to be able to field different teams of equal strength at the two international contests. Good luck to them.

Welcome Support

Prizewinners at the 1952 British Nationals (R.N.A.S. Gosport, 3rd–4th August) will be gratified to receive awards that are more in keeping with such an important event than has obtained in the past. This year, the Federation of Model Aircraft Manufacturers and Wholesalers have donated the sum of 50 guineas towards the prize fund, and this gesture has been followed by the decision of the Council to allocate the sum of £25 to the same cause. In consequence we hope to see " Nats." prizes at least on a par with those seen recently at locally organised Rallies, etc.

Other news from S.M.A.E. quarters is that in future all senior affiliated members will be regarded as eligible to operate as timekeepers—a welcome concession in view of the long standing confusion in this direction. For too long have meetings been handicapped by the lack of a main essential in the proper conduct of flying, i.e., sufficient recognised timekeepers. Perhaps we shall at long last dispense with that everlasting call for " more timekeepers, please !"

The 1952 United Kingdom Challenge Match will take place at Tilstock Aerodrome (near Crewe) under the direction of the North Western Area. Date is, of course, the 14th September, and we hope to see all four eligible countries participating this year, having learnt that Wales will definitely be sending a team this time. May we hope that the fine standard set by the Scottish hosts last year will be maintained, for we regard this annual Match as a highlight of the British calendar.

Photo's . . . . Glossy please !

Interesting photographs, action shots or posed pictures of unorthodox models, are always welcome at the editorial office. Whether for article illustration or any of our regular features, the quality of the submitted print must be of the best quality for reproduction. Sharp and clear prints, size 6 × 4 ins., on *glossy* paper are needed ; but please, oh—please, include a piece of card packing to keep the print safe from creases. Unsuitable prints are returned quickly, and if a glossy enlargement is not within your scope, submit the negative instead. Payment is made for all published photographs.

By Air to Belgium

The two major control-line contests of the year, the World Speed Championship and Championship of Europe to be held at Melsbroek aerodrome, Brussels July 4th–8th, and the second International at Namur on August 10th can easily be visited by cycling aeromodellers with minimum of expense and wasted time. Ostend is only 35 minutes by air from Southend in Essex, where Silver City Airways operate a regular air ferry service on the hour, every other hour with their famous Bristol 170 Freighters and Brussels is only a further 80 miles from the Belgian airport.

Keen cyclists will scoff at this distance, passing through interesting Belgian scenery, and by virtue of the fast and regular air service, can allocate an extra day for a sight-seeing journey whilst on the way to the contest. Namur is but 30 miles further on.

Fares are 25/- each way for the bicycle, and 75/- per passenger, but should the pressure of the purse make itself evident, the twenty minute flight from Lympe to Le Touquet in France can be made for 65/- each way including bicycle, and the journey at the other end lengthened by only a few miles, though involving a frontier crossing.

Even further economies can be made where club parties of 24 passengers can make the trip for as little as 46/- per bod and bike. Sounds like just the thing for that holiday on the Continent, we suggest you write for details from Silver City, 11, Gt. Cumberland Place, W.1.

Bound "Aeromodellers"

Stocks of bound yearly volumes of the AERO-MODELLER are waning fast and we must report that only three volumes are now available. As a special offer to clear our shelves and make way for other sumptuous items we have in hand, the original price of 27/6 is now clipped to £1 only, which is indeed a very reasonable figure for these handsomely bound collections of countless valuable references.

The three volumes still on sale are No. 11 (Dec. 1945–Nov. 1946), No. 12 (Dec. 1946 Nov. 1947) and No. 13 (Dec. 1947–Nov. 1948. Orders should be sent with remittance to our offices at 38, Clarendon Road, Watford.

LIL – ABNER

DESIGNED BY

A. E. BURCH

4/6

THE AEROMODELLER PLANS SERVICE

38 CLARENDON RD WATFORD HERTS

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED

- DATA -

SPAN — — — — 36"

WING AREA – 310 SQ INS

TAIL AREA — 56 SQ INS

LENGTH — — — — 26"

WEIGHT — — — 7 OZS

POWER — — — 3.5 C.C.

- MATERIALS REQUIRED -

SHEET BALSA 3" LONG

2 SHEETS OF 1/8" X 4" HARD

4 " " 1/16" X 3" MED.

STRIP BALSA 3" LONG

1 STRIP OF 1/2" X 1/2" HARD.

2 " " 1/2" X 1/8" "

2 " " 1/4" X 1/8" MED.

3 " " 3/16" X 1/16" "

MISCELLANEOUS

18" OF 12 S.W.G. WIRE

36" " 16 " "

12" " 14 " "

6" " 20 " "

3 1/2" " 10 " BRASS TUBE

10" " 14 " " "

PIECE OF 24 S.W.G. TIN 3 1/2" X 10".

PIECE OF 1/16" DURAL 2" SQ.

" " 1/16" BRASS 5/8" X 3/16"

3, 3/8" C'SK WOODSCREWS

PIECE OF 3/16" DOWEL 6" LONG

" " 1/8" PLY 2" X 3 1/2"

" " 3/32" " 2" X 3 1/2"

" " 1/16" " 6" X 4"

2 BLOCKS BALSA 2 1/2" X 3" X 1".

COCKPIT COVER

CRACK HERE & OFFSET PIN AS ABOVE

TRIPLATE 1/4" TUBE SUPPORTING FORMER SANDWICH BETWEEN FIRST TWO LAYERS OF F1.

10 S.W.G. BRASS TUBES SOLDERED TO TINPLATE

SOLDER

16 S.W.G. WIRE

6 S.W.G. WIRE

2 1/4" SCRUB WHEELS

SOLDER

16 S.W.G. SPREADER

12 S.W.G. COLLETS

- FORMERS -

C1 1 OFF 1/16" PLY

C2 1 OFF 1/16" PLY

C3 1 OFF 1/16" PLY

F1 1 OFF 1/8" PLY

F1 1 OFF 1/8" BALSA

F1 2 OFF 3/16" PLY

F2 1 OFF 1/8" BALSA

F3 1 OFF 1/8" BALSA

F4 1 OFF 1/32" PLY

F5 1 OFF 1/8" BALSA

F6 1 OFF 1/8" BALSA

1 1/2" SPINNER

PLANK WITH 1/8" SHEET

- TANK -

1/16" PLY

3/16" BALSA

1/8" PLY

1/8" SHEET

COVER WITH 1/16" SHEET

1/16" SHEET

3/16" SHEET

TOP LINE OF SHEET SIDES

45°

PAPER HORN

45°

22°

22°

1/8" SHEET

18 S.W.G.

RIGHT HALF OF COWL IS REMOVABLE

1/16" SHEETING

MODEL SHOWN BALANCED ON FRONT LINE

FLAP HORN 18 G. BRASS

AMCO 3.5 SHOWN

SOFT BLOCK COWL

AMCO

16 G. DURAL

16 G. PUSH RODS

20 G. WIRE EMBED IN ELEVATOR

BEND AFTER FITTING TANK

5/32" BAMBOO DOWEL

20 S.W.G. LEAD OUTS

HOLE FOR FLAP PUSH ROD

SOLDER

ALL TUBES 14 S.W.G.

DEVELOPMENT OF TANK BODY

1 OFF TINPLATE

END PLATE 2 OFF TINPLATE

FRONT VIEW OF TANK WITH END PLATE REMOVED

TAILPLANE & ELEVATOR CUT FROM 1/8" HARD SHEET

- 1/8" SHEET SIDES 2 OFF -

POSITION OF HOLES IN LEFT SIDE ONLY

POSITION OF HOLE IN RIGHT SIDE ONLY

LINE GUIDES

1/16" SHEET WING RIBS 17 OFF

LINEN HINGES

SLOT FOR ELEVATOR HORN

1/2" X 1/2" LE.

1/16" PLY LINE GUIDES

1/2" X 1/8" SPARS TOP & BOTTOM

COVER CENTRE SECTION WITH 1/16" SHEET BALSA TOP & BOTTOM

CUT FROM TINPLATE

FLAP ARM HINGES

3/16" X 1/16" CAP STRIPS TOP & BOTTOM

HARD 1/4" FILLING

1/8" SHEET BETWEEN SPARS

3/4 - 1 OZ. LEAD WEIGHT

1/8" SHEET TIP

COVER WITH 1/16" SHEET TOP & BOTTOM

1/16" SHEET FLAP

FLAP HORN 18 G. BRASS

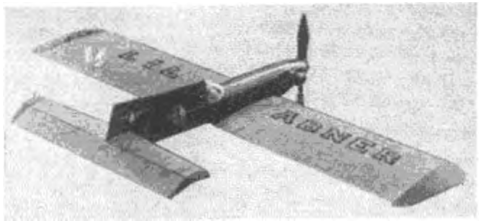
LINEN ANCHOR

16 G. WIRE

TAPE HINGES

TE. 1/16" SHEET TOP & BOTTOM

PUBLISHED AEROMODELLER JULY 1952 CL 470



LIL ABNER

A FOLLOW-UP from the Demon King which we published in the March 1950 issue, the Lil Abner series by A. E. Burch, has been developed up to Mk. V in the past year, and it is this ultimate form that we publish here. The designer gave us a special faultless demonstration of his prototype, and its simplicity plus high performance left a considerable impression.

A FLAPPED STUNTER for 3·5c.c. by A. E. BURCH

With 310 square inches for an Amco 3·5 diesel, Lil Abner circulates at between 60 and 65 m.p.h. on 60 ft. lines. It is absolutely smooth to fly, and by virtue of the full span flaps, there is no limit to the manœuvres it can tackle. Even if an occasional error of judgment should bring unwelcome contact with mother earth, the structure is such that repairs are very rarely necessary.

Construction

Make up the engine bulkhead, and fit the tank in place before adding the side panels, then fit controls. When making the control system, bend the flap push-rod to the exact dimensions given on the plan; but leave slight over-length on the elevator rod for adjustment. Now add all formers and plank the forward decking.

Whilst this is drying, the tailplane can be made, the elevator hinged and the horn firmly cemented in place, with two locking pieces of wire as shown. Then fit the tailplane, and with the bellcrank set at neutral bend the push rod to suit. Sheet the wing bay, with the exception of the rear two inches, which gives sufficient space to locate the flap horn and make adjustments. When this has been done, the bay may be completely sheeted, leaving the access slot shown. Fin offset, if desired, can be built into the rear upper fuselage when the sheeting is applied. Otherwise, construction of the wing is conventional, needing no explanation, except perhaps for the ballast weight which is fitted in the starboard tip between spars with ¼ in. sheet at front and ⅛ in. at rear.

Full-size copies of the ½ scale plan opposite may be obtained price 4/6 post free from the Aeromodeller Plans Service.

SULTAN

A MID-WING SPORTSTER FOR 1·3 — 2 c.c.

By
BERNARD R. WILDMAN

Aged 23 . . . a bachelor resident in Edmonton . . . applied photographer by trade . . . aeromodelling interests are centred on semi-scale and rubber duration . . . also a keen cyclist.

HERE'S a sport model with a "vintage" air about it, resembling in several ways the familiar lines of the pre-war era, and soundly designed to be tough to the extreme.

When Bernard Wildman first thought of this design, he had in mind that vivacious looking fighter, the Vickers Jockey, and he set about producing a model that would combine the semi-scale appearance with appropriate performance in the air. Power in his prototype was the ever faithful Mills Mk. 1, and right from first tests, the Sultan fully conformed to all that was required of it.

Take-off is a delight to behold as after a long run on the ground, the nose lifts to a steep interceptor-like climb, whilst each flat glide is terminated by smooth "wheeler" landings.

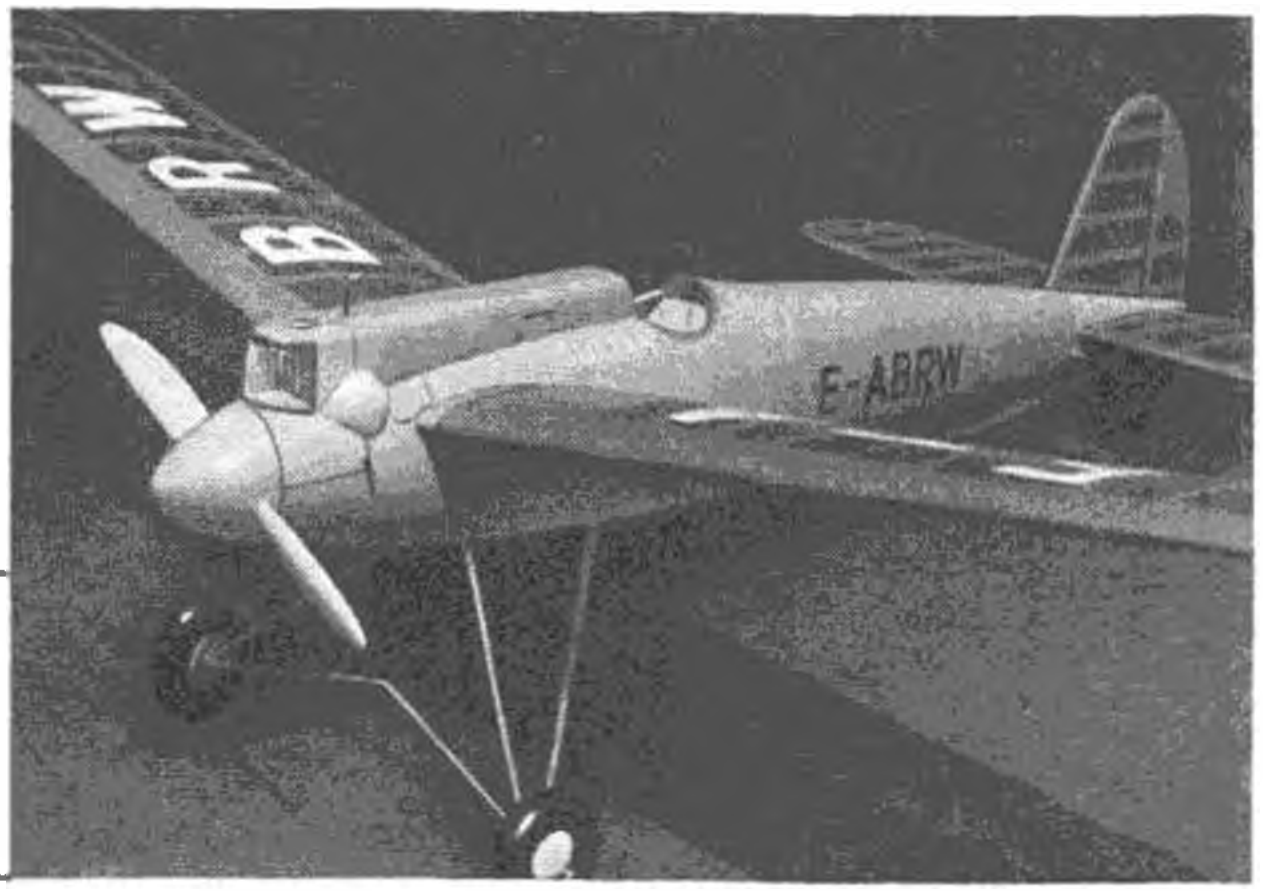
No doubt with the more powerful rotary valve 1·5 c.c. diesels now available, the Sultan would climb skywards at a rate indicating prop-jet performance; but we prefer the lower power and that old-time open cockpit type of flying.

A leaflet giving the designers' full building instructions is supplied free with each copy of the full-size plans from the Aero-modeller Plans Service: but to whet your appetite for this out-of-the-rut model, we give the trimming and flying advice here.

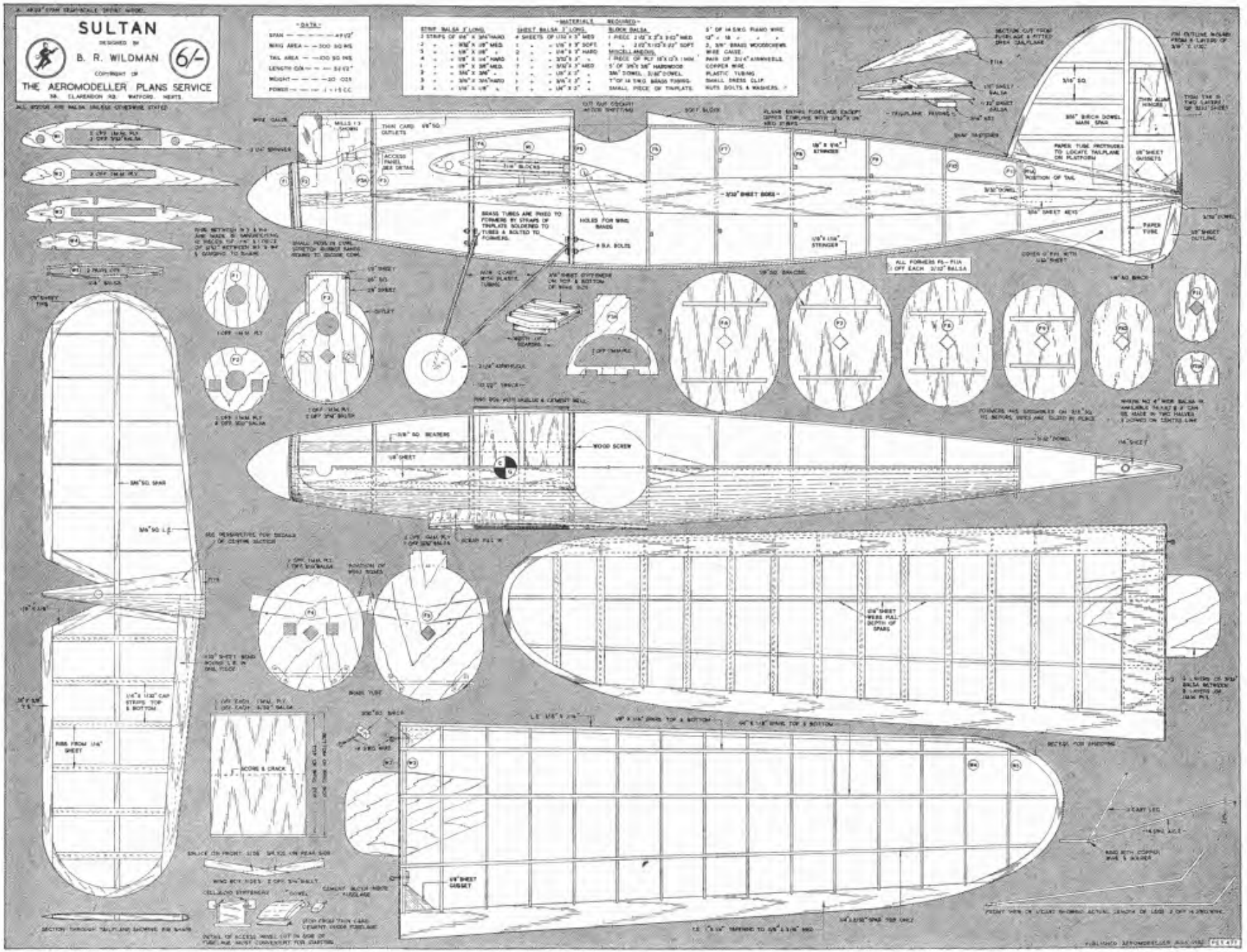
Trimming

Check the line-up and that the C.G. is immediately below the mainspar. Ballast should be added if necessary. Then wait patiently for a calm day for the first flight test. Don't attempt to carry out glide tests in anything other than reasonable wind conditions, or a false trim may result and have disastrous effect on the power flight. Test into wind, preferably gliding down a slight incline so that the Sultan will have a chance to gather correct flying speed. Add packing under the tail-plane if required, no more than $\frac{1}{32}$ in. at a time, and adjust the trim tab until a fast flat left hand turning glide is achieved.

Fill the tank and start the engine, then with timer set for a ten second power run, launch gently into wind. Observe both power and glide trim carefully, and when the set-up is considered correct, try the first take-off. You'll be thrilled at the way the model races along and then rises to a steep climb.



Portable, streamline, tough yet very pretty, are points of note when studying this design. The prototype, seen in the hands of designer Wildman in the heading view, has made countless trouble-free flights at Fairlop.



THIS IS A $\frac{1}{8}$ SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 6/- POST FREE FROM THE AEROMODELLER PLANS SERVICE

A 19 3/4" SPAN JETEX POWERED SCALE MODEL

D.H. 108. (SWALLOW).

DESIGNED BY

D. P. GOLDING.

3/-

THE AEROMODELLER PLANS SERVICE
38 CLARENDON RD. WATFORD. HERTS.

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED

MATERIALS REQUIRED.

1 BALSA BLOCK	12½" X 2½" X 2"	MED. SOFT.
1 "	5" X 1/8" X 3/8"	SOFT.
1 "	3" X 1/2" X 1/2"	HARD.
1 SHEET OF	1/32" X 3" X 36"	MED. SOFT.
1 "	1/16" X 3" X 36"	"
2 STRIPS	1/16" X 1/16" X 36"	"

4" X 2" OF ACETATE SHEET.
LIGHTWEIGHT TISSUE 2 SHEETS.
DOPE. SILVER & CLEAR.
LACQUER. BLACK.

INSTRUCTIONS FOR FUSELAGE.

CARVE FUSELAGE FROM SOFT BLOCK TO EXTERNAL CONTOURS. MARK OUT COCKPIT, JET ACCESS HATCH & WING ROOT OPENINGS. CUT FUSELAGE INTO TWO IDENTICAL HALVES ON VERTICAL ℄. HOLLOW OUT TO INTERNAL CONTOURS. GIVE FUSELAGE INSIDE A COAT OF CLEAR DOPE. LINE REAR HALF WITH ASBESTOS SHEET OR ALUMINIUM SHEET IF DESIRED. CEMENT TOGETHER THE TWO FUSELAGE HALVES. CUT OUT MARKED PORTIONS BUT RETAIN JET HATCH & HINGE TO FUSELAGE WITH SILK. HATCH IS SECURED ON OTHER SIDE WITH SELLOTAPE.

3/8" SHEET FAIRING (SEE ROOT RIB DETAIL)

ROOT RIB

LEAVE OPEN. (SEE FRONT VIEW)

1/16" SHEET TOP & BOTTOM.

CUT TO THIS LINE FOR 3/8" SHEET FAIRING.

ROOT RIB.

CUT OUT CENTRE OF RIB.

NOTE.
ALL WING & FIN RIBS CUT FROM 1/16" SHEET.

W1.
W2.
W3.
W4.
W5.
W6.
W7.

R1.
R2.
R3.

FIXED SLATS ON TG 283

PAINT LINES.

ENGINE HATCH.

STARBOARD WING PANEL.

1/16" DIA. BAMBOO PITOT HEAD.

1/16 X 3/16 L.E.

APPROX POSITION ON UNDERSIDE.

BLUE
WHITE
RED

1/16" SHEET.

3/16 x 1/16 T.E.

SOFT BALSA TIPS.

ADJUSTABLE TRIM TAB.

SOFT FOIL HINGES.

FIN ROOT FAIRING.

7/8" O/D METAL RING. 1/4" WIDE. LET IN & CEMENT.

PAINT LINES TO SHOW ELEVATOR & ELEVON.

1/16" SQ. TOP & BOTTOM

3/8" SHEET FAIRING

LEAVE OPEN.

NOTE:
WHEN SECURING WINGS TO FUSELAGE ENSURE TOP SPARS ARE LEVEL.

DOTTED LINE INDICATES T.E.

CUT OUT CENTRE.

FRONT ROOT SPAR 1/16" SHEET.

REAR SPAR 1/16" SHEET.

2 1/4 x 1/2 x 3/16 HARD BALSA MOUNT FOR JETEX.

1/16 SHEET FIN OUTLINE.

CUT OUT TO DOTTED LINE IN FUSELAGE SIDES.

FIN ROOT FAIRING FROM SOFT BLOCK.

FORM COCKPIT CANOPY FROM ACETATE SHEET.

ENGINE HATCH.

JETEX MOUNT.

TRIM TAB.

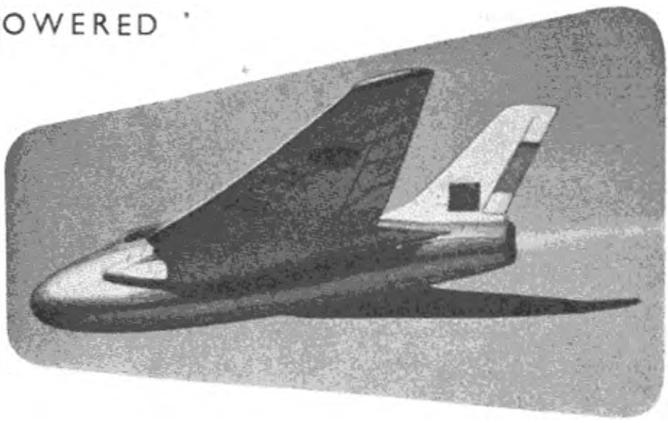
A.A B.B C.C D.D

PUBLISHED AEROMODELLER JULY 1952 J479

A "JETEX" 100 POWERED

D.H. 108 SWALLOW

By D. P. GOLDING



THE famous T.G.306 "swept" flying wing that provided so much valuable information for the design of the Comet and subsequent de Havilland jet fighter designs, is the subject chosen by scale expert D. P. Golding for scale Jetex free-flight. And for fast flying thrills, unique stability and absolute realism, this departure from the normal Jetex type of job is very hard to beat.

The **Fuselage** is carved from a soft balsa block to the external contours given in the four cross-sections. The cockpit, jet access hatch and wing root openings are then marked on, and the fuselage is cut into two identical halves by bisecting on the vertical centre line. Hollow out to the internal contours, give the insides a coat of clear dope and line the rear half with asbestos sheet or aluminium foil as a safety measure if you feel this is necessary; the original had none. Then assemble the two halves and cut away the marked cockpit, etc. Save the jet access hatch, so that it can be hinged with a silk strip at a later stage, it is retained on the other opening side with Sellotape.

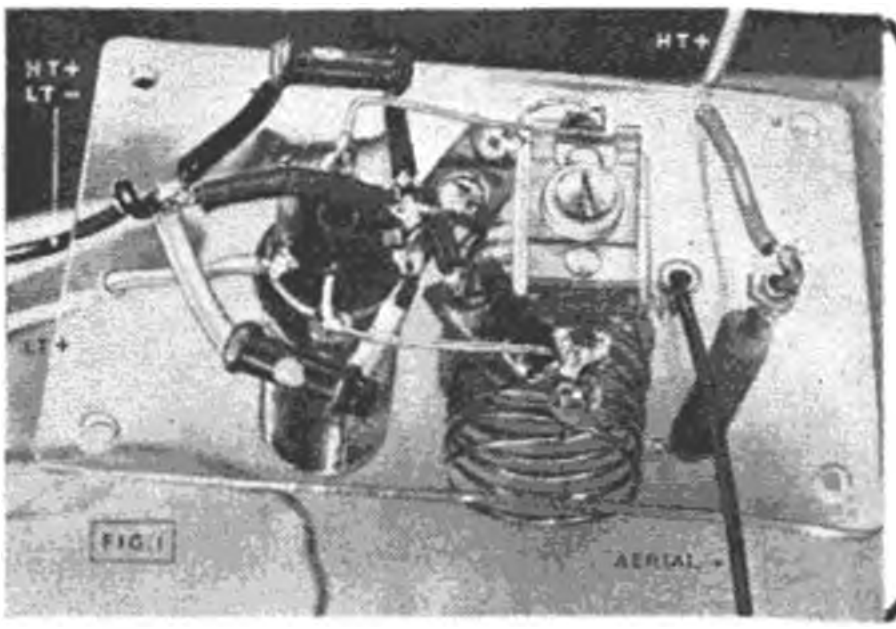
The **Fin** root is cut to plan and side views from soft block, fixed in place and carved concave to fair in with the normal fin structure. Attach to fuselage, then add fin after building over plan. Cement the root ribs accurately in position, add fairing blocks carved from ¼ in. soft balsa and build **Wing** over plan, starting with the 1/16th square lower mainspar. Add upper spar, lift the wing off the board to fit one piece rear spar, and then the tips and leading and trailing edges. Trimming tabs can be inset into the T.E.; but rudder correction is generally adequate.

