AEROMODELLER

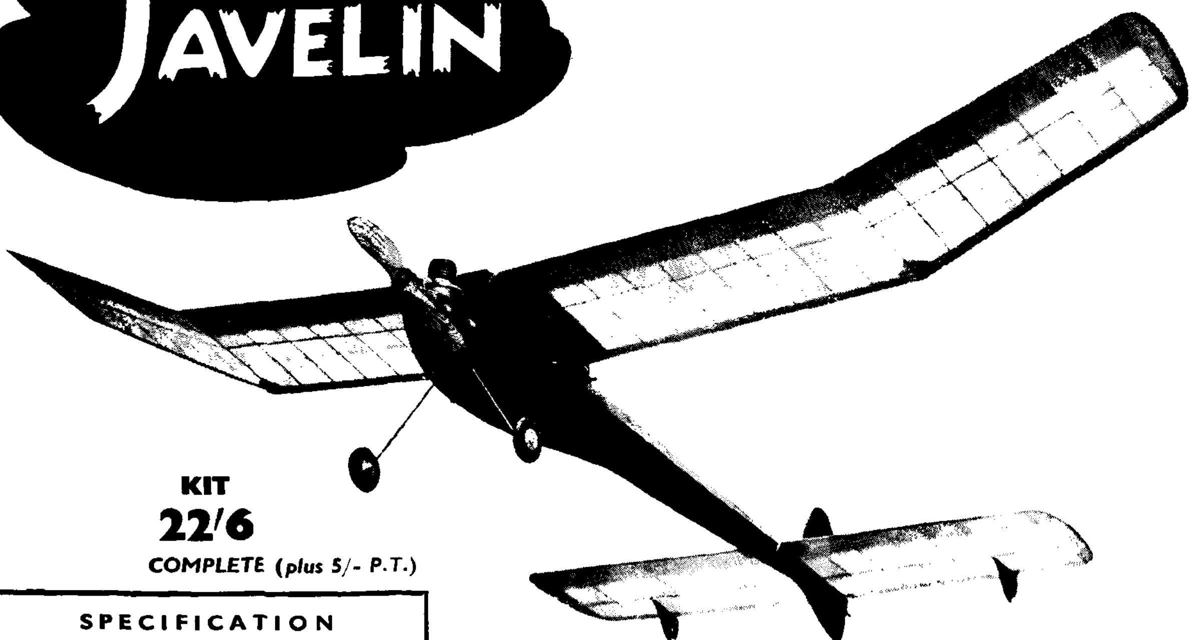
CONTENTS

- Junior and Senior versions of John Coasby's stunter—"Icarus"
- Sturdy, attractive and reliable Flying Boat, shown here — "Aquarius," by W. B. Heginbotham
- Scale free-flighter by Scotland's Robert Burns for 2-3·5 c.c. motors "Prestwick Pioneer"
- Australian Nationals report. Pictures and results of the New Year event "down-under"
- Details of a safe winding system for rubber - powered models by Garnett and Woolls
- Service Modellers in Germany
  A novel Balsa Hardness Gauge
  Three Italian engines analysed

APRIL 1951

1'6

JAVELIN



KIT

22/6

COMPLETE (*plus* 5/- P.T.)

SPECIFICATION

WINGSPAN 50". LENGTH 29"

WING AREA 283 sq. ins. (1·96 sq. ft.)

WEIGHT 12 ozs. WING LOADING 6 ozs./sq. ft.

★ **Fully detailed Plan and Building Instructions, Best Quality "Solarbo" Balsa Wood, Plywood, etc.**

★ **Pre-formed Undercarriage and Profiled Nose-blocks, Efficient Dethermaliser System.**

★ **Designed to give maximum flight performance with the new Allbon "Javelin" and Elfin 1·49 engines.**

TWO VITAL QUESTIONS ANSWERED. . .

How can I eliminate the vicious spinning tendencies shown by my Pylon layout models ?

The high thrust line and low C.L.A. of the "Javelin" have proved to have the best spin-prool and stable flight characteristics, including "snap-roll" recovery from any looping position.

How can I control the lightly loaded model under power ?

To control the power flight of the "Javelin" we have the most useful asset of increased wing and tail areas, replacing the unnecessary drag of a heavily-loaded machine and resulting in exceptional gliding qualities for contest work.

Designed to F.A.I. requirements this model represents the absolute in modern free-flight design. Featuring positive "flip-up" tail D/T system, compact fuel tank, timer, cut-out assembly, this kit is abundant in all that is necessary to make contest power flying a certainty.

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FORMULA "C" Tissue Adhesive Price **4d. and 6d.** per tube.

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Clear Dope. Medium tautening and suitable for small and medium models ...	—	8d.	1/-	1/9	2/6	3/6
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Specially prepared transparent medium which dries within 10 mins. of application. Renders surfaces immune from all methanol and diesel fuels.

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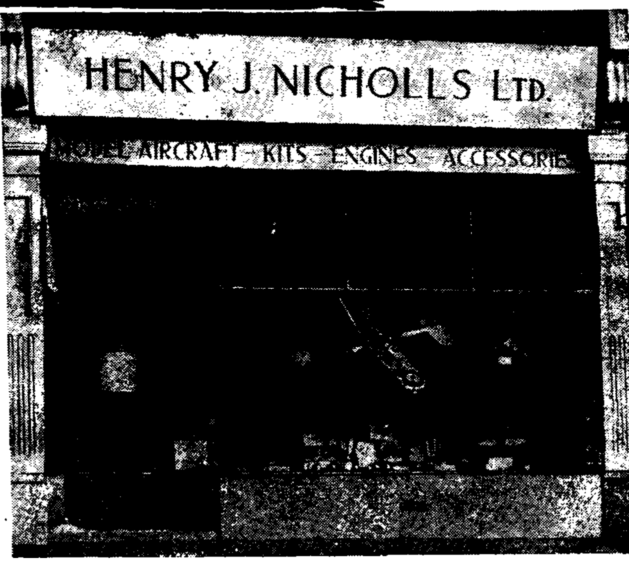

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We offer
★ **SOME ATTRACTIVE BARGAINS**

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Frog 500	75/–
Frog 250	72/6
Mills Mk. II 1·3 ...	91/1
Mills 0·75 (cut-out)	66/9
Mills 0·75 (no C/U)	60/9
E.D. Bee, 1 c.c. ...	47/6
E.D. Comp. Spec.	57/6
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E.D. Mk. IV ...	72/6
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Midge	5/6
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Mk. I Team Racer ...	19/3

K.K.

Phantom	22/7
Phantom Mite ...	14/1
Stunt Queen ...	25/8
Skystreak 26 ...	11/7
Stunt King	22/8
Ranger T/R... ...	12/10

VERON

Seafury	27/6
Spitfire	33/7
Focke Wulf ...	23/10
Bee Bug	14/–
Midget Mustang ...	25/8
Philibuster	28/8

Free-Flight Power

MERCURY

Stinson 105 ...	23/10
Mallard	18/4
Jnr. Mallard ...	13/9

K.K.

Ladybird	22/8
Pirate	14/8
Bandit	22/8
Outlaw	27/6
Slicker Mite ...	21/5
Slicker 50	30/6
Superslicker 60 ...	42/9
Halfax Spartan ...	38/6
Frog Powavan ...	22/6
Royle's Tiger Moth	56/6

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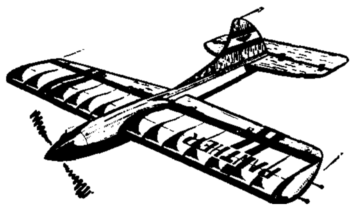

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A new Stunt C/L Kit for your "500", Amco 3·5 or E.D. Mk. IV. Will lead the field in 1951. A sleek, fast and 100% stuntable model featuring short moment arm and fully flapped wing. De-luxe kit includes spinner, stunt tank, etc. *Post free* **30/6**

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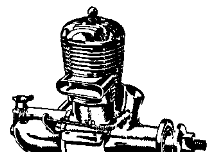
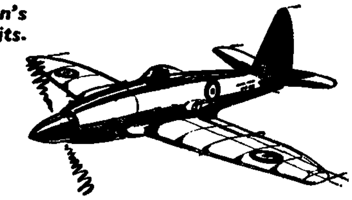
Learn C/L flying with this superb fully finished semi-scale model. Reinforced plastic throughout. Complete with C/L handle, lines and propeller. A special for your E.D. Bee *Post free* **39/-**



FROG "500" RED GLOW ENGINE

Capacity 4·92 c.c. Weight 7·75 oz. R.P.M. 4,000 to 15,000

The "500" is a superb engine for top performance in C/L or Free Flight. Superior to any similar capacity engine, yet at an exceptionally low price. **75/-**



VERON 'WESTLAND WYVERN'

Span 28¾ ins. 1/20 Scale.

Phil Smith gives us yet another winner. A fast, highly manoeuvrable Scale C/L model of the Navy's new strike fighter. Fully comprehensive kit includes detailed plan showing installation for "500", Amco 3·5, E.D. Mk. IV engines. *Post free* **28/8**

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Capacity 1 c.c., 7,000 plus r.p.m. Weighs only 2¼ ozs. Overall height 2¼ ins. Britain's most popular engine for all the smaller C/L and free flight models. *Post free* **47/6**

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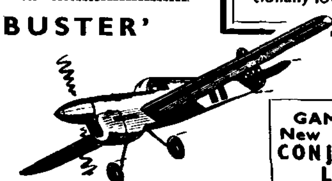
Yet another winner by Phil Smith. Superbly kitted with supersonic spinner, moulded cockpit cover, "Sorbo" wheels and tank parts. Accurately cut high-grade balsa and detailed plans. For Frog "500", E.D. Mk. IV, Amco 3·5 and similar motors. **28/8**



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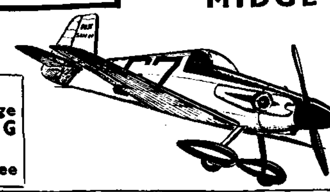

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A scale C/L model which is ideal for team racing. Will complete the full stunt schedule and has a top speed of over 80 m.p.h. Spinner, Stunt tank parts, moulded cock-pit cover. Sponge rubber wheels and pre-shaped parts. **25/8**

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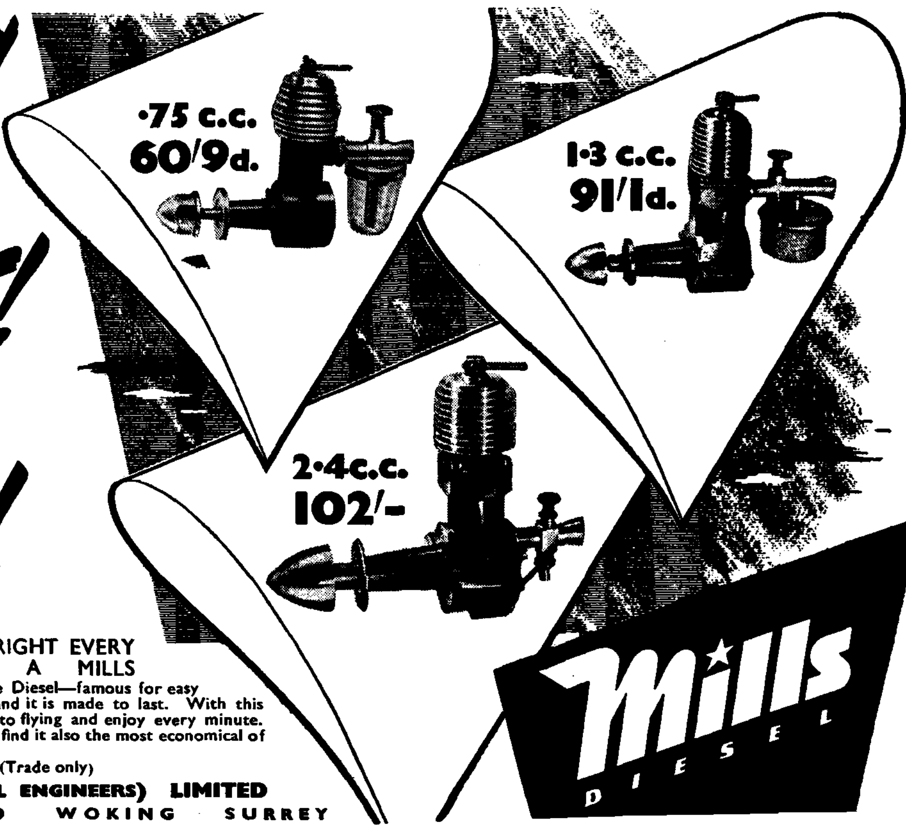

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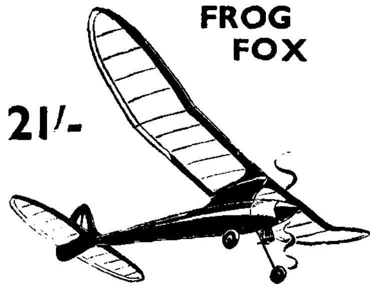

21/-

"FOX"—NEW ! ! A 40 in. span "Simple-to build" pylon duration model for up to 1·5 c.c. motors. "FOX" features ready formed fuselage shells.

CONTROLLINE

Veron Mustang ...	21/–
Veron F.W. "190" ...	19/6
Veron Philibuster ...	23/6
Veron Sea Fury ...	22/6
Mercury Musketeer ...	19/6
K.K. Team Racer ...	22/6
K.K. Skystreak "26"	11/7
K.K. Stunt King ...	18/6
K.K. Stunt Queen ...	21/6
Aerobat	10/6

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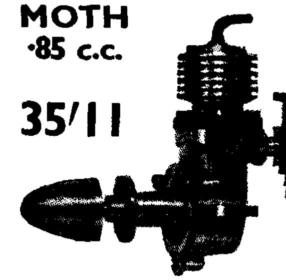
D.C. "350" ...	£4 7 6
Frog "500" ...	£3 18 9
Elfin 1·49 c.c. ...	£2 19 6
Elfin 2·49 c.c. ...	£3 10 0
Yulon "29" ...	£4 18 8
Yulon "49" ...	£6 3 6
Mills ·75 c.c. ...	£3 0 9
Mills 1·3 c.c. ...	£4 11 1
E.D. Bee ...	£2 7 6
E.D. Mk. IV ...	£3 12 6

MOTH ·85 c.c.



35/11

See "Aeromodeller" February issue test report on this engine.

GLIDER

Keilkraft Invader ...	6/6
Keilkraft Soarer Minor	8/6
Keilkraft Cub ...	2/6
Mercury Norseman ...	17/6
Keilkraft Soarer Baby	5/–
Keilkraft Soarer Major	11/6
Keilkraft Cadet ...	4/11
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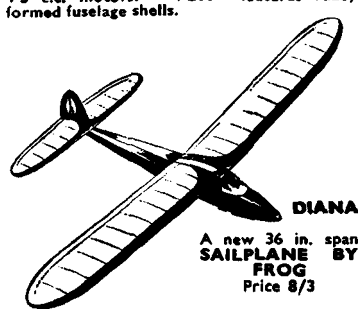
Veron "Sea Hawk"	7/4
Frog "45"	28/10
Halfax Hermes ...	15/6
Frog Strato D. ...	15/–



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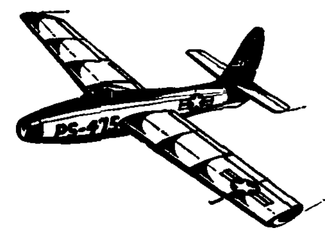

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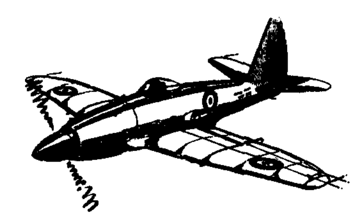

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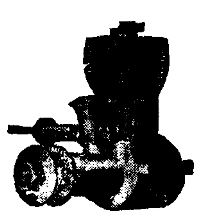
Super Scale C/L Kit. 26" Span.
For Engines 2·5 c.c. to 5 c.c. 28/8



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Don't hoard cash in your model box. Ask for a generous allowance for that engine you aren't using. It will pay your deposit and cut a hole in the other payments.

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ENGINES	Cash or C.O.D.	Deposit	Six mthly pymts.
Kalper ·32 c.c. Diesel	52/6	12/6	7/6
Allbon Dart ·5 c.c. Diesel ...	65/2	13/6	9/6
Mills P ·75 c.c. Diesel	60/9	12/6	9/–
Frog 100 1 c.c. Diesel	48/–	9/6	7/–
E.D. Bee 1 c.c. Diesel	47/6	9/–	7/–
Elfin 1·49 c.c. Diesel	59/6	12/–	8/7
Frog 180 1·6 c.c. Diesel ...	55/–	10/–	8/4
Elfin 2·49 Diesel	69/6	14/6	10/–
D.C. 350 3·5 c.c. Diesel ...	87/6	15/6	12/9
E.D. Mk. III Series II	72/6	15/–	10/6
E.D. Mk. IV 3·46 Diesel ...	72/6	15/–	10/6
Frog 500 5 c.c. Glowplug ...	75/6	15/–	11/3
ETA 19 3·2 c.c. Glowplug ...	124/5	24/5	17/6
Yulon "Eagle" 5 c.c. Glowplug	86/10	15/6	12/9
Yulon "49" Glowplug ...	124/5	24/5	17/6
E.P.C. Moth ·85 c.c. ...	35/11	10/–	5/–
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E.D. Mk. III Receiver only ...	75/–	12/6	11/1

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E.D. Comp. Special 2 c.c. Diesel ...	35/–
Allbon Arrow 1·5 c.c. Diesel	37/6
Frog 500 5 c.c. Glowplug	55/–
Yulon 49, new and unused	95/–

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Compliments on the efficiency and ease of operation of this unit are flowing in from all directions. My radio staff are working overtime to satisfy the demand, and so far I can give delivery within a few days.
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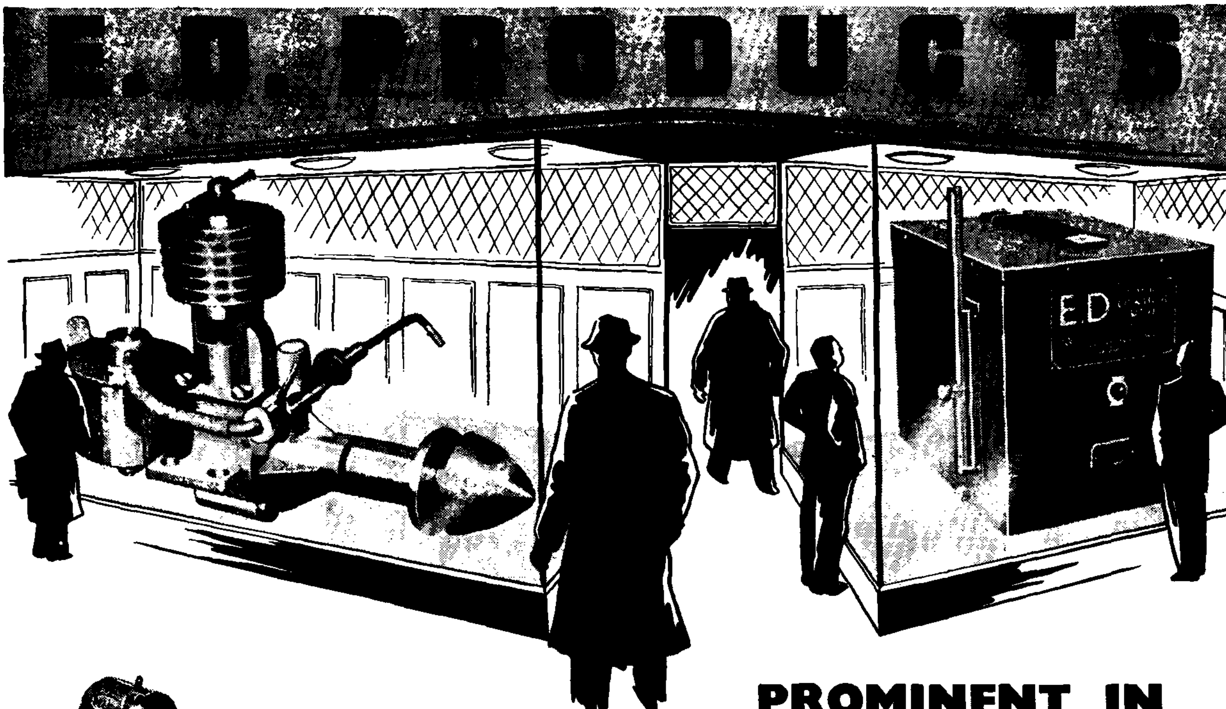
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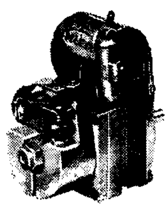
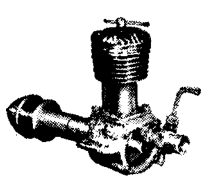
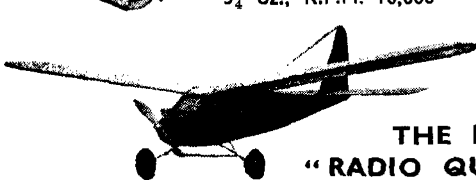
E.D







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"Covers the World of Aeromodelling"

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Alice at the Customs House !

LACK of space prevents us giving here the full history of the recent decision in the High Court that has led to the imposition of purchase tax on kits, engines and accessories. In a sentence, the High Court's decision was to the effect that aeromodelling was an " amusement " within the meaning of the Act. Since Parliament has laid down that " amusements " are liable to purchase tax, it followed that model aircraft kits, engines and accessories became liable. It is not for us to offer a single word which might be thought of as criticism of the Court's decision . . . if only because we accept completely the correctness of this decision *as interpreting the working of the appropriate Statute*.

We do not believe that when Parliament approved the inclusion of the word " amusements " in the Act, the intention was to bring aeromodelling kits, engines and accessories within the scope of purchase tax.

However, now that the High Court has ruled as noted above, the Customs & Excise, no doubt with well meant intentions, have sought to bring under liability for tax every possible item used by the aeromodeller. They, of course, are " within their rights ". The Act says " . . . and accessories thereto " ; and thus it is claimed that a control-line petrol tank or handle, prop spinner or engine spare, *down to the smallest part*, is liable to tax ! In fact, the Customs & Excise use the expression " an identifiable part of the whole ", and it is in this respect that we consider that the whole matter has passed from the solid realm of sense into the ethereal realm of nonsense. The Customs & Excise, in the interpretation of the Act, are kind enough to exclude a nut and bolt on a petrol engine as " non identifiable ", but they persist in treating all other parts of the smallest engine as " identifiable parts " and, therefore, insist they are liable for tax when sold separately.

Thus, for example, when some aeromodeller sends his engine to his local model shop for repair, he will receive a bill for labour in carrying out the repair, to which will be added the cost (say) of a few pence for a new con-rod, plus a few further pence, being purchase tax on the said con-rod. As the purchase tax on engines, kits and accessories is calculated, not on the retail selling price, but on the price at which the item is charged by the manufacturers to the retailers, the percentage of purchase tax payable will vary as between different manufacturers' products . . . it's all *so* simple !

We feel sure that even the youngest of aeromodellers will appreciate the chaotic state of affairs which must exist in the offices of some of our largest aeromodelling manufacturers, and the amount of additional book work which must be done to calculate the purchase tax payable on all these very small " identifiable parts of the whole " !

We ourselves are sure that the amount of additional work which has now been created by the Customs & Excise, solely on account of their one-hundred-per-cent. rigid interpretation of the Statue, must exceed by a large margin the amount of tax collected.

Surely here is Bureaucracy run amok, if not run mad !

Would that we had a pen such as with wit and satire we could caricature and " guy " this present state of affairs. Unfortunately, ours is a logical and practical mind which cannot comprehend fully the enormous " nothingness " of all that this amounts to !

However, the position is legalized by Act of Parliament, and only an Act of Parliament can vary it. Write to your M.P.! Write to your next but one M.P ! Write to all the M.P's ! Let all the Clubs and the S.M.A.E. write to all the M.P's ! Solicit them, send them broken con-rods in envelopes ; send them worn out pistons as well, and ask them if there is any sense in a lot of grown men filling in forms, and other grown men calculating and analysing the figures on these forms, so that, at the end of a year, perhaps sufficient tax has been collected as will pay the salaries of one or two tax collectors !

Uninvited Guests

A LETTER received from the P.R.O. of the R.A.F. Odiham and District M.A.C. is deserving of wide attention, and every aeromodeller with the interests of the hobby at heart should read, mark, learn, and thoroughly digest the following. Mr. Goldsack writes :—

" *We request that all clubs and people desiring to use R.A.F. Station, Odiham, for model flying should contact the Honorary Secretary prior to their visit.*

This is for two reasons ; one, that as the aerodrome is operational there is a possibility that a visit ' on spec ' will result in disappointment ; and two, that our permission to fly there is granted subject to the terms of our Insurance contract being adhered to. This contract states that flying may be carried out by the R.A.F. Odiham and District M.A.C. and by clubs expressly invited or supervised by the O.D.M.A.C., all being subject to the consent of the Officer Commanding.

You will appreciate that we do not in any way wish to monopolise this ideal flying ground—in fact we are always pleased to meet our fellow aeromodellers. But, because the place is so ideal, we wish to ensure that no untoward incident happens to place in jeopardy something that is fast becoming a rarity—a good flying field.

I wish to add in closing that any club desiring to fly at Odiham will get our whole-hearted co-operation in obtaining permission, but anyone who does so without consent is rendering us liable to lose our privilege and also to nullify our insurance."

With memories of other R.A.F. aerodromes in mind, we thoroughly endorse the Odiham club's remarks, for we want no recurrence of former troubles that resulted in the loss of good flying fields to many enthusiasts through the unthinking attitude of a stupid few.

To the individuals who have (obviously) been trespassing at Odiham, we say ' play the game ', and set about obtaining permission in the correct manner. The ignoring of such common courtesy is becoming far too frequent, and it is high time it stopped.

Apologies All Round

Our comparative list of American and British records (page 76, February issue) brought a quick comment from some readers, taking us to task for not appreciating that current American records are based on a three flight aggregate, with a ten minute limit per flight.

An air mail check up with the A.M.A. brought full details by return, and, to quote " Russ " Nicholls :—

" Your critical reader is both right and wrong. In other words, our free-flight scoring and records are based on the total of three official flights. Having a ten-minute flight limit it is possible to encounter a tie score in the event any two contestants under ideal conditions should make three official flights of ten minutes or more. This has not occurred as yet, although several contestants have made a near perfect score, including Carl Wheeley of A.M.A. Headquarters, who made three official flights totalling 29 minutes 45 seconds in the Plymouth Meet last year.

" In connection with the scoring and records of control-line speed, these are based on a single flight."

Well, there it is—and our apologies are due to our American friends for not taking into account the full requirements. For our part, we have a leaning towards the American system of a three flight aggregate for records purposes, this view we know also being held in the North West Area. Frankly, with some exceptions, the majority of our single flight records are more an indication of exceptional meteorological conditions than any particular excellence in model design.

The Yanks are Coming !

We are very pleased to announce that attendance of a full American Team at the 1951 Wakefield Finals in Finland is assured. A sponsor has been found who is guaranteeing the transport of the team members to Helsinki and back, travel being by one of the " Queen " boats from New York to England, thence by air to Scandinavia.

Our informant is Ed. (The Shirt) Lidgard, member of the 1949 team which put up such a good show at Cranfield, and one of a three-man " American Wakefield Committee " which has been making strenuous efforts to ensure American participation at the 1951 event. (Ed. will long be remembered for his Fire-extinguisher act at Cranfield !)

It is of interest to note the similarity of the American Team selection system with our own. Knowing the interest of their 1949 team members in our Area Elimination plus Trials method, it is no surprise to find that this has apparently influenced the U.S., who are conducting an initial Eliminator in twelve widely separated districts to decide who will compete in the Semi-finals (Trials) on May 20th. Those selected for Semi-final competition must average at least 2 minutes, and place within the top 15 per cent. at their Elimination meet.

The Semi-finals will take place at Sacramento, California ; Chicago, Illinois ; Dallas, Texas ; Atlanta, Georgia ; and Philadelphia, Pennsylvania. Two members will be chosen from the California meeting, and one each from the remaining four centres. Though there are some obvious snags in the final selection, we must remember the vast distances to be coped with in the States, which make it virtually impossible to conduct a centralised Trials as in this country.

A final point that we recommend to British aeromodellers is the special entry fee charged to all aspirants. $2.50 is the entry fee per contestant (equivalent to about 17/6d.), which sum will be used to defray contest expenses and help pay the fares of successful team members to New York and back. Whilst such a high fee would not produce results in this country, we strongly advocate a special " double-entry fee " for the British Eliminators, for the expenses to be met are high, and it may further serve to deter some of the hopeless and frivolous entries that clutter up the British events. (We would appreciate the opinions of our readers on this subject.)

Wakefield Musings

In the course of much nattering over the topic of the Wakefield—and British Team selection in particular—the following point has come to light. Has it ever struck you that to gain a place on the British Team denotes an even greater achievement than actually winning the Trophy ?

Look at it this way. To-day a successful member must have slogged his way through two Area eliminating rounds, and the final Trials. In the Area meetings he has to beat his own immediate rivals (no mean feat in some Areas), and at the Trials proper he is up against 99 men who have proven that they are top-grade Wakefield fliers. Allowing for the relative weaker opposition in some districts, it cannot be denied that a good 75% of the Trials competitors are first grade men.

At the actual Finals what do we find ? Firstly a fluctuating entry (31 in 1948, 95 in 1949, and 63 in 1950) of which a number cannot be said to reach the average standard of British Wakefield ability. At a fair estimate we would say that no more than 25% of any Finals entry is up to British Trials standard, for allowance must be made for the percentage of models proxy flown—a " second best " method at any time.

Whilst various systems have been recently advocated to " improve " the method of British Team selection, we have no hesitation in stating that (*a*) we have the fairest and most democratic system in the current " two Eliminators and Trials " method, and (*b*) the very nature of the present selection system cannot help but produce a very strong Team, capable of holding its own with the rest of the aeromodelling world.

We feel sure that any attempt to appoint even part of the Team by any other method will prove most unpopular. Nomination makes no allowance for the fact that an individual may have " gone stale " or otherwise be off form, neither does it accommodate the new man who may have at last reached the top grade—and remember we have new names cropping up each year ! Nor can we see eye to eye with those who advocate choosing the Team on the aggregate of the Eliminators and Trials, for it must always be remembered that at other than a centralised meeting, weather and other conditions are not alike for all the contestants, and whatever we do, we must always ensure that everyone has the same chance.

The only improvement on the present system we can suggest is to have more than one centralised Trials meeting, but at present that is impracticable from many points of view.

More Russian Records !

F.A.I. Information Circular No. 50 credits four more International model aircraft records to the Russian pool as follows :—

Cl. I—B, Ic. (Tailless Power-Height)—
Boris Parparov 12th August, 1950 1,788 metres.
Cl. II—B, Ic. (Tailless Hydroplane Power-Height)—
E. Rakov 28th July, 1950 1,550 metres
Cl. IV, Ic. (Tailless Sailplane-Height)—
Moti Koutcer 17th August, 1950 547 metres
Cl. III—B2, (ii)d. (Control Line Speed—Special Aircraft, Gyroplane)
Voldemar Rounkov 17th October, 1950 67·320 km/hr. (42·075 m.p.h.)

Both Parparov and Rounkov were using Russian K.16 engines of 4·4 c.c., whilst Rakov used a Bachkine motor of 2·5 c.c. It would be interesting to know just what method the Russians are using to determine height records with model aircraft, for if it is a miniature barograph, the rest of the modelling world would be most interested in working details. The lack of suitable equipment of this nature has brought about a total lack of interest in height records in Great Britain.

Warning—Dodgers About

In the interests of aeromodelling sportsmanship we pass the following warning to Area Officials in connection with the two Wakefield Eliminators. We learn of a few smart Alicks who, realising that they have no earthly chance of proceeding to the Trials via competition in their own Area, are contemplating travelling to other Areas where the local opposition is not so hot.

We strongly deprecate such action, and trust that particular note will be taken at such meetings where these " dodgers " turn up, as we are sure the S.M.A.E. Competition Secretary will be only too ready to collate their times into the results of their proper Area.

Wakefield Draw

In view of the success of the 1950 Wakefield Draw, a further collection has been organised on similar lines in order to ensure British participation in the four main International Championship events in 1951. Financial commitments are much greater this year, with the Wakefield again in Finland, A/2 in Yugoslavia, Power Championships in France, and Control Line in Belgium, and prestige demands that we compete in all such affairs.

Tickets have been distributed to all affiliated clubs and country members, but should any reader have difficulty in obtaining supplies, application may be made to " Clubman " c/o this magazine. Tickets are 1/- each, and prizes range through free trips to France and Belgium for various International contests, right down to 50th place, which may (or may not !) be a tube of balsa cement !!

C/L Championships, Wembley Stadium

Arrangements for this big event of the control-line season are now finalised, and readers should take special note that the date has been brought forward from the 21st July to Saturday, the 14th July.

Entries must be in the hands of the S.M.A.E. Competition Secretary not later than 1st June, and it is emphasised that pre-entry is obligatory.

