MODEL Aircraft

IN THIS ISSUE

● THE NEW WAKEFIELD CUP RULES ● THE FROG "250" ON TEST ● PHOTONEWS ● OVER THE COUNTER ● TOPICAL TWISTS ● TEAM RACING ● THREE MODEL PLANS ● AEROMODELLING IN AUSTRIA

FEBRUARY 1951

1'6

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Digital Edition Magazines.

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

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

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

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

Digital Edition Magazines.

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

Hip Pocket Aeronautics Gallery
Free Plans.

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

Diligence Work by Hlsat.

JAVELIN

KIT
22/6
COMPLETE

SPECIFICATION

WINGSPAN 50 in. LENGTH 29 in.
WING AREA 283 sq. in. (1.96 sq. ft.).
WEIGHT 12 oz. WING LOADING 6 oz. sq. ft.

- Fully detailed Plan and Building Instructions. Best Quality "Solarbo" Balsa Wood. Plywood, etc.
- Pre-formed Undercarriage and Profiled Noseblocks. Efficient Dethermaliser System.
- Designed to give maximum flight performance with the new Allbon "Javelin" & 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-proof 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.

TITANINE

DOPES

CEMENTS
FORMULA "B" — Quick Drying Tissue Adhesive — Price 5d., 7d., and 1/- per tube
FORMULA "C" — Price 4d. and 6d. per tube

DOPES

	½ oz.	1 oz.	2 oz.	4 oz.	6 oz.	½ pint
Clear Dope. Medium tautening and suitable for small and medium models	—	8d.	1/-	1/9d.	2/6d.	3/6d.
Glider Dope. Extra strong tautening and suitable for large and heavy models. Ideal for use on Silk, Nylon or Rag Tissue	—	1/-	8d.	1/9d.	2/6d.	3/6d.
Banana Oil. Non-tautening and waterproof. Suitable for lightweights. Of superior "banana oil" finish it can be used as a final surface treatment on large gliders, seaplanes, etc., etc.	—	8d.	1/-	1/9d.	2/6d.	3/6d.
"Supergloss" Glossy coloured dopes available in the following shades:— White, Light, Medium and Dark Blue, Green, Black, Cream, Brown, Orange, Red, Yellow, Silver, Grey and Transparent	6d.	10d.	1/6d.	2/3d.	3/-	4/-
Thinners For use with all "Titanine" Cellulose Dopes and Lacquers	—	—	8d.	1/3d.	1/8d.	

WOODFILLERS
Sanding Sealer. An easily sanded priming compound which ensures a perfect finish on Balsa Wood — — 8d. 1/- 1/9d. 2/6d. 3/6d.

FINISHES

FUEL PROOFER
Specially prepared transparent medium which dries within 10 min. of application. Renders surfaces immune from all methanol and diesel fuels.
2 oz., 1/6d. ¼ pt. 4/-d.
(Replacement 1 oz. Hardener, 9d. bottle)

STOP PRESS!

RAF CHAMPIONSHIPS CRANWELL, LINCS.

Congratulations to A.C.1. E. North, winner of the "Victor Ludorum" Trophy, flying his Halfax "ROMA" glider and "HERMES" FF power models.

DOUBLE TRIUMPH FOR HALFAX 'CONTEST PROVED' MODELS

MANUFACTURERS
IMPORTERS
EXPORTERS

HALFAX MODELS LTD

GREEN MOUNT WORKS — HALFAX PRODUCTS — HALIFAX YORKSHIRE

Phone: HALIFAX 2729
Grams: "AEROMODEL," HALIFAX

KEILKRAFT brings you yet another fascinating model!

Flying Saucers are news! — and Keilkraft are in the news with their latest kit. You will be amazed at the way in which the Flying Saucer flies and glides. The model is of all balsa construction and is very simple to build. It can be flown with either a Jetex 50 motor, or as a chuck glider. Either way it will give you plenty of fun!