The main spar (root) may now be cemented to the fuselage at the correct angle, and the trailing edge curve added also. When set, add the wing panels to the fuselage, again checking the sweep-back angle and making good butt joints at each spar. The centre section is capped with 1/32nd sheet, leaving the duct open at the leading edge for cooling air to pass through to the jet mounting via the hole in the root rib.

After covering the whole model with lightweight Modelspan, making sure that the reflex trailing edge is not warped out of shape, the bubble cockpit can be added, and the 2¼ × ¾ × ¾ ins. hardwood jet mounting block inserted through the access hatch and glued firmly to the fuselage bottom. Jet alignment is easily accomplished by attaching the clip with one screw only, then inserting a wooden dowel of about ¾ in. dia. through the fuselage from the rear and engaging it in the jet clips. Thus aligned, packing can be added and the second screw fitted to lock the clip in correct place. Now hinge the hatch in place and colour the model all silver with black lettering and national insignia.

Use rudder trim for **Flying** tests, which should start in calm conditions over long grass. Wing tabs can be used to correct warps but careful construction should eliminate this altogether.

D. P. Golding with the prototype model. Note the open fuselage hatch for easy access to the "Jetex" 100 unit.



RADIO CONT

Howard Boys

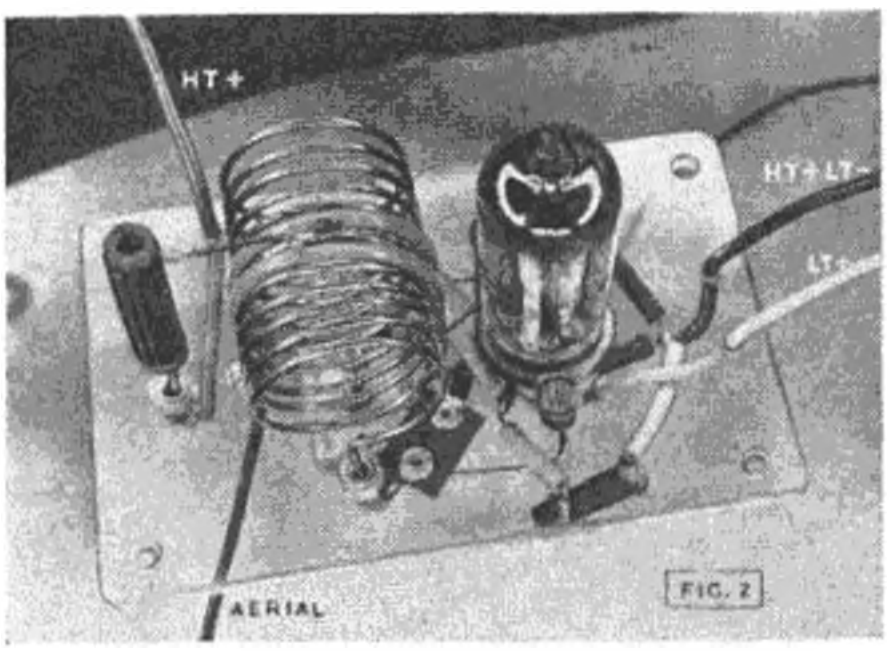
"AEROMODELLER"

A TYPE of question sometimes asked is, can Mr. A's transmitter be used with Mr. B's receiver? In general any single valve receiver can be used with any single valve transmitter, only the range will be short if a sensitive receiver is not used with a low power transmitter. For instance, using the Dalton transmitter (June 1950 Notes) the range to be expected with an XFG1 receiver is about 400 yards but with a Bolton No. 1 receiver (May 1951 Notes) it should be about 800 yards. While a range of 400 yards will cover all normal flying, 800 yards gives greater peace of mind. The transmitter here described will give a range of 800 yards with an XFG1 receiver.

The basic idea behind this transmitter, however, is to provide Radio Control equipment that can be carried without much trouble by a cyclist. An XFG1 receiver complete with batteries and actuating gear can be built for a weight of about 8 ounces, and this can be carried by a model of 3 or 4 feet span with an engine of around 1 c.c. The heaviest part of the equipment is the transmitter batteries, but those used for testing this transmitter weighed no more than 5 pounds.

"Aeromodeller" No. 1 Transmitter

The radio unit is shown in the photos Fig. 1 and 2, in which it has been built on "Perspex" so that the layout can more easily be seen. This is the one which is shown in diagram form in Figs. 4 and 5 of the May 1952 Notes. The panel is shown in Fig. 3 and is made of Perspex or Paxolin 1/16 or 3/32 in. thick. Besides the panel the following parts will be required.



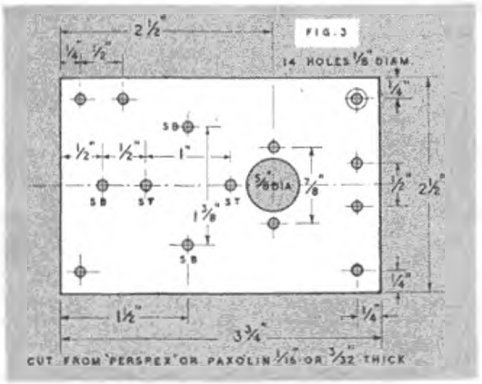
Valveholder, B7G, ceramic or amphenol	1 off
Fixed condensers, 100 pf, 1% silver-mica	2 off
Resistors, 10,000 ohms ½ watt	2 off
Trimmer, 30 pf, ceramic (rectangular)	1 off
R.F.C. Eddystone No. 1011 or similar	1 off
Solder tags	5 off
Screws 6 B.A. by ¼ in. long, with nuts	2 off
Wire, 18 s.w.g. tinned copper—about 3 ft.	
Sleeving, Systaflex or P.V.C.—1 ft.	
Flex, plastic covered—about 3 ft.	
Valve, Mullard DCC 90 or American type 1A5.	

Start by drilling the panel, the ¾ in. hole can be made by drilling a number of smaller holes first in a ring just inside the ¾ in. diameter and then filing out to size. Fix the solder tags with eyelets or hollow rivets on top at ST and below at SB. If in difficulties over eyelets, pieces of soft brass tube ⅛ in. outside diameter can be used. Full particulars of the method are given on page 553 of Sept. 1951 AEROMODELLER. Make the tuning coil by winding 9 turns of 18 s.w.g. wire on a ¾ in. diameter former. A piece of dowel, paxolin or cardboard tube or anything similar will do. Leave ¾ in. sticking straight out at each end. To make this coil neat it can be pulled out to about 3 ins. long and then squeezed up on the former again, pulling the turns tight, and repeating two or three times. A piece of sleeving 6½ ins. long is put on another piece of 18 s.w.g. wire and wound 1½ times round the middle of the tuning coil, and forms the link coil or aerial coupling coil. These coils with the former still inside are put on the panel, the tuning coil ends going through the pair of SB eyelets and the link coil ends being cut to length to fit the ST tags. All the ends are then soldered in place and the coil former removed. The R.F.C. has one end cut to length and soldered to the top centre of the tuning coil and the other end is pushed through the odd SB eyelet and soldered to the tag. The tag end of the valveholder is put through the panel from the coil side and fixed with the 6 B.A. screws. Note that the centre tag faces straight towards the coil end. Trim the ends of the two fixed condensers to ¼ in. long, and put ¾ in. of sleeve on one end of each. The sleeved ends are then crossed

ROL NOTES

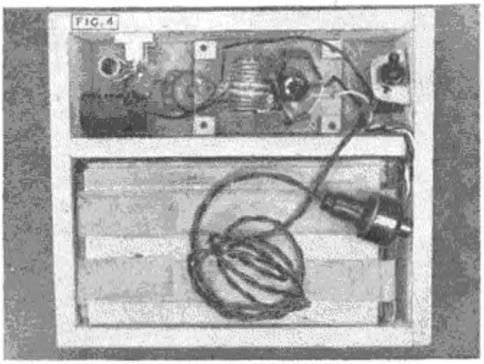
Describes the

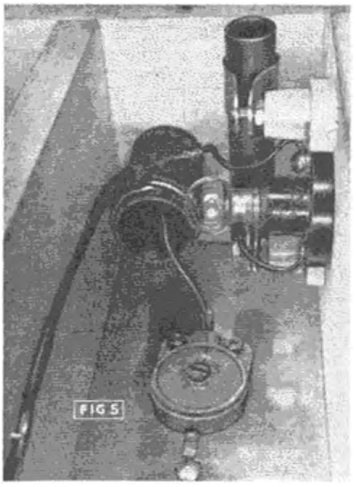
No. 1 TRANSMITTER



to form an X and the right hand condenser end soldered to the left hand tag nearest the centre on the valveholder, and the left hand condenser to the right hand tag. The other ends of the condensers are then soldered to the tuning coil ends. A piece of wire is soldered to the nearest end of the link coil and the centre valve tag, and left one inch long with ¾ in. sleeved. This becomes the common negative lead. The ends of the two resistors are trimmed to ¾ in. long with ⅛ in. of sleeve on each. One end of each is soldered to a valve tag that already has a fixed condenser attached, and the other ends are joined together on the common negative. The two valve tags that are wider apart than any others are joined together and become low tension positive. The other two valve tags are connected to the tuning coil ends on the same side. The trimmer (or tuning condenser) is connected to the tuning coil ends. The battery leads can be connected to the common negative through a switch to H.T. and L.T. negative, the low tension positive straight to the battery, and the tag end of the R.F.C. through a push button or key to H.T. positive. These leads should be of flexible wire with distinctive colours. Use black for the negative, yellow for L.T. positive, and red for H.T. positive. The aerial lead can be green, and this can be connected from the odd end of the link coil to the bottom of the aerial. All this wiring is identical with Fig. 5 of the May 1951 Notes. If the transmitter is housed in a metal box the aerial should be 8 ft. 4 in. long from box to tip. The transmitter could be slung on rubber bands in the end of the model box, and if this is wood or something similarly rigid, the aerial could be mounted on it. Another way is to make up a box to hold transmitter and batteries, with the aerial mounted in one corner as shown in the photo, Fig. 4. A convenient mounting for the aerial is made from two "stand-off" ceramic insulators, with clips holding a piece of tube into which the aerial will plug.

The best way of coupling the aerial is that described in Mr. F. C. Judd's article in the June 1951 AEROMODELLER, and Fig. 5 is a photo of this part. The only extra items required are a coil, and a pre-set condenser of 8–115 pf. The coil





Photo, left, shows made-up transmitter box complete with batteries and control lead. Right: Close-up of aerial coupling with test bulb in circuit.

is made by winding 9 turns of 18 s.w.g. enamelled copper wire closely on a ¾ in. diameter former, with tappings at 3 and 6 turns. A piece of paxolin tube about 1¼ in. long makes a good former. Drill a 1/16 in. hole ¼ in. from one end, and two more ¼ in. from the end. Poke one end of the wire down and up through these two holes, then wind on three turns, twist a small loop, and wind another three turns, another loop and three more turns. Push the wire down through the end hole and out of the tube, leaving it long enough to reach the condenser. This is mounted in a convenient position between the coil and the bottom of the box. On the outside of the bottom fix a tin or aluminium plate, to which the other side of the condenser is connected, or take a lead from the condenser to a spike to stick in the ground. The coil is mounted on the side of the box near the bottom of the aerial mounting, and a link of two turns of flexible wire wound on the middle, with the ends taken to the link coil on the transmitter. For mounting the tube, put a plug of wood in the plain end, with a hole through the middle for a screw. The bottom of the aerial is connected to a tapping on the coil, the best one being found by trial, after the transmitter has been tuned to the right frequency. This is best done by tuning it to a frequency meter such as that described in the AEROMODELLER for December, 1950. Every transmitter such as this should be checked for frequency by one of these meters at frequent intervals, say every two or three journeys. The meter is set up two or three feet away from the transmitter aerial, and the screw on the transmitter tuning condenser rotated to give the highest reading on the meter. If a meter is not available, it will be necessary to get a competent radio engineer to tune the transmitter to a frequency of 27 12 megacycles per second. Note that it may be necessary to have a hole in the box just underneath the screw of the tuning condenser.

To tune the aerial, and find the best tapping on the coil, the meter is set up three or four feet from the transmitter aerial and the 8 115 pf condenser tuned to give maximum reading. Try this with the different taps on the coil, and leave it at the setting which gives the highest reading.

Another method of tuning the aerial is to use a bulb in the lead between the aerial and the coil as shown in Fig. 5. This bulb should be 6 volts, 04 amps, and the tapping on the coil, and tuning of the condenser is adjusted for greatest brightness. The bulb is then removed and a lead taken straight from tapping to aerial, or short circuited. The meter is, however, much better to use.

Various batteries are suitable for use with this transmitter, some combining H.T. and L.T. In Ever Ready there is the Portable 61 giving 90 volts, Winner 108, 108 volts, and B103 of 90 volts and 1½. In Drydex there is the H1044, 108 volts, the H1005, 100 volts, the H1157, 503 and 518 of 90 plus 1½ volts. For separate L.T. the D18 or U2 type can be used. The separate batteries are usually the most economical as they are unlikely to run down at the same time.

For the aerial, the most convenient at present on the market is to use 9 plug in tubes each 12 in. long, available ex-Government at 2d. each. At the time of writing, two firms are advertising suitable ex-Government valves at less than 10/- each. Sometimes ex-Government batteries are available.

There is another type of valve, available ex-Government, that can be used, the 3B7/1291 at 10/- or less, but it requires a larger valveholder and therefore a slightly larger panel. It has 8 pins instead of 7, No. 5 not being used, but otherwise it is connected up just the same.

Short Circuits

A few queries have been received regarding the transmitter in Fig. 1 of May 1951 Notes, asking for component values. This was a diagram only for the purpose of describing a transmitter, and a reference was given to a full description of a transmitter using this circuit. Mention of the D.L. 94 valve in the photo of parts of the diagram was merely to prevent someone wiring up a valveholder in the same way and using a different valve. For instance, if a D.L. 92 valve was plugged in it would soon be destroyed without burning out the filament. Regarding Fig. 4 in the same " Notes " a misprint has got through. The L.T. + lead is shown short circuiting the filament. It should of course stop at the first filament connection. The photo shows things connected up correctly.

The term " short circuit " has been used, but a beginner may not understand this. It is a short, easy path for the current, between two points, along which the current will flow, instead of the path along which it would normally flow. The opposite to this is " open circuit " when the circuit is open or disconnected somewhere such as by a broken wire, or a switch not closed, so that there is not a complete path for the current.

International Radio Controlled Models Society

Some readers may not be aware of the new address of the Society's Hon. Secretary, which is as follows:

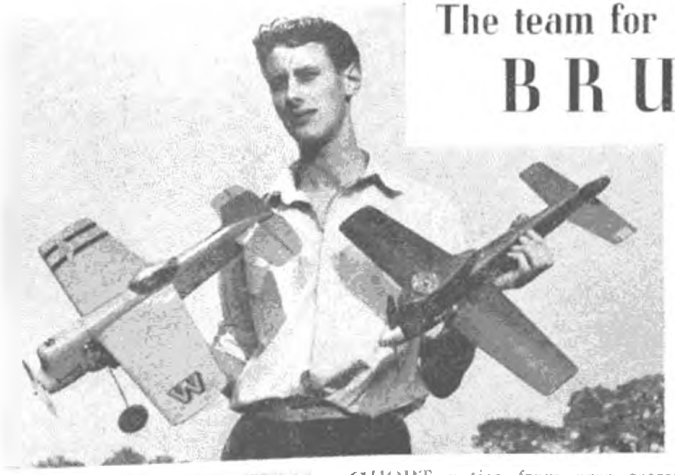
C. H. Lindsey Esq.,
VI 3rd Court,
Christ's College, Cambridge.

Also in connection with the I.R.C.M.S., we would mention that at the A.G.M. of this Society a new Pamphlets Secretary was elected as follows:

V. J. Howell, Esq.,
27 Binton Croft, King's Heath,
Birmingham, 14.

Pamphlets are available to non members and are issued periodically. They describe all types of radio control apparatus and full details can be obtained from the above gentleman.

The team for BRUSSELS



THE FOUR MEN

Left: Johnny Claydon, of East London, whose team narrowly won the team race, and who gave good average performance in speed and stunt, with his racer and Class III job. Below him is his clubmate, R. Davenport, who recorded highest speed in Class III with his Dooling 61 model. Bottom left: Macclesfield's Peter Ridgeway, who has always been an outstanding stunt flier, and who eclipsed all to win his place as stunt man on the team. Bottom right: Peter Wright, the St. Albans speed specialist, takes it easy after establishing a new record of 105 m.p.h. for F.A.I. Class I.

SHORT notice from area secretaries, and the selection of a centralised venue at Chigwell in the London area, which meant high travelling costs for Northern contenders, reduced the total number of would-be British team members for Brussels and Namur to less than fifty.

Last year's representative, Alan Hewitt, was hampered by motor wear in his prototype Ambassador (of which there were many on the field), leaving first in stunt to Peter Ridgeway. This is a very fair position, for it can be said that all but one of our top-line stunters will now have had their chance to show the flag abroad. In third place, M. Jarvis of Outlaws put up a good showing, and it was his pit work that helped to make the team race final such a close affair. Flying at 82, but with two stops, the Outlaws' racer was only a few yards behind J. Claydon's 72 m.p.h. one-stopper at the 80 lap mark. Over ten miles, the position might have been reversed.

Only Pete Wright shone in the speed, with top place in I and II, the former at the new record speed of 105. Class III had a bevy of over 120-m.p.h. entries, R. Davenport placing highest at 128 s. Team Manager will be Colonel Yates. R. G. M.

WORLD NEWS in Pictures

Australia, that vast country to which so many aeromodellers seem to immigrate, often features in our columns, but mostly with news of activity in the Eastern States. This month we have gen from Western Australia, the largest and least populated part of the country. Hundreds of miles inland are the Goldfields of KALGOORLIE, and from there we hear of Perc Webb, founder and President of the Kaly M.A.C., and builder of a series of multi-engined scale controliners. The B.24 Liberator in our heading is one of his larger efforts, using four Australian made GB 50 5 c.c. glow plug motors, and generally flown by his son Ronald. Other photos indicate a predominance of C/L jobs, including smart team racers and indicating a fifteen member turn-out for a day's flying in the blazing sun.

Supplies are a great difficulty for these faraway clubs, for when things are short in the big cities, local retailers get first service and the boys outback get nothing at all.

Even in PERTH, where modellers can pop along to Freemantle and see modelling supplies long awaited from U.K. lying in ships cargo, they have to wait for the cargo to go on to the eastern ports, be unloaded and then returned back to Perth before they can enjoy what they ordered anything up to six month's previously! How many bods in Britain would stick at the game under those conditions we would not like to guess! Just the same, the Perth boys have, through the last two years persevered through ups and downs and formed an active group known as the Mercurians. At a rally held in February, Rod Ashton of another club, the "Thermal Thumbers", seen leaning on his Senior stunt model, won the aerobatic event. Both Class A and B team races were run, and while on this point, the Mercurians request co-operation from a comparative 25 member British club for a challenge team race over ten miles with four models partaking. Gross times of all four to be sent to us, the fastest being the winner . . . any takers? Ex-Geordie Frank Anderson will organize the Australian end.

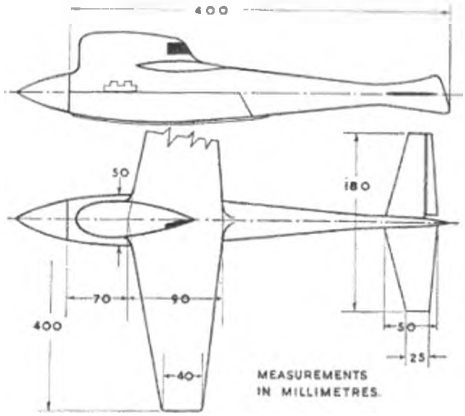
From **Canada** we have news from J. B. Kennedy concerning the 1952 Wakefield team, as decided by trials flown on May 11th. Flown in cool weather, with gusty winds up to 25 m.p.h. prevailing through the day, it was a day for the high climbers capable of reaching thermal height.

Woods, flying the only geared model placed top with 13 : 40 was in good company with McKay, Loates and Walter, all of whom have taken part in previous Wakefield finals. Two newcomers to the

Australian Rod Ashton and flapped stunter, below.

1952 Canadian Wakefield team, Rosewarne, Woods and McKay, Eisen and Walter. Absent is 3rd man, Frank Loates.

Canadian team are Eisen and Rosewarne who were flying in their first Wakefield trial and put in sterling performances to gain the place of honour on the team. These models will be proxy flown.



From **Switzerland** we learn that the GENEVA club has been reorganized and the new secretary is our friend Rico Neidhart, Swiss r/c exponent. Among the members of this active Swiss club is Roger Peclet, Champion in Classes I and II for speed, and holder of the handsome plaques which have always been a most attractive feature of the Swiss prize lists. His 5 c.c. model (Dooling 29) set a record Swiss speed of 194 59 k.p.h., which compares very favourably with our own best efforts in Britain. Also from Geneva is the unusual scale subject by Si. Manini, of the Curtis Ascender Canard Fighter, in this case fitted with a Bonnier 5 c.c. diesel. Makes one wonder if Signor Manini has to give 'up' to go down, or *vice versa* with the elevator out front!

Swiss speed champion Roger Peclet of Genera poses with his two winning models and the magnificent plaques awarded at the Nationals. The Dooling 29 powered model is outlined at left. Below is the Ascender by Signor Manini, also of Genera.

Very British, is, of course, the Prestwick Pioneer built from A.P.S. plans by L.A.C. T. A. Alder of the Phoenix M.A.C. at General H.Q., MIDDLE EAST LAND FORCES. The model has already made over fifty flights and by our rough calculation, should be just about due to hook one of those super-powerful Middle East thermals. Better fit a d/t Mr. Alder! The photo comes from Club Secretary, Cpl. L. F. Brambley.

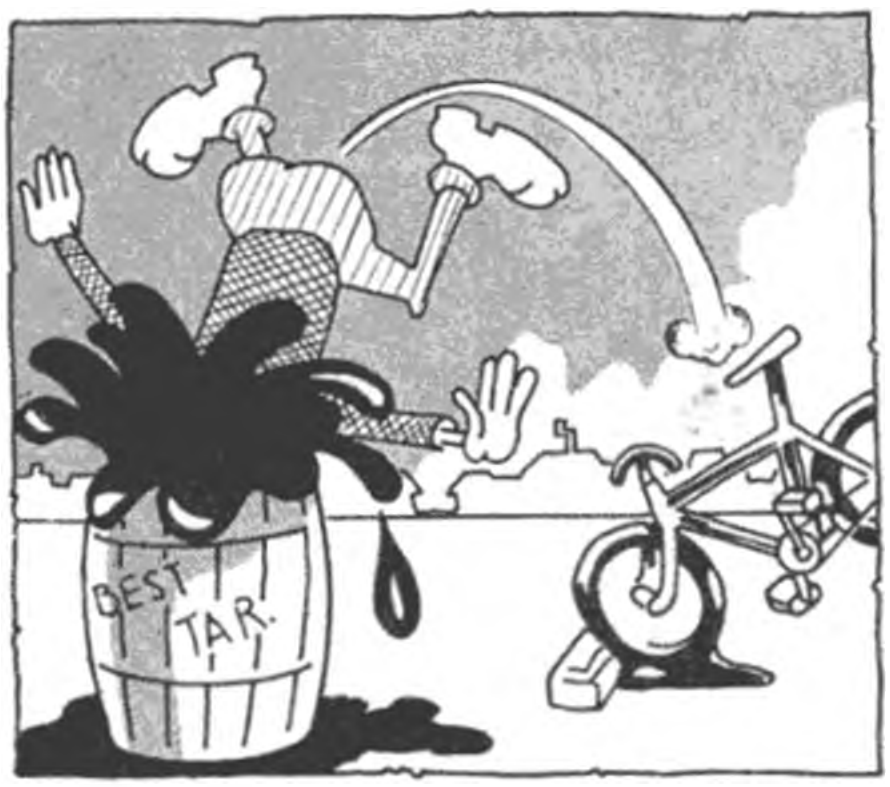
ESPECIALLY FOR THE BEGINNER

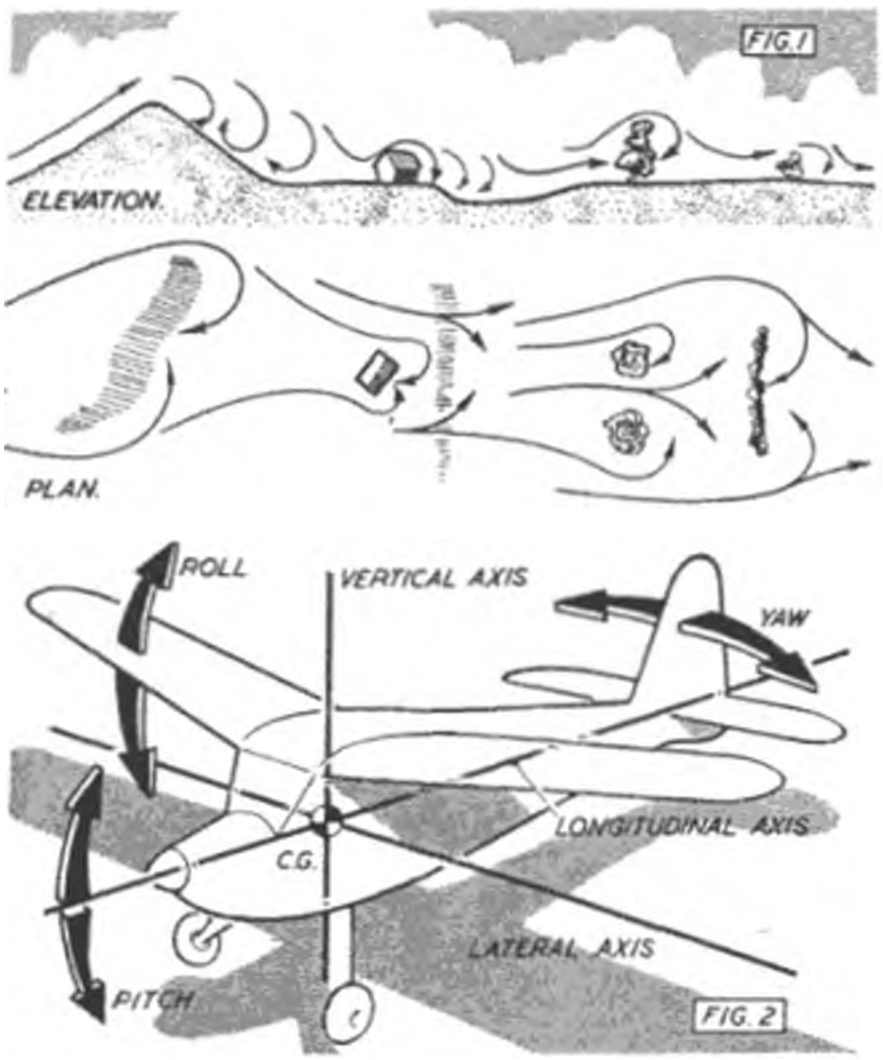
PART XXVII By VIC SMEED

The Ups and Downs of STABILITY

IF air was always still, model flying would be considerably easier. As it is, our models must be able to cope with updraughts, downdraughts, gusts, eddies, turbulence, and other pranks played by moving air, as well as the self-upsetting antics the models themselves indulge in. Not that any movement of the air would be all that much of a nuisance, if only it were constant. It is the sudden, unexpected whirl that we have to guard against, for a model possesses INERTIA—broadly, the tendency to want to keep on with what it is already doing—and, instead of immediately reacting to a fresh air direction, it resists the change and as a result gets upset. Fig. 1 shows some of the causes of turbulence and differing air directions, which can be further complicated by variations of temperature and humidity. The STABILITY of a model may be gauged by the time taken to recover itself to a normal flight path.