National Air Races

Saturday, the 23rd June, 1951, will be a very busy day at and around Hatfield Aerodrome, Herts., the occasion being the Festival of Britain National Air Races, organised by the Royal Aero Club. Events will be :—

THE KING'S CUP AIR RACE—British Handicap Race.

GROSVENOR CHALLENGE CUP RACE—International Speed Race.

NORTON-GRIFFITHS CHALLENGE TROPHY RACE—International Speed Race.

KEMSLEY CHALLENGE TROPHY AIR RACE—International Speed Race.

S.B.A.C. CHALLENGE CUP RACE—International Speed Race.

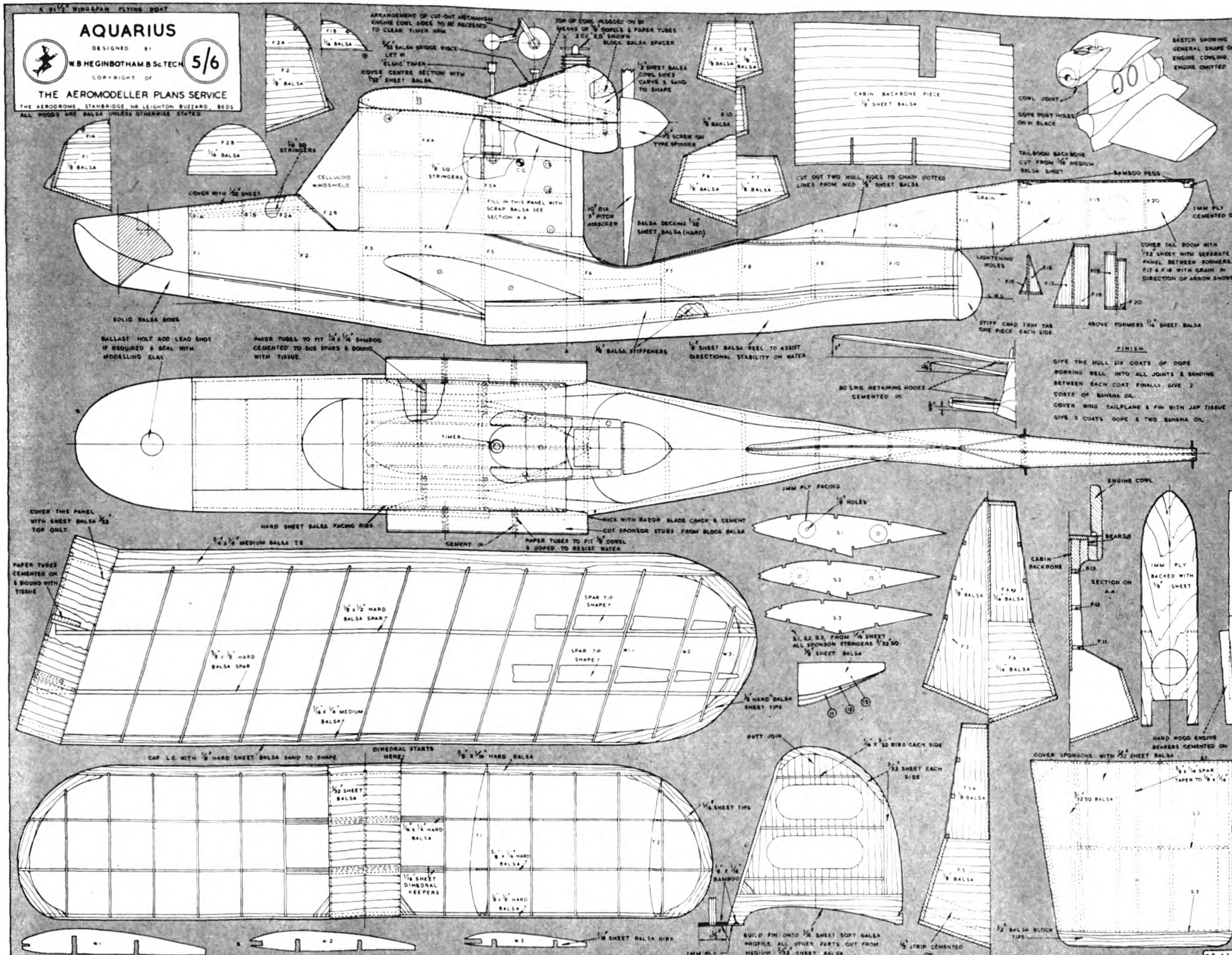
AIR LEAGUE CHALLENGE CUP RACE—International Speed Race.

ROYAL AERO CLUB JUBILEE TROPHY RACE—International Handicap Race.

Those aeromodellers who boggle at the few regulations imposed at our meetings would open their eyes if they could see the official General and Special Regulations distributed for the above contests—four foolscap pages of them ! However, it will not be necessary to study such material before attending as a spectator, and we have no doubt that many keen modellers will be eager witnesses of the events at Hatfield.

Cover Photograph

Designer Heginbotham retrieves his " Aquarius " flying boat after enjoying all the thrills of water flying in the beautiful surroundings of a Lancashire reservoir. " Aquarius " is fully described on the following pages.



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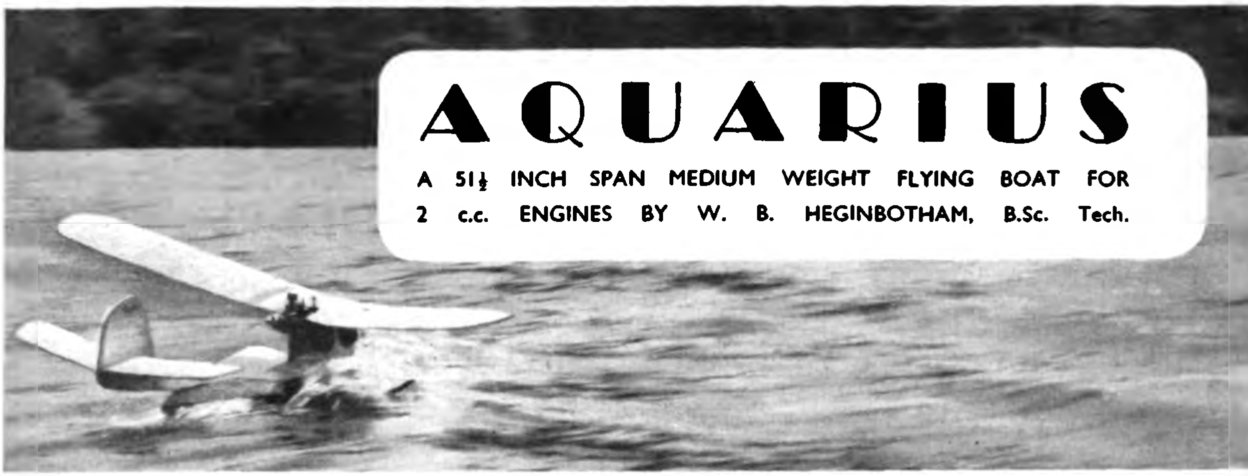


AQUARIUS

A 51½ INCH SPAN MEDIUM WEIGHT FLYING BOAT FOR 2 c.c. ENGINES BY W. B. HEGINBOTHAM, B.Sc. Tech.

THE fascination of mastering two elements with one machine is indeed very real, and anyone who cares to divert at least part of his modelling enthusiasm to the building and flying of either model Flying Boats or Seaplanes will be amply rewarded.

" Aquarius " is not a high performance machine but its flying and water characteristics are suitable for anyone who is interested in beginning this very intriguing branch of our hobby. Although a reasonable standard of " scalishness " and air / water efficiency has been preserved, profiles consist in the main of straight lines, and thus all awkward contouring work has been eliminated. It is not, however, a model for a raw beginner, but will make a very suitable first " water " model.

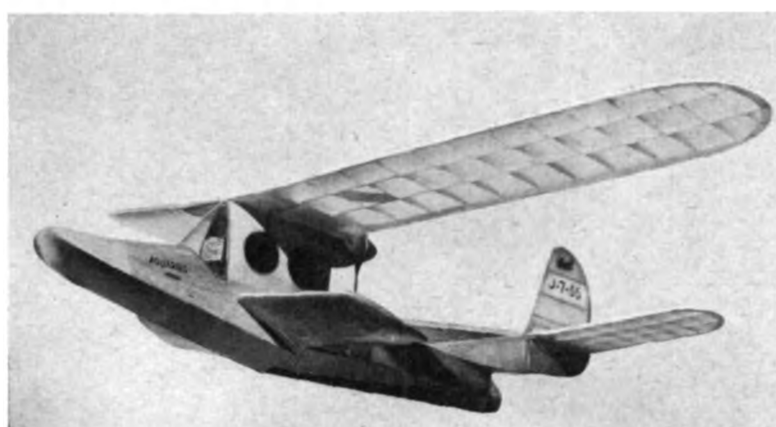
The reasons for adopting a pusher layout are as follows :—(*a*) The absence of the airscrew over the front of the machine enables adequate forebody volume to be maintained without an extremely high thrust line. Thus the risk of " nosing " over on landing is reduced and the " digging in " effect present during the initial take off acceleration period is reduced. There is no disadvantage in a low freeboard aft. (*b*) The other feature is that if the model is accidentally upset in the water it floats on the leading edge of the wing and the bows with the hull inclined at such an angle that the engine remains clear of the water.

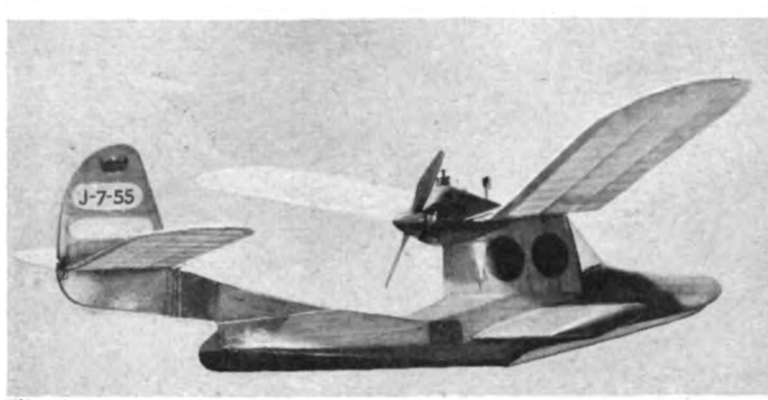
The machine is very stable both in the air and on the water, and if correctly constructed will give many hours of instructive pleasure.

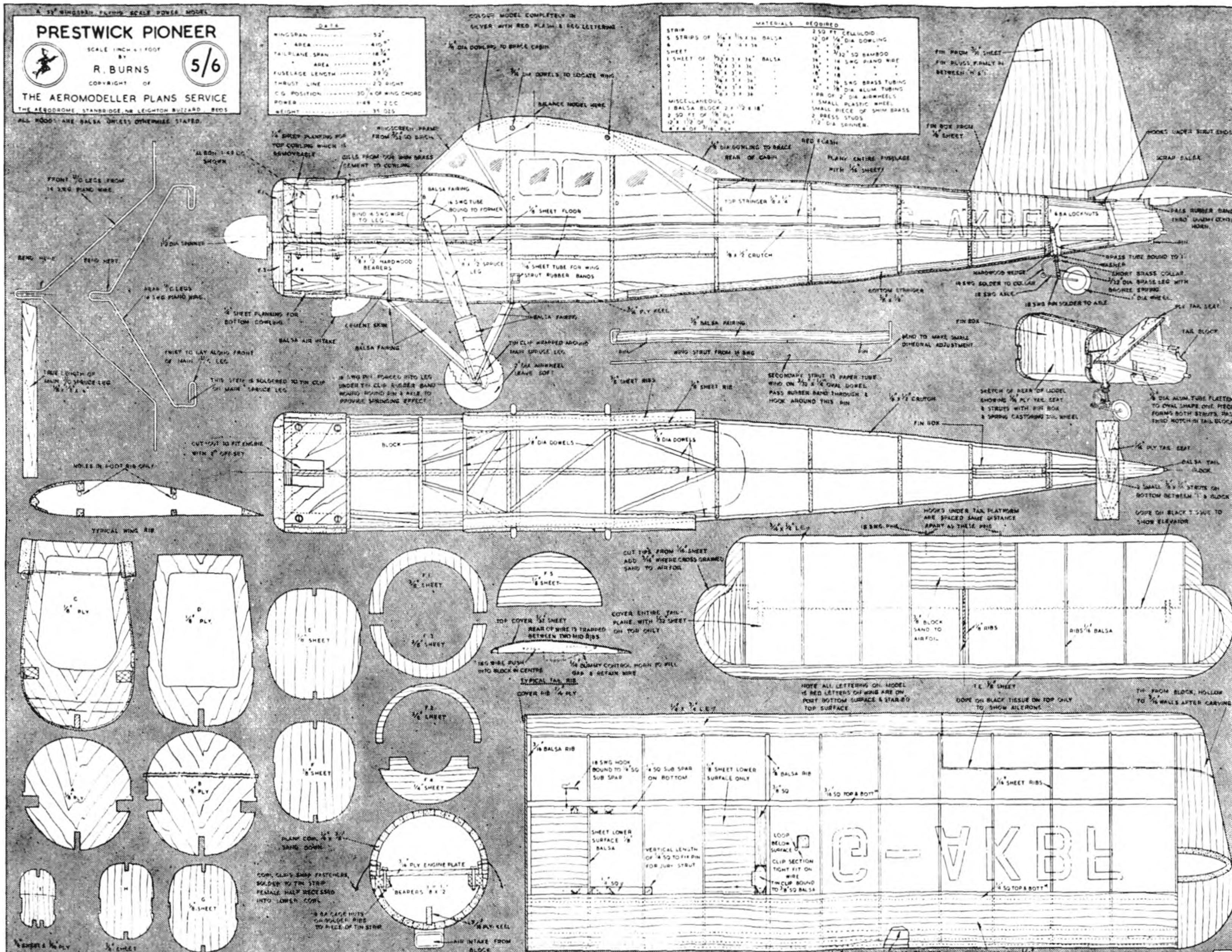
The take-off when the machine is correctly trimmed is fascinating, especially if the water is calm. About a 30 to 40 ft. run is taken and all the phases associated with a full size take-off can be noted right from the first hop onto the step, to the termination of the wash and final unsticking.

THE DESIGNER
A Bachelor . . . . aged 25 . . . . Research Student at Manchester University . . . . started modelling in 1937 and like most of us has not stopped since . . . . other hobby is motor cycling.

The original model has been flown successfully from roughish water (about 6 to 8 inch waves) although this practice is not recommended over open water, as trouble is experienced after touch-down, due to the fact that the model is blown over and over at a fair speed downwind, indeed it may take some pretty hectic rowing to even catch the model.







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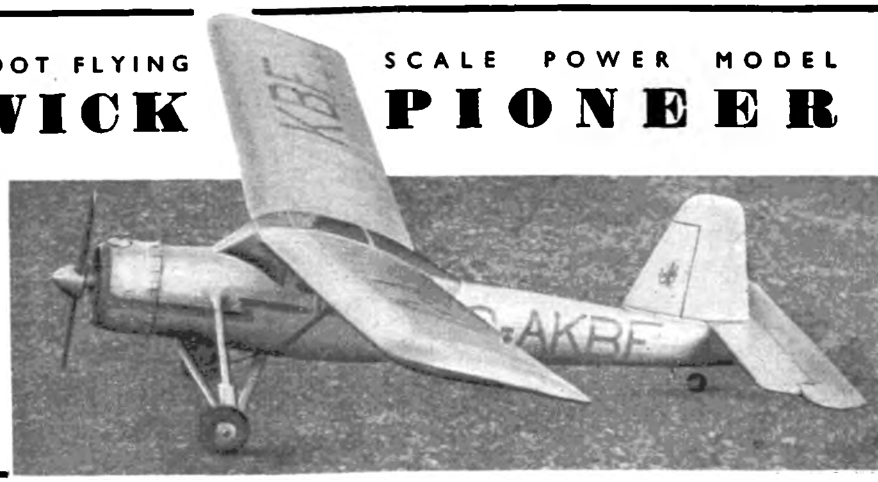
A 1 INCH TO 1 FOOT FLYING SCALE POWER MODEL

PRESTWICK PIONEER

BY ROBERT BURNS

Treasurer West of Scotland Area . . . chairman, Ayrshire Aeromodellers Association . . . Age 42 . . . Chartered Accountant . . . currently working on research for power ratio contest designs . . . also keen on photography.



THE " Pioneer " is a natural flying scale model, of high wing layout, yet with enough unusual items to be distinctive. So far only a prototype exists, and that has been the subject of numerous development changes which makes it difficult to be sure that the final version will be the same as the one from which this model was built.

In fact, the cabin interior is " free lance," as no details could be obtained apart from the number of seats. There have been several Service, civil and ambulance layouts tried, from two or three seats plus radio, to only one seat plus ballast, so that some doubt is excusable. The prototype has been flown with various dihedral angles and at least three fin shapes, so that if you are able to check with a later edition, you may find yet another change. One item which is noticed in the flight pictures of the " Pioneer " is that the undercarriage seems longer than that on the model, but this is due to the very long travel of the oleos, the wheel being more than a foot lower in flight than on the tarmac, when the model length is correct. It is reported that when the engine is run up, the " Pioneer " rises quite a bit on the oleos, which must be quite a sight.

Producing a flying scale model is a matter of having the right size and weight for the engine to be fitted, and the size of a 1/12th scale model being 52½ inches span, it was decided that a Kestrel 1·9 c.c. should be used, which gives around 22 ounces static thrust. This would require the weight of the model to be 32 ounces or so, and heavy construction was used to bring the weight up to that figure, which was exactly reached. This heavy weight gives a fairly fast model and a strong nose on the fuselage while safety wing and tail fixings were decided on, to absorb the bumps. This worked out very well, as the first few flights had very bad luck, such as hitting a tree and falling into a rocky river, but no damage resulted.

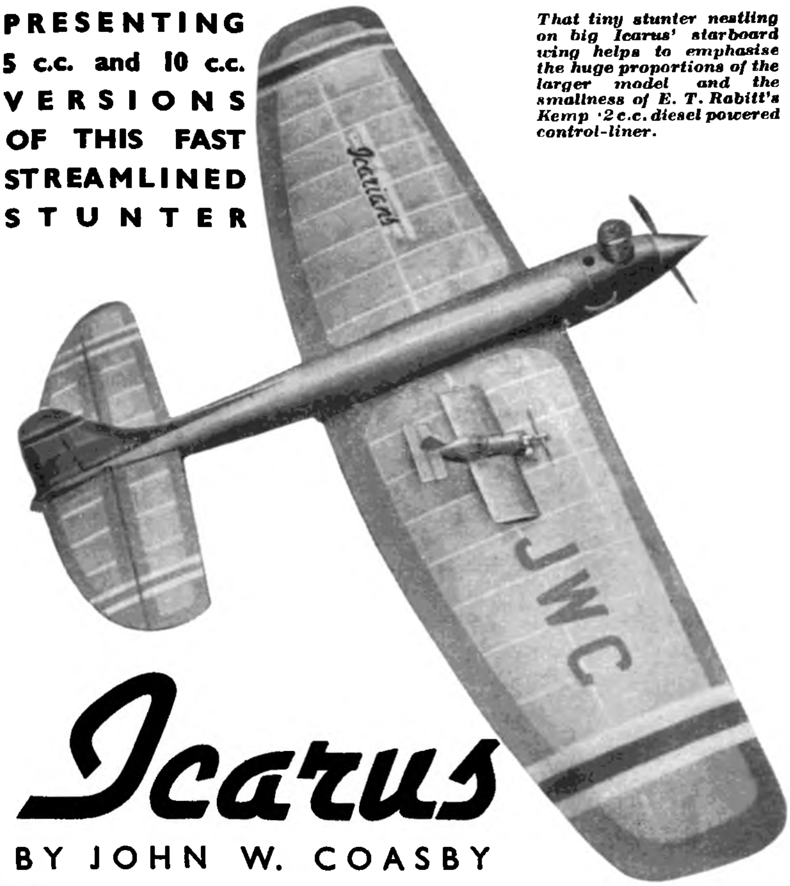
It would be easy to reduce weight to around 24 ounces, using balsa formers, with thin ply facings for the first two, and a size smaller in wing spars, and sanding the fuselage covering down a bit more, covering with thin tissue in place of bamboo paper, and using light wheels. This would allow a good 1 c.c. engine to fly the model, especially if the cabin interior is left undetailed. Any modern 1·49 would take the original weight with ease.

No matter what engine you decide to choose for use, you will find that the large cowl puts the original airscrew which you would use on free flight duration models out of court. It seems that the airflow around the cowl, blanks the blade hubs, and I had to change from the normal 8½ by 5 to first a 9 by 4, then a 9½ by 4, and finally a wide-bladed 9½ by 5, which gives the best results, being a Truflex 11 by 5 cut down. It was found that when a very small fast-running propeller such as an 8 by 4 was used, there was not enough thrust to taxi the model on grass ! The tank, cut down from an old timer, and using a rubber bung, which is pushed down for short flights and pulled up for long ones, is very accurate indeed, but with large airscrews you get almost double the flight time you expect from trials with small ones. Any tube with a closed bottom will serve the same purpose ; I have seen metal pill boxes which would be ideal.

Full instructions for building this model, and the designer's trimming notes, are supplied with each copy of the full-size plan, which is available through the AEROMODELLER Plans Service, price 5/6, post free.

Robert Burns' prototype model is of the 52 ft. 1½ ins. span Pioneer II with the Alvis Leonides motor. Diligent scale enthusiasts may adopt the very latest Pioneer tip shape from G. A. Cull's drawing on page 242 ; but the difference is very slight. Colouring is all silver, with a red cowling front and fuselage flash, plus red registration lettering. The fin crest is in red and black.

PRESENTING 5 c.c. and 10 c.c. VERSIONS OF THIS FAST STREAMLINED STUNTER



That tiny stunter nestling on big Icarus' starboard wing helps to emphasise the huge proportions of the larger model and the smallness of E. T. Rabitt's Kemp ·2 c.c. diesel powered control-liner.

Icarus

BY JOHN W. COASBY

ICARUS senior (780 sq. ins.) is the successful Taurus in streamline, the same aerodynamic layout, the same power unit, and approximately the same weight; but the difference lies in its considerable increase in speed, which is enough to enthuse even most ardent anti-control-liner. And as if the reaction of a four pound stunter zipping around loops, bunts and eights on 100 ft. lines is not enough, each flight finishes with a glide of over two laps. . . and that's a distance of over 650 feet!

Specially prepared for the much larger band of 5 c.c. enthusiasts, Icarus Junior is a 42-in, 325 sq. ins. version of its bigger brother. Full size copies of the ¼-scale plan of Icarus Junior opposite can be obtained, priee 4/6 post free from the Aeromodeller Plans Service. Please specify plan CL/422 when ordering Incarus Senior, and note the increase in price to 5/6

> Secretary Icarians Club . . . Age 31 . . . Aeromodeller draughtsman . . . . a modeller for 15 years . . . main interest is control-line . . . also keen on motor-cycling and reading science fiction . . . . wife is his sharpest critic

Construction

Cut engine bearers to length and mark for position of bellcrank pivot block. Bolt engine to bearers and glue and screw pivot block into position.

Remove engine from bearers and lay over plan. Cement ¼ in. × 7/16 in. crutch to bearers and temporarily cement into position ¼ in. × 7/16 in. spacers behind former positions. Make and solder up tank. Remove crutch from plan, cement and screw U/C box to F2, and cement in all formers. Place strong rubber bands around crutch in front of F2, and then remove spacer behind this former. Install tank, bell-crank, control rod and lead-outs, then in the case of the large model cement in position the fuselage backbone. Commence planking fuselage with ⅛ in. × ⅜ in. strips in the case of the large model, with 3/32 in. × ⅜ in.strip for the small model.

When half planked, remove temporary spacers. Install wing dowels, then finish planking and remove nose half-formers " B " and " C ". Lightly cement top cowling block to fuselage and carve to shape. Remove and hollow out to about ¼ in. wall thickness. Lightly cement tail blocks to bottom and carve to shape.

Construct tailplane and elevators and hinge-up. Remove tail blocks from fuselage, and cement tailplane to crutch. Solder up push-rod to elevator horn. Bend piano wire skid around piece of hard sheet, and cement to fuselage. Hollow out lower tail block in the case of large model, for free movement of elevator horn, and cement to crutch. Cut top tail block to fit over tailplane and fin spar, and cement into position. Construct fin outline over plan. Cut out slot in top tail block for fin L.E., and then cement fin to fuselage. Install fin ribs and capping strips then cement dorsal fin to fuselage and L.E. of fin.

The wing is quite straightforward, and needs very little comment. Bottom spar is pinned to plan and ribs cemented into position and then L.E. cemented to ribs. Bottom T.E. is then laid in position on plan, and wing structure tipped slightly so that ribs can be cemented to T.E. Add top T.E. block tip and top spar in the case of large model. Lift from plan when dry and add L.E. sheeting. Repeat procedure for other wing half. With both halves completed, prop tips up to 1¼ in. dihedral (2 ins. on Senior model) and cement in dihedral keepers. Add C/S sheeting, lead weight in outboard tip, and lead out wire guide on inboard tip.

ICARUS JUN.

A 42" WINGSPAN STREAMLINED STUNT MODEL

DESIGNED BY JOHN. W. COASBY

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THE AERODROME, STANBRIDGE, NR LEIGHTON BUZZARD, BEDS

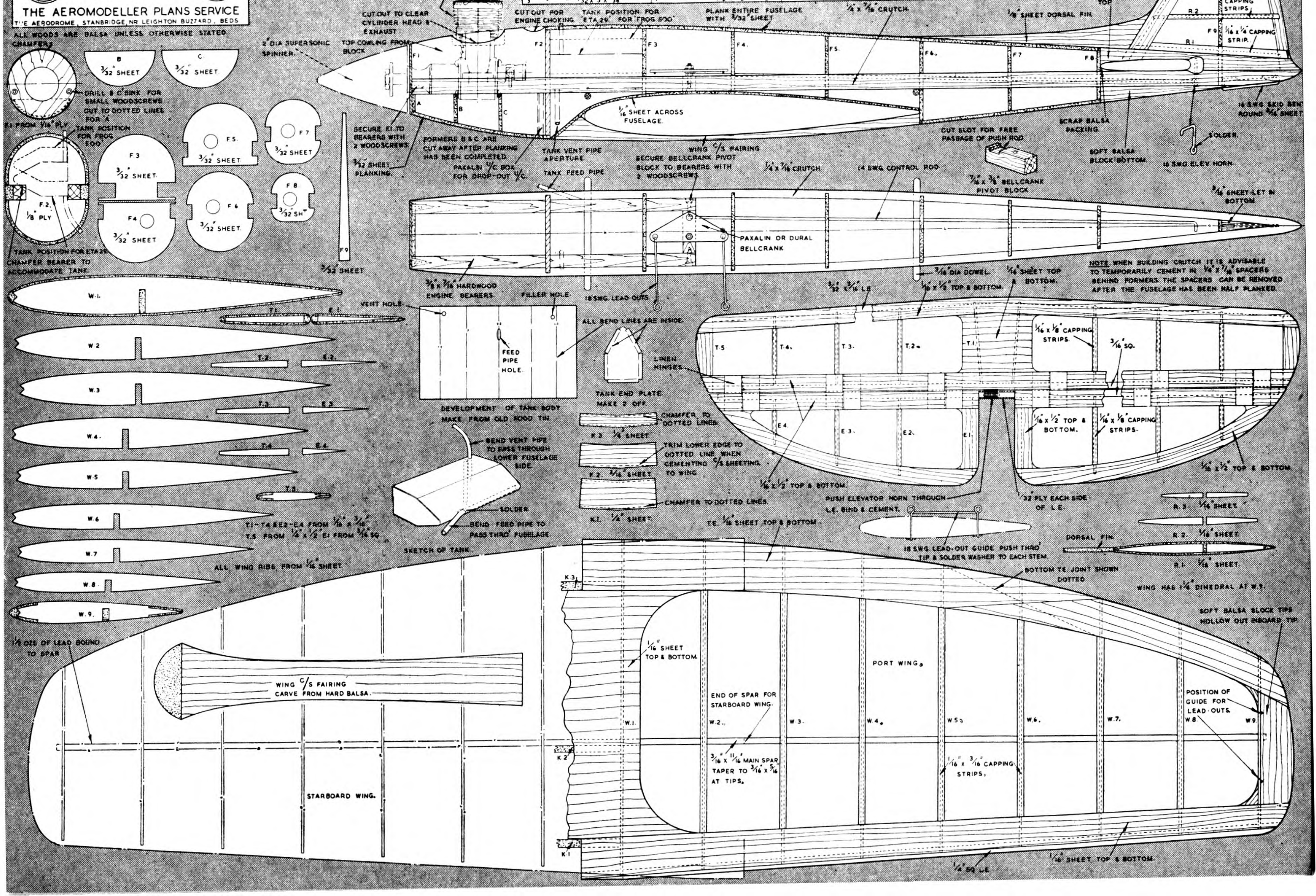
4/6

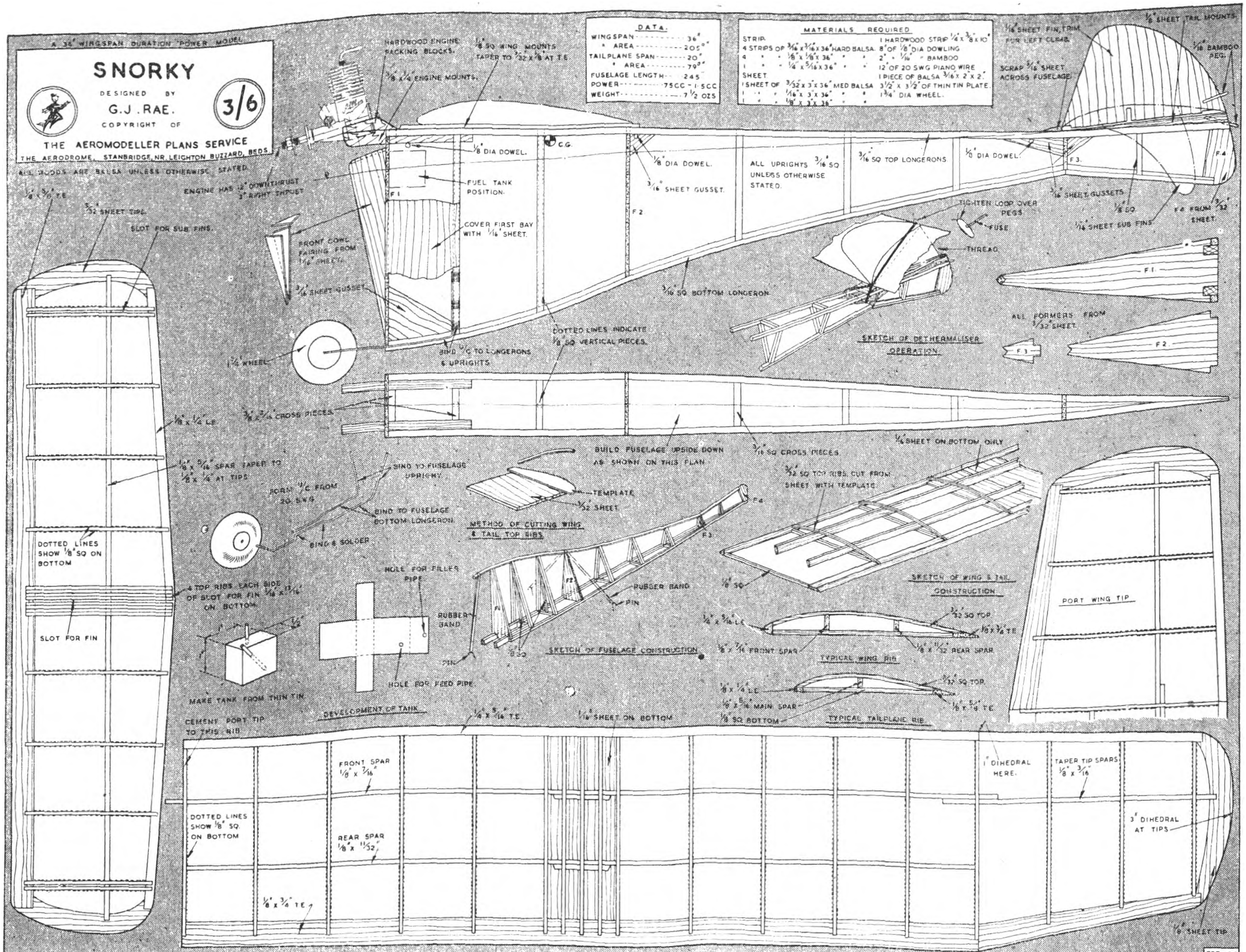
DATA	
WINGSPAN	42"
EFFECTIVE WING AREA	325 □"
TAILPLANE SPAN	18"
" AREA	80 □"
ELEVATOR "	35 □"
OVERALL LENGTH	29.5"
POWER	5-6 CC
LINE LENGTH	60 - 65 FT

MATERIALS REQUIRED

STRIP	1 SHEET OF 1/8" x 1 1/2" x 8" BALSA	1 BALSA BLOCK 11" x 3/4" x 2 1/4"	PAXALIN OR DURAL BELLCRANK
1 STRIP OF 3/16" x 3/16" x 36" BALSA	MISCELLANEOUS	2 " " 5" x 1" x 5/8"	" U/C BOX
2 " " 1/4" x 1/4" x 36" "	1 STRIP OF 1/32" PLY 3/16" x 2 1/4"	7" OF 3/16" DIA DOWLING	10" OF 14 SWG BRASS TUBING
2 " " 3/16" x 3/4" x 36" "	1 PIECE OF 1/16" " 2 1/4" x 2 1/4"	2 STRIPS HARDWOOD 3/8" x 7/16" x 8 1/2"	OLD FOOD TIN
2 " " 1/4" x 7/16" x 36" "	1 " " 1/8" " 2 1/2" x 3 1/2"	1 " " 3/8" x 7/16" x 1 1/4"	4 SMALL WOODSCREWS
SHEET	1 BALSA BLOCK 4" x 1 1/2" x 2 1/2"	14" OF 18 SWG PIANO WIRE	2" DIA SUPERSONIC SPINNER
7 SHEETS OF 1/16" x 3" x 36" "	1 " " 6" x 3/4" x 1 1/2"	8" " 16 " " "	SCRAP PIECE 1/4" SHEET BALSA
3 " " 3/32" x 3" x 36" "	1 " " 4 1/2" x 1/2" x 1 1/2"	18" " 14 " " "	1 1/2 OZ LEAD

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.