PRICE **2/6** plus Purchase Tax

FOR JETEX 50 POWER

Also flies extremely well as a glider!

KEILKRAFT

LADYBIRD

Latest Keilkraft kit for the E.D. Bee and similar capacity diesels.

The Ladybird is a semi-scale free flight model of outstanding beauty and performance. A truly de luxe kit for the owner of a small diesel motor.

WINGSPAN 42" *LENGTH* 26"
WING AREA 230 sq. ins.

PRICE **18/6** plus P.T.

The FINEST range in the World!

FREE FLIGHT POWER				Phantom	21"		18/6
Slicker Mite	12"		9/6	Scout Biplane			
Slicker	42"		17/6	(Team Racer)	20"		22/6
Slicker 50	50"		25/-	Stuntmaster	30"		19/6
Super Slicker	60"		35/-	Stunt King	36"		14/6
Southerner Mite	32"		10/6	Stunt Queen	40"		21/-
Southerner	60"		40/-	Skystreak 26	26"		9/6
Pirate	34"		12/6	Skystreak 40			
Bandit	44"		18/6	(Basic kit)	40"		10/6
Outlaw	50"		22/6				
Scorpion	44"		32/-	**DURATION**			
Junior 60	60"		39/6	Playboy	20"		3/3
Falcon	96"		107/6	Orion	23"		3/6
Cumulus	54"	Price later		Achilles	24"		4/-
JETEX				Eaglet	24"		4/6
Skyjet 50	18"		3/9	Ajax	30"		6/-
Skyjet 100	24"		5/6	Ace	30"		5/-
Skyjet 200	32"		7/6	Competitor	32"		5/6
CONTROL LINE				Senator	32"		5/6
Phantom Mite	16"		11/6	Gypsy	40"		10/6
				Contestor	45½"		23/6

GLIDERS			
Chief			
(A-2 class)	64"		18/6
Invader	40"		6/6
Minimoa	50"		7/-
Soarer Baby	36"		5/-
Soarer Minor	48"		8/-
Soarer Major	80"		11/6
Cadet	30"		4/-
Cub 20" (also for Jetex 50)			2/6
CHUCK GLIDER			
Vega	12"		1/3
Spook	12½"		1/6
Polaris	20"		2/6
Comet	24"		3/6
FLYING SCALE			
Piper Cub	26½"		
Pixie			
(Semi-Scale)	23"		4/-

WE REGRET TO ANNOUNCE THAT ALL THE ABOVE PRICES ARE NOW PLUS PURCHASE TAX

KEILKRAFT

Kits and Accessories

Manufactured by E. KEIL & CO. LTD. LONDON, E.2
(Wholesale only)

Distributors of E.D., ELFIN, YULON, AMCO, and NORDEC engines, JETEX motors and kits. ELMIC & BAT Accessories SOLARBO, E.C.C. Radio Control Equipment.

ALL EXPORT ENQUIRIES TO BUTLER ROBERTS & CO., LTD., 4, DRAPERS GDNS., LONDON, E.C.2

F.M.A.W. UNITAS

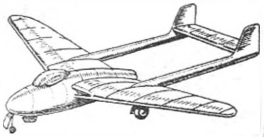
JETEX *for CHEAPER flying*

Jetex kits and motors are inexpensive to buy, and offer you the most economical form of power flying possible. The kits are easy to build, and the motors are clean and safe to operate.

ASK YOUR DEALER ABOUT JETEX

Jetex **METEOR** '50'

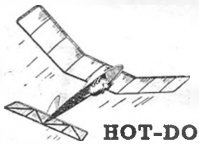
Powered by 2 Jetex "50" motors, the Meteor has an excellent performance. Price of complete kit **7/6**



Jetex **VAMPIRE**

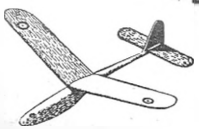
An exclusive model of Britain's famous jet fighter. This model has proved so popular that it has been kitted in two different sizes: one for the Jetex "100," and one for the Jetex "50." Start building yours today, and find out what fun you can have with Jetex