In addition to the vagaries of the air, models are subjected to forces arising from the fact that they are unsupported by anything but air—in other words, they are not resting on anything solid, and so must possess inherent balance when flying. We have already seen how the tendency of the C.P. to move is controlled by the tailplane, and this automatic "balancing" has to be extended to cover any unwanted movement of the aeroplane. Movement can take place in three planes—pitch, roll, & yaw (Fig. 2); to understand what happens in each we will examine them separately.





Movement in Pitch

Any nose-up or nose-down motion of an aircraft is movement in pitch—climbing, diving, stalling, and oscillating—and is affected by weight distribution and the angles of incidence of the wing and tailplane. We know that the tailplane controls pitching, but the efficiency with which it does so is governed by, largely, the C.G. position and what is often termed the LONGITUDINAL DIHEDRAL of the aircraft. The latter is merely the difference in the angles of incidence of the wing and tail (Fig. 3). A small difference means that the tailplane will stall at almost the same time as the wing and must then "unstall" before it can perform its function of unstalling the wing. This means a time-lag, during which time the model is heading earthwards. A large difference causes the wing to assume a larger angle of attack than is desirable, and, while this can be a stable arrangement, the wing is working at an inefficient L/D and the sinking speed will be materially increased. A normal longitudinal dihedral value is 2 degrees to 5 degrees depending on the best L/D angle of the aerofoil used, and the C.G. position should be moved to allow the wing and tail settings to approach this difference if necessary. Instability in pitch usually takes the form of late stall recovery or a tendency sharply to enter and remain in a

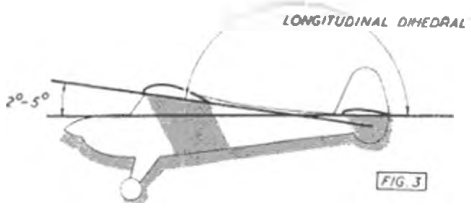


FIG. 3

dive ; the cure for this is to move the C.G. forward and increase wing incidence. Models overstable in pitch usually sink fast and require less wing incidence and a rearward C.G. shift. A fault which occasionally arises, most often in rubber jobs, is late stall recovery due to the inertia of the fuselage when its weight is distributed along its length rather than being concentrated in one place. The best method of dealing with this is to use a larger tailplane and move the C.G. back slightly.

Movement in Roll

Any tendency of an aircraft to bank, dip a wing, or turn on its back is movement in roll. Roll may be induced by incorrect lateral balance, physical or aerodynamic—that is, one wing heavier or one giving more lift due to warps, etc.—but the main trouble in the model world arises from torque. TORQUE is usually explained by talking about a dog wagging its tail—if you grab the tail, the dog's body will wag. An airscrew (propeller) in action produces a reaction from the air resisting its movement, and this reaction is transmitted to the model along the propeller shaft. Holding a fully-wound rubber job only by the prop. will give you the idea, the only difference being that in this case the propeller is stopped completely rather than being merely resisted. The tendency for the whole model to rotate in the opposite direction to the prop. produces bank in the air (Fig. 4). The slipstream (air thrown back by the propeller) pursues a spiral path imparted to it by the prop. and an immediate effect is that it tends to strike the undersurface of one wing and the upper surface of the other. A rolling force in the opposite

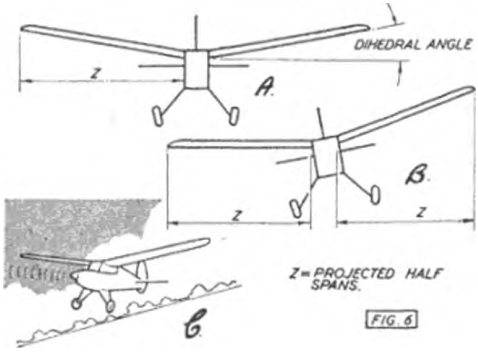


FIG. 6

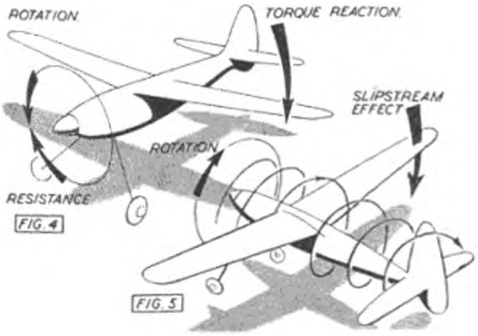


FIG. 4

FIG. 5

direction to that of torque is thus applied to the model (Fig. 5).

The answer to roll is to provide an automatic compensating force as soon as the roll commences, and this is done by the simple but clever expedient of incorporating in the wings DIHEDRAL ANGLE (Fig. 6). The explanation of how this produces the necessary compensating force is shown in Figs. 6b and 6c. In normal flight the slight angle of the wings permits a certain amount of slip in the airflow, and the effective area of the wing is that which may be projected on to the horizontal plane. It will be seen that when banked the projected area of the low wing increases, while the high wing's projected area decreases. This results in a difference in lift tending to right the model, and for many years was thought to be the full explanation of the effect of dihedral. However, when an aircraft banks in straight flight, a certain amount of sideslip takes place, and instead of the airflow being parallel with the longitudinal axis of the machine, it tends to head slightly across this axis. If we look along the line of the airflow we see the model as in Fig. 6c, and it is immediately apparent that the low wing (i.e., the nearer one) has a considerably greater angle of attack, with a reduction of angle in the higher wing. The resulting difference in lift is greater and appears earlier than the difference arising from the change in projected areas. The lift of each wing-half being unequal, the low wing will rise until once more a state of balance is achieved.

When a constant rolling force such as torque is applied, the model banks until the difference between the lift of each wing-half balances the applied force, and the model will fly in this attitude unless other measures are taken. A result of this will be a state of continual sideslip, with its consequent difference in angles of attack ; the drag of the low wing is increased because of its greater angle and this will turn the model to that side. The outer wing will gain lift from its increased speed, increasing the bank ; the drag of the low wing pulls the model's nose down, and a spiral dive may result. Offsetting the motor or fin to turn the model in the opposite direction to

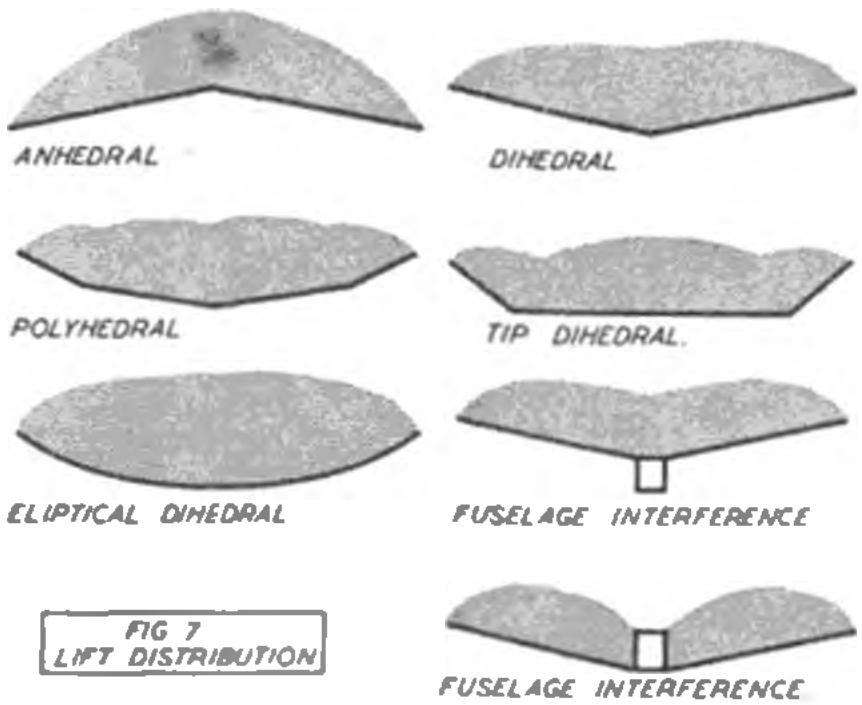


FIG 7
LIFT DISTRIBUTION

torque may be necessary to prevent this state of affairs from arising. On the other hand, if a model is influenced more by slipstream effect than torque, it may be desirable to induce the model to turn "with torque" to prevent a similar occurrence in the other direction . . .

Dihedral is only one member of the Hedral family—Polly, Ann, Cath and Di. Anhedral and cathedral mean a reversed dihedral, the "V" being upside down; naturally, this arrangement is unstable and is not used in the model world except occasionally on tailplanes, where it has the effect of increasing side area and/or providing two points of contact with the ground for single-wheel take-offs. Polyhedral means any arrangement wherein more than two dihedral breaks are employed, the main advantage of this being that most of the wing has a projected area nearly equal to its actual area and is hence more efficient, while the angle of attack change of the tip sections in a bank produces just as much of a righting couple as normal dihedral. Tip dihedral consists of two breaks only, with a flat, extended centre-section; this seems just as good as polyhedral does but only partway helps in the above conditions. There is also elliptical dihedral, though constructional difficulties and lack of data prevent this form from becoming very popular. The idea behind all these variations is to increase lift efficiency while still retaining the corrective benefits of dihedral, or in other words, a better lift distribution curve—smooth, unbroken lift over the whole of the wing. Fig. 7 gives an idea of the lift areas associated with various lay-outs and incidentally shows fuselage interference—one reason why the high or parasol wing position is the favourite for model work.

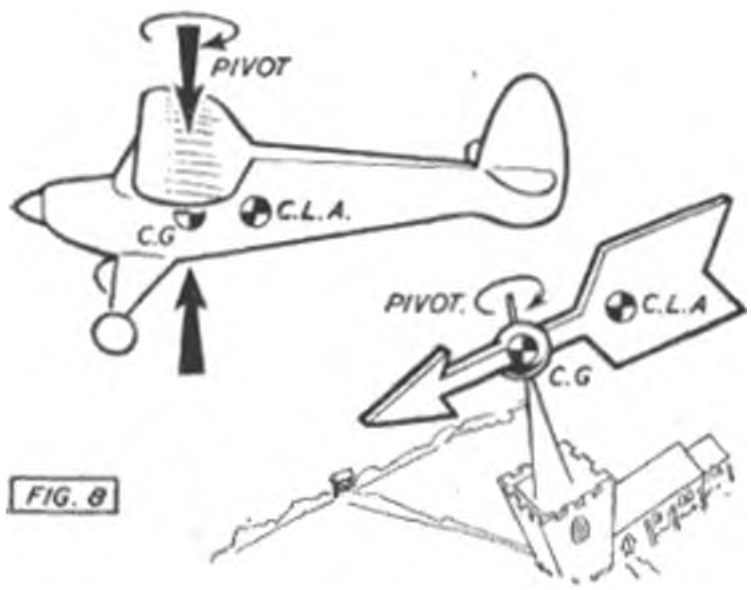


FIG. 8

Instability in roll usually takes the form of excessive sideslipping from a bank (insufficient dihedral), excessive bank from torque or slipstream effect (insufficient dihedral or use of sidethrust or opposite fin), wallowing, which often includes a pitching movement and is due to too much dihedral, and Dutch Roll, which is a combination of roll, pitch, and yaw, and is usually caused by too much dihedral and/or insufficient fin area. 10–12 degrees of straight dihedral is a safe average figure for normal models; less can be used for sailplanes and low-powered jobs, but more may be desirable with high power.

Movement in Yaw

Any turning tendency of an aircraft, banked or not, is movement in yaw. Directional stability is influenced by roll (and hence torque), dihedral, slipstream, and disposition of side areas. Probably less is known about the determining of correct fin area than any other factor in design—even the full-size designers find it a headache, as witness the Avro Manchester, a recent Martin flying boat, and the Wyvern, to name three. As a general rule, WEATHERCOCK STABILITY is aimed for, which means that the centre of all side area, known as the CENTRE OF LATERAL AREA, or C.L.A., must be behind the C.G. so that if the aircraft is pivoted about its C.G. (which, in effect, it is) it will always face into wind (Fig. 8). A large difference in the C.G./C.L.A. positions will cause the model to head into wind steadily the whole time, which is useful for slope-soaring sailplanes but undesirable for normal flying. A small difference will produce a model which wanders, heading first one way, then another, which is extremely good for normal thermal-hunting but can be a little critical. Between these two extremes come the average models which will circle steadily. Placing the C.L.A. in front of the C.G. is undesirable and leads to spiral diving or, if the model first stalls, spinning. Most of the leading designers will not commit themselves on fin areas, other than to say "Between 7 per cent. and 12 per cent. of the wing area", and many use a sheet balsa fin of the largest likely area and cut it down if necessary during flight tests. With a normal model using average dihedral and fin moment with low or medium power, 12 per cent. would not be dangerous. A longer moment arm would allow less area, more dihedral would require more area.

It is a good idea to err on the side of too much area and to reduce if necessary during the trimming stages.

Rubber Motors on Test Part 2

The ELECTRONIC REV COUNTER

DESIGNED BY E. J. HOOK

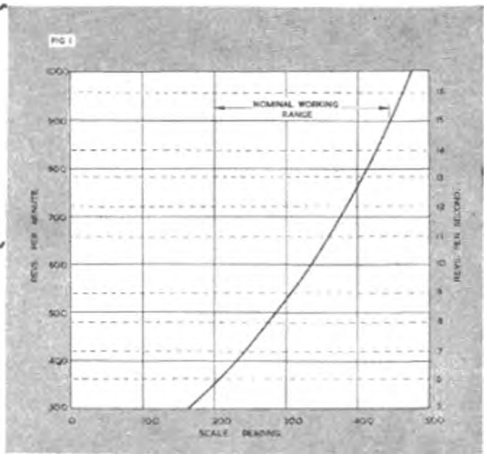
THE rev. counter used in the experiments described in the previous article had to meet a number of rather stringent requirements :—

1. No load whatsoever could be imposed on the rotating propeller.
2. The instrument following the speed of the propeller had to be able to follow instantaneous changes in r.p.m.
3. Readings to be direct, not interpolated.
4. It was necessary to cover a range of speeds between about 5 revs. per second at the lower end, and an extreme high speed of possibly 20 revs. per second.
5. If the instrument used batteries the readings had to be sensibly independent of changes in voltage, which might readily occur.

The first requirement could be met fully by using a photo-electric cell as a means of counting the r.p.m. The second and third conditions were fulfilled by using a three inch diameter moving coil micro-ammeter with a scale calibrated from 0 500 μA. Thus a reading which was directly related to the r.p.m. could be taken at any instant by observation on the position of the ammeter needle relative to its scale. In other words, over a test run, meter readings could be taken at set time intervals and the results plotted in the form of a graph showing variation of meter readings with duration or time of power run. As far as possible a simple relationship between scale readings and actual r.p.m. was desirable, but not essential. It would be instructive to know the actual r.p.m. at any particular point or points on the graph, but not strictly necessary for the tests originally contemplated. These were concerned with comparative performances of motors under different conditions.

As it so happened, the meter scale did turn out largely linear over the upper part of the working range and so plotting meter readings against time did, in fact, produce almost the same curve as would have been obtained by plotting actual r.p.m. against time. The latter was subsequently checked by calibrating the meter by practical tests, whence a relationship between meter readings and actual r.p.m. was obtained, as in Fig. 1.

The calibration graph also shows how the fourth of the original requirements was met. Between meter readings of 200 and 500—corresponding to



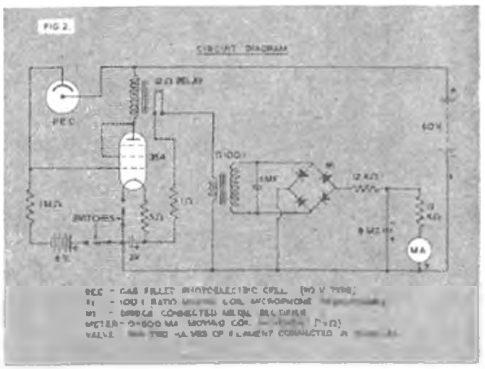
speeds of approximately 2 to 25 revs. per second—the meter scale is substantially linear. Below a meter reading of 200, i.e. a rev. per second figure of five, it is not. Since such low speed figures were not required, this was unimportant.

The fifth basic requirement listed was accommodated within the design of the circuit.

The instrument finally developed for the purpose utilised a light source of any convenient size, an interrupting vane on the propeller, and the photo-electric counter unit. The two former were external features, quite independent. The effect of the small vane on the propeller was negligible as regards performance of the propeller and was, in any case, used mainly as a convenience.

The interruption to the light source given by the blades of the propeller alone did not give satisfactory operation of the relay since the duration of time that each blade interrupts the light beam is only a few milli-seconds and the particular relay used would not respond satisfactorily to a

Meter is 0–500 μA. not MA as stated in figs. 2 and 5.



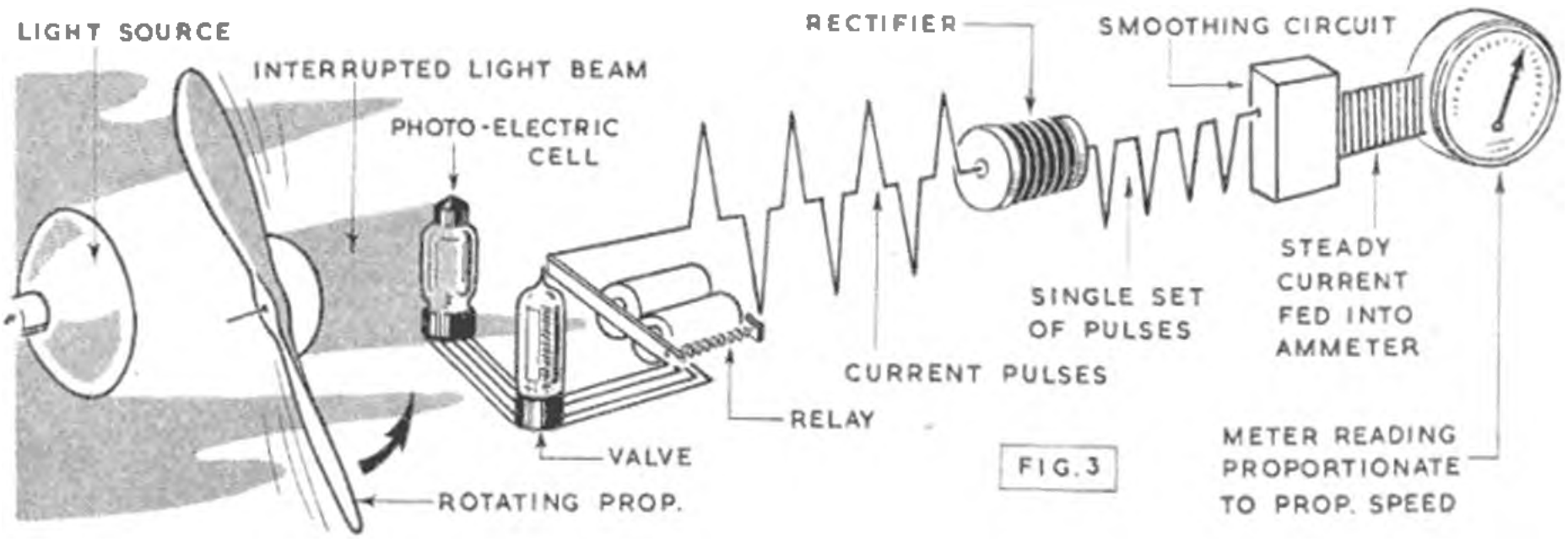
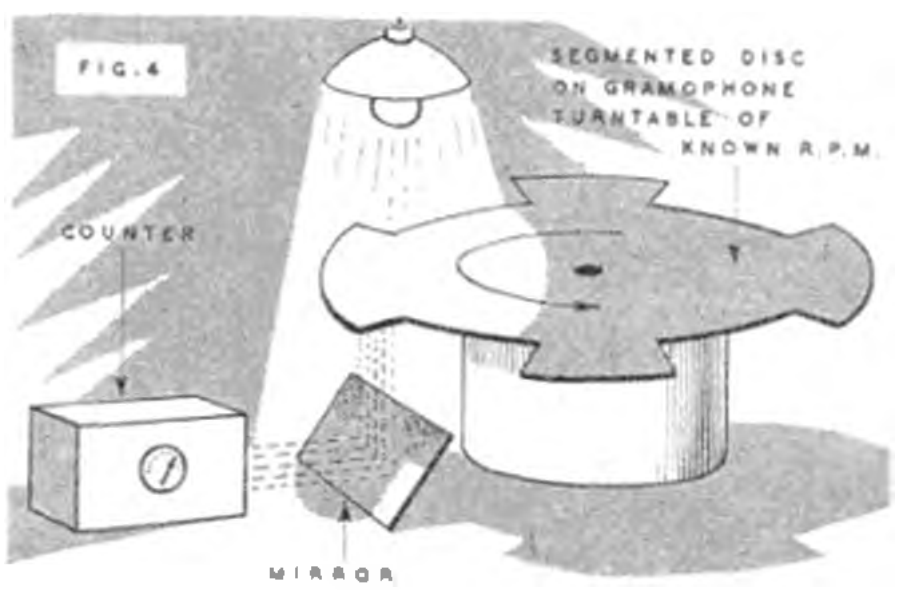


FIG. 3

pulse of less than about 15 milli-seconds. As a matter of interest, results could be achieved, but for satisfactory working was dependent on an almost exact value of the strength and positioning of the light source. A different type of relay would have overcome this difficulty, but rather than going to the trouble of rebuilding part of the circuit, the simple modification to the propeller was adopted and proved entirely satisfactory. The whole set-up was then almost completely non-critical, requiring only that the interrupting vane on the propeller cast a shadow on the photocell "window" in the case of the counter unit over roughly one half a revolution. A 100 watt lamp was used as the light source, stationed roughly two feet away from the instrument, which would then operate satisfactorily in normal room lighting, either daylight or artificial light. Variations in external illumination of this kind had no effect on the working of the counter. The photocell unit counts only the interruptions to the light beam from its near source, interrupted at the same rate as the speed of the propeller at any given instant.

The complete circuit is shown in Fig. 2. The light falling on the photocell increases its effective conductivity and thus raises the grid of the relay valve to a potential high enough to cause the consequent increase in anode current to operate the relay. The relay points then complete the battery circuit through the primary of the transformer and cause a pulse of current in the secondary.



Now when the vane cuts off the light from the photocell the current through the valve drops and the relay points open again. When the points open a somewhat larger pulse of current appears in the transformer secondary. The two pulses, one on the making and the other on the breaking of the relay points, are of opposite polarity, i.e. one is positive and the other is negative. Only one is used to operate the meter and so the output of the transformer is fed into a bridge rectifier. This leaves us with only a negative output which consists of a train of very narrow pulses of constant amplitude—narrow, that is, in time. All that remains to do is to count them, since one pulse occurs for every revolution of the propeller.

Counting is done quite simply with the resistance and condenser smoothing circuit immediately following the rectifier. The time constant of this circuit is arranged to be long enough to smooth out the pulses at above five pulses per second and give a steady uni-directional voltage which, in turn, gives a steady meter reading as long as that pulse rate is held constant. At the same time the time constant of the smoothing circuit must be short enough to allow the meter to follow any sudden speed change, i.e., any sudden fluctuations in propeller r.p.m. In effect, this solution is a compromise, but one which was quite satisfactory for the purpose.

Possibly too, this simple description of the electronic circuit may appear unintelligible to the non-radio minded modeller. In that case Fig. 3 showing the "physical" working of the unit in diagrammatic form should show what goes on.

Actually the principle used is exactly the same as the principle of the ignition system used with a spark-ignition motor—for those enthusiasts who can remember when this was the *only* form of miniature aeromotor available! Replace the relay points in the counter circuit by the contact breaker and the transformer by the ignition coil and the two basic circuits are identical! The ignition circuit subsequently uses the resulting pulse as the contact breaker points open to spark the plug; the counter circuit rectifies the pulses, takes one set and counts them—counting, if you

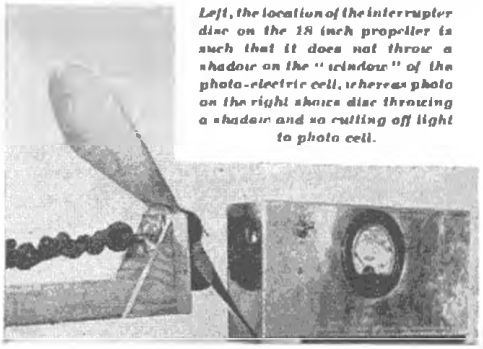
like, the rate at which the plug would have been firing had it been an ignition circuit.

The description of the circuit will also show that the meter reading, besides being a steady reading corresponding directly to test r.p.m., is quite independent of the *amount* of light reaching the photocell, and of the high tension battery voltage, as long as there is sufficient of both available to operate the relay with reliability. The only factor which really governs the stability of the readings is the low tension battery voltage, which means that this *must* be derived from an accumulator if drift is to be avoided.

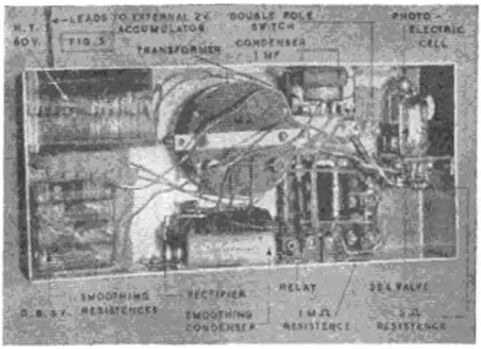
Thus tests taken at different times, and possibly under slightly different conditions, can be compared directly without correction. About the only criterion likely to affect the result—apart from the low tension accumulator going flat—is the physical disposition of the counter unit itself. It should always be used the same way up as there is the possibility of obtaining slightly different scale readings for the same speeds with the unit, say, upright and laid down flat.

Calibrating the finished instrument was quite a simple matter. It was considered advisable to do this by practical means rather than attempt to analyse the mathematics of the circuit.

A gramophone turntable was used for the calibration tests, fitted with an overlapping card disc cut with a number of segments. The apparatus was positioned as shown in Fig. 4 so that as the gramophone turntable rotated, and carried with it the card disc, a known rate of interruption of the light beam could be established. Actually tests were made at four different turntable speeds between 65 and 91 r.p.m.—speed at 78 r.p.m. checked by a stroboscopic disc and the other test speeds counted against a stopwatch—and with two discs—one with four and the other with eight segments. Segments and intervening spaces were of equal length so that the ratio of " light on " to " light off " (as far as the photocell was concerned) was unity. The mirror was used so that the counter unit could be calibrated in the same attitude as used for measuring propeller speeds in the previous tests described.



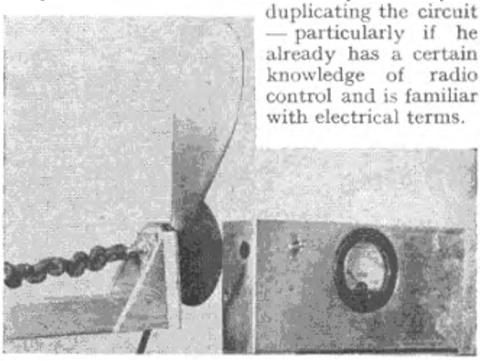
Left, the location of the interrupter disc on the 18 inch propeller is such that it does not throw a shadow on the " window " of the photo-electric cell, whereas photo on the right shows disc throwing a shadow and so cutting off light to photo cell.

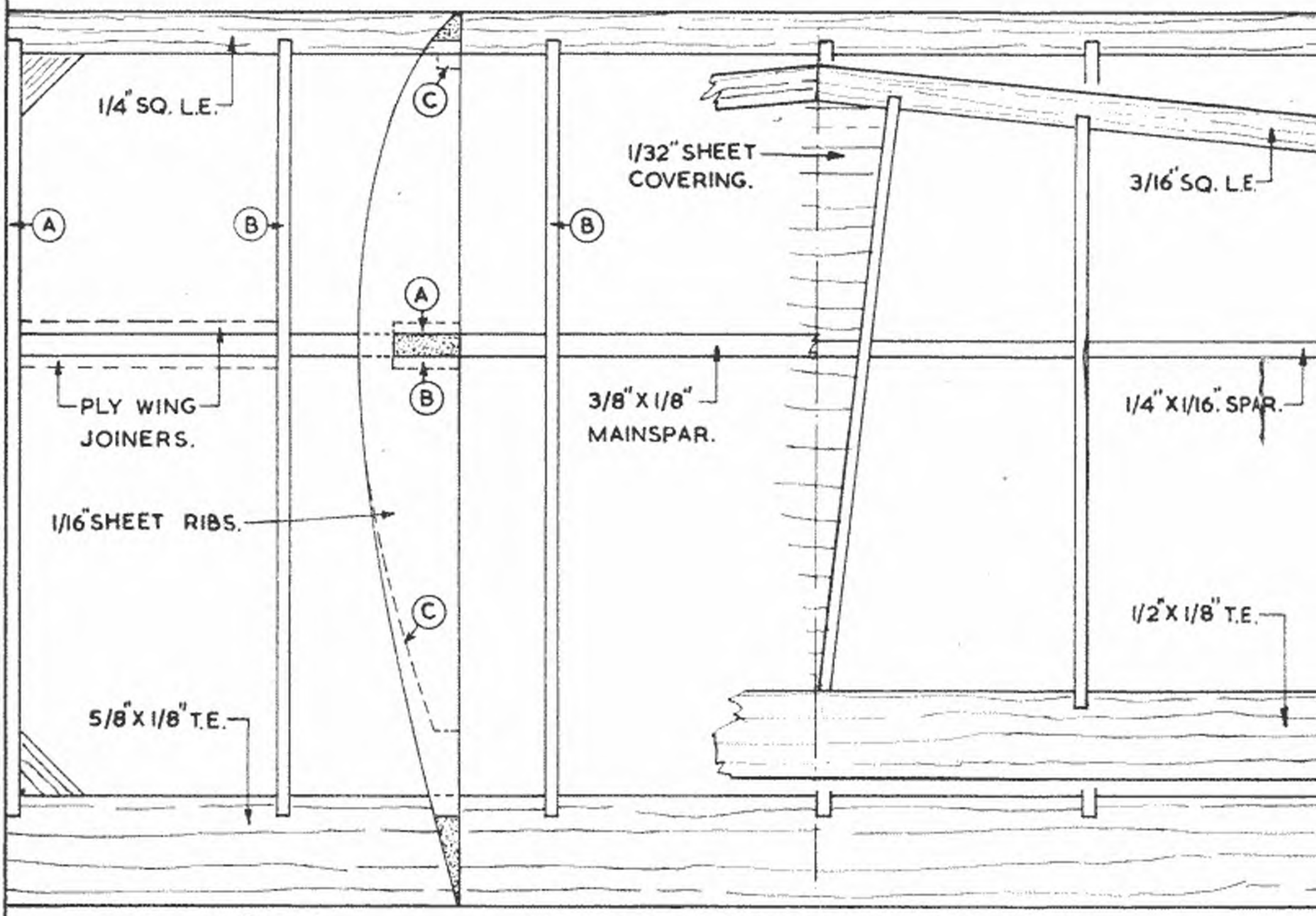


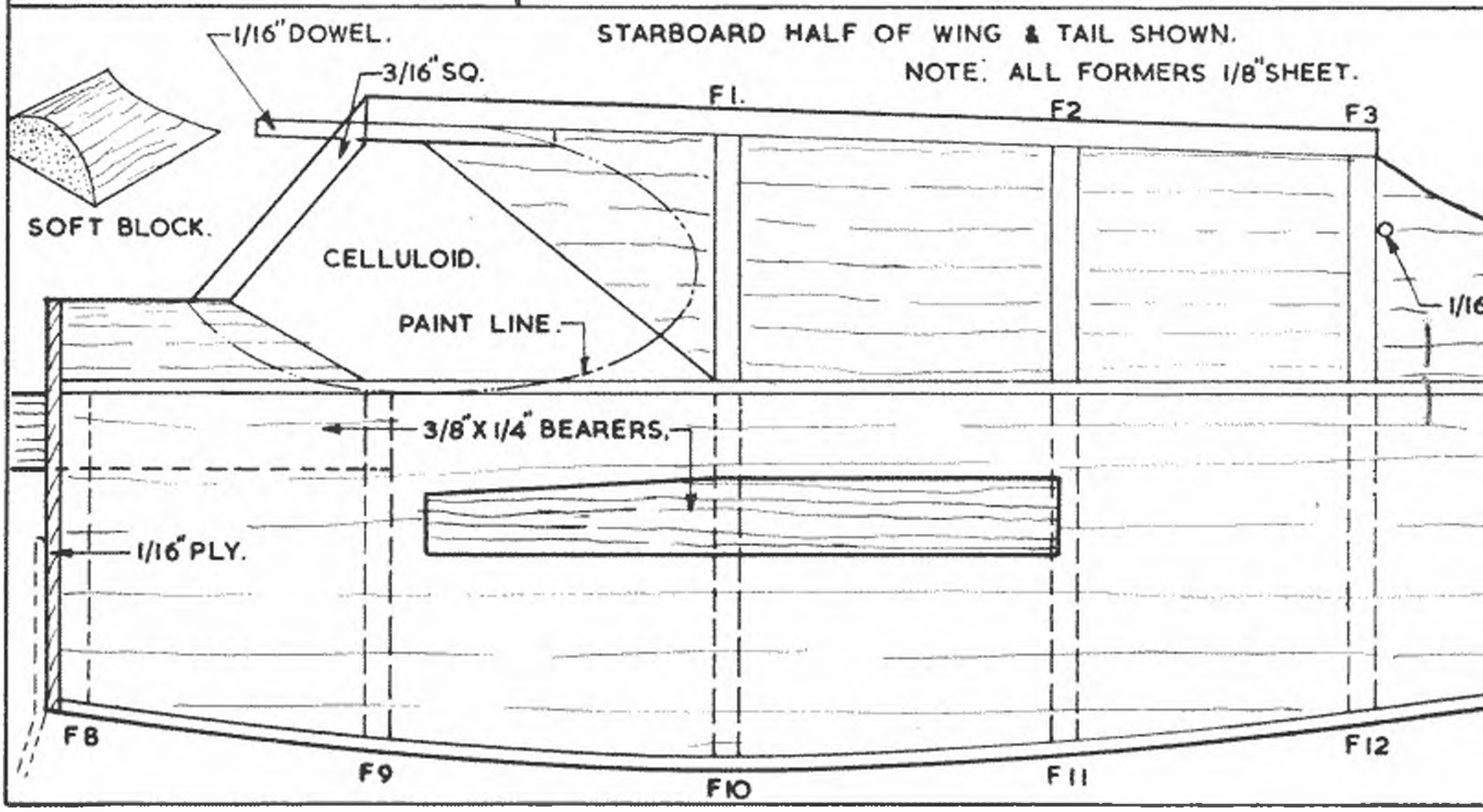
With very little modification the same unit could be used to " count " propeller speeds up to about 10,000 r.p.m.—and thus be applied directly to power model r.p.m. tests. Above a speed of about 10,000 r.p.m however, the relay may begin the " skip " some of the counts.

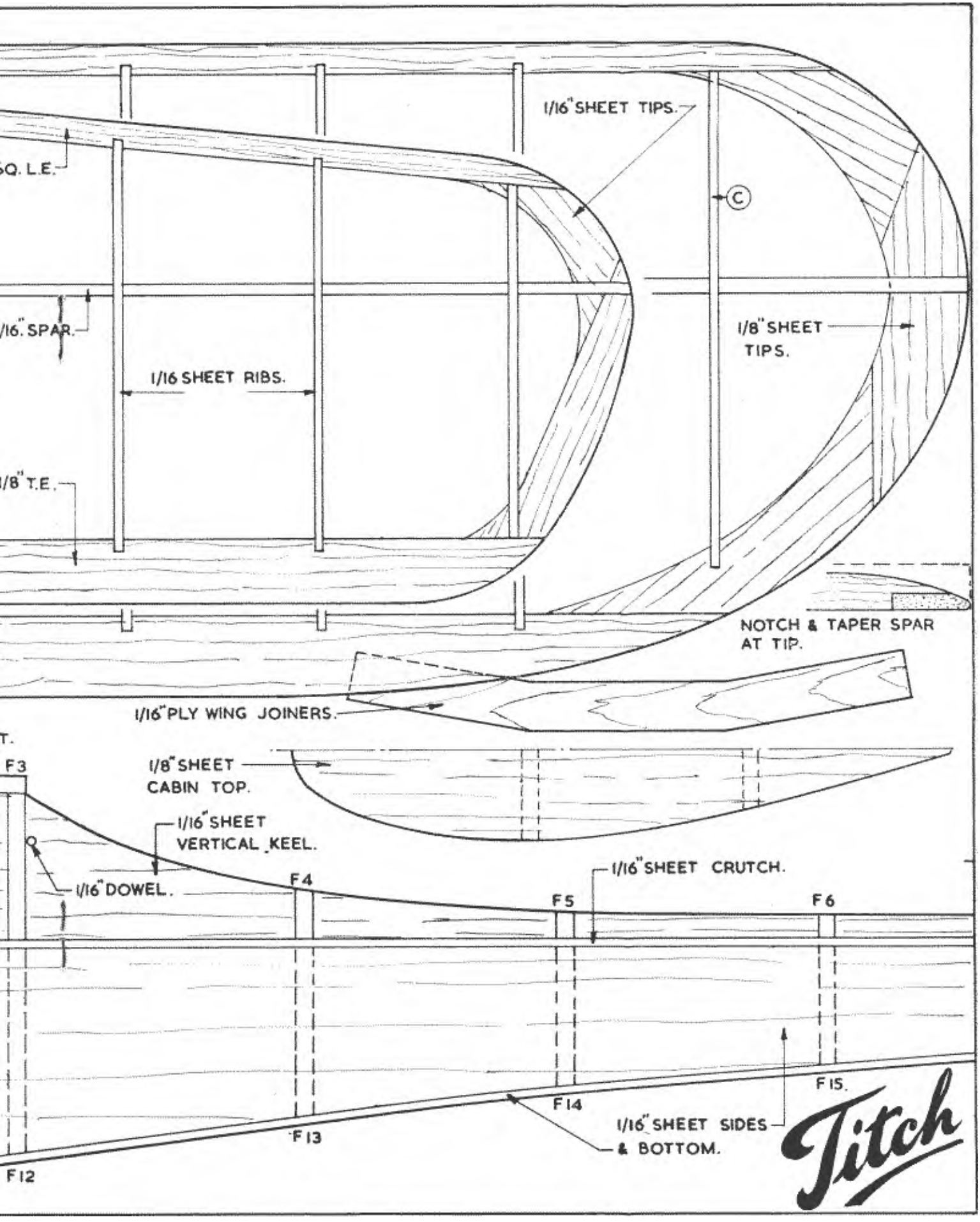
In any case, the relay used would have to be of the high speed type (e.g., Siemens) and possibly the use of a DL 94 valve would be better than the 3S4. It would also be an advantage to increase the high tension voltage to 90 volts and the grid bias voltage to 9 volts. Apart from a slight modification of some of the resistance values the same circuit would then hold valid.

The main attraction of such a counter unit, of course, is that it is entirely independent of the apparatus or machine whose speed is being measured. It relies simply on that machine or apparatus interrupting a light beam at a frequency related to its shaft speed, when the shaft speed can readily be determined by the " count " afforded of the frequency of interruption. Unlike so many other speed-measuring instruments it requires no adjustment. In other words, it does not have to be " tuned in " or adjusted to the observed speed. It reads this observed speed direct, and, if the speed varies, follows such variations instantaneously. Nor is it a complicated electronic project. No competent modeller should have any difficulty in duplicating the circuit — particularly if he already has a certain knowledge of radio control and is familiar with electrical terms.




1/4" SQ. L.E.
C
1/32" SHEET COVERING.
3/16" SQ. L.E.
A
B
B
A
B
PLY WING JOINERS.
3/8" X 1/8" MAINSPAR.
1/4" X 1/16" SPAR.
1/16" SHEET RIBS.
C
1/2" X 1/8" T.E.
5/8" X 1/8" T.E.


1/16" DOWEL.
STARBOARD HALF OF WING & TAIL SHOWN.
NOTE: ALL FORMERS 1/8" SHEET.
3/16" SQ.
F1.
F2
F3
SOFT BLOCK.
CELLULOID.
PAINT LINE.
1/16
3/8" X 1/4" BEARERS.
1/16" PLY.
F8
F9
F10
F11
F12

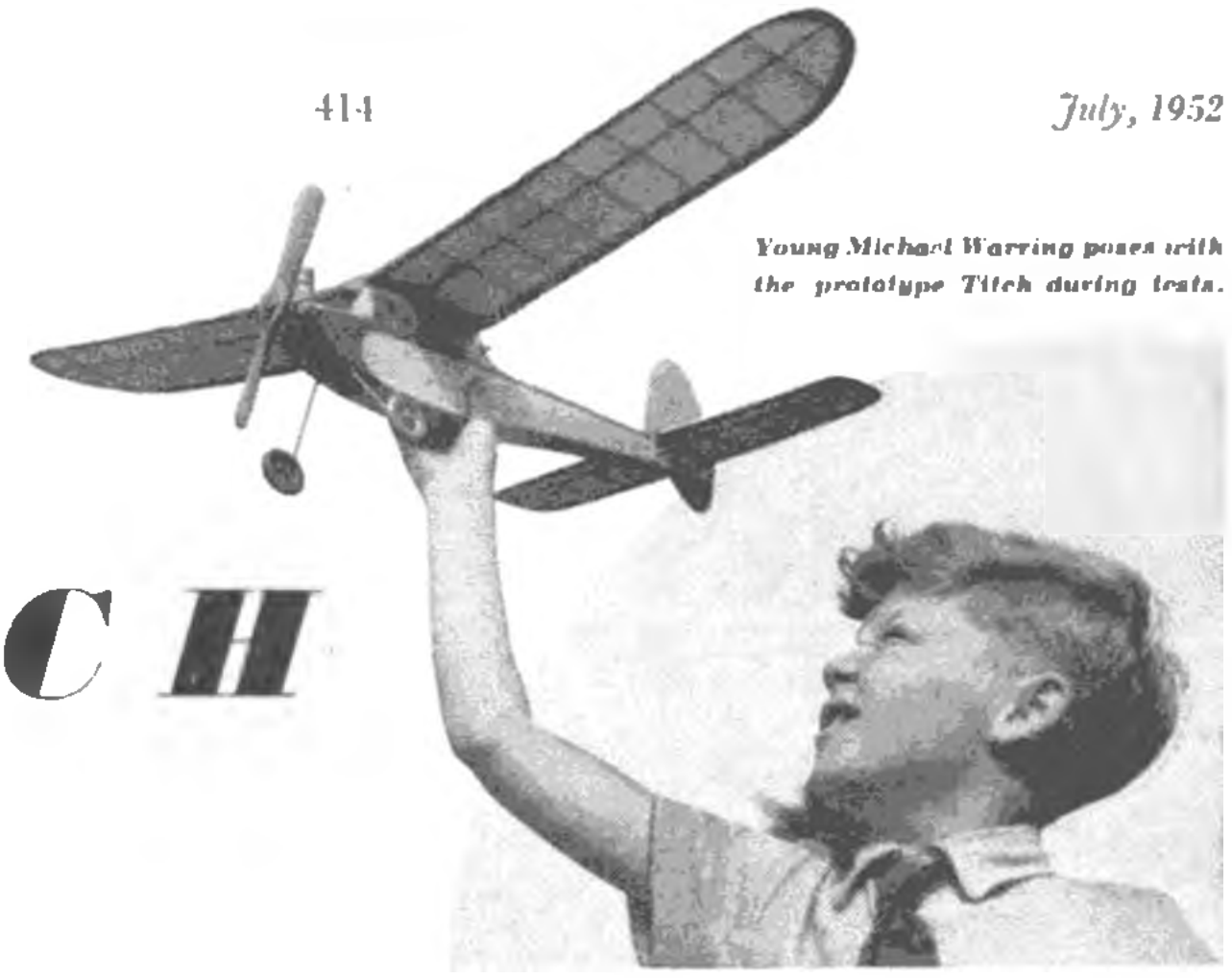

1/16" SHEET TIPS.
SQ. L.E.
C
1/16" SPAR.
1/8" SHEET TIPS.
1/16 SHEET RIBS.
1/8" T.E.
NOTCH & TAPER SPAR AT TIP.
1/16" PLY WING JOINERS.
T.
F3
1/8" SHEET CABIN TOP.
1/16" SHEET VERTICAL KEEL.
1/16" DOWEL.
F4
F5
1/16" SHEET CRUTCH.
F6
F15.
F14
1/16" SHEET SIDES & BOTTOM.
F13
F12
Titch

Join up three pages for full-size plans of a sport model

TITCH

By RON WARRING

DESIGNED FOR ALL BEAM MOUNTED ·5 c.c. ENGINES



Young Michael Warring poses with the prototype Titch during tests.

THE fuselage is built up on the sheet box principle —accurate, rugged and yet extremely simple. Start by cutting two identical sheet sides from 1/16 sheet balsa stock of medium or light medium grade. Now cut accurately a set of formers 8 to 16 inclusive from light ¼ in. sheet balsa and check that all these are square.

The fuselage is assembled on a 1/16 in. sheet balsa crutch in the inverted position. For the crutch a piece of 1/16 in. sheet 18½ ins. long and at least 1¾ ins. wide is required. Mark a centre line on this sheet and then cement on all the formers in their respective positions. Centre lines should be marked on these formers as a guide.

When the formers have set, cement on the two sheet sides, pinning in place to each former until set. Trim down as necessary. Cut the two motor bearers from ⅜ in. × ¼ in. hardwood, chamfering the top edges at 3 degrees for downthrust, and also cement in place. Then cement on the bottom planking of 1/16 in. sheet.

Cut the vertical keel from 1/16 in. sheet to the exact shape shown on the plan and cement this in place. Support accurately by adding all the other formers, two off each, cemented either side of the vertical keel. The cabin top is cut from a single piece of ¼ in. sheet and cemented on top of the vertical 1 keel and formers 1 and 2.

Cut the firewall from 1/16 in. ply, bend the undercarriage from 1/16 in. (16 s.w.g.) piano wire and bind in place. This former can then be cemented to the front of the assembled fuselage. Add the soft balsa block immediately behind this former and carve and sand to shape. The fuselage is then virtually complete, ready for covering with tissue. The front or cabin portion is, of course, covered with this celluloid. Note, too, the addition of the dowels to take the wing rubber bands.

Tailplane construction is quite straight-forward. The wing is built in three panels—a starboard panel, a port panel and a small centre section. Ply wing joiners built in with the centre section align the final assembly at ten degrees dihedral angle and also reinforce the dihedral joints. Add small sheet gussets.

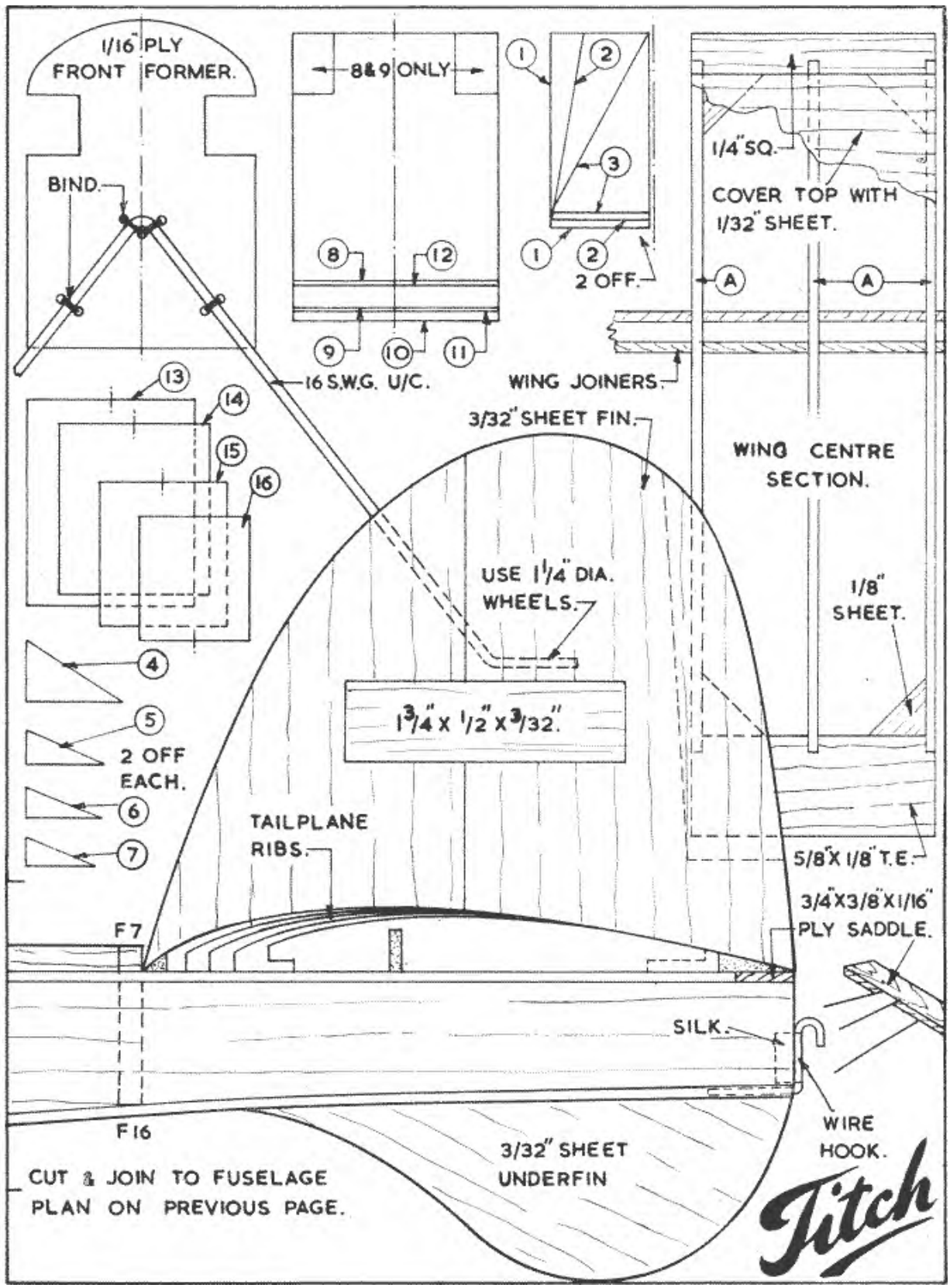
The fin is cut from soft 3/32 sheet balsa. Join two pieces to build up the required width and let in a key piece which will both strengthen the assembly and prevent it warping. The grain in the key piece is horizontal; in the main fin sheeting it is vertical. Sand the fin down to a nice streamlines section and shape the base to conform to the aerofoil section of the tailplane. After the tailplane has been covered the fin is cemented in place.

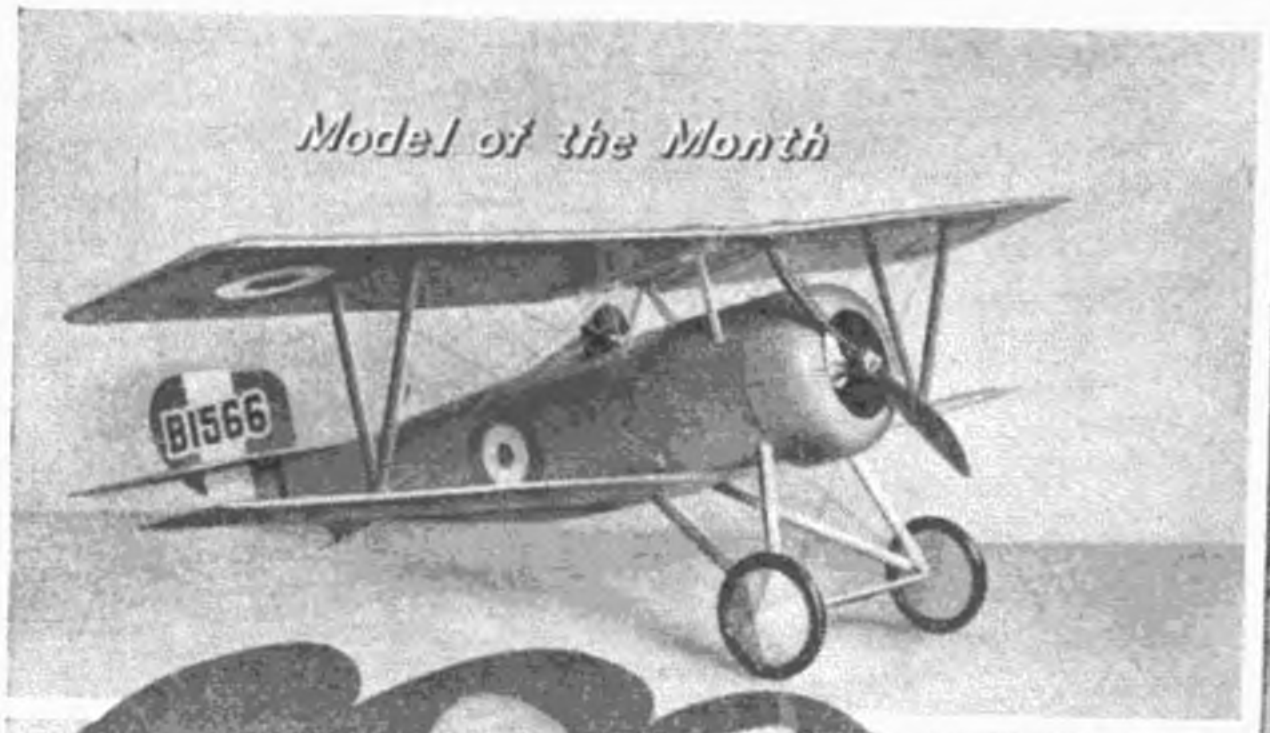
After all the components have been finished and covered and doped, bolt the motor in place on its bearers. The slotted mounting holes of the E.D. "Baby" make sidethrust adjustment easy, but initially set the motor straight. The downthrust angle given by the tapered bearers should be more than sufficient to keep the nose down under power flight and excessive sidethrust may be dangerous during initial tests. As flight tests proceed sidethrust can be added, a little at a time, to turn the model in one direction or another, if desired.

Balance will probably vary with different models owing to the difference in weight of the wood used. Balance point should come out 2 ins. behind the leading edge of the wing. Provided it is in this region you can adjust the glide trim as necessary by increasing the tailplane incidence (positive) to cure any stalling tendency or increasing the wing incidence to cure a dive.

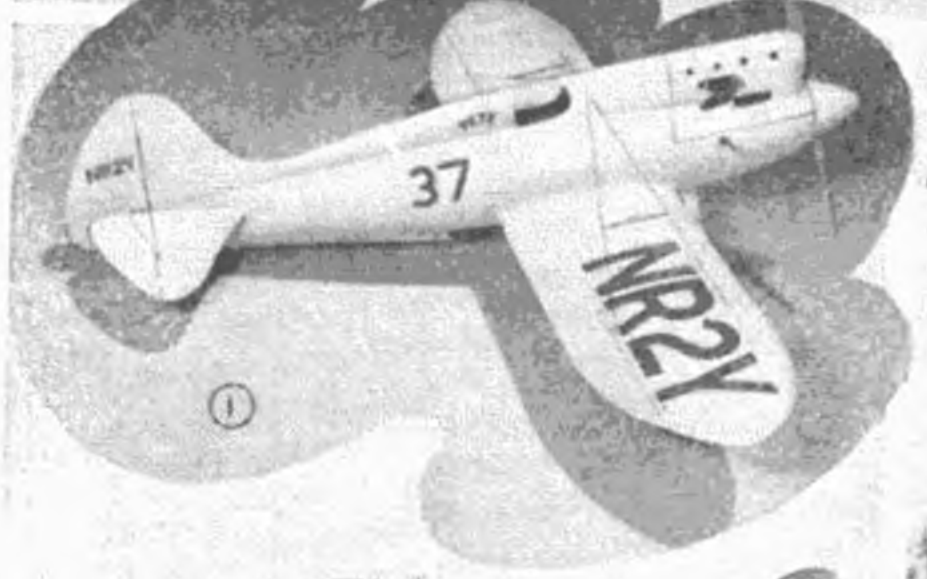
Climb on a powerful motor will be quite spectacular whilst the relatively low weight will ensure a good glide.

If you have built your model well, and chosen good, light wood, you should have weight to spare which can be taken up with more elaborate paint trim. Built normally, the weight, with motor, should not come out at much more than four to four and a half ounces, a figure which could quite easily be increased to six or seven ounces without serious effect on the flying qualities.


1/16" PLY FRONT FORMER.
8 & 9 ONLY
1
2
3
1/4" SQ.
COVER TOP WITH 1/32" SHEET.
BIND.
8
12
1
2
2 OFF.
A
A
9
10
11
16 S.W.G. U/C.
WING JOINERS.
13
14
15
16
3/32" SHEET FIN.
WING CENTRE SECTION.
USE 1 1/4" DIA. WHEELS.
1/8" SHEET.
4
5
2 OFF EACH.
6
7
1 3/4" X 1/2" X 3/32".
TAILPLANE RIBS.
5/8" X 1/8" T.E.
3/4" X 3/8" X 1/16" PLY SADDLE.
F7
SILK.
WIRE HOOK.
F16
3/32" SHEET UNDERFIN
CUT & JOIN TO FUSELAGE PLAN ON PREVIOUS PAGE.
JOIN THIS EDGE WITH PAGE 413 FOR FULL SIZE FUSELAGE PLANS
Titch


Model of the Month
B1566


DO YOU SELL TOY AEROPLANES?
MODEL NEWS
SELECTED ITEMS BY FLIAR PHIL


37
NR2Y
1


2


3


63
N-NGD
4


5

6

AN excellent photograph of a well-built model is our choice of the month and the subject is W. Kitchings' Mills Mk. 1 powered A.P.S. Nieuport 17c. Already a veteran of three seasons' hard flying, this faithful reproduction of the famous World War 1 fighter boasts a leather clad pilot to match, complete with traditional fur collar, leather helmet and glazed goggles. A very fine effort, Mr. Kitchings; we wonder how many more of our readers could produce a three-year-old in such fine fettle.

Built from an American "Stirling" kit, the scale Howard "Pete" racer shown in picture 1 was made by Canadian modeller Dave Mackay and photographed by his pal Alec Burns. Beautifully finished with no less than twelve separate coats of white dope, rubbed down in between, the model started life with a McCoy 29 up front; but now has a Fox 35 for even greater flying speed. As photographer Burns states, this scale model makes an ideal team racer; but, alas, there is a surprising lack of enthusiasm for this type of flying in his part of Ontario.

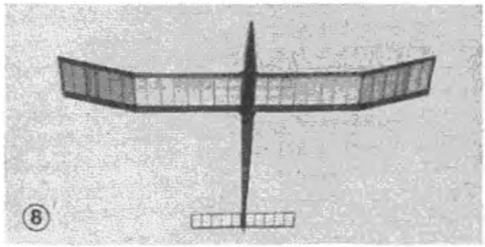
Number 2 has special interest for radio fans. It is H. T. Holman's photo of W. Manuel's radio-controlled 11-foot (one-piece, too ! !) span sailplane about to go up on test at Chobham Common. Equipment is E.D. Mk. 1, total weight 7½ lbs., and total area 2,280 sq. ins. An interesting feature is the two-part rudder for climbing to the left or turning right to lose height.

Displaying the feathering prop to full advantage is the Themis Wakefield by Eric Smith in No. 3. This diamond fuselage, high efficiency model was Eric's design for early '51, and boasts a light air-frame weight with many "knock-off" features.

The unusually large scale of 2 ins. to one foot was necessary when Peter Donavour-Hickie made a scale model of the "World's Smallest", the American Stits Jr. Using spark ignition for its Ohlsson 29 engine, all-up weight is 17½ ozs. and wing area, the handy team racer size of 125 sq. ins. With its petrol engine and the known economy of such motors, the Stits should be quite a novelty in any team event.

A scale specialist, with preference for the smaller motors, is Bob O'Brien of Goring-by-Sea in Sussex. Friend R. A. Figg took photo 5 which shows Mr. O'Brien with his latest effort, an E.D. Bee powered Westland Wizard with a very sporty performance. Once voted one of the twelve most beautiful aeroplanes, the Wizard is a perfect subject for free-flight scale, if one has the patience to evolve a suitable parasol wing mounting.

Streamlined fuselage, swept leading edge and tea-tray mounted tail are all novel features in E. Fearnley's "Mills Bomb" design No. 6. Built to check theories on wetted area, parasite drag and suchlike, this all silver semi-scale job with Mills Mk. 1 has a contest performance with fast climb and sailplane-like glide, all of which should be well in keeping with its fighter-like appearance.



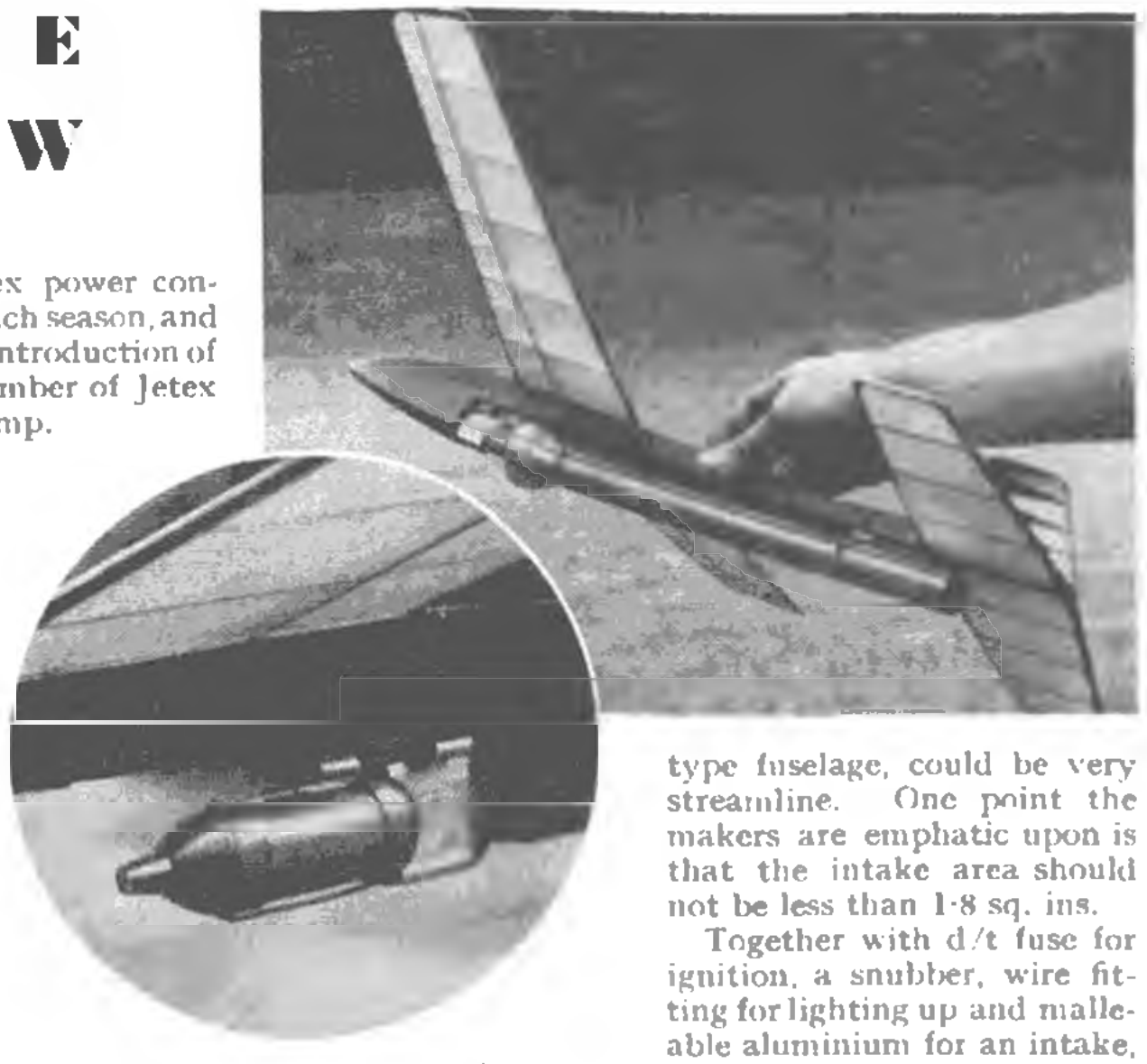
The pretty little sport cabin monoplane in No. 7 is an A.P.S. Wren, built by W. J. Porter of Alfreton in Derbyshire, and using an Elfin 1.49 diesel. For the man who likes to have a few curves in his general sport models, the Wren is the right choice.

For contrast, No. 8 shows a "square" model in the shape of Keith Donald's S. Eastern Area H.L. A/2 record-holding "Thermal Dodger". The record flight of 5.45 was made o.o.s. and we presume that the model was doing its best to contradict its name. Span is 56 ins. and tail area a diminutive 16 per cent. of the wing.

And so to the smallest of the month, and like the Nieuport, a veteran of three seasons, and a model of a '14–'18 fighter. V. King is the proud builder of this Albatros D.IV, built to solid scale plans and made for rubber power. Weight is but a mere one-and-a-half ounces !

We shall be back next issue with more photos of interesting models, and don't forget there is always room for that picture of *your* model.

TRADE REVIEW



THE growth of interest in Jetex power continues to flourish even more each season, and we have no doubt that with the introduction of the new **Jetmaster** unit, the number of Jetex fans will really go up with a bump.

The accepted thrust quota of a standard '100' unit has always been one ounce. For the Jet-master '100' there is a claim for one and three-quarter ounces, an increase by 75 per cent., and furthermore, when used with the new augmenter tube inside a hollow fuselage, the thrust increases by 125 per cent. to 2¼ ozs. We carried out practical tests, using the new 'Red-Spot' fuel, and can fully confirm all that the makers claim.

A contest duration model for the standard '100' showed commendable increase in rate of climb using the Jetmaster alone, and did on one test accelerate off grass for a sliding unassisted take-off that was not possible with the standard unit. The Jetmaster is simpler than its forerunner with just one easy to roll on locking spring, and every part designed by Joe Mansour to be practical and handy to the aeromodeller. With each unit, igniter wick and six pellets of fuel, a cleaning reamer, spare washers and complete instructions are provided, the latter including some helpful advice on how to increase the duration. Cost of the Jetmaster, which is 1¼ ins. longer than the standard '100' and requires more fuselage space for fitting, is 29/4d., including purchase tax.

An additional accessory for scale jets is the augmenter tube. Made of very light gauge aluminium, and weighing only half an ounce, this has its best application in a fuselage of the MiG 15 or Thunderjet type, where a straight-through flow is possible. The Jetmaster is mounted centrally in the neck of the augmenter tube, and thrust is automatically increased by a further half ounce. Application of the tube for general contest flying might also have possibilities, it would certainly bring in a new era in free-lance design. We tested the tube on an external mounting just to satisfy odd curiosity, but of course no material advantage can be gained with the tube stuck on Buzz-bomb fashion.

Structurally, the tube can be used to advantage as the basic structure of the fuselage, it is surprisingly strong, and with a former and stringered type fuselage, could be very streamline. One point the makers are emphatic upon is that the intake area should not be less than 1·8 sq. ins.

Together with d/t fuse for ignition, a snubber, wire fitting for lighting up and malleable aluminium for an intake, the cost is 6/1d. per tube, complete in well-packed box.

Frog Vantage T.R. 17/2 (plus 3/10 P.T.)

Wing span 27 ins. Length 21 ins. Effective Wing Area 139.6 sq. ins. Our weight with Frog 500 GP. 21 ozs.

Packaging of this kit is tightly effected with every square inch used to accommodate the myriad parts. We would ask buyers to disregard the illustration since this is a temporary pack.

Quality of the wood rates high, all die-cut wood is completely pierced and ready to pop out blocks have reasonable tolerance, and strip wood is hard. Obechi is used extensively for major structural components. The supplied tank parts were lengthened by 9 mm. to add a permissible 4½ c.c., bringing the capacity up to 30 c.c. Fresh paper tubes were also made, those in the kit being too small for engine retention bands.

Completeness. Except for cement and dope, the builder need buy no extras other than those mentioned above. This is a kit complete to the last woodscrew, washer or bolt, including a smart plastic spinner, correct size wheels and even a few elastic bands. For this reason, and also for its rather long construction time, we especially recommend the Vantage to hospitalised or bed-borne modellers.

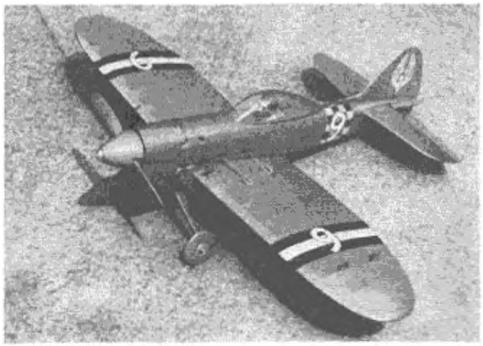
Assembly is aided by an excellent four-page instruction leaflet, which although it has one or two minor errors, is a perfect guide to stage by

stage assembly. Die-cut parts are a great aid; but the average builder will find up to 48 hours work necessary, in spite of prefabrication.

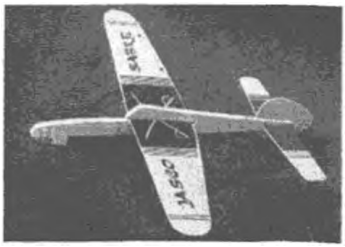
Value of this kit is well above average; we doubt very much whether the same model could be built from stock at anywhere near as low as a guinea.

Flying. The manufacturers wisely make no claims for astounding performance, for team racer operation depends entirely on the modeller concerned. The Vantage looks nice, and handles beautifully. If the tank is increased to 30 c.c. it should give stiff competition in any Class B race. Oversize wing area makes it also suitable as a sport flier and gives a generous safety margin for manœuvrability. Airspeed of the test model averaged 76 m.p.h.

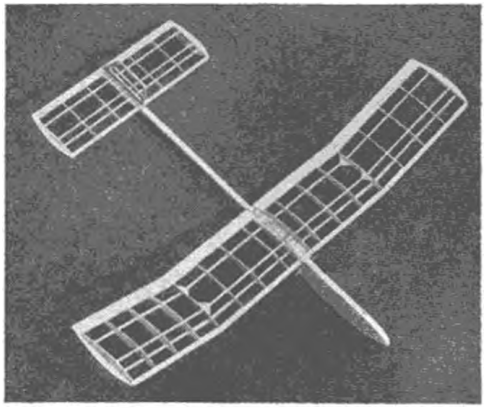
To protect the elastic bands and to let some air out of the power department, we recommend that air louvres be cut in the metal cowl behind the plug hole, exhaust and on the starboard side. The projecting louvre behind the exhaust will then baffle oil off the vital wing bands.



Jasco Scout is a ready-made all balsa job of remarkable performance, now available at 5/6 and a good buy for the youngster.



Jasco Sabre is ready to fly for Jetex 50 or as a glider. For only 2/6 it's a colourful present for the beginner.



Mercury Gnome. 7/4 (including P.T.).

Wingspan 32 ins., length 20½ ins., wing area 157 sq. ins. Weight, covered and including ballast, 3¼ ozs.

Packaging. The contents were comfortably enclosed in a sturdy cardboard box attractively printed in red, yellow and black, with a large photographic illustration of the model itself, for the benefit of prospective buyers.

Quality of Contents was first-rate.

Completeness. This is, of course, a "dry" kit, so that no cement or dope is included, but is absolutely complete otherwise. We found no deficiencies, there being ample wood, etc., for the job.

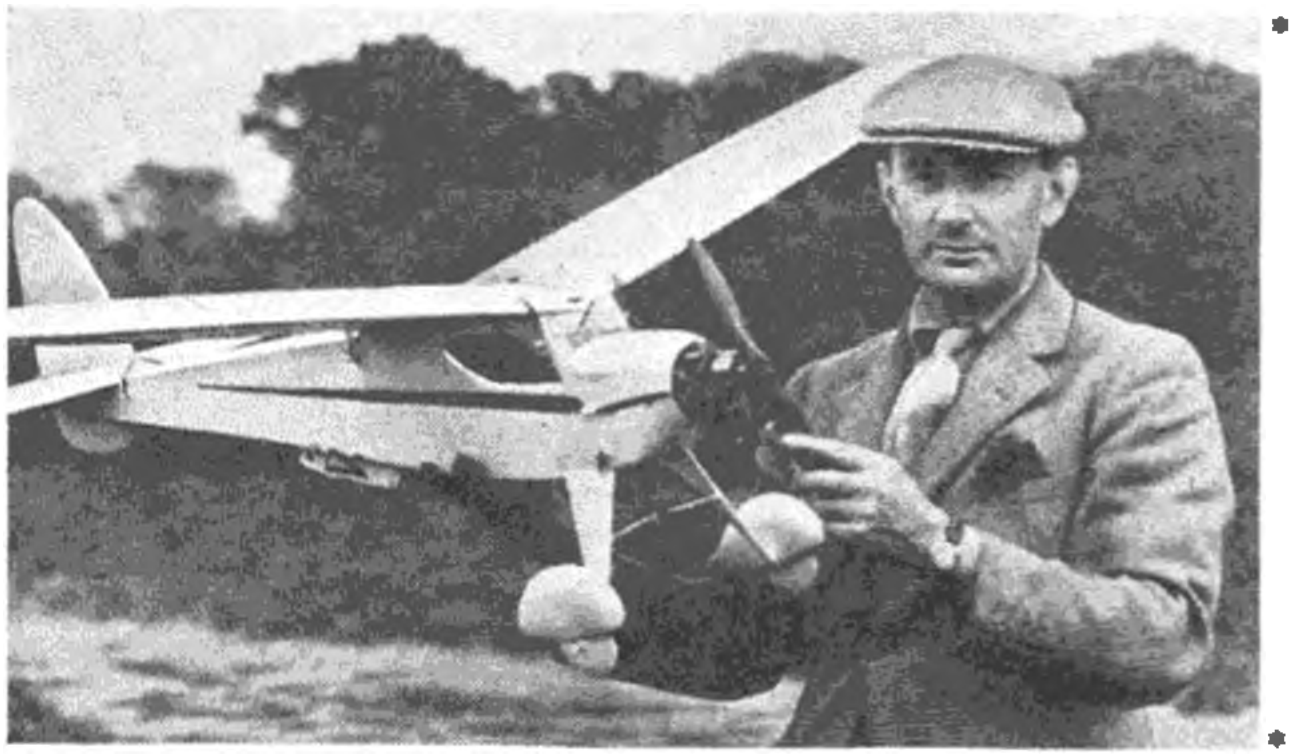
Ease of Assembly. The usual clear and well-drawn Mercury plan, plus separate printed building instructions, made construction as simple as could be wished. The beginner, for whom this kit is primarily intended, should experience no difficulty. Wing ribs, dihedral keepers, etc., are all on printed sheet.

We particularly admired the sturdy construction of this model, which is capable of taking drastic punishment. Reviewer's small son aged six has repeatedly "pulled the model in" on a hundred feet of line without so much as splitting tissue.

It took two evenings' building time for an experienced modeller from opening the box to final doping. The average tyro should be able to start building on a Monday, with the model all ready Friday night.

Flying. Very little trimming was necessary on the review model, just 1/64th under the leading edge of the tailplane. Model had a natural left-hand turn and was simple to handle on the towline. Third tow launch from only 50 feet of line resulted in an o.o.s. flight, and subsequent fly-aways were numerous. In fact, our only criticism is the omission of advice regarding a dethermaliser. This can very easily be accommodated by attaching the rubber band holding down the tail to the rear fuselage slot by means of a loop of cotton. Thread your fuse through the loop and the job is done. Another addition we would suggest for those intending the model for contest work is the fitting of an extra tow hook ¾ in. behind the one shown on the plan. This for calm weather towing; our old legs became a little weary from having to run so hard!

Value at 7/4 including P.T. is very good. For this the beginner gets a simple to build, easy to fly glider, capable of contest performance.



BOWDEN

In presenting the following are fully aware that the precision programme. Nevertheless, habits vast majority of aeromodellers Bowden's viewpoint for their

"WHAT are the official minds doing to cater for, and encourage, the large band of aero-modellers, who are not contest duration men, and not natural club men? In my submission, not nearly enough. This is one of the underlying secrets of the falling off in popularity of model aircraft activity over the past year or two. Even if the organizers of the movement are self-satisfied at their efforts, the model trade can tell you that there has been a marked decline in popularity. I maintain that, through our one-track competition trend towards duration only, we are developing a type of aircraft that does damage to itself and the movement.

" The average contest is a dismal sight of damaged power units and unstable crashing aircraft, with baulky motors in far too many instances, when easy and immediate starting should be the order of the modern day, followed by stable flight and safe landings. The sight of a radio competition, with its major marks for so-called stunts, is even more depressing. Unending twiddling with radio tuning, perhaps followed by falling about in the sky, called stunting, followed if lucky by (but almost unrewarded by marks) an occasional landing near the starting point.

" *Through our present competition trend, we are developing a type of aircraft that is far from what the public wants to see, and far from what the man outside the club requires as his ideal.*

" We can only think in terms of duration, which demands a very high climb at great speed, which in turn develops an unstable design, with an over-" hot " motor with its emphasis on high power / weight ratio, rather than moderate power and easy starting

" Let there be no mistake—there are a number of people who don't give a damn about contest work, who are not interested in being a club member, but want to fly a model aeroplane just for fun and stable flight, with the knowledge that they can start their motor with ease and rapid certainty. This also goes for radio, where stunting is a minor consideration, and where the " experts " are often not too clever at quick get-away and *control back to base without flyaway !*

" These people would be lured into flying their stable flying craft in an occasional competition, *if the model journals publicised suitable competitions well ahead, so that they could make their arrangements in good time, with a reminder just before the event, and clear directions where the flying ground is and how to get to it !* (We would if *we* were told !—*Ed.*)

" All that the chap outside a club contact gets at present is a brief mention in an events calendar, sometimes stating a place ' somewhere in England.'

" Let us face the fact that the present duration contests are most excellent for the experienced club man, but they do develop the rocketing unstable model with its involuntary crash flying on grand scale for the average modeller, whether he is in a club or outside, and they are frightfully bad propaganda for the parents who are often the deciding factor in paying for their young hopeful's hobbies. *The general public has the impression that model aircraft are unstable crashing toys.* So often have I seen the look of polite disbelief on the faces of parents when I have remarked that a model aeroplane can be made to come back to earth undamaged with almost unfailing certainty, if you choose the right design.

" Believe me, if we want to widen, instead of narrow our movement, we must dispel this general disbelief of the G.P. We can only do it by encouraging the stable model, the quick starting motor, and the reliable, stable, radio receiver. The stupid thing about this problem is, that such models and equipment all exist on the model market today, but many people do not know of it, because we have over emphasised the wrong type of flying.

" Let me here say, without any possibility of being mistaken by the biased, that I do not

COMMENTS

discourse from our old friend Colonel Bowden, we type of contest has never proved popular in a National and trends are always changing, and as undoubtedly a are not competition minded, we are presenting Colonel interest, and would appreciate readers' comments.

condemn pure duration at all costs for experienced clubmen who know what they want for themselves, and are able to control their models, and don't let us forget that these clubmen are the backbone of the model movement.

" But what we must do is to realise that these come under the heading of ' experts ' for the sake of argument. The average man must be shown how stable and easily trimmed a model can be made, and it is the large contests that come under the public eye, as our most effective propaganda medium.

" If we look more deeply into the matter, the organisers of competitions under the public eye are not blameless. They view the matter from the narrower confines of club interests, failing to see the interests of the movement as a whole. Like many a politician, they give way to the immediate clamour of the contest club man on the spot, who they feel elected them. The answer is invariably a rut of duration contests, with little or no relief.

These men must realise, in my opinion, that it's the general public's opinion of model aeroplanes that matters, and widens their hobby, and that it is only the stable flying model of great reliability that will do this.

" It is always easy to be destructive and full of criticism, like the Opposition in each Parliament, but it takes something to produce a better 'ole to go to ! Therefore let us imagine for a moment what would happen for the good of our movement if we were to divide our contests into half for the ' duration ' boys of the clubs, and half for the ' stable ' flight boys in the clubs and also for those outside the clubs also keen on sport general purpose flying :—

(*a*) We should concentrate on stable movements in the air, quick starting, and landings without damage after a given time. Any instability, or boggle starting, or bad landings would be heavily penalized.

(*b*) Radio contests would demand, on penalty of disqualification for that flight, that the competitor had to be in the air after 4, or if you want to be generous, 5 minutes ; that marks would be lost unless the competitor could control his model within a radius of ¼ mile. ANY STRAYING from that would be called lack of control and mean loss of marks. Any violent dives, spiralling on turns, over-climbing, or diving, would be lack of control, and penalized, and any competitor who could not control his model back to base into a 30-yd. circle *would lose all marks*, for it cannot be called radio control if you are unable to get the thing back !

" Instead we give all the worthwhile marks to a lucky fall-over called a loop, even if the man doing it cannot get his model in to a spot landing !

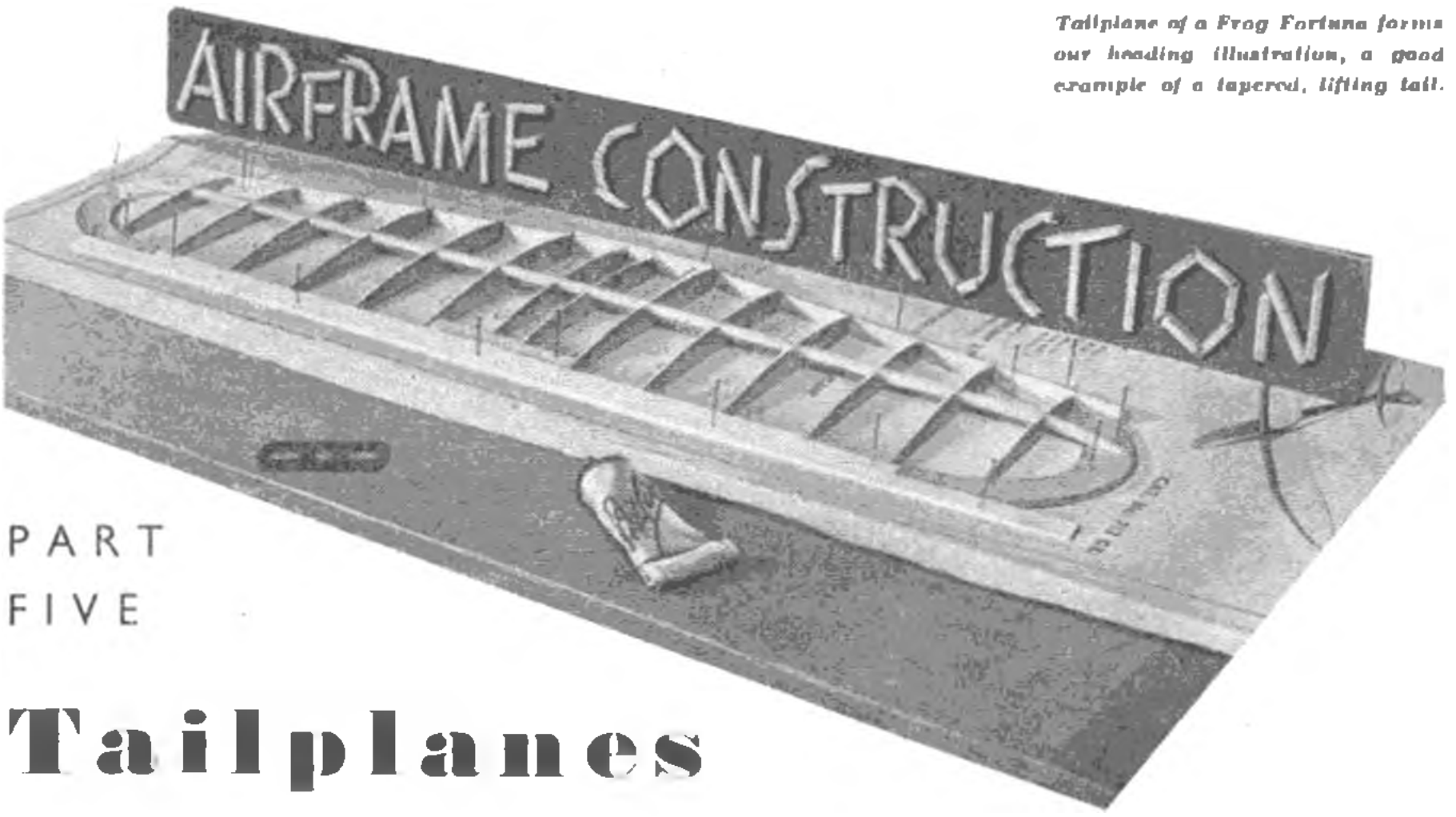
" The above sort of flying would be pleasant to watch, have excellent propaganda effect, and develop reliable equipment. The unreliable designs and equipment would go into well-deserved oblivion. We should still satisfy the duration and radio stunt experts with their remaining half of the contests. (Incidentally, some of them might find quite a struggle, as things are today, to show up well in our stable flight contests !)

" I think of my own ' Bowden Trophy ', which I gave for stable flight above all other considerations, for its history is a valuable pointer, and a case in point. For a number of years it was very well attended by reliable flying models of all types and great interest, with a large number of spectators. Certain ' duration ' men, and certain members of the press, began to agitate for modification of the rules, until last year when we went all pay-load duration, the greatest mistake we ever made. As soon as the original stressing of stability was departed from, this one remaining bulwark of stability flying began to fade, until last year it became a farce, tucked in with another contest on the same day, and providing pay-load duration as the motive. Entries and interest outside were almost nil. All we gathered was a handful of the ' expert class '.

" We have got to change this outlook, if we are to expand and widen the model aircraft movement, instead of losing ground. There is a big revival of interest in stable free flight, now that control line has faded in paramount importance as a novelty. Radio control that is quite reliable is there for the asking if the right equipment is used, and all it wants is the belief by the general public that flying model aircraft can look like the real thing, and is reliable and crash-free."

Tailpiece !

As we go to press we hear that the Council of the S.M.A.E. have decided to reinstate the well known " Bowden Trophy " for 1952. It is intended that the contest shall take place on a date when no other contests are being held and we shall be interested to see the response, which we sincerely hope will vindicate Colonel Bowden's comments.



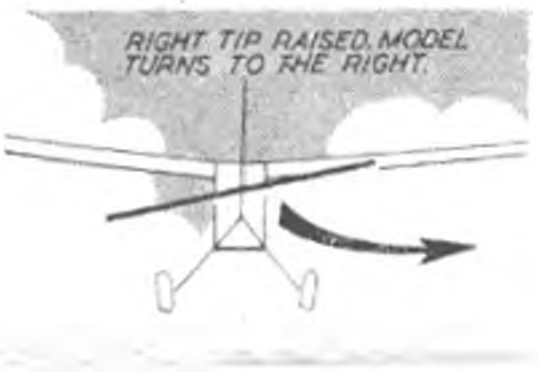
Tailplane of a Frog Fortuna forms our heading illustration, a good example of a tapered, lifting tail.

PART FIVE

Tailplanes

THE tailplane of a model is usually a relatively simple component – but most important in many respects. The Americans call it a stabiliser and it is, in fact, just that. It stabilises the model in flight and automatically compensates an involuntary dive or stall, when correctly rigged. Being at one end of the model, distant from the point of balance, it needs to be light—which is where simple construction comes in—but this introduces a conflicting requirement. It must also be true and remain true. If it warps when completed it may affect the stability of the machine—not so much in an " up-and-down " direction as sideways or in turning flight, for a tailplane can have quite a powerful turning action.

Many modellers use this effect in trimming for turn. Two such methods are shown in Fig. 1. If the tailplane is tilted as shown in the direction of the raised tip—tilt the right tip of the tailplane up for a turn to the right, and vice versa. This turning action is quite moderate and relatively " safe "— better in many cases than offsetting the rudder or trim tab.

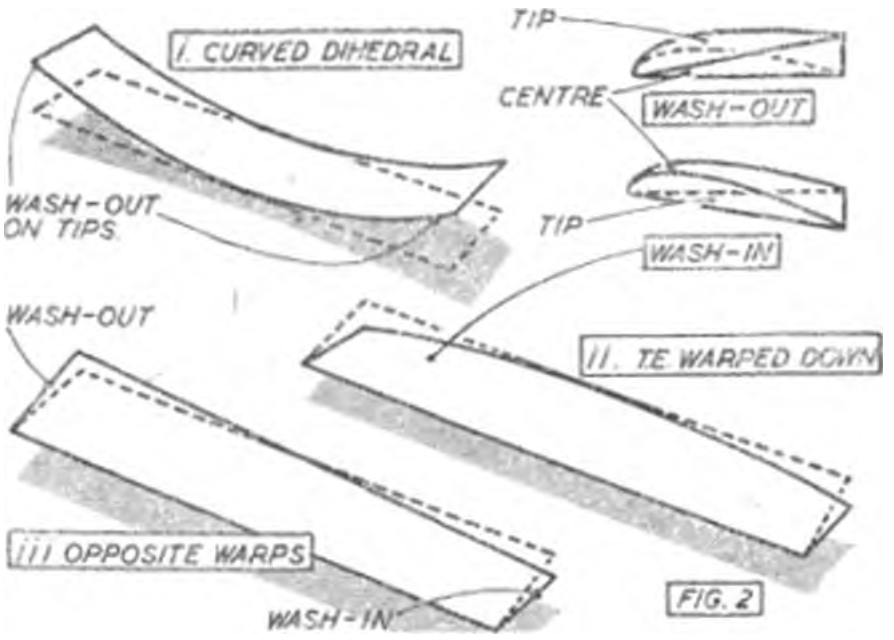


'TAIL TRIMMING' FOR TURN USED TO ADJUST GLIDE CIRCLE

DIAGRAMS ARE EXAGGERATED

RIGHT TIP SLEWED FORWARD MODEL TURNS TO THE RIGHT.

A more powerful turning action is given by slewing the whole tailplane. In this case the model turns towards the side with the foremost tip. Slew the tail out of line with the fuselage so that the right tip is forward, the model turns to the right.



A tailplane slewed through an angle of 10 degrees —5 degrees either side of its true position— can make a difference between a right and left hand glide circle on some models.

These effects, of course, do not directly concern construction. They are mainly a matter of rigging and trim. But as far as construction is concerned a *true* tailplane is the ideal to aim at, so that warps may not produce accidental changes in trim and the tailplane itself is so constructed that it is automatically re-assembled each time in its correct position.

As far as warps are concerned, these are likely to be one of three main types (Fig. 2). The first, and most common, is where the whole tailplane bows upwards into a curved dihedral. Generally this also results in the trailing edge washing out towards each tip. If both the dihedral and wash-out induced are equal on both sides, such a warp is not harmful. It may even be beneficial. Quite a number of contest fliers do, in fact, deliberately wash out the tips of the tailplane for improved stability. The only danger is that a tailplane which warps readily in this fashion may change its setting during the course of a day's flying and thus upset the trim of the model.

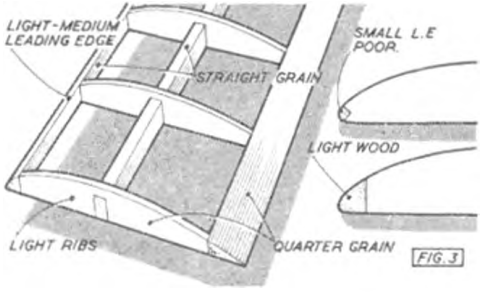


FIG. 3

The second type of warp is a bad one. Here the trailing edge warps downwards towards each tip and gives wash-in to the tailplane. Generally this is the result of faulty constructional *design*. The spar system is unbalanced, tending to stress the structure downwards when the covering tautens.

The third warp is also bad and may put the model into a spiral dive. Here one side of the tailplane warps up and the other down. One side has wash-out and the other wash-in. Generally this is due to faulty *construction* rather than design. With these possible faults in mind we can then go on to discuss the actual construction of tailplanes.

The tailplane is really a smaller edition of the wings, but usually flat without dihedral breaks. It is built in a similar manner to the wings. One of the main requirements is to select suitably stiff spars so that the resulting structure will be rigid without being too weighty.

Wood Selection

Fig. 3 shows the type of wood you might use. The leading edge and main spar are of straight grained stock, whilst the thinner trailing edge will be best cut from quarter grain. This is not essential, but is good practice. A common fault is to make the leading edge too small in section, so that hard wood has to be used for sufficient strength. A wider, deeper trailing edge is usually better—stronger overall, giving a better entry, and quite as light if light medium or medium stock wood is selected. Do not, however, use brittle wood for the leading edge.

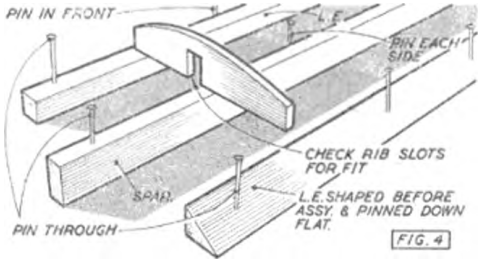


FIG. 4

Usually the tailplane incorporates an aerofoil section with a flat undersurface. The leading and trailing edges and the spars are pinned down, as in the case of wing construction previously described in detail, and the ribs then cemented in place. No harm will result from using thin pins through both the leading edge and the trailing edge, but the spar should only be pinned through outside the tip. Locate with pins either side within the outline of the structure (Fig. 4).

Keep Everything Flat

The most common fault at this stage is to have the underlying plan slightly wrinkled or creased so that the spar is not resting absolutely flat. In other words, you are actually laying out the tailplane with an inbuilt warp. Obviously this must be avoided, so take care to ensure that all the spar members are pinned down flat with the building surface and that the ribs are also properly bedded down when cemented in place.

It is a definite advantage to slot in the ribs to both leading and trailing edge if possible, but using only very shallow slots, otherwise the strength of these spar members will be reduced (Fig. 5). If the leading edge is of particularly narrow section, then do not slot it. Always slot the ribs into the trailing edge if possible, however.

The trailing edge itself will not be very deep and if the end of the rib is cut to exact depth may, through a little inaccuracy in cutting, actually be less than the depth of the trailing edge at this point. This may spoil the appearance of the covering job later, but what is far more important it will reduce the strength of the rib-trailing edge joint. When working with thin trailing edges it is better to cut the ribs slightly oversize at the trailing edge, that is, slightly too high, and then sand down flush with the trailing edge later. Small fillets of cement between the rib and the trailing edge will also improve the strength of the joint.

Now a word about preparing the spars. The same rules apply as for wing construction. Shape the trailing edge before assembly and form the leading edge to section after assembly. However, a thin, finely finished trailing edge warps readily —i.e. it has little resistance to bending—and

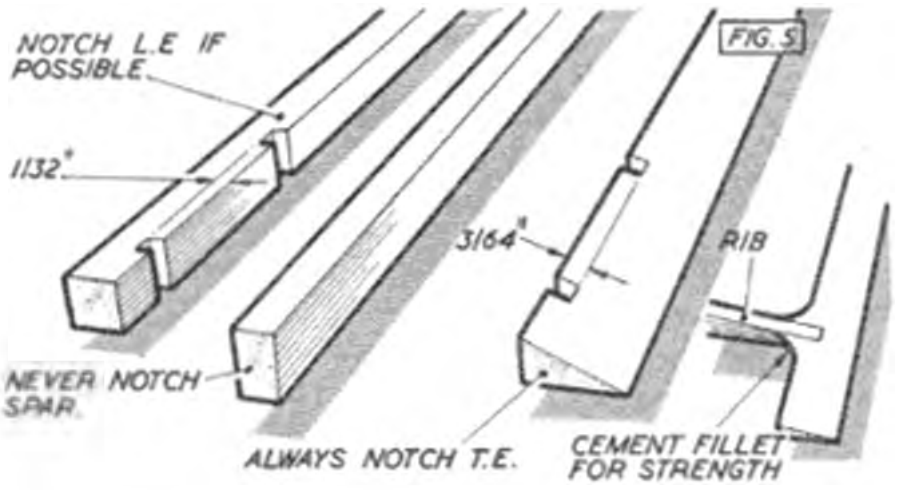


FIG. 5

sometimes it is better not to finish this member to a true trailing edge section. This is a good tip when dealing with small tailplanes where the actual dimensions of the trailing edge are small (Fig. 6). The section is shaped by rounding off the top edge rather than tapering to a wedge shape, greatly increasing the effective depth of the trailing edge and its resistance to warping.

Flat Tailplanes

This is often done to all the outline members where a simple flat plate tailplane is called for—Fig. 7. This enables relatively small outline spars to be used to save weight and at the same time increase bending strength. In tailplanes of this type all the bending strength comes from the outline spars. A mainspar is very seldom used and, even if it were, would not be very effective. Such tailplanes are more prone to warp than built-up structures with a deeper aerofoil section. They are generally tissue covered on one side only and not doped. Their application is mainly limited to very small models, although similar construction is used on lightweight contest models, Flimsiness, in this case, is tolerated as the price that has to be paid for extremely light weight, for obviously such a tailplane can be built using the minimum volume of wood.

One of the main points in favour of a flat tailplane—flat plate, or built-up with a flat undersurface—is that it can be built flat, readily checked for trueness by laying on a flat surface, and easily pinned down to that same surface whilst drying after doping and covering. Where a symmetrical section is called for few of these advantages can be realised.

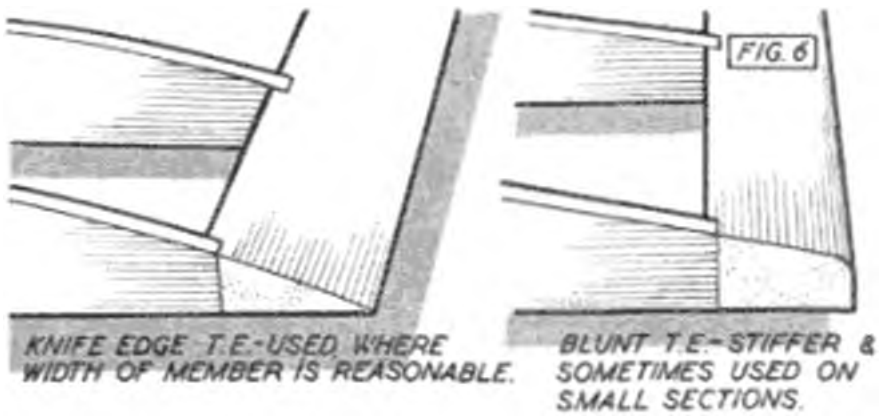


FIG. 6

The importance of ensuring that the building board is perfectly flat and that the plan is pinned taut and flat over it, has already been emphasised. But we repeat this point again, for the flat-plate tail and its natural tendency to wander from the true line with warps at the extremities is not quite as easy to make as its structure would have us believe. Always keep the flat section tail pinned down whilst water shrinking and doping. If this precaution is not observed, the result will be somewhat like that indicated in Fig. 8. Even after the dope is thoroughly dry, changes in atmospheric temperature, particularly exposure to hot sun, will have the same effect. It is advisable, therefore, to keep a scrap piece of thick balsa sheet handy, and to keep the tail pinned flat between flying days, using large-head drawing pins to get a good grip over the leading and trailing edges without damage.

One of the best ways of building a true symmetrical section tailplane is to do the job in two stages. The tailplane is virtually split along a line as indicated in Fig. 9, and the main part of it built flat, just like an ordinary tailplane. When completed it is turned over and the remaining part

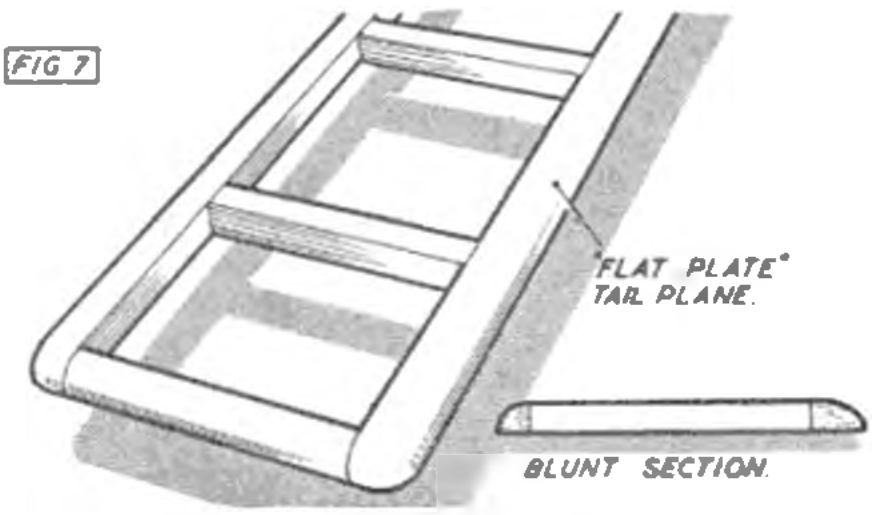


FIG 7

ribs added to produce the required symmetrical section. This method is generally easier, and more accurate, than building the same tailplane with full symmetrical ribs, propping up the leading and trailing edge members as required with scrap wood between them and the flat surface of the plan.

Quick Building Methods

There are also quick and simple methods of tailplane construction which at one time found considerable favour for power models. No rib cutting is involved. Strips of wood of the required depth are cemented in place and sanded down to section after assembly is completed. The main spar is the same depth as the rib section, but thicker.

Mainspar leading and trailing edges are pinned down as shown in Fig. 10. All the rib " rectangles " are then cemented in place. When set, the whole lot is sanded down to aerofoil section.

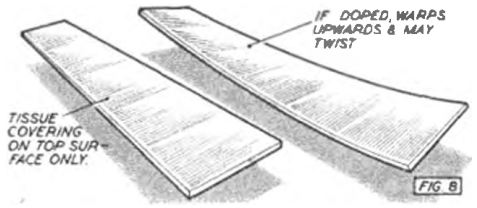
Generally the results do not compare with orthodox construction using pre-cut ribs. It needs very great care to reduce all the ribs to the same section. It is very easy to sand " flats " in the tops of the ribs and unless the cement joints between

ribs and spar are particularly good, these may fail when the tailplane is covered and let the section warp. After sanding, if this method is used all these joints should be checked over and possibly reinforced with a fillet of cement on each side.

Elliptical Shapes

With large power model tailplanes of this and similar construction elliptic outlines are often formed from laminated leading and trailing edges, using narrow strips for the leading edge and square section for the trailing edge, moderate curves can be negotiated with ease—Fig. 11. A row of pins is erected around the inside outline, the strips cemented and then pinned down in place. Ribs and spars are added in the normal way, but the whole assembly should be left pinned down for several hours before removing to give the cement joints between the laminations adequate time to set. The laminated outlines are then carved and sanded down to conform to the rib sections to complete the tailplane ready for covering.

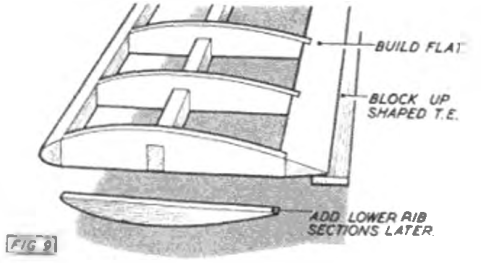
Since the design of the tailplane itself is a major factor in subsequent warping, it is as well to have a



little knowledge on this particular subject. Whatever form of construction is used, the frame should be perfectly true before covering. If not, then that is just bad building. Bad covering can induce warps—a subject which will be dealt with in a article in this series—but even the best of covering and doping jobs cannot be expected to correct in-built warps. All tailplanes will be subjected to a considerable amount of *stress* when covered and doped—the covering would not stay taut if it were not pulling on the points where it is attached—and it is how the structure reacts to these stresses that determines what warps, if any, will subsequently develop.

Warp-resistant Structure

It is possible to make the structure stiff enough to resist warping under the action of normal covering tension if enough volume of wood is used in the construction, and really hard, rigid wood at that. Unfortunately such a tailplane would also be too heavy. The designer has either to compromise by using small section spars intelligently to get adequate strength at an acceptable weight, or resort to more advanced types of construction such as geodetic rib spacing, built-up hollow torsion box leading and trailing edges, and so on.

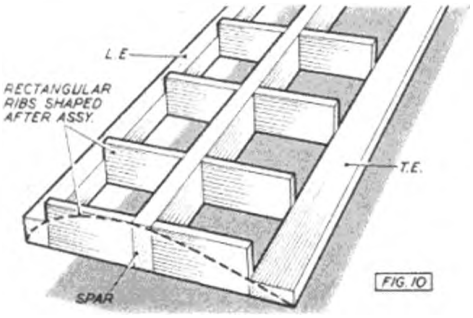


The most popular, and one of the simplest, types of tailplane structure used a monospar of reasonable depth (Fig. 12). This is quite strong and reasonably light, as well as being easy to build. It usually gives a satisfactory structure, but one which is prone to flow upwards into a curved dihedral—the type of warp described in Fig. 1, which is not really harmful.

Built-up T.E.

On larger tailplanes the same type of construction may be employed, only this time with two separate mainspars. This is more warp-resistant, but proportionately heavier. Used, for example, in a power model tailplane, a more rigid structure at about the same weight—but more difficult to build—would retain the two spars, although of smaller section, have a built-up "V" trailing edge and sheet covering on the top surface of the aerofoil back to the mainspar. This is a very satisfactory design for most large tailplanes, particularly those of rectangular plan form. Careful workmanship is called for in assembly of the final trailing edge. The tailplane is first built flat on the plan with just the lower thin sheet member of the trailing edge pinned down. Previously this has been chamfered off as shown in Fig. 13. The ribs overlap this member.

When the main assembly has been completed, the upper trailing edge member is cemented in place and pinned down accurately. A final sanding down when set reduces the built-up trailing edge to the required section, as shown. Sheet 1/16 in. thick is invariably employed for



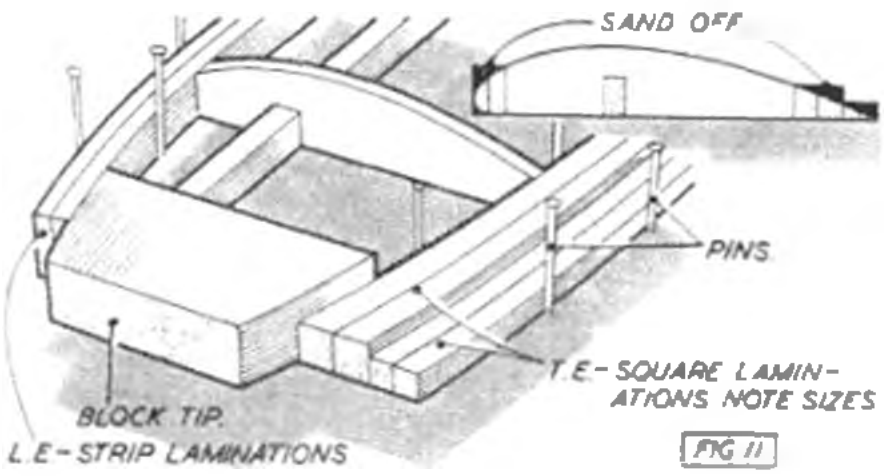


FIG 11

built-up construction of this kind on power models. Similar construction has been duplicated in smaller sizes for Wakefields, but here the work is more tricky as it is all too easy to sand right through thin sheet in the final stages.

In general, rigidity of the structure is only obtained at the expense of increased weight, increased complexity of building, or both. Possibly the simplest of all " rigid " structures is the monospar, where a large number of small section spars are used, as in Fig. 14. These spars are roughly balanced along the top and bottom of the section and the resulting structure is extremely rigid. Its main failing is that, to keep the weight to comparable figures, each of the individual spars is of

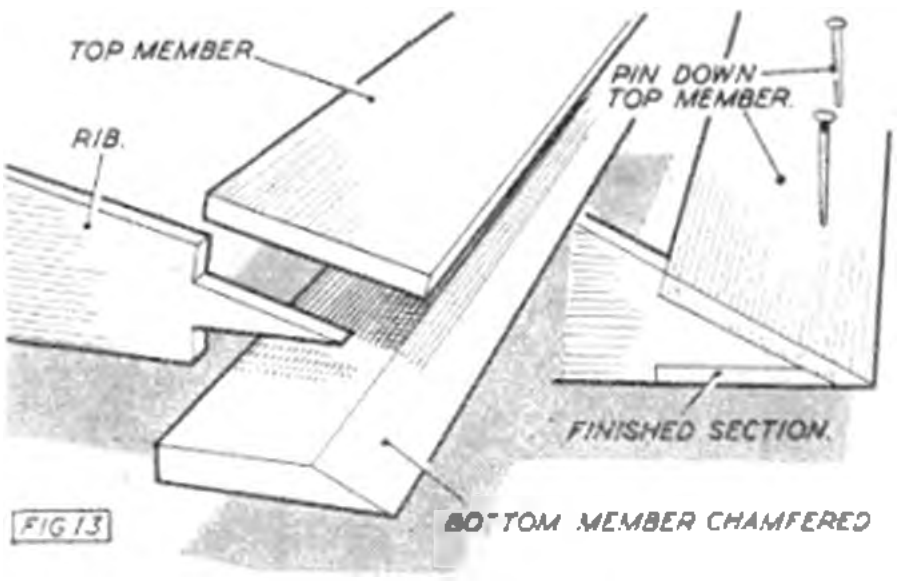


FIG 13

extremely small section—1/16 in. square, for example—and thus locally weak. It is easy, in other words, for a single spar to be broken and thus weaken the whole structure. Two such small breaks might even warp the whole assembly.

The types of tailplane structures to be avoided are those which are unbalanced, such as the two final examples. Here the bulk of the spar strength is concentrated in the upper part of the section in the hope that since tailplanes usually tend to warp upwards, adding rigidity to the upper surface will obviate warping. What does happen in such cases is that the structure warps downwards or produces a tailplane with negative dihedral. A tailplane with negative dihedral may not be bad in itself—some designers deliberately employ such a feature—but produced as it is by warping, almost certainly wash-in will be induced in the tips, which *is* bad. Far better, in fact, to have a tailplane which warps upwards.

Dihedralled Tailplanes

To conclude with a further comment on dihedral, where this is deliberately employed as a design feature. There is still little evidence to show that this is necessary. In other words, what advantages

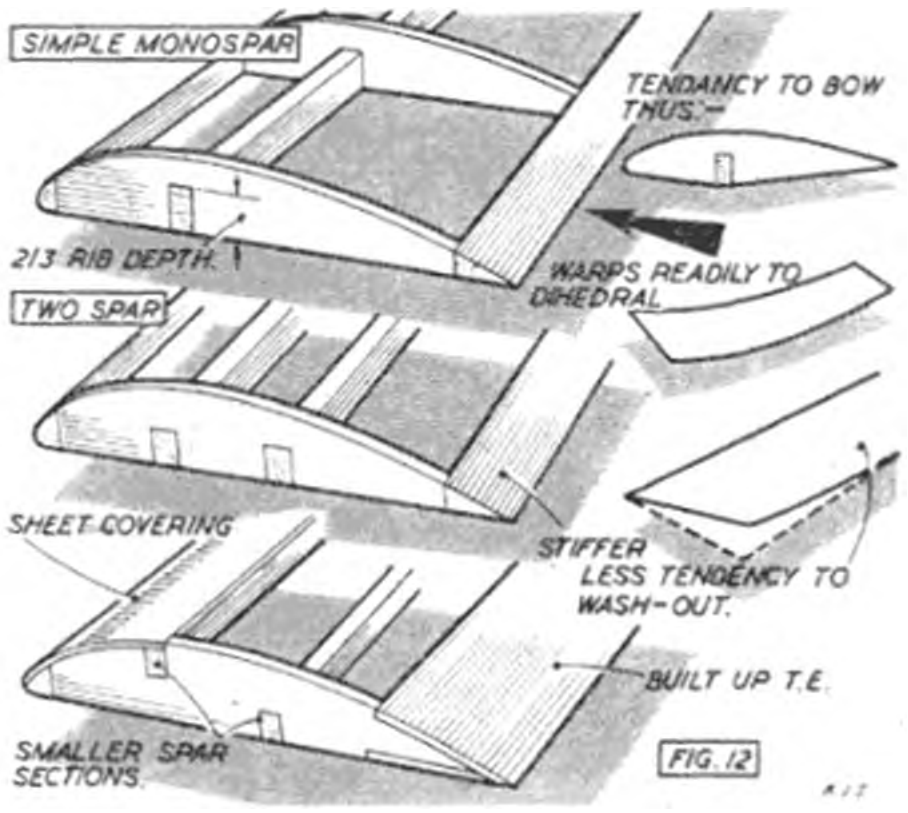


FIG. 12

might be gained by a dihedralled, or anhedralled, tailplane can generally be obtained, perhaps more effectively, by other means. To introduce a dihedral break into what has been built as a flat structure when it is not strictly necessary is bad practice. It must inevitably add weight, introduces a point of possible inaccuracy and/or weakness and makes the tailplane more difficult to mount on the fuselage. From purely structural considerations a flat tailplane is undoubtedly best.

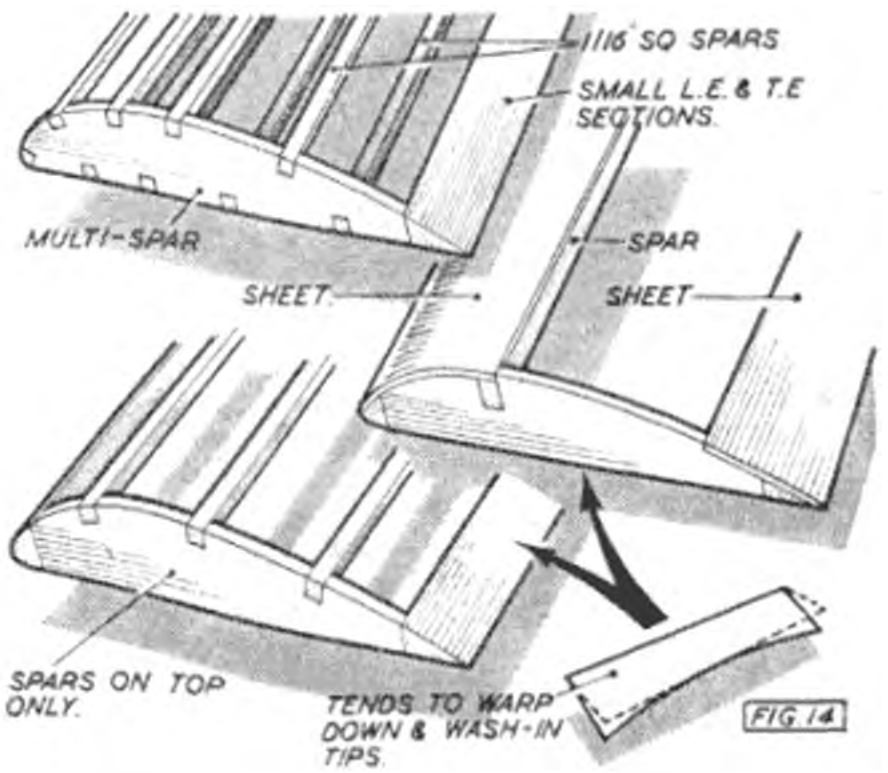


FIG 14

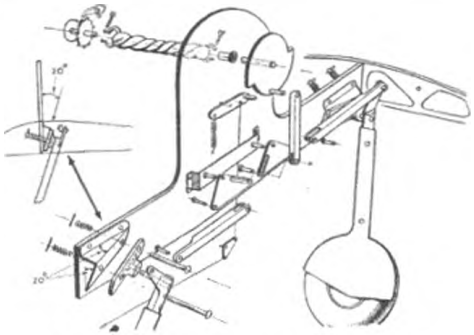
A Super Detailed SPITFIRE Mk. Vb

VERY occasionally we receive news of outstanding individual effort that has gone into a "one-off" model. Such an instance was the South African radio controlled semi-scale design which we featured in the May issue. Now, we have pleasure in giving news of a superbly detailed scale control-line model of the famous Spitfire Vb, which is exactly reproduced, complete with working undercarriage and coupled engine cut-out, by Z. Wojda who served with the Polish Air Force as a Battle of Britain fighter pilot.

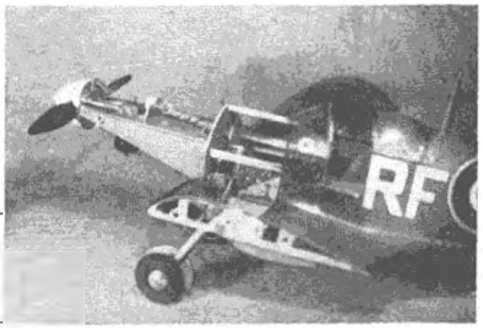
The undercarriage mechanism is particularly interesting and although we have seen a similar arrangement installed in another experimental model, Mr. Wojda's simple scheme for tripping either "up" or "down" at the slight pull of a third line, is the result of careful thought and ingenious workmanship. Without wishing to put a damper on this magnificent effort, we would point out, from our own practical experience, that in the case of a retracting undercarriage whatever comes "down" must certainly go "up" in the same place whence it came, every time. A smart blow, as often suffered in quite normal landings, can easily affect the relatively small diameter pivot at the top of each undercart leg, and even though sprung as in this case, the leg pivot remains the weakest link of a most intricate chain.

Brief details of the construction are given by Mr. Wojda as follows :–

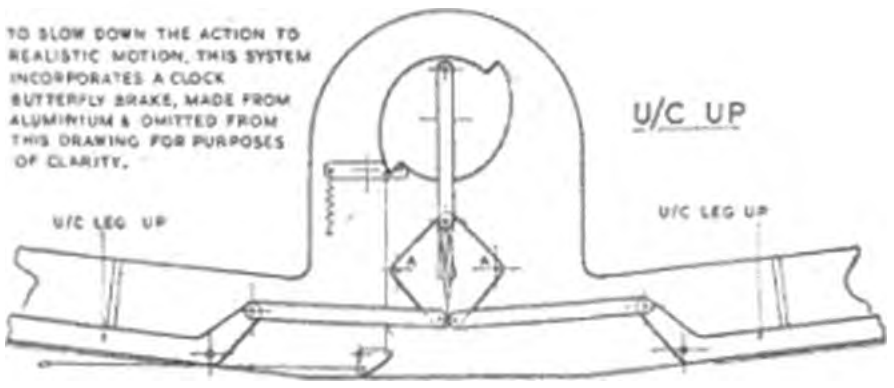
Fuselage. The first and second bulkhead, control plate and first wing rib on each side are made in plywood and compose a strong box, which incorporates the undercarriage automatic mechanism and controls. Engine compartment is built as a self contained "Power Egg", held to the first ply bulkhead with three 6 B.A. bolts and nuts. It incorporates an Amco 3·5 c.c. diesel, K.K. cut-out connected to the undercarriage mechanism, pressure feed fuel tank and rubber motor which gives



The undercarriage mechanism in perspective.



Whilst the heading photo reveals Mr. Wojda's close adherence to scale and attention to detail, the view at right shows the complex mechanism beneath the cowlings.



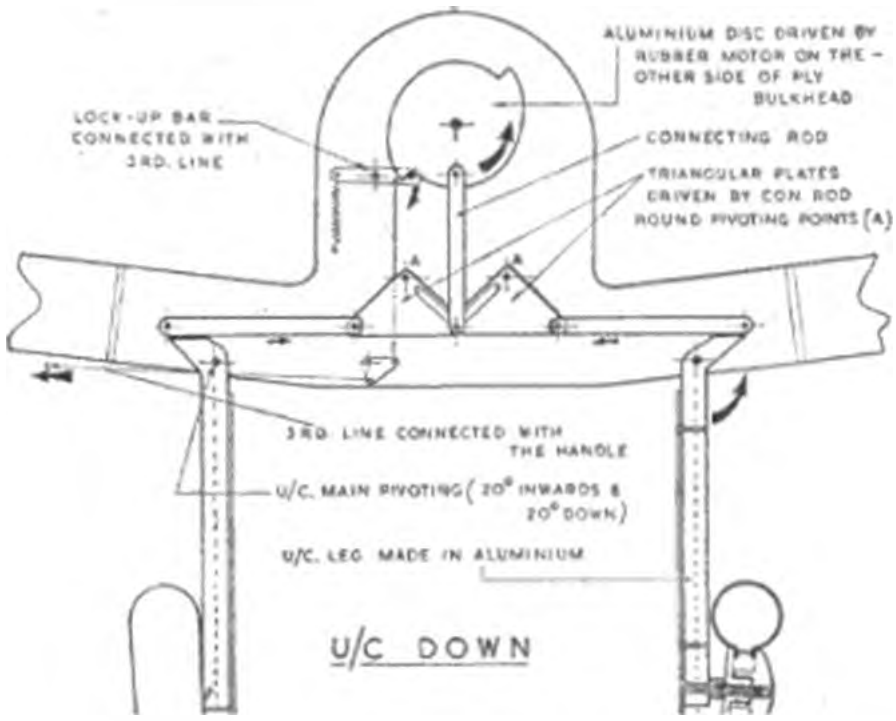
the driving power for the undercarriage operation. Cockpit compartment is equipped with all the instruments and control detail exactly as fitted on that mark of actual aircraft. Basic construction consists of bulkheads and four main longerons, four secondary ones ($\frac{1}{4} \times \frac{1}{4}$ in.) and planked with 1/32 in. and 1/16 in. balsa. Finally covered with tissue and after three coats of clear dope, sprayed with camouflage colours.

Wings are built in the same way, planked and tissued and are attached to the fuselage with two dowels and one 6 B.A. bolt and nut each.

Tail Unit is of the same construction. The elevator is of scale size and may have to be enlarged after preliminary tests.

Automatic Undercarriage. This took the biggest portion of building time and designing. It has been made in aluminium, some parts turned on a watchmaker's lathe. The system operates by pistol lever on the control handle and a third line. After take-off a short pull on the lever causes the undercarriage to retract into the wings. The second pull lowers the undercarriage down, which in its turn cuts the engine off in about 7–10 secs. Details of the system are enclosed on the separate drawings.

Markings. This model carries, for sentimental reasons, all the original markings of my squadron and actually my machine, which I flew for nearly 18 months. " RF " was the 303 Fighter squadron, based at Northolt Aerodrome during and after the Battle of Britain.



Readers' Letters

Ground Loop Control

DEAR SIR,

In the article on Ground Loop Control by Mr Holt in the May AEROMODELLER, he gives the impression that the use of solid wheels will prevent this unwanted manœuvre. This has not been so in my case in which two models have been cured, by moving the wheels aft, as described in my " Notes " in the February, 1952, AEROMODELLER. One model had soft pneumatic wheels with very small hubs, and the other had solid wheels. The trouble recurred on the solid wheeled model, after modifications had increased the weight and extended the take-off run. The model is 44 ins. span, 30 ozs. weight, and Mills 1 3 c.c. powered with flexible prop. After moving the wheels further aft again, the model can be safely taken off even though the run has extended to 50 yards or more on some occasions, and the model no more than 4 feet above the ground 200 yards away.

During take-off there is a critical period between the tail wheel (or skid) leaving the ground, and speed becoming sufficient for the fin and rudder to become effective. This period can be shortened by having the ground angle as flat as possible. In other words, the main legs as short, and the tail leg as long as possible. A low power model with a slow take-off is the most difficult to deal with and any tendency to swing must be corrected in the early stages.

There is one difficulty. A model is needed that will respond quickly to the control. Some notes on obtaining this appeared in the AEROMODELLER for April, 1951.

Rugby. H. BOYS.

On Timekeeping

DEAR SIR,

I have read with great interest your article " A New System of Timekeeping ", based on ideas put forward by the Leeds M.F.C. I am, however, rather doubtful of its practicability. The system mentioned only gives justice to modellers lucky enough to obtain a strong-sighted timekeeper, but the poor fellow who is credited with a low time owing to the bad sight of the timekeeper does not benefit in the least under the suggestion put forward in last month's article. He would be given exactly the same time as he would have

received under the present system owing to his flight being under the average maximum.

Surely this means that the whole object of this idea is set at nought, or at least as far as the chap it is meant to help is concerned.

Some years ago I remember hearing a suggestion that the flight time in secs. should be multiplied together by the use of logarithms (to the base 10). For our purpose this entails one unnecessary step, which to save time, may be omitted. The final time would then be the sum of the logarithms of each flight.

1 sec. scores 0.
10 secs. scores 1.
1·00 secs. scores 2.
3·00 secs. (a maximum) scores only 2·4771.

By using this method consistent flights would always triumph over inconsistent flights, as shown below :

Three flights of 200 secs. scores $3 \times 2{\cdot}301 = 6{\cdot}903$.
Three inconsistent flights of the same total aggregate such as 100, 300, 200 score $2{\cdot}0000 \times 2{\cdot}4771 \times 2{\cdot}3010 = 6{\cdot}7781$.

It does, however, entail more work, but for such comps. as the Wakefield and A.2 trials, upon which so much depends, it is an ideal method.

Hooley. P. GASSON.

. . . and Timers

DEAR SIR,

With reference to your comments on the F.A.I. Report contained in the January, 1952, issue of the AEROMODELLER, I should like to express an opinion on the subject of engine run.

I have always felt rather strongly on this point, as I consider that it is definitely the responsibility of the entrant to ensure that his engine run is within the time limit specified. I felt so strongly on this that at the A.G.M. of the R.A.F. Models Association I expounded my theories, and, together with S/Ldr. Greenhow, was responsible for the ferocious (?) rule that in R.A.F. contests for every second over the limit 20 seconds will be deducted from the flight time.

Under the present rule of 5 seconds deduction (or even 10) it pays to let the engine run over the limit as a definite gain results. Not so with the new rule. (I don't think you saw many engines run over 20 seconds at the R.A.F. Championships !)

It improves the breed, and makes the modeller take as much care over his timer and cut-off arrangements as any other part of the model, and I'll go as far as to say that I consider an accurate and reliable timer and cut-off is worth two or three ounces of weight, for the engine can be run to the limit. I have suffered from timer trouble in the past, and timers I find are *not* a fit-and-forget item. They need servicing and regular examination and calibration.

R.A.F. Linton-on-Ouse. C. W. BEASLEY (F/LT.)

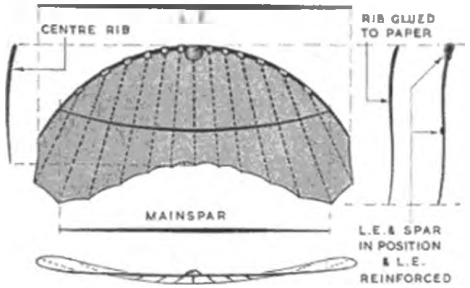
That Infallible Glider

DEAR SIR,

I have just received the copies of your AERO-MODELLER from December 1951 till March 1952 and read with much interest the article " Infallible Glider " by Julian Allen in the January issue.

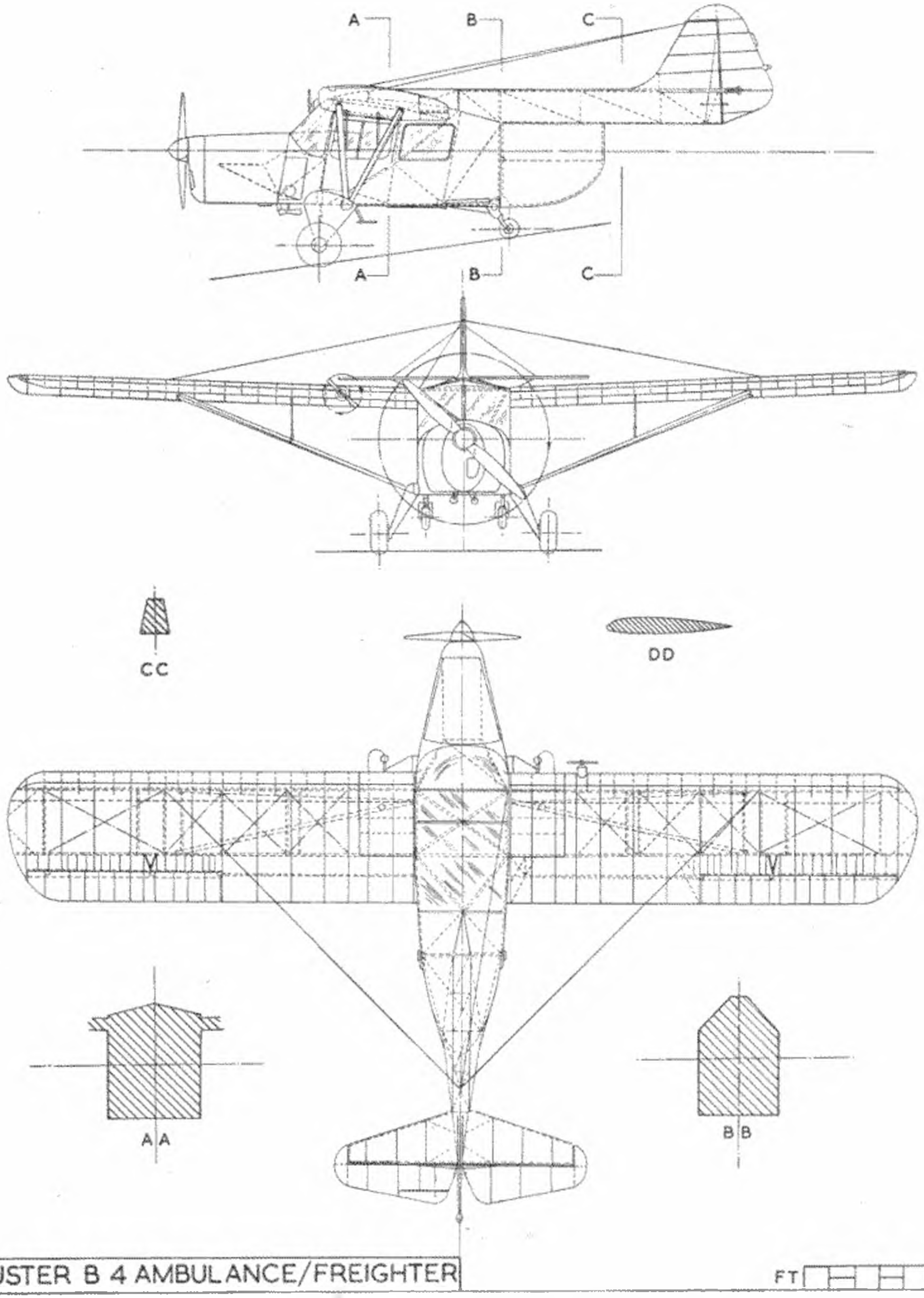
For the real oldtimer (I have been a modeller for 44 years) the Zannonia model is a well-known thing. Mr. Ahlborn from Hamburg, Germany, Professor of Botanics, who had lived for a long time in Java, was the first in 1909 or 1910 to advise the Zannonia seed as a model for a real perfect stable glider. He inspired the Austrian engineer Wels to build his gliders (10 m. span, 38 qm, 14–15 m.p. sec. and 164 kg.), with which he started by gliding down a platform like the ones used for ski-jumping. In the " Bohmerwald " he made flights of 200–300 metres. Afterwards he worked together with the industrialist Etrich from Vienna and they built the first motor-driven plane with Zannonia form. Later they added a tailplane. Rumpler, Berlin, got a building license and developed the Etrich-Rumpler " Taube ", which became famous by its pilot Helmuth Hirth and during the First World War by its flight over Paris.

1911/12 I myself built dozens of them in all dimensions, and I can only confirm Mr. Allen's statements. Such a model is perfectly stable, you can throw it in the air as you like it. It will dive and stall, but after gaining the right flying speed it will glide down at a beautiful shallow angle.



The ideal material for such a single surface glider is bamboo and stiff parchment paper. The trailing edge and spars must taper in thickness from the middle to both ends, the ribs (strips of bamboo) from the fore-end to the rear. Glue the ribs to the underside of the paper, the leading edge and the spars to the upper side. Reinforce the connection points, leading edge to both ends of the spars, and to the ribs, with strips of stiff writing paper. When perfectly dry, bend the ribs between the fingers to the required very shallow ' S ' shape. Add a bit of modelling clay to the centre of the leading edge. Start gliding and trim by adding or reducing clay and bending the tips more or less up or down. No dihedral !

Tel-Aviv. DR. M. SULTAN.



AUSTER B 4 AMBULANCE/FREIGHTER

FT

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

The AUSTER B.4 Ambulance/Freighter

AIRCRAFT DESCRIBED No. 50

By G. A. CULL

Sideways springing for the thickly faired main undercarriage legs, and fore-and-aft for the rear pair, takes ample care of all landing loads. The pilot is Ranald Porteous.

IN recent years the increasing use of aircraft for freight carrying has given rise to specialised designs, wherein the normal rear fuselage is replaced by a raised boom to enable unobstructed loading from the rear. The latest British machine of this layout is the Auster B.4.

First flown in September, 1951, the B.4 has demonstrated its versatility, which may also appeal to civilian operators. With a far bigger cabin than usual for a machine of its size, the B.4 can be quickly adapted for many jobs. Normal seating is for one next to the pilot, and two on a two-part bench type seat. To accommodate two stretcher cases, one part of the rear seat is removed together with that next to the pilot, to allow the stretchers to be stowed one above the other, on the starboard side. For easy handling of all the loads the rear plywood fairing hinges to starboard but will fold on the other side on future machines. Much flying has been done without the rear fairing for supply dropping and the carriage of lengthy items which project out under the tail boom. A pair of wing spars have flown in this way. The floor is a sandwich of balsa between light alloy, and is quickly detachable so that alternative floorings fitted for air-to-ground loudspeaking gear or telephone cable laying (11 miles may be laid) can be substituted as needed. While the B.4 is a new aeroplane, much of the airframe, such as wings and struts, tail unit, wheels and engine mounting, is interchangeable with the Auster Model "S".

The engine is a six cylinder Blackburn Cirrus Bombardier 702, which for the take-off, delivers 180 h.p. to a Fairey Reed fixed pitch metal airscrew. Cartridge starting and direct fuel injection are employed, and the smart throttle response is a good point for Army flying. Cooling air escapes from the engine bay through flush side outlets, and another neat feature is the metal faired undercarriage which has Dowty liquid springing. The prototype has bungee-sprung tailwheels which originally castored freely, but now the port wheel is steerable and this design is shown on the drawing. It is intended to fit liquid springs on any later aircraft, which will also dispense with the prototype's wing mounted generator in favour of an engine driven unit.

Colour. Very light glossy grey all over, with registration and all other markings in bright red.

Construction. Fuselage of welded steel tube as is tail unit, which is of flat plate section. Tail boom is detachable. Wings have two wooden spars with sheet alloy L.E. and open girder ribs of alloy strip. Metal-covered manual split flaps. 23 gallon tank in each wing root.

Specification. Span: 37 ft. 0 ins. Length: 24 ft. 8 ins. Height: 8 ft. 4½ ins. Max. cruising speed: 105 m.p.h. Initial climb: 750 ft. per min. Range: 300 miles. Weight empty: 1,624 lb., all-up weight: 2,600 lbs. Payload for max. range: 550 lbs.

Without the rear fuselage fairing, the freighter is able to dump packages precisely from low level. Lower view clearly shows the standard wings and tail, plus traditional transparent cockpit roof. Photos courtesy Auster Aircraft Co.

FUTURE contest dates in the **SCOTTISH ASSOCIATION** and **AYRSHIRE AEROMODELLERS ASSOCIATION** are as follows :—

4th August : The Edinburgh Rally.

10th August : The Scottish Aeromodellers Assn. National Control-Line Stunt, at Stirling.

24th August : Inter Scottish S.M.A.E. Areas Eliminator Contest for U.K. Trophy Scottish Team, at Balado.

7th September : K.L.M. Trophy (F.A.I. Power) and the C.M.D. Trophy (rubber) at Abbotsend.

21st September : The Scottish Aeromodellers Assn. National Glider (Alison Trophy), at Heathfield.

4th and 5th October : Ayrshire Aeromodellers Assn. Gala days, for Ayrshire aeromodellers only. Team racing on the 4th. Glider, Power, Rubber and Flying Scale on the 5th (Trophies for each).

Included in the above is the S.M.A.E. contest at Balado when the best there is in Scottish Aeromodelling will be fighting it out for a place in the Scottish team for the United Kingdom Challenge Match, the finals of which will be held in England this year.

The **WEST OF SCOTLAND AREA'S** power merchants are still in good form, and this Area should provide a major portion of the 1952 Scottish Team for the U.K. Trophy. Joe McMaster of Glasgow M.A.C. is still going to be way up top, but he's being closely run by leading flying men from the Prestwick and Kilmarnock Clubs. Joe is still flying his 1951 " Toreador ", and in spite of a few battle scars, she's one of the best finished models to be seen on the contest field, and the " Frog 500 " power plant seems to be hauling it up there better than ever. I notice he's changed his " straight up " tactics now, and has a bit of a spiral incorporated in the climbing trim of the job, consequently he doesn't lose so much height when switching from power to glide.

So far this year, in the West Scottish Area anyway, performances haven't been particularly high. Our usual wind has been rough, and models just fade out of sight quicker than the proverbial snowball.

PRESTWICK MODEL AERO CLUB have been hitting out lately, with Bob Parsons and Brian Harris front and centre. Brian's got an Elfin powered " Powavan ", and a " Norseman " A/2 on the field these days, both planes flying well. For real spectacle Bob Parson's variation on the " Highball " theme really burns the air. Bob's model packs an Elfin, too, and after a very unusual flight pattern on release, it goes cloud chewing but fast.

The **LANARK M.F.C.** have had a bit of hard luck recently, having to move out of de luxe class premises. However, they are still in the same building, which is only about five minutes' walk from their first class flying field, and although the new room is smaller than the old, the Lanark boys are faring a great deal better than most other clubs.

In the recent decentralised Pilcher Cup event, J. Hall (Junior) surprised visiting clubs and his own club by clocking 10 mins. 23 secs. o.o.s. in seeming non-thermal and very windy conditions. The model was found 11 miles away and is one of his designs popularly known as " Halls Horror " series. Another fly-away was made from the club flying ground, when R. Owston (Glasgow M.A.C.) flying in the Astral Trophy flew o.o.s. His model was picked up 20 miles away at West Linton. R. S. Spiers has shown the way, by qualifying for the first Merit Certificate of the season.

STEWARTON M.A.C. seem to be working mostly on scale models currently, with club chairman Bob Burns setting the pace.

Up Glasgow way again, Alec Clark of the " **BARNSTORMERS** " has an interesting new Amco 3·5 power model. This pylon job features a neat line in gadgetry for cutting the motor and applying right trim simultaneously. At time of writing Alec was engrossed in those tentative first trials and if its ultimate performance is any match for its finish and appearance it'll be grade one.

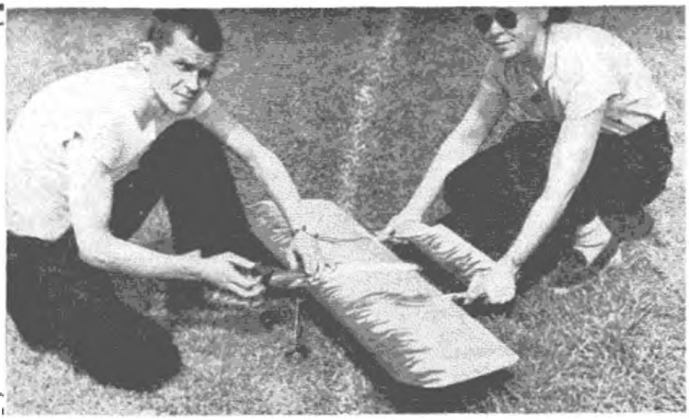
Down to the seaside now, or in local dialect " Doon the Watter, " we have John Lindsay of **IRVINE DISTRICT M.A.C.** stalwartly carrying the banner for said club. He could be doing with more support from his fellow members at the contest though, the same applying to S.A.S.M.A.C.'s Jim Miller. Talking of S.A.S.M.A.C., this club has what constitutes a really keen aeromodeller. Tom Park of the said club, recently swam about 150 yards into the sub zero temperature Firth of Clyde, to rescue his brand new A/2 Sailplane which had landed therein.

To organise flying meetings and competitions, **INVERNESS & D.S.M.E.** have set up a special sub-section. Contests will be run in conjunction with other local bodies, including the Dalcross (R.A.F.) M.A.C., and to stimulate interest Major MacLeay has offered special prizes. Any enthusiast not yet a member is urged to get in touch with Mr. C. J. Cresswell, Ballifeary Lane, without delay.

At the first glider contest this year held by the **HAWICK M.A.C.** first place and the " Murray " Cup went to W. Armstrong, flying an A.P.S. " Satu ". Weather, as usual, was very gusty, and times well below average. A team-race affair is planned this year, but as nearly every member will be flying, rules have had to be modified—pilot will have to re-fuel and start his own motor, the planes using release gear.

Mac.

CLUB NEWS



Master Sgt. C. H. Croce of U.S.A.F. was a welcome competitor at the recent c/l eliminators. Now a member of Harrow MAC, M/Sgt Croce and his wife have been modelling in many parts of the world. His flame and chrome yellow stunter is McCoy 60 powered.

A REMARKABLE feature of the 1952 contest season to date is the high standard of durations being set up in all parts of the country—despite weather conditions that are not always of the best. Following the extraordinary situation of four "possibles" in the Pilcher Cup, two competitors scored treble maximums in the "Weston Cup", Johnny O'Donnell of Whitefield being unable to make a fourth flight to decide the tie with Ray Monks. In addition, the Gamage, Halfax, S.M.A.E. and Astral events were all won with scores little below the 15 minute mark.

Even more outstanding are the repeat performances being set this year. Grahame Gates retained his title to the Pilcher Cup in March, and this feat has been followed by the even more astonishing feat of Ron Lucas of Port Talbot, the Lady Shelley Cup returning to his credit with a win three years on the run. It will therefore be extremely interesting to see the results of the 1952 Wakefield and A/2 Trials, for the known names are still appearing in the top scores with unfailing regularity.

Ireland

The **BELFAST M.F.C.** has got well into its stride for the summer flying programme, Saturday, April 12th being a really terrific day with plenty of thermals and a light breeze. Many power duration jobs were flying, and Norman Osborne lost his Nordic on an o.o.s. flight of 5 minutes plus, being fortunate enough to recover the model the following Monday. The second Ulster Nationals will be held at Maydown Aerodrome, Londonderry, on the 21st and 22nd June. Contest for Wakefields and Gliders will take place on the first day, with Duration and Precision Power and C/L on the Sunday.

South Midland Area

The second Area meeting was held in fine, sunny conditions at Kidlington, the Weston Cup producing two maximums in the first round. Bunny White, of Icarians, lost his model through having no d/t, the other loser being Fraser, of Hatfield. Recovering the job, Fraser kept his lead in the second round, and Jeffrey came up into third position with a flight of 4 : 22. In the final round, the leaders kept their margin, with Fraser increasing the lead slightly with a flight of 2 : 40, the conditions having changed to dull, windy and cold. The Astral showed quite an improvement in power flying to that of the previous meeting with a number of maximums scored, Waldron of Henley finally placing top, with Bennett (Chorleywood) and Stone (Reading) following for the other placings. Best man for the International Elims. was Stott, who also won the first trials. Full scores were :—

Weston :	**Fraser, J.**	**Hatfield**	**9 : 31**
	Cooke, A. W. M.	**Henley**	**8 : 28**
	Jeffrey, R.	**Reading**	**7 : 41**
Astral :	**Waldron, J. G.**	**Henley**	**11 : 39**
	Bennet, K.	**Chorleywood**	**11 : 02**
	Stone, L. R.	**Reading**	**9 : 31**
F.A.I. :	**Stott, G.**	**Luton**	**7 : 57**
	Howe, L. F.	**Berkhamstead**	**5 : 20**

The fine weather on Easter Sunday saw three members of the **HENLEY M.C.** out flying for their "B" certs., and two, R. F. Sandy and P. S. Pengilley, put in the necessary flights. Sandy, flying his Wakefield, had successive r.o.g. flights of 3 : 45, 5 : 09 (new club record) and 4 : 36, whilst Pengilley clocked 4 : 58, 3 : 14 and 4 : 40 with his 6-ft. span lightweight glider. Cooke was the unlucky member for he pranged his large glider after flights of 7 : 05 and 4 : 42.

The **SOCIETY OF BEDFORD AERO-MODELLERS** has just entered its second year of existence, and though not claiming many contest successes reports the unqualified success of four exhibitions, three of which included C/L demonstrations. A C/L B-36 with six E.D. 3·46's aboard has been nearly finished by P. C. Grant, and will probably have flown by the time this appears in print.

The various Eliminators flown off, the **LUTON & D.M.A.S.** are concentrating on the club comps. The "Brown Trophy" was flown off under ideal conditions on the 18th May, when R. Brown, flying a Warring Lightweight, came first, another Warring design, the "Zombie", placing second, flown by P. Sullivan. Brown has flown his lightweight ever since it first appeared in the A.P.S. range, and has proved it a most consistent performer over the past three seasons. Scale models are on the increase, J. Symmonds' 1·3 Mills powered "Swordfish" being most impressive with its long, slow take-off. Sid (R/C) Miller had his beautiful radio-control job out, but after one or two flyaways can be excused when he called it "Quo Vadis".

North-Western Area

The **KNUTSFORD & D.M.F.C.** free-flight season opened with a practice run for the glider cup, during which D. E. Parmenter lost his o.d. 15–1 A/R job on its second flight from a 90-ft. line. In the contest proper, he managed to retain the trophy he won last year, flying a completely new job in which the A/R was reduced to 8-1 and was to Nordic specification. Parmenter's times were 5 : 31, 1 : 46 and 2 : 12, runner-up being G. W. Grainger, nearly four minutes less in total. There are now only two members without their Merit Certs. and it is hoped to remedy this immediately.

The **WHITEFIELD M.A.C.** regret to announce the sudden death of their chairman, Mr. R. Lawton, as announced in our last issue. A member of the club since its foundation, he was a great helper and organiser in all its activities, and will be greatly missed. The club has done well in recent contests, J. O'Donnell being unlucky in not being able to record a fourth flight in the Woston, his model being badly damaged by cows after the second flight. After much repairing and the substitution of new wings, he managed a third maximum, but the job was lost. On combined results of the two power eliminators, the club has three out of the five Area qualifiers. At Tilstock on the 4th May, for the Area Open Day, A. D. Bennett was top in the Keil Trophy (and on collated results the National winner), his Amco 3·5 powered design having a better glide than most A/2's. In the Lady Shelley (tailless) Hugh O'Donnell was the only member to manage three flights and aggregated 3 : 29. Much test flying was carried out, and several sets of flights for A, B and C Certs. made. All told, the club scored 20 maximums during the day, the only lost model being A. Bagnall's 7-ft. long Nordic owing to a d/t failure.

During the next few weeks the **OLDHAM & D.M.A.C.** are competing in an Anglo-American contest with the Minneapolis boys. Power, glider and rubber events will be run on separate Sundays, teams of six flying in each event. This is another club to have a thoroughly good time at the Area open day, an impromptu club comp. organised on the spot going to the lucky member totalling 27 : 42 in four successive flights, all terminating on the aerodrome boundary.

1952 CONTEST CALENDAR

June	15th.	**West Essex Gala.** (Fairlop.)
	21/22	**Second Ulster Nationals.** All Classes. (Maydown Aerodrome, Londonderry.)
	22nd	**FLIGHT CUP.** Unr. Rubber. (Decentralised.) **C.M.A. CUP.** Unr. Glider. (Decentralised.) **Butlin's Contests.** All Classes. (Filey, Skegness Ayr and Pwllheli.)
	29th.	**Clwyd Slope Soaring Contest.** (Clwyd, N. Wales.) **Northern Heights Gala.** (Langley.)
July	5/6.	**IRISH NATIONALS.** (Baldonnell.)
	6th.	**HAMLEY TROPHY.** Unr. Power Duration. **FROG JUNIOR CUP.** Unr. Rubber/Glider. (Decentralised.)
	20th.	**JETEX CHALLENGE CUP.** Jetex. **FARROW SHIELD.** Team Unr. Rubber. **WOMEN'S CHALLENGE CUP.** Unr. Rubber/Glider. (Area.)
Aug.	3/4.	NATIONALS. (Gosport). **THURSTON CUP.** Unr. Glider. **MODEL AIRCRAFT TROPHY.** Unr. Rubber. **"GOLD" TROPHY.** C/Line Stunt. **CONTROL LINE (SPEED).** All Speed Classes. **S.M.A.E. R/C TROPHY.** Radio Control. **SIR JOHN SHELLEY TROPHY.** Unr. Power.
	10th	**North East Coast Contests** (Town Moor, Newcastle-on-Tyne).
	17th.	**International Model Aircraft Contest.** (Blackpool.)
	23rd/24th.	**Irish International Meeting.** (Baldonnell.)
	24th.	**All Herts. Rally.** (Radlett.) **Bolton M.A.S. Rally.** (Edgeworth.)
	31st.	Centralised. (Cranfield). **BRITISH CHAMPS.** Rubber/Glider/Power. **TAPLIN TROPHY.** Radio Control. **Daily Dispatch Rally.** (Woodford.)
Sept.	7th.	**Yorkshire Evening News Rally.** (Sherburn In Elmet.)
	14th.	**U.K. CHALLENGE MATCH.** (Centralised.)
	21st.	**Butlin's Contests.** All classes. (Filey, Skegness, Ayr and Pwllheli.)
	21st	**Southern Counties Rally.** (R.A.F. Thorny Island.)
	28th.	**FROG SENIOR CUP.** Power. (Area.) **MODEL ENGINEER CUP.** Glider. (Area.) **South Midland Area Rally.** (R.A.F. Halton.)
Oct.	12th.	Centralised. **DAVIES TROPHY.** A and B Team Race. **RIPMAX TROPHY.** Radio Control. **C/L SPEED.** All Speed Classes.

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

Northern Area

The Third Annual Exhibition of Hobbies and Crafts held at Easter by the **SHEFFIELD SOCIETY OF AEROMODELLERS** was a great success in all respects. G. H. Mellar won the rubber and glider sections, another double win being by J. D. McHard in the solid and flying scale classes. The latter model, a Vought SBU–1 (carrier-based biplane) powered with an Allbon Dart was also adjudged the best model at the show. Other winners were K. Thackray (power) and J. A. Seymour (c/line). Mellar was until February a junior member, and is a very up-and-coming young man, not only in concours events but also in the field.

The **STOCKTON & D.M.F.C.** held a contest for rubber models on April 27th, when, despite the rain, Tom Chambers won top place with an aggregate in excess of eight minutes, one flight being over 4 : 00. C. Plant and M. Robson were runners-up, and it is gratifying to note that at last the top three places in a club comp. were taken by original models.

Midland Area

Rubber and sailplane models are most popular in the **LEICESTER M.A.C.** at present, many "Ace" jobs being trimmed for the final round of this stage-by-stage contest. A small band of members visited the A/2 elims. at Pershore, but with no success, though a considerable amount of crashery was experienced. In the Midland Area knock-out affair, they were well and truly K.O'd by the Loughborough College lads, all flying A/2's.

Radio control receives a lot of attention from the **BURTON ON TRENT M.A.C.**, C. Smith's "Rudderbug" being a good performer after many engine changes. He is now engaged on a "Goliath" fitted with a Magpie 15 c.c. A glider comp. resulted in a win for J. Vannam (7 : 34), P. G. Ellis being only 4 seconds behind for second place. Club records to date are glider, 12 : 40, by D. Clarke, rubber, 10 : 10, by F. Vale, and power, 6 : 18, by M. Honton's Mallard.

Gamage Cup day coincided with the **SOLIHULL M.F.C.** fly-off against West Coventry in the Area knock-out, the Solihull boys again coming out on top. Having had plenty of practice with A/2's the club was disappointed with their showing at the first Eliminator, the only members doing well being J. Rogers and

Maurice Hanson, who placed 3rd and 5th in the Area results, both flying models developed from Hanson's original A/2. In the first Wakefield Elims, the only two long-fuselage jobs came to grief, one fouling a tow-line in mid-air, and the other being struck in flight by a power job ! And I suppose the owners politely asked the other fliers to kindly keep their models in check ! ! Or words to that effect.

The **FORESTERS (Nottingham) M.F.C.** club hut is resonating long into the night with hordes of "Quickies" on the go, and it is tantamount to heresy to suggest there are other A/2's. Pete Ball's version consistently does 4 minutes in still air ; nevertheless, the best flight recently was Cyril Powell's 14 : 00 o.o.s. with his own design high A/R job. Bill Ward has built an interesting swept-forward tailless model powered with a Mills 75, a few hectic flights showing great promise. Radio control is pressing on, Douggie Bolton's latest job sounding like a tube train, but produces proportional non-sequence rudder and independent cut-off. The snag so far is that the cut-off is too mad keen !

South-Western Area

The second Area Rally was held at Chagford Common in fine weather, though the wind increased during the afternoon. The site proved that maximums are possible, and several machines were lost—in three cases before their unfortunate owners could make official flights ! Ah, those test flights. R.A.F. type Peter Royle of the Midland Area put up the best times in both Wakefield and Power classes, the top Area times being :—

Wakefield :	**Royle, P. J.**	**R.A.F. St. Mawgan**	**11 : 46**
	Tancock, D.	Plymouth	6 : 47
	Robins, W. J.	Plymouth	6 : 42
Astral :	**Royle, P. J.**	**R.A.F. St. Mawgan**	**6 : 01**
	Gibbons, S.	Exeter	5 : 33
	Rogers, G.	Exeter	4 : 08

In the open rubber and glider contests sponsored by the Area, H. A. Stillings (Exeter) was top glider man with 10 : 02, while P. J. Ash (Plymouth) clocked 5 : 51 with his rubber machine.

May 10th saw an inter-club meeting between the **SALCOMBE M.A.C.** and boys from the Dartmouth club, resulting in a win for the home lads by 18 points to 3. Inclement weather restricted flying in the morning, but fine flying was witnessed as conditions improved through the day. Outstanding event of the day was a demonstration of R/C flying by S/Ldr. Sholto-Douglas and H. O'Hefferman.

The **PLYMOUTH M.F.C.** held the first round of its rubber, glider, power and Jetex championships on April 27th, the affair running over six rounds. Conditions were ideal, and thermals were about for the 22 competitors who made the most of the unusual fine weather. One of the non-competing members made best flight of the day with a flip of 7 : 13 with a glider. What a waste of energy ! ! Junior member G. Parkhouse was top man in the comp., his A.P.S. "Satu" aggregating 7 : 25, the best individual comp. flight being by another junior, A. M. Shipman, with a time of 5 : 21. In the rubber event a junior was again top, D. Brock scoring 8 : 44, and the story was completed when junior A. Thomas carried power honours with 9 : 20. Only in the Jetex event did the seniors have a look-in when M. D. Richards returned one flight of 7 : 58. Three club records were broken, and it is evident that the club policy of encouraging juniors is paying dividends.

S.M.A.E. CONTEST RESULTS

KEIL TROPHY

1.	Bennett, A.	Whitefield	45·91 ratio
2.	Butcher, N.	Croydon	43·90
3.	Chinn, J.	Gt. Yarmouth	55·15
4.	Woodhouse, R.	Whitefield	52·2
5.	Brooks, A.	Grange	50·65
6.	Upfold, A.	Headley	49·82
7.	Lamble, J.	Wayfarers	49·80
8.	Down, J.	South Bristol	48·63
9.	Belfield, K.	Macclesfield	46·29
10.	Yates, R.	Headley	46·26
11.	Monks, R.	Birmingham	45·66
12.	Dilly, M.	Croydon	44·03

(86 competitors)

LADY SHELLEY CUP

1.	Lucas, A. R.	Port Talbot	12 : 08
2.	Edwards, D.	St. Albans	11 : 06
3.	Gates, G. K.	Southern Cross	10 : 28
4.	Rowe, B.	St. Albans	9 : 38
5.	Boulter, O.	Port Talbot	7 : 51
6.	Dorsett, A.	Blackheath	7 : 22
7.	Smith, F.	Southern Cross	6 : 11
8.	Donald, K.	Southern Cross	6 : 08
9.	Waters, D.	Grange	5 : 37
10.	Woolls, G. A. T.	Bristol & West	5 : 24
11.	Hume, J.	Belfairs	5 : 00

(26 competitors)

K. & M.A.A. CUP

1.	H. O'Donnell	Whitefield	13 : 29	J.
2.	R. Askew	Whitefield	11 : 55	
3.	T. Riddihough	Leamington	11 : 03	J.
4.	B. Bower	Salford	10 : 51	
5.	B. Harris	Prestwich	10 : 45	
6.	I. Ellison	Burnley Skyrangers	10 : 27	
7.	M. Thomas	Bolton	9 : 53	
8.	Miss W. Bennett	Whitefield	9 : 52	J.
9.	G. White	Littleover	9 : 50	
10.	S. Targett	Whitefield	9 : 23	
11.	G. Jackson	Littleover	9 : 15	
12.	W. Dalson	Salford	9 : 01	

(362 competitors)

GUTTERIDGE TROPHY

1.	P. Vickary	Swansea	10 : 30
2.	P. Allaker	Surbiton	10 : 08
3.	B. Picken	Wigan	9 : 27
4.	K. Robinson	Bolton	9 : 25
5.	R. Copland	N. Hts.	9 : 13
6.	F. Boxall	Brighton	8 : 45
7.	R. Sandy	Henley	8 : 40
8.	W. Dalloway	Birmingham	8 : 35
9.	C. Jackson	Ashton	8 : 23
10.	T. Rhead	Wigan	8 : 18
11.	D. Bennett	Whitefield	8 : 07
12.	P. Buskell	Surbiton	7 : 59

(149 competitors)

Southern Area

Entry for the Area A/2 and F.A.I. Power events was much better than last year, nine clubs being represented. Weather was far from good, but it improved as the day wore on, and one or two maximums were recorded. E. J. John of Grange did particularly well during the Halfax, returning a total of 11 : 21. For the second Area "do" the weather improved, as also did the number of entries, and Wakefield flying showed much improvement, but the same cannot be said for the power boys. Another Grange man, J. Blackmore, topped the Wakefield times with 10 : 08, and John repeated his performance in the power section. Blackmore won the Area open glider event held on the same day with a score of 11 : 45, flying his own designed 100-inch span "Truant".

Chuck gliders are receiving a lot of attention from many clubs these days, and the **WINCHESTER M.A.S.** report a hectic day of comp. work with this type of model following which the entrants had stiff arms, aching torsos and much patched models ! Times were not high, being largely due to unhelpful weather, but Bill Childs made a total of 64 seconds for three flights, which isn't at all bad. A sailplane contest held

a week later resulted in a win for R. H. Lewis who aggregated 11 : 06, including a max. on his second flight, this chap being in the lead for the Society's championship with a two-point lead over Childs.

In addition to the successes at the Area meetings reported above, members of the **GRANGE M.A.C.** did well on May 4th. Tony Brookes wound up his Class C free-flighter (Fox 35) for a total ratio of 51–1 in the Keil Trophy, and Dave Waters' 5-ft. span tailless flew a 5 : 39 total in the Lady Shelley. Weather was overcast, with a slight drizzle.

Three **SWINDON M.A.C.** club records were broken on the occasion of the Swindon/Trowbridge challenge match held recently at Keevil Aerodrome. R. Smith, flying his A.P.S. " Nord II " in the open glider event clocked 9 : 15, thus setting up new open and A/2 records for Swindon. The power ratio figure was pushed up by D. Turtel when his " Mallard " turned in a flight of 9 : 17 on a 20 secs. engine run. Trowbridge collected 27 points in the match, but lost out to Swindon who aggregated 30, and it was a keen fight and a grand day's flying- full points going to G. Waldron for his motor-cycle recovery service, appreciated by others as well as the " middle-age spread " members.

BRISTOL & WEST M.A.C. seem to be making a slow start this season, probably owing to unkinder weather than experienced in most other parts, according to general reports. Andy Wilson and George Woolls were the only representatives in the Wakefield Elims. Wilson's 48-inch span with a 20-inch single bladed folder appearing happiest in fairly still air, when it put up good times. Woolls lost his " Wizard II " on a test flight before the Weston (d/t failure), and his second string of a different design failed to get away in the second round, smashing the centre section. Ace speed wallah A. V. Coles is getting good times from his Dart powered high-thrust pylon free-flighter, but highlight is George Woolls' successful attempt on his own rubber-powered tailless British Record, which he has raised to over the two-minute mark.

London Area

The recently affiliated **WALTHAMSTOW M.F.C.** celebrated its first anniversary with a control-line rally in the playground of the local school, cups being won by D. Mason and T. Holbrook. Highlight of the meeting occurred when an " Elfin " powered " Hornet " broke off the lines, and after a hectic climb was found two roads away !

The **PARK M.A.L.** has now got back on its feet after an orgy of motor cycles (wot a pun !) and a grand day was spent on Epsom Downs on the 27th May when they flew against Surbiton for the first round of the L.A. Cup. Although they lost the round, some good times were put by both teams, best Park members being W. Hinks in rubber, with 10 : 01, and G. D. Crabbe, 11 : 43, in glider.

South Wales Area

The Area was out in great strength at Fairwood for the Halfax and A/2 trials. It was a grand day, though a very high wind blew across the 'drome, and the Area welcomed a strong contingent from the R.A.F. St. Athan club, who gave a good account of themselves. H. Savage of the Croydon club was another very welcome visitor. Area results were :—

Halfax :	Barker, P.	R.A.F. St. Athan	8 : 19
	Verney, M.	R.A.F. St. Athan	8 : 06
	North, P.	Cardiff	6 : 55
Glider :	Phillips, J.	Cardiff	18 : 52
	Holland, F.	Swansea	8 : 32
	Verney, M.	R.A.F. St. Athan	8 : 18

Frank Holland lost his A/2 in the first round after a flight of 3 : 35, and we learn that his Wakefield efforts have been dogged by ill luck. Verney put up a new Fairwood " record " by breaking his tow-line five times in one contest ! However, this did not prevent him making best times in the K.M.M.A. as the following list shows :—

K.M.M.A. :	Verney, M.	R.A.F. St. Athan	7 : 39
	Boulter, D. O.	Port Talbot	6 : 58
	Davies, A. L.	Port Talbot	6 : 58
Gutteridge :	Vickery, P. M.	Swansea	10 : 30
	Crumplin, E. C.	Swansea	5 : 42
	Evans, B. J.	Swansea	3 : 51

The **CARDIFF MODEL RAILWAY GUILD** has been invited to sponsor an exhibition of models at the Welsh Ideal Homes Exhibition to be held at the Sophia Gardens Pavilion, Cardiff, in November, and it is hoped to have as many local clubs as possible participating. Will secretaries of all model clubs and societies who are interested please communicate with Mr. L. C. Humphries, 8, Vaughan Ave., Llandaff.

South Eastern Area

Conclusive proof of some aeromodellers' insanity was shown by the arrival of two coach-loads and several motor cycles and cars at the snow-covered Epsom Downs for the Surbiton Glider Gala ! However, the day was not wasted, and much energy was expended practising for the hard game of chuck gliding.

" Marsh Mutterings ", the gen sheet from the **EASTBOURNE M.F.C.**, reports that a wonderful day was spent at the Gamage comp. when Tom Underdown's glider broke the club record with a fine flip of 9 : 52.

A nominated time comp. staged by the **SOUTHERN CROSS M.A.C.** was more furtunate than its predecessor, and the unusual happened when the organiser, comp. sec. F. C. Smith, won the affair with an error of only 11·5 seconds in a 9 : 28·5 nominated total. Grahame Gates seems well set to carry off the club championship, his announced total of 14 : 50 for four flights being well ahead of K. Donald's 12 : 28 for seven ditto. The Worthing section of the club has been wound up.

A new club for this Area is the **LEWES M.F.C.**, which announces that they have followed the Henley club lead by making the very nominal charge of 2/6 per annum for membership, and membership is steadily rising.

Finally, David O'Leary of 659, Hawthorn Road, E. Brighton, Melbourne, Victoria, Australia (age 15) would like to correspond with an English modeller about his own age, and interested in small powered free flight and C/L jobs.

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LEWES M.F.C.
R. A. Ockenden, 45, Southover High Street, Lewes, Sussex.
WALTHAMSTOW M.F.C.
D. Pottle, 79, Beaconsfield Road, Walthamstow, E.17.
ALDENHAM SCHOOL M.E.S. (formerly M.A.C.).
J. M. A. Carter, McGills House, Aldenham School, near Elstree, Herts.

SECRETARIAL CHANGES

WEST BROMWICH M.A. & C.S.
N. A. Groucutt, 29, Nicholl Street, West Bromwich, Staffs.
GRANTHAM S.M.E.
R. Gerard, 42, Houghton Road, Grantham, Lincs.
SOCIETY OF BEDFORD AEROMODELLERS.
J. R. Mathers, 82, Putnoe Lane, Bedford.
WALLASEY M.A.C.
R. A. Alexander, 32, Grange Road West, Birkenhead, Ches.

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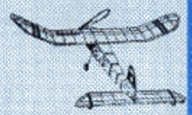

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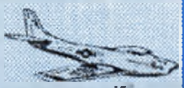

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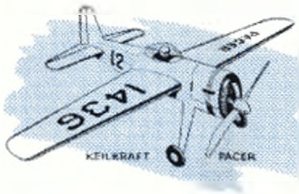

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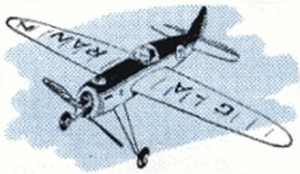

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