THIS IS ¼ SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 3/6 POST FREE FROM THE AEROMODELLER PLANS SERVICE

A 36 INCH SPAN, LOW C.L.A. DESIGN FOR 1·5 c.c. MOTORS

BY G. A. RAE

Age 20 .... ex R.A.F. rigger .... winner of two RAF contests .... now scientific assistant Atomic Energy plant .... a modeller since 1941 .... also keen on model engineering and motoring.

SNORKY

DESIGNER Rae, deciding that we were in a rut with present-day Contest Power Design, and using Grant's low C.L.A. theory as a basis, has produced a model that is most definitely unusual in appearance, and performance. It can be relied upon even in rough weather for a comfortable 2 mins. on a 20 sec. engine run, and the low C.L.A. position contributes greatly to the general stability, enabling very tight turns to be maintained without spinning. Use of a thin section reduces drag on the climb, enabling a wing of larger area to be used and thus reducing wing loading. This, together with the rearward C.G. position providing work for the tail, assures a good glide.

Construction is simplicity itself and building time is therefore kept to a minimum, not forgetting the unusual wing construction which saves precious and expensive balsa wood.

CONSTRUCTION

Fuselage: Cut engine bearers to length, and space them to suit the particular engine being used. Cement the $\frac{1}{8} \times 3/16$ spacers in position and complete the crutch, remembering to place the longerons on the outside of the bearers (see sketch on plan). Add formers F.1, F.2 and F.3, and $\frac{1}{8}$ square uprights, push pins into bench as shown in sketch, cement bottom longerons in position, utilising elastic bands to retain the necessary curve, and then cement F.4 and the uprights in position, which completes the basic structure.

Remove from board, add undercarriage gussets and cover with 1/16 sheet from F.1 to F.2, finally fit front fairing. Complete by glueing the engine packing blocks in place.

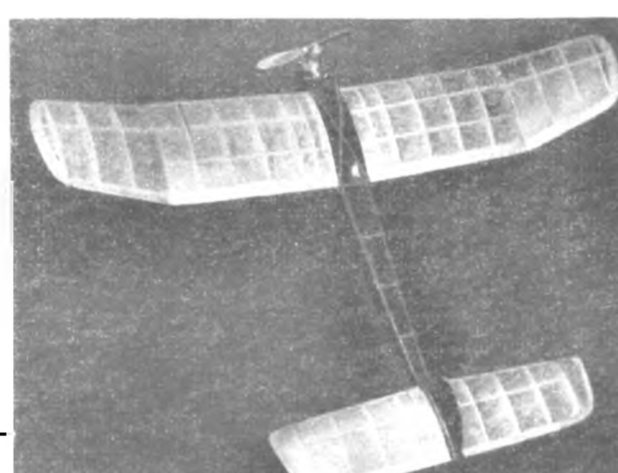
Wings: Build the two inner panels first, commence by positioning the leading and trailing edges, add centre section sheeting, followed by the $\frac{1}{8}$ square bottoms of the ribs. Cement front and rear spars on top, and whilst waiting for these to dry, cut out rib contours from 3/32 sheet. Cement these in position, and then cut spars at the centre and prop up so as to obtain 2 in. dihedral at the tip juncture. Add dihedral braces and the three centre ribs. Build tips in similar fashion, overlapping spars at the tip dihedral joint, dihedral at tips being 3 ins.

Tailplane: Build as per wing, note that fin fits in slot between top rib contours.

Covering: Fuselage is covered with heavyweight rag tissue, also the centre section of the wing. Rest of wing and tail surfaces are covered with lightweight rag tissue. Apply usual coats of dope and fuel proofer.

Dethermaliser: With "Snorky's" particular affinity to thermals this is an essential fitting. A tip-up tail is used, as shown on plan, which is, of course, fuse operated.

Flying: Check flying surfaces for warps and ensure that the correct amount of side and downthrust is being used. Test glide over long grass in the usual fashion and trim by increasing or decreasing the angle of the tailplane. After satisfactory glide, attempt short power flight with four to five second engine run. The model is quite safe to turn in either direction, but it is recommended that a right-hand turn is used, as this permits a smooth transition from power flight to glide providing the model is also trimmed to glide to the right.



From above, Snorky assumes normal shoulder wing proportions: but look at the heading view and note the low C.L.A. fuselage for stability

THE 4TH AUSTRALIAN NATIONALS

ADELAIDE . . . . DEC. 29—JAN. 2, 1951

BY OUR SPECIAL CORRESPONDENTS

AUSTRALIAN aeromodellers celebrate their New Year with the annual National Championship Meeting. The 1951 event was held over New Year week-end in Adelaide, South Australia.

Thanks to the excellent organisation by the South Australian Associated Aeromodellers, the meeting was an outstanding success, and was attended by fliers from all over Australia, who must have piled up an astronomical number of man miles in their travels. About 50 entrants came from Victoria (500 miles), while nearly as many made the 1,000 mile trip from N.S.W., with lesser numbers from West Australia, Queensland, Tasmania and Angus MacDonald, the globe trotting New Zealander, on his way back from England. (. . . . seems only a few weeks since Angus was sporting his silver A/2 over Eaton Bray—ED.)

Indoor

Flying was spread over 25 events on five days, beginning with the Indoor events on December 29th in the Centennial Hall. Fliers took advantage of the large floor space and 60 ft. clear height to break 12-year old records in both events. In the Indoor Stick event H. Halmshaw of Victoria put up a very fine effort in his winning and record flight of 14 mins. 36 secs. Gordon Burford (the engine manufacturer) of South Australia was second with 13 mins. 30 secs. Boyd Felstead (S.A.) was easily first in the Indoor Fuselage with his flight of 12 mins. 36 secs., as Alan King's (Vict.) time for 2nd place was only 15 secs., while Wal Reeve clocked 3 mins. 23 secs. with his Helicopter.

Team Racing

Two full days, Saturday 30th and Monday 1st, were devoted to control line flying at Glenelg Oval, with accent on Team speed, in the expectation that it would prove popular with the spectators. The early heats were not very promising, some being little better than farcical, with motor cranking, tangled lines and crashed models. The weaker entrants were soon eliminated, however, and the finals produced some very exciting flying indeed. Chris Gallagher won the main event by virtue of the fact that his Frog 500 had been doctored up by increasing the crankcase compression, so that it started readily when hot. J. Cook (Vict.), K. Hearn (Vict) and C. Clarke (Vict.) took the first three placings in the Class 'A' team speed.

In the class 'C' Team event, Monty Tyrrell, using an Anderson Spitfire, had an easy win, as his ignition motor would do over 50 laps at 80 m.p.h. on the 3 oz. tank, and left the glow plug motors far behind. Monty also won the Senior Stunt with a Spitfire-powered Go-Devil. Derry Brown used an Elfin 2·49, while McClaren, a born flier, had a McCoy 19 in a modified Veco Squaw. Generally speaking, there was less interest shown in stunt this year, though the standard was higher than ever.

Arthur Wild's win in the scale event shows that you can't keep a good man down. Last year he had a Thunderbolt involving over 400 hours of work, but wrecked it on the first flight. Undismayed, he set-to straight away on this year's superb Chipmunk, which scored so many appearance points that it only had to become airborne to win. Arthur made no mistake this time, and flew it cautiously but capably. Two "K" Falcon 2 c.c. diesels powered M. Robinson's Mosquito to second place, and Monty Tyrrell's Orwick 64 "Sammy Mason" Stearman placed third.

Speed

There was a big improvement in speed this year, with the Sydney boys showing the way. Outstanding performance was Jack Finneran's 120·9 m.p.h. in class 'B' with a Dooling 29. Last year's winner, Norm Bell also used a Dooling, while Jack Black did very well to get 113 m.p.h. from a hotted-up Eta 29. ½A speed was won by Val Rochfort (N.S.W.) with a speed of 80·36 m.p.h. Laurie Cantwell (N.S.W.) set a new record when his model turned in a speed of 100 m.p.h. in Class 'A' speed.

At left: Over 1,000 working hours went into Arthur Wild's superb C/L Chipmunk, and building cost, including the Atwood 49 motor, amounted to £25. Covered with aluminium foil, and with working cockpit hood and undercarriage, it won the scale C/L event. Below: National Champ. Alan King and his winning Dooling 29 streamlined 7 ft. pylon job.

All competitors in Class 'A' used McCoy 19's excepting one lone N.Z. Pepperill 19, which seemed very fast, but did not fly. Class 'C' winner, H. Henke, had a McCoy 60, series 20, and made his run on plain fuel and stranded lines. Shepherd's 116·9 m.p.h. second place winner had an Australian made Vampire 61 motor, and took the trophy for the best by an Australian motor. Third place went to R. Neville's Fox 59 entry at 113·9 m.p.h.

The under 2·5 c.c. (½A) winner had an Elfin 2·49, and flew without a spinner, using a stock commercial prop.

Free Flight

For the free flight on the Sunday, 31st, at West Beach Aerodrome, a stiff wind, hot sun and bumpy thermals made conditions rather trying (it was calm, damp and foggy here—ED. !), and there was a high rate of crashery. The sensation of the day was Alan King's beautifully built, 7 ft.

span Dooling 29 model, a development of his flying pencil design. With methane fuel and a one-blade toothpick prop., it had a screaming climb and floating glide which electrified the spectators. The ratio (14 : 3) would have been much higher, had not motor overheating ruined his first flight. Closely behind in 2nd place was M. Borella of N.S.W. with a ratio of 13 : 9, using a 5 c.c. G.B. diesel powered Toreador.

Sabre 2·49 diesels, made by Gordon Burford of South Australia, placed first and third in the under 2·5 c.c. event, which attracted a large entry, and was won by E. Pascoe (S.A.) with an average ratio of 14 : 9. Norm Bell of Vict. was second with a ratio of 8·4, using an " Elfin " 2·49 powered Foote Racer.

The big Class ' C ' models did not fare too well, even the winner, an 8 ft. Tempest 10 c.c. powered pylon design, crashed on its last flight.

Rubber and Glider

Tuesday, January 2nd, the final day, was hot and sultry, with no thermals, due to a slight sea breeze. Alan King took the Hordern Trophy for Wakefield types, his model proving a little more consistent than J. M. Fullarton's in the dead air conditions, though their best flights were about even. He flew the usual local design, with a box fus., twin fins, big one-blade folder and retracting u/c.

The glider boys had to struggle for their times, the winning Thunderking catching what must have been the only thermal of the day. A Nordic A/2 event was run concurrently with the F.A.I. and was won by R. Howie (S.A.) with an agg of 5 mins. 19 secs., while Val Rochfort of N.S.W. was second with 4 mins. 6 secs.

Another event which is included in Nationals in all countries of the Empire, and the U.S.A., but not here in England, is the Chuck-glider contest. First in hand-launch glider was R. Monck of S.A. with his flight of 63 secs., A. Lonergan of N.S.W. coming second with a flight of 53 secs. Not far behind was Wal Reeve of S.A. with 52 3/5 secs.

B. Hearn of Vict. flew his model to first place in the Jetex Duration with an agg. of 2 mins. 43½ secs., while closely following in second position was A. Lonergan of N.S.W. with 2 mins. 36 3/5 secs.

The first three placings in the Unorthodox event were respectively taken by W. Reeve of S.A. with his 203 sec. indoor Helicopter, J. Fullarton of Vict. with a Bee-powered canard, and V. Tullett with a flying wing sailplane.

Radio Control

There were five actual starters in the R/C event, the first of its kind out here. Jack Hearne was an easy winner, making numerous long flights under good control, with some excellent spot landings, and a few nerve-racking controlled spirals thrown in. He made several attempts at a loop, but the Bug was not having any, and fell away in a stall turn. Model was a standard " Rudder Bug " with Frog 500 and E.D. Mk. 1 radio.

The new National champion is 23 years old Alan King, a really keen modeller, who spares no efforts in his desire to get the utmost from his models. Victoria retained the AEROMODELLER Shield for the leading state.

J. Finneran of N.S.W. was National Speed Champion with highest speed of 120·9 m.p.h. Val Rochfort of N.S.W. gained the E.D. Trophy for the highest time with an E.D. motor.

It was obvious that a great deal of work and organisation had been put into the Nationals by the South Australia Associated Aeromodellers who ran the Nationals. At both free flight days there was a large crowd but no admittance fee. Considering the expense of the Nationals, this possible source of revenue was unfortunately missed by allowing so many spectators to enter the ground free—but the important fact was that the modeller's enjoyed themselves and had no cause for complaint. It will be interesting to see if the M.A.A. of New South Wales can organise and run as good a National Championships at Sydney, in a year's time.

SPEED & DURATION RESULTS

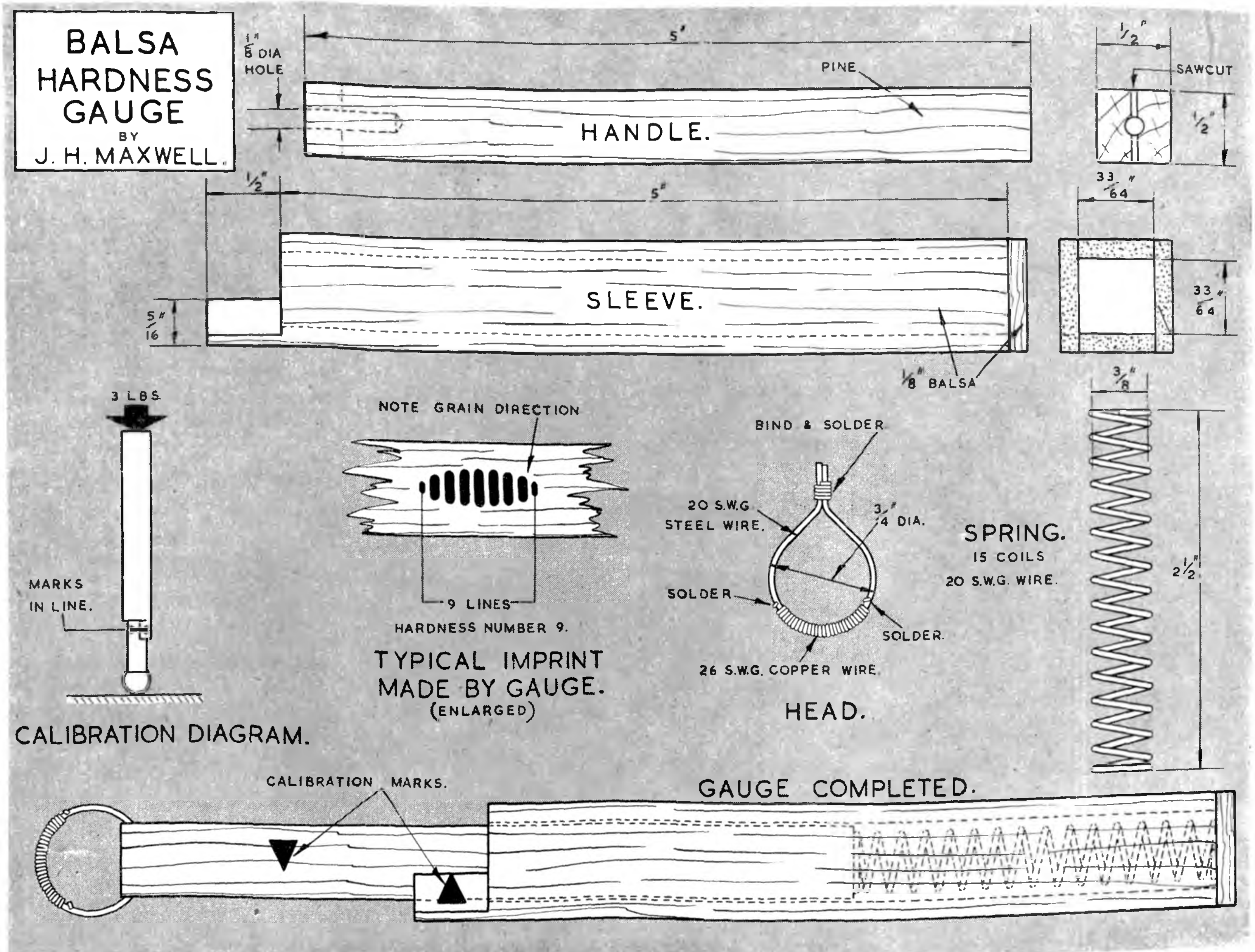
(Lack of space prevents publication of complete results, including the eight C/L Team and Stunt events, however, the winners are mentioned in the report.)

Indoor Stick	(1)	H. Halmshaw	Vic.	14 mins. 36 secs.*
	(2)	G. Burford	S.A.	13 ,, 20 ,,
	(3)	B. N. Felstead	S.A.	10 ,, 26½ ,,
Indoor Fus.	(1)	B. N. Felstead	S.A.	12 ,, 36 ,, *
	(2)	A. D. King	Vic.	0 ,, 15 ,,
Speed Class ½A	(1)	V. A. Rochfort	N.S.W.	80·36 m.p.h.*
	(2)	G. C. Ray	Vic.	75 ,,
	(3)	S. Smith	Vic.	70·92 ,,
Class ' A '	(1)	L. Cantwell	N.S.W.	100 ,, *
	(2)	D. Simpson	N.S.W.	95·75 ,,
	(3)	N. Bell	Vic.	94·75 ,,
Class ' B '	(1)	J. Finneran	N.S.W.	120·9 ,, *
	(2)	N. Bell	Vic.	114·7 ,,
	(3)	J. C. Black	Vic.	113·9 ,,
Speed Class ' C '	(1)	H. C. Henke	Vic.	117·7 ,,
	(2)	M. Shepherd	Vic.	116·9 ,,
	(3)	R. D. Neville	N.S.W.	113·9 ,,
Jet Speed	(1)	J. C. Black	Vic.	120·7 ,, *
	(2)	K. Hearn	Vic.	104·6 ,,
Free Flight, Class ' ½A '	(1)	E. A. Pascoe	S.A.	14·9 ratio
	(2)	M. Bell	Vic.	8·4 ,,
	(3)	M. J. Robinson	S.A.	8·03 ,,
Class ' A—B '	(1)	A. D. King	Vic.	14·3 ,,
	(2)	M. C. Borella	N.S.W.	13.9 ,,
	(3)	D. B. McDonald	S.A.	10·6 ,,
Class ' C '	(1)	G. Cash	Vic.	5·5 ,,
	(2)	N. L. Evans	S.A.	4·7 ,,
	(3)	G. F. Wilsdon	S.A.	2·9 ,,
F.A.I. Sailplanes	(1)	A. Vidale L. O'Rielly	S.A.	176·8 secs. avge.
	(2)	W. Malcolm	N.S.	136·6 ,,
	(3)	V. A. Rochfort	N.S.	82 ,,
Nordic Class Sailplanes	(1)	R. J. Howie	S.A.	106·3 ,,
	(2)	V. A. Rochfort	N.S.	82 ,,
	(3)	E. Pascoe	S.A.	70·6 ,,
H.L. Gliders	(1)	R. Monck	S.A.	63 secs.
	(2)	A. Lonergan	N.S.W.	55·6 ,,
	(3)	W. Reeve	S.A.	52·6 ,,
Anthony Horden Trophy (Wakefield Types)	(1)	A. D. King	Vic.	188·8 secs. avge.
	(2)	J. M. Fullarton	Vic.	167·8 ,,
	(3)	A. Lonergan	N.S.W.	163·8 ,,
Junior Rubber	(1)	Elaine Miles	N.S.W.	83·2 ,,
	(2)	G. Cooper	S.A.	59·2 ,,
Unorthodox Models	(1)	W. Reeve	S.A.	Helicopter (indoor)
	(2)	J. M. Fullarton	Vic.	Canard diesel
Jetex Duration	(1)	B. G. Hearn	Vic.	54·5 secs. avge.
	(2)	A. Lonergan	N.S.W.	52·2 ,,

* Australian Record.

NATIONAL CHAMPION—A. KING
NATIONAL FREE FLIGHT CHAMPION—E. A. PASCOE
NATIONAL SPEED CHAMPION—J. FINNERAN
NATIONAL STUNT CHAMPION—V. M. TYRRELL

Monty Tyrrell won both Class " C " Team, and the open Stunt plus the National Stunt Championship, using ignition Anderson Spitfires. Seen here with an Anderson-powered Super-Zilch, Monty would appear to be un-superstitious


BALSA HARDNESS GAUGE
BY
J. H. MAXWELL.
1/8" DIA HOLE
5"
PINE
HANDLE.
1/2"
SAWCUT
1/2"
1/2"
5"
33/64"
SLEEVE.
5/16"
33/64"
1/8" BALSA
3 LBS.
MARKS IN LINE.
CALIBRATION DIAGRAM.
NOTE GRAIN DIRECTION
9 LINES
HARDNESS NUMBER 9.
TYPICAL IMPRINT MADE BY GAUGE.
(ENLARGED)
BIND & SOLDER
20 S.W.G STEEL WIRE.
3/4" DIA.
SOLDER
SOLDER.
26 S.W.G. COPPER WIRE
HEAD.
SPRING.
15 COILS
20 S.W.G. WIRE.
3/8"
2 1/2"
CALIBRATION MARKS.
GAUGE COMPLETED.

A Balsa HARDNESS Gauge

BY J · H · MAXWELL

BALSA, as every model builder knows, varies considerably in strength and density. Thus, when describing the construction of a model, one must specify the grade of balsa used, and usually this is done by stating " hard," " medium," or " soft."

This somewhat rough and ready method of grading works fairly well, but for a long time keen aeromodellers have been acutely aware of its limitations. Chief among these is the fact that the terms " hard," etc., are purely arbitrary, and what one man calls " soft " balsa another may regard as " medium."

Colour Coded Balsa

At various times, attempts have been made to grade balsa in a rather more scientific manner, and in particular the colour coding system introduced by a number of supply companies (notably JASCO of New York) in the late 1930's is worth mentioning. With this system, each sheet and strip was coloured on one end in accordance with a density code. For example, yellow indicated a density of 6 lbs. per cubic foot, light green 7 lbs., and so on up to 15 lbs. per cubic foot.

Colour coding was certainly a step in the right direction, but it too had its limitations. The weighing and colouring process was carried out when the balsa was in the billet stage ; that is, before it was sawn up into sheets and strips. But balsa can vary quite a lot even within a relatively small billet, and so it often happened that the colour on the end of the strip or sheet bore little relationship to the actual density. We can personally remember strips which, according to their colour, should have had a density of 9 lbs. per cubic foot, but in actual fact their densities ranged from 6 to just over 12 lbs. per cubic foot. This was no fault of the suppliers ; it is just that balsa is naturally inconsistent.

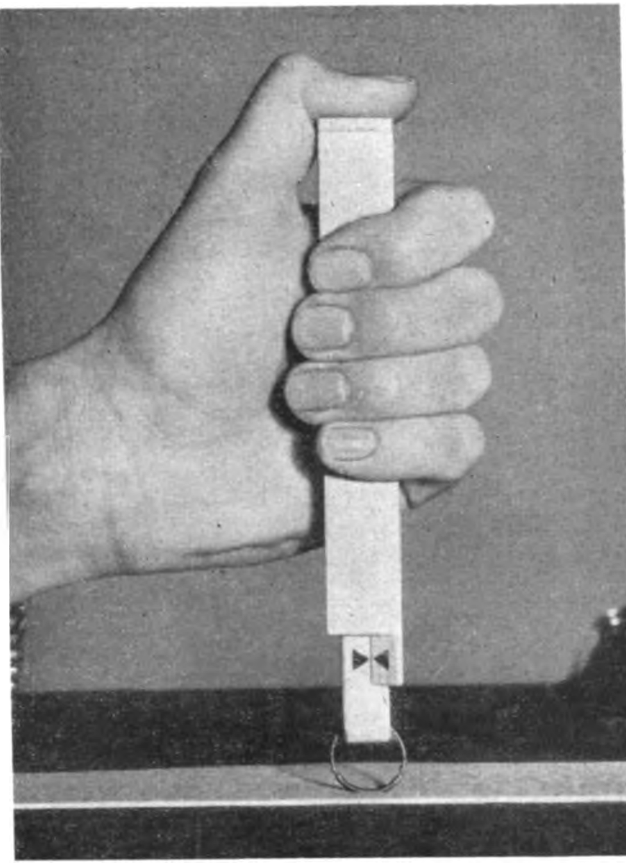
Hardness Gauge

Experience with colour coding taught us that balsa grading, if it is to be effective, must be carried out in the final sheet and strip stage. This was obviously too big a job for the supply companies, or even the local shopkeepers, and therefore we felt that what was needed was a simple method or device whereby a model builder could quickly grade each piece of balsa as he selected it from his stock.

There are three basis on which balsa could be graded ; namely, Density, Strength, and Hardness. Density we rejected because it requires accurate measuring (in thousandths of an inch) and accurate weighing. Likewise, Strength is impractical because it requires accurate measuring and special test apparatus. That leaves Hardness, and it seemed to us that it should be possible to devise some sort of suitable hardness gauge.

After a good deal of experimenting with a variety of devices, we eventually evolved the hardness gauge illustrated in the accompanying photograph, and drawing.

The principle of this gauge is that a serrated ring, standing on edge, is pressed on the surface of the balsa with a certain fixed force. Each of the serrations in contact with the balsa leaves a little impression, and the softer the balsa the farther the gauge sinks into it, and the greater the number of impressions. Thus, by counting the number of impressions, one can ascertain the grade of the balsa.



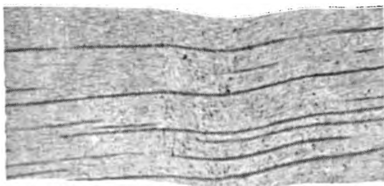
In practice, the head of the gauge (*i.e.*, the serrated ring) consists of a loop of 20 s.w.g. (0·036 in.) steel wire, tightly bound with 26 s.w.g. (0·018 in.) copper wire. The outside diameter of the loop is exactly ⅜ inch and the coils of copper wire must be touching one another on the inside of the loop. There are, of course, tiny gaps between the coils on the outside of the loop, and these are made equal by pressing the edge of a penknife blade into each.

The head is fitted into the end of a handle, consisting of a length of ½ inch square pine or similar wood, and secured with a liberal application of balsa cement. The handle in turn is a smooth sliding fit in a sleeve which is made from ⅛ inch sheet balsa. (For details, see drawing.)

Also inside the sleeve is a compression spring, which can be made as follows. A piece of 20 s.w.g. steel wire is wound round a ¼ inch diameter dowel or rod 18 times. When released, the wire springs back and forms a spring of 15 coils, ⅜ in. diameter. This spring is then stretched out until its free length is 2½ ins.

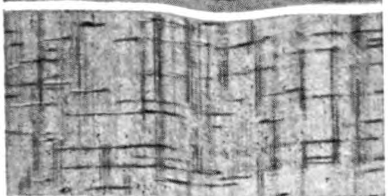
The purpose of the spring and sliding sleeve is to ensure that the head of the gauge is always pressed on the balsa with the same force. Our experiments showed that this force should be 3 lbs. The gauge is therefore calibrated by placing the head on a scale, or other weighing device, and pressing down on the sleeve until the scale registers exactly 3 lbs. A mark is made on the sleeve extension, and another in line with it on the handle. Now each time the sleeve is pressed down until the two marks come into line the force on the head will be 3 lbs.

In use, the gauge is first of all inked by pressing the head on an ink pad, as used for rubber stamps. Next, it is placed on the piece of balsa to be graded, with the head parallel to the grain. Then the sleeve is pressed down until the two cali-

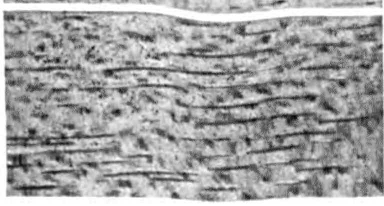


Flat sawn balsa is cut tangential to the annular rings of the log. It bends easily and is best for sheet covered leading edges, planking, etc.

Short grain lines in flat sawn sheet indicate that the grain runs through the sheet at an angle, making the sheet somewhat brittle.



Quarter sawn sheet is cut radially from the centre of the log, and at right angles to flat sawn. Such sheets are very stiff and ideal for ribs.



Not quite quarter sawn gives a mottled appearance and indicates a sheet unsuitable for bending, but good for bulkheads, formers or ribs.

bration marks come into line. This must be done with reasonable care, for if the head is allowed to rock, a false reading will be obtained.

The imprint made by the inked head consists of a series of short lines. By counting these little lines, one obtains the Hardness Number of the balsa. Every line which is visible should be counted, even the very small ones at the end of the imprint. In counting the lines, it is helpful to use a pin as a pointer.

Tests

To test the capabilities of this instrument, we cut 21 sample pieces of balsa from a variety of 1/16 in. sheets. These were carefully weighed and measured, and their densities calculated. Then each was subjected to the hardness gauge test, and the results were plotted, as shown on the graph given here. The Hardness Numbers on this graph represent the number of short lines printed by the gauge. Each sample was tested in two places, and the average of the two readings taken—that is why some of the points on the graph fall midway between whole numbers.

Looking at the graph, the reader will notice that the amount of scatter of the points is quite small, and even in the worst cases the error is less than 15 per cent. It would be an advantage if the gauge were a little more sensitive in the hard grades, but we found that this could only be achieved at the expense of a great deal of complication, and, on the whole, we feel that the gauge as it stands is sufficiently accurate for all practical purposes.

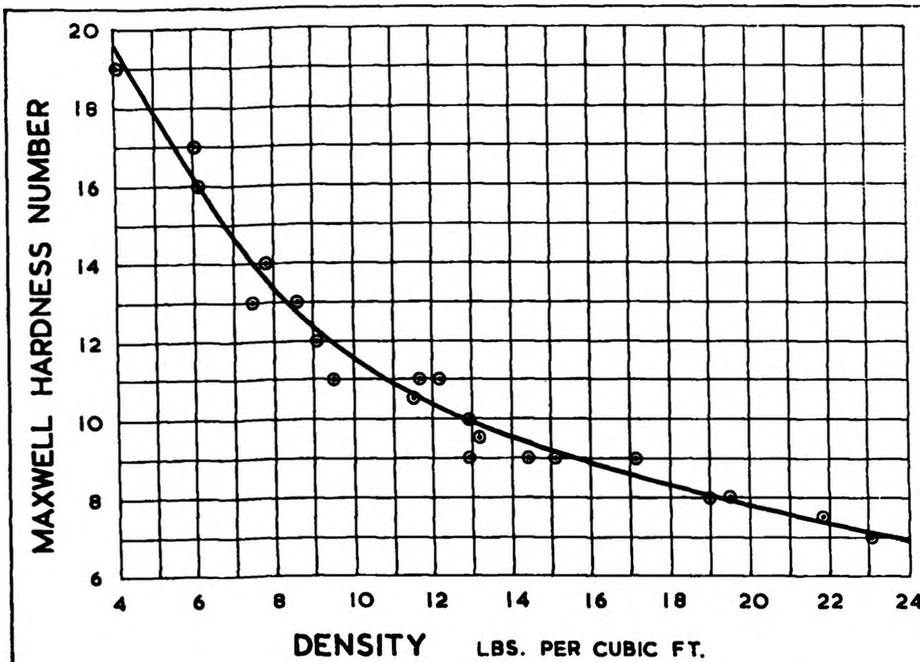
From the graph we drew up the accompanying table of Hardness Numbers related to Density. This presents the hardness code in its most useful form.

Conclusions

The gauge is suitable for use on any size of block balsa, on sheet not less than 1/32 in. thick, and on strips not less than 3/32 in. wide. It can easily be constructed in an evening, and the time taken to grade any piece of balsa is well under one minute.