VAMPIRE "100" kit ... 7/6
VAMPIRE "50" kit ... 5/-



HOT-DOG

High performance model designed for contest work with the Jetex "50" motor. Incorporates dethermaliser tailplane. Complete kit **3/-**



MIJET

An easy-to-build beginner's model. Solid balsa construction. For Jetex "100" and "200" motors. Regular flights of 1½ minutes. Complete kit **5/6**

Jetex **DURA JET** Contest Model

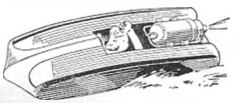
For the Jetex "350" motor. Dura-jets have already won several important competitions. The kit includes a special jet to give extra boost to your "350" motor. **14/6**

With the exception of the Rota-Kite, plastic racing car and plastic hydroplane, all prices in this advertisement are now plus purchase tax.

Plastic **HYDROPLANE**

COMPLETE WITH JETEX "50" MOTOR, ACCESSORIES AND FUEL

This is the fastest speedboat in the world for its size It is unsinkable! **12/10** including P. Tax



ROTA-KITE

It spins as it flies! Kit of parts ready to assemble **10/-** incl. P. Tax

Jetex '50' **JETCRAFT**

Build this streamlined hydroplane for your Jetex "50" motor. The kit contains full size plan, printed balsa panels, cement, and plastic driver. **5/-**

Plastic **RACING CAR**

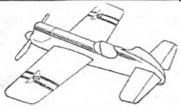
COMPLETE WITH JETEX "50" MOTOR, ACCESSORIES AND FUEL

Speedy and good-looking. Ready to run. **17/6** including P. Tax

WILMOT, MANSOUR & CO. LTD.
SALISBURY ROAD, TOTTON, HANTS

JETEX

RAEBURN MODEL SERVICE



MERCURY MK. I. Team Racer. Price 17/6

ENGINES

Allbon Dart.5 c.c. ...	65/2
Mills S .75 c.c. ...	67/3
Mills P. .75 c.c. ...	61/1
Amco .87 c.c.	72/6
E.D. Bee I c.c. ...	45/-
Mills 1.3 c.c.	91/8
Elfin 1.49 c.c.	73/10
Allbon Javelin 1.49 c.c.	68/3
Allbon Arrow 1.49 c.c. (G.P.)	68/3
" K " Kestrel 1.9 c.c.	45/-
" K " Tornado 1.9 c.c. (G.P.)	49/6
" K " Falcon 2 c.c. ...	59/6
E.D. Mk. II, 2 c.c. ...	55/-
E.D. Comp. Special 2 c.c.	57/6
Mills 2.4 c.c.	95/-
Elfin 2.49 c.c.	86/3
E.D. Mk. III. 2.5 c.c. ...	65/-
D.C. 350 3.44 c.c. ...	87/6
Amco 3.5 c.c.	121/-
Amco 3.5 c.c. (G.P.) ...	121/-
E.D. Mk. IV 3.46 c.c. ...	72/6
Yulon 29 4.89 c.c. (G.P.)	79/6
Frog 500, 5 c.c. (G.P.)	75/-
E.T.A. 29, 4.85 c.c. (G.P.) (A)	149/5
"K" Vult. Comp. Spec. 5 c.c.	59/6
Yulon 49, 8.2 c.c. (G.P.)	99/6

R.C. UNITS

E.D. Mk. I ...	£14 10 0
E.D. Mk. III ...	£7 19 6

FREE FLIGHT KITS (POWER)

Frog " 45," 45" ...	27/-	K.K. Southerner Mite, 32"	10/-
Frog Centurion 60" ...	63/6	K.K. Southerner, 60"	40/6
Frog Strato. D., 42" ...	15/-	K.K. Pirate, 34" ...	12/-
Frog Janus, 44" ...	15/-	K.K. Bandit, 44" ...	18/6
Frog Vixen, 36" ...	12/6	K.K. Outlaw, 50" ...	22/6
Frog Powavan, 36" ...	25/-	K.K. Scorpion, 44" ...	32/-
K.K. Slicker Mite, 32"	9/6	K.K. Falcon, 96" ...	107/6
K.K. Slicker, 42" ...	17/6	K.K. Cumulus, 54" ...	—
K.K. Slicker " 50 " 50"	25/-	Mercury Mallard, 48"	17/6
K.K. Super Slicker, 60"	35/-	Veron Streaker, 37" ...	19/9

EASY TERMS

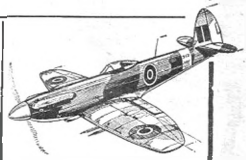
We have been assured by many customers that our easy payment service is the simplest and most reasonable yet devised. We can supply Engines, Engine and Kit Combinations and Accessories of total cash value of £2 and over under this scheme

★

WRITE TO-DAY FOR FULL LIST AND HIRE PURCHASE FORM.

★

It's Easy to Buy,
THE RAEBURN WAY



SPITFIRE 22. Price 27/6

R.C. KITS

E.D. Radio Queen ...	78/6
Veron Skyskooter ...	25/-

CONTROL LINE

K.K. Phantom Mite, 16"	11/6
K.K. Phantom, 21" ...	18/6
K.K. Scout Biplane, 20" (*Team racer*)	22/6
K.K. Stuntmaster, 30"	19/6
K.K. Stunt King, 36" ...	18/6
K.K. Stunt Queen, 40"	21/-
K.K. Skystreak '26', 26"	9/6
K.K. Skystreak '40', 40"	10/6
Mercury Junior Monitor, 30"	14/6
Mercury Monitor, 39"	27/6
Mercury Junior Musketeer, 28"	14/6
Mercury Musketeer, 40"	19/6
Mercury Mk. I ... (*Team racer*)	17/6
Mercury Speedwagon, 30"	14/6
Mercury Midge, 12" ...	5/6
Veron Sea Fury, 25½" ...	22/6
Veron Spitfire '22', 27½"	27/6
Veron Focke Wulf '190', 33½"	19/6
Veron Midget Mustang, 24"	21/-
Veron Bee-Bug, 22" ...	11/6

GLIDERS

Frog Prince, 60	25/-	Mercury Gili Chopper, 42"	12/6
Frog Dart, 16" ...	2/6	Mercury Magpie, 24" ...	3/9
K.K. Vega	1/3	Mercury Norseman, 58"	17/6
K.K. Speck	1/6	Skyleada Midge	1/3
K.K. Polaris	2/6	Skyleada Swift	3/6
K.K. Chief, 64" ...	18/6	Skyleada Wizard ...	3/-
K.K. Invader, 40" ...	6/6	Skyleada Jeep	3/-
K.K. Minimoa, 60" ...	7/-	Skyleada Skyrova, 16"	1/6
K.K. Soarer Baby, 36" ...	5/-	Skyleada Three Footer ...	5/-
K.K. Soarer Minor, 48" ...	8/-	Veron Swift	1/6
K.K. Soarer Major, 60" ...	11/6	Veron Tomtit	1/9
K.K. Cadet, 30"	4/-	Veron Wren	3/3
K.K. Cub, 20"	2/6	Veron Coronette, 26" ...	3/3

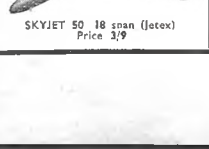
TO ORDER
Send Postal Orders, or we can supply C.O.D.

All Orders over £1 post free.

EASY TERMS CAN BE ARRANGED IF REQUIRED.

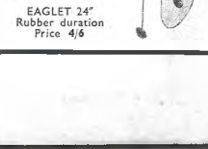
RUBBER KITS

Frog Venus, 38"	15/-	K.K. Contestor, 45" ...	23/6
Frog Goblin, 24"	4/9	Mercury Maybug, 32" ...	7/6
Frog Saturn, 