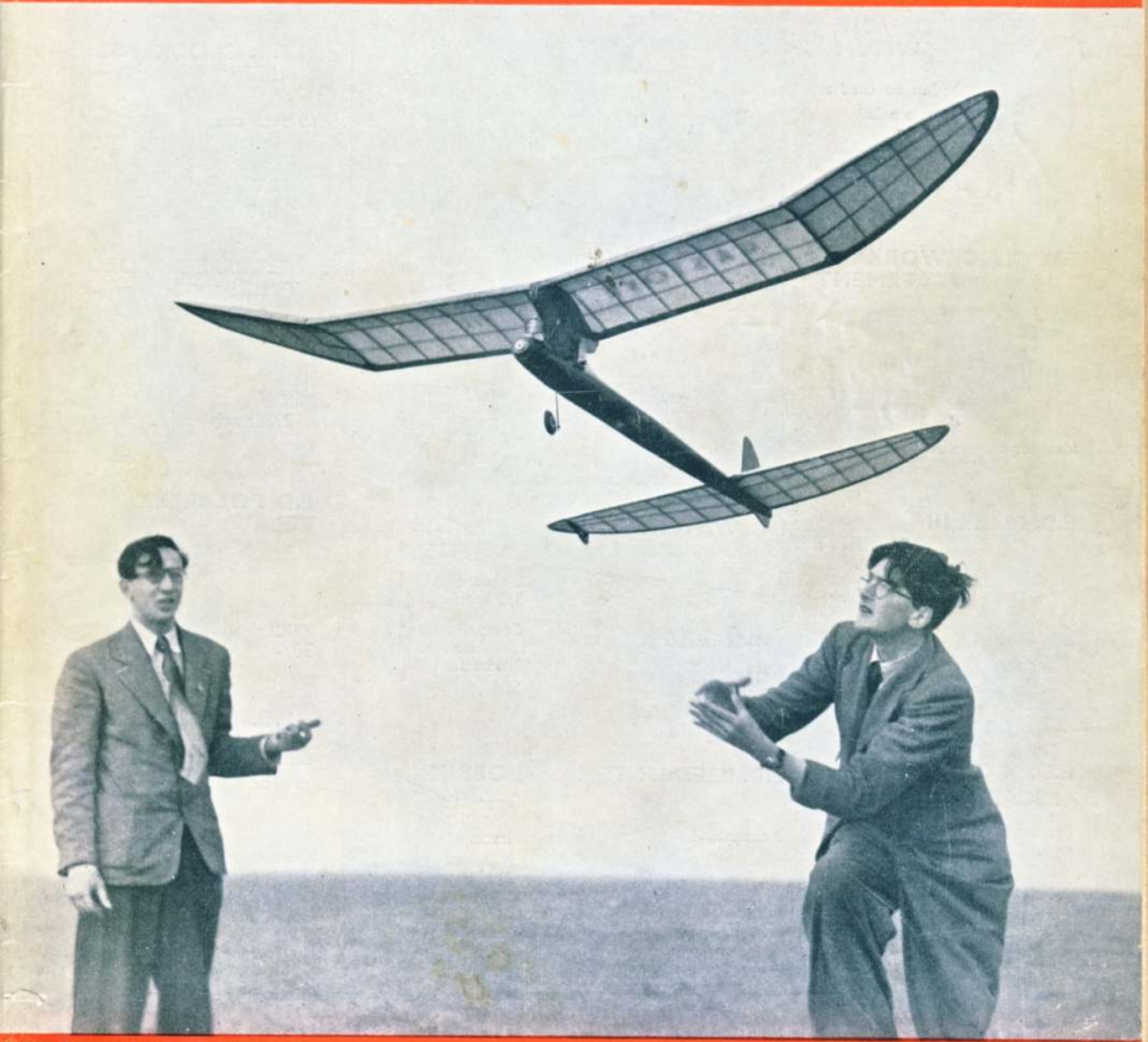
AERO MODELLER

MAY, 1952



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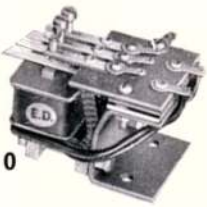

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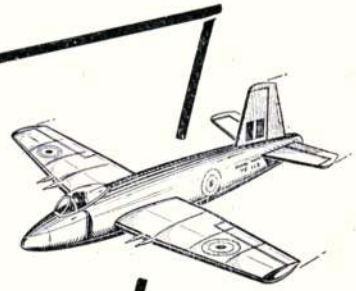

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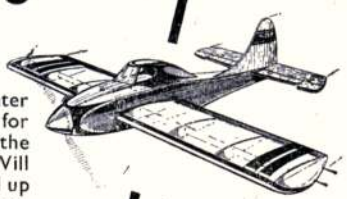

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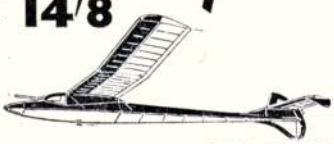

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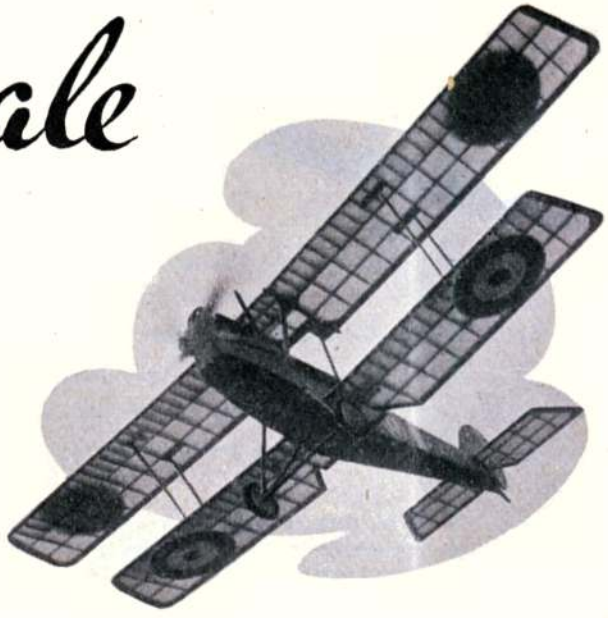

Thanks to the encouragement given for so long by the AEROMODELLER to flying scale designers, right from the days of the original Moore Drive for Rubber powered models, to P. E. Norman, with his pendulum elevators and rudder, and to the enterprise of manufacturers who have provided ever better and lighter engine units, the keen aeromodeller is now turning more and more to scale and semi-scale models.

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POWER

FSP 343	**Avro 504K** by R. Booth. 36" span. ·5 to 1 c.c.	5/6
340	**Chilton D.W.1** by J. M. Greenland. 36" span. ·5 to 1 c.c. ...	3/6
290	**D.H.C.1 Chipmunk** by J. M. Greenland. 36" span. 1·3 to 2 c.c.	5/6
372	**Typhoon 1B** by P. E. Norman. 32" span. 1·8 to 2 c.c. ...	5/6
160	**Westland Lysander** by A. Welsberg. 60" span. 2·5 c.c. ...	7/6
285	**Bishop's Nieuport** by L. C. Bagley. 41½" span. 1 to 1·3 c.c. ...	5/6
319	**Republic Sea Bee** by H. J. Towner. 58½" span. 1 to 2 c.c. ...	7/6
305	**Sopwith Pup** by G. E. Fisher. 40½" span. 1 to 1·3 c.c. ...	5/6
331	**Chrislea Super Ace** by E. J. Riding. 54" span. ·5 to 1 c.c.	5/6
174	**R.W.D.8 Polish Trainer** by A. Welsberg. 67" span. 10 c.c. ...	8/9
404	**Missel Thrush** by E. J. Riding. 42" span. ·75 to 1·5 c.c. ...	5/6
418	**R.E.8** by D. R. Hughes. 43" span. ·75 to 1·5 c.c.	4/6
425	**Prestwick Pioneer** by R. Burns. 52" span. 2 to 2·5 c.c. ...	5/6
373	**S.P.A.D. S-7C1 Scout** by L. C. Bagley. 38" span. 1 to 1·5 c.c. ...	5/6
388	**D.H. C.2 Beaver** by A. Moore. 60" span. 2 to 2·5 c.c. ...	5/6
392	**Zaunkoenig** by J. M. Greenland. 39" span. ·5 to 1 c.c. ...	5/6
395	**Boeing XL15** by E. C. Martin. 49" span. 1 c.c.	5/6
410	**Gloster Gamecock** by P. E. Norman. 36" span. 2 to 3 c.c. ...	5/6
441	**Sopwith Scout F1 (Camel)** by F. C. Saunders. 42" span. 1 to 1·3 c.c.	6/–
445	**Fokker FV11b3M** by R. Parrish. 40" span. ·32 to ·5 c.c. ...	4/–
453	**Fokker Triplane** by P. E. Norman. 40½" span. 2·46 to 3·5 c.c.	6/–
466	**English Electric Wren** by P. Wyatt. 62" span. Up to 1·5 c.c.	6/–
468	**Avro Avian Sports** by R. Booth. 35" span. Up to 1·5 c.c. ...	6/–

CONTROL LINE

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322	**Tipsy Junior** by H. G. Hundleby. 34" span. 2·5 to 5 c.c. ...	5/6
323	**Tipsy Junior** by H. G. Hundleby. 39½" span. 5 to 10 c.c. ...	6/6
335	**Tempest II** by H. J. Pridmore. 31" span. 2 to 3·5 c.c. ...	3/6
328	**Lockheed Sirius** by W. Musciano. 32" span. 2·3 to 5 c.c. ...	3/6
243	**Miles M48** by J. H. Pridmore. 36½" span. 2 c.c.	4/–
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385	**Ercoupe** by D. Deeley. 39½" span. 5 c.c.	5/6
411	**T.K.4 Team Racer** by R. G. Moulton. 2·5 or 5 c.c.	3/6
403	**Fokker D VII** by R. Ward. 29" span. 5 c.c.	3/6
433	**Wackett Boomerang** by C. A. Taylor. 38" span. 3·5 c.c. ...	4/–
462	**Hawker Hart** by W. Musciano. 28" span. 2·5 to 3·5 c.c. ...	4/–

RUBBER DRIVEN

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100	**Airacobra** by K. H. Hodgson. 40" span	3/6
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110	**B.A. Swallow** by J. L. Roberts. 30" span	2/6
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205	**Hawker Typhoon** by C. Rupert Moore. 41½" span ...	6/6
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ESTABLISHED 1935

AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

VOLUME XVII
NUMBER 196
MAY 1952

"Covers the World of Aeromodelling"

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Assistant Editor:
H. G. HUNDLEBY

Public Relations Officer:
D. J. LAIDLAW DICKSON

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Contents

Editorial and Advertisement Offices:
38, CLARENDON ROAD, WATFORD, HERTS. Tel.: 3837

"A change is as good as a rest"

AS aeromodellers, we have always deemed ourselves fortunate, in that our work is our pleasure and our pleasure our work (or so it seems at times). An additional pleasure in recent years was our occupation of offices in the country. Not only had we the pleasure of the larks singing above the editorial roof and the wholesome breath of rural air, but also the availability of Eaton Bray aerodrome, where the editorial models were flown during summer lunch hours.

The advantages of a pastoral existence are in their turn to some extent outweighed by disadvantages, especially where the production of a National Magazine such as the AEROMODELLER is concerned. And so the stern necessities of commercial life deem it desirable to move nearer to the great Metropolis.

The new home, therefore, of both Editorial and Advertisement Departments of the AEROMODELLER is 38, Clarendon Road, Watford, Herts. For the time being our Subscription Department will remain at Leicester, and subscription orders should therefore still be sent to Allen House, Newarke Street, Leicester, until further notice.

In addition to our change of abode, certain reorganisation of administration has also occurred, Mr. D. A. Russell, M.I.Mech.E., having ceased to be Managing Editor of AEROMODELLER and our associate magazine *Model Maker*, and he has left the board of Model Aeronautical Press Ltd.

This seems a fitting opportunity to set out in full for the benefit of readers the details of our organisation. First and foremost, Model Aeronautical Press Ltd. are the publishers of the National Monthly Magazines AEROMODELLER and *Model Maker*, and that regular best seller AEROMODELLER ANNUAL. It is hoped in the near future to extend the scope of our book publications to include up-to-date manuals on various aspects of modelling by leading authorities in their fields.

Our two magazines each produce, as one of their many services to readers, the well-known AEROMODELLER Plans Service and *Model Maker* Plans Service, covering the most extensive range of working model plans in the world.

During its seventeen years of publication AEROMODELLER has been foremost in the support of worthwhile aeromodelling objects and will continue to give unrivalled editorial coverage and features which have made it the most sought after modelling journal of its kind.

We need hardly remind our older readers of the many developments in aeromodelling that we have fostered and pioneered in this country. To name but a few, let us recall—the introduction of the model diesel engine, and with it the publication of the first authoritative and scientifically conducted tests of commercial engines; the postwar coverage of international aeromodelling contests and many other not so obvious events such as the delicate negotiations with the G.P.O. which secured special wavebands for radio control enthusiasts.

Comfortably settled in our new offices at Clarendon Road, Watford, we look forward with confidence to the continuing expansion of the grandest of all hobbies.

Cover Picture . . . .

Caught in an attitude that brings to mind the adage 'Launch and Pray'. M. Gaster releases his 81 inch pylon design 'Gastove VII', timed by Vic Jays. This model is current British record holder for class C duration with a flight of 10 m. 44 secs. and when active at contests last season, was renowned for its phenomenal rate of climb due to the high power/weight ratio offered by its 10 c.c. Hornet racing engine.

1952 Nationals

Thanks to the good offices of Lieut. Commander Sproule, the Royal Navy have offered the use of Gosport Aerodrome as the venue of the 1952 Nationals, an offer which the S.M.A.E. Council has been happy to accept. As this is the first time this event has been staged on a R.N. airfield we need hardly urge the necessity for aeromodellers to leave it "shipshape and Bristol fashion". For careful readers who have not yet acquired their S.M.A.E. Competition Programme we would mention that the date is again the August Bank Holiday week-end, August 3rd/4th.

Godalming M.A.C. have offered to run a Team Race on this occasion, and in addition to offer a suitable trophy for the winning team, which will provide a growing section of the model community with an event of their own besides giving Southerners an opportunity to enjoy a thrilling spectacle featuring some of the best model pilots in the country.

The Indoor Nationals, scheduled for August 17th will be held later in the year. Date and venue will be announced shortly. An opinion has been expressed that they might with advantage be held in London this year, and thereafter on a rota basis, on a similar system to the main Nationals contests.

2nd World Speed Championships and 4th Championship of Europe

The blue riband of Control Line fliers will again take place this year at Knokke-sur-Mer, that Belgian watering place which, with its associate towns of Zoute and Albert Plage, has done so much to further this branch of the hobby.

In order to provide better facilities for teams and their friends to be housed in the same or adjoining hotels, the date has been advanced to the first week-end in July, exact dates being 4th to 8th of the month. Continental holiday-makers traditionally start their "high season" on July 14th, and this slightly earlier date avoids both excessive crowding and the higher holiday tariff.

The team will, as usual, be the guests of the organisers, who once again are offering special terms to "supporters" who fancy a pleasant and sporting week-end in Belgium. Terms have not yet been finalised, but will be between 400/500 frs. Belgian for the period of the contest, that is about £3; add about the same for pocket money and the fare from London to bring the total to about £15, or a little less if travelling third—no great hardship.

A special feature this year is the introduction of a team racing event. Rules are a simpler version of our own with the addition of a rule that filling must be done from a 30 c.c. graduated bottle. However, the organisers assure us that if tanks are processed there will be no objection to using the larger pressure fillers common to British events.

Translations of the draft rules are available from our offices, and will be sent to interested readers on receipt of a stamped addressed envelope marked "Knokke Rules".

There is also the possibility that a British team will be competing at the Namur Control Line Meeting, scheduled for the same week-end as the Knokke eliminators. If, as appears, the team is invited not only as guests of the organisers, but also with a travelling grant, there will be no ifs or buts, a team will go, and the eliminators be set back to May 15th, the same team representing us at the two Belgian meetings. We hope this can be fixed, as we understand a veritable model stadium has been built at Namur, and this will be its inaugural meeting.

Going Down!

The advent of really reliable small diesels of 0·5 c.c. capacity, four well-known makes being already on the British market or imminently available, in the shape of Frog, E.D., Elfin and Dart, invites some thoughts on size through the years in model aircraft engines.

It was in 1914 that Stanger first established petrol-driven model records with a V-twin engine weighing 2¾ lbs. and a four-cylinder job weighing 5¼ lbs., according to Col. Bowden's book *Petrol-Engined Model Aeroplanes*. This record stood until Bowden's *Kanga* beat it with a 30 c.c. engine developed by E. T. Westbury from an American two-stroke taken from a speed boat. Other interesting engines of the intervening period included Westbury's Atom I of 52 c.c., his Atom

Minor of 14·2 c.c., and Stalham s flat twin 30 c.c. design. Then, in 1935, came the famous Brown Junior of only 10 c.c. from America, which heralded the downward slide of engine sizes. By 1936, 6 c.c. engines were available, and even 2·4 c.c. had been attempted commercially. Enthusiasts in their workshops were toying with even smaller models, and we note our own Laurence H. Sparey published a 1·75 c.c. design about this time.

All these designs were handicapped by the difficulty of scaling down the weight of the necessary electrics that provided the essential spark, until Vantini's experiments in Padua at the beginning of the war with platinum coils, which eventually led to the glowplug, and Klemenz of Dyno developed the hot-bulb or semi-diesel with more immediately successful results.

That day to some extent sounded the knell of the larger engine, until today the 10 c.c. enjoys a vogue only in its class for speed control line models and to a very limited degree for the larger radio control planes, though even here smaller and smaller radio control seems the trend.

Looking through the appendices of *Model Diesels* published in 1946, the first edition lists only Buchmann's 0·6 c.c., Allouchery's 0·7 (his ·16 was experimental only), Maraget's 0·8 and Micron's 0·8 c.c.—the last three of which enjoyed considerable popularity, and led to such miniatures as Sparey's 0·8 c.c., its commercial equivalent, the Amco 0·87 (now incidentally on the market as a going concern to any enterprising enthusiast !), the little Clan 0·9 c.c., which never established itself, the tiny Kalper 0·32 c.c. and the Kemp 0·2 c.c. which had some vogue as a mechanical " smallest ever ".

Now in this first year of the new Elizabethan age we have four designs of 0·5 c.c. that can be relied upon to function even in the hands of the comparatively unskilled, powering models as light as Wakefields—a development that few if any of those pioneers can have envisaged, as they swung their 22-in. props. to bring to life their weighty prototypes. But let us spare a thought now and then for our old timers—many of whom are still with us flying modern descendants of their early prototypes—and say a quiet thank you for their sterling efforts !

Better than Ever

The Northern Area have some new ideas this year to make the " Yorkshire Evening News " Second National Model Flying Festival the most spectacular event of the year.

From the modeller's point of view it will surpass last year's record breaking event. There will be nine classes, and besides the Yorkshire Evening News Perpetual Trophies, 8 personal Trophies will be awarded to winners for keeps. Thirty other prizes will be available, all of a useful nature, as last year's winners will witness.

Don't miss this " American size meet "—make a note of the date (September 7th at Sherburn in Elmet, near Leeds) and start arranging your transport now. Further details will be published in due course.

Keep off the Grass

We reprint below a warning that has been issued by the S.M.A.E. that should be regarded as meaning exactly what it says. Readers are reminded that strict adherence to these instructions is essential if that goodwill and tolerance that has made so many fine flying grounds available is to continue.

WARNING

All model fliers are warned against the grave consequences which will be incurred if models are recovered from private property without permission first being obtained from the owners.

Furthermore, even when permission has been obtained, the greatest care must be exercised so that there is no damage to crops or property. The Society will take strict and immediate action against those who disregard this warning.

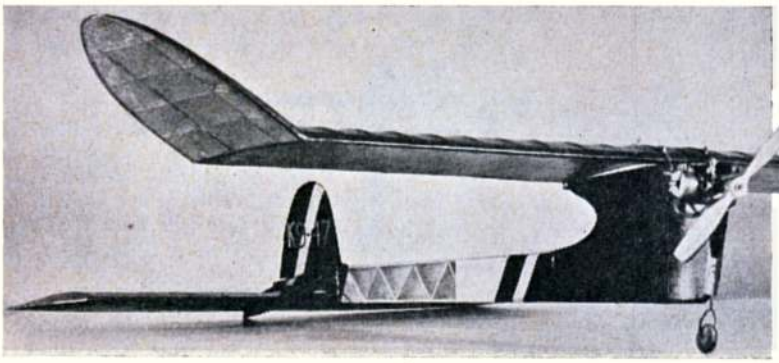
Model fliers are reminded that they have no right to trespass on private property to retrieve their models.

Issued by The Society of Model Aeronautical Engineers Limited,
Londonderry House, Park Lane, London, W.1.

Many fliers living in urban districts may have some difficulty in recognising growing crops, and to them we would give the further advice to avoid *anything* in a field that looks as if it had been planted for a purpose—that green pasture-like field may well be young corn ! And the damage done by even a *careful* man recovering one model may exceed its value several times over.

The Stag at Eve . . .

. . . had drunk his fill down at the " Crooked Billet ", Penge, where we had the pleasure of imbibing at the annual Zombies Stag Party. In between pints of mild and bitter we were entertained by aeromodelling's Rabelais Geoff Moss (appearing by kind permission of Northern Heights) and also the trio below, featuring from left to right, Frank Dobson, Unknown Guest and Sam Mayo.



ELF-AXE

"F.A.I. MODEL" FOR 1·5 c.c.

By JOHN LAMBLE

About the designer . . . aged 25 . . . Wayfarers Club . . . Accountant by profession . . . won Thurston Cup 1951 . . . believes in flying for fun . . . also a mountaineer.

DURING the 1949 Nationals at Fairlop the writer stood (*me too ! Ed.*) watching one pylon job after another bite the dust as they tried to cope with the tricky breeze. More careful observation showed three main ways in which disaster overtook the unfortunate.

1. Straight over loop into the deck.
2. Attempted loop with turn, skewing into a spiral dive.
3. Straight forward spiral dive for no very apparent reason.

A loop appeared to start two out of three prangs, and my answer was to adopt a high-thrust layout. A high-thrust line, 200 sq. ins. model was built, powered by an Amco ·87. It became known as " Lamble's Folly " and looped perfectly. However, we flew the answer out of it and a twice size version was built for the Amco 3·5 ; named " Battle-axe " and with a wing area of 600 sq. ins. It is now over two years old and still going strong.

Subsequent models were fairly small and highly powered. They were trimmed to a fast, shallow climb by using downthrust ; but they proved inconsistent and eventually the penny dropped, that in this layout at least, downthrust is an unstabilising force.

Thus, latest in the line comes the " Elf-axe ", it appears to combine the tolerance of trim and the steady yet deceptively fast climb of the earlier " Battle-axe " with a much improved glide, and a size that fits in the average model box.

It is designed for any good 1·5 c.c. engine, capable of between 12,000 and 13,000 r.p.m. with a 7 in. × 4 in. prop. If your engine is more powerful, then build something bigger or check your rev. counter ! If contests are not your main object, then any motor from 1 to 1·5 c.c. should do.

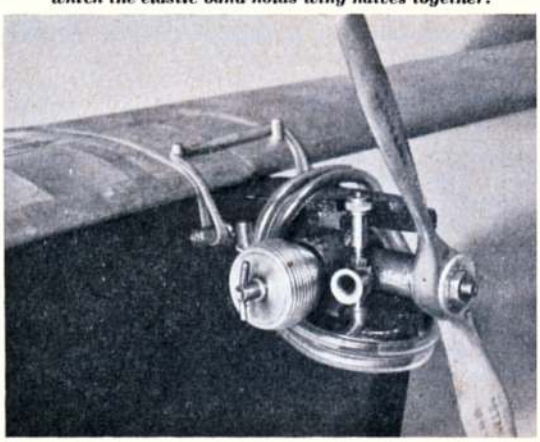
Flying. Try offsetting the rudder tab about $\frac{1}{8}$ in. for a left glide and embark on low power tests. These should show a steady left turn under power and a similar pattern on the glide. Increase power gradually and the model should perform a climbing turn in a practically unbanked attitude with the nose held high. If the angle of bank is appreciable try adding some right sidethrust (the original used 5°). If the climb is " wallowy " and the pull out bad, add some more rudder offset. Lastly, do remember the D.T. for you never know, your last adjustment may have been the right one.

Wing and Tailplane are conventional in all except the following points. Dihedral braces are of $\frac{1}{8}$ in. sheet plugged between the birch spars. Note particularly that the wash-in is incorporated by adjusting the angle of the rear brace on the left wing. Centre section joiners are 3 strips of 1/32nd ply each, not stuck together.

Fuselage. Follow sequence in perspective drawings. (1) Lay down bottom longeron, add vertical bulkheads and tailend sides. (2) Add to longeron. Slot in keel and reinforce front. Slot in fin and add rear wing supports and diagonal bracing. (3) Glue in engine bearers, pre-cementing well. Commence sheeting as shown. Add wing platform. (4) Complete sheeting. Fill in round engine mount. Add dowels, hooks, etc. Add tailplane platforms and fill in undercamber of the wing, making sure wing and tail seat firmly.

Full size copies of the $\frac{1}{4}$ scale reproduction opposite are obtainable at 4/6 post free from A.P.S. Note new address, on page 257.

Close up of the engine mount and neoprene tube fuel 'tank', also displays the wing attachment and way in which the elastic band holds wing halves together.



ELF - AXE

DESIGNED BY

J. LAMBLE.

4/6

THE AEROMODELLER PLANS SERVICE.

38 CLARENDON RD. WATFORD. HERTS.

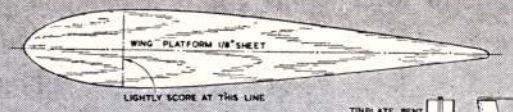
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.

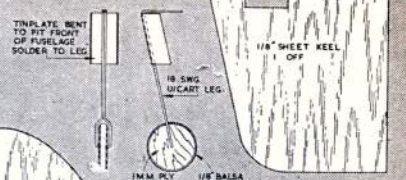
- MATERIALS REQUIRED -

SHEET BALSA 3' LONG	MISCELLANEOUS
2 SHEETS OF 1/8" X 3" HARD	8 STRIPS OF 1/16" X 1/8" BIRCH 3" LONG
4 SHEETS OF 1/16" X 3" MED.,	6" OF 1/16" X 1/4" BIRCH
STRIP BALSA 3' LONG	PIECE OF 1MM PLY
2 STRIPS OF 1/4" X 5/16" HARD	SMALL LENGTH OF 18 SWG WIRE
5 STRIPS OF 1/16" X 1/8" MED.	SMALL PIECE OF TINPLATE
1 STRIP OF 3/16" X 3/16" MED.	8" OF 1/2" X 1/4" BIRCH

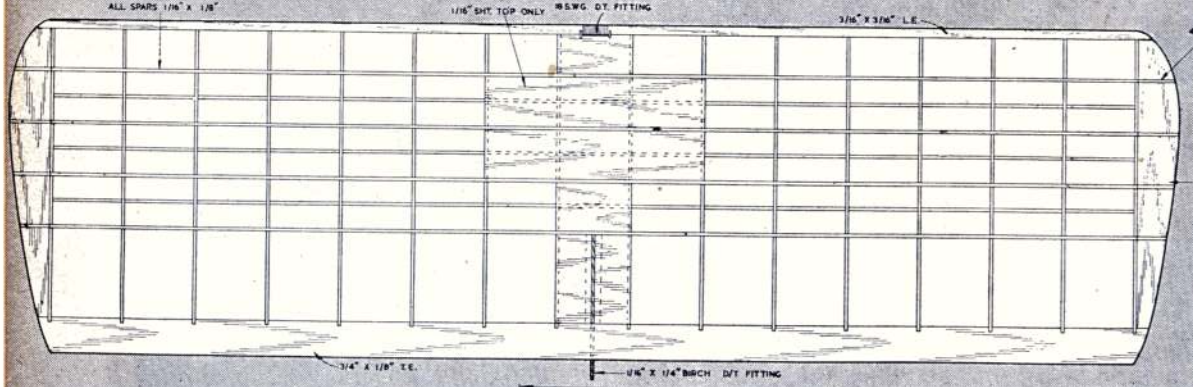
- DATA -

SPAN — — — — 46 INS.
WING AREA — 329 SQ. INS.
TAIL AREA — 186 SQ. INS.
LENGTH — — 33 3/4 INS.
WEIGHT — — 13 3/4 OZS.
POWER — — — 1.5 C.C.





- STAGES IN FUSELAGE CONSTRUCTION -

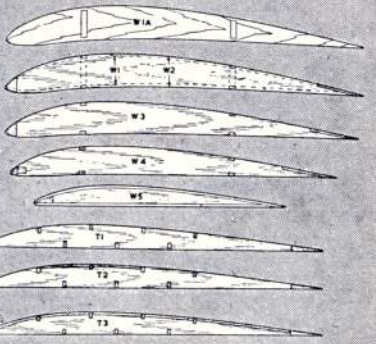


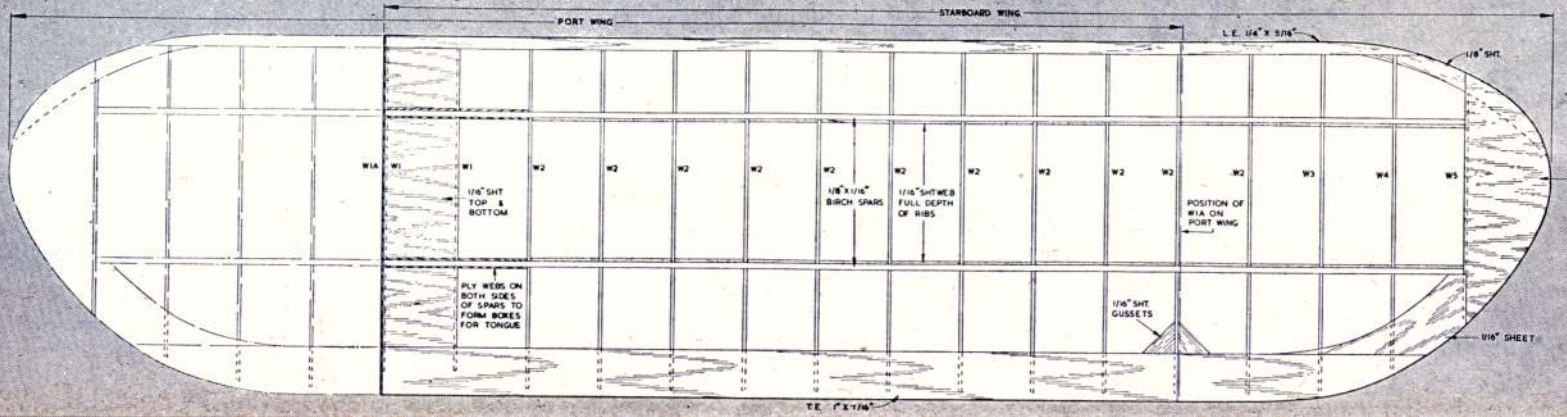
- WING RIBS -

W1A - 2 OFF. 1 M.M. PLY.
W1 - 4 OFF. 1/16" BALSA.
W2 - 22 OFF. 1/16" BALSA.
W3 - 2 OFF. 1/16" BALSA.
W4 - 2 OFF. 1/16" BALSA.
W5 - 2 OFF. 1/16" BALSA.

- TAIL RIBS -

T1 - 12 OFF. 1/16" BALSA.
T2 - 2 OFF. 1/16" BALSA.
T3 - 2 OFF. 1/16" BALSA.





WINGS ARE FITTED TOGETHER BY PLY TONGUES EACH 3 LAMS OF 1MM PLY

4 3/4" DIHEDRAL UNDER EACH TIP

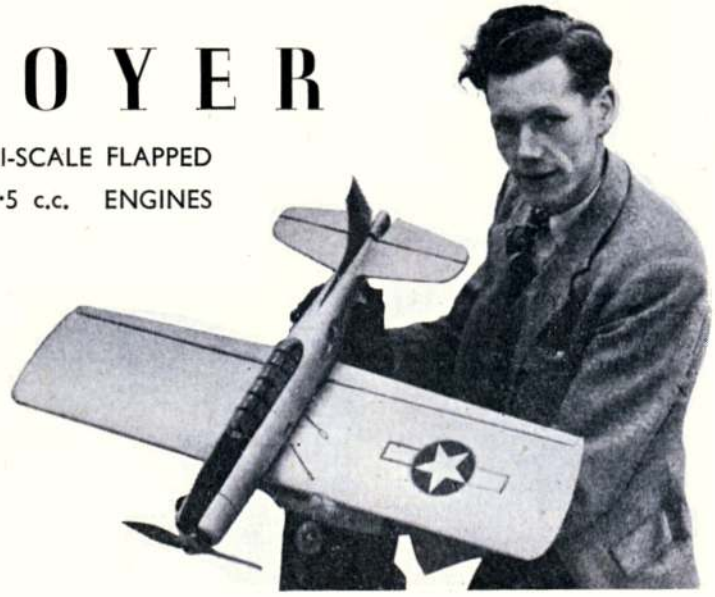
NO DIHEDRAL ON CENTRE PANELS

DESTROYER

A 280 SQ. INS. SEMI-SCALE FLAPPED STUNTER FOR 3·5 c.c. ENGINES

By

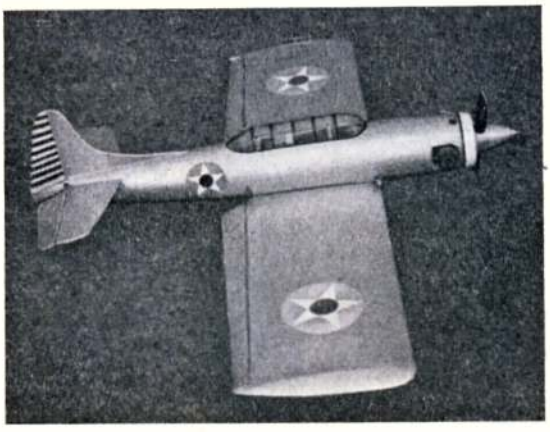
BILL GREEN



About the designer . . . Aged 25 . . . married, has a daughter and son . . . . free-lance modeller from Thame, Oxfordshire . . . . Capstan Lathe Operator by trade . . . Interested in Control Line stunt and Free-flight sport flying . . . . also interior decorating.

COMBINING both elevator and flap control, this stunt model is typical of the modern trend in design. In one respect is differs from the usual run of stunt controliners, in that its attractive appearance makes it almost unique as a model that can both look and fly the part of a semi-scale attack bomber of the 1939 era.

Moreover, considerable thought has gone into the structural design of the Destroyer and even though the reader may not wish to build this model, he will find many interesting ideas incorporated and worthy of reproduction in other designs. Sandwich type hinges are put to good effect with their realistic appearance. A commercial canopy cut in half and lengthened by a plain celluloid insert goes to make the ideal reproduction of the cabin which was so typical of the American attack bombers. A simple drop-out undercarriage adds to realism on the ground whilst radial type cowling with reasonable size spinner does not look altogether out of place and combines good cooling with streamlining.



Perhaps the most interesting feature of this model is the novel way Bill Green has connected his wing flaps to the elevator push rod. The joint is made by pushing the flap spigot into a tube which swivels on the pushrod and so provides a detachable fitting, enabling the builder to remove the wing for transport.

We have had an opportunity of testing this model and found it quite a revelation in smooth control through unlimited consecutive loops, bunts and all those manoeuvres which go to make the well known S.M.A.E. contest schedule. Bill's model had considerable pull on the lines and through liberal use of colour dope and heavy wood, its wing loading was higher than most. This was no detriment to the flying qualities which are of the highest order.

In spite of a rough motor run during one flight, we found that the heavy loading maintained line tension and we were able to split the circle with perfectly vertical wingovers with no fear of falling-off at the top. For inverted work the model handled like a charm, flying rock steady at any altitude down to zero and once again due to this higher loading completely unaffected by unwelcome gusts of wind. The thrill of flying this pleasing model extended right through from take off to landing and the latter was always preceded by at least one complete lap of practically beautiful glide.

As a stunt model that would not shame any Gold Trophy winner and the appearance of which gives one considerable satisfaction in flying, we thoroughly recommend the Destroyer to all 3·5 c.c. owners.

Complete building instructions are issued with each full size copy of the ¼-scale plan opposite, price 4s. 6d. post free, from the AEROMODELLER Plans Service, 38 Clarendon Road, Watford, Herts.

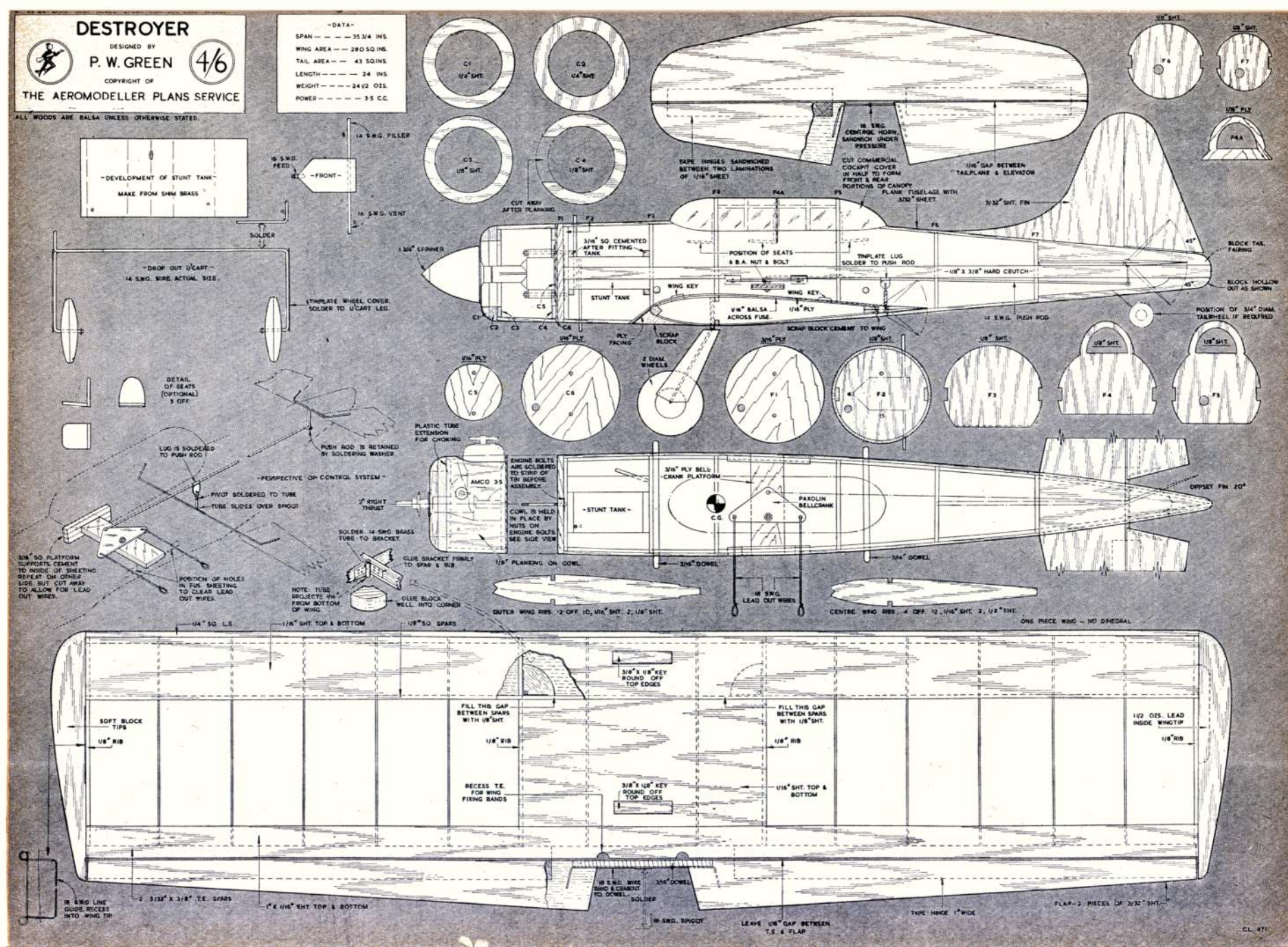
DESTROYER

DESIGNED BY
P. W. GREEN
4/6

-DATA-

SPAN	35 3/4 INS.
WING AREA	280 SQ INS.
TAIL AREA	43 SQ INS.
LENGTH	24 INS.
WEIGHT	24 1/2 OZS.
POWER	3.5 C.C.

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.



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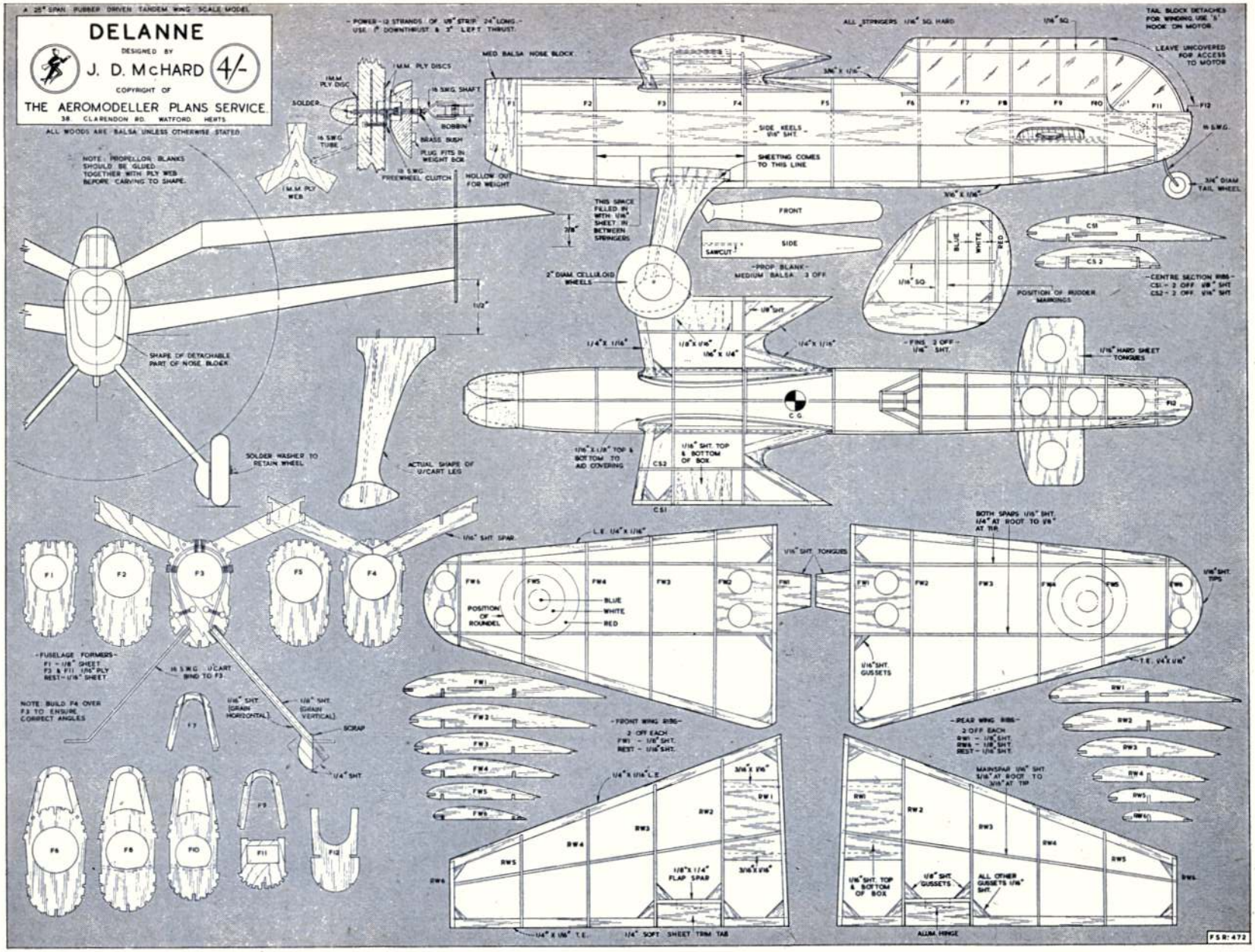


THIS IS A 1/4 SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 4/- POST FREE FROM THE AEROMODELLER PLANS SERVICE

A WELCOME RETURN TO FLYING SCALE RUBBER

The DELANNE

Tandem Wing Fighter scaled to 25 ins. span

By

J · D · McHARD

Corporal in the R.A.F... Photographer by trade ... Aged 24 ... has been modelling since 1938 ... concentrates on flying scale and abhors controliners and pylon power models.

NOT since September, 1948, have we published a rubber driven flying scale model in these columns and we are glad to break the 44 months' gap with this reproduction of Corporal McHard's novel selection. Tandem wing monoplanes are unconventional whether flying scale or not. This one has proven itself an excellent flier and the prototype was actually built at Kai Tak airfield, Hong Kong.

The actual Delanne aircraft was constructed in France in 1938 as a two-seater fighter for probable use with the French L'Armée de L'Aire. Very little is known of the performance or production figures, so it may be presumed that the design did not progress further than the prototype stage.

The original models of the Delanne have been powered by both rubber and the KK CO_2 engine. Both versions fly equally successfully. The model shown on the plan is the rubber-powered job, it is particularly adaptable to this type of power, owing to the long fuselage and the C.G. position—about midway between front and rear motor hooks.

Construction of the fuselage is the first step, this being the trickiest unit and also the "foundation" for the mounting of the flying surfaces.

Start by cutting out two side keels of 1/16 in. sheet balsa and mark the former positions on them with a soft pencil at this stage so as to get them both identical. Cut out slots for rear wing tongues, which are made from 1/16 in. hard sheet balsa, Cut out top and bottom keels from 1/16 in. sheet balsa and mark former positions on these also. Next cut all formers Nos. F1–F12, noting carefully the material specified for each part, also grain direction. Former F4 should be built on top of the completed former F3 so as to ensure perfect dihedral and incidence settings for the wingstubs. Start assembly by cementing the two side keels to former F12 on a flat surface, this will ensure the correct alignment of the fuselage. When completely dry fix former F1 in position and allow it to dry before proceeding further. When you are satisfied about this step, cement all the rest of the formers and keels in position, working from prop to "tail". If you have been careful with the job of cutting out these parts, they should just about fall together.

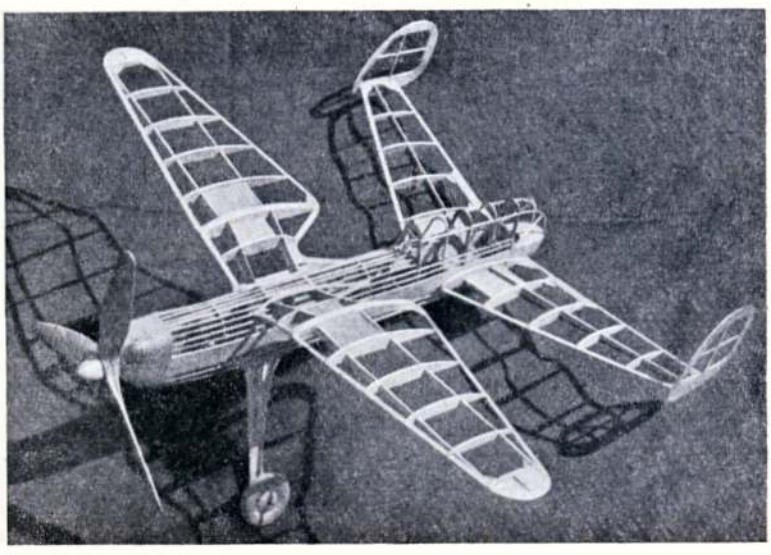
The undercarriage should be added now before putting any stringers in position. Use 16 S.W.G. wire, bend to shape, and bind and glue it to former F3. Add the undercarriage fairings after the wire is secure. The inside fairing is 1/16 in. sheet grain running across the strut, the outside one of $\frac{1}{8}$ in. sheet, grain running lengthwise, the wire sandwiched between the two, the lower wheel hub fairings added, and the whole thing carved and sanded to a streamline shape. Stringers are added next of 1/16 in. square balsa. Fill in part of fuselage between formers F2 and F4 with 1/16 in. sheet between stringers, making sure the undercarriage moves smoothly and sand the whole unit. Add the wing ribs CS.1 and CS.2 and make sure they are in alignment, complete the stub wings by adding leading and trailing edge strips, wing boxes (make sure the angle is correct, and do not forget the $\frac{1}{8}$ in. × 1/16 in. trimmings where the stub wing joins the fuselage). These are a great aid when covering. Take a pencil, wrap a piece of medium sandpaper around it, scallop all the formers between the stringers except those to which tissue will have to be stuck, such as formers F1 and F11 and top of former F6, etc. Nose and tail blocks should be added next. Slightly glue them in place for shaping. After this is done cut them free and add ply discs, bearings (incorporating 3° *left* sidethrust), spigots, etc. A simple freewheel may be used although a better one could be incorporated behind the airscrew, in the noseblock

itself as in the original, this way there is nothing to spoil the appearance of the spinner. The prop is carved of medium hard balsa and is extremely tough if assembled as per drawings.

Wings. Nothing difficult here, just lay spars on plan together with trailing edge, cement ribs in correct positions, add tips, tongues (1/16 in. hard-sheet or boxes in case of rear wings), also of 1/16 in. balsa. Leading edges are slotted into ribs after assembly. Sand the entire assembly smooth. Tip fins are made up of 1/16 in. balsa and sanded smooth.

There is nothing unusual in the covering of this model, in fact it is simpler than most scale models because of the almost complete absence of surfaces with a double curvature, requiring strip covering. Use the highest grade lightweight tissue obtainable. Cover cockpit with thin celluloid before covering the fuselage.

Flying. Before we start flying I must say once again *don't* test on *anything* but the calmest day, otherwise you will be without a model in short order. Make certain that the wings are both at *zero* incidence, that the fins and rudders are perfectly aligned vertically and fore and aft and that there are NO WARPS. Support the model on the fingertips at the wing stub trailing edge where indicated C.G. is on the plan. Add ballast until the fuselage is horizontal, check the prop thrust line, there should be 1 (*one*) *degree* downthrust, and the original required 3 (*three*) *degrees left* side thrust. Check the glide by launching from the shoulder into breeze, from a kneeling position. Launch into long grass if possible. If nose drops correct as much as possible by bending the trim tabs up. However if the nose rises sharply then the model drops one wing and dives, *do not* bend the tabs down but add weight to the nose until a flat glide is achieved. Try about 50 turns on the motor, no more to start with. Launch as before and note very carefully what happens. (This model is rather critical on the thrust line and the aircraft must not turn sharply to the right under power—this is fatal!) If it shows any tendency to wallow and then dive in on one wing (probably starboard), which is a peculiarity with this design, add a *little* downthrust, about 1/64th to the top of the nose block and try again. Do not increase the turns over 100 until you are certain the model is not turning to starboard. When you are satisfied, *gradually* increase the turns and correct faults as they crop up. Power is 12 strands $\frac{1}{8}$ flat rubber, 24 ins. long. Average duration is 50 seconds. It will do 40 seconds to order any time at all. Best flight on record to date from any of these Delannes is 2 mins. 5·25 secs. with the rubber job—1 min. 10 secs with the CO_2 version. Remember—if it wallows, dips a wing and dives, it is actually stalling, although to a man used to orthodox layout aircraft, it may not seem to be, so add that downthrust right away. Treat it properly and the Delanne will give you hours of flying pleasure. Any queries on this model, I will gladly answer if you write to me, c/o the AEROMODELLER.



Three better examples of well designed undercarriages on radio controlled models would be difficult to find. The heading shows Roger Ormerod's 11 lb. design, using a widely tracked tricycle unit and extra springing on nosewheel.

Bottom Left is Lt. Col. J. N. Larcombe's workmanlike interpretation of the Stentorian undercarriage, sent from the Kolar Gold Fields in India. Note the wide track, ample airscrew clearance and forward position of the wheels. At the right is W. Ross's Rudder Bug with large diameter wheels on the close set undercarriage.

Each of these examples is noteworthy for good tyre pressures in the balloon wheels used to absorb heavy landing shocks. Smaller models would be better with solid 'sorbo' type wheels.

ONE of the major problems that confronts the builder of large radio control or semi-scale models is that of safe take off. This problem has in fact reached such proportions that even experts prefer to hand-launch their models rather than risk the almost inevitable " ground loop ". It is already well known that one way of overcoming the difficulty of getting the type of model in question to take off, is to fit a tricycle undercarriage, but as this subject has been dealt with quite fully by various writers, this article will only deal with the orthodox two-wheeled undercart.

Ground Looping. In endeavouring to solve the problem of " ground looping " it is of course necessary to decide what causes same. There are two reasons why the large model " ground loops ", and strangely enough they are both due to the universal use of pneumatic wheels on the large R/C and semi-scale model. The first reason is that the majority of these wheels are badly designed for take off purposes. As readers know, the popular pneumatic wheel is the " balloon " type, having a small hub and a large type. This design is in accordance with " full size " practice and gives the model that " scale " look.

The second reason is that so few modellers take the elementary precaution of seeing that both wheels are inflated to the same degree, i.e., have the same pressure. If this precaution is overlooked one wheel will drag on the ground to a greater extent than the other. The result of course is a ground loop.

The Solution. There are several methods of avoiding ground-looping. Pneumatic wheels should not be used on any but the larger size model (over 6 ft. span) unless the wing loading is so high that they are essential for safe landing.

If pneumatic wheels are used, obtain the type with a large hub and a narrow tyre. If your model is already fitted with " balloon " type wheels and you do not wish for some reason to change them, check the tyre pressure regularly.

Undercarriage Design. In addition to the points previously mentioned there is another factor of importance regarding take off and that is undercarriage design. This is not as important as correct choice of wheels but should nevertheless be taken into consideration. The location of the undercarriage does not seem to be of great importance and may be placed well forward to ensure a good landing. The important point is that the track should be as wide as possible.

Summary. The important points are then: (1) Wheels should be solid, if possible to obtain them in the size required. (2) The undercarriage should have a reasonably wide track. (3) If balloon wheels are used pump them up hard and check that pressures are equal *with a pressure gauge* before each flying session. (4) The ideal wheel has a large diameter hub and a small tyre.

In conclusion the writer would like to point out that his model, fitted with solid wheels, never once failed to make a perfect take off and was never hand launched no matter how bad the weather.

R.A.F. TRAINING GLIDERS

BY J. C. REUSSNER

THE R.A.F. first used light gliders during the last war and at the present time there are six distinct types in service, these are the Cadet Mks. 1, 2, and 3, the Prefect, the Sedburgh and the Eton T. Mk. 1 Primary Glider.

Gliders are used principally by Home Command to train members of the Air Training Corps in elementary gliding. In addition to the direct flying experience obtained, the training is intended to develop qualities of initiative, team spirit and self confidence in the pupils.

With the increasing number of two seaters becoming available the R.A.F. are hoping to be able to provide more advanced training and possibly in the future experience of soaring. At present, very few pilots are able to advance beyond the stage of the A and B gliding certificate.

The machines described in this article are used by the civil clubs in this country in addition to the R.A.F. and in many countries abroad.

From the aeromodelling angle, the training glider is not an altogether suitable subject for a scale flying model if high performance is required. This article is published in response to innumerable requests for scale drawings of the gliders in which so many aeromodellers have received their first experience of being airborne, and will be followed by another article dealing with high performance types which are useful flying scale subjects.

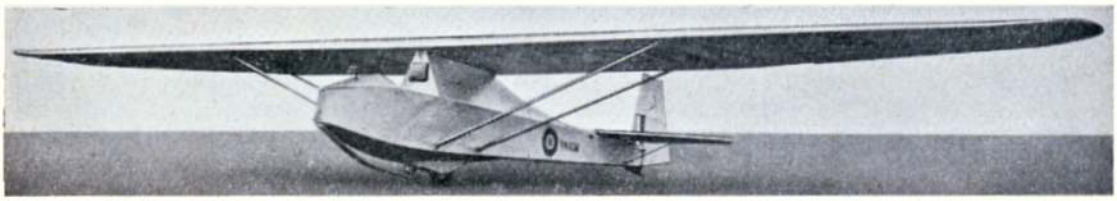
The Eton T Mk. 1 Primary Glider

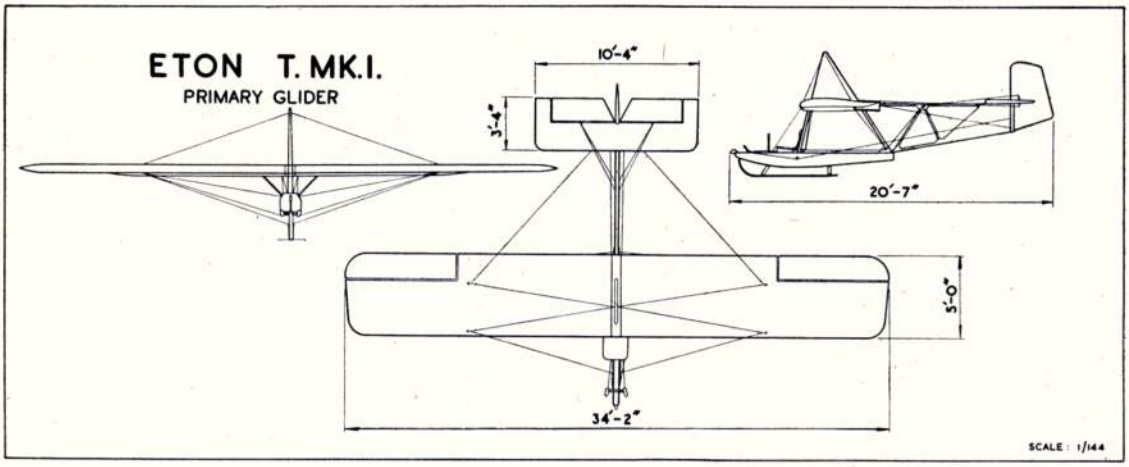
Manufactured by Elliotts of Newbury, the Eton primary glider is in service with Cadet forces at public schools and A.T.C. units. Lately it has been used in conjunction with an unique stand which supports the machine clear of the ground and enables the pupil to be trained in co-ordination of controls without leaving the ground. The Eton is balanced on a ball joint below the C.G. and is free to swing in any direction or bank at a considerable angle to the right or left. The elevators can be used in the normal way to put the machine in the position of a steep dive or climb, and the only motive power required is a natural wind force sufficient to give power to the control surfaces.

Data

Wing Area	179·5 sq. ft.
Tare Weight	265 lbs.
Load	225 lbs.
Wing Loading	2·73 lb. sq. ft.
Minimum Sinking Speed	4·25 ft./sec. at 30 m.p.h.
Maximum Diving Speed	80 m.p.h.
Best Gliding Angle	1 in 10 at 32·5 m.p.h.

Just airborne on a winch tow in the heading picture, is a Sedburgh Mk. 1. Light coloured bands are yellow, the rest of the glider is silver **(Air Ministry Photo.).** ***Left: Tandem seating in the Cadet Mk. 3. Below: A Cadet Mk. 2 single seater.***





Kirby Cadet Mks. 1 and 2

The Cadet Mk. 1 was the first light glider to be introduced into the R.A.F. and to date many thousands of pilots have learnt to fly in them. The Mk. 2, or Tutor as it is known in the civil clubs was introduced later and was intended for more advanced training. The Mks. 1 and 2 are identical except for wings.

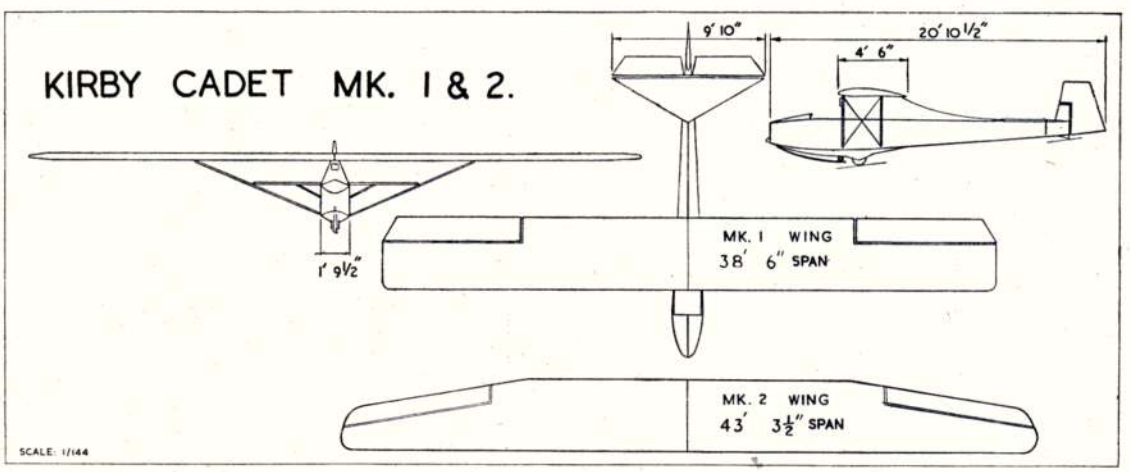
	Mk. 1	*Mk.* 1
Wing Area	170 sq. ft.	170 sq. ft.
Aspect Ratio	8·5 to 1	11 to 1
Tailplane and Elevator Area	24 sq. ft.	24 sq. ft.
Rudder and Fin Area	7·14 sq. ft.	7·14 sq. ft.
Tare Weight	297 lbs.	340 lbs.
Max. all up Weight	525 lbs.	565 lbs.
Airfoil Sections.		
Root	Gott 426	Gott 426
Tip	Gott 426 with reflex	Gott 426 with reflex
Root Incidence	2°	2°
Aerodynamic Twist	0°	0°
Aileron Differential Movement	1 to 1	3 to 2
Tailplane Incidence	0°	0°
Flying Instruments fitted as Standard	A.S.I.	A.S.I. Altimeter, Variometer
Minimum Sinking Speed	3·4 ft. /sec.	2·8 ft. /sec.
Best Gliding Angle	1 in 16	1 in 18
Gliding Angle at 45 m.p.h.	1 in 13	1 in 17

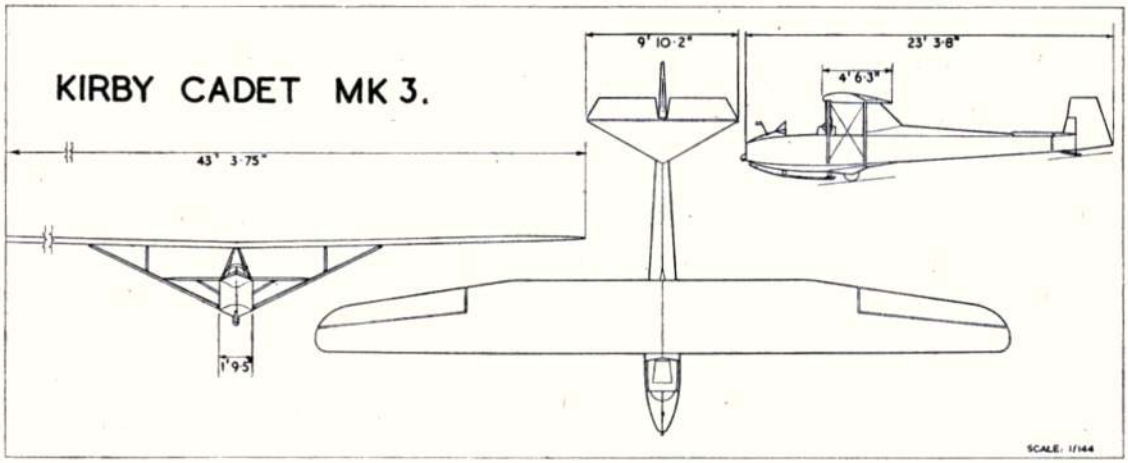
The Cadet Mk. 3

The Cadet Mk. 3 is the latest glider to be introduced into the R.A.F. It is used for initial training in gliding and has the advantage that it is very similar in its handling to the Cadet Mks. 1 and 2 which the pupils fly in the next stage of their training. Standard equipment in the machine includes front quick release for aerotowing, rear quick release for winch launching and Gosport tubes for communication between the two pilots. The Cadet Mk. 3 is the lowest price two seater in production anywhere in the world.

Data

Wing Area	170 sq. ft.
Aspect Ratio	11 to 1
Tailplane and Elevator Area	24 sq. ft.
Rudder and Fin Area	7·14 sq. ft.
Tare Weight	403 lbs.
Max. All up Weight	830 lbs.
Airfoil Sections.	
Root	Gottingen 426
Tip	Gottingen 426 with reflex
Root Incidence	2°
Tailplane Incidence	0°
Minimum Sinking Speed	3·4 ft. /sec.
Best Gliding Angle	1 in 18·5
Gliding Angle at 45 m.p.h.	1 in 18·5





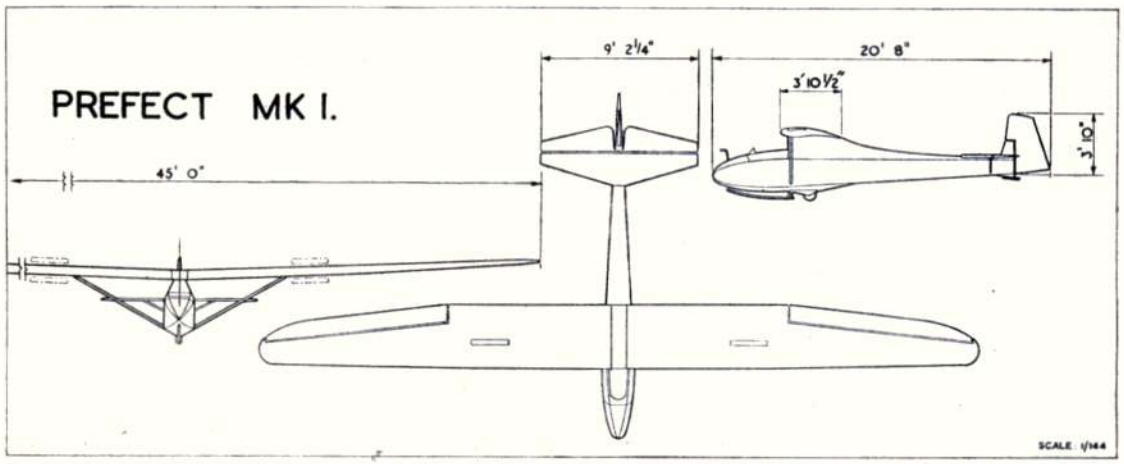
Prefect Mk. 1

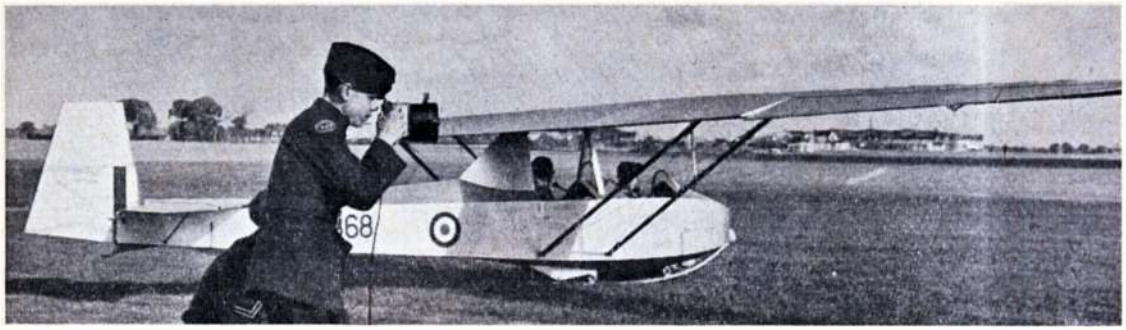
The Prefect is a single seater medium performance machine principally used by the R.A.F. for advanced training of instructors. The machine is very pleasant to fly and soars well in hill lift and thermals. Standard equipment includes front and rear quick release and dive brakes. The dive brakes, when open, limit the terminal velocity of the machine to less than the maximum permissible dive speed.

Data

Wing Area	154 sq. ft.
Aspect Ratio	13 to 1
Tailplane and Elevator Area	24·4 sq. ft.
Rudder and Fin Area	8·3 sq. ft.
Tare Weight	364 lbs.
Max. All up Weight	614 lbs.
Airfoil Sections.	
Root	Gottingen 535
Tip	Symmetrical
Root Incidence	2°
Aerodynamic Twist	7°
Aileron Differential	3 to 2
Tailplane Incidence	2°
Flying Instruments fitted as Standard	A.S.I., Altimeter, Variometer Electric Turn and Slip Indicator
Minimum Sinking Speed	2·6 ft./sec.
Best Gliding Angle	1 in 21
Gliding Angle at 45 m.p.h.	1 in 21

Left: A civilian Prefect. This was designed as a much improved replacement for the Grunau Baby and is well known as an advanced trainer for pilots up to Silver "C" standard. Many standard Cadet fittings are used for ease of maintenance. The open cockpit is standard; but an enclosed coupé cover can be fitted as shown here.





Almost a perfect advertisement photo for A.T.C. recruiting, this action view of cadets signalling winch instructions as the Cadet 3 begins to roll, might encourage some of our readers to join this interesting volunteer service. Two seater trainers are fast initiating many cadets into advanced gliding, and when conditions are favourable, are capable of soaring flight. **(Air Ministry Photo.)**

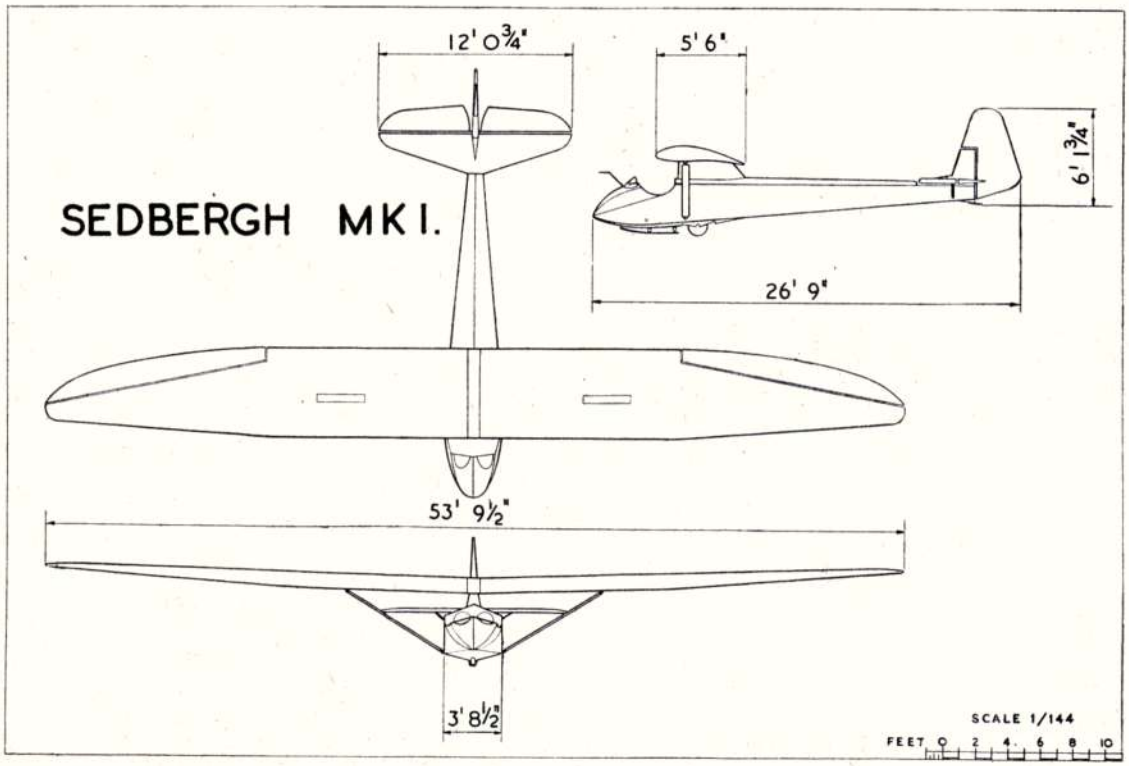
The Sedburgh Mk. 1

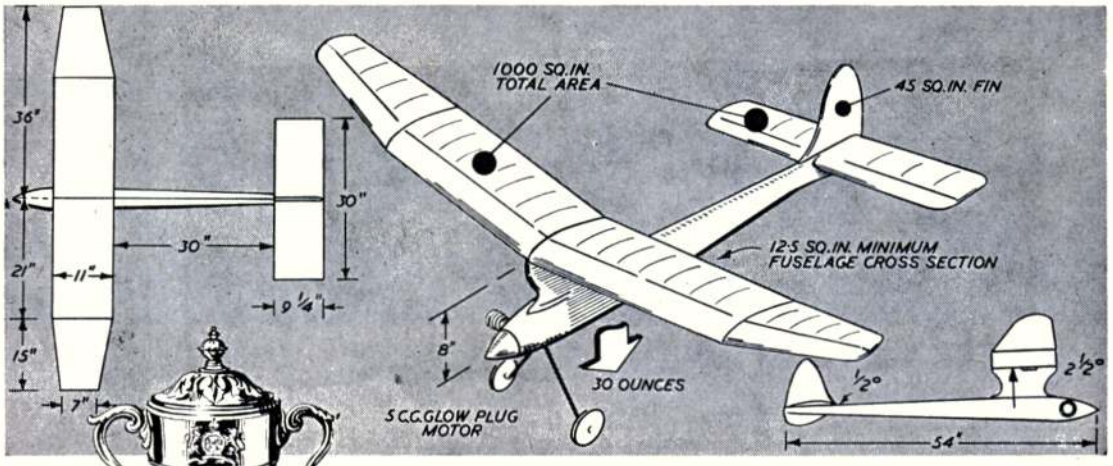
The Sedburgh was the first two seater training glider to be adopted by the R.A.F. It is used for elementary and advanced instruction of pilots and it is ideal for initial training in thermal flying, the side-by-side seating arrangement provides easy communication between the instructor and pupil.

In addition to the R.A.F. and the civil clubs in this country, the Sedburgh is used in many countries throughout the world including Sweden, Holland, Portugal, Pakistan and Egypt. It was recently referred to by one instructor as the " ugliest and most loved glider in the world ".

Data

Wing Area	260 sq. ft.
Aspect Ratio	11·2 to 1
Tailplane and Elevator Area	34 sq. ft.
Rudder and Fin Area	15·7 sq. ft.
Tare Weight	600 lbs.
Max. All up Weight	1,050 lbs.
Airfoil Sections	
Root	Gottingen 535
Tip	Symmetrical
Root Incidence	2°
Aerodynamic Twist	8°
Aileron Differential	3 to 2
Movement	
Tailplane Incidence	2°
Flying Instruments fitted as Standard	A.S.I., Altimeter, Variometer, Electric Turn and Slip Indicator
Minimum Sinking Speed	2·75 ft./sec.
Best Gliding Angle	1 in 21
Gliding Angle at 45 m.p.h.	1 in 20·5





QUEEN'S CUP 1952

Completely revised rules call for more thought on selection of power unit to suit the specification

THE QUEEN'S Cup competition, highlight of the Northern Gala Day, is now entering its fifth year, but more significant than this is the fact that the specification has been completely changed—from rubber to power duration. The new rules call for a power model of 1,000 sq. ins. total area, minimum weight 30 ounces and powered by any size of motor up to 5 c.c. The contest will be decided on a flight duration basis, with a maximum motor run of fifteen seconds permitted. There is one novel rule. A bonus of five per cent. of the flight time will be added *if the model lands within a specified area*. Thus with a five-minute maximum flight limit a possible maximum *score* is 15 mins. plus half of 15 = 22½ minutes.

Now it would appear that the success of this bonus scheme is going to depend very largely on weather conditions. It has been suggested that the award of a fifty per cent. bonus opens the way to radio control. But the fact remains that the contest is still essentially a *duration* one, motor run is limited to only fifteen seconds, and the complication of radio gear does not appear worthwhile investigating, at our present state of radio control development, at least. The best approach seems to be to design a power duration model to the best advantage within the rules and rely on intelligent use of the dethermaliser to bring the model down in the " bonus area " *if this is practical under the weather conditions prevailing at the time of the contest.* Suppose, for example, the drift is such that in four minutes a model reaches the " bonus area " downwind. It would then seem very worthwhile to dethermalise the model at, or just before, four minutes in an attempt to get that bonus score. If the drift is stronger, however, and the " bonus area " corresponds to about two minutes flight time, dethermalising to score two minutes flight time plus a possible extra fifty per cent.—total score three minutes—is less likely to lead to success than aiming for four or five-minute flights in the normal way.

Having thus assumed that a normal power duration model is best, what about the size and proportions of this model ? Unfortunately, the specification again appears to be an " individual " one. In other words, a contest which needs a special model. At the same time it is not a popular *size* of model although, on sheer performance, many modellers prefer larger craft.

The new Queen's Cup specification calls for a total area of 1,000 sq. ins. (plus or minus 25 sq. ins.) and a minimum total weight of 30 ounces. This corresponds to a wing loading slightly in excess of that required for an F.A.I. power model of the same total area (3 ounces per 100 sq. ins. total area as against the F.A.I. figure of 2·73 ounces per 100 sq. ins. in total area). However, this should not matter a great deal on a model of this size. What is more significant is the relationship between total area and motor size.

Working *down* to minimum F.A.I. values produces an extremely good power duration specification. Most modellers then take the view that performance can be improved, for " open " contests, by still further reducing the wing loading. With the Queen's Cup model we cannot do this, and have to tolerate a higher loading than F.A.I.

The F.A.I. rules also call for a certain minimum weight (7·06 ounces) per c.c. of motor capacity. For F.A.I. power contests it usually pays to work down to this limit. The other fellow is going to do so, so why put yourself at a possible dis-

advantage ? The corresponding motor " size " for the Queen's Cup thirty-ounce minimum is, however, 4·25 c.c. approximately — an " in-between " size which is not covered by commercial motors. (*Note*—F.A.I. power rules apply to motors up to 2·5 c.c., the maximum size permitted for International Competition work. The same conditions are applicable, however, to larger motors). The main problem thus seems to be whether to use the next smallest or the larger commercial size—3·5 c.c. or 5 c.c.

The minimum " F.A.I." size for a 3·5 c.c. motor would be 910 sq. ins. total area, but the corresponding " F.A.I." minimum weight of such a model is only 24·8 ounces. The " F.A.I." size of a 5 c.c. model is 1,300 sq. ins. total area, and corresponding total weight 35·3 ounces.

The problem becomes simpler if we are prepared to regard the model as solely for the Queen's Cup competition. But since this only amounts to one contest a year it would seem more reasonable to produce a Queen's Cup model which could also be flown in F.A.I. power contests. Unfortunately it must remain ineligible for *International* F.A.I. work, where motor capacity is limited to a maximum of 2·5 c.c. At the same time a 2·5 c.c. motor in a Queen's Cup model seems out of the question, for the corresponding F.A.I. size and weight is 650 sq. ins. total area and 17·7 ounces respectively.

On the face of it, the 3·5 c.c. " F.A.I. " type model is nearest the Queen's Cup specification, but would have to be modified for F.A.I. contest work. It would have too much total area (calling for different wings or tail, or both), and be carrying 5·2 ounces weight more than it need do (which could be in the form of removable ballast, and might be an opportunity to couple P.A.A. load purpose in the same model).

Looking at the specification from the point of view of sheer performance, however, the larger (5 c.c.) motor would appear more attractive. Again, however, the model would be ineligible for F.A.I. contests, having too little area and too small a total weight, although its wing loading would actually be higher than F.A.I.

To make a proper job of the Queen's Cup model, therefore, we have got to depart from the now accepted practical F.A.I. specification, and evolve something special.

A 3·5 c.c. motor is ample power for a model with a total area of 1,000 sq. ins. and at 30 ounces total weight the wing loading is far from excessive.

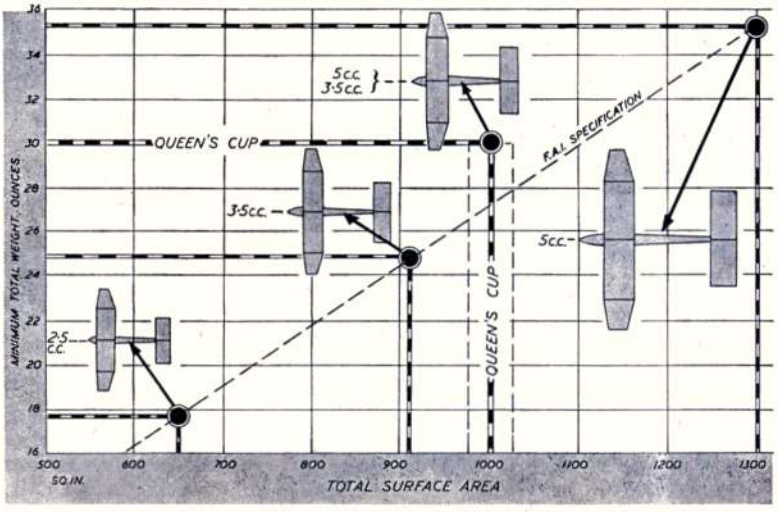
A 5 c.c. motor, for a model of the same total weight, will produce a model which should have a markedly superior climb, whilst still retaining the same glide characteristics. The well-known American Comet " Sailplane ", with a total area of 1,150 sq. ins. was originally designed for 10 c.c. long-stroke motors. Even with the Super Cyclone, one of the most powerful motors in this class, it was still underpowered to the point of having a very " gentle " climb. More startling results, and higher times, have been achieved with racing motors up to and including the McCoy 60, Dooling and Hornet ! And this an only 125 sq. ins. over the Queen's Cup limit !

What is the final choice ? It seems that the 1,000 sq. ins. (total area) model could have a satisfactory performance with a *good* 3·5 c.c. motor and probably be relatively docile to handle. In view of the limited motor run, however, the advantage lies with the 5 c.c. model, kept to the minimum 30 ozs. weight specified.

We understand that one of the first considerations borne in mind by the committee for the new rules, was that the specification should cover a size of power model hitherto untouched by kit manufacturers. This certainly does promote the need for new designs ; but might also limit the entry to those with the confidence to produce a self-designed model.

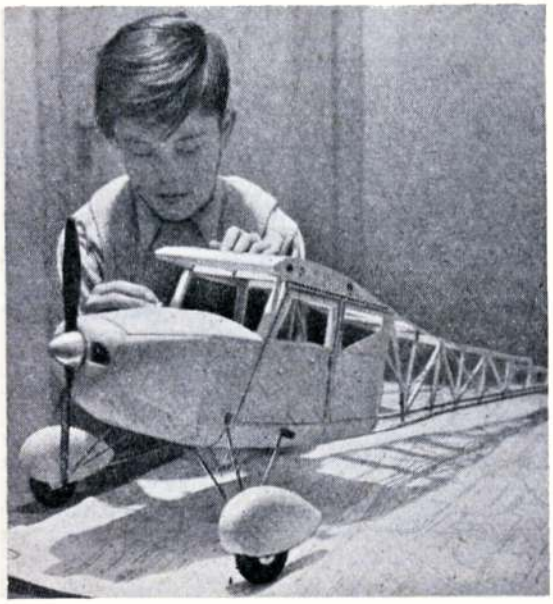
However, there are two excellent duration designs in the A.P.S. range, either of which could be built to take a 5 c.c. motor and come out at the correct weight. The 78-in. Swiss shoulder-wing F.19 by F. Strub, of Basle, is a high thrust-line contest model of International repute having a convenient gross area of 999 sq. ins. or 985 sq. ins. projected.

The other design is A. Anastasiou's Overlander, a 1,013 sq. in. diamond fuselage pylon job with elliptical wing-tips and pleasing lines. Both plans are priced at 7/6 each, post free from *Aeromodeller Plans Service*. Note : New address !



AIRFRAME CONSTRUCTION

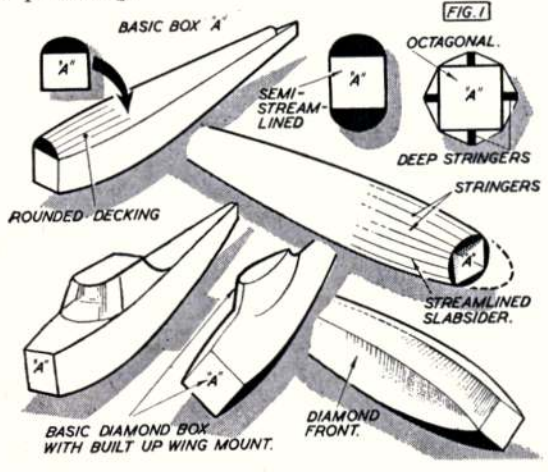
PART III ADVANCED FUSELAGES



14½ years old Alan Smallwood of the N. West Middlesex M.A.C. is encouraged by an aeromodelling father and finds no difficulty in tackling as large a model as the Mercury Monocoupe 60. The Monocoupe is his second power model, the first being a Mallard.

ONCE having mastered the art of simple box fuselage construction there are a number of variations which the more ambitious modeller may care to attempt. First, however, let us get a proper perspective on this. The ordinary box fuselage is quite suitable for straightforward gliders and power models of all sizes—whether for contest work or flying for fun. A simple box fuselage need not necessarily be ugly. Quite attractive lines can be incorporated with a rectangular cross section or the box itself can be used as a basis for further construction, such as the addition of a rounded top decking.

FIG. 1



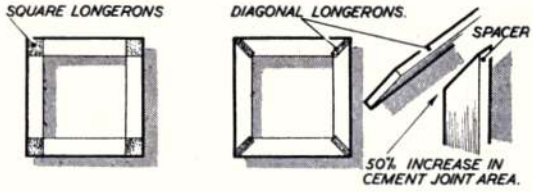
Variations on the simple box fuselage are numerous. Rather than attempt to describe some of the more outstanding examples we have included a representative selection in Fig. 1. Such methods are popular with semi-scale and sports models. For competition work, elaboration is to be avoided as this usually adds weight—an undesirable feature.

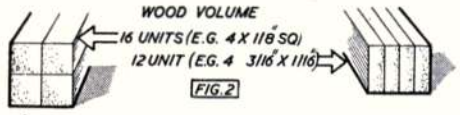
Weight is most critical on a Wakefield type of model where, to get a four ounce motor weight (which is now considered essential for contest work), quite a large airframe has to be built down to four ounces or less, including the propeller assembly, if the model is not to exceed the desirable $8\frac{1}{2}$ ounces minimum specified by the rules. As a general rule, therefore, Wakefield fuselages have been kept relatively simple both in outline and construction with streamlined or rounded sections in the absolute minority. To make any given length of fuselage down to a minimum weight means an almost automatic selection of a simple rectangular or square cross-section. Most other lightweight models—rubber powered or glider—it will be noticed, also follow this trend.

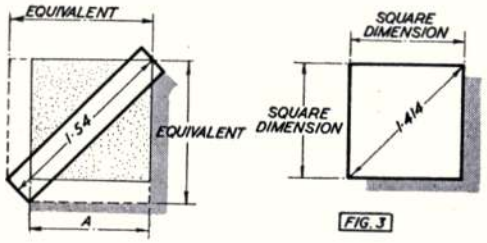
It has been argued in favour of the streamliner that a circular or elliptical section fuselage can be produced with *less volume* of wood than a corresponding box or slabsided fuselage. In practice, it is not possible to build a multi-stringered streamlined fuselage down to the same weight as that of a simple box of the same length and cross section. To do so would mean sacrificing *local* strength on the streamlined fuselage which would therefore be a weaker structure.

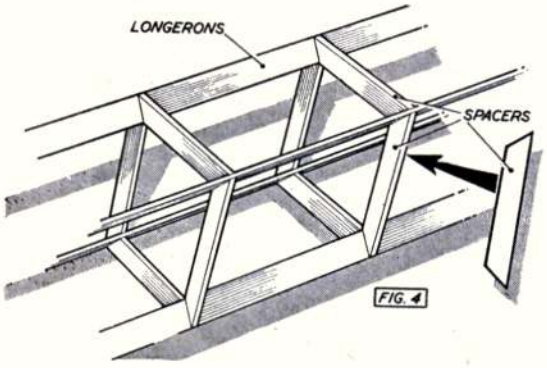
Quite a lot of development has taken place with the simple slabsided Wakefield fuselage during the past two years which has resulted in *improved* strength for *less* overall weight, making it even more attractive for competition work. The price paid for this has been increased complication in building. The method, which is now becoming more widely adopted, is the use of diagonal longerons.

Fig. 2 compares the cross section of a normal slabsided fuselage with square section longerons with one using diagonal longerons. Typical Wakefield wood sizes would be $\frac{1}{8}$ square or $\frac{5}{32}$ square in the first example, whilst the diagonal longerons would be $\frac{3}{16} \times \frac{1}{16}$ in. Bearing in mind the fact that the longerons are the hardest, and therefore the heaviest members of a slabsided fuselage, the saving in material volume, and therefore overall weight, is quite considerable with diagonal longeron construction. Using $\frac{3}{16} \times \frac{1}{16}$ diagonal longerons,









for example, instead of $\frac{1}{8}$ sq. longerons represents a saving equivalent to one complete length of $\frac{1}{8}$ square. Using $\frac{1}{8} \times \frac{1}{16}$ diagonal longerons, as some builders have, represents a fifty per cent. saving (two complete $\frac{1}{8}$ square longerons).

Nor is this the complete picture, for diagonal longeron construction is invariably used with $\frac{1}{8} \times \frac{1}{16}$ spacers. The same size spacers could, of course, be used with $\frac{1}{8}$ square longerons, but the joints would not be so satisfactory for " diagonal " construction gives a glue joint surface roughly fifty per cent. greater.

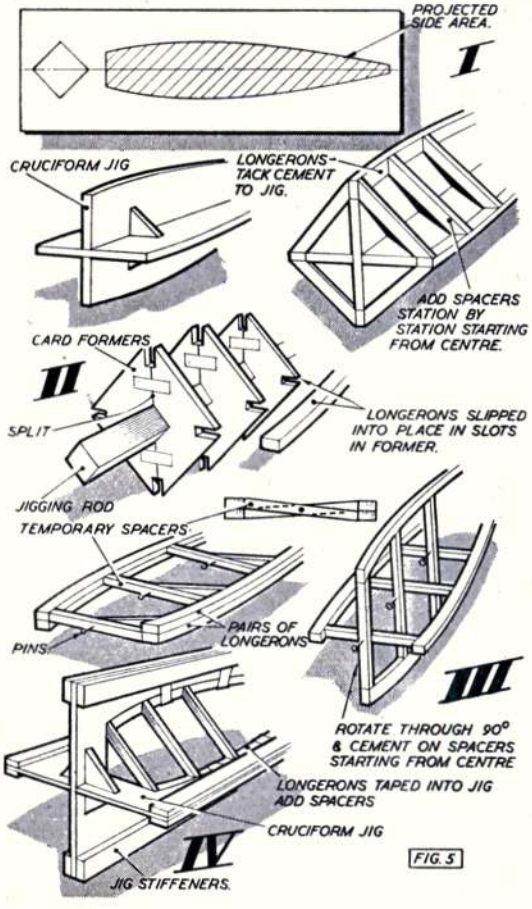
The strength of a fuselage with diagonal longerons is generally superior to that of orthodox slabsided fuselage constructions with square section longerons, partly because there is more depth of longeron, either direct or projected, in any direction in which stress is applied—Fig. 3. This applies when comparing $\frac{3}{16} \times \frac{1}{16}$ and $\frac{1}{8}$ square longerons.

A part section of a fuselage with diagonal longerons is shown in Fig. 4 and, at first glance, would appear to present something of a problem to build. Obviously building two sides flat on a board and then joining in the usual way is impracticable and so the diagonal longeron fuselage immediately becomes a more complicated project. It is, perhaps, not knowing how best to tackle the construction which has prevented more people from adopting this weight-saving method.

Four 'Diagonal' Methods

We have investigated the methods used by those builders who have gone over to diagonal longeron construction and the four which seem to offer the best methods of approach are detailed in Fig. 5. This is the first time, in fact, that methods detailing " diagonal " construction have appeared in print.

The first, and probably the most widely used method is that originated by **Evans**. This takes the form of an internal jig cut from soft $\frac{1}{16}$ sheet balsa. It is suitable only for square section fuselages, *e.g.* " diamond " types, and the two parts of the jig are cut to the exact shape of the *inside* line of the longerons in projected side elevation. The jig pieces are fastened together at right angles and the four longeron lengths tack-cemented to the jig. Spacers are then cut and cemented in place, each of the four spacers at any one station being of identical length and all spacers having the ends



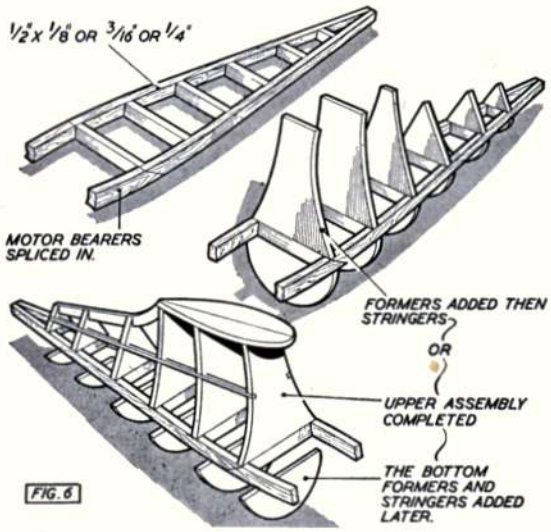


FIG. 6

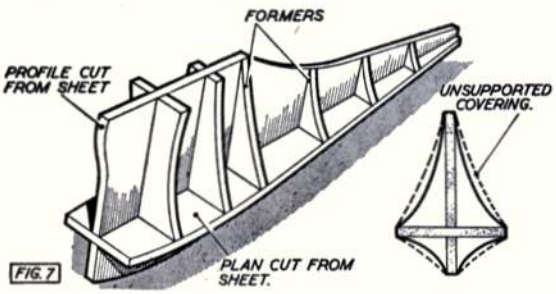


FIG. 7

chamfered off at 45 degrees. When all the spacers have been added and the cement has set, the light balsa jig is broken up and removed, leaving just the complete fuselage frame.

The second method was used by **Warring** in duplicating his Zombie fuselage with diagonal longerons. Cross section is rectangular and so a form of construction similar to that normally employed for streamlined fuselages was used. False card formers were plotted for every other spacer station and mounted on a central jigging rod. Each card former was split along a diagonal and then re-joined with strips of cellulose tape, back and front. The corners of each former were also slotted to take and hold the longerons in their true diagonal position.

With all the formers on the jigging rod the four longerons were slipped in place in the corner slots, then the spacers cut to length and cemented in. When complete, the card formers were again split by peeling off the cellulose tape, the halves shaken out of the frame and the bare jigging rod removed. The front false former, incidentally, was permanently mounted on the jigging rod at the required angle of down- and side-thrust so that the nose former cemented onto the finished frame at the correct setting. This method, in all those we have heard of, is still the most satisfactory for building a *rectangular* section fuselage with diagonal longerons. All the other methods are suitable only for true *square* sections.

The third method shown was developed by **Gorham** and members of the Ipswich club. Here two false " sides " are laid out directly over a plan —actually a projection of the full side area—and joined with temporary $\frac{1}{16}$ square spacers. These spacers run from the bottom longeron on one side to the top longeron on the other side, and vice-versa, at every station chosen. These stations are spaced at four or five inch intervals, depending on the length of the fuselage and the curve to be accommodated.

When these temporary spacers have set they are pinned together pair by pair, along the exact centre line where they cross. The two " side " frames can then be rotated apart. In this position the spacers proper can be cut and cemented in place, each set of spacers being of identical length, squaring up the fuselage at each point. This method works, and can, indeed, produce very accurate results, but is far more liable to error than the others described.

The fourth method is again by **Warring,** this time for square section (diamond) fuselage and employing an external jig. This jig is shaped to the outline of the outside of a full projected side elevation and the respective formers are held in position by cellulose tape. Spacer stations are marked on the jig and it is a relatively simple matter to cut and cement these in place. To remove the finished fuselage, one quarter section only of the jig need be removed, the longerons untaped and the whole fuselage lifted out. The jig can then be re-assembled ready for the construction of a second fuselage.

The jig itself is the major item of construction. Originally it is cut from four sheets of $\frac{1}{16}$ in. balsa (*i.e.* the same as the longeron width). One half of the projected side elevation is plotted on one sheet and cut out. This part then forms a template for cutting the remaining three pieces to identical shape. All four pieces are assembled, cruciform fashion, with suitable stiffening strips running along the edges of the jig, and bracing the mid sections to provide rigidity.

Pylon Fuselages

For power models, at one time for streamlined gliders, crutch construction offers many advantages over orthodox " box " frames. It is, in fact, particularly adapted to streamlined and semi-streamlined fuselages where no end-to-end internal clearance is needed. It is strong, relatively simple, makes for accuracy and not unduly heavy. Yet strangely enough it has again fallen into disuse, mainly because of a trend away from semi-streamlined fuselages, even in power models.

As diagram **6** shows, the crutch is the main strength member of the fuselage. It must be made of fairly hard strip of generous section—deep and narrow, rather than square. A common error is to use strip which is both too hard and too heavy, which results in an overweight structure. With

proper crutch sizes, wood stock about equivalent to that you would choose for the longerons of a box fuselage of similar length is erring slightly on the heavy side, if anything.

The crutch is simply built directly over a plan of the fuselage. On power models the hardwood motor bearers can be splice jointed to the crutch members and left to protrude from the front. When the crutch is set it is removed and full formers, cut from sheet, added. The addition of stringers then complete the basic fuselage. Alternatively, the formers can be cut in two parts—top and bottom. The crutch can be left pinned down, all the top formers cemented in place, stringers added and the whole framework of the upper half of the fuselage completed. This assembly will remain rigid when the crutch is finally unpinned, turned over and the bottom fuselage and stringers added. The second method is, in fact, a very accurate one to adopt for building.

Crutch construction has been largely superseded for contest type power model fuselages by sheet cruciform construction on the larger models, or a reversion to the pure pylon type of layout instead of the faired-in pylon.

Cruciform construction is interesting, if only because it is so simple. It is strong enough for all models. The first " popular " use of this building method was in Leon Shulman's " Banshee " where almost the entire fuselage covering was unsupported, except at the edges—Fig. 7. Making such a fuselage entails little more than cutting a side elevation profile, and plan view from suitable sheet and then cementing together, cruciform fashion. In practice, the side elevation sheet is split, so that the top can be erected with the plan shape pinned down on a flat surface to preserve accuracy. A limited number of formers and the nose and pylon section built up, completes the basic assembly.

Cruciform construction of this type has been adopted, and improved, by Gorham. His method gives greater rigidity to the sheet sections by capping the edges with strip—Fig. 8. This diagram of a typical Gorham power model fuselage design does, in fact, summarise tried and proven practice with this type of construction.

For the pure pylon model, of almost any size, a form of construction which is half way between " crutch " and a simple triangular box is widely employed. This method originated in the United States some years ago, was used on a limited scale on both sides of the Atlantic and now seems to have gained a new lease of life.

As Fig. 9 shows, the bottom of the fuselage is laid out flat on the plan. This becomes virtually a crutch member for the rest of the fuselage frame is now added to this elementary frame. Formers are cemented in place to give the required section—usually square or rectangular at the front, tapering off to triangular at the rear—and the pylon structure built in. On larger models, the sides, including the pylon are then covered with sheet before removing from the plan. The bottom is then sheet covered to complete the fuselage.

There are so many other types of power model fuselages which have appeared from time to time that it is impossible to mention them all. Those we have dealt with are representative of popular practice. Some others, perhaps equally good, are not so widely known. Many are simply variations around one or other basic scheme. Study the various plans of outstanding models which have appeared and try to assess the merits of the various forms of construction used.

Simple box construction does not really suit power duration design other than the simple pylon types since, for example, a faired-in or semi-cabin pylon layout is bulky if a purely rectangular section is maintained throughout. Power duration fuselages are generally narrow and quite deep (from wing mount to the bottom of the fuselage) and ordinary " box " construction becomes less economic and less attractive the farther the cross section departs from a truly square section. The " best " type of slabsided fuselage, in fact, from the weight and strength point of view is the diamond type—even if used " flat " so that it becomes a normal square section.

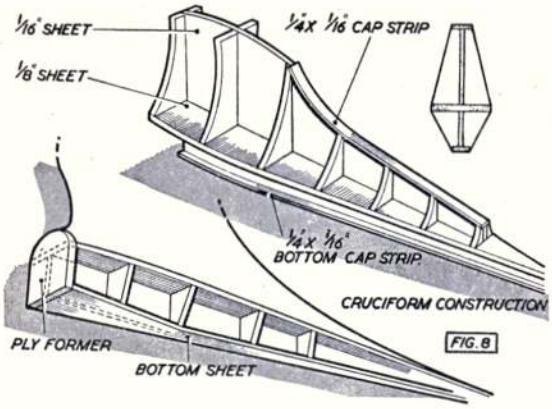


FIG. 8

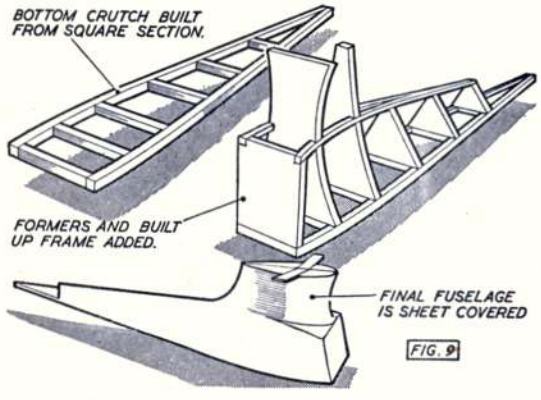
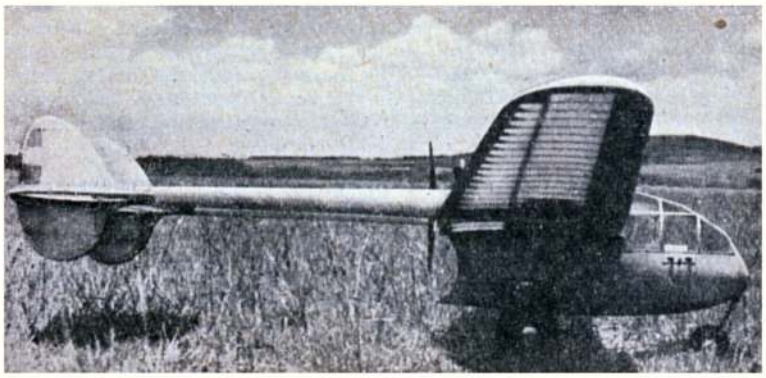


FIG. 9

SOUTH AFRICAN ENTERPRISE



Looking almost as though it might be a scale test model for a full-size project, this very original model from Johannesburg bears many features both in outline and construction that would not disgrace a modern light plane.

IT is not often that we receive enough data on one single model of outstanding interest for us to be able to make a feature such as this. Last year we received from South Africa this absorbing description of a pod and twin boom radio controlled project by a Johannesburg enthusiast. The photographs reveal its pleasing semi-scale lines and involved construction which can only be the result of many hours of patient designing and building.

Over to Mr. Barenbrug for his description: "The model has made a number of free flights, all of which were very realistic R.O.G.'s, but although the radio receiver has worked very well on a show, at short range, I have been unable to obtain satisfactory results at a distance exceeding 200 yds. I would have preferred to send you these photographs after successful radio-controlled flights. However, a number of photos of this model were taken at the last S.A. Nationals, and in view of this I am sending you my own photos, together with technical details."

Technical Data. Design: Original. Span: 7 ft. 8 ins. Overall Length: 4 ft. 6 ins. Wing Area: 7 sq. ft. Wing Section Gottingen 630 (with slots). Stabilizer (symmetrical): 27 per cent. wing area. Fin Area approximately 7 per cent. wing area. Engine: O. & R. 60, 10 c.c. Propeller: 16 in. diameter × 6¾ in. pitch; left hand and hand cut. Revolutions: 4,700 r.p.m.

Weights. Airframe, 86 oz.; Engine and Equipment, 18 oz.; Radio and Equipment, 47 oz.; Total, 151 oz. Wing Loading: 22 oz./sq. ft. Power Loading: 15 oz./c.c.

DESCRIPTION

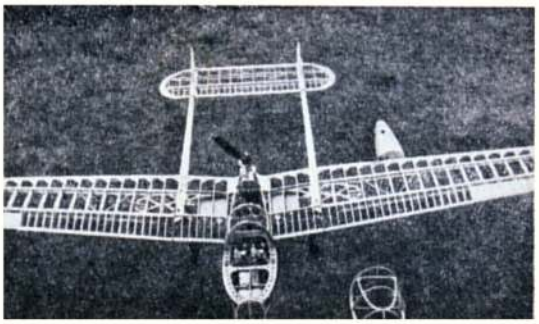
General Structure. Fuselage frames—4 m.m. plywood. Wing tongues—plywood. Remainder—balsa. Booms hollowed balsa. Wingspars built up out of four square chord members and single lacings, front spar 5/32 in. square, rear spar 3/32 in. square.

Covering. Fuselage—3 layers of 1/32 in. balsa crosswise and silk covering. Wings—1/32 in. sheet balsa, leading edge, the whole silk covered.

Radio. 2 "R.C.H." receivers, each having one Hivac XFG1 valve circuit as per AEROMODELLER, May, 1950, Page 300. Electric servo motor for rudder, self-centralising and limit switches.

Operation. Right Receiver—right rudder. Left Receiver—left rudder. Both Receivers—change of engine speed (double timer).

Testing. Hand launching of the plane with this wing loading being impractical, the plane was launched in a glider fashion by means of winch and nylon string, but "R.O.G." After successful glides, power take-offs were carried out, and after runs of approximately 50 yds. the plane lifts, at first very slowly, after which the climb gradually increases to a satisfactory degree, estimated airspeed being 19 to 25 miles per hour."



Full size plans are overleaf for this baby scale model.

Arrested by 1/500th shutter speed, the climbing attitude of the Pacer on acceptance tests would hardly seem to warrant Ron Moulton's concerned expression, for this prototype easily managed repeated flights of over 150 ft. with around 20 seconds duration.

THE "Piper Pacer" is the twentieth design to come from the famous Piper company. Derived from the "Vagabond" it is the modern version of the old " Family Cruiser ". It is smaller than the latter but still seats four passengers in about the same space as a Renault baby car.

The model is exact scale in outline and sections, except for the airscrew and tail. It is, however, essentially meant as a flying model, not for the super-detail fiends and an alternative tailplane is shown. With this it is quite a nice little flyer. It is interesting to note that the *scale* down thrust proved just right on the model.

The fuselage sides should be built first on the shaded details, ignoring the rest. When removed, add formers F6, F7 and F8 followed by the window-sill longeron accurately cut to length. Then bend the two sides at F8 to conform to the plan view and assemble with the spacers shown. Now add F2, F3, F4, F5, W1a (which overlaps on outside of top longerons), W1 and F9. The (authentic) stringers can now be put on and the front up to F3, F6 and F5 covered with 1/32 in. sheet. Make the ¼ in. sheet sides of the engine cowling accurately and add oversize top and bottom pieces. Square up the front ends with a sandpaper block, cement to F2 and add F1. Make the nose-block with plug and push into place before carving the whole of the front to shape in accordance with F1, F2 and the side and top views on the plan.

The remainder of the model is straightforward, but care should be taken to get the undercarriage assembly true. Complete the model and cover it, leaving the attachment of the wing struts until last. Push the fuselage strut anchoring loops into place and cement. Then prop up the fuselage into a horizontal position, plug in the wings and prop them up to the correct dihedral angle—2 ins. from the " ground " at the tip with the fuselage belly resting on the ground. Prepare the two Vee struts by adding the hinges and when dry, cement them as shown to the wing and to the fuselage forward of and hard up against the loops. Now add the small pin in the end of the strut by pushing it through in such a position that it comes out against the inside edge of the loop, and cement it. When this is dry cut through the strut-to-fuselage joint. These wings are quite rigid yet will knock off easily in the event of accidents while the fitting is almost invisible.

Any colour scheme " to customer's choice " is possible on this type of subject. The rule here is to go easy on coloured dope and be content with coloured paper. On the original an inferior quality tissue was used because it was reasonably opaque and preserved scale appearance. The wood parts were as far as possible also covered with paper, coloured dope being used on noseblock, wheels and wheel spats. Black paper registration letters were used also to save weight. The registration is fictitious but for those who are sticklers for authenticity, one de luxe Pacer has the U.S. number N 7100 K. This should be in ⅛ in. high letters, 1 in. up on either side of the rudder, and in 1 in. letters on the top of the starboard wing reading outwards and on the bottom of the port wing reading inwards. Finish by adding Indian ink lines to represent flaps, ailerons, elevators, rudder and doors.

With the large tailplane, the model should be ballasted to put the c.g. at 50 per cent. of the chord, with the scale tail at 30 per cent. chord. The original needed no ballast and was built with average wood. The model should not exceed three-quarters of an ounce with rubber, if it is light, use a 15 in. loop of ⅛ in. flat rubber, if not, use 8 in. only.

Check the glide and ballast to get it as flat as possible. When this is satisfactory, trim for power flight in the usual way. The plan shows the model as flying trim but you may need a little left side-thrust. It will be safer to have a straight glide but if you wish the fin can be offset easily.

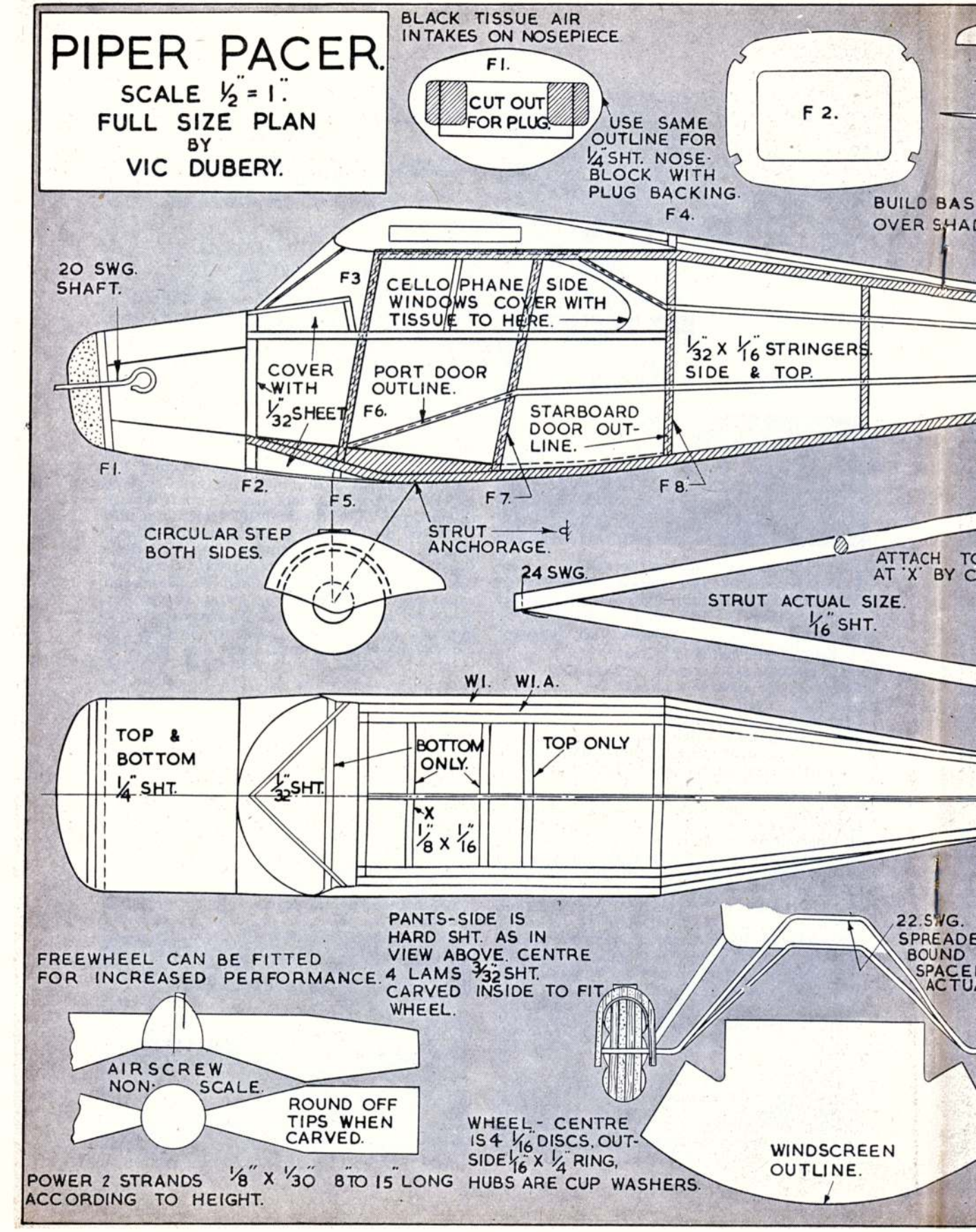
PIPER PACER.

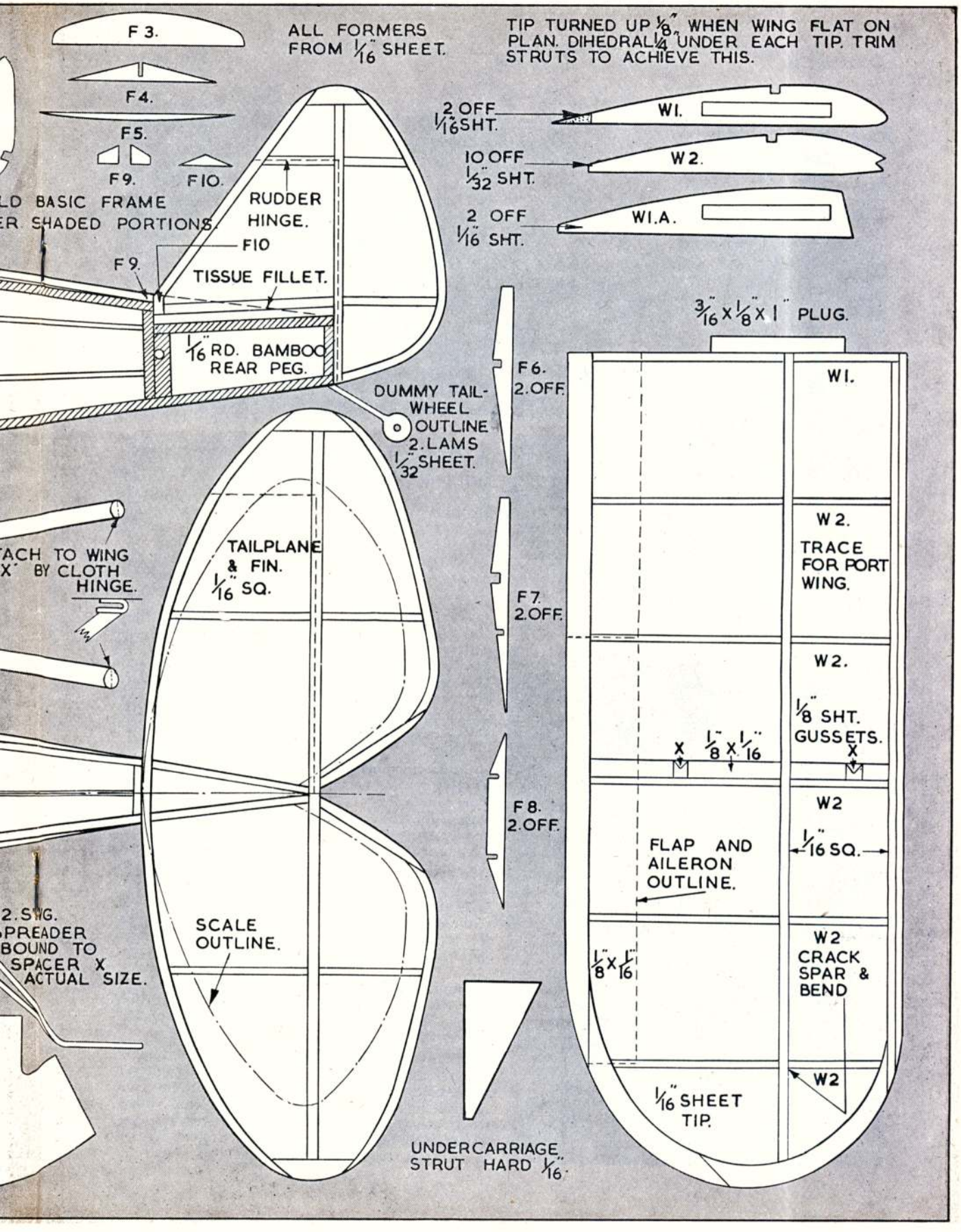
SCALE ½" = 1".

FULL SIZE PLAN

BY

VIC DUBERY.




F 3.
F4.
F5.
F9.
F10.
ALL FORMERS FROM 1/16" SHEET.
TIP TURNED UP 1/8" WHEN WING FLAT ON PLAN. DIHEDRAL 1/4" UNDER EACH TIP. TRIM STRUTS TO ACHIEVE THIS.
2 OFF 1/16" SHT.
W1.
10 OFF 1/32" SHT.
W2.
2 OFF 1/16" SHT.
W1.A.
LD BASIC FRAME
ER SHADED PORTIONS.
RUDDER HINGE.
F10
F9.
TISSUE FILLET.
1/16" RD. BAMBOO REAR PEG.
DUMMY TAIL-WHEEL OUTLINE 2. LAMS 1/32" SHEET.
F6. 2.OFF.
3/16" X 1/8" X 1" PLUG.
W1.
W2.
TRACE FOR PORT WING.
F7. 2.OFF.
W2.
1/8" SHT. GUSSETS.
1" 1/8 X 1/16"
X
F8. 2.OFF.
W2
1/16" SQ.
FLAP AND AILERON OUTLINE.
W2 CRACK SPAR & BEND
1/8" X 1/16"
W2
1/16" SHEET TIP.
ACH TO WING
X" BY CLOTH
HINGE.
TAILPLANE & FIN. 1/16" SQ.
2. S.W.G.
PREADER
BOUND TO
SPACER X
ACTUAL SIZE.
SCALE OUTLINE.
UNDERCARRIAGE STRUT HARD 1/16".

A WELL-BUILT example of the 54-inch A.P.S. Chrislea Super-Ace is our choice of the month, and it comes from Elyria in Ohio, U.S.A. Harold Copas made the model, and chose a reputable British diesel in the Mills ·75 to provide the right amount of power. Lightweight coloured covering has kept the weight to a minimum without detracting from its pert scale appearance, and at the same time, reveals Mr. Copas's neat construction.

Micky King, of Leigh-on-Sea, sends a very interesting photograph (No. 1) and reports that the model is a 74-inch Nordic sailplane named Patriot. The person holding the model is Pat Healy (hence the Pat-riot !) and we understand that her own version of this large span Nordic is superior in performance to designer King's ! Technical data, on the model of course, is that the tail is but 22 per cent., and the wing section Benedek G 8356b.

Junior member of the West Middlesex M.F.C., D. Ridley, is seen in Number 2 with his rubber-powered A.P.S. A.B.C. Robin. Finished black and yellow and weighing 4 ozs. complete, this same model gained a " Commended " at the last Model Engineer Exhibition. As well as being a good looking model, it is also a consistently good performer, the best flight to date being 69 seconds.

From the same Club comes the team racer in Number 3, built by B. L. J. Neal from American plans. It is " Shadrach ", all green, with gold lettering, and boasting a dural sheet undercarriage. An E.D. 3·46 diesel gives an airspeed approaching 65 m.p.h. and about 55 laps per tank. Amateur detectives may care to note that the registration letters are in fact the telephone number of Mr. Neal's friend overseas.

If any kind of aeroplane may be termed a power assisted glider, then J. G. Waldron's " Hercules " seen about to take a radio controlled flight in picture 4 certainly comes within that category. With clubmate W. Aston assisting (Henley Model Club), the Hercules project became a reality in 1950. Power is a Mills 1·3, and wing

3

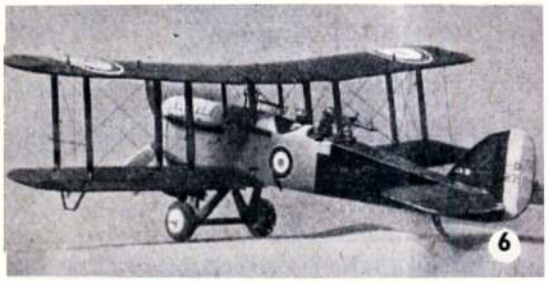

4

area no less than 9 sq. ft. for the 4½ lbs. weight. The engine is mounted above the wing on a small pylon, and the Mercury radio equipment is thus reasonably free of vibration in its fuselage position. Unfortunately, this interesting experiment saw fit to make an unwelcome acquaintanceship with a solidly constructed house, so all reference should really be made in the past tense.

Seventeen-years-old G. V. R. Davico from Godalming admits he is one of the " Spit and Polish " brigade when it comes to finishing a model, but he also makes sure that the final product is a *flying* job. His Wyvern, photo 5, was made from a standard Veron kit. Wings are covered with 1/16th sheet, and the fuselage is entirely planked. Power is an Amco 3·5.


5

Another scale enthusiast who puts a great deal of effort into the finish and small detail of his models is Capt. Cesare Milani of S. Kensington. His De.H. IV to one-inch scale is shown in photo 6, and it very closely rivals our choice of the month for clever workmanship. Note the pilot, and the observer ready for action in the rear cockpit with dummy Lewis gun. The undercarriage is sprung, and elevators on this control line model work by using the scale horn and double elevator wires—just like the real thing. Flying is limited to general sport manœuvres, but is perfectly stable and responsive. A Frog 500 drives the four-blader.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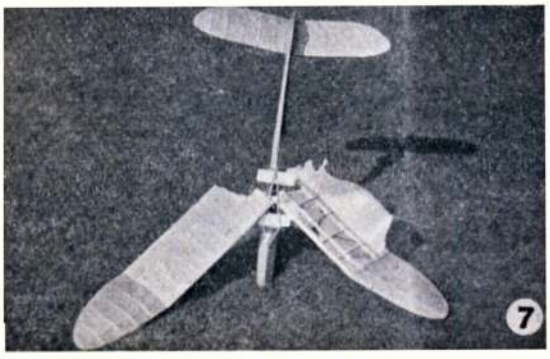
And to close our collection for this issue, we present in No. 7 a view that will strike a chord with all modellers, and possibly draw many a sympathetic wince. At the risk of leading a bad influence by showing you how a model should *not* come to earth, we publish this unposed prang of G. H. Barton's Fugitive as an action shot with a difference and also as an excellent example of what can be done with the simple Kodak Brownie. Lest readers should think that this is a typical landing attitude of the popular Fugitive design, we hasten to add that this is indeed a most unusual conclusion to a flight, and one which must surely have been effected with considerable force !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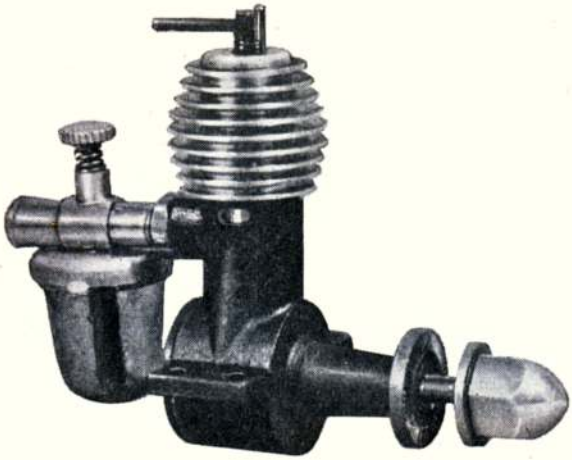


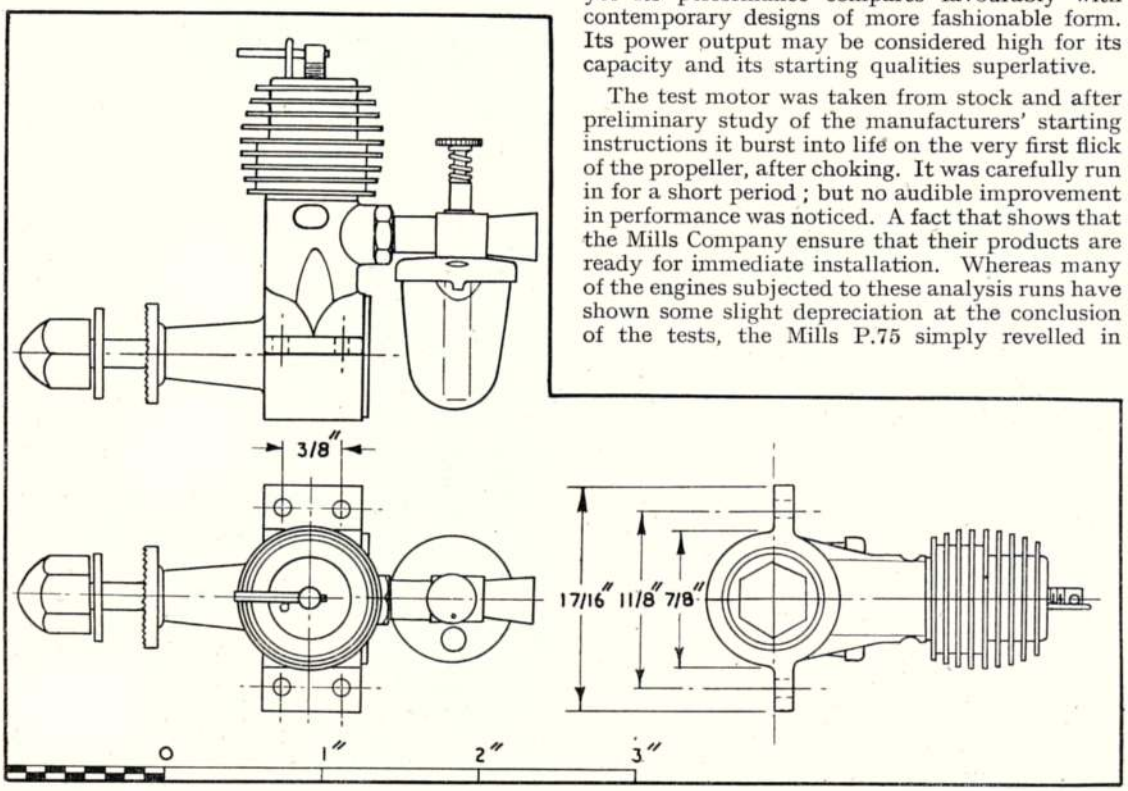
The Mills P.75

FEW miniature engines can match the enviable reputation attributed to the Mills marque for easy starting, reliability and long wearing qualities. To conduct a test on one of these well behaved diesels is indeed a pleasure and when the results are above expectations, as with this P.75, the pleasure is even doubled.

Already proven in its thousands, the Mills ·75 c.c. enjoys popularity in parts as far as Los Angeles in California and Auckland, New Zealand. Production of this motor continues at a fast pace in an endeavour to keep up with the world wide demand and this in itself is a tribute to the sound design, which is by no means new.

The current engine design trend is to adopt an almost " square " proportion of bore and stroke, and utilize rotary valve induction. The P.75 is of the old school of long-stroke and side-port engines, yet its performance compares favourably with contemporary designs of more fashionable form. Its power output may be considered high for its capacity and its starting qualities superlative.

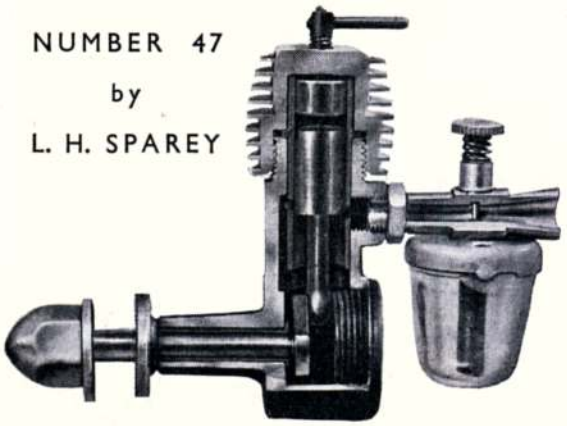
The test motor was taken from stock and after preliminary study of the manufacturers' starting instructions it burst into life on the very first flick of the propeller, after choking. It was carefully run in for a short period ; but no audible improvement in performance was noticed. A fact that shows that the Mills Company ensure that their products are ready for immediate installation. Whereas many of the engines subjected to these analysis runs have shown some slight depreciation at the conclusion of the tests, the Mills P.75 simply revelled in



NUMBER 47

by

L. H. SPAREY



showing its paces and, if anything, displayed a slight improvement in spite of these abnormal high speed runs.

Skilled workmanship contributes greatly to the good performance of this little engine and correct selection of materials, including employment of a phosphor-bronze main bearing, will make sure that even the most unappreciative owner will gain a long life from the motor.

TEST

Engine : Mills ·75 c.c. Diesel.

Fuel : Mills Blue Label.

Starting : Starting good and immediate at maker's settings.

Running : Excellent at all tested speeds.

B.H.P.: As indicated by the graph, a maximum of ·059 b.h.p. was reached at 11,350 r.p.m., with a drop of ·0545 b.h.p. at 12,000 r.p.m. After this speed the curve falls steeply, and ·040 b.h.p. is shown at 12,470 r.p.m. The curve indicates that the engine is running with good efficiency at speeds between 10,000 and 12,000 r.p.m., which allows a good margin.

Checked Weight : 1·8 oz. (including tank).

Power/Weight Ratio : ·525 b.h.p./lb.

Remarks : Considering its size and light weight, this engine stood up to the test extremely well. Compression is exceptionally good, and seemed to improve with running.

Spares : 7 days' service (ex-works).

Type : Compression ignition.

Specified Fuel : Mills Blue Label.

Capacity : ·75 c.c., ·045 cu. ins.

Weight (Advertised) 1¾ ozs. (with tank).

Mounting : Beam, upright and inverted.

Recommended Airscrew : 8 in. × 4 in.

Flywheel : 2¼ ozs., 1½ in. dia. × ¼ in. brass.

Bore : ·33 in.

Stoke : ·52 in.

Cylinder : Nitraloy Steel.

Cylinder Head : Light alloy, screwed on crankcase.

Crankcase : Magnesium gravity casting.

Piston : Deflector type.

Connecting Rod : Hyduminium.

Crankshaft : 3 % nickel steel, hardened.

Main Bearing : Phosphor bronze.

Induction : Sideport.

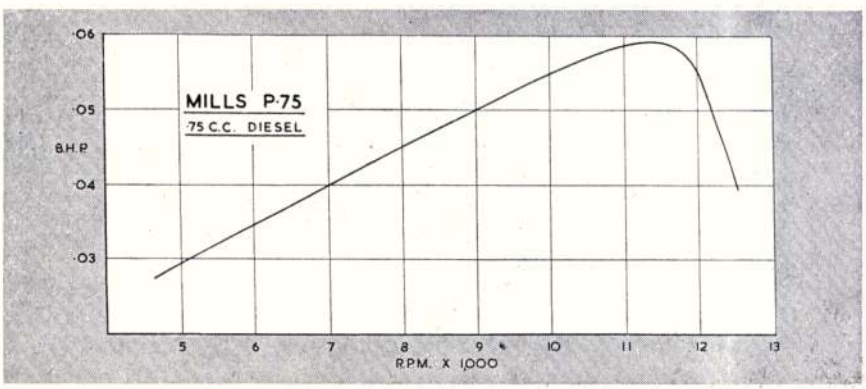
Special Features : Easy starting, robust construction, flexibility in power.

CONSTRUCTION DATA

Manufacturers : Mills Bros. (Model Engineers) Ltd., 143 Goldsworth Road, Woking.

Retail Prices : P.75 50/– plus 10/9 P.T.; S.75 55/– plus 11/9 P.T.

Delivery : 7 days' service.



Using an imported Mills 1·3 c.c. diesel, the A.P.S. Sparky at left was constructed by Bill Butler of Los Angeles, California, who appears to have reproduced the decoration of the prototype, as featured in the September 1951 " Aeromodeller ".

A NUMBER of readers have criticised Mr. Judd's letter, which was only to be expected. Without knowing details of his circuit, or having a receiver to test, it is impossible to say if his claims can be substantiated, how much the life is increased, or if there is any effect on the sensitivity. It is quite true that the usual circuit alterations do nothing to prolong the life, though this is the apparent effect, and it is quite possible that Mr. Judd has designed a circuit that does prevent the gas in the valve being used up as quickly as in the normal circuit. Messrs. Hivac explain in their leaflet why the life is short, but apart from this there is little that can really be criticised except the bombastic announcement without giving details. Mr. Judd is a clever radio man it is just a pity that he did not give us details of the circuit.

In the Readers' Survey, Radio Control Notes have not obtained a very high percentage of votes. This is understandable since at any meeting, many more rubber, power and glider models are seen than radio control types, yet there is a very healthy interest in radio control. Accordingly, the Editor has decided to reduce the space available for radio control, since it seems only fair that space should be allotted roughly in proportion to the number of readers interested. A number of letters were received with the votes, and many asked for articles for the very beginner. One says he has built a " Flight Control " receiver, and although he has no doubt that it will work, he won't know why. Another asks for wiring diagrams instead of theoretical circuits. Someone else would like to know what is considered good, and what not so good. Yours truly would like to thank all those who have taken the trouble to write as this shows what sort of articles are most needed. These notes have always been written according to the correspondence received. Regarding wiring diagrams, these are never given when it is thought that the beginner who cannot understand them would have difficulty in getting the apparatus to work. When anything looks particularly good and fairly simple it is usually made up and tested so that hints can be given, but it is not possible to make up everything.

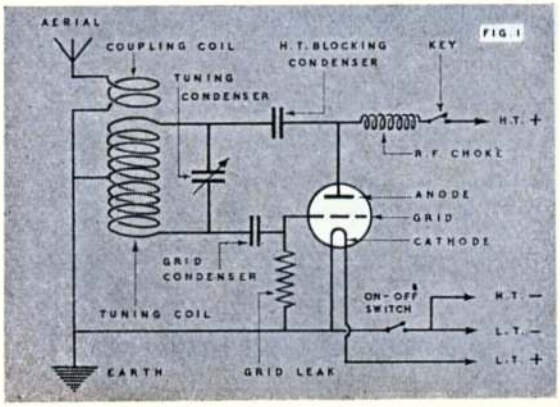
One correspondent asked for better details of the range of receivers as one had been quoted as twice as good as another. He wanted to know the range of the other. This sort of request is quite natural but there is a difficulty, it depends also on the transmitter. In future, a figure will be given for receivers with particulars of the transmitter.

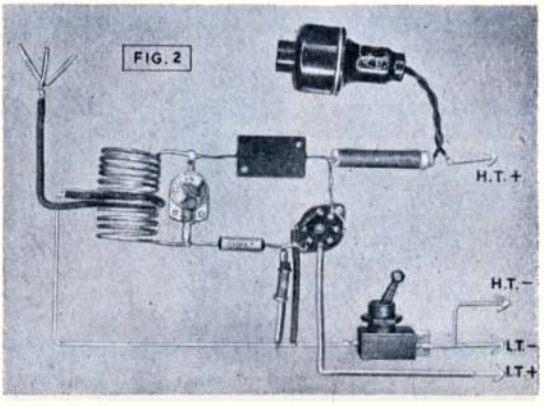
Radio for Beginners

Let us now have some notes on radio for the beginner, from the model control point of view.

Beginners always fight shy of theoretical diagrams, no doubt because they do not know what the symbols mean, but they are really as simple as A.B.C. After all you know that letters arranged in a certain way will represent a sound. Even each single letter will represent a sound, and there are 26 letters in the alphabet and some of them have more than one sound. There are not many symbols that you need bother about, just look at the photographs of radio components with their symbols alongside.

The theoretical diagram shows in a straightforward way just how the various components are

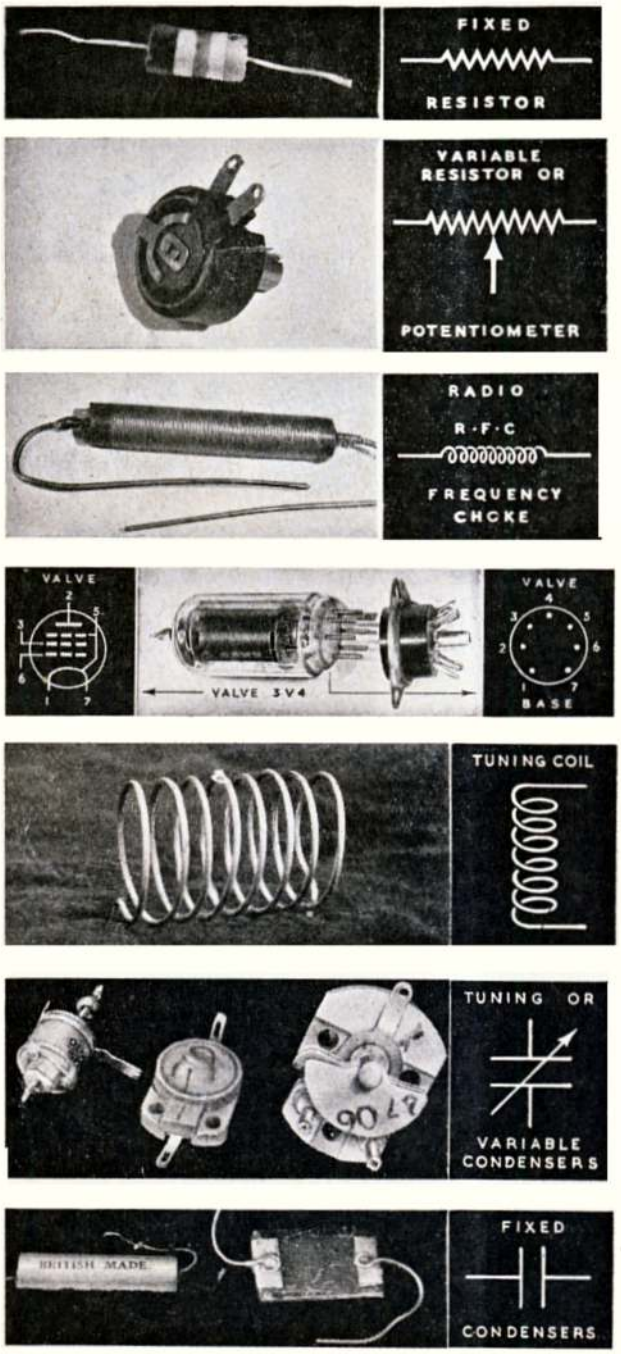


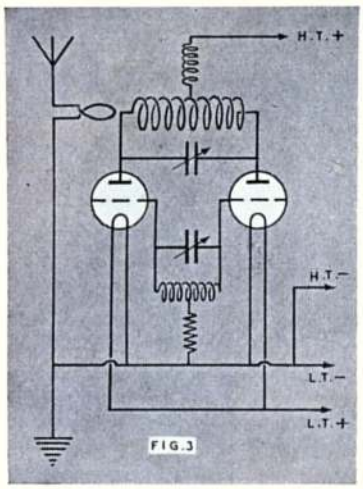


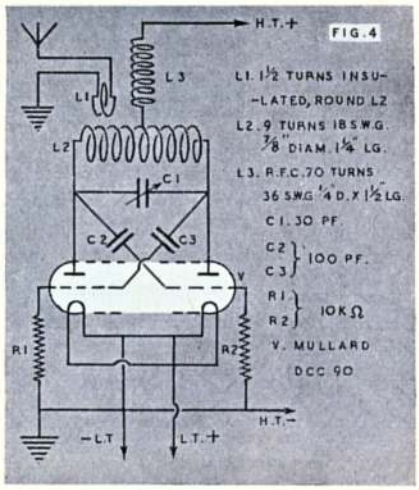
joined together. Fig. 1 shows the circuit for a simple oscillator that can be used for a transmitter, and Fig. 2 is a photograph of suitable components laid out in the same form as the diagram, to suit the Mullard D.L.94 valve.

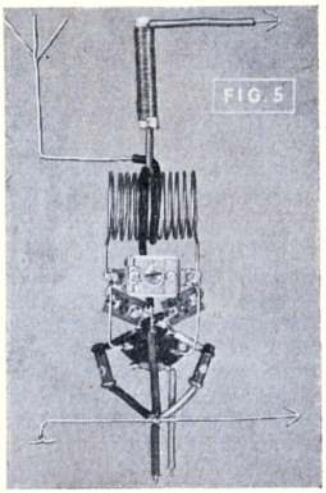
Before explaining these components, let us have a paragraph on electricity.

There are two kinds of electric current, alternating (A.C.) and direct (D.C.) though in radio, A.C. is usually termed oscillating because it alternates so quickly. D.C. is the kind that comes from batteries, and flows in one direction. A.C. flows in each direction alternately, and when it oscillates at radio frequency, it will radiate energy into the ether. The frequency with which it oscillates in our transmitters is 27 million times a second, or in radio language 27 megacycles per second, a cycle being one oscillation from positive to negative and back again. In a transmitter the power from the batteries is used to generate an oscillating current tha is radiated from the aerial. This is done by using a suitable valve and there are lots of ways of doing it. One simple circuit is shown in Fig. 1. In the valve there is a cathode which is heated by a low tension (L.T.) supply, and is often in the form of a filament, something like that in a torch bulb though not heated so brightly. Then there is a grid, and an anode or plate. There are sometimes other grids and things inside but don't worry about those at this stage. When the cathode is heated, electrons fly off or are " emitted ". If a sufficiently high voltage (H.T.) is connected with positive to the anode and negative to the cathode the electrons will be drawn towards the anode and will flow round the circuit back to the cathode. A meter in the circuit will show a flow of current from H.T. positive to the anode because the electron flow is the opposite way round to the current flow. The higher the voltage on the anode the greater will the current flow be up to the maximum emission of the cathode. The current will vary according to the H.T. voltage, and it can also be varied by a voltage applied to the grid. By a suitable circuit a greater change can be obtained on the anode than on the grid. If enough energy is fed back to the grid from the anode, it will build up into an oscillation. The H.T. is fed to the anode through a radio frequency choke (R.F.C.) and this allows D.C. to pass without much resistance, but resists the radio frequency (R.F.) current. The condenser next to this allows the R.F. to pass but stops the H.T. The tuning coil and condenser determine the radio frequency at which the circuit oscillates. The grid condenser and leak provide a bias on the grid, which is a voltage that sets the operating conditions of the valve and is generated by the oscillations. If the circuit does not oscillate there will be no bias and the anode current will rise. It is often possible to check a circuit in this way, if the current rises when a grid connection is touched with the finger, it must have been oscillating.









The oscillator just described is about the simplest type obtainable, and anyone who can handle a soldering iron and hand drill should have no difficulty in building one. There was one described in these notes for June 1950 and although step by step instructions were not given, there was a dimensioned drawing that showed quite clearly where all the wires went. It proved a good transmitter too or it would not have been described so well. There is just one point, a 100 pf tuning condenser was specified, but 50 pf will do as well, perhaps better. It was only a low powered transmitter but with a sensitive receiver gave a range of 800 yards on the ground, which is enough for all normal flying.

There are two other transmitter circuits in popular use that might as well be referred to briefly, the " Tuned Plate-Tuned Grid " Fig. 3 and the cross connected, Fig. 4. Both these circuits use two separate but similar valves, or a twin valve in which is the equivalent of two valves with one cathode. Fig. 3 will only oscillate when both the grid and plate circuits are practically in tune, and is just a little difficult to adjust for best output at the correct frequency, but is very good and efficient circuit. The feed back from the anode to grid is through the valve itself, the anode and grid acting like a condenser. The coils have to be kept well apart so that they will not interfere with each other. In Fig. 4 the feed back is from the anode of one valve to the grid of the other, and it oscillates without any trouble. It is easy to tune to the correct frequency, but at the same time it will easily stray from that, so a check ought to be kept on the tuning. The cross-connected circuit is shown in Fig. 5, for use with a Mullard D.C.C. 90 valve and the connections to this do not work out exactly as the diagram due to the way in which the insides are brought out to the pins.

There is another type of oscillator that ought to be mentioned, that is the crystal controlled. A special type of crystal has the property of oscillating at a particular frequency, and acts like a tuning coil and condenser that cannot be varied. A simple type was briefly described in May 1951 Notes, but as it has certain advantages for the beginner it is hoped to give a more complete description later.

It would be as well to have a few more notes about the components at this point. The tuning coil is called an inductance and the valve is usually measured in micro-henrys. In our circuits we generally state the size of coil and wire used. When current flows along a wire it creates a magnetic field, and if wire is wound into a coil the field is much stronger. When the current is increasing the field induces a current in the coil in the opposite direction, and slows down the rate of increase. When the current is decreasing the magnetic field tries to prevent it decreasing. The radio frequency choke is also an inductance.

A condenser consists of two conductors spaced by a non-conductor called a di-electric. It is said to have capacity which is measured in micro-farads (mfd) or pico-farads (pf) called " puffs " or " peeks ". One hundred puffs equals ·0001 mfd.

A resistor is measured in ohms the letter k being used to signify 1000, and m or meg to signify one million. When a resistor or condenser is variable the maximum value is quoted.

Tools need little mention, soldering iron, hand drill, files, pliers and small hack saw, as described in "Airframe Construction" in March, 1952 AEROMODELLER, will cover most of the radio. A small vice and pair of tin snips will then cover installation and the making of other bits and pieces. For some of the other items you may find taps and dies useful, but they need not be bought until the need arises.

Some kind of meter will be required for measuring electric currents and voltage. The best thing is to obtain an ex-government meter reading from from 0 to 5 milliamps and build it into a multi-purpose instruments as described in the AEROMODELLER for April, 1950.

ESPECIALLY FOR THE BEGINNER PART XXV

BY VIC SMEED

Enter the DEMON DRAG

The Stall

Last month we saw how the air flows round an aerofoil with the result that pressure is reduced above the wing and very slightly increased below it. The airstream has to follow the camber (curve) of the upper surface and at normal angles of attack this does not entail a great amount of " bend " in the airstream. At greater angles of attack, however, the departure of the stream from its normal course is increased and it has a bigger distance to travel from A to D, relatively, Fig. 1, which results in a greater difference in pressure and hence more

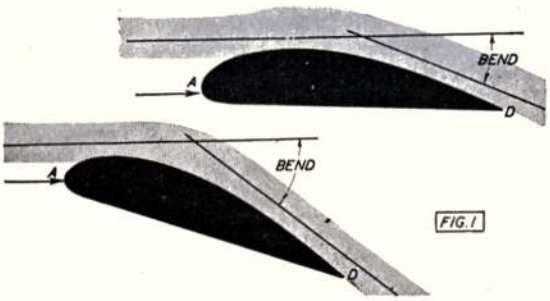


FIG. 1

lift. There comes a time, though, when the top airstream is reluctant to bend so far and where the high pressure beneath tends to creep round the trailing edge into the low pressure area, Fig. 2. At one critical point the top airflow refuses even to entertain the idea of following the camber and suddenly separates from the airfoil, leaving an even lower pressure area, Fig. 3a, which the lower airstream joyfully rushes to fill, Fig. 3b. Lift is thus destroyed and the wing is said to have stalled. The STALL normally takes place at about 15 degrees angle of attack (varying slightly with different aerofoils). Now, enter the tailplane. Being set at a smaller angle of incidence, its angle of attack is smaller, so that while the wing has stalled, the tailplane is still manfully lifting, Fig. 4. The sudden loss of lift at the front end, coupled with the rear end still being lifted, results in the nose dropping, and the aeroplane dives. The tailplane influences the attitude, forcing the nose down until the wing is once again at an angle of attack at which it becomes " unstalled ", and of

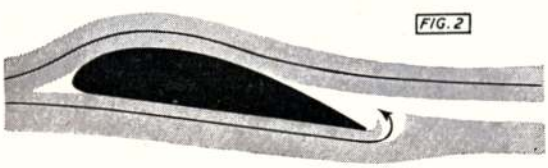


FIG. 2

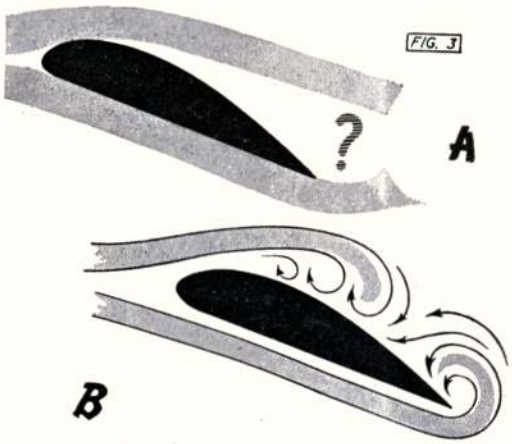


FIG. 3

course, once the wing is lifting again, the balance of forces is restored and the aircraft eventually resumes a normal flight path. A badly trimmed model can repeat this pattern indefinitely, giving a flight path of greater or lesser undulations, until, of course, the model " comes into contact with some solid obstacle ".

Drag

In between watching apples fall off trees, Isaac Newton found time to put forward one or two notions besides the one about gravity. Among them were the axiom that two bodies may not occupy the same space (though we *have* seen armchairs—er—quite) and the third law of motion : " To every action there must be equal and opposite reaction ". If we have a body in the air it will displace air, and if we move the body a reaction takes place in the air. It whirls and eddies, molecules are stopped or slowed, other molecules slide over them—in short, the air offers resistance and the total of all the various retarding reactions and resistances is termed DRAG. In aerodynamics, we have two main divisions of drag, that which we cannot possibly avoid because it is an inherent adjunct to lift, and that produced by every part of the aircraft not contributing to lift. The latter is called PARASITIC DRAG and it is simply the

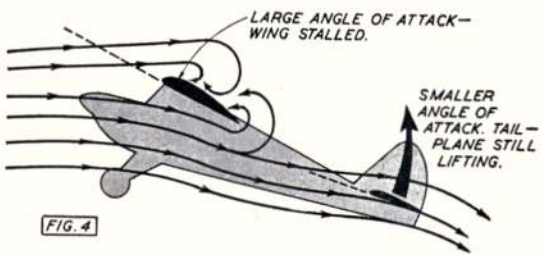


FIG. 4

head resistance offered by the fuselage, tail, undercarriage, struts, etc. In this field we can materially increase efficiency by careful design, the height of efficiency coming in the true flying wing, which requires astonishingly low power for flight due to the absence of parasitic drag. Attention to streamlining can reduce this type of drag to a great extent in conventional aircraft, and is of great importance in the full-size world. Drag increases as the square of the velocity, so that the faster an aeroplane flies, the greater is the problem of drag. With the low speeds of models, the increased weight of a streamlined structure often offsets the gain in aerodynamic efficiency, and parasitic drag becomes of lesser importance in lightweight and ultra-lightweight jobs.

For average models, the first candidates for drag reduction are any parts of the aeroplane which are not strictly necessary for flight. Design is always a matter of compromise, and if, for example, a wing cannot be made strong enough to be cantilever (that is, without external braces) struts must be employed. What weight or efficiency that may have been gained in designing a very light or thin wing can easily be lost on the struts which will become necessary. Few modellers use struts for this reason, but if they are used, they must be as small in cross-section as possible, and careful attention must be paid to their streamlining. Undercarriages are one of the biggest drag-producing nuisances ; they are totally unnecessary in the air, and many contest models nowadays employ hand-launching if possible, omitting the undercart entirely. Other models find the weight of a retracting gear worthwhile. If " realism " rather than ultimate efficiency is the aim in a design, fairing the undercarriage will still add many seconds to the average flight time. Some builders add semi-scale excrescences (dummy radiators etc.) all over their models and wonder why they drop like stones when the motor cuts. . . .

The fuselage is an essential part of a conventional aircraft, but its main function is to provide (in a model) a firm platform on which to fix the wing, motor, and tail unit. Otherwise it provides certain side area, affects the looks of the complete model, and produces drag. The worst offender in the last respect is the builder who just finishes off the fuselage at the engine bulkhead and sticks the engine out in front, in the breeze. This is termed a " built-in headwind " ; even a simple rudimentary cowling will halve the drag. The lines of the fuselage and its cross-section also play an important part, and streamlining is the main means of improvement. Streamlining means providing a shape over which the air will flow smoothly without sudden changes of direction. It is interesting to note in this connection that a penny presented flat to an airstream has the same drag as an ideal streamline body (a teardrop shape with a length four times its diameter) of some twenty inches in diameter. Other interesting experiments suggest that a square-section body has three times the drag of a round one of the same length and volume, and twice the drag of a similar diamond section form.

The tailplane and rudder are also necessary appurtenances, and are usually kept as small as is practicable to keep down their weight and drag. Care in the design of their attachments and the use of suitable streamline sections also aids in the reduction of parasitic drag. Keeping the tailplane to a minimum is of further benefit for, as we have seen, it acts for much of the time as a small wing, and thus produces the types of additional drag associated with a wing.

Skin Friction

A further contributor to the general drag of an aircraft is a little item called SKIN FRICTION. No-one will deny that if you plunge your hand into water it comes out wet, but few people realise that if you swish the hand around a bit before withdrawal, the chances are that the water adhering to it is still the same water with which it originally came into contact. Exactly the same thing happens in the air (which is, of course, only another fluid)—a thin film remains static round any body moving in air. This film is called the BOUNDARY LAYER, and it is always present no matter at what speed the body is moving. In the case of a well-finished model aircraft, the boundary layer is generally accepted as being about four thousandths of an inch in thickness, but a poor finish (*i.e.* a rougher surface) will cause the film to build up in thickness, Fig. 5. The snag about all this lies in

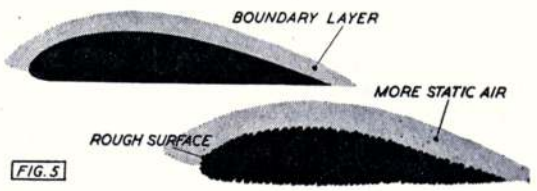


FIG. 5

the fact that when a moving amount of fluid passes over a static amount of the same, a great deal of friction is set up by intermingling of the two strata ; this results in considerable turbulence and consequently high drag. The thicker the boundary layer, the greater the turbulence, so that any roughness in the finish of a model will add to the drag—to a far larger extent than is often realised. A further development of this business is WETTED AREA, which is simply the area of actual surface of the model in direct contact with the air. Fig. 6 shows what is meant by the oft-heard expression " reduction of wetted area "—in the illustration the shaded areas show the alteration possible to achieve the same fuselage functions while reducing the surface area and hence the drag.

It may be as well to mention at this juncture that turbulence of the boundary layer of the wing is sometimes deliberately employed or brought about, either by the design of the aerofoil or by use of a small strip of thread or wood cemented in place after covering, called a " turbulator ". The idea is that if the boundary layer turbulence can

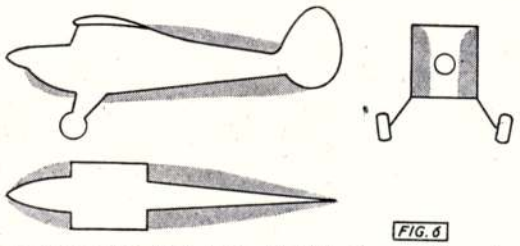


FIG. 6

be arranged so that it " rolls " back over the wing (Fig. 7), the airstream tends to stick to the wing rather than separate from it ; this has the effect of increasing the stalling angle by two or three degrees, and may also be of help in reducing C.P. travel, thus stabilising the machine and rendering trimming less critical.

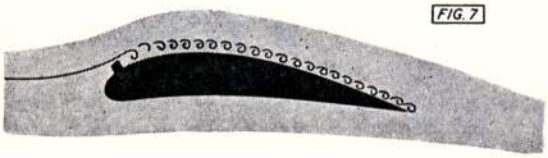


FIG. 7

Wing Drag

The other main division of drag—that inseparable from lift—comes, of course, from the wing, and may be split up for consideration (but not for measurement) into PROFILE DRAG and INDUCED DRAG. If we once more visualise the airstream round an aerofoil, Fig. 8, we see that air

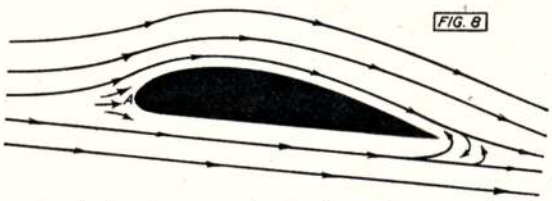


FIG. 8

molecules impinge on the leading edge at point A at right-angles to the surface. Other molecules have their paths drastically deflected, as shown by the little arrows, while at the trailing edge we have, of course, two airstreams moving at different speeds and of slightly differing pressures coming together. These factors create turbulence, and a further result is that the main airstream is " bent ", *i.e.* deflected in its course very slightly. All of this arises from the shape of the aerofoil and constitutes profile drag. Visible examples very similar in

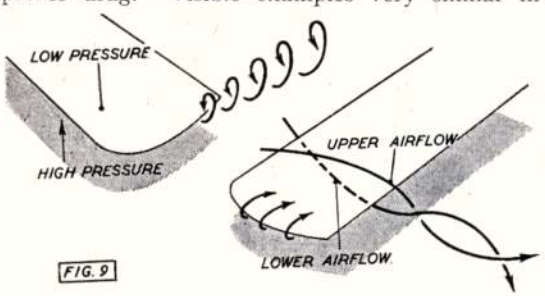


FIG. 9

nature are the wash of a sailing dinghy and the eddies behind the pier of a bridge spanning a fast-flowing stream.

Induced drag was brought up in an article in the March issue, but briefly, it arises from the difference between the lower and upper surfaces of the wing. The high pressure beneath tends to spill over the tip to the low-pressure area above, Fig. 9. This produces a corkscrew whirl or vortex of air at the tip, and also imparts an outward deflection of the airflow beneath. The upper airflow assumes a similar deflection inward, and these two streams, meeting at the trailing edge but moving in different directions, create small vortices all along the trailing edge. These whirls tend to further increase the " bend " in the airflow produced by profile drag, and the total deflection in the air moving away from the trailing edge is called the DOWNWASH ANGLE, Fig. 10. This angle in model work is usually two to four degrees, and the effect may extend back a distance of four or five wing chords. (The downwash obviously reduces the angle of attack of the tailplane, by the way.) Induced drag can be reduced by an increase in ASPECT RATIO —that is, the " length /breadth " ratio of the wing, determined roughly by the span divided by the average chord, or more accurately, span squared divided by area. A higher aspect ratio, *i.e.* a longer, narrower wing, means a smaller tip vortex and hence less deflection of the upper and lower airstreams, smaller eddies at the trailing edge and therefore, less induced drag. Unfortunately, there are drawbacks to high aspect ratios, but we shall be discussing these later. Further improvement in the induced drag situation can be brought about by fining down the tips of the wing, a thin double ellipse being generally considered best, or by using an endplate (tip fin). Inset tip fins, forming air barriers or fences, reduce the sideways deflection and are coming into general use in the full-sized field on swept wing machines not fitted with tip tanks. Visible evidence of tip vortices frequently

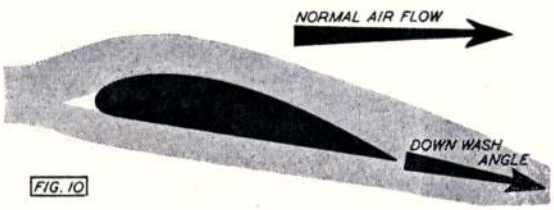
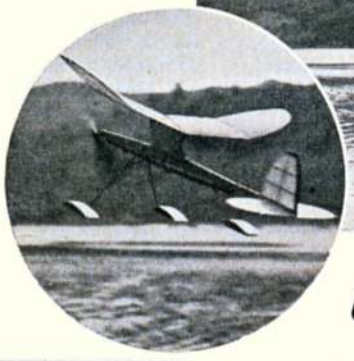


FIG. 10

occurs in very humid conditions when a full-sized aeroplane (especially a square-tipped type) suddenly changes its angle of attack. A faint white plume appears at the tips, because the tip vortex temporarily increases in size, and the air spinning in it is thrown outward by centrifugal force ; this leaves a very low pressure area in the centre of the vortex and moisture in the air condenses in the low pressure.

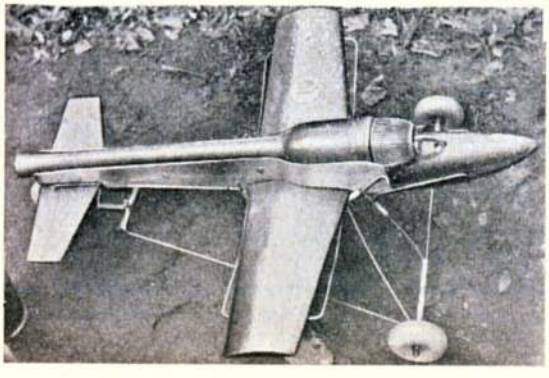
Next month we shall definitely get around to the ins and outs of the various groups of airfoil sections —why we choose what for which jobs, etc.

WORLD NEWS



New Zealand. John Sheppard is particularly fortunately placed at Tairua, N. Island, where he is able to enjoy waterplane flying over what appears to be a conveniently shallow lake. At the recent N.Z. Nationals, John established a Waterplane (rubber) Junior record with a converted Keil Kraft Senator, and the model at right is his 30 inch three-float spar type floatplane, built from a New Zealand kit, the Modelair Monarch.

in Pictures



India. Our regular correspondent in Shimshapura, Mysore State, Southern India, is D. Hardaker, and his latest contribution is the colourful picture, left, showing a friend in national costume holding his Bowden Meteorite.

Czechoslovakia. An unusually close-finned head on the jet unit is a feature of the bottom left photo. The model is " Bambitka ", designed by F. Svatos and built by M. Zdarsky and its top speed so far registered is 150 km.p.h. which corresponds to 93·25 m.p.h.

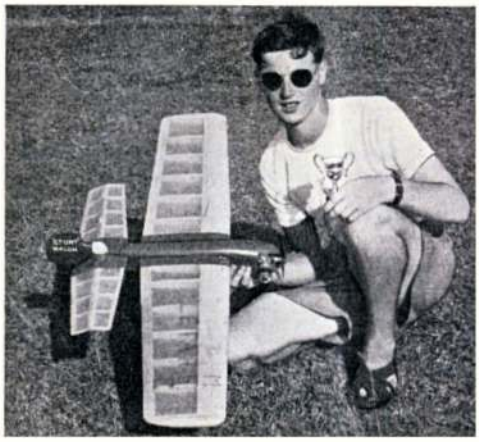
Japan. Did you ever see a Pig fly ? or a Witch astride the traditional broomstick circling the flying field ? Modellers of Tokio have blended quite a touch of humour with their sport control-lining, as is shown in the picture top left opposite. Smiling Japanese enthusiasts are admiring the representation of a Pig on the left, and the Witch with Broom on the right.

Singapore. A long time ago, the Seletar M.F.C. held their annual rally. Pressure on space did not permit us to publish a report at the time ; but we can say that it was a most successful affair which was enjoyed by the four Singapore clubs. The R.A.F. Model Flying Club at Seletar carried off several first places, and one of their outstanding victories came in A/C.1 Norman Frere's astounding stunt flying. Almost gaining maximum possible points, Norman, who is from the one-time Loughton Skyrangers club in W. Essex, flew a Stuntwagon with a Frog 500 for power. His photo appears at top right with the short coupled winning model.

The tropical workshop scene, bottom right, comes from another part of Singapore and shows David Lees from Birimingham M.A.C. in the club-room at R.A.F. Changi.

Germany. Two puzzled modellers conducting an inquest on a pair of hearty prangs are British born Eric Spivey and Gunter Bodemann of West Berlin. Bodemann's model is the biplane on the right, using a 2·5 c.c. Webra diesel.

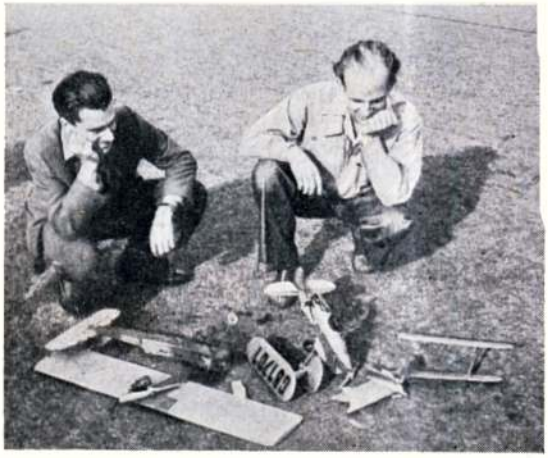
In central Germany, sailplanes hold a greater

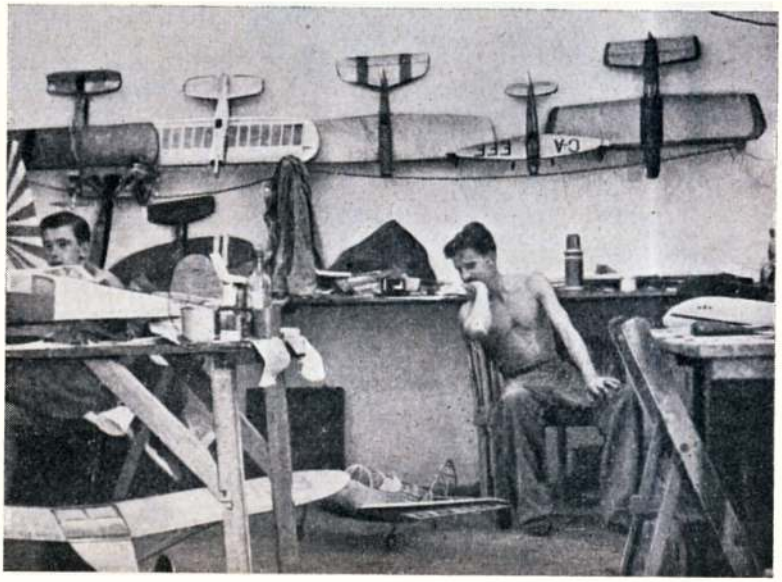


interest and the picture below by Hans Justus Meier shows one of the most prominent designs about to be launched by designer S. Strojek. It is the " Cloud Scythe " which has already appeared in the AEROMODELLER ANNUAL, 1950.

The German Nationals are to be held on Juue 13th-15th this year, at Nuremburg in the U.S. zone. They will include eliminators for the selection of International teams and there seems every hope of German participation in the Wakefield, A/2 and Power International contests.

U.S.A. Californians are pleased that the 1952 American Nationals are to be held within their province over July/August. The Santa Ana Air Base is to be used for this big event, and judging from a recent analysis of the whereabouts of modellers in the U.S.A., this should be the most heavily attended Nationals ever.

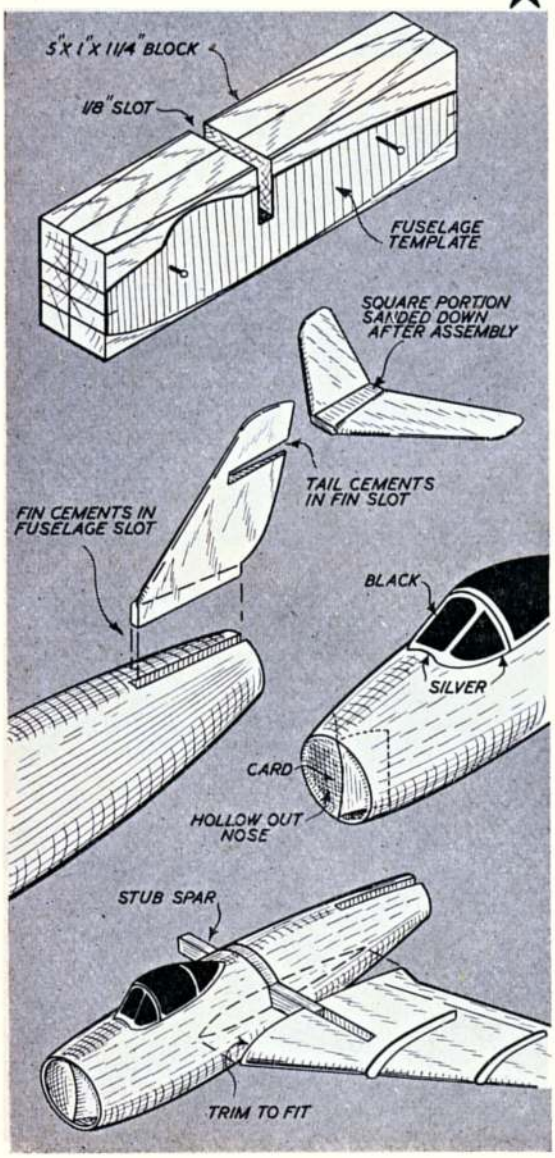




A SIMPLIFIED SOLID

MiG 15

Following the article in March issue describing Simplified Solids, we present this special drawing of the famous Russian fighter in response to many requests. Precise information on this craft from behind the Iron Curtain is not forthcoming; but we have every reason to state that this is an accurate compilation of all known lines of this elusive subject.



THIS Russian jet fighter, which has consistently been in the news since the outbreak of the Korean war, makes an excellent prototype for solid modelling. Rather than the conventional 1/72nd scale we have chosen the slightly larger size of $\frac{3}{16}$ in. equals one foot for our model so that the full scale span of 33 ft. 6 in. reduces to just a little over six inches. The various sub-assemblies have been designed on the lines detailed in a previous article on solid scale modelling.

It is recommended that all the template parts (shown tinted on the drawing) be pasted onto thin card and then cut out carefully. In cutting card accurately, use a modelling knife or a razor blade in preference to scissors. Use these templates to mark out the fuselage block and the wing, tailplane and fin panels. Taper these latter panels as required and then cut carefully to outline shape. The templates can be pinned in place, or pasted down with a rubber gum.

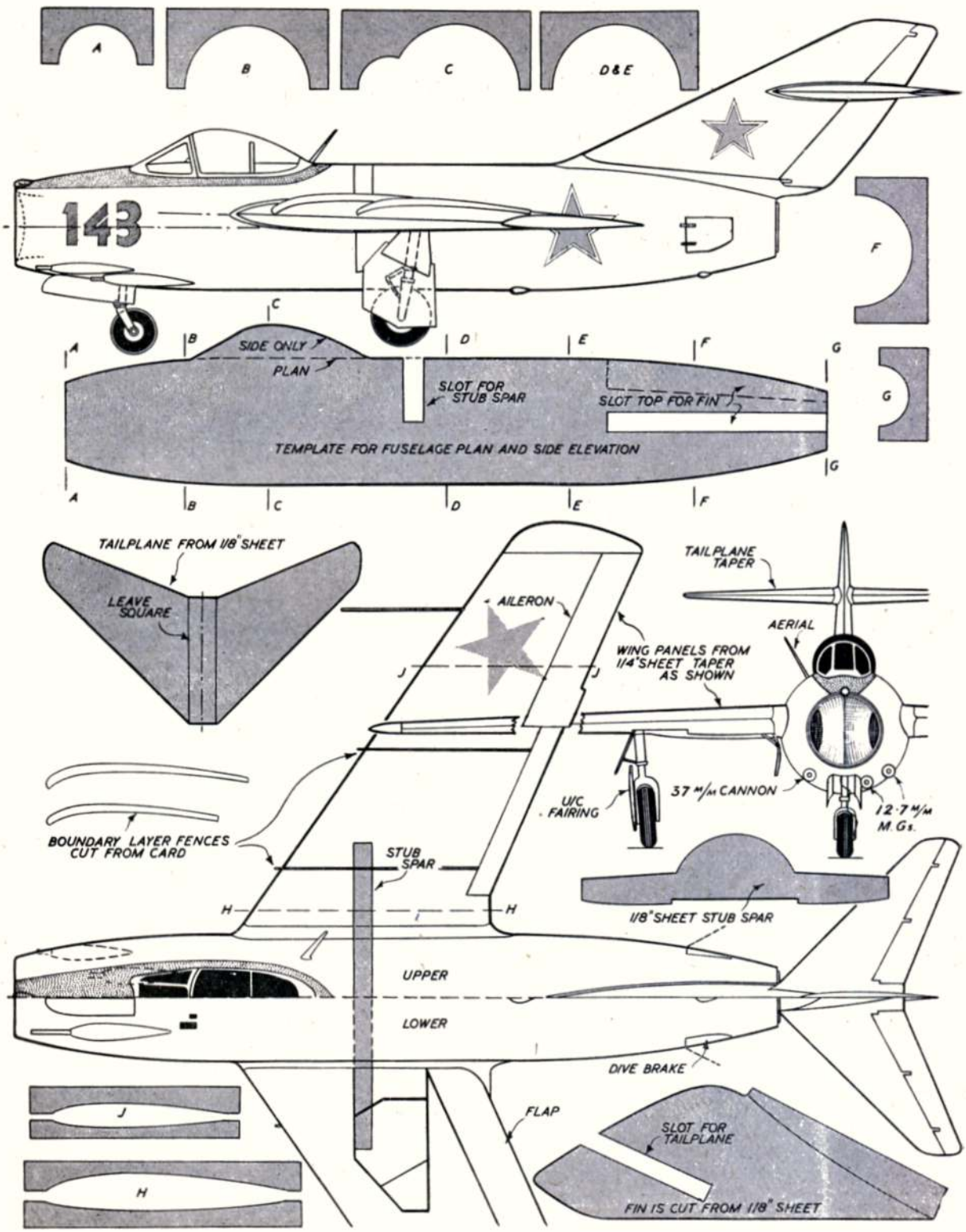
Carve and sand the fuselage carefully to correct shape, using the template as a guide. Cut the slots for the wing stub spar and the fin accurately. It will be an advantage to cut the spar slot before sawing the fuselage block to outline shape. The front of the fuselage should be hollowed out and the inside painted black. A piece of card or tin bent to a vee shape and wedged in place represents the baffle dividing the air intake on the full size machine.

When the stub spar has been cemented in place, try the wings for fit and trim the wing roots to fit flush against the sides of the fuselage. When the wings are finally glued in place, check that they are square with the fuselage. The fin is cemented in the slot on top of the fuselage and the tailplane cements in the slot in the fin. Line up the tail unit assembly with the wings. When set, sand lightly.

The various fillets are best made from a paste of clear dope and talc, mixed to the consistency of thick cream. Allow to dry thoroughly before attempting to sand down. The whole model is, of course, given several coats of sanding sealer (Grain filler), smoothing down carefully between each coat.

The bubble canopy for the cockpit can be finished by painting a carved hood matt black, with the frame picked out in silver. Control surface lines can be scored in place, whilst small detail fittings can be bent from pins, wire, etc. If an undercarriage is to be made, gumstrip rolled around pins is excellent for building up the legs. Undercarriage fairing doors can be cut from card and cemented in place.

The finish of the whole model is silver, with the star insignia in red with white outlines. Use good quality silver dope and allow each coat to dry thoroughly before applying the next. The anti-glare panel is black. After a hardening period of at least twenty four hours, it is possible to reproduce a shiny surface like polished metal by rubbing with "Hendon" polish.


A
B
C
D&E
143
F
G
SIDE ONLY
PLAN
SLOT FOR STUB SPAR
SLOT TOP FOR FIN
TEMPLATE FOR FUSELAGE PLAN AND SIDE ELEVATION
TAILPLANE FROM 1/8" SHEET
LEAVE SQUARE
AILERON
WING PANELS FROM 1/4" SHEET TAPER AS SHOWN
TAILPLANE TAPER
AERIAL
U/C FAIRING
37 M/M CANNON
12·7 M/M M.Gs.
BOUNDARY LAYER FENCES CUT FROM CARD
STUB SPAR
1/8" SHEET STUB SPAR
UPPER
LOWER
DIVE BRAKE
FLAP
SLOT FOR TAILPLANE
FIN IS CUT FROM 1/8" SHEET
J
H

"THE GROUND WORK"

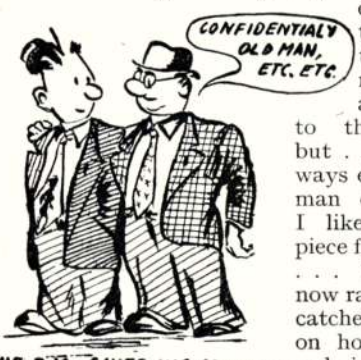
THE FATE OF

As experienced by R. W. (Bob) BENNETT

IN most clubs the job of secretary is like a grenade with the pin out; everyone passes it as smartly as possible but in the end some unlucky bod is stuck with it.

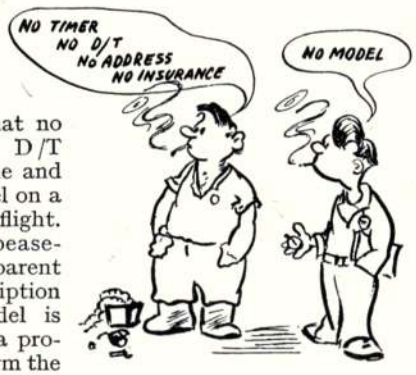
Some clubs show the guile of a con-man in their approach; one member with a trusting nature is told lurid tales of how the club is rapidly going to the dogs due to the depredations and backslidings of the low type who is the present secretary. After this softening up process comes the suggestion that an honest, upright individual is desperately needed and need they look further, etc. . . . He finds his first secretarial duty is a letter to AEROMODELLER advising change of Secretary.

Comes the first Sunday of his new position. Model box is packed with loving care; a Wakefield and A/2 prototype and a peach of a power job all ready for trimming. On arriving at the field he is a little puzzled when no one raises a cheer for "Honest Joe". Before he has time to unpack anything he is buttonholed by the "Oldest Member"; every club has at least one. After congratulations on becoming secretary comes a long and "confidential old man" dissertation on the short-comings of each and every member. Oldest Member proceeds to assure secretary that he would have taken the position himself but feels that he should give the younger members their chance. Now the committee; the O.M. would most certainly accept election to the committee but . . . "they always elect me chairman old man and I like to say my piece from the floor" . . . The secretary, now rather bemused, catches several hints on how to manage a chairman and committee, and glancing around, notices his predecessor, the low type, enjoying a spot of flying, having lost that haggard, hunted look.

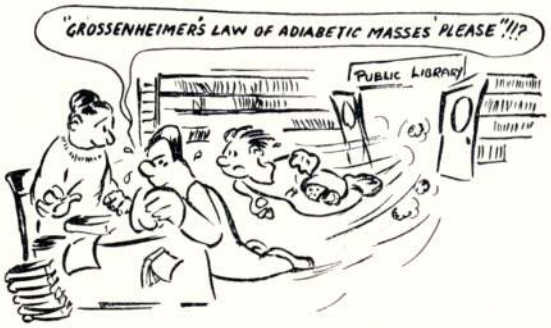


THE O.M. GIVES HIS COUNSEL

This discourse is interrupted by another club type who is bemoaning the fact that his new power job has just gone o.o.s. and seems to expect the Hon. Sec. to gallop off in pursuit and retrieve. After a few questions the facts are elicited that it had no D/T fitted and no name and address label affixed but the secretary is looked at pityingly and told that no one fits a D/T and/or name and address label on a first test flight. Slight appeasement is apparent after a description of the model is given with a promise to inform the County Police.



In the slight lull that follows the secretary is able to undo one strap from around his box but is then approached by two studious looking modellers with handfuls of graph paper and a slide-rule at the alert. They have decided that the secretary is the man to settle a slight difference of opinion that is troubling them at the moment, and show an air of diffidence and regret that they have to trouble him with such a trivial matter. The Sec. assumes a look of erudition suitable to such an occasion and this is swiftly followed by a look of anguish as he hears . . . "the variation of pressure with height is given by the formula $h - ho = C\theta$ (Kig P_0 — log p) is C, a constant, and what is its value if the height is measured in inches" . . .



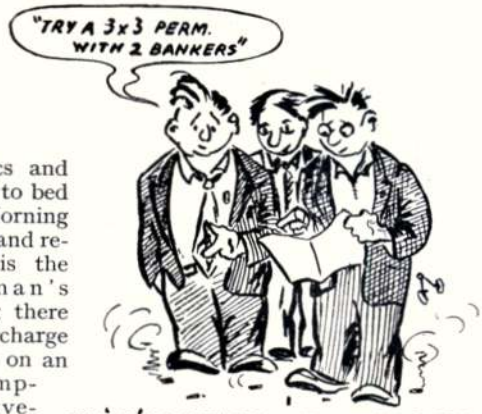
A CLUB SEC.

with illustrations by "RUSS"

His anguished look is mistaken for mental strain and pencil and graph paper are offered to assist his labours. Recovering his mental balance he immediately suggests they use a simpler method by applying " Grossenheimer's Law of Adiabetic Masses " of which they are no doubt familiar ! Assent is given rather than admit ignorance !

A hearty slap on the back, which almost puts the Sec. through his model box, and a loud " Wacko " heralds the arrival of the Competition Secretary who, thrusting stop watches and flight cards into the Hon. Sec.'s hands, prepares to dash off, explaining that he promised to take some " popsie " out for a flip the third Sunday after Wakefield and would the Hon. Sec. please take care of the decentralised power/ratio comp. Any attempt at a refusal is drowned by cries from would-be competitors who immediately crowd up, grab flight cards and queue up for the four o'clock thermal. This bunch is quickly dispersed by a request for time-keepers as each intending entrant discovers some drastic need for trimming before they could possibly take their comp. flights. The resulting prangs and fly-aways leave two or three model-less members who now agree to do some timekeeping, but the Hon. Sec. suspects only in order to wreak vengeance on those still lucky to be able to fly. After congratulating himself how smoothly the comp. has been run the Sec. realises that it is practically dark, and not having had a chance to get the lid off his model box he has the prospects of an evening's work getting the ratios worked out.

After a merry time with Sanskrit and Swahili dictionaries, a magnifying glass and a crystal ball, he is able to decipher all the timekeeper's hieroglyphics and . . . so to bed . . . Morning comes and reveille is the postman's knock ; there is a surcharge to pay on an unstamped envelope. Pays up and then reads that Johnny Smith would not be flying on Sunday as his model was not quite finished but he has a day off on Monday, could he have his comp. flights then . . . ?



THE 'SEC' HELPS OUT ON A KNOTTY PROBLEM

I should think that all readers of these jottings will be sure that it can't be their club. Are you sure ! I'll give you a clue . . . the last three letters of my club title are M.A.C. Here's a few tips on how to ruin a good club :—

(*a*) Never accept office of any description, then you are in a good position to criticise anything.

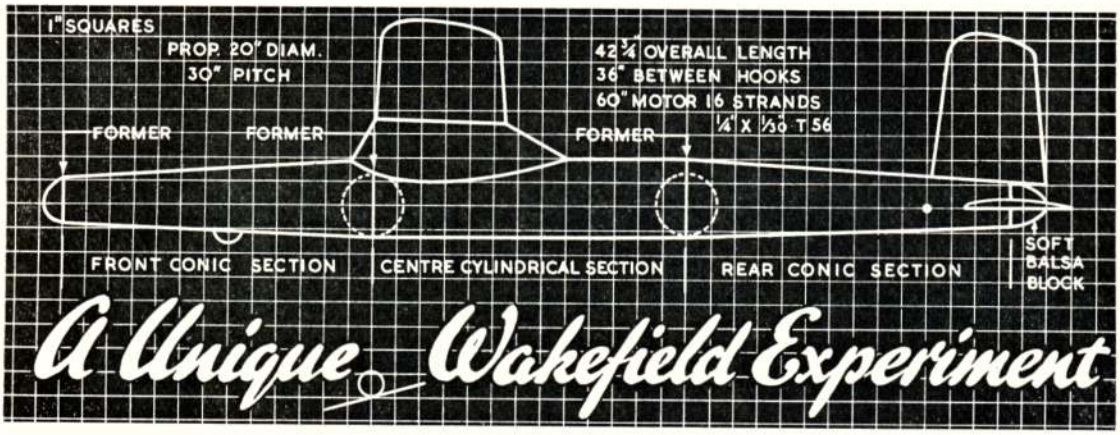
(*b*) Never turn up at any club meetings or the A.G.M., but hint at what you would do if you did.

(*c*) Never pay your subs when they are due, this makes the treasurer's job too easy.

(*d*) Never let the secretary know your change of address then you can always complain you never had a bulletin.

(*e*) Lastly, never, never, offer to be timekeeper anywhere, those beastly stopwatches are so difficult to read.

THE NIGHT SHIFT



DESCRIBED BY WALLY FROMM

For many years WALLY FROMM *of Chicago has been a regular correspondent, and we had the pleasure of meeting him personally at Akron in* 1948, *during the Wakefield Contest of that year, where he acted as proxy flier for Vernon Grey of New Zealand. Wally has always been a " deep thinker " and experimenter, and the following extracts from a recent letter interested us to such an extent that we thought many readers would like the opportunity of learning of his current experiments with an unorthodox system of airframe construction. Further details and photos of the finished ship are promised, and will be published in due course*—ED.

9th December, 1951

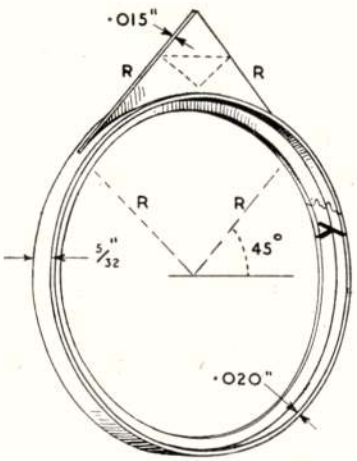
" And now to the latest dream—the Wakefield Mk. '52. This is going to be something of a shocker to some on this side who complain about the need for a Wakefield entrant being something more than an ordinary modeller. You've undoubtedly heard and read the howls of some of our modellers who say that not everyone can enter into Wakefield competition because of its acute (?) specialisation ! (*Here too*—ED.)

" I'm enclosing a couple of sketches regarding the major ideas of the proposed model, these being taken from my half-completed plans. I fully intend to make this ship, and use it for the Trials this Spring. As long as nothing untoward interferes, I shall have the model essentially as I describe it further along.

" To date there has been some work done on the basic design ideas of the ship. I made a fuselage of the same configuration and approximately the same length for use in last year's Team Trials, but had trouble with the model as a whole. That particular ship was merely a new fuselage and tail with an old wing, all being more or less thrown together rather hurriedly. Later in the year I made an approximately half-size version of the proposed '52 model, benefitting in this by the meagre experience gained with the earlier hybrid. The second ship worked out well, and is being used as the basis for the next model.

" One idea has been to make the ship more streamlined. This can best be accomplished in fuselage design, the other components being more or less fixed. With my tendencies towards sheet-balsa styling, I naturally felt that I should use sheet construction again. (This can easily lead to difficulties when decent wood is not available, of course.)

" Well, I had to decide on a cross-section, so I chose something of a tear-drop made up in the following manner :—



" In this case both the circle and the square are each the figures enclosing the greatest area for the minimum periphery—hence minimum wetted area. My figures tell me that a 42-in. fuselage of this section has about the same wetted area as a square 36-in. fuselage ; both units being of the same

cross-sectional area. Essentially, in the case of sheet construction, this means that the two fuselages should weigh the same. I figure about 1·7 ozs. maximum for the complete fuselage with landing gear and other sundry attachments. However, I'm hoping to get hold of some 5 or 6 lbs./cu. ft. balsa that will give me a unit weighing closer to 1·5 ozs.

" Making this sort of thing out of many formers, then stringers, and then planking would add much weight in glue joints alone, so it's necessary to work in wide sheets. This eliminates compound curves to a great extent, therefore I find it necessary to design the fuselage of several conic sections separated by a cylindrical section in the centre. Here I found that—for a Wakefield fuselage 38–40 ins. length, the skin could be just over 1/32 in. thick and would hold up reasonably well with care in handling. It is quite strong enough to take any loads from the motor and in flying ; trouble may come in clumsy handling. In the trial model the formers, which were made of two plys of 3/64 in. sheet, were on 4-in. centres except for an additional former two inches from either end of the structure.

" These formers were something of a nuisance. They had to be about 3/16 in. wide to do a decent job of supporting the skin without caving in, and then the motor would bang around and beat out the pieces of former ! This was O.K. until some oaf such as myself took hold of the ship at that point expecting that it was a strong point—then the skin cracked. Also I felt that the *minimum* opening about the centre of a thrashing Wakefield motor should be 2½ ins. diameter. This, plus the 3/16 in. widths of the former sides, gave me a ship some 3 ins. diameter at the centre, and increased the wetted area throughout. Further, it is something of a bother to cut out formers—so I decided to eliminate formers as far as possible.

" After much thought I decided to use either aluminium or magnesium formers. The basic round section made it simple to turn them on a lathe, and they could be far stronger (and heavier !) than balsa. This definitely meant that the number of formers must be cut to a minimum. One was needed for the nose I felt, and another at each end of the central cylindrical section—but how to make the skin sufficiently rigid ? I harked back to an experiment of some years ago, and got out the samples.

" In that experiment I had taken two inch wide strips of 1/64 in. sheet and spirally wrapped them about a 3-in. diameter tube. When the first layer had dried I wrapped another layer of 1/64 in. sheet about it, *but with the grain running perpendicular to the grain of the first sheet.* When both were dry I cemented the seam of the first wrapping while still on the tube, then cemented the seam of the second over the first. The cement at the joints was all that held them together, except of course for the ends.

" Since I could only get 36-in. lengths of 1/64 in. sheet I could only make short lengths of tube—BUT—it was exceedingly light, having no formers, and it was extraordinarily strong—one 12-in. length of the tube easily supporting 40 lbs. ! Now, with this tear-drop section, all I need is a soft longeron at the top, and I can cement my wrapping plys to it. I don't need any long pieces of 1/64 in. sheet, and I also know now (per previous model) that simply cementing the fuselage sections together, using a former as a stiffener at the joint, produces as rugged a fuselage as you could want.

" With this arrangement it is definitely possible to use metal formers, providing that I only use three or four of them. (I'm going to try for three.) My calculations for the former weights say that I can make the nose former, based on a 1½-in. diameter circle, plus the two larger formers at 2·6 ins. for a total of 0·25 oz. The weight of the wood involved in a 42-in. fuselage runs from 0·55 to 0·7 oz., depending on how light a wood I can get. (7 lbs./cu. ft. max.). Almost all weight over this is either cement or dope.

" One of the metal formers offers an excellent spot for affixing the landing gear—the mounting members can be fashioned right into the former as it is made. The nose former can be rugged enough to take any wear it is likely to get, and offers something even further—an aluminium nose-block with a Schmitt (Wakefield '50 team) type tensioner incorporated right into the block during its manufacture. Calculations of the nose weight call for a ·24 oz. maximum. This sort of block cannot ever get beaten into a pulp as can the ordinary balsa variety, and the weight compares favourably with many of the hardwood or balsa hardwood combinations I have checked.

" And that's about all for the metal-cum-balsa Wakefield ! Other more or less novel ideas may or may not be incorporated as I go along, but at the moment this is it. One thing I forgot to mention—and it's important too. To make this wrapped ship with the tear-drop section requires that a form be carved to have something to wrap things on. That really is the biggest drawback to the project ".

We shall appreciate comments from British Wakefield exponents on this radical change from the ordinary model aircraft make-up, but feel that Wally Fromm is to be congratulated on breaking away from tradition in both ideas and materials.

A Reminder !

... that the editor is always pleased to consider original ideas, manuscripts and designs not only from readers with established reputations but also from any reader who can offer items of interest. Contributions well illustrated with good photographs will be particularly welcomed, but diagrams and drawings need only be carried to accurate pencil stage.

Left: In the full regalia of 43 Squadron, this Siskin IIIa has extra checkerboards on fin and elevators identifying the C.O's. machine.

Bottom left: The Siskin II, winner of the 1923 King's Cup race.

(Photos, courtesy of "Flight").

Bottom right: The Siddely Siskin I after fitting with the 300 h.p. Jaguar engine.

AIRCRAFT DESCRIBED No. 49. By G. A. CULL

The ARMSTRONG WHITWORTH 'SISKIN'

IN 1920 there appeared the Siddely "Siskin" fighter embodying war experience plus some new ideas: the stationary A.B.C. Dragonfly radial engine boasted a cowling fitting closely around each cylinder and which reduced fuselage drag by 30%. The undercarriage was an innovation with oleo-pneumatic springing and was linked to a pair of vee-struts which primarily carried extra lift wires running from the bottoms of the parallel interplane struts. 1921 saw the amalgamation of Siddely Deasey Motors and the Armstrong Whitworth firms and the Siskin was modified to take the new 14-cylinder Armstrong Siddely "Jaguar".

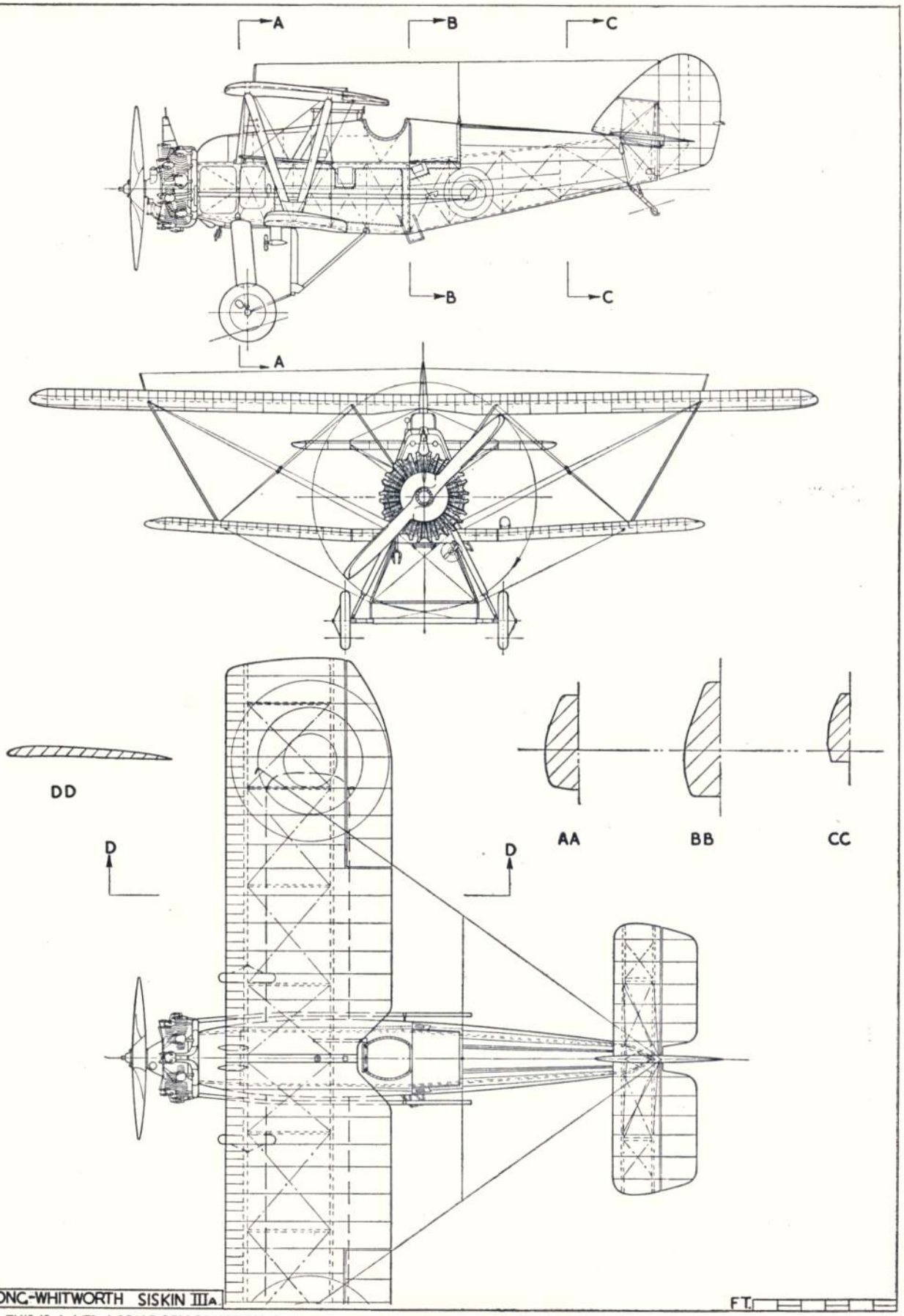
The following year produced a Mk. II which was a two-seat trainer complete with the very latest in fuselages, this being made of steel tubes. Registered G-EBEU this Siskin retired from the 1922 King's Cup Race with a broken centre fitting, but won the next year's contest with ease. Next came a single seat Mk. II registered G-EBHY, which led an active life demonstrating on the continent and in 1925 was sold to Sweden where it flew on skis. Two civilian Mk. III's with 350 h.p. Jaguar II's, followed in '24 and became G-EBJQ and 'JS. These sported new sesquiplane wings with vee-struts and for that year's King's Cup were fitted with two massive long-range tanks under the top wings. 'JQ finished fourth, making best time at 126 m.p.h. The Mk. III was to eventually become the service Siskin but not before Mks. IV and V had arrived. The Mk.IV G-EBLL was a one-off with cut-down old type wings and did without the usual underfin. In the '25 King's Cup, 'LL flew from scratch into 2nd place, but a second Siskin victory was won at 151·4 m.p.h. by the Siskin V G-EBLQ. The other Mk. V 'BLN, succumbed at Newcastle. These Mk. V's reverted to the old 28 ft. 4 ins. span wings but were otherwise similar to the Mk. IV.

The Siskin joined the R.A.F. in 1927, 41 Sqdn. receiving Mk. III's which had the usual flat-sided fuselage and underfin. A year later, these were replaced by IIIa's with a new fuselage with "cocked-up" tail and faired by stringers. With 425 h.p. Jaguar IV engines this version equipped Nos. 1, 19, 25, 29, 32, 41, 43, 56 and III squadrons and the R.C.A.F. also used the IIIa. Thus equipped, the R.A.F. furthered the art of display flying and tied together aerobatics and the upward roll were introduced on the Siskin. For the benefit of new pilots, all squadrons had some two-seat Mk. III's and there were two others in "Civvies". These were G-ABHT and 'HU, the last named surviving until 1938. By 1932 the Siskin had been replaced in the squadrons by the newer Bulldogs and Furies.

Colour. Matt silver all over with roundels above and **below top wings.** Lower wings had serial number only. Each squadron had own markings; the example illustrated has black and white checkerboard on fuselage and between the roundels on top wing. Wheel discs doped flight colour (red, yellow or blue).

Specification. Span: 33 ft. 6 ins. Length: 25 ft. 4 ins. Wing area: 293 sq. ft. (bottom wing 1/3 area of top). Loaded Weight 3,000 lbs. Maximum Speed: 153 m.p.h. at 10,000 ft. Climb to 10,000 ft. in 6½ mins. Armament: 2 machine guns, four 20 lb. bombs.

Construction (IIIa). All steel. Wings have two rolled spars with Warren truss ribs. Tubular spar in lower wing. Fuselage has steel tube longerons and struts. Tail unit is steel framed. Fabric covering.



ARMSTRONG-WHITWORTH SISKIN IIIA

F.T.

THIS IS A 1/72nd SCALE REPRODUCTION OF THE 1/48th SCALE DRAWING WHICH IS OBTAINABLE PRICE 1/- POST FREE FROM THE AEROMODELLER PLANS SERVICE.

Readers' Letters

Lost Weekend !

DEAR SIR,

As one who is a very ardent though not particularly skilled aeromodeller, may I burden you with my own opinion of this exceptionally vicious vice.

Less than nine months ago I was a free man, able to go for walks without being encumbered by crates and baskets. I could go shopping without ending up in the hobby shop, and above all my weekly pay packet usually stretched to a little deposit in the bank, and a present for the wife.

Yes ! that was only a few months ago.

What, you will say, changed that picture of Suburban bliss ?—I will tell you.

On a walk one day, my wife and I saw a couple of kids flying a model aircraft. My wife said " you ought to build one like that, we could have some fun at weekends ". That harmless remark was the equivalent of an atomic blast in our lives. I forthwith bought a Southerner Mite kit and an Amco ·87 engine. For the next three days I neither slept nor ate, and by the following weekend the model was built and painted a suitable rosy hue. On its first flight it flew best part of a mile, and gave me a kick equivalent to three gallons of best champagne.

Since that day my every waking moment has been taken up by either instruction, construction or destruction of model aircraft.

To summarise :—

Give Up Smoking ? .....Easy.

Join Alcoholics Anonymous ? ..Simple.

Stop Aeromodelling ? .....IMPOSSIBLE !

Gloucestershire. D. A. VENNARD.

Keep Team Race Rules

DEAR SIR,

In reply to Mr. Templeman's ideas on team racing rules I feel that the " tightening of the rule, Scale and Semi-scale " suggestion is just asking for trouble. He points out that there are very few scale models to be seen. This is understandable as there are very few aircraft suitable to be scaled down to team racing size *and* comply with the existing rules.

As far as semi-scale is concerned, how many successful team racers can really be classed as such. Ninety per cent. of racers are fitted with piano wire undercarriage legs. Very practical but hardly semi-scale ! Streamline wheels, protruding tank-vents, rubber-banded cowls, are among other things which admittedly could be altered. But, after all, do they make a race any less exciting ?

I think that the existing rules are exacting enough to keep team racing popular, by all means have a separate class for scale but limit the rules to engine and tank size only.

Don't let us kill team racing before it's hardly started by being too critical of the other fellow's model.

A. E. J. EDWARDS.

Godalming & District F.C.

"A" Class Team Racing

DEAR SIR,

I see that there is some uneasiness about the present state of " A " class racing. Like others, we have found that the new E.D. 2·46 and the Elfin 2·49 tend to set such high speeds, around 72 m.p.h. being typical, that even with three or four more pit stops than 1·49 c.c. models they still have a great margin. But their high speeds are troublesome on 42 foot lines, and some reduction in their speed would improve racing in that crashes would be fewer. It would also prevent the domination of the events by models too closely alike, and restore the intended balance between speed and range.

Our club started team racing (before the S.M.A.E. rules for small models existed) with an " Up to 2 c.c." class, which had ten examples, and gave good racing, and our rules covered the expected advantage of larger engines by requiring wing areas to be 50 square inches with an addition of 20 sq. inches per c.c., so that sizes ranged from 70 sq. inches for 1 c.c. up to 90 for 2 c.c. We are inclined to think that the idea might be revised with profit, making the rules read " 70 sq. inches for engines up to 1½ c.c., engines over this size to require 20 square inches added, per c.c. of extra capacity " so that 2½ c.c. engines would have 90 sq. inches.

From our observations we think that this would reduce the speeds of big " A " class models by about 8 to 10 miles per hour, and would also reduce the range a little, so that they would need one more pit stop. This is not much of a reduction in speed, just enough to make the difference between dangerous and safe racing, and the models would handle better on the extra wing area, particularly on landing. It should not be hard for the trade to meet this rule with kitted models, by adding a little to chord and span and producing an optional wing in addition to the present size.

To those who say, why bother, we suggest that the wider the possibilities of winning the better, as events which require one to use only a limited few engines and stereotyped tactics are not going to hold the favour of the majority. Or not for long.

Stewarton, Scotland. ROBERT BURNS.

CLUB NEWS

By

CLUBMAN

Junior members of Arbroath Model Aero Club demonstrating construction methods on the occasion of their recent 'Visitors' night'. The club President, Mr. D. Niven, is seen second from right.

FEBRUARY 24th seems to have been one of those days we aeromodellers dream about, and there is no doubt that hundreds of new models were aired on that exceptional day of fine weather with its almost total absence of wind. Scads of applications for Merit Certificates are one result of that bright spot in the aeromodeller's firmament, and it confirms the opinion that, in this country at any rate, winter can be the best time to try out new ideas and machines. We continue to be happily optimistic that a similar day will bless the debut of our long promised Wakefield ! !

At an earlier date we had contemplated the introduction of a " lost and found " department, but the response did not justify our going ahead with the project. However, we would like to bring to your notice the fact that Mr. D. T. Webb of 37, Heathfield Road, Croydon, is holding an Elfin 2·49 engine (No. 3115), said motor being found on Epsom Downs last summer. If the owner reads this, will he relieve Mr. Webb of his responsibilities pronto.

Radio control enthusiasts will be interested to learn that an International contest will be staged by the **RADIO CONTROLLED MODELS SOCIETY** at Stanley Park Aerodrome, Blackpool, on Sunday, August 17th. This is actually part of a double event, as a similar contest for boats will be held at the same venue on the previous day.

Ireland

Paddy Hartnett, secretary of the **CORK M.A.C.,** announces that his club will be organising the Munster Championships for open rubber, power and C/line events on Whit weekend. They hope it will be convenient for South Wales enthusiasts to attend, and full details can be obtained from the aforementioned Paddy at Dunsland Cottage, Glanmire, Cork.

Another Irish meeting is the Control-line Rally to be staged by the **DROGHEDA M.F.C.** on the 8th June. The affair will take place on the Drogheda United football field, Windmill Road, and entries must be in by the 24th May.

The **BELFAST M.F.C.** held their first Class A Team Race event at the R.A.F. Station, Aldersgrove on the 2nd March, coupled with a C/line stunt contest that went to Jim Bellew of the Drogheda club. The team event was held in a large hangar, and run in three heats, the usual prangs occurring mainly due to miscalculation of the girder heights ! The final proved very exciting, and was won by B. Boyce of the Belfast club at an average speed of 55 m.p.h., motor being an Elfin 2·49 c.c. The trophies were presented by S/Ldr. Studenous, officer in charge of the local R.A.F. club, whose co-operation helped to make the day most enjoyable. Encouraged by the attendance of four of the clubs from the newly formed Northern Ireland Area, plus one club from Eire, it is hoped to make this event an annual affair.

Scotland

After a quiet spell, the **HAWICK M.F.C.** is beginning to revive, and membership has risen to 20, with juniors coming in well. The lads are taken on a month's trial, then after an interview, the keen types are admitted to membership. This " weeds out the type who larks about and keeps the keener lads off their work ". With miles of open country around, and use of a good clubroom, this club should be well set. The Hawick fellows would like to contact clubs in neighbouring towns with a view to forming a Border group and indulge in some communal flying.

Two more members of the **EDINBURGH M.F.C.** have gained their A class Merit Certificates. J. Norbury (a junior) clocked 2 : 05, 2 : 10 and 2 : 25 with a modified club designed A/2, while W. Park's all-sheet Nordic (weight 19 oz. ! !) managed 2 : 15, 2 : 03 and 2 : 35—all o.o.s. after five bad prangs and much perspiration. Rubber powered models are beginning to appear again, mainly ultra-lightweights and Wakefields, and there is much more general activity probably owing to better weather and enthusiasm resulting from Merit Certificate activities. As an inducement, juniors are awarded a year's free club subscription if they succeed in getting an " A ". Another worthwhile activity of this club is a Parents' Night, the latest effort being a small but select exhibition, with C/line flying done on very short lines. J. Glynn's semi-scale " Monster " stole the show, this model featuring slots, fully sprung trike undercart, and highly detailed cabin—with a very feminine pilot in one of the four seats.

Western Area

The final composition of the Committee for the 1952 season was decided at a meeting held in Bristol on December 9th, 1951. Mr. Pocock of Trowbridge is

Chairman, with D. Wilson of Bristol & West undertaking secretarial duties. Following the success of previous winter meetings, it was decided to hold similar events this season, the results of which should be available for our next issue.

Lulsgate Aerodrome has seen much flying this last few months by the **SOUTH BRISTOL M.A.C.**, and many new models have been tried out in readiness for the coming contest panic. Club membership has risen, interest being mainly divided between team-racing and free flight power, with ·5 c.c. engines most popular. An enjoyable evening was spent at a film show, when scenes of past activities brought many laughs—particularly when one film was accidentally run in reverse !

1952 CONTEST CALENDAR

Apr.	20th.	**WESTON CUP.** Wakefield Elim. (Area.) **ASTRAL TROPHY.** Int. Power Elim. (Area.)
May	4th.	**KEIL TROPHY.** Unr. Power Ratio. (Decentralised.) **LADY SHELLEY CUP.** Tailless. (Decentralised.)
	11th.	**GUTTERIDGE TROPHY.** Wakefield Elim. (Area.) **K. & M.A.A. CUP.** A/2 Glider Elim. (Area.)
June	1/2.	Centralised. **INT. POWER TRIALS.** Power Trials. **AEROMODELLER R/C.** Radio Control. **C/LINE SPEED & STUNT.** Int. C/L Elim. **SHORT BROS. CUP.** P.A.A. Load Power. **SUPER SCALE TROPHY.** Scale Power.
	7/8.	**WAKEFIELD TRIALS.** **A/2 GLIDER TRIALS.** (Centralised.)
	15th.	**West Essex Gala.** (Fairlop.)
	22nd.	**FLIGHT CUP.** Unr. Rubber. (Decentralised.) **C.M.A. CUP.** Unr. Glider. (Decentralised.) **Butlin's Contests.** All Classes. (Filey, Skegness, Ayr and Pwllheli.)
	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. **THURSTON CUP.** Unr. Glider. **MODEL AIRCRAFT TROPHY.** Unr. Rubber. **" GOLD " TROPHY.** C/Line Stunt. **CONTROL LINE (SPEED).** All Speed Classes. **S.M.A.E. R/C TROPHY.** Radio Control. **SIR JOHN SHELLEY TROPHY.** Unr. Power.
	17th.	**International Model Aircraft Contest.** (Blackpool.)
	23rd./24th.	**Irish International Meeting.** (Baldonnell.)
	24th.	**All Herts. Rally.** (Radlett.)
	31st.	Centralised. **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.)
	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.

Following a very successful display, membership of the **ABINGDON & D.M.F.C.** has soared, and an admirer came forward and presented the club with a fully equipped clubroom. (And they say there is no such person as Santa Claus !) This room is now open each evening from 7 till 9.30 p.m., and a series of lectures, film shows, etc., are planned. In spite of pouring rain, the lads staged a flying display at the request of many townspeople—who obviously still thought that model flying was a kid's game. This opinion was soon dispelled when many noteworthy flights were made, one of the funniest being by a Mills ·75 powered " Zaunkonig " which stooged around about 3 ft. in the air at a speed of less than 5 m.p.h. Nicknamed the " Flying Lawnmower ", this machine looked very impressive as it carried out its circling flight. Biggest laugh was provided by the club Sec. who—having boasted that his tank held enough to " fly the Channel "— launched the job, and forgot to set the timer ! When last seen the model was still buzzing merrily at some thousand feet altitude, and is believed to have landed in the river 5 miles away.

South Midland Area

At the half-yearly meeting of the **HENLEY M.C.** it was decided that, in view of the club's very healthy financial state, the annual subscriptions would be reduced to 20/- seniors, and 10/- juniors. (And I hear of " clubs " trying to run on half a crown a year—and wonder why they never get anywhere ! The answer is obviously an adequate subscription.) An ambitious club flying programme leaves very few weekends free. On February 23rd T. G. Waldron set up a new club A/2 record with a time of 7 : 03 flying a new design featuring a 70 in. long fuselage.

East Anglian Area

It was my pleasure to attend the 6th Annual Exhibition held by the **BELFAIRS M.A.C.**, and I repeat my congratulations to the lads for a fine display of models well presented. The Senior Champion was K. J. A. Strowlger who exhibited a 1914/18 Rumpler Biplane of Wakefield area that weighed only 2¾ oz. less rubber. Junior Champion was M. Pressnel with an own-design A/2, this lad also winning the prize for the best collection of three models. B. Lavis won a special prize for showing the greatest improvement in building technique. During the exhibition flying was carried on, including three-in-a-circle with Keil-Kraft rubber scale jobs, plus scale Jetex jobs. Demonstrations of building were given by members—including their much prized lady member Pat Healey (see Model News). Seven new members were enrolled as a result of this show.

Northern Area

Main news from the Area Committee is concerned with arrangements for the forthcoming Yorkshire Evening News Rally on September 7th (see paragraph in " Heard at the Hangar Doors "). All five Area semi-centralised meetings will be held at Rufforth this year, so buses can now be booked for this definite venue. Henry Tubbs has been roped in to act as Assistant Comp. Sec., and we are interested in a scheme proposed to deal with that old chestnut " control of time-

keepers ". A system has been devised whereby each competitor is made responsible for timing (or getting timed) double the number of flights he makes. I think all who have had any handling of this major problem will be anxious to learn the outcome of this scheme.

STOCKTON & D.M.F.C. report absolute calm on that famed February 24th, with a complete absence of thermals that made for perfect trimming conditions. Wakefield and A/2 fans certainly made good use of the opportunity, and three members made the requisite flights to gain their " A " Certificates, bring the club bag to 8 " A "s and 2 " B "s. This means that over half the club's active members have a certificate. Dave Rennison appears to find 4 minutes a relatively easy target with his nylon covered A/2, and great progress has been made in this category.

One or two fine Sundays brought members of the **HALIFAX M.A.C.** out of hibernation, and some very pretty flying has been seen. Messrs. Haley, Grant and North have all passed the 5 minute mark, and it is expected to field at least 15 Nordics at the first Eliminators.

George Adcock of the **BRADFORD M.A.C.**—one of the oldest members, and an old opponent of mine in pre-war days—created a lot of interest at a recent club meeting by producing an " A framer " and describing the methods of building. Many reminiscences proved that the technique in those days was the same as now—get 'em up and keep 'em up !

E. Midgley of the **BARNSLEY & D.M.A.C.** set up a new club glider record of 11 : 35 under conditions so still that the owner just sat down at the point of take-off and waited for it to come down. Club members have flown every Sunday since before Xmas, and the valuable experience gained will be put to good use in the coming season. An immediate result is the gaining of more Merit Certificates, the club total to date being 16 " A "s and 8 " B "s, a very good record indeed.

Midland Area

A very well attended Delegate Meeting was held on the 8th March at Walsall, when arrangements were finalised for the first three Area contest meetings, which will take place at Pershore, Bramcote and Pershore respectively.

Now in its fourth year, the **ZENITH M.A.C.** reports a good year and stable finances despite heavy expenditures last year. Several new members have been enrolled thus helping to plug the gap left by members serving in the R.A.F., and a very ambitious programme has been set out for the new season.

The **FORESTERS (Nottingham) M.F.C.** are now enjoying the experience of slapping on that last coat of dope and then tripping out, barefoot, in the still dewy grass to test-fly at crack 'o dawn! One enthusiast was even seen at the Witching Hour flitting like a will-o-the-wisp in the moonlight after what could have been a vampire bat, but proved to be a new lightweight on a pre-Gamage jaunt. A most enjoyable day was spent recently when the Derby club visited Tollerton to compete in the Area knock-out contest. Mainly due to Dave Bainbridge and his excellent A/2 (based on the " Quickie ") the Merry Men beat the Derby boys by approx. 28 minutes to 15 minutes.

The 2nd March brought a howling wind when the **SOLIHULL M.F.C.** set out to fly against North Birmingham in the second round of the knock-out comp. Although times were not high, the Solihullites were able to better their opponents by a fair amount, but both teams suffered damage to their models. They now go forward to meet West Coventry, and hope for better weather.

At the A.G.M. of the **WORCESTER M.A.C.** a good attendance confirmed that enthusiasm is not entirely lacking, as a poor 1951 season tended to indicate. A few committee changes, and an earnest resolve to get around a bit this season should help to put Worcester on the map again. Control-line flying seems to have had its day with these chaps, both in stunt and speed, the latter proving too expensive for A. Viles after some very successful efforts, best of which was 132 m.p.h. in Class VI. Reg Parham has two Wakefields under construction featuring long fuselages and tapered wings—an innovation for Reg. He has also knocked up a few indoor jobs with some newly acquired American balsa in readiness for the next Indoor Nats. Gliders seem to have lost favour, apart from some experimental heavyweights by R. Baxter, construction being almost entirely of 1 m.m. ply, including fully sheeted surfaces.

North Eastern Area

The A.G.M. of the Area was held at Durham on the 24th February. (Wonder how the delegates felt at missing out on that day of days !) The Chairman intimated that more interest could be shown by the member clubs, and asked for a greater interest in Area affairs in the coming season. Plaques were presented to the Tynemouth teams for both class A and B team-racing, the stunt award going to P. Oswald, also of the Tyneside club.

North Western Area

Main news from the N.W. Area Committee is the alteration of date for the Daily Despatch Rally, which will now take place on August 31st. Unfortunately

Presentation of awards to winners of the North-East Coast Model Aircraft Competition by George Robledo, the Newcastle United International, took place on the stage of the Regal Cinema, Monkseaton.

Woodford Aerodrome is not available on the planned date owing to intensive activities connected with the Farnborough Show.

It has not been possible to obtain the use of Salmsbury yet, so it will be necessary for clubs to travel to Tilstock for the first three Area contests, but it is hoped to even matters up for the clubs situated to the North of the Area as soon as possible.

MERSEYSIDE M.A.S. annual Clwyd Slope Soaring Meeting has been fixed for June 29th, and it is hoped to attract the usual number of enthusiastic glider fliers. The mixture is as before, with medals for the winners, and an additional selection of prizes for the runners-up. There will be a Nordic and Unrestricted class open to all, also a junior class. R. F. L. Gosling continues with his A/2 designs, while Ian Cameron has a new pusher Wakefield laid out; this following success with previous models of this type.

The recent spell of fine weather produced a number of fine flights by members of the **OLDHAM & D.M.A.C.,** the most notable of these being 29 : 00 by Jim Shaw, one of the club's regular performers. Flying his own-designed A/2, the model went o.o.s. and was followed by the owner for over 36 minutes.

Another excellent flight was that of Allan Lee's lightweight glider which set a new club record of 12 : 25. This junior is to be congratulated on exceeding the senior record in the same class.

With three contests flown in the past month, the **WHITEFIELD M.A.C.** have completed their " winter programme ", and are looking forward to the contest season proper. A. D. Bennett won the power duration event on 17th February with 2 : 33 and two 3-minute maximums, with H. O'Donnell placing second with an aggregate of 6 : 23 flying a Jetex powered job. A fortnight later the Freshman's Trophy was held in dull and windy conditions, resulting in a win for H. O'D. who flew a high aspect/ratio Nordic to an aggregate of 6 : 44, despite breaking the wing on the second flight. To complete the trio of meetings, J. O'Donnell won the glider event held at Affetside with the Bury and Bolton clubs, managing three 5-minute maximums.

London Area

Main news from the **ST. ALBANS M.A.C.** is relative to their Rally on August 24th, full details of which can be obtained from 96, Victoria Street, St. Albans. The pylon will be on hand for those wishing to break speed records, and a " spectator participation " event will take care of the wife and kids ! An increase in activity has been noticed in the clubroom, and the number of members who build there is such that they are now using the forms to build on ! !

The **NORTH KENT M.A.S.** had a very pleasant social evening on the 21st February, when prizes were presented by Mrs. Bruce. This club is proud of the fact that three of their members have been helped and encouraged to take up the career of aviation, and are now at R.A.F. Farnborough, being among the 32 successful applicants from over 400 entrants.

The **THAMES VALLEY M.A.C.** has continued to meet at weekends in Bushey Park, and plenty of new models, especially gliders, have appeared. The recent A.G.M. reported a successful 1951 season, and the treasurer asked for subs. to be increased to meet rising costs and demands (Fairlop, etc. !)—a request that was readily agreed to when it was pointed out that the club sub. was one of the lowest in the Area.

The **BATTERSEA M.A.C.** propose to hold a Team Race Rally on Fairlop on Easter Monday, 14th April, commencing at 11 a.m. Class A and B races will be run, with three prizes in each event, entry fee 2/- per model.

The value of reports in these columns is confirmed by the **LAMBETH M.F.C.,** who state they have enrolled several new members as a result of their last report in Club News. They have just held an interesting contest in which others may be interested, having had difficulty in getting juniors to participate in contests as they could not afford the same models as the seniors. The club purchased a kit for each member, and those who wish can have them on hire purchase. The contest is in two parts, the concours section being won by V. Rinaldi with a very nicely finished black and silver model, and a flying session will take place at Fairlop in a few week's time.

Southern Area

Eleven clubs were represented at the Area A.G.M. held at Winchester, the various reports intimating that better support would be welcomed from member clubs. It is evident that chaotic Sunday travel arrangements in this part of the country affect meetings.

A team glider comp. against the Farnham M.A.C. gave the **GRANGE M.A.C.** a clear win, E. John and A. Brooks flying 6 ft. span Super Trojans into the two top places in spite of continuous rain and a strong wind. Fine weather for a recent weekend encouraged members to make flights for Merit Certificates, 3 " A "s, 3 " B "s and part of an International C being completed. Joe Cox's " B " flights brought forth much comment when, after two 3½ minute flights he turned loose his lightweight hatchet glider for 13 : 56, *and* finished up with the model.

The " Hobart Trophy ", presented in 1947 by Lt. Commander Hobart for annual competition between the **SOUTHAMPTON M.A.C.** and Portsmouth was again retained by the Saints.

Formed in November, 1951, with twelve members, the **SWANAGE M.F.C.** has swelled its numbers to 31, and is believed to be the first aeromodelling club to be formed in Dorset. Indoor contests are a regular feature, and outdoor activities include all types of flying.

With which, I leave you all to get those last few finishing touches to your winter's efforts, and hope that you avoid a prang first time out ! The CLUBMAN.

SECRETARIAL CHANGES

HAWICK M.F.C.
G. S. Renwick, 152, Ramsay Road, Hawick, Roxburghshire.

REDDITCH & D.M.E.S.
D. H. Field, 8, Clent Avenue, Crabbs Cross, Redditch, Worcs.

SOUTH-EASTERN AREA S.M.A.E.
C. V. Christoff, 3, The Broadway, Haywards Heath, Sussex.

MONIFIETH MONARCHS M.A.C.
Ian T. McWalter, 7, North Balmossie Street, Monifieth, Angus.

ABERDEEN & D.M.F.C.
R. L. Cook, 253, Holburn Street, Aberdeen.

SOUTHAMPTON M.A.C.
A. C. Wemyss, " Gleniffer ", Wynter Road, Bitterne, Southampton.

BLACKHEATH M.F.C.
A. E. Dorset, 73, Barriedale, New Cross, S.E.14.

WORCESTER M.A.C.
J. E. L. Bishop, 3, Woolhope Road, Worcester.

WORKINGTON & D.M.F.C.
D. Hill, 75, Southey Street, Workington, Cumberland.

MERSEYSIDE M.A.S.
I. S. Cameron, 2, Forest Road, Overpool, Ellesmere Port, Wirral.

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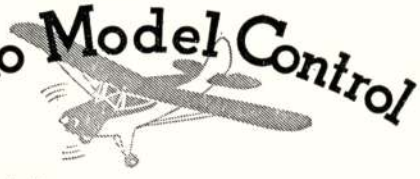

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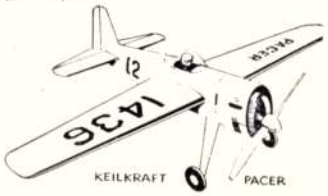

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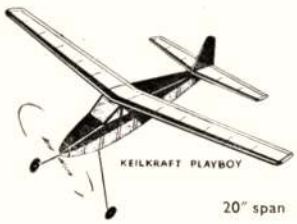

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An inexpensive rubber-powered model that presents no difficulty to the newcomer to the hobby. The clean attractive lines make for good flying, and the plane is robust enough to give many hours of pleasure on the flying field. Price 4/–

24" span RANGER class A Team Racer for engines up to 2·5 c.c.

Price 12/10

The kits contain authentic plans with full details for conversion to rubber power, building and flying instructions, ample building and covering materials, and plastic cowls.

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(RUBBER-POWERED)

Erco Ercoupe 20" span

14 Authentic Scale Models of popular light planes. (See list on right.)

All less than 5/-

Cutie—ready-to-fly glider	9d.
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Gort Space Ship (Jetex 50)	3/1
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16" Elf—rubber powered	3/8
24" Kirby Prefect—glider	3/8
15" MIG 15—Jetex powered	3/8
15" N.A. Sabre—Jetex powered	3/8
14" Hawker P1067—Jetex powered	3/8
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16" Fokker D-8	3/8
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18" Fairey Junior	3/8

All of these kits contain ample building materials and easy-to-follow plans and building instructions.

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20" Ercoupe	3/8
20" Globe Swift	3/8
20" Fairey 17	3/8
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21" Auster Arrow	3/8
21" Piper Family Cruiser	3/8
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SCALE ½" = 1".

FULL SIZE PLAN

BY

VIC DUBERY.

BLACK TISSUE AIR INTAKES ON NOSEPIECE.

F1.

CUT OUT FOR PLUG.

USE SAME OUTLINE FOR ¼" SHT. NOSE-BLOCK WITH PLUG BACKING.

F 2.

F 3.

F4.

F5.

F9.

F10.

ALL FORMERS FROM 1/16" SHEET.

TIP TURNED UP ⅛" WHEN WING FLAT ON PLAN. DIHEDRAL ¼" UNDER EACH TIP. TRIM STRUTS TO ACHIEVE THIS.

2 OFF 1/16" SHT. — W1.

10 OFF 1/32" SHT. — W2.

2 OFF 1/16" SHT. — W1.A.

F4.

BUILD BASIC FRAME OVER SHADED PORTIONS.

RUDDER HINGE.

F10

F9.

TISSUE FILLET.

20 SWG. SHAFT.

F3

CELLO PHANE SIDE WINDOWS COVER WITH TISSUE TO HERE.

COVER WITH 1/32" SHEET

PORT DOOR OUTLINE.

F6.

1/32" X 1/16" STRINGERS. SIDE & TOP.

1/16" RD. BAMBOO REAR PEG.

STARBOARD DOOR OUT-LINE.

F1.

F2.

F5.

F7.

F8.

DUMMY TAIL-WHEEL OUTLINE 2. LAMS 1/32" SHEET.

F6. 2. OFF.

3/16" X 1/8" X 1" PLUG.

W1.

W2.

TRACE FOR PORT WING.

W2.

1/8" SHT. GUSSETS.

X 1" 1/8 X 1/16

W2

1/16" SQ.

FLAP AND AILERON OUTLINE.

W2 CRACK SPAR & BEND

1/8" X 1/16"

1/16" SHEET TIP.

F7. 2. OFF.

F8. 2. OFF.

CIRCULAR STEP BOTH SIDES.

STRUT ANCHORAGE. ℄

24 SWG.

ATTACH TO WING AT 'X' BY CLOTH HINGE.

STRUT ACTUAL SIZE. 1/16" SHT.

TAILPLANE & FIN. 1/16" SQ.

SCALE OUTLINE.

W1. W1.A.

TOP & BOTTOM 1/4" SHT.

1/32" SHT.

BOTTOM ONLY.

TOP ONLY

X 1/8" X 1/16"

UNDERCARRIAGE STRUT HARD 1/16".

FREEWHEEL CAN BE FITTED FOR INCREASED PERFORMANCE.

PANTS-SIDE IS HARD SHT. AS IN VIEW ABOVE. CENTRE 4 LAMS 3/32" SHT. CARVED INSIDE TO FIT WHEEL.

22. SWG. SPREADER BOUND TO SPACER X ACTUAL SIZE.

AIRSCREW NON-SCALE.

ROUND OFF TIPS WHEN CARVED.

WHEEL - CENTRE IS 4 1/16" DISCS, OUT-SIDE 1/16" X ¼" RING, HUBS ARE CUP WASHERS.

WINDSCREEN OUTLINE.

POWER 2 STRANDS 1/8" X 1/30" 8" TO 15" LONG ACCORDING TO HEIGHT.