When being used to grade a sheet of balsa, the gauge should be applied at several places, and the average taken. With strips, it is usually sufficient to test each end.

We sincerely hope that as many readers as possible will construct similar gauges and use them regularly. Then, if enough of us quote balsa Hardness Numbers in our conversations, letters and magazine articles, the idea may catch on, and some day, who knows, the hardness code given here may be adopted as standard throught the aeromodelling world.



MAXWELL HARDNESS NUMBER	DENSITY LBS. PER CUBIC FT.
19	4·1 – 4·6
18	4·6 – 5·2
17	5·2 – 5·8
16	5·8 – 6·5
15	6·5 – 7·2
14	7·2 – 8
13	8 – 9
12	9 – 10
11	10 – 11·6
10	11·6 – 13·6
9	13·6 – 17
8	17 – 21
7	21 – 25

SERVICE MODELLING IN GERMANY

Above: Sqdn. Ldr. E. G. Couch, Chairman of the Association, briefs contestants. Left to right: Cpl. J. McVey, Cpl. J. Ross, Cpl. Skinner and Lance Cpl. Hale.

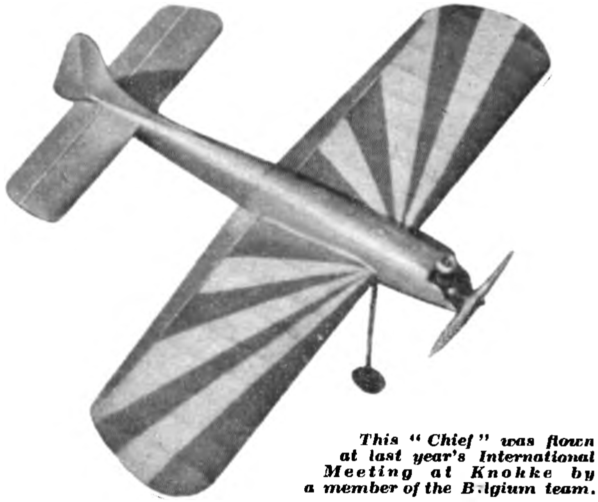
FIRST INDOOR MEETING OF THE B.A.F.O. MODEL AIRCRAFT ASSOCIATION

HELD in the Adastral Theatre, Buckenburgh, and consisting of both static exhibition and flying display, this was a novel and somewhat lively event from all angles. The auditorium of this ancient " Rathaus " was cleared enabling spectators to look down on the show from the safety of the balcony. With a flying arena of only 50 feet diameter, speed flyers suffered a little from dizziness, but aeromodellers being dizzy anyway, no-one worried. The date of the event being the 13th January, *i.e.*, during the school holidays, brought youngsters from far and wide who had the opportunity of flying the " Bucking Bronco " (a specially adjusted control line model) and it was in fact a fourteen-year-old boy who won the event. Not to be outdone, a twelve-year-old youngster judged to within one m.p.h. the speed of the model in the " Speed Judging Contest."

For the flyers there was an engine starting contest, won by Lance-Cpl. Hale with his Mills 1·3 in 25 seconds, in addition to the usual speed events. More spectacular items were a control line model fitted with navigation lights landing on a circular flare path ; helium-filled balloons which were released by one model and burst by another. A "Jeticopter" was brought from England in kit form at 5 p.m. on the day of the meeting, making its maiden flight within two hours !

B.A.F.O. Model Aircraft Association Clubs are at present flourishing at R.A.F. stations Gutersloh, Sundern, Buckeburg, Sylt, Wunstorf, Headquarters (Unit), Hesedorf, Handorf and the Hook of Holland.

Right: Lance Cpl. Hale, member of the Headquarters B.A.F.O. Club, who won the engine starting contest with his Mills diesel, demonstrates that winning flip with an E.D. Bee powered Skyskooter.



This " Chief " was flown at last year's International Meeting at Knokke by a member of the Belgium team.

Why's and Wherefore's OF STUNT DESIGN

BY

R · H · W · ANNENBERG

Renowned for putting his often much advanced theories into practice, R. H. W. Annenberg was prompted to write this article after reading the " Aeromodeller " "It's Designed for You " feature, on stunt models. That article dealt solely with the practical aspects and here, expert theorist Annenberg explains how you can obtain maximum performance in stunt design by using theory.

NO doubt there are many stunt control-line enthusiasts who readily accept the practical side of stunt model design without the slightest inkling of the " Why's and Wherefore's." Do you know what happens when the moment arm is shortened, the C.G. moved aft, or the flaps coupled to the elevators ? If you don't, we suggest you digest " Scalded Kitten," R. H. W. Annenberg's explanations, which are based on ideas used and accepted as logical in full-sized aircraft practice, and set out here in aeromodeller's language.

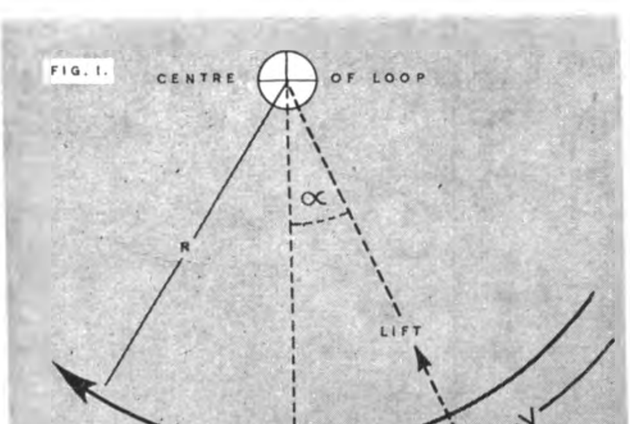
R. H. W. Annenberg makes no claim that the following explains all there is to know about stunt design, but it is hoped that it forms a basis for the " Stunt Merchant " who likes—and wants, to know why.

Fundamental Ideas

Before attempting explanations of manœuvrability, we have to get a clear understanding of certain fundamental ideas.

1. AIRCRAFT NEUTRAL POINT.

This is the point between wing and tailplane quarter chord points at which the resultant of the " Wing and tail unit changes of lift due to an overall change of attitude " occurs, there being no relative movement of the wing to tailplane to elevator during the change of attitude, *e.g.*, a very rough approximation gives the neutral point behind the wing quarter chord as a distance $\frac{1}{2} \times \frac{\text{tail unit area}}{\text{wing area}} \times$ distance between wing and tail unit quarter chord points. In the above, tail unit means tailplane plus elevator. It should also be noted that the distance of the C.G. ahead of the neutral point (in terms of wing mean chord) is a measure of the Static longitudinal stability. If this is too small or negative, the model will have to be " controlled " all the while in level flight and may be so unstable as to be uncontrollable.



2. LOOPING AND THE TAILPLANE.

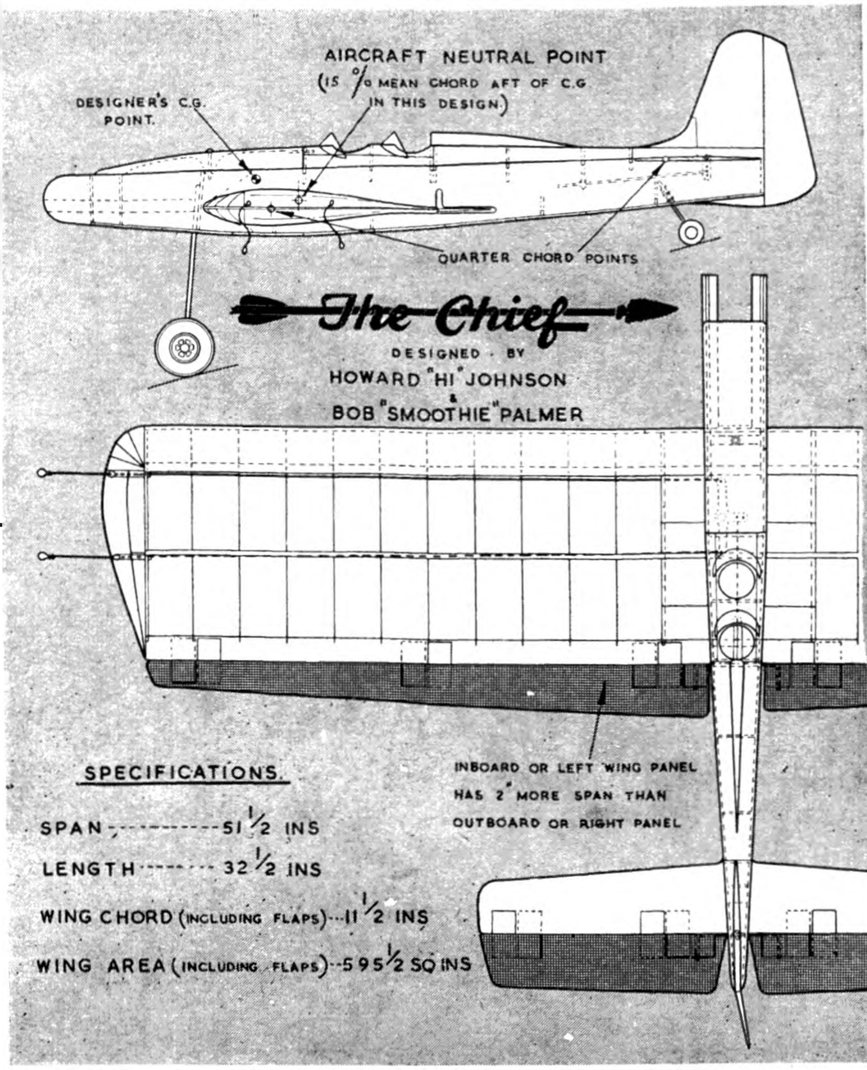
With reference to Fig. 1 it is evident that during a loop radius R, the airflow past the tailplane (due to the rotation alone) behind the C.G. is at an angle α greater than that at the C.G., *i.e.*, looping at radius R changes the tailplane incidence locally by α approximately equal to $57{\cdot}3 \times \frac{l}{R}$ degrees. Hence the change of tailplane lift due to looping is proportional to l/R. The nose down pitching moment change about the C.G. due to this lift change, is evidently proportional to l^2/R, *i.e., halve the tail arm length and you reduce the pitching moment change* (which opposes the looping tendency) to a quarter of its previous value. But for a given elevator movement you have only halved the pitching moment forcing the model into the loop. Hence it is obvious that reducing the tail arm tends to reduce the looping radius for a given elevator movement.

3. POINT OF ACTION OF THE CHANGE OF LIFT DUE TO A CHANGE OF FLAP DEFLECTION.

It should be made quite clear at this juncture and emphasised that we are not considering or explaining where the centre of pressure of wing lift on a wing (with deflected flap) occurs. The point of action of the change of lift due to a change of flap deflection invariably lies between the ¼ and ½ chord points on the wing. For full span flaps of small percentage chord the point of action is near 50 per cent. chord, and for the very large chord flaps (greater than 50 per cent. chord ratio) the point of action lies near 25 per cent. chord. For part span flaps the point of action is very little changed but the change of wing lift due to a given change of flap deflection is obviously less.

One of the earliest commercial designs to utilise full span wing flaps was the VECO "Chief". It has already established itself as a great favourite with Australian, South African and American aeromodellers and has proven its versatility by flying with all types of motor from 3·5 c.c. to 11 c.c. Illustrated on the opposite page, and shown in plan and profile here, the "Chief" employs an unusual air foil section, which has recently been introduced to the British market in the new Veron Panther.

On the drawing, the aircraft neutral point referred to as '1' under Fundamental Ideas, has been calculated and shown as 15 per cent. mean chord aft of the centre of gravity. The success of the "Chief" would indicate that its neutral point is in the right place!



4. MINIMUM STEADY LOOPING RADIUS.

Purely on a basis of Lift = Centrifugal force, it is clear that (ignoring the level flight condition) centrifugal force cannot exceed the maximum lift, *i.e.*, C_L max. defines the minimum looping radius since we explain later that forward speed changes do not affect loop radius. All the other explanations we are concerned with reduce the "effective" elevator power, but do not appreciably modify the minimum loop radius. Evidently, too much elevator power readily changes the attitude to past the stall and produces what is popularly termed a "mush" pull out.

Having digested these four fundamental ideas, let us now consider their application during a manœuvre in the looping plane.

Loads During a Steady Loop

At the bottom of a loop radius R and speed V, the increase in "apparent weight" due to centrifugal force $WV^2 \div Rg$ has to be compensated for, by means of more wing lift. Now this lift can be developed either by (*a*) increasing the attitude of the model, or (*b*) depressing flaps, or (*c*) a combination of the two.

We can see from (2) that an increase of lift due to an increase of attitude comes on at the neutral point, which is behind the C.G. for a statically stable model, and this tends to open out the loop. It is also clear from (3) that the coupled elevator-flaps deflection applies a change of wing lift at approximately 30–40 per cent. chord which is usually much nearer the C.G. than the neutral point except for very short tail arms. *Hence an orthodox coupled elevator-flaps layout has less resistance to looping than the same model without flaps.*

Furthermore, if the flaps are depressed at constant attitude, the increase in downwash at the tail due to the increase in wing lift causes download on the tail which helps the model into the loop. It is to be understood, however, that this effect is probably to a large extent nullified by the tail lying in the disturbed and "slowed up airflow" wake which reduces the tail efficiency.

For a given flying speed V, an increase in weight (all other things remaining constant) requires an increase in extra wing lift to compensate for the extra centrifugal force. This can only be obtained by an increase in the attitude change required for a given loop radius, the increase in lift coming on at the neutral point (it being presumed that the new attitude does not exceed that corresponding to C_L max.).

Thus from (2) we see that *an increase in wing loading for a given model at a given speed opens out the steady loop.*

One further effect of flap deflection should be noted. The change of drag tends to slow up the model appreciably. Now if lift = centrifugal force at C_L max., corresponding to minimum looping radius, we find that since both are proportional to V^2, that the steady loop radius is independent of V *provided* that the elevator is powerful enough at that speed to bring the model up to C_L max.

This appears to conflict with experience but it should be remembered that with many of the low power loading stunts, the small radius attainable at the top of the loop is produced at very low speeds by the model weight opposing the centrifugal force, which also helps wing lift to create the small radius. The opposite effect happens at the bottom of a loop.

Notes on Unorthodox Layouts

1. CANARD LAYOUT.

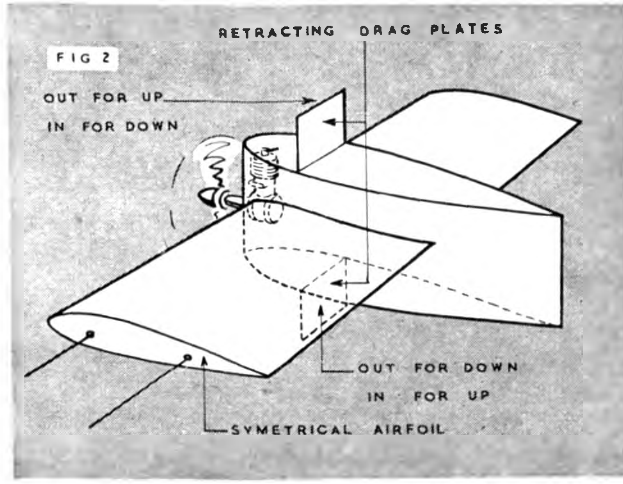
Since the neutral point of a Canard layout is ahead of the wing quarter chord, the lift change due to a change of flap deflection comes on aft of the wing quarter chord. But the neutral point and the C.G. are well ahead of the wing quarter chord. Obviously the tendency for the extra wing lift to open out the loop radius is greater if coupled flaps are used than if they are absent.

2. TAILLESS LAYOUT.

This is obviously the extreme case of the short moment arm trend and on first sight one would expect it to have the smallest looping radius. Unfortunately, the necessary up-elevator required to induce a loop also acts as a negative flap, thus reducing the C_L max. appreciably and working against the attainment of a small loop radius (*see* (4) in "Fundamental Ideas").

3. LAYOUT FOR SMALLEST LOOP RADIUS.

The layout which gives this a purely functional one and is an adaptation of N. K. Walker's "Flying Wind Tunnel." Tail surfaces and flaps are absent and the model is symmetrical about its centre line. Changes of pitching moment are provided by drag surface plates well above and well below the wing chord line, moving in and out of fairings. When the upper plate moves out of its fairing, the lower plate moves into its fairing and *vice versa*. Fig. 2 shows the layout in a diagrammatic form with the undercarriage absent. The C.G. should be slightly forward of the wing mean quarter chord.



Effect of Inertia and C.G. Position

It is worth noting that if the moment of inertia about the C.G. is increased, then it is more difficult to change attitude and the manœuvrability is reduced. An increase in moment of inertia is caused by (*a*) spreading weight further away from the C.G., (*b*) adding weights ahead and behind the C.G.

If we shift the C.G. forward, changes of lift due to changes of attitude or flap deflection occur relatively further aft than before. Therefore the nose-down moment produced by the lift change is increased and (opposing the nose-up moment produced by the elevator) opens out the loop.

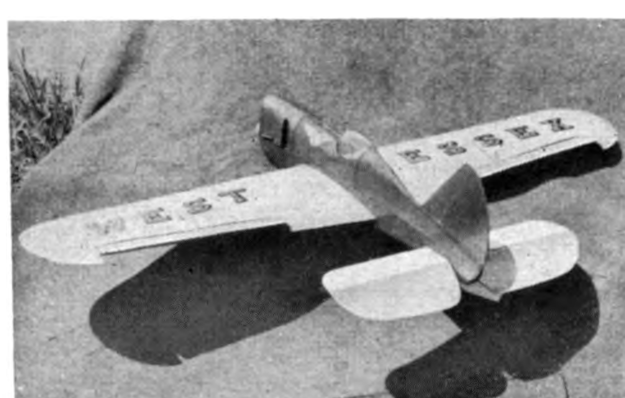
Sundry Thoughts

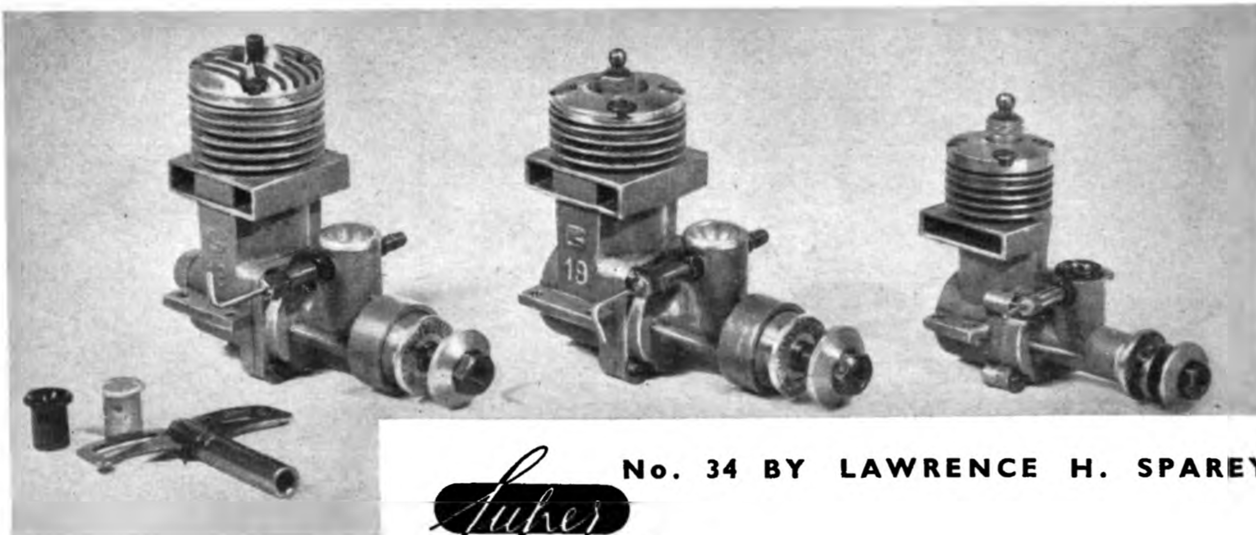
There always seems to be a certain amount of controversy about the competition points to be awarded for a particular manœuvre. Might I throw out a vague suggestion for discussion (and possibly even tried out) that the height from the ground to the top of the manœuvre in terms of line length or wing chord be estimated for the awarding of *bonus* points for skill and manœuvrability as distinct from smoothness of flight ? A striped rod about 10 ft. high could be used without much difficulty for this.

Why don't experts try full span, *large* chord flaps on ordinary tractor layouts ? There seems no reason why they should *not* be better than the small chord, part span flaps at present being used.

We have little doubt that many of our readers will remark on the huge elevator proportions of K. Suzuki's (Tokyo) stunt model. Winner of the 1950 Open Japanese stunt event, this model is powered with a Mamiya 60 engine. The flaps, though diminutive, probably help to reduce the looping radius. The deflected wing tab would indicate that Mr. Suzuki has trouble with this large model on long lines.

Below: K. Muscutt's Meteor, already presented in the "Aeromodeller," features wide chord wing flaps which are part of the aerofoil, and are attached outboard of the tailplane span. Thus they do not blanket the tail surfaces during violent manœuvres.





No. 34 BY LAWRENCE H. SPAREY

ENGINE ANALYSIS

Super Tigre G.19 & G.20

THE first Italian, and for that matter the first European motors to be submitted for Aeromodeller Engine Analysis, are those of the current Super Tigre range, now in production under new management.

Readers will probably remember the famous Super Tigre GB.16b, 5·65 c.c. diesel which appeared with various forms of induction design during 1947–49, and was probably the most powerful diesel to go into quantity production. That mark, produced by the Osam company at Cremona, gained great popularity amongst stunt control-line fliers the world over, and became known for two outstanding features. Firstly its characteristic misfire which was always accompanied by a puff of smoky exhaust, and more important, its robust construction was such that even though in use at a time when all stunt flights terminated in an undesirable manner, the GB 16b always seemed to survive the airframe.

Recently the manufacturing rights for Super-Tigre engines were taken over by the Micromeccanica Saturno at Bologna and the three types described herewith put into production.

The G.19A or B

Retaining the robust characteristics of its predecessors, but successfully eliminating the old tendency towards misfiring, the G.19 can be obtained in either diesel or glowplug form. Still featuring the twin transfer passage, and one-piece cylinder body/crankcase die casting, it bears little further resemblance to the earlier designs.

The exhaust is via four separate ports, disposed one on each side of the transfer ports, the piston is now flat topped and fitted with two rings, and the carburettor is of voluminous proportions and fitted for rotary shaft induction between the two ball race bearings. Each of these features may be considered somewhat unique, especially, the use of rings on the light alloy piston of the G.19A diesel, and reflect ingenuity on the part of designer Signor Garofali.

By reducing the capacity to 4·82 c.c. from the 5·65 c.c. earlier designs, the Super Tigre can now compete in the more accomodating 5 c.c. competition class in Italy, where in the diesel form it has already become popular with stunt enthusiasts. It has won speed contests, one at 86 m.p.h., as a glowplug engine.

There would seem to be little doubt that with increased experience, Italian modellers should be able to rival the speed figures of other countries if they make full use of the good horsepower that the G.19 can quite easily produce. The maximum ·485 b.h.p. compares most favourably with other 5 c.c. engines tested in the Aeromodeller Analysis. If anything, the diesel version may have an even better b.h.p. figure, though at much lower r.p.m. than the glowplug G.19B tested.

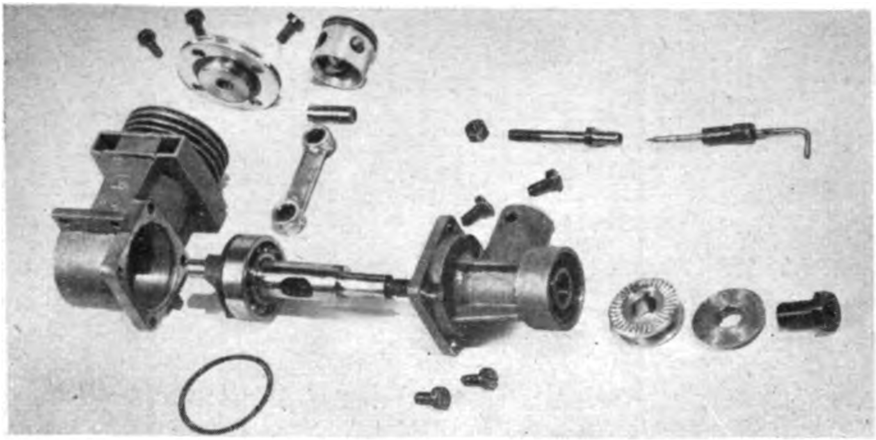
Most thoughtfully, the manufacturers provide a large clock key with each diesel. This is used to vary compression by turning the neat square ended contra-piston screw. Another feature of the G.19 is a detachable screw plug in the rear of the crankcase which can be quickly replaced by the cut-out valve provided with earlier Super Tigre engines.

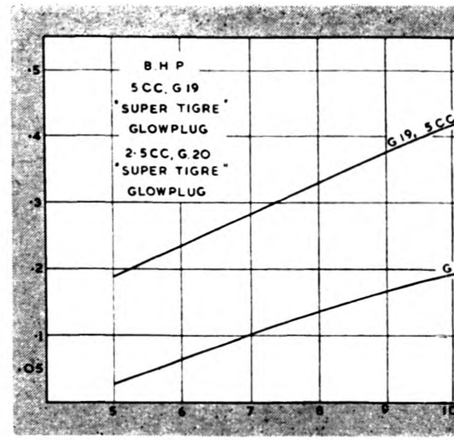
The G.20

Using a large diameter crankshaft and huge carburettor intake as on the G.19, the smaller G.20 is one of the first glowplugged 2·5 c.c. engines to be mass produced, if not the very first. It is also the most powerful motor of that capacity yet tested in this series, and even rivals several leading 3·5 c.c. designs, falling short by ·02 b.h.p. or so, despite the concession of 1 c.c. capacity.

Its fuel consumption also merits comment for its economy, and, combined with " first time " starting qualities, it should be an ideal engine for Class A team racing. Similarly the adoption of the 2·5 c.c. class by the F.A.I. for International free-flight events should evoke great interest in this new and powerful engine.

Apart from the induction system mentioned above, Signor Garofali appears to have employed many of the better features in current racing engine design and has produced the smallest engine yet seen with two piston rings. The additional service of supplying three alternative carburettor venturis is something one might have expected much earlier in the post-war engine market and is to be recommended to other manufacturers The difference in flexibility and performance between the racing and stunt venturis provided, more than justifies their introduction with the engine.





The G.19B dismantled displays to advantage its large diameter crankshaft and twin ball-races which contribute greatly to the total 8·6 ounce weight. The flat topped piston has two rings, and two extra holes to contribute to the normal transfer passage system. Four separate exhaust ports are unconventional features. Unmachined exterior parts are finished with an attractive grey anodic effect. Note the sturdy con rod which is brass bushed at both ends.

Availability. Difficulties arising out International monetary exhange can be overcome by the correct approach through proper channels. An Import Licence is necessary and an International Money Order may be applied for through the local post office. Both items give little difficulty if correctly negotiated. We would suggest that intending British purchasers first contact the manufacturers for their advice, and remember that Purchase tax and Import duty collectively add approximately 50 per cent. to the cost of the engine when it arrives in Great Britain.

The cost in Italy of the G.19 series is 8,500 Italian Lira (£4. 18s. 0d.) and the G.20 5,800 Italian Lira (£3. 7s. 0d.).

TEST

Engine : Super Tigre G.19B, 5 c.c. Glowplug.

Fuel : Mercury No. 5.

Starting : This engine starts easily with needle valve at around 4 turns open, but a prime with fuel on the piston makes things easier. Engine was started by pulley and cord for testing purposes, when no priming was found necessary.

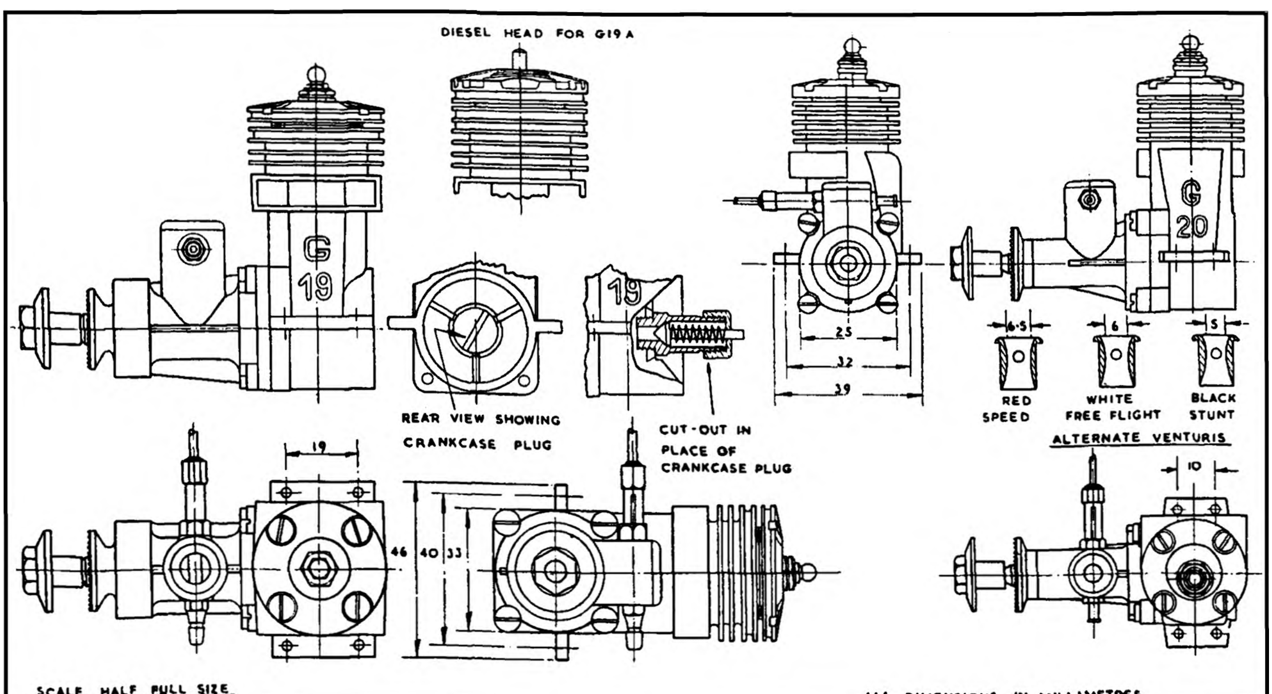
Running : Extremely good over a wide speed range ; not unduly sensitive to needle control.

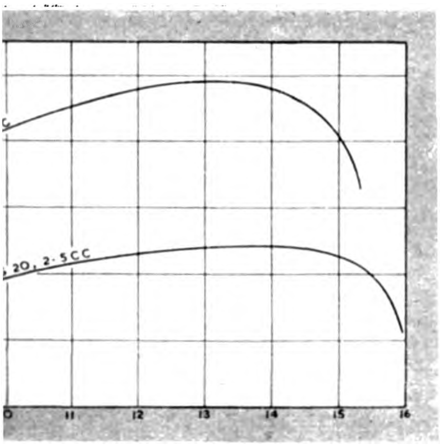
B.H.P. : As will be seen from the curve, tests were recorded at speeds between 5,000 r.p.m. and 15,300 r.p.m. It was not found possible to reach the manufacturers figure of ·50 b.h.p. at 15,500 r.p.m. but a very excellent result of ·485 b.h.p. at 13,300 r.p.m. was attained. Between 11,000 and 14,600 r.p.m. the curve is exceptionally flat, and the engine may be considered to be performing well at all speeds between these limits.

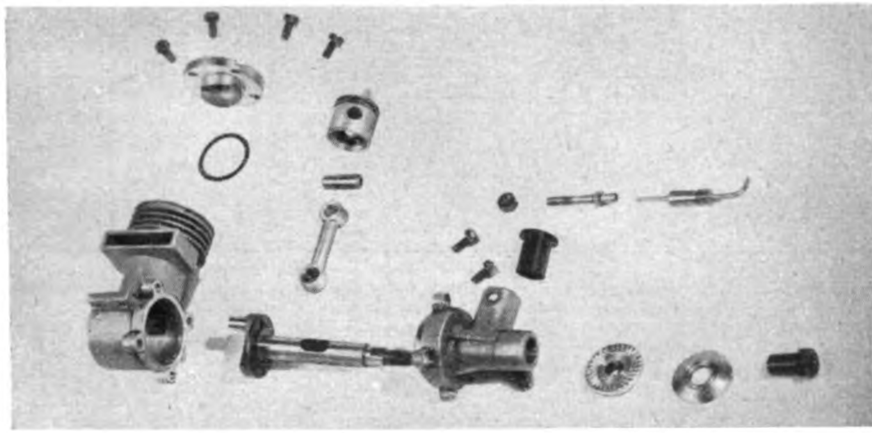
Checked Weight : 8·6 ozs. (less tank).

Power/Weight Ratio : ·9 b.h.p./lb.

Remarks : This engine is probably the sturdiest that we







The 2·5 c.c. Super Tigre G.20 incorporates many features relevant to larger racing motor design. The die-cast piston is fitted with two beautifully made rings, and has the high domed head design generally found in 10 c.c. racing motors. The cylinder head is shaped to accommodate the piston, and the sturdy connecting rod is bushed at the big end. A large diameter ball-race is fitted in the main bearing. The shaft has a flat with an appropriate "key" on the propeller driving washer.

have yet encountered, and no concessions seem to have been made to reliability in order to save metal or cramp design. In spite of this, the power/weight ratio is very good, so that we have an engine which should give long life and reliability with an excellent power output.

GENERAL CONSTRUCTIONAL DATA

Name : Super Tigre G.19B.

Manufacturers : Micromeccanica Saturno, Via Fabri 4, Bologna, Italy.

Retail Price : 8,500 Italian Lira (£4. 18s. 0d.).

Type : Glowplug.

Specified Fuel : 66 per cent. Methanol, 33 per cent. Castor oil.

Capacity : 4·82 c.c., ·29 cu. ins.

Weight : 8·5 oz.

Mounting : Beam, upright or inverted.

Bore : 19 mm. **Stroke :** 17 mm.

Cylinder : Special iron lapped sleeve pressed into die cast body.

Cylinder Head : Light alloy, plain unfinned (diesel version has cooling fins).

Crankcase : Light alloy, pressure die casting.

Piston : Light alloy, two steel rings.

Connecting Rod : Light alloy, bushed each end.

Crankshaft : Large diameter, hollowed.

Main Bearing : Ball races each end of shaft.

Induction : Rotary shaft inlet valve.

Special Features : Robust construction, large intake area, four exhaust ports.

TEST

Engine : Super Tigre G20, 2·5 c.c. Glowplug.

Fuel : Mercury No. 5.

Starting : The engine is supplied with 3 types of plastic venturi tubes which may be fitted into the air intake of the carburettor. One, coloured red is for racing purposes; one black, for stunt flying, while a white one is recommended for general and free-flight. The engine was run-in using the black venturi and starting was excellent with good flexibility of needle control. Tests were undertaken with the red venturi in position, and starting was still excellent though the engine was faster and more sensitive to needle control.

Running : All that could be desired over a wide speed range.

B.H.P. : The results from this engine are rather exceptional, not only for the high power output, but for the remarkably flat curve obtained. We thus see that between speeds of 10,500 r.p.m. and 15,500 r.p.m. the variation in output is only ·04 b.h.p. so that the engine may be considered efficient over a range of 5,000 r.p.m.

Maximum output was found to lie somewhere in the region of 14,000 r.p.m. but the extreme flatness of the curve at this point makes it difficult to pin point within a few hundred r.p.m. The exceptional figure of ·24 b.h.p. was recorded, which falls little short of the maker's claim of ·25 b.h.p. at 15,500 r.p.m. At this speed, however, our results showed that the output was down to about ·15 b.h.p.

Checked weight : 4·4 ozs. (less tank).

Power/Weight Ratio : ·872 b.h.p./lb.

Remarks : The sturdy construction which is a characteristic of the G.19 is again evident in this smaller edition. This naturally results in an engine of greater weight than we have come to expect in a unit of this capacity. In spite of this, power/weight ratio is high, and long service should again be coupled with excellent performance.

GENERAL CONSTRUCTIONAL DATA

Name : Super Tigre G.20.

Retail Price : 5,800 Italian Lira (£3. 7s. 0d.).

Type : Glowplug.

Specified Fuel : 66 per cent methanol, 33 per cent castor oil.

Capacity : 2·46 c.c. ·15 cu. ins.

Weight : 4·25 ozs.

Mounting : Beam, upright or inverted.

Bore : 15 mm. **Stroke :** 14 mm.

Cylinder : Special iron lapped sleeve pressed into die cast body.

Cylinder Head : Light alloy, unfinned.

Crankcase : Light alloy pressure die-casting.

Piston : Light alloy with two steel rings.

Connecting Rod : Light alloy, bushed at big end.

Crankshaft : Large diameter, hollowed.

Main Bearing : Ball race at web end.

Induction : Rotary shaft inlet valve.

Special Features : Robust construction. Single transfer passage. Single exhaust port, large bore intake for interchangeable venturis.

AFTER a three month break in publication, the AEROMODELLER gadget file has become choc a-bloc with interesting innovations to aid you with your aeromodelling. Consus has dived deep to present the nine ideas illustrated opposite, as a typical and most interesting selection of the many gadgets recently submitted.

Top of the bill, and incidentally, the farthest travelled of this month's gadgets, is one from Australian expert Jim Fullarton. He tells us that he had repeatedly used the idea for an all-metal elevator on his Class A (up to 2·5 c.c. in Australia) speed model, and there is no reason why it should not be applied to speed jobs of bigger calibre.

It has the following advantages : (1) Ease of construction ; (2) Free action ; (3) Elevator cannot come off in the air, or get broken in a cartwheel landing ; (4) It may be adjusted for more down or more up movement by bending. It is made from a single thickness of strong tin plate for small models, while for larger types, a double thickness of tinplate or heavier gauge of brass should be used. It is held onto a ply tailplane with two strips of ·005 ins. shim brass pinned or riveted through. Reference to the illustration will show that the elevator is shaped to be wrapped at its leading edge, over a 20 s.w.g. piano wire hinge pin ; and at right angles, the elevator horn is bent up at the inboard end.

From G. A. Hingley of Norwich, we get an idea which is not entirely original, for the basic principle has already been published in our American contemporaries, but which includes in this case, a novel illustration of how to enclose the dethermalising cotton reel.

The cotton reel is housed in a four sided box which is open at the top, and at one end. As the fuse burns through a small piece of cotton which is used to hold the door shut, the door is pulled open by the rubber band.

This sudden action will eject the cotton reel clear of the plane ensuring that it goes out clear of the tail unit, and does not get tangled with any other part of the airframe. With the heavy cotton reel dangling from the wing tip, the model is then forced into a spin until the reel touches earth. At this point the aircraft should stop spinning, in theory ! A perfect landing should ensue.

Moreover, Mr. Hingley's idea would eliminate a serious fault already observed by Consus on the flying field. A fast climbing pylon model was seen to have its cotton reel dethermaliser enclosed in a box beneath the fuselage. Due to a somewhat haphazard retainer, the reel was released during the steep power climb—with disastrous results. Only a premature fuse would allow similar occurrence with the above idea.

Idea number three comes from R. A. Ward of Weston-super-Mare, designer of the neat Fokker D.VII which was featured in our Christmas issue. Noted for his specialist activities with scale control liners, Mr. Ward has been using this idea for undercarriage leg fairings on almost all of his many scale models. A piece of perforated zinc can be soldered to the undercarriage leg and recessed into one half of the fairing as shown. Liberal application of cement will run through the perforations and hold the balsa to the piano wire leg through any crash. All that is needed to complete the streamlining is the application of the outer half which must be suitably grooved to take the wire.

The annoying tendency for airdraulic timers to open the cutout on a diesel at a crucial moment is well known among most aeromodellers. From J. A. Field of Waltham Cross, Consus has at last received the answer to this perplexing problem. Illustrated as number four, you will note that the timer is attached to a hinged door in the fuselage side. When the door is opened, the cutout can be easily retained in the "shut" position. So, when the engine has been started and tuned for flight, the timer can be set quickly, the door shut and locked with a catch, and the timer is then engaged to cut the motor after a desired duration. Readers will appreciate that this idea further facilitates adjustment to the bleed valve on the timer.

Down in glorious Devon, at Exeter in fact, John Wickers submits number five, which he has already used with his team racer. The wheel spats consist of two " Mercury " small type cockpit covers, and are fitted over the axle of the undercarriage in such a way that a bad crash will not knock them off. The 18 s.w.g. wire frame is soldered to the main axle, and in turn, the cockpit cover is cemented to the wire hoop—after the wheel is fitted, of course ! Not only light in weight, they can also be painted with a very easily obtained high gloss finish, and are flexible enough to withstand any collision.

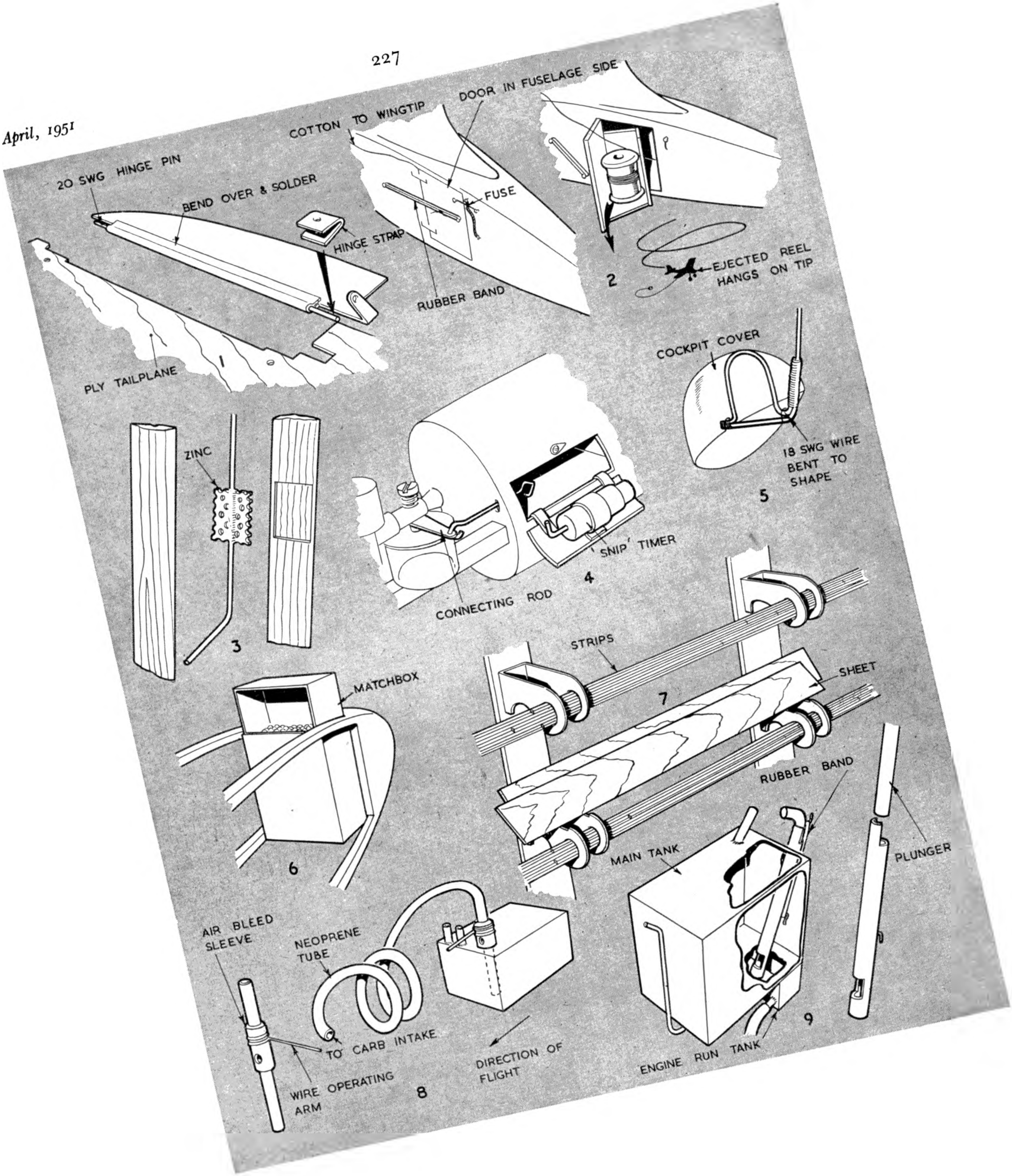
Dodging about the country a bit, and dashing from Devon up to Ayrshire, Consus first received a simple but very useful idea from T. Menzies of Troon. This gadget is so simple that we wonder that nobody has ever used the idea before. It is a matchbox which is cemented hard against the rear face of the nose block as shown. The drawer may be taken out and the required weight inserted. It is but a simple matter to add or take away any trimming weight from this drawer type ballast box.

Have you ever thought what use you might find for those old Sellotape metal reel holders. Judging by the widespread use of Sellotape on the flying field, Consus supposes that thousands of these reel holders are donated to the local refuse collector annually. David Twyman of Birmingham has been using his to make a balsa storage rack as shown in number seven. Just invert the reel holder, screw it to a lath of wood, or even the legs of your work bench, and you will find the holes quite useful for storing strip wood, whilst sheet can rest across the top.

With the fast approach of the competitive season, free flight power contestors will find a special interest in the two fuel limitation tanks presented as numbers eight and nine. Number eight comes from A. V. Coles of Bristol, and to many modellers familiar with E.D. and Mills cut-outs, the illustration is self explanatory. The length of neoprene tube is arranged to provide the required power run. The engine is started and tuned on the main tank, and when ready for flight, the wire operating arm can be moved to open the air bleed sleeve, and thus present any extra flow of fuel from the main tank to the neoprene tubing.

B. T. Faulkner's idea from Cheadle, number nine gives a mechanical shut-off within the main fuel tank. The wire plunger can be tripped when the motor is tuned and seals the flow of fuel on the main tank to the engine run tank. A small tube must be arranged as an extra ventilator from the engine run tank.

Having gone round the country and nipped across to Australia, Consus now retires and awaits a further flow of good ideas from the gadgeteers.


20 SWG HINGE PIN
BEND OVER & SOLDER
HINGE STRAP
PLY TAILPLANE
1
COTTON TO WINGTIP
DOOR IN FUSELAGE SIDE
FUSE
RUBBER BAND
2
EJECTED REEL HANGS ON TIP
COCKPIT COVER
18 SWG WIRE BENT TO SHAPE
5
ZINC
3
'SNIP' TIMER
CONNECTING ROD
4
MATCHBOX
6
STRIPS
SHEET
7
RUBBER BAND
MAIN TANK
PLUNGER
ENGINE RUN TANK
9
AIR BLEED SLEEVE
NEOPRENE TUBE
TO CARB INTAKE
WIRE OPERATING ARM
8
DIRECTION OF FLIGHT

Wind in Safety!

Eliminate the mental agony of those last few tortuous turns.

BY M. GARNETT & GEORGE WOOLLS

Who, as shown above faces a long stretch with complete confidence during the 1950 Gutteridge Trophy contest.

LIKE the proverbial bad ha'penny, the devastating effect of that broken rubber motor is always turning up, especially during contests. The early stick models did not suffer markedly from the effects of a broken, writhing, bunching and thrashing motor, and probably the early birch and silk fuselages were relatively immune. With the introduction of the balsa and tissue fuselage, however, the problem was accentuated and, even to-day, after years of alleged progress, fatalities from that source are still legion.

Early attempts to overcome the danger included the motor stick and noseblock combined, see Fig. 1. There one simply discarded the rest of the model while winding, and merely plugged in the wound up motor, etc. Provided there was a suitable arrangement at the rear end so that you could see easily whether or not the rear end of the stick went back in the right place and was suitably and securely locked, nothing much could go wrong. One snag, of course, was that side or down thrust could not be readily arranged by sticking in a bit of "sixteenth" or "thirty-second"—something more permanent had to be done to the angle between the noseblock and the stick, for only infinitesimal adjustments were possible by moving the rear of the stick around. The scheme lost favour because of this and also because of excessive weight, particularly when motors exceeded an ounce. Tubular sticks with the motor inside were tried, but trouble was experienced with bunching. (We believe that J. H. Maxwell used such a tube about 1942 or 1943, but there he discarded the rest of the fuselage.)

Detachable sticks, *i.e.*, sticks which were discarded after the wound motor had been inserted also were never popular. J. B. Allman did use such an arrangement in his twin skein Wakefields before the eight ounce rule came in. He wound the motors separately and used an H-plan jig affair: after stretch winding after a fashion, the wound motors were hooked across opposite arms of the jig. One point was that the jig was shorter than the distance between the hooks in the fuselage—in that way, the wound and waiting motors were considered to be "resting." When both motors were ready, he laid the jig on top of the fuselage, which opened up for the whole of the distance between the hooks, then he transferred the ends of the wound motors to the fuselage hooks and all was ready. Perhaps you can imagine the effort required to transfer four ends of fully wound motors, and can see why the scheme did not catch on.

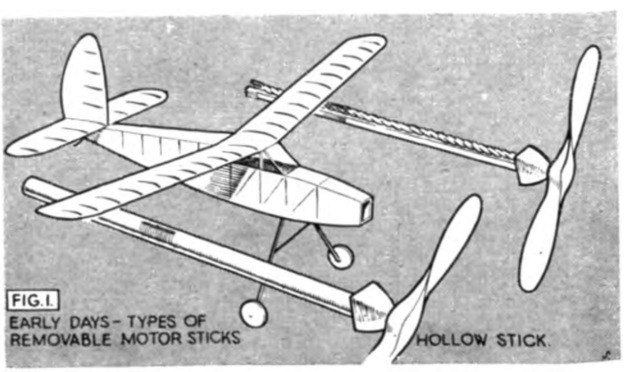
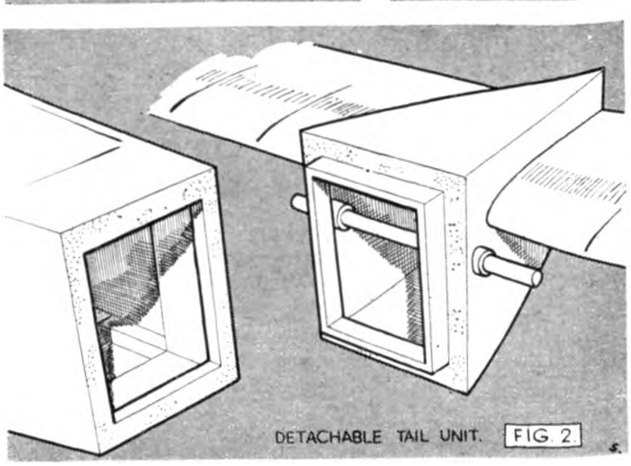
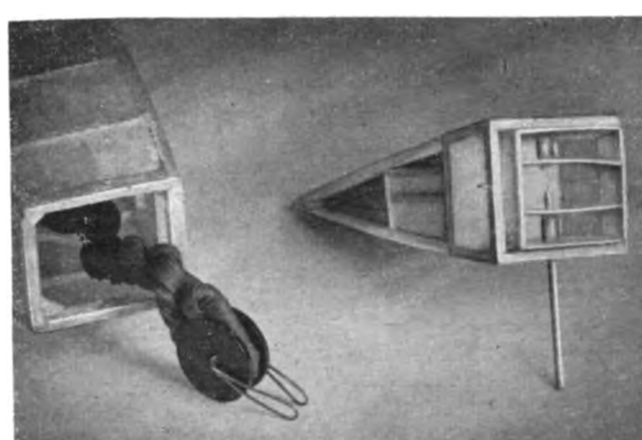


FIG. I. EARLY DAYS - TYPES OF REMOVABLE MOTOR STICKS. HOLLOW STICK.

We can discover no further development until about 1941 when wartime rubber started to be scarce and of uncertain quality and age. During a contest in that year, C. S. Wilkins of the Bristol club ruefully regarded the effects of the breakage of a four ounce motor. Then, he went into a huddle with A. H. Lee, and together they produced a simple and effective method for winding outside, which has remained substantially unaltered, and is still in regular use. We think that a detailed



DETACHABLE TAIL UNIT. FIG. 2.



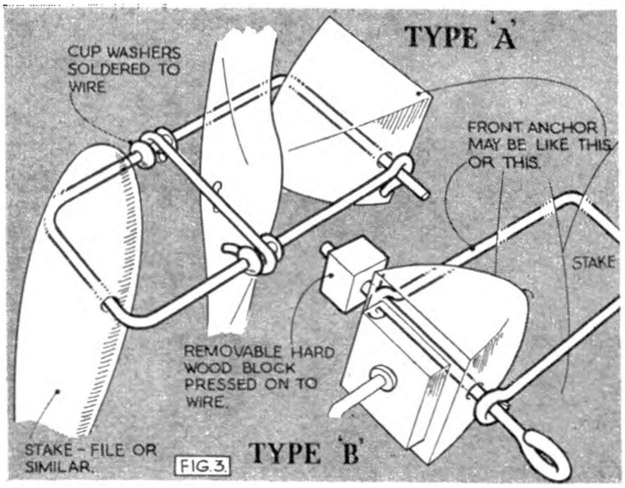


FIG.3.

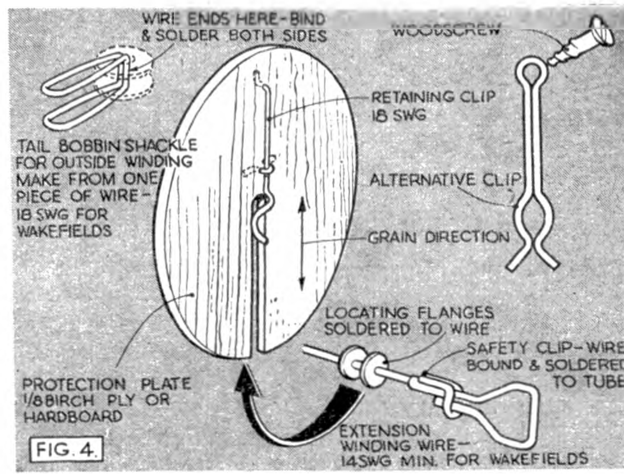


FIG. 4.

description of this method as it exists to-day will be of interest, but before doing so, it will be just as well to get the correct perspective by describing the type of model to which it was applied originally.

Geared models were used regularly in the Bristol club, until about three years ago when the straight drive became universal. In anticipation of the wisecracks, this longevity of the geared model was not due to the remoteness of the West, but because such models could easily hold their own with contemporary straight drive models. As an example, a geared low wing Wakefield by A. H. Lee consistently averaged flights of over three minutes, under conditions varying from good to heavy rain. Models usually had a single skein with a step up—about 3·2—gearbox forward, driving a medium diameter—12–16 in. diameter—fine pitch airscrew. For ease of winding and to avoid transferring a wound motor, these models featured a detachable tail unit—Fig. 2—which was held on by tension in the motor. Advantages over the conventional type include simplicity of tailplane and fin attachment and adjustment, ease of access for motor insertion and greater collapsibility for transport, all set against a small weight penalty (at the wrong end, unfortunately). With reasonable motor pre-tensioning, no trouble is experienced on the glide, and the locating block need not be a tight fit, as this may give trouble on landing. In the other extreme a Stubbs Wakefield type by J. Weber was seen in flight with the whole tail unit slowly rotating: surprisingly enough, the flight path was not affected, and the model eventually glided with the unit upside down. We cannot however recommend this for normal flying.

These geared models were also adapted to solo winding when the noseblock, with freewheel engaged, was anchored by either of the arrangements shown in Fig. 3. Old files or large screwdrivers stuck in the ground are standard, and either type of wire yoke is satisfactory. This scheme, of course, is equally suited to straight drive models and is the one used today. Type A is similar to the original, and has the advantage of no loose parts.

For outside winding, the only modification to this layout was an extended hook shaft on the winder. A 14 s.w.g. shaft is advisable to avoid whip, and the shaft passes right through the fuselage, which is retained and protected by a plywood disc clipped onto the wire. The arrangement is illustrated in Fig. 4.

Winding procedure should be fairly clear, and the sequence as follows :—

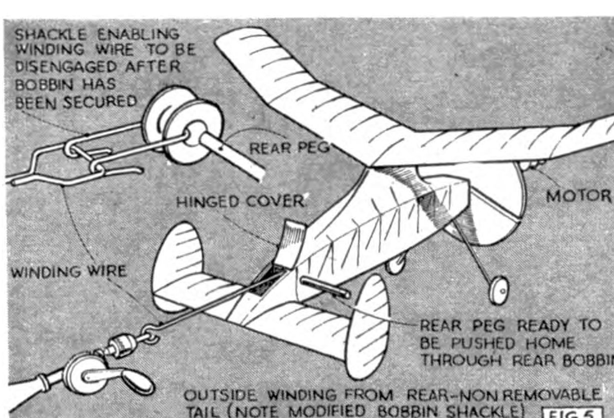
(1) Lock the noseblock in the front anchor with the freewheel engaged, (2) detach the tail unit, hold the rear bobbin and remove it by slipping out the rear dowel, (3) hook the bobbin shackle onto the winding hook, (4) pass the fuselage onto the wire and fit the plywood protection plate (the disc securing clip should be just strong enough to hold the disc on the wire, and yet permit easy removal), (5) stretch wind the motor in the usual way to finish winding with the motor length the same as the fuselage hook distance—with practice, this becomes quite easy to judge accurately, (6) remove the protection plate, and slide the fuselage up to the noseblock, (7) before removing the winding hook, insert the bobbin shackle and slide the rear dowel home. Then remove the winding wire which has served as a safety handle until assembly is complete, (8) finally fit the tail unit, unhitch the front end, and all is ready.

This long and peculiar sequence of winding sounds very complex in words, and consequently it may be argued that excessive time will be lost after winding. To check this we clocked three people who use this method, and found that the average time taken to re-assemble after winding was fifteen seconds.

Even in the Bristol club, some people did not like the detachable tail, and C. E. P. Smith introduced an open and cocked up rear fuselage through which the winding wire could be passed—see Fig. 5.

Thanks to C. S. Wilkins then, we now had a safe method of outside winding, which was applicable to practically every type of rubber driven model, and which had the added advantage of being single handed.

There have been no real developments from the basic scheme, but some time ago it was suspected that winding from the rear was upsetting the C.G. and in the wrong direction. Certainly, models wound in that manner seemed to have a tail-down attitude for the initial portion of the flight, and as



OUTSIDE WINDING FROM REAR-NON REMOVABLE TAIL (NOTE MODIFIED BOBBIN SHACKLE) FIG 5.

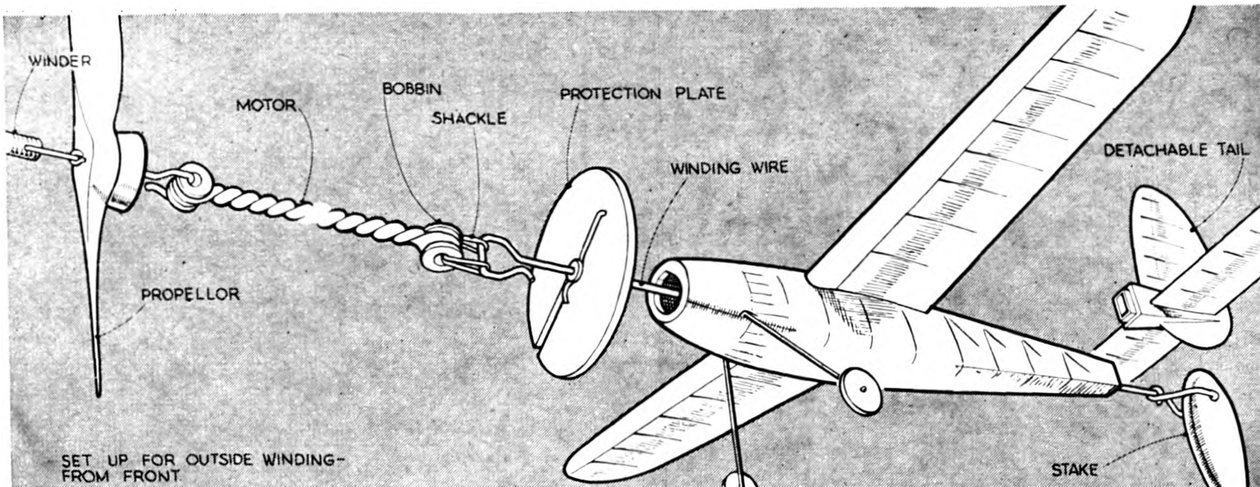


FIG. 6

though to cap matters, a Jaguar flown by S. Matthews last year had been trimmed whilst being wound from the rear. When wound from the front, the model refused to take off at all, although winding from the rear produced satisfactory results immediately. We checked a Wakefield wound from each end in turn, and found there was a C.G. shift, but only about ⅛ in. and *away* from the wound end, *i.e.*, a model wound from the rear would have the C.G. forward.

However, to satisfy the pundits, we have devised a scheme for outside winding from the front. This is shown in Fig. 6, where it will be seen that a normal size winding hook is used, and the model is slid over a shaft anchored to the ground. If this scheme is used, however, some method of preventing the airscrew from rotating is required, while the tail is being fitted, either a removeable lock, or an assistant.

Concerning the use of either outside winding system, we have experienced trouble at rallies in finding ground suitable for inserting the anchoring stake close to the take-off area. All too often we find rock or something similar a few inches below the surface. This usually causes a little bother, and necessitates a liaison between the take-off area and the winding point. Some may remember a certain amount of hand waving and shouting on the part of the Bristol contingent at the 1949 Fairlop Wakefield trials. To overcome this snag in the future, it is intended to use two-man outside winding, the assistant taking the place of the original ground anchor, and hanging on to a suitable handle at the end of the wire—see Fig. 7. The assistant will also attach the motor and fit the tail unit, whilst the winder-upper hangs on to the airscrew and model. For even greater protection to model

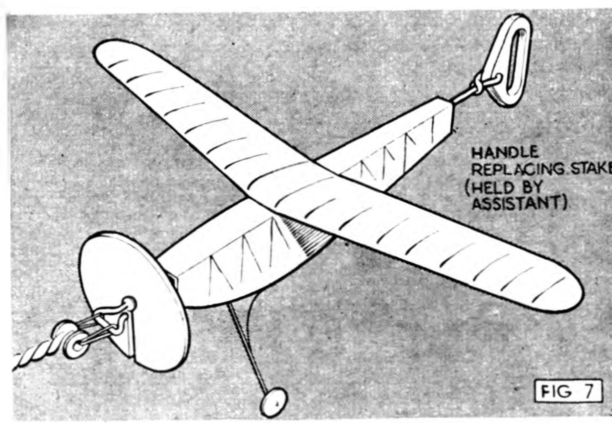


FIG. 7

and airscrew, a second plywood disc could be fitted to the propeller shaft, between the noseblock and the motor. Here, however, our experience shows that no damage to airscrews has occurred yet, despite a goodly percentage of broken Wakefield motors.

Then is all this clap-trappery really worth it ? We think it is, as it removes one hazard from contest life, and may enable you to get the most out of your motor on each flight. It will also increase the chances of a long life to your model, and if we may cite one example—Witch I—reference AEROMODELLER, April, 1950—was built over two seasons ago, and its performance seems to improve with age. Note its performance in the Gutteridge in 1950.

Finally, we would thank all those members of the Bristol club who have contributed to this article, not forgetting C. W. Needham, who remembered the early motor stick days.

Our roving camera at the 1950 Wakefield Trials at Fairlop, caught this scene of Bristol Club members using their safety system. On the right, holding the handle as in Fig. 7 above, is George Woolls.

We present in this Review a further four kits which have been built and test flown by members of the AEROMODELLER staff. A further Review of additional kits and also accessories will be following in the very near future.

FROG POWAVAN. 25/-

48 in. wing span. 25¼ in. length. 250 sq. ins. wing area, Our weight 16 oz. with Frog 100 diesel.

Packaging

Multi-coloured, attractively printed carton boxes are now an established Frog trademark. It is a pity that rigidity has had to suffer for the sake of the distinctive colour printing, for not only is this type of packaging difficult to stack in shop counter or shelf display, but the risk of damage to individual kits in postal transit also requires considerable additional wrapping. We were pleased to note that NO damage to contents was found in our review kits, and that the tightly packed contents are now accessible through the box lid, and not through the box end as in earlier kits.

Quality of Contents

Good grade balsa and hardwood parts, with ready shaped leading and trailing edges, and every sheet part die-stamped with perfect accuracy, make this a kit of A1 quality

Completeness

Apart from the need to supplement the supply of cement, the kit is complete to the finest detail. Even the elastic bands for assembly of the completed model, and tiny woodscrews for holding the alloy cowling, are supplied.

Ease of Assembly

Frog kits are so near to being completely prefabricated that we might expect the instructions to read " shake the box in the left hand, squirt cement with the right, and the kit will assemble itself ". We found the Powavan almost as simple as that to build. We say *almost* because this model is made from what appears to be literally hundreds of component parts. Halfway through construction, which takes longer than average for a 48 in. contest job, we began to wonder if the dozens of pieces that go to make the fuselage were really necessary ! However, our patience won through, and though our test model exceeded the specified 13 oz. by 3 extra oz. we were satisfied that we had a virtually indestructible model. In fact, when on test it landed, without intent, on the Managing Editor's office roof with a resounding crash usually indicative of a write-off, the only damage was a smashed celluloid wheel which had taken most of the impact.

Powavan is not for hasty builders, it is a model for those who enjoy building as much as high performance flying.

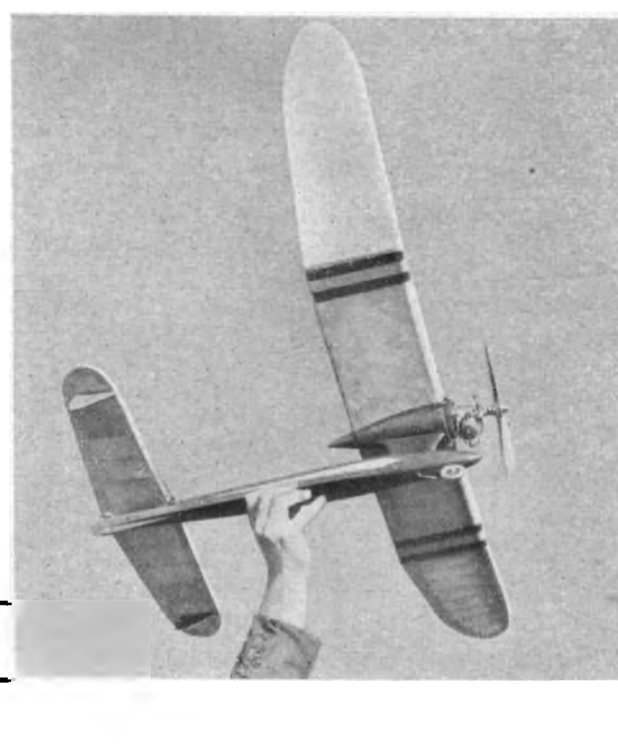
Instructions

Are without fault and key perfectly with numbered parts shown on the plan. The flying instructions are unique in that they describe exactly the best method of trimming.

Value is 100 per cent.

Flying

Fitted with a Frog 100, driving a Frog 8 in. × 5 in. prop., the test model was put through all forms of trim ; but the advised straight climb, and left-hand glide turn, proved best with regular still air ratios of between 6 : 1 and 9 : 1. This may sound a trifle far fetched for a contest model with a 9 oz./sq. ft. wing loading, and a power loading as high as ·07 b.h.p./lb. but the ability of the Powavan to sustain a steady near-vertical climb, without the slightest tendency to stall, is something which calls for greater study of this unusual high thrust-line layout. No downthrust was needed ; but 3/16 in. packing under the tailplane T.E. was required (due to wash out on the wings of our particular model) before the model assumed its remarkably flat glide. A right hand turn is not to be advised at any time, nor is movement of the whole tail unit as a trimmer for turn. The trim tab itself is sensitive to a fractional movement.



In our heading photograph, Ron Moulton demonstrates the Powavan's vertical climb. View on the right displays the unusual layout.

" Andy " and Adrian, Harry Hundleby's five year old son, who consistently flies this robust little model.

HALFAX " ANDY " 5s.

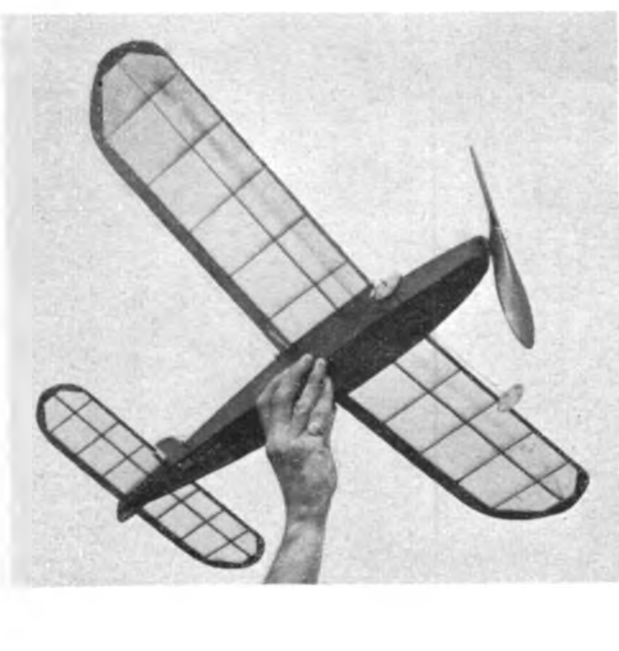
20 in. span. 15¼ ins. length. 53 sq. ins. wing area. Our weight, 1⅛ ounces.

Packaging

A sturdy and well finished cardboard box of the correct size, attractively printed in three colours give this kit good shelf appeal, and well protect it from the rigours of our postal services.

Quality of Contents

First rate medium grade balsa, cleanly printed, good quality plywood and a neatly finished pair of hard wood wheels, left the reviewer well satisfied from the timber angle. Although the part shaped airscrew of good quality could, we thought, have been ready drilled, as it is not a simple matter, especially for the more junior modeller, to drill a pre-shaped airscrew dead true. The detailed building and flying instructions are first rate, and the plan includes useful perspectives for the guidance of the younger builder.



Completeness

A small amount of wood was left over and the hardware, i.e., wire, cup washers, brass tubing and aluminium tubing proved sufficient. In addition, small sized tubes of Titanine balsa cement and Titanine covering cement proved adequate, the covering tissue, provided in two colours.

Ease of Assembly

The printed sheet sides show the position of the various cross pieces, etc., and make the fuselage construction particularly simple, as indeed was the rest of the model. We would suggest that the undercarriage tube is not merely cemented to the former as given in the building instructions, but that the joint is additionally strengthened by a strip of tissue. When it came to assembly, it was found that the apertures in the fuselage side were slightly undersize, and needed enlarging before the wing could pass through. Builders should work well to the outside of the printed line when cutting out these apertures.

Apart from the above points construction was absolutely straightforward, and when the framework was finally covered and doped, it was apparent that " Andy " was blessed with a rugged constitution capable of taking punishment.

Value. 100 per cent.

Flying

The rubber version was first tested, and this came off the production line slightly tail heavy, but was soon adjusted by a small piece of ballast in the nose. No other trimming adjustments were necessary, and the test model had a pleasing climbing turn to the right under power, followed by a gentle left hand circle on the glide. Duration was good for such a small model, and flights of over 50 seconds were achieved.

" Jetex " powered, the model is possessed of a very nifty climb, and it was possible to obtain a tight spiral without any spinning tendencies.

As a glider the model was satisfactory, but as can be imagined, somewhat light on the line. It was however reasonably stable on the line for its size, and were it not for its somewhat masculine title we would quote this model as being a reliable " maid of all work ".

MERCURY MAYBUG 8s. 3d.

32 in. span. 22¾ ins. length. 182 sq. ins. wing area. Our weight, 5⅛ ounces.

Packaging

Parts neatly packed in firm cardboard box, minimising possibility of damage in transit.

Quality of Contents

Good balsa, graded according to the job it has to do, from hard for wing spars to medium soft for ribs. All necessary parts are printed in clean lines, simplifying cutting out, and the plans are good and clear.

Completeness

Everything necessary to build the model is present, including practically finished balsa propeller, part-shaped propeller shaft, rubber motor and hardwood wheels. A tube of Britfix cement is included.

Ease of Assembly

Maybug is an excellent beginner's model; straightforward to build, if the detailed Building Instructions are followed, and with one or two refinements which make the construction more interesting. The finished model is quite robust for a little 'un, the lines are attractive and it is just the thing for that young nephew's first model.

Two points, not in the Building Instructions, which the beginner would wish to know more about, are the fitting of the windscreen and how the wheels are kept on the axles. In the case of the former, the shape should be worked out with a piece of thin card before the celluloid is touched, as the curves are tricky. On our Maybug, the wheels are retained

The pleasing lines of the Frog Firefly are shown to best advantage on the right.

with a few turns of fuse wire soldered around the axle.

Instructions

Complete, save for the two small points mentioned.

Value. Very good.

Flying

The AEROMODELLER Maybug was slightly tail-heavy and required packing under the leading edge of the tailplane to obtain a satisfactory glide. For power flight the best results were obtained with 1/16 left side sidethrust on the nose block. With the motor well lubricated only 600 turns were possible before the propeller shaft cut through the rubber; a piece of valve tubing would rectify this.

Once trimmed, Maybug will give the beginner consistent flights, and, in our opinion, an increase of one third in the motor length, **after some experience with the motor supplied,** which is 4 strands of 3/16 ins. flat, would improve the performance and give the beginner an even better idea of what this model can do.

FROG FIREFLY. 22/6

36 in. span. 23½ in. length. 298 sq. ins. wing area. Our weight, 13½ ounces, with Frog 100 diesel.

On **Packaging** of this kit we would refer to the Powavan review; the same remarks apply equally to both kits.

Quality of Contents

Just as complete as the Powavan, right down to the elastic bands and tissue paste, the Firefly kit contains an additional quality feature in its special plastic-coated moulded balsa fuselage. This light shell makes an almost indestructible fuselage and requires but little work in its assembly. The quality of all the woods, including the thoughtful supply of hardwood mainspars, is excellent.

Completeness

Firefly is an absolutely self-sufficient kit, with enough cement, plenty of scrap left over for trimming, adjustments, and even the special spinner and adaptor screw to fit it to the Frog engine.

Ease of Assembly

The review kit was assembled by a relative novice in power flying, and, we might mention, she was of the fair sex. Without assistance, and with but little previous experience of aeromodelling, our selected tester completed the model in approximately two weeks spare time and reflected on the ease with which each part accurately fitted into place. It would be very difficult for even the most raw of beginners to go wrong in making the Firefly.

Instructions

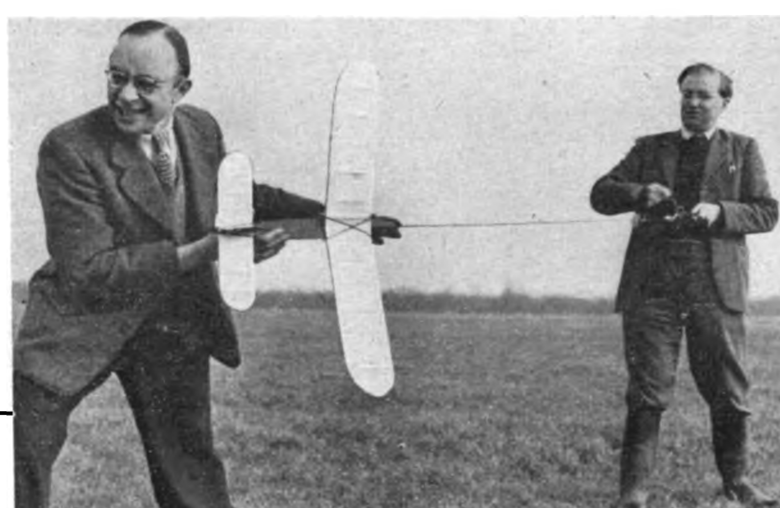
Can be credited as a great aid to the pleasure of making this model; little is left to the imagination, and perspective views of the more difficult parts are shown with clarity on the plan.

Value is absolutely 100 per cent.

Flying

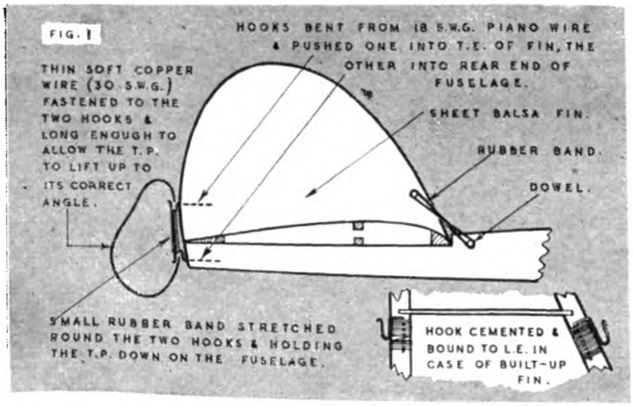
The test model has been flown over fifty times, has been subjected to all forms of trim, and has on many occasions spun in under power, or on the glide. The only damage has been to the foremost part of the upper wing platform, and to the tissue around the strut fittings. On **all** of these unfortunate occasions, the model was trimmed to fly to the right and at least two spins were due to movement of the lower wings (which can twist the strut out of line and thus form an outboard rudder). On each crash, the model literally flew to pieces, and even after a 40 m.p.h. spiral dive from well over 100 ft,. it was just a case of gathering all the components, adding new rubber bands, filling up and flying again within five minutes.

After securing the lower wings with a transverse rubber band and arranging the very sensitive rudder for a slight left hand turn under power and tighter left turn on the glide, plus the addition of lead ballast on the nose and ⅛ in. packing under the tailplane leading edge, we have enjoyed many hours of safe and impressive flying with the Firefly. It is a fast flying job and takes off after a most realistic run of 20 ft. into a climb of about 30° at 35–40 m.p.h.



Extreme left, simplicity and clean design are the main features of the Mercury "Maybug". On the right, Fred Turner appears to doubt Ron Moulton's capability of counting during the test flying.

ESPECIALLY for the BEGINNER



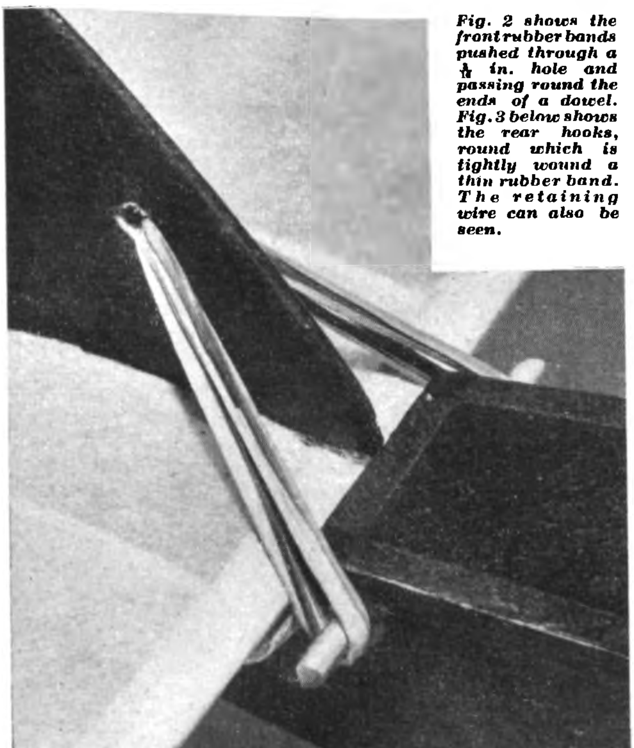
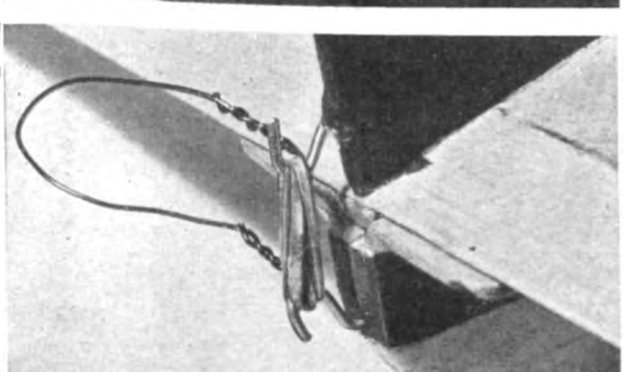


***Fig. 2** shows the front rubber bands pushed through a $\frac{1}{16}$ in. hole and passing round the ends of a dowel. **Fig. 3** below shows the rear hooks, round which is tightly wound a thin rubber band. The retaining wire can also be seen.*



By the Rev. F. Callon

Dethermalisers

So far we have had no mention of dethermalisers in this series, partly because there have been so many other important things to deal with, but mainly because it would seem that by the time a modeller feels the need for them he can scarcely be classed as a beginner any longer. But for those of you who have been building regularly since the series began over a year ago, the time has come (as the Walrus said) to talk of many things; of parachutes and tip-up tails, fuses and floating wings. Another reason for this month's subject is that Roland Scott has been just a little too clever in designing a brand new addition to the Walthew series of models: this one flies so well that unless you want to lose it you will have to employ a dethermaliser.

What is a D.T.?

D.T. is the usual abbreviation for "dethermaliser", and has nothing to do with the pink elephants commonly associated with *Delirium Tremens*. Thermals, as you probably know, are rising currents of air which are largely responsible for the appearance of clouds. Warm air does two things: it absorbs water vapour (at this stage quite invisible), and it rises. As it goes up it grows colder and its load of water vapour gradually condenses and becomes visible in the form of a cloud. Cumulus clouds (the big white puffy ones) and dark thunder clouds generally have a pretty strong thermal beneath them, while smaller patches of rising air will be found over any dark-coloured areas of ground which have soaked in plenty of heat from the sun's rays.

If a model is circling in one of these columns of rising air, it goes higher and higher and can very easily disappear o.o.s. I know of one case where three old and rather battered rubber models were deliberately got rid of by being launched directly below a large thunder cloud; they climbed steeply, disappeared into it and were never heard of again! A tall story if you like, but perfectly true.

The object of a D.T. is to prevent this sort of thing from happening. It is an arrangement intended to bring the model fairly swiftly down to earth after a specified number of minutes by upsetting its glide in some way. To accomplish this, the angle of attack—the "balance" of the model in the air—is drastically altered, or the smooth flow of air over its flying surfaces is spoiled.

Different types of D.T.'s

Quite a number of ingenious methods have been worked out to achieve the above end. The wing may be made to tip up—or even to float right off, being attached to the fuselage only by a length of thread fastened to one tip; one wing tip may be drawn down by a weight on the end of a long cotton, previously concealed under the centre of gravity of the model; or a small parachute may unfold, attached to the tail and holding it slightly higher than the nose. Of these methods the floating wing or the small parachute are the simplest and perhaps the best adapted for lightweight gliders, though it must be mentioned that in a really strong thermal a parachute may take over and draw the entire model up with it—even though you *did* remember to cut a hole out of the centre of the fabric.

At present most people seem to agree that the simplest and most effective system is the tip-up tailplane; we will deal with it here in detail.

Timing Devices

Whatever type of D.T. is being used, there is need for some arrangement to "set it off" after a given number of minutes in the air. Compressed air timers tend to be rather expensive and not too accurate over a number of minutes, so fuses have become far more popular. For a few pence you can make enough fuses to last the whole season. All you need is 2 ozs. of saltpetre (4d. from the nearest chemist) and a quantity of good quality, thick, white string—the cord from a small silk parachute is ideal.

First of all make a saturated solution of saltpetre—*i.e.* dissolve the crystals in a small amount of warm water, and keep on adding them until no more will dissolve. You will probably find that 2 oz. will be more than enough for a tumbler full of water. The string, as much of it as you like, is then thoroughly soaked in the solution, squeezed out very slightly, and left to dry in a warm place. When it is quite dry, put a match or a lighted cigarette to one end, and you will find that it glows brightly and splutters its way along, just like the blue paper on the end of a firework. The speed at which the string burns away is very important, for on this depends how long your fuse will have to be. Mark off three or four inches (using a ruler) along the fuse, and carefully time how long it lasts. It will probably be something like one minute per inch. You can now calculate how long a fuse will be needed for a three, four, or five minute flight, and cut off so much accordingly. The saltpetre solution will keep well if stored in a corked bottle.

How the Tip-up Tailplane Works

This system is excellent for models where the fin is cemented to the centre of the tailplane, and the whole unit is detachable from the rear of the fuselage. Fig. 1 shows the general arrangement. The pull needed on the front of the fin is quite considerable if the tail unit is to spring up sharply, so two or three thin rubber bands will be needed here. If the fin is of sheet balsa, it is quite a simple matter to bore a 3/16 in. hole through it at the point indicated, and the bands are then passed through this hole and over the ends of the dowel at either side of the fuselage (see also Fig. 2). If the fin is of the built-up variety, then a hook should be bent out of 18 s.w.g. wire and bound and cemented to its L.E.—see inset to Fig. 1—the same method being used for the upper of the two rear hooks. A small rubber band wound tightly round the two rear hooks prevents the strong front bands from pulling the tail unit up at an angle, the size of which is governed by the length of the thin retaining wire fastened permanently at either end to the two rear hooks—see Fig. 3.

The angle at which the tailplane tips up depends on the length of the thin retaining wire between the rear hooks, which in its turn will vary according to the width or chord of the T.P. The tip-up angle generally recommended is 30 degrees, but I have found this insufficient in certain cases. At any rate, never employ a smaller angle, or the model may come down in a never-ending series of tight loops! When the angle is slightly too small, the descent is made in short, sharp stalls—first the nose, then the tail pointing vertically into the air. A landing under these circumstances can easily mean a bad smash. The remedy is to increase the tip-up angle by lengthening the retaining wire until, when the fuse burns through the rubber band and releases the tail unit, the model floats down to earth quite steadily with its nose pointing very slightly upwards. There will be a few sharp stalls to begin with, of course, but these should grow less and disappear in a matter of seconds, after which the model should behave very much like a parachute descending vertically.

The Tip-up D.T. in Use

No trouble will be experienced here. All you have to do is to cut off the required length of fuse and push one end of it between the strands of the rear retaining rubber band, (see Fig. 4), the other end of the fuse being ignited just before the model is taken up on the towline. An extra half inch or so of fuse should be allowed for the time the model will take to climb up on the line before being launched. The rest of the procedure is out of your hands and quite automatic; as soon as the fuse burns along to the retaining band, up goes the tail unit (see Fig. 6) and down comes the model. And as long as the string has been properly soaked in saltpetre, you need have no doubt about its burning through the rubber band; I have never yet come across a case of failure in this respect.

Latest News for Beginners

There has been a lot of talk recently about "A.2" gliders. These are quite large models, the wing and tail areas adding up to about 500 sq. ins., and the weight being over 14½ oz. Too big for a beginner to tackle? At first sight one would be inclined to say that it was; but after inspecting and flying Roland Scott's Walthew A.2 the answer is definitely "NO". Specially designed for beginners, it is even easier to build than the original Walthew Glider, although being so much bigger it will take longer to complete. It calls for strong, accurate construction, and so it is scarcely a *first* model, but no beginner with even a little experience need be afraid of building it.

It is a slab-sider, the fuselage built from 3/16 square balsa, even chord wing and tail, both of Clark Y section, and employs a tip-up tail D.T. as described above. The wing has a tip dihedral like the Walthew Glider but it is mounted directly on to the top of the fuselage—no wire supports and wing bearers to worry about this time—the correct angle of incidence being automatically built in along the top of the fuselage upper longerons. And it flies like a dream! The plan and all the "gen" will appear next month.

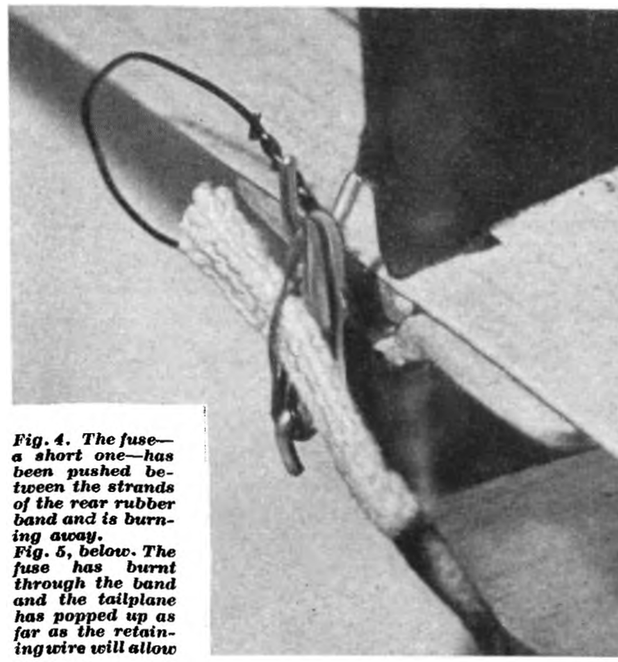
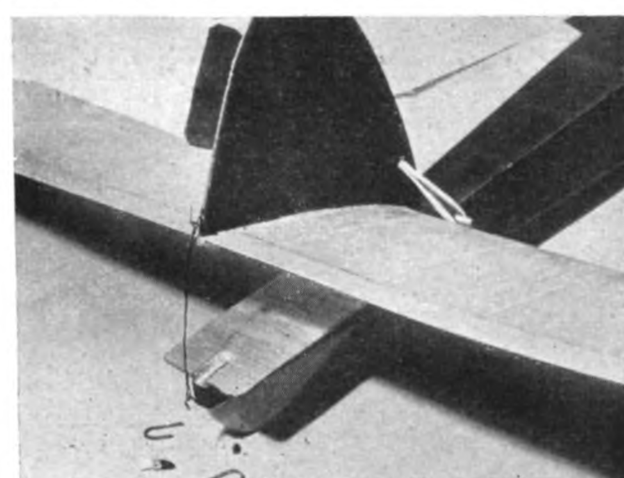
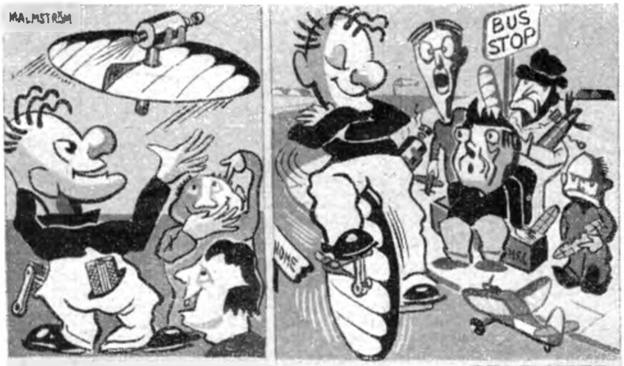


Fig. 4. The fuse—a short one—has been pushed between the strands of the rear rubber band and is burning away.

Fig. 5, below. The fuse has burnt through the band and the tailplane has popped up as far as the retaining wire will allow





MODEL NEWS

SELECTED ITEMS BY FLIAR PHIL

GREETINGS Bods ! It's your old pal Fliar Phil rolling in again with all that's new in pictures. Just to prove that the old maestro's flying saucer is no balloon, take a peek at the graphic sketch Raymond the Malmstrom has made this month—that saucer makes a new form of aeromuddler transport, by deft addition of a pair of old bike footpads it swiftly converts to a novel monocycle . . . trust Phrend Phil to lead the Phield ! !

Better not try to hand-launch this model of the month—it looks so beeg ! hmm ? So you don't believe it, well just to show you how honest Phil is, we'll let you into a secret. Trick photography is the answer, bods . . . just a pose on the part of the builder, Ray Edridge, who is staggered a little way back from his very unusual P.R.U. Junior 60. With a carefully placed camera you too can fake a fool-size shot of your favourite model. This particular Junior 60 is a Photographic Reconnaissance Unit in miniature. Inside the fuselage, there's a small camera, and this is tripped off at a set time after take-off by the usual kind of flight timer. F.P. has already seen a wizard pic of the runway at Boxted, Essex, aerodrome, which was taken by the P.R.U. 60. Boxted is the flying ground for the Colchester club, of which the late Ray Edridge was the keenest member. Ray was lost in a motor-cycle accident last summer; but his memory is cherished with a Memorial cup for open competition among his club members.

Over at the top of the left hand column is an example of what appears to be a dying art ; it's a solid model to the once very popular 1/72 scale. This Hawker Tempest II was made by D. B. Davies of Horton Hospital of Epsom, Surrey. Built entirely of balsa and ply, the model took over 160 hours to complete. A fellow patient took the photo using two 100 watt bulbs for lighting and ten seconds exposure on the camera. After making the Tempest, Mr. Davies recommends harder wood than balsa for solids, that is if one wants a true to scale sharp trailing edge.

Also from Epsom, but out on the downs this time, is the next photo at left, of J. A. Geesing's free-flight contest job. Amco 3·5 diesel powers this " Zilliboy ", note that for initial tests the prop is fitted backwards to reduce its efficiency. Better keep an eye on that tiny fin Mr. Geesing, it'll disappear altogether soon !

From away out at Tripoli, A. P. Oddy, B.O.A.C. engineer, and late comp. secretary of Bournemouth M.A.S., sends the picture of his latest Class III speed model. Modelled after design characteristics given in the AEROMODELLER "It's Designed for You " article on speed models, it is 16 ins. span and uses an Amco 3·5 c.c. diesel turning a 7 in. × 12 in. prop. This model flew straight " off the board ", and has already clocked the admirable speed of 101·7 m.p.h. Nice work Mr. Oddy ; please try to keep the Tripoli sand out of the intake won't you !

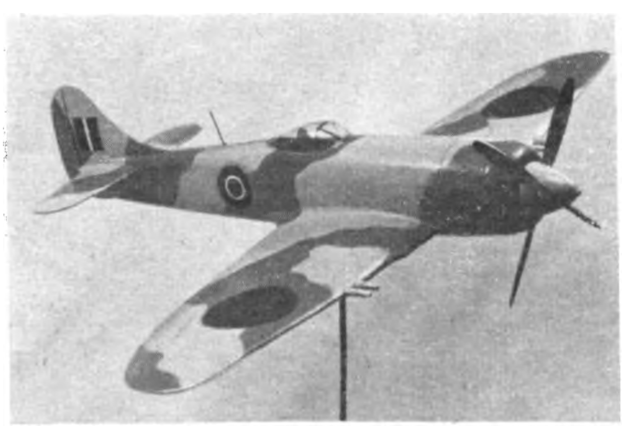
That Nordic class sailplane at far right is known as " Joy ", not the female variety bods, but from the good old Raffism " bags 'o joy ". Co-designed by G. A. Briggs and P. S. Pengilly of Henley-on-Thames, this particular model was built and photographed by Mr. Pengilly. Coloured deep blue and white, this streamliner has an air of realism about its fuselage that is rather unusual in modern contest glider design.

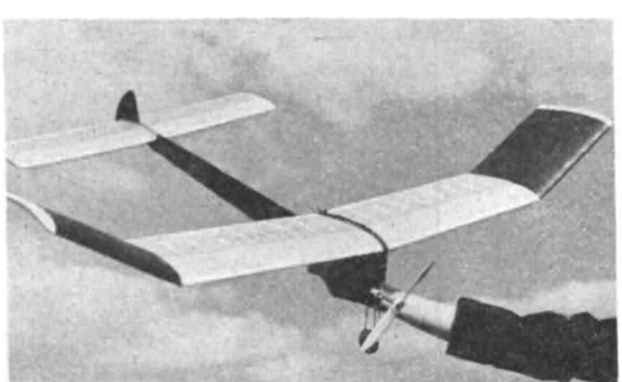
Yes bods ! ! Those are real match boxes in the next picture, you can take Phil's word for it. That diminutive model resting atop of standard Bryant and Mays best really is a flying job. Keith Millar took this shot of Doug. Crow's (Croydon) scaled down version of the Keil Kraft Slicker. Known as the Slicker Babe, it boasts a span of six huge inches, and has several times disappeared o.o.s. over the garden fence on its four strands of 1/32 square rubber motor. Note the baby Bee, reduced in keeping with the rest of the model !

Further right is a much bigger job. An E.D. Radio Queen with Frog 500 and built by Jeff Walsh of Hale, Cheshire, it is finished blue and yellow. Photo was taken by C. Christianson, using an Ensign Carbine camera, with HP3 film and yellow filter.

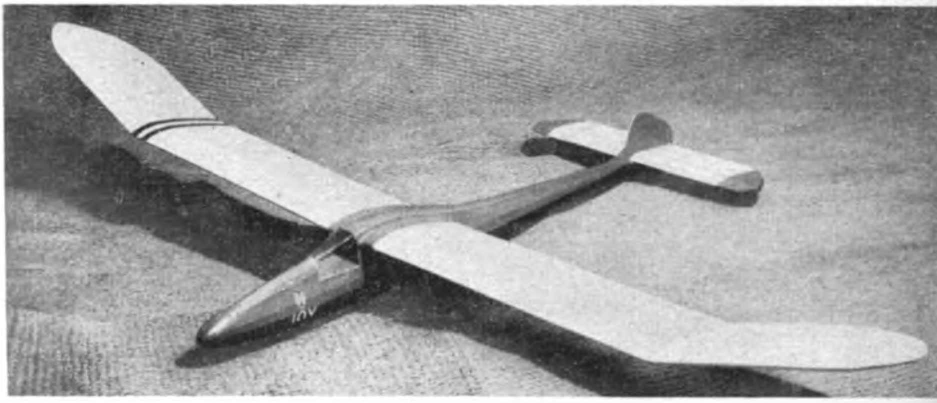
Fliar Phil admires the noteworthy conversion by W. J. Barrett of Manchester, of the A.P.S. rubber-powered Airspeed Envoy to control-line. By fitting two E.D. Bees, this 52½-in. scale version of the one-time King's Flight aircraft can maintain line tension at 40 ft. radius, and has already collected a first and a second place at local Concours d'Elegance events. Total weight is now 27 ounces. Spurred by the success of the Envoy, builder W. Barrett is now at work on a four engined control-liner of the Avro Lincoln. It should be very interesting after last month's reports on control-line multi's.

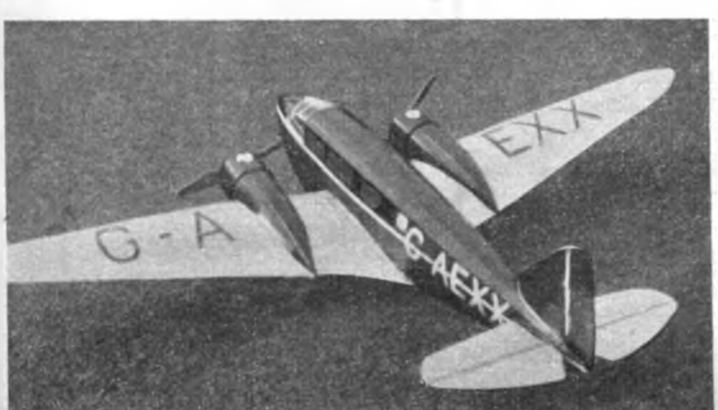
That's all for now bods, no team-racers this month, Phil is right out of stock of them at the moment. Look out for the Uniplane at the Ripmax won't you ?





MODEL OF THE MONTH





WORLD NEWS

BY ARIEL

Wildcat diesel powered Stentorian shown at vast Kolar airfield, India, is radio-controlled. See India paragraph below.

India

Lt.Col. J. N. Larcombe, who is at Kolar Gold Fields, Mysore State, sent us some good photographs (6 in.×8 in. glossy prints, just what we like for reproduction) and full details of his R/C " Stentorian ".

Radio is an E.D. Mk. III, the receiver being removed from its paxolin tube and mounted on flat ebonite. This alteration was made to simplify valve replacement and relay adjustment. Separate H.T. and L.T. switches are fitted.

The photos were taken by Mr. L. H. McLaggan using a Rolliflex and Super XX. film, 1/100 second at f11.

The runway is on the ex-R.A.F. field at Kolar (one time Liberator Conversion Centre) which is perfect for model flying, although Col. Larcombe has to go 25 miles by car on each occasion. He considers the journey worthwhile, however, and we are inclined to agree with him.

Pakistan

The Mauripur Modelling Club is in the news again, vide its Secretary, Sgt. J. McCafferty.

His latest report concerns the 1951 All Pakistan Aeromodelling Competition, held at R.P.A.F. Station, Drigh Road, on the 21st January, at which the Mauripur Modellers carried off most of the " silver ware ".

W/O Riches won the Concours Event with an E.D. Comp. powered D.H. Dove, with F/Sgt. Probert in second place with his finely finished Frog 45. Flying this model, Probert was third in the Semi-scale Cabin Duration event.

Our correspondent won the Pylon Power Ratio with his own design Mills ·75 powered job, with two flights, the model diving in under power on the third. However, this win brought the Challenge Shield back to the Mauripur Clubroom, for the second year, F/Sgt. Farley having gained it in the 1950 Competition, as World News readers may remember.

Despite the non-thermal conditions, A/C. George Howard, late of the Paisley Club, concluded a very polished performance with his K.K. Chief, in the Glider Event, with a 4¼ min. flight. Probert's " Norseman " was second and Colin Lennox got his o/d lightweight into third place.

Mauripur again swept the field in the C.L. events, Stunt going to A/C. Fisher flying an Elfin powered " Small Fry " and Speed to W/O. Farley (last year's Challenge Shield winner as a F/Sgt.), with a modified " Phantom ", E.D. IV powered. Sgt. Kinder, in second place, was flying another E.D. IV model, his own design, and superbly finished, which left the lines at speed. Thanks to a brisk repair job, assisted by Club members, he was back in the circle in time to place, and is to be congratulated on a good try.

A/C. Howard was second in the Stunt event, flying a " Stoo plate " which caused quite a sensation, being the first " flying saucer " to appear in Pakistan!

Sgt. McCafferty has promised us pictures of this Competition, and we look forward to seeing them.

Malta

From yet another source we learn something of the aeromodelling situation on the G.C. Island, to wit, Joe Borg of Pawla. He is a keen modeller, but complains that he does not find much encouragement to continue with his hobby. Flying space is very restricted, the only " wide open spaces " being at the Service Aerodromes, and it would seem that it is difficult for civilians to obtain permission to fly there.

Borg states that there are hundreds of aeromodelling enthusiasts on the Island, faced with the same difficulty as far as flying room is concerned, and this is diminishing the chances of the hobby becoming as popular as it could.

It seems, therefore, that the future of aeromodelling in Malta depends on the good offices of the R.A.F., and it is to be hoped that the C.O. of Luqu Aerodrome will find it possible to let these keen types do some flying on his field. What about it, sir?

Italy

The 1950 Italian Nationals were held at Bologna from the 12th to the 15th of October, and a full list of winners was sent to us by Carlo Tione of the Aero Club d'Italia.

There were four contests, F.A.I. Gliders, 50 metre towline, F.A.I. Rubber, F.A.I. Power and Control Line Stunt.

The Stunt event was held on the 15th, a Sunday, with some 3,000 interested spectators, and at the conclusion of this they were treated to a demonstration of Team Racing by leading exponents, Gottarelli and Fiorini. Gnesi and Brotto put on a show of pursuit type racing, which, also, went down well with the spectators.

The Aeromodellers Society of Karachi, Pakistan, are featured at left. Taken at one of their regular Sunday flying meets, the picture shows, left to right: Joe Pereira and Kan Doo, Rust. B. Mobed and old Wakefield, Homi Vaccha and E.D. Bee Dizzy Diesel, Y. N. Mobed and E.D.II powered Wildfire, whilst in front are R. M. Patel, Mansurali and a very important person—Viraf, the retriever and helper.

Competitors in the 1950 Italian Stunt Championships display their models. Flown at Margherita's garden, Bologna, the comp was won by Piero Gnesi, who can be discerned at the rear, holding his two McCoy 29 "Vertigine" (in English, "Lunatic") stunters above his head.

The top place fliers in the four events were: Piazza, of Milan, with an aggregate of 7 : 57·3, in the Glider. Annoni, of Rome, second, and Russo, of Treviso, third. The winner of the F.A.I. Rubber was Leardi, of Milan, with an aggregate of 13 : 14·2, Licen, of Monfalcone, being second, and Di Pietro, of Rome, third. In the Power Event, Padovano, of Turin, was first, with 13 : 01·8, followed by Batistella, of Venice, and Di Pietro, of Rome, with his second success.

The winning team of the 29 entered was CAM, of Milan, with FIAT, of Turin, and the A Rome Team, second and third.

We could pick out, from excellent pictures, Leardi with his Wakefield, modified from its 1950 appearance, and the Jaguar flown by Sabbadin, of Venice. Manncelli's M.O.42 Experimental Glider, which was given a page sketch in the AEROMODELLER ANNUAL, 1950, was shown airborne, having been built by Bacchi, and it is certainly an unorthodox job. Another unorthodox design is Di Pietro's power model with the "shark's fin" Pylon, powered with a McCoy 29. Another model recognised was Gottarelli's Team Tacer, also sketched in the AEROMODELLER ANNUAL, 1950.

The first demonstration of R/C flying in Italy was seen during these Contests, put on by Frillici and Caravello, of Viterbo with a model bearing a likeness to "Radart", which, from what we can see from the photos, was powered with an ignition engine. It carries twin aerials, from the wing centre-section back to the fin, and would appear to be between 5 ft. and 6 ft. span.

Argentina

H. N. Gedge, of Roca, a member of the "Asosiacion de Aeromodelistas Tuco Tuco", tells us that this club held its 100th contest on October last. Founded in 1943, with eight members, it can now boast a membership of 490 and claims to be the largest model club in S. America, not, we feel, without justification.

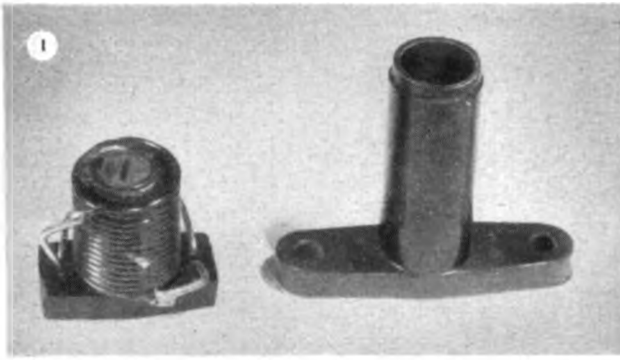
The Club is very active, holding monthly contests in most classes, including special ladies' meetings. Amongst their assorted claims are the first jet flights in S. America, including Jetex; 410 models lost o.o.s. to date (rubber and glider), and 535 Cups, and 750 models presented at Contests. It is largely due to the President of the Club, Juan Cartoceti, that it is so successful, as it has benefited by his unbounded enthusiasm from the beginning. Our correspondent tells us that the Club has its model car fans also with their own track and pylon.

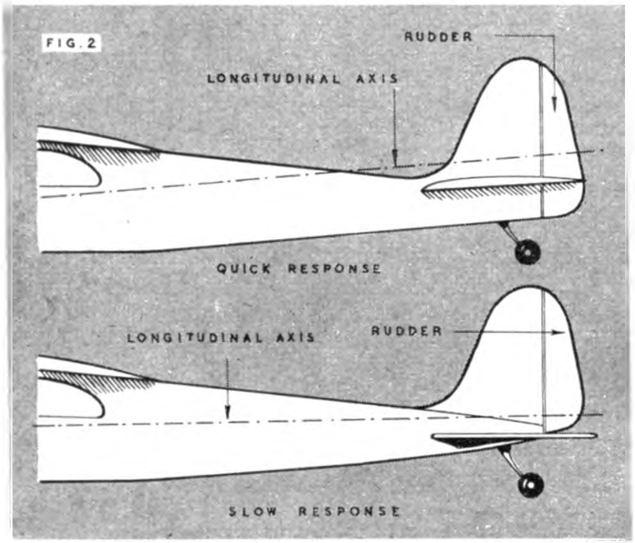
For anyone wishing to contact "Tuco Tuco", the address of the Secretary is Italia 1624, Martinez, F.C.B. Mitre.

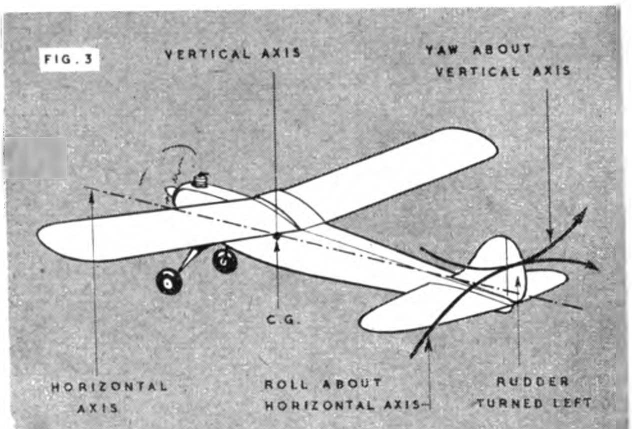
Upper photo at right shows the control centre of last October's Italian Nationals. Note the useful sunshade! In the foreground is the first Italian radio control model to make a successful public demonstration.

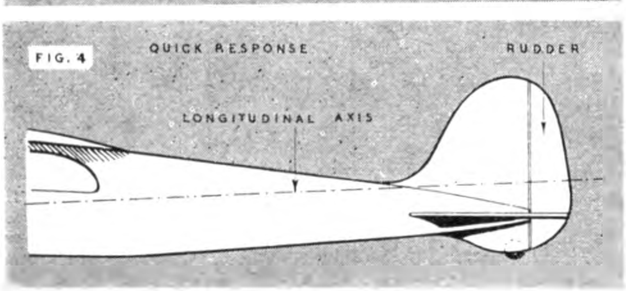
Next is a most unusual departure in free flight power design, which may be a forerunner of future trends—who knows? Made by Di Pietro, it has McCoy 29, diamond fuselage, shoulder wing and large forward stabilising fin. It finished third in the Duration event.

Bottom, is an extra long F.A.I. rubber job, by Maina of Torino. This model features gears, and, need we say it, spliced longerons!









RADIO CONTROL

Dust Iron Coils

Information in demand this month concerns tuning coils with dust iron cores.

These coils are most convenient when used with the Hivac XFG1 valve resulting in a small, robust receiver, and are a standard fitting on the writer's receivers. Aladdin formers just over ⅜ in. diameter are used with a screw-in core to fit, and the core is fixed in with glue. The formers and cores can be obtained from radio dealers and sometimes from government surplus stores. The formers are longer than necessary and are cut down for use. Fig. 1 shows a former as bought, and as cut down. The wire used is generally about No. 24 or 26 and the number of turns depends on the valve and circuit. Usually about 10 to 14 turns.

Rudder Reaction

Has anyone noticed the difference in response to control of different model aeroplanes ? Two models flown by the writer last summer were quite different. The first one answered the rudder control quickly, but the other one was very slow, quite some time elapsing after applying rudder before the model would start to turn. This slowness was rather awkward at times. Such a fault might not show up very much with a fixed amount of control such as is normal for an escapement operated rudder, but fully proportional control was fitted to the model in question and the amount of turn was regulated by watching the model, full turn being enough to put the model into a violent spiral. It took about three seconds after applying turn to know how much turn had been applied, and another three seconds to alter this. Such slow response was very inconvenient, especially for landings.

The quick and slow models were compared for differences. Also, a pilot who had flown a great variety of full size aeroplanes was consulted, but he did not remember ever trying to turn a 'plane on rudder alone, but turned mostly with the control column or " stick ". This reminded the writer that two models flown previously with aileron control had answered the control quickly and turned well. The first difference noted between the two models was that the fuselage of the slow model was deeper in proportion but this was not the answer, and in any case this should have been balanced by the larger rudder. The other main difference was that the rudder had been built on to the fuselage so that it would always be left connected to the control rod, and had not been extended below the tailplane for reasons of portability. The rear part of the two models is shown in Fig. 2. Could the higher rudder position be the cause of the trouble ? On looking back it was considered possible, and this is how it was figured out.

The first model tried had turned excellently on aileron control, so had another model with ailerons. The model with its rudder extending below the tailplane turned very well. What had caused surprise over this rudder control model when first flown, was that the first thing noticed when rudder was applied, was that the model banked. The bank was noticed before the model commenced to turn, so it seemed that the first thing required for turning the model was correct bank. However, the rudder must have produced a slight amount of yaw, to cause the bank. Now looking at Fig. 3 we see that a highly placed rudder will produce a rolling moment as well as yaw. This rolling moment will be opposing the bank required for the turn, so it seemed that the two forces produced by the rudder were fighting against each other until the stronger won.

The whole fin and rudder unit was lowered, necessitating a cut away in the tailplane, to that shown in Fig. 4, and the model taken out for further trials. The model now responded to the control as quickly as had been hoped, any correction to its course taking effect almost immediately.

Mention has been made of extending the rudder below the

NOTES BY HOWARD BOYS

tailplane, but it is not thought that the tailplane is the important feature. The important thing is to get the centre of the rudder low down, or near to the longitudinal axis (passing through the centre of gravity). The rudder position is well worth serious consideration on new, or old models, as it is so much more delightful to fly a machine with a quick response to its control.

The Ivy Receiver

An advert. appeared in the Christmas issue of the AEROMODELLER with almost startling claims for a receiver. An anode current change of 1½ m.a. on 45 volts H.T. and a valve life of 1,000 hours seemed too good to be true for a receiver with good sensitivity, and a weight of less than three ounces. It just cried out for investigation. At the bottom of the advert. the name W. S. Warne was quoted. Could this be the Bill Warne who had run across the tarmac at Fairlop to photograph the writer's crashed model, and then sent a print via the AEROMODELLER ? Well ! it was the Bill Warne, and he sent along a receiver and a note to say that he had written to ask Mr. Ives, the designer, to give a few details.

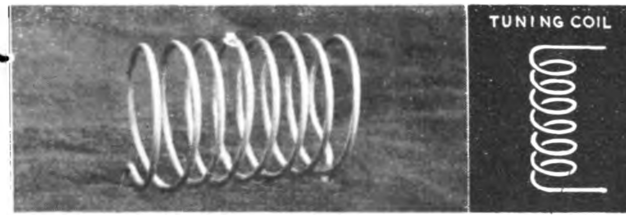
The receiver was carefully unpacked, and connected up and tried exactly as stated in the instructions. With a new 45-volt H.T. battery the maximum standing current was 2½ m.a., and on receipt of a signal, this dropped to ½ m.a. The range was then tested with a very weak transmitter which has a two-foot aerial, and an H.T. input of ·05 watts. The receiver relay operated at a range of 60 yards, which was about six times the range of any other receiver so far tested. The valve used is a standard hard type as used in the personal type broadcast receivers. The receiver was then tried with a 45-volt H.T. battery that had run down to 35 volts. The standing current under these conditions was 1¾ m.a. but still dropped to ½ m.a. on receipt of a signal. The results speak for themselves . . . . and the writer will be fully describing the complete Ivy equipment in a future "Radio Review".

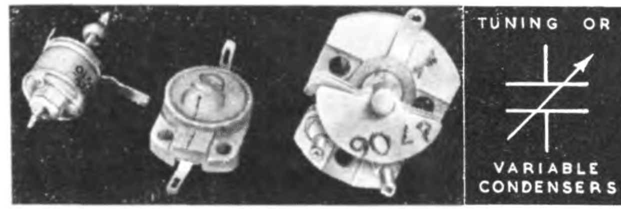
In writing, Mr. Ives says he believes it would render a service to radio control enthusiasts to stress the importance of maintaining the relay adjustment. Here is a passage from his letter :—

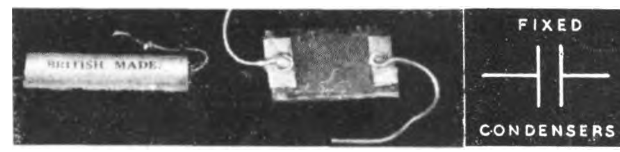
" My experience has shown that 95 per cent. of the troubles are not due to failure in the radio side, but to wrong adjustment of the relay. My own personal views are that the points should have a gap of at least four-thousandths of an inch, and that the relay should be adjusted to close the contacts on a current drop of ·5 to ·75 m.a. They should not close at a point higher than ·25 m.a. below the point of standing current so that if the battery volts drop while in use, the contacts will remain open. In my opinion, more time spent on this (and actuator adjustment) and less on tuning is repaid a thousandfold."

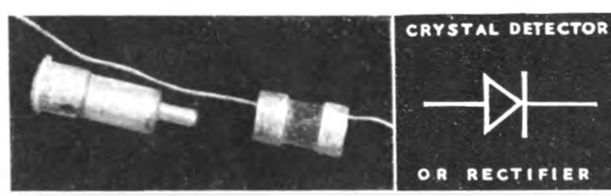
Component Symbols

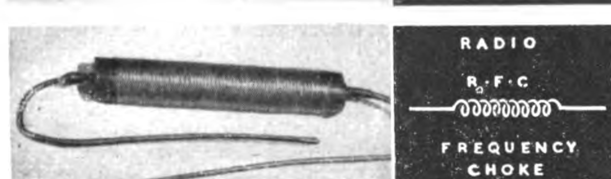
A few requests have been received for wiring diagrams for some of the readers' equipment that has been described. A case in point is the transmitter described in the November, 1950, AEROMODELLER. Such a diagram would mean complete working drawings for this transmitter whereas the intention of the description was to enable a person with the necessary knowledge to build up a somewhat similar outfit, and not an exact copy. In the description mentioned, a different valve was quoted as also suitable, but this other valve would need quite a different diagram due to the different internal connections, and different base. The best thing to do seems to be to try to help people to understand the theoretical diagrams with the illustrations on this page. On the right of each item is shown the symbol from the theoretical diagram, and on the left is an illustration of what the actual object looks like. Only one valve is shown, but there is a large variety. The pins are always numbered clockwise and in case of difficulty, a radio dealer will usually supply a diagram of the internal connections.

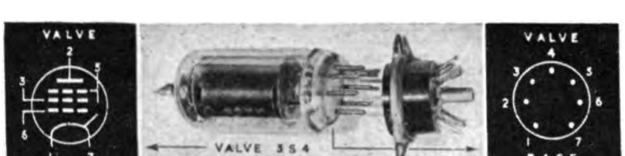


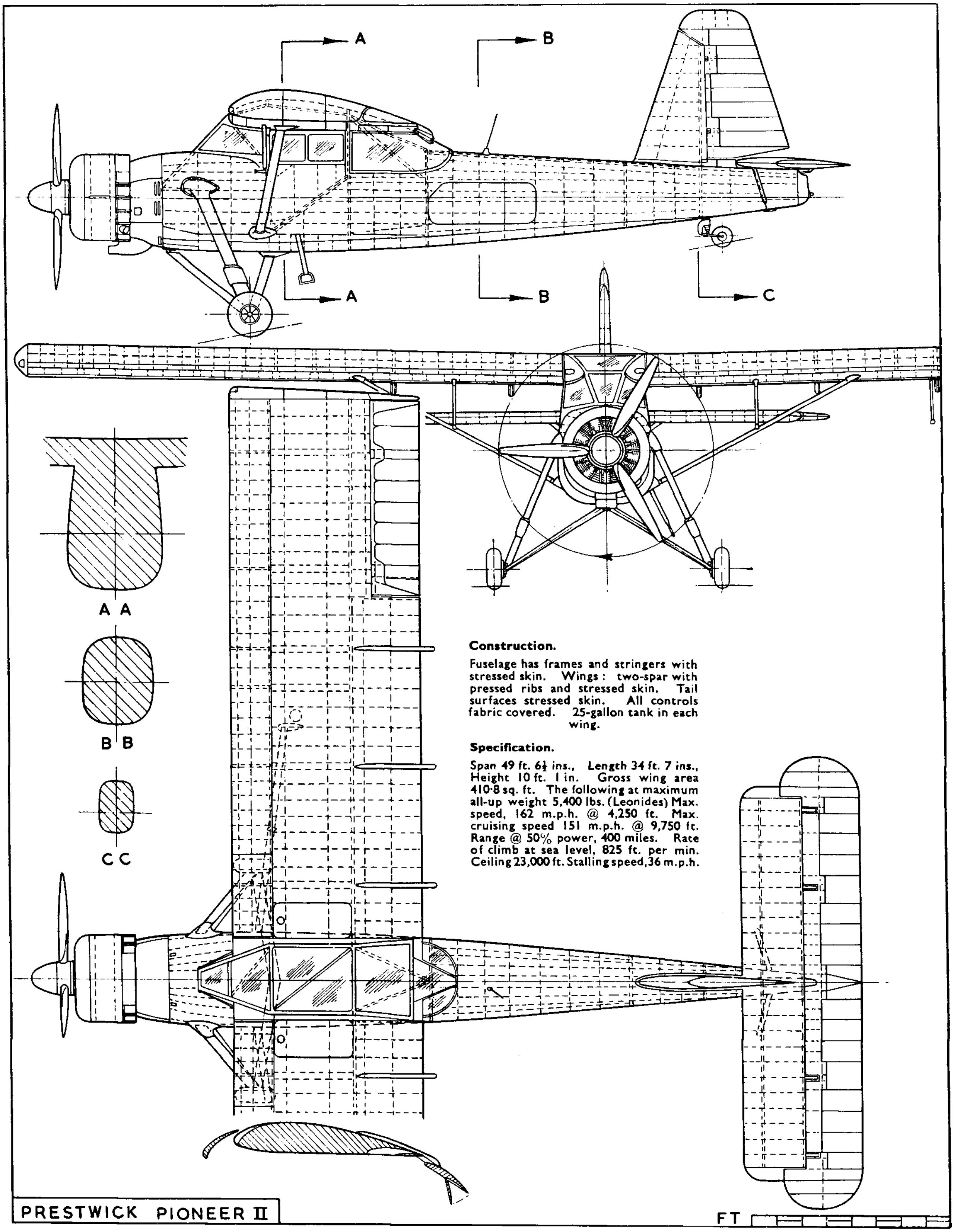












Construction.

Fuselage has frames and stringers with stressed skin. Wings: two-spar with pressed ribs and stressed skin. Tail surfaces stressed skin. All controls fabric covered. 25-gallon tank in each wing.

Specification.

Span 49 ft. 6½ ins., Length 34 ft. 7 ins., Height 10 ft. 1 in. Gross wing area 410·8 sq. ft. The following at maximum all-up weight 5,400 lbs. (Leonides) Max. speed, 162 m.p.h. @ 4,250 ft. Max. cruising speed 151 m.p.h. @ 9,750 ft. Range @ 50% power, 400 miles. Rate of climb at sea level, 825 ft. per min. Ceiling 23,000 ft. Stalling speed, 36 m.p.h.

PRESTWICK PIONEER II

AIRCRAFT DESCRIBED No. 40

By G. A. CULL

PRESTWICK PIONEER

WHILE the majority of modern aircraft are now examples of sleek streamlining, the field of slow flying designs provide a contrast, for that very property of remaining airborne at very low speeds rules out the smooth lines of the faster machines and a slow flier's function is written on its airframe in the terms of slots, areas and flaps.

Consequently the Prestwick Pioneer is easily recognised as an exponent of slow flying and is the newest British aircraft in this class, to which may be added the further distinction of being the first aircraft to be designed and built by an aircraft firm, Scottish Aviation Ltd., in Scotland ; hence its name.

Designed to comply with the M.O.S. specification A.4/45, the Pioneer was also intended for commercial use and from the outset R. McIntyre, chief designer, aimed to produce a highly versatile and robust machine. The result is an aeroplane of useful size, capable of performing a number of oft-recurring jobs with ease and safety. Obvious military duties such as spotting, liason in rough country, supply dropping, picking up messages, etc., are well within the Pioneer's scope, which is able to operate from a rough strip no bigger than a football pitch with only primitive servicing facilities.

In civil roles, the payload when used as a freighter is 830 lbs., or four passengers may be seated side by side in two pairs in the roomy cabin with doors both sides. As an air ambulance, a stretcher is accommodated on the port side with provision for a nurse and a doctor, and radio is carried. Crop dusting is another application, and as a dual control trainer a second pilot's seat is fitted in the middle of the cabin behind the existing seat. The pilot is seated centrally and higher than the passengers and has a good view, especially over the nose when taxying.

With a view to the Pioneer being employed on this diversity of work in remote areas anywhere in the world, simplicity has been maintained throughout the all-metal airframe, built on well-tried conventional lines. A variety of engines may be fitted, namely the A.S. Cheetah 25, P & W Wasp Junior and D.H. Gipsy Queen 70, as well as the Alvis Leonides with which the Pioneer is now flying. The undercarriage has the exceptionally long travel of 11½ ins., a good point for steep descents onto rough ground, and skis or floats may also be fitted. A hydraulic system operates brakes and the large Fowler flaps which are interconnected with the full span slats which extend simultaneously. The effect of these has amazed onlookers at the past three S.B.A.C. shows, and a photograph of the Pioneer in the act appeared in the February issue.

In practice, a landing run of a mere 66 yards is obtained, and take-off effected after a run of 75 yards, both distances being at fully loaded weight.

First fitted with a Gipsy Queen 32 engine, the Pioneer wore R.A.F. markings and the serial VL515. As a result of test flying, the rudder was heightened, slotted ailerons fitted and the elevators extended beyond the tailplane tips. On being "demobbed" the experimental registration G–31–1 was allotted and after slight damage occurring at Boscombe Down, the 520 h.p. Alvis Leonides 501 engine was installed driving a 3-blade constant speed Rotol airscrew, just before the 1949 S.B.A.C. show.

Colour : Natural Alclad all over with red front to cowling running into fuselage flash. Registration letters G–AKBF in red. Crest on fin in red and black.

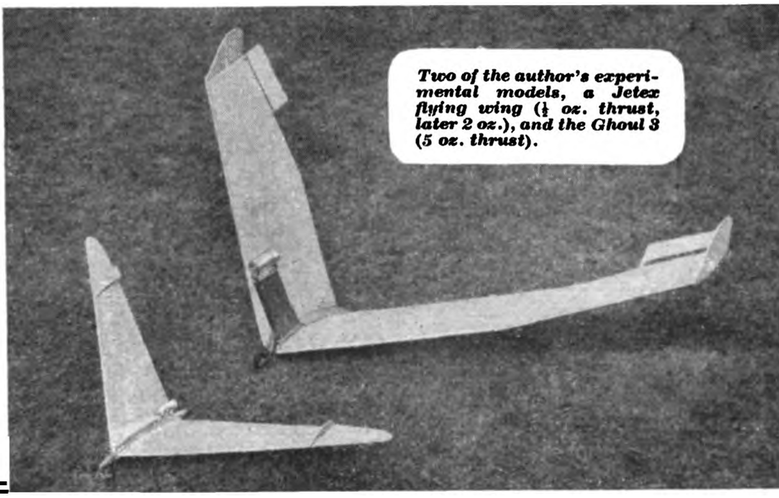
Photos: Courtesy of Scottish Aviation Ltd.

POWERED TAILLESS MODELS

PART 3

BY

M. M. GATES



Two of the author's experimental models, a Jetex flying wing (½ oz. thrust, later 2 oz.), and the Ghoul 3 (5 oz. thrust).

ALTHOUGH a fair amount of theory is often used in designing models, e.g. in calculating tail areas, etc., the one factor which more than any other decides whether a model will be a success or not is usually decided quite casually. The budding young designer who sits down with his book of formulæ and his new 1·5 c.c. engine to design his duration job, thinks: " Old Pete's got a 40 in. span job for his 1·5 c.c. engine, and it looks a bit underpowered, so I'll make mine 36 in. span.

In actual fact there is definitely a best span for a given engine and model layout, and provided you have a fairly good idea of a few simple things, such as thrust and the lift and drag coefficients, you can calculate fairly accurately the best size of model to make. This is especially helpful with experimental models, where you may have little or no previous experience as a guide. In this way I have investigated the characteristics of tailless models powered by a 1 oz. motor giving 5½ oz. thrust. The method depends on the fact that the total weight of a model is made up of two parts; the constant weight (from the power unit and undercarriage) and the weight which varies with the wingspan (airframe weight). I have found the assumption that the airframe weight varies with the square of the wingspan is quite accurate, but only when applied to similar models with the same engine. Although the method has a wider field of application, I will confine my description to this particular problem of tailless models.

L. Ranson, of West Essex Aeromodellers, with his interesting 48 in. Allbon Javelin powered Pusher model, which is often to be seen flying at Fairlop.

Design Factors

The first factor to be decided is the aspect ratio. A figure of 7 can be decided upon as a reasonable compromise between high efficiency and low structure weight. Secondly, the maximum lift coefficients are assumed to vary from 0·45 for 30-in. span to 0·55 for 58-in. span, while the wing drag coefficient drops from 0·051 to 0·045. These values are based on experience and L.S.A.R.A. tests—they represent a well designed flying wing. The variation of the coefficients agrees with the well known fact that larger models are more efficient. Some of the values are shown in Fig. 2. If the constant weight is measured and found to be 1·63 oz., the variable weight, judged from previous models, will be $\frac{S^2}{592}$ oz. where S = wing span in inches.

Again, based on L.S.A.R.A. tests, the drag coefficient of the jet and wheels may be taken as 1 on their frontal area (2·16 sq. ins.). Therefore, based on the wing area A, their $C_D = 1 \times \frac{2 \cdot 16}{A}$

Durations are calculated for both F.A.I. loading, and lightweight models, over a selection of wingspans. The procedure is as follows: calculate the weight and the wing area $\left(\frac{S^2}{7}\right)$. Next the T/W ratio, and the wing loading W in ozs./sq. ft. Add the wing drag coefficient to the jet and wheel drag coefficients to obtain the overall drag coefficient. From this and the estimated lift coefficient calculate the gliding lift/drag ratio, which is approximately the gradient of the glide. The gliding speed can be obtained in ft./sec. from the formula $\sqrt{\frac{57 \cdot 8W}{C_L}}$, or from Nomographs. Dividing this by the lift/drag ratio gives the sinking speed.

Now for the climb. The rate of climb Vc can be read off the curve in Part II, multiplying by $\sqrt{\frac{W}{4}}$ where necessary to correct for wing loading, should it be other than F.A.I. (taken as 4 oz. /sq. ft. Alternatively, Vc may be calculated, rather more accurately, direct from the formula. Vc is in feet per minute, so dividing by 6 gives the altitude reached in 10 seconds. This divided by the sinking speed is the duration of the glide. The duration can also be calculated for a ½ ft. /sec. thermal, since it merely reduces the sinking speed by ½ ft /sec.

Although these calculations are intended to be *applicable only to a jet model of 5½ ozs. thrust*, they also correspond almost exactly with the case of an Allbon Dart flying wing, which has a thrust of 5½–6 oz. The figures for structure weight are average values which I have found to give a sufficiently strong model. To calculate the structure weight required for any other engine I have found it is accurate to assume that it is proportional to the square root of the weight of the engine and propeller (in this case 1 oz.) as well as to the square of the wing span. This seems to work out well in practice for all types of model. Thus we have sufficient data to estimate the duration of a flying wing of any span powered by any engine. By calculating these over a suitable range of spans (perhaps 4 or 5 values) the best span can easily be decided.

Duration and Span

Now let us have a look at the two duration graphs, Fig. 1, remembering that one or two secondary factors have been neglected. Firstly, the effect of the weight of the fuel, which will result in a slight all round reduction of duration. Secondly, since a theoretical vertical climb is impossible, the durations shown for vertical climbs should be slightly reduced. If this latter effect is small we can see that the vertical climb is only better than a limiting angle climb when the thrust/weight ratio exceeds 1·31. In other words, when the span is less than 32½ ins. for an F.A.I. loaded model, or 38 ins. for a lightweight in this case (with 5½ oz. thrust). If we call the ratio of actual climbing speed to the theoretical rate of climb, the *climbing efficiency*, it is reasonable to suppose that an efficiency of around 95 per cent. could be obtained, but in practice it may be anything between 50 per cent. and 95 per cent. Thus a vertical climb would not pay unless T/W was greater than 1·4. It is noticeable, however, that in still air the best vertical climbing model is better than the corresponding best limiting angle model. Against this, it must be remembered that the vertical climber with a thrust nearly twice the weight of the model will be much more difficult to trim.

Effect of Thermals

A thermal of the strength used in the calculations must be quite common since models with a sinking speed of as much as 1½ ft./sec. are often seen to maintain height. ¾ ft./sec. was also chosen because it shows the effect of thermals rather well. The thermal will be seen to have little effect on the best size of an F.A.I. loaded model, but lightweight models are more affected by a thermal, and a larger model is desirable than in still air (see Fig. 1). Here the normal climb is as good as the vertical climb, and in a stronger thermal the normal climber, with relatively large span, would be better. To look at the graph, you might think that a span of 60 ins. was desirable for a lightweight model. Such a large model would have a very poor climb, and consequently might be unable to climb to a sufficient height to contact a thermal (since thermals do not extend right down to ground level at their full strength). Thus any comparison must be made with care. A typical thermal would have a lift of ¾ ft./sec. at about 15 ft. altitude and about 2 ft./sec. at 500 feet. Obviously the design will be better under these conditions if designed for a ¾ ft./sec. thermal than if designed for still air.

	Lightweight Limiting Angle	F.A.I. Limiting Angle	Lightweight Vertical Climb	F.A.I. Vertical Climb	F.A.I. LDC2 Vertical Climb
Best Span, ins. ...	38	30	30	26½	26½
Weight, oz. ...	4·37	3·58	3·152	2·84	2·84
Loading, oz./sq. ft.	2·83	4·0	3·52	4·0	4·0
CL ...	·474	·45	·45	·442	·56
C_D overall ...	·0595	·0678	·0678	·0729	·0711
T/W Ratio ...	1·353	1·534	1·746	1·938	1·938
Vc ft./min. ...	1,736	2,050	2,710	3,118	3,160
Duration, secs. ...	134	110	151	148	215
Best Span in 75 ft./sec. thermal	55+	32	36	26½	26½

FIG. 2.—Calculated values for the best model sizes as determined from the graph (using 5½ oz. thrust).

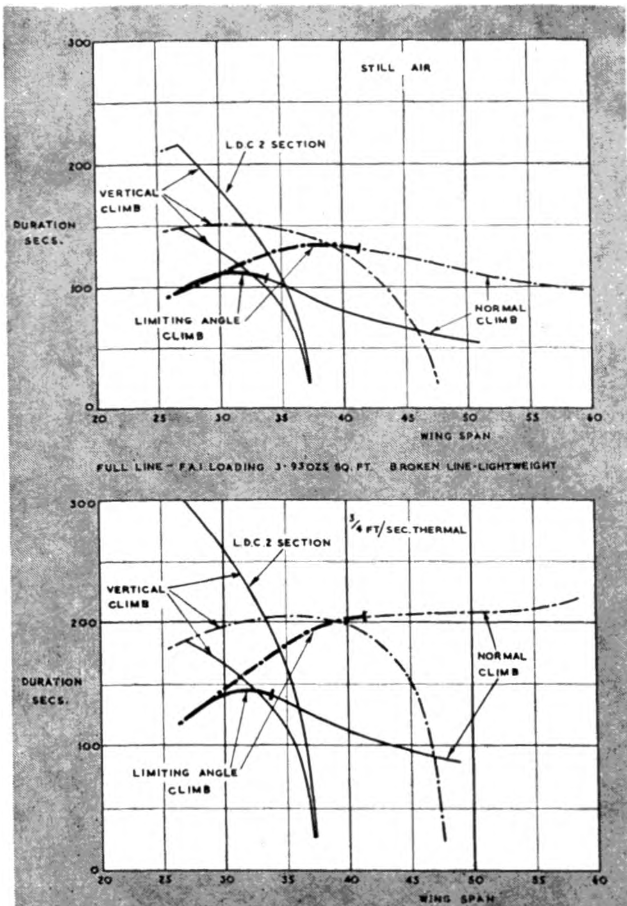
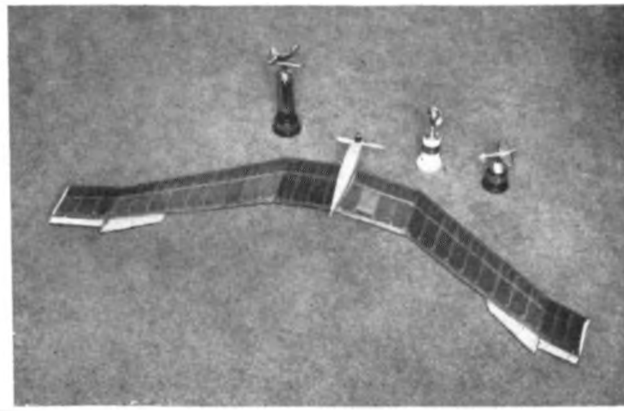


FIG. 1. VARIATION OF DURATION WITH WINGSPAN, 5½ OZS THRUST FOR 10 SECS.

The most striking feature of the graphs is the long durations which are given. Values of the peak durations are shown in Fig. 2 with the characteristics of the models giving them. The assumed lift and drag figures were chosen in the first place to be good values for a powered tailless model but not unattainable ones. I considered that they might be obtained after two or three years of development. But these durations were so high, being several times those achieved at the time, that I began to doubt the value of the assumptions myself. However, no climbing efficiency values have been used in the graph calculations, and these will of course reduce the overall durations in the ratio of the climbing efficiency. I should estimate that 70 per cent. is an average climbing efficiency, and taking this value, the calculated durations have very nearly been achieved with the latest models, and I believe that at any rate the values at the lower T/W end of the curves will be exceeded in time, as more is known about suitable aerofoil sections. It needs only a small change in aerofoil characteristics to make a large change to the durations obtained.

The double crossing of the " limiting angle " climb curves at first seems strange. It indicates that the more heavily loaded F.A.I. model actually gives a better duration here than an otherwise similar light-weight of the same size. I should emphasise that by a " lightweight " model I mean the lightest model that can be made with the specified motor, of any wingspan, whilst having sufficient strength. At the extreme left hand end of these curves the lightweight is heavier than the F.A.I. loading limit requires. In other words, a model built to the F.A.I. limit, of such a small size, would be too weak to carry the motor. But here the heavier



M. M. Gates's American contemporary, Donald C. Broggini, who has been writing a series of articles on Tailless Design in " Model Airplane News " is shown at left with the dethermaliser parachute extended from the centre section of his twelfth design. Readers will note that this model incorporates a cathedral centre section for down thrust effect, and also to raise the centre of gravity. The upraised and cambered tips aid stability. Above: Broggini's seventeenth and most successful design, with three of the trophies it has collected. It weighs six ounces, is 54 ins. span and has a ·8 c.c. glowplug motor. At the Nassau Plymouth Eliminations it amassed a three-flight total of 12 mins. 24 secs in the half-A open contest.

" lightweight " gives the better performance! This is unusual and is of course due to a high thrust model having to fly at a very low climbing angle if it is making a true " limiting angle " climb; the rate of climb will actually decrease if it is lightened until the thrust/weight ratio exceeds 1·41 Hence the overall duration begins to fall.

General Conclusions

What conclusions can we come to, from studying these graphs, which we can expect to be true for all powered tailless models? Firstly, that for best performance from an F.A.I. loaded model with any given engine, it should be as small as possible without having to be made weak to keep the weight down to 4 oz./sq. ft. By contrast a lightweight should be larger, with loading somewhat less than F.A.I., the exact amount to be decided by the conditions for which it is designed (still air or thermals). However, in this case the duration is not so much affected by variations of size.

Configurations

To clear things up a little, here is a summary of the features required on a tailless model for the various types of climb :—

1. *Normal Climb* (T/W less than 1·22). Fairly small downthrust and dihedral (about 8°–20°), but increasing with T/W. Moderate fin area, (a total of perhaps 8 per cent. wing area). Trim to climb straight or in a wide circle.

2. *Limiting Angle Climb* (T/W above 1·22). Large downthrust, medium dihedral (say 15°–25°) and small fin area (about 5 per cent. wing area). Trim to climb straight or with very slight turn. Disadvantages: high flying speed; high C.G. reducing stability. Model will dive in at high speed, unless launched at the (fast) climbing speed, and with sufficient thrust. Gusts of wind may easily cause instability.

3. *Vertical Climb*. Here there are two distinct possibilities: (*a*) a straight climb at an angle slightly short of the vertical, made stable by an automatic stabilising device; (*b*) a spiral climb, also at about 85°. This seems to be stable under certain conditions—the most important is that it should not be too gusty. If it were, the model would be likely to pass the vertical. The cure is to apply more downthrust in a high wind, to decrease the climbing angle—in any case the climbing efficiency will be lowered. A large dihedral (20°–30°) and small fins (3 per cent. wing area) seem to be essential if the model has no large side areas.

The above summary applies fundamentally to jet models, and a few alterations will be necessary to apply it to models with " gyroscopic " power plants. I have just commenced a series of tests to compare the climbing characteristics of high thrust diesel and jet tailless models. So far it looks as though the diesel is better on high thrust models, while the jet is superior with low thrust weight ratios.

Model	By	Span (ins.)	Area (sq. in.)	Weight (oz.)	w oz./sq.ft.	Power	CHORDS (ins.) Root	Tip	Aerofoil Sections	Stabilising Means
—	N. K. Walker	24	84	1·13	1·93	Glider	3½	3½	LDCZ, LDS	6° washout, small elevons
PS1W5	L.S.A.R.A.	56	265	6·68	3·61	Glider	—	—	NACA 23012	Small elevons
AR398	P. Koorn	82·7	473	11·28	3·42	Glider	8	3	Gott 497 and Symmetrical	17° washout on tips
Scythe	H. Hekking	118·1	756	15·87	3·02	Glider	8·7	4·4	Gott 500	10° washout
Fire Engine	H. Boys	50·5	306	4·81	2·27	Rocket	9	3	Gott 436	15° washout
Record	J. Marshall	40	280	13·5	6·95	Mills Mk. 2	8½	5½	Clark YH	7° washout, small elevons
Flying Wing	Wilmot, Mansour	28	96	1·28	1·92	Jetex 50	6	2½/½	Undercambered C/S, Plano-convex tip	× 5° washout, tips at −13°
Ghoul 2	M. M. Gates	37	203	3·56	2·52	5 oz. jet	6	3	Clark YH	6° washout, elevons
Ghoul 2	M. M. Gates	31½	184	4·6	3·60	Dart	6	3	Clark YH	6° washout, elevons
Ghoul 3	M. M. Gates	46½	340	7·0	2·96	Dart	7½	4½	NACA 6409	10° total washout, inverted section at tips, elevons

FIG. 3. CHARACTERISTICS OF SOME TAILLESS MODELS.

Members of the Colchester M.F.C. play that amusing game peculiar only to aeromodellers known as " Hunt the needle valve " !

WITH time chasing my heels this month, I am getting straight into your reports with no preliminary natter (loud cheers from all three of my readers !) but would stress one important thing in connection with reports from all sources. There is a definite slacking off in attention to the correct procedure in forwarding club reports, and it again becomes necessary to state that all information must reach the AEROMODELLER Leicester Offices **not later than the 10th of the month preceding** publication. This means therefore that reports you wish included in the June issue (published in May) must reach me by the 10th of April at the latest, otherwise a month's delay will ensue.

Further in connection with club reports, it must be clearly remembered that news must be of a general and not merely domestic interest. It should not be necessary to promulgate news to your own members through the medium of the national press, which by virtue of monthly publication obviously dates the news in many cases. It should also be kept in mind that it is no good notifying us of coming events that will have been concluded before the gen. appears in print. O.K.? If you can't remember all the details, we shall be only too pleased to introduce you to Pelmanism—at an appropriate fee, of course !

I am pleased to report a renewed vitality in the **NORTH EASTERN AREA,** as evidenced at their recent A.G.M. This meeting was preceded by a prize-giving tea at which the Area Delegate, S.M.A.E. Vice-Chairman R. F. L. Gosling, was mistaken for the Durham club's president, Lord Lawson of Beamish ! ! Bet it takes some time to live that down, Bob. A first hand account of the Swedish A/2 contest was given, also two excellent colour films, kindly loaned by Len Stott for the occasion.

Mr. S. Norris, secretary of the **LONDON AREA** is apparently worse informed than ourselves regarding his member clubs. Owing to secretarial changes not being notified to him, much of his official correspondence is apparently going astray, and he there asks that all London Area secretaries immediately inform him of their present addresses in order to bring his files up to scratch. (His address is 3, South Hill Park Gardens, Hampstead, N.W.3.) I am also requested to inform London members that meetings take place the second Monday in each month at the Horse Shoe Hotel, Tottenham Court Road.

January 28th saw the **WESTERN AREA** members meet on Lulsgate Aerodrome for a winter rally, held in fine weather ! Much interest was displayed in team-racers, T. Smith's job going up in flames when the fuel tank caught fire ! One member nearly chopped his finger off on the pump when starting up a jet job, but managed to finish second in the Class B team race, though in obvious pain. Results were :

Open Rubber :	**M. A. Garnett**	**(Bristol and West)**	**7 : 03**
	Smales		**6 : 44·3**
	G. A. T. Woolls	**(Bristol and West)**	**6 : 43·4**

CONTEST CALENDAR

March	**16–18th.**	**Northern Models Exhibition. Corn Exchange, Hanging Ditch, Manchester.**
	25th.	**GAMAGE CUP & PILCHER CUP. (Decentralised.)**
	26th.	**Croydon & D.M.A.C. Gala. Fairlop.**
April	**1st.**	**Surbiton Glider Gala. Epsom Downs.**
	15th.	**ASTRAL TROPHY ; S.M.A.E. CUP ; RIPMAX TROPHY. (Area.)**
	29th.	**2nd North Hampshire Rally. Lasham Airfield, Alton.**
May	**6th.**	**WESTON CUP & HALFAX TROPHY. (Area.)**
	13–14th.	**INTERNATIONAL MEETING ; " AEROMODELLER " R/C TROPHY ; BOWDEN TROPHY ; POWER DURATION. INTERNATIONAL C/L ELIMINATORS.**
	21st.	**Bushy Park M.F.C. Gala.**
	26–27th.	**Precision Power, Stunt, Speed, Team Racing, Italy.**
	27th.	**GUTTERIDGE TROPHY & K. & M.A.A. CUP. (Area.)**
June	**10th.**	**WAKEFIELD & A/2 TRIALS. Cranwell Aerodrome, Lincs.**
	15–16th.	**Power Championships & Radio-Control. Paris.**
	17th.	**West Essex Gala, Fairlop.**
	23–24th.	**Speed, Salon Challenge & Plymouth Trophies. Paris.**
	24th.	**Merseyside M.A.S. 9th Annual Clywd Slope Soaring Meeting. S. Wales.**
July	**1st.**	**MODEL ENGINEER CUP ; WOMEN'S CHALLENGE CUP ; POWER 1·5 c.c. (Area.)**
	7–8th.	**Wakefield Trophy. Finland.**
	14th.	**FESTIVAL OF BRITAIN CONTROL-LINE CHAMPIONSHIPS. Wembley Stadium.**
July	**15th.**	**KEIL TROPHY & LADY SHELLEY CUP (Decentralised.)**
	29th.	**Control-line Championships. Belgium.**
August	**5–6th.**	**BRITISH NATIONALS. Fairwood Common, Swansea.**
	12th.	**South Coast Gala Day. Brighton.**
	15–20th.	**A/2 Glider Finals. Yugoslavia.**
	19th.	**All Herts Rally. Radlett.**
	19th.	**INDOOR NATIONALS—MANCHESTER.**
	26th.	**4th Huddersfield Rally.**
August to September	**21st. to 1st.**	**Model Engineer Exhibition. Royal Horticultural Hall. London.**
	2nd.	**F.N.A. Cup. Holland.**
	2nd.	**FARROW SHIELD ; FLYING SCALE ; JETEX. (Area.)**
	16th.	**BRITISH CHAMPIONSHIPS & TAPLIN TROPHY.**
	30th.	**DAVIES TROPHY. Team Race League Finals.**
October	**7th.**	**UNITED KINGDOM CHALLENGE MATCH. Scotland.**
	14th.	**FLIGHT CUP & FROG JUNIOR CUP. (Decentralised.)**
	28th.	**HAMLEY TROPHY. (Decentralised.)**
November	**17th.**	**S.M.A.E. Annual Dinner & Prizegiving.**
	18th.	**S.M.A.E. Annual General Meeting.**

(National Contests in Capitals.)

Open Glider :	J. F. Price	(Aces)	14 : 29·2
	A. G. Taig	(Bristol and West)	12 : 52
	Hewitt	(Trowbridge)	6 : 37
Power/Ratio	R. J. Hillman	(South Bristol)	24.15 ratio
	O. A. Wilson	(South Bristol)	21 ,,
	J. R. Stainer	(Aces)	20 ,,
Class A Team :	Holmes	(Aces)	48 m.p.h.
	N. Blagg	(Phoenix)	25 ,,
Class B Team	D. Phipps	(Phoenix)	
	B. Hopkins		

NORTHERN AREA news this month includes a very worth-while decision. In future, members who volunteer to carry out a specific duty at area meetings can claim out of pocket expenses. This will only apply to cases where the individual works the whole time at his appointed task, and will not be available to the many who do five minutes time-keeping and five hours flying, and then wear a halo for the rest of the year in recognition of the amount of work they put in for the rest of their members! The following list of New Year Resolutions might interest you :—

1. I resolve to remember that the ratio of non-aero-modellers to aeromodellers is 1,000–1 and I don't stand a chance in an argument.
2. I resolve to recognise that obligations as a club member must be fulfilled before I can claim my rights.
3. When I am not working for other members I will do what those that are working ask me to do.
4. I will remember that this is a hobby for enjoyment only, but that others also wish to enjoy it.
5. I recognise that although it is for enjoyment, there must be rules and they must be obeyed.

The **WEST OF SCOTLAND AREA,** now well on its feet, and showing the usual Scottish tenacity for getting things done, is hard at it arranging details for the U.K. Challenge Match event which takes place next October at Heathfield Aerodrome, near to the well known airport of Prestwick. Though we have heard some misgivings—mainly from people who have never travelled—about the suitability of this contest, we have no doubts at all that once the initial challenge has been met, interest will snowball, and it has all the ear-marks of developing into a grand annual battle.

Outlook for the **WOODLANDS M.F.C.** is brightening, and with the conclusion of their projected exhibition and film show, we have no doubts that they will increase in strength. In spite of shocking weather, they managed to get in the first club comp. of the year on January 21st when G. G. Bromly won the power precision event with a "dead on the mark" duration of 42 seconds. Flying a new "Tomboy" the job had only one test before the contest, and we are told the feat was accomplished by putting the prop. on back to front ! ! !

The second of the **OLDHAM & D.M.A.C.** indoor comps. took the form of a Team Race—though with only one competitor flying at a time, the definition is a new one on us ! The idea was that each competitor put in as much flying time as he could within the space of 15 minutes, the winner—K. Gabriels- -getting just over 3 minutes in the air. This may appear low, but it is surprising how much time it takes winding, etc. Try it. R. Walsh has succeeded in raising the junior glider record to 3 : 21 o.o.s.

A member of the **SOUTHERN CROSS M.A.C.** was flying a control line job recently when it struck some overhead high tension wires. Both lines were burnt through and the model badly damaged in the ensuing prang. Although considerably shaken the flier was fortunately unhurt—but we are certain he will steer clear of such hazards in future ! We hear that he shudders at the mention of pylons these days. Grahame Gates of the same club recently logged a new Area record when his 12 ft. span glider clocked 4 : 26·5 from a hand launch.

The **WHITEFIELD M.A.C.** are determined not to be stopped by winter weather, and held two comps. during January, a time limit of 2 minutes per flight being imposed in view of the size of the field. The rubber contest for the Currington Cup was won by ubiquitous J. O'Donnell who scored three maximums, and he also tied for top place later in the glider comp. for the Leeming Cup, held in a dead calm and mist. These two contests decided the championship for the 1950 season, points being awarded throughout the year in all club comps. and S.M.A.E. decentralised events. Senior and Junior champs were J. and younger brother M. O'Donnell, with 22½ and 13 points out of a possible 31.

Membership of the **DURHAM CITY M.F.C.** has increased rapidly in recent weeks, and about a dozen juniors are at present undergoing instruction in the art of building. When they reach a sufficiently high standard they become full club members, and are presented with an S.M.A.E. badge.

Members of the **CROYDON & D.M.A.C.** are to give instruction to the local Sir Phillip Game Boy's Club on how to make model aircraft. The request for instruction came from the Croydon Police, who run the club, which has had 900 members since it was started five years ago, and has become famous as an example of police social enterprise. The club is giving the boys enough material to build five six-foot gliders, and members will attend to give instruction in building once a week. A very worthwhile effort, and one for which we give the Croydon members full marks.

It was my privilege recently to attend the first Annual Dinner of this Club, where an imposing army of silverware gracing the top table was ample evidence of the very successful season enjoyed in 1950. General talk with the members made it clear that they are all-out to retain their title of Champion Club, and a number of new models should give a good account of themselves in the current season. (Incidentally, we learn that Miss Green, for many years secretary to the Club, particularly during the difficult war years, is getting married in May. We add our best wishes to the many already received.)

Their Easter Monday Club Gala at Fairlop promises to be an interesting event. Rubber, glider and power jobs will all fly in the same contest, and it will be most illuminating to see which type scores best. Prizes down to twelfth place will be awarded, and Croydon members will not be competing !

Since the inauguration of the **NORTH WEST MIDDLESEX M.F.C.** last July the club has been steadily getting on its feet. A 2nd and a 5th in the Hamley, and a 5th place in the M.E. Cup event in 1950 gave a rough idea of their capabilities and a standard to aim at for 1951. This has resulted in a frantic building of power jobs, lightweights, and Nordic gliders.

At the recent A.G.M. of the **READING SOLID MODEL SOCIETY,** initial arrangements were discussed for the coming summer. (Huh !) These include the Battle of Britain Exhibition for the R.A.F. Association, the pleasure of flying at the Benson "at home" display, and the usual coach trip to the S.B.A.C. Show at Farnborough. Most important at the moment however is the joint exhibition of all the clubs in Reading, organised by the Solids club, which will take place in Reading early in April.

CHINGFORD M.F.C. lads are taking full advantage of calm weather on Sunday afternoons at Fairlop to test new models for the coming season, the stunt boys going round claiming that "Lil-Duper Zilches" and "Frog 500's" are the combination. Ian Haddox's new swept forward design, powered by an Allbon Javelin did 7 : 00 o.o.s. on a 15 second engine run—not bad for a test flight ! Also the team-race boys are flying around the 80 m.p.h. mark.

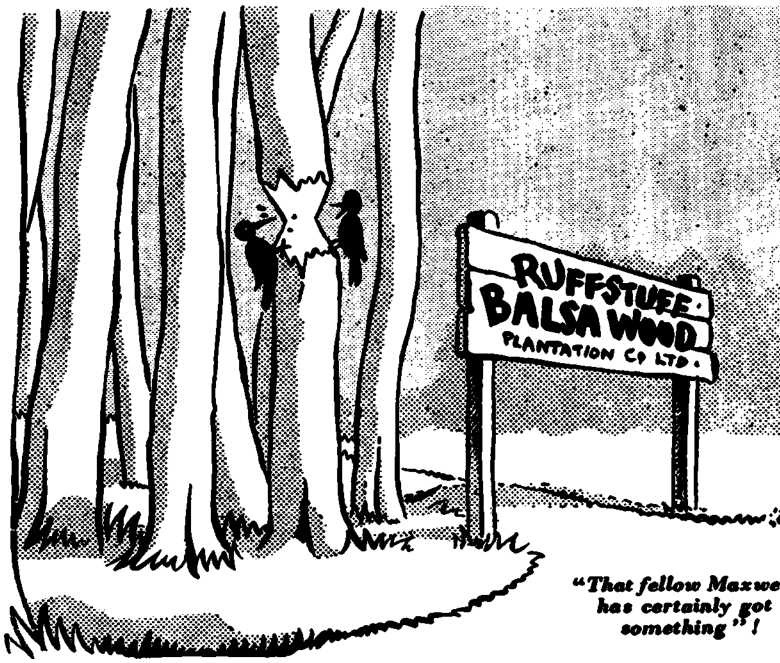
Organised by the **STOCKTON & D.M.F.C.,** a rally was held on the 28th January, to which members of the Darlington and Durham clubs were invited. The day was voted a great success, though the Stockton hopes were dashed when the Darlington boys brought out their "Ambassador" A/2 gliders. Despite the absence of wind, these jobs went right to the top of the lines with very little effort, and recorded excellent times despite the cold, non lifting air. The main event was a combined rubber/glider class, and the surprise of the day was the fact that, in spite of the huge numbers of power jobs usually seen at such meetings, only one entry was received for the power event, this being C. Chamberlain's "Tomboy". Results were :

Kell	Darlington	"Ambassador"	8 : 15·5
Skelton	Darlington	"Ambassador"	7 : 32·8
Dent	Darlington	Original	5 : 58·2
Spurr	Stockton	"Raf V"	4 : 52·5

Aeromodellers in the Inverness district are advised that a new club known as the **INVERNESS & DISTRICT S.M.E.** has been inaugurated, and if sufficient model aircraft members are forthcoming, a separate aircraft section will be formed. Meetings are held in the Royal Hotel, Inverness, on the second Monday of each month at 7.30 p.m., and all interested are cordially invited to attend. Secretarial details are given in the New Clubs section.

Originally formed in 1945, the **LEIGH (Lancs) M.A.C.** went out of circulation, but I am pleased to learn that they have come to life again, currently having a membership of 25. Though the free flight facilities are not too clever, stunt C/L is very keen, and we learn that at present there are no less than 41 motors in the club.

Another club to re-form is the **DUNFERMLINE M.A.C.**, recently affiliated to the S.M.A.E., and helping to swell the rapidly increasing ranks of the West of Scotland Area. Having now settled down, the members are getting ready for the new season, and have the use of the pavilion at a large sports ground only twenty minutes walk from the town centre. Several contests were entered last year, the most notable success being the winning of the Edinburgh Glider Cup by a (then) junior member, Joel Addison.



"That fellow Maxwell has certainly got something"!

Members of the **LUTON & D.M.A.S.** are hard at it getting new jobs ready, some hoping to qualify for places on the 1951 British Teams for various places abroad! Ron Hinks is concentrating on A/2, whilst the power section is going onto larger areas with medium power, i.e., 750 sq. ins. with a Frog 500. Should have some glide!!

Culled from the **SOUTHAMPTON M.A.C.** magazine "Digest". "We hear that, wanting to oil the chain of his Corgi, Pete Cock found an old frying pan in the garden, and, having run out of oil, purloined some cooking fat and soaked the chain in said frying pan over the kitchen stove. Next morning, having finished a hearty breakfast of bacon and tomatoes, he found the old frying pan still on the stove—his sister having used it, with all that lovely fat, to cook his breakfast!"

Arne Nilsson, of Tattengatan 33, Noorkoping, Sweden, spent a few happy weeks over here last summer, though he still takes a dim view of the Fairlop Filcher who pinched his new mac. Nineteen years of age, Arne would like to correspond with someone on all topics connected with aeromodelling.

Calling the R.A.F. bod. who left his grip containing a number of engines and other model accessories in the car of a kind motorist who gave him a lift recently!

Sir,

At about midnight on December 12th I gave a lift to a young airman returning from leave to an R.A.F. station in Yorkshire, the name of which he did not disclose. He left in my car a canvas grip containing several model aeroplane engines and other parts, which together may be worth anything up to £20. The lad told me he was an enthusiastic aeromodeller and he will have felt his loss keenly. The police say they cannot help because the bag was not "found in the street in the ordinary way".

If anyone can help me trace the owner of this property will they please contact me as soon as possible. I picked the airman up at Brixton Hill and dropped him at Kennington.

Kenneth J. Younger,
Overton Lodge, Overton Road,
Brixton, S.W.9.

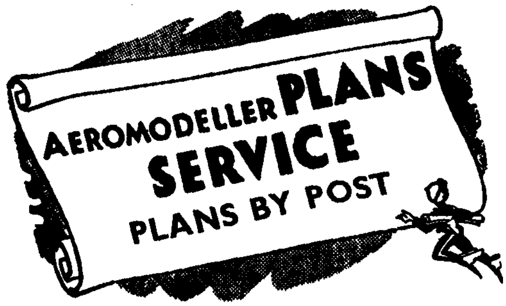
And finally, to this month's Tall Story, which goes to the credit of Bruce Cannon of Blackhall, Edinburgh. When returning from a mode meeting, ferry was taken across the Firth of Forth, and it was suggested that as there was a clear deck space, a spot of control line flying would not come amiss, and permission of the captain having been obtained, a machine duly took the air. Lines were reduced to ten feet, and the captain kept the deck lights on, taking a real interest in the somewhat unusual proceedings. Despite the somewhat unstable footing, the model was maintained in flight for the crossing, and can presumably be classed as the first model to fly across the Firth of Forth by intent! The CLUBMAN.

NEW CLUBS

SOUTH PEMBROKESHIRE M.A.C.
John C. Bowen, Greville House, Hamilton Terrace, Milford Haven Pembs.
SIDCUP AERONAUTES (Formerly R.P. M.F.C.)
A. Hodgson, 80, Riefield Road, Eltham, London, S.E.9.
DUNFERMLINE M.A.C.
G. M. Simpson, 11, Headwell Road, Dunfermline, Fife.
INVERNESS & D.S.M.E.
J. Kennedy, 30, Midmills Road, Inverness.
LEIGH (Lancs) M.A.C.
D. R. Rowbottom, 50, Pennington Road, Leigh, Lancs.

SECRETARIAL CHANGES

LETCHWORTH M.A.C.
E. Page, B/42 National Service Hostel, Letchworth, Herts
WELLINGBOROUGH M.A.C.
B. Ravine, 42, Park Road, Wellingborough, Northants.
BLACKPOOL & FYLDE M.A.S.
R. Martin, 37, Plymouth Road, Layton, Blackpool, Lancs.
NORTHERN HEIGHTS M.F.C.
A. T. Widgery, 20, Marriott Road, Barnet, Herts.
LINCOLN M.A.C.
J. Marshall, 57, Nelthorpe Street, Lincoln.
AMPLEFORTH COLLEGE M.A.C.
Brian J. Twomey, St. Bede's House, Ampleforth College, York.
ABERDEEN & D.M.F.C.
Alan G. Diack, 23, Bright Street, Aberdeen.
SUNDERLAND & D.M.A.C.
G. T. Jackson, 28, Nye Dene, Castletown, Sunderland, Co. Durham.
NORTHAMPTON M.A.C.
G. A. Watts, 9, Queen's Park Parade, Northampton.
NORTH EASTERN AREA S.M.A.E.
P. McAlroy, 2, Wayside, Marsden, South Shields.
SALISBURY & D.M.E.S.
R. A. Read, 96, Woodside Road, Salisbury.
FIVE TOWNS M.A.C.
D. W. Viggars, 8, Rangemore Terrace, Basford Park, Newcastle Staffs.
MATLOCK M.A.C.
R. Kirkland, Artists Corner, The Dale, Matlock, Derbys.



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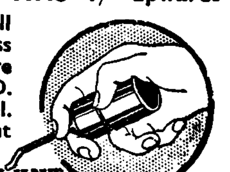

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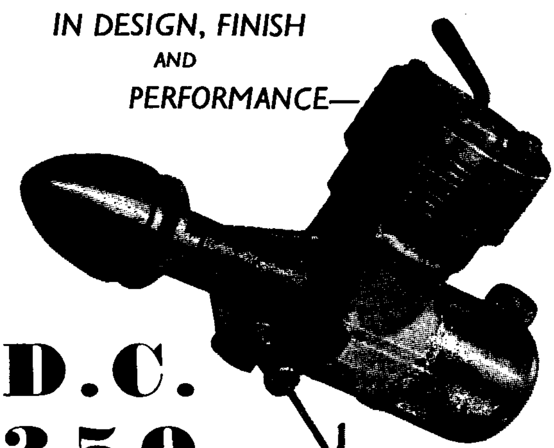

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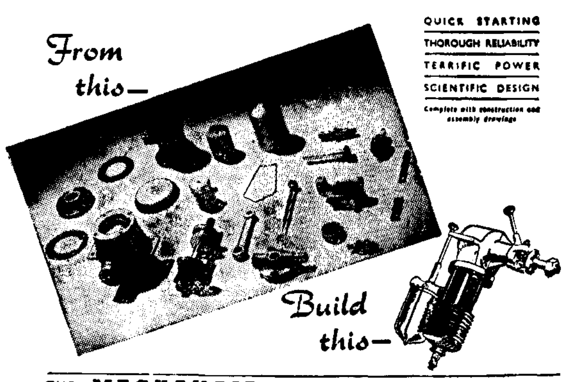

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HOLLAND:	Suls Modelvliegtuigbouw, 48a Weimar Str., Den Haag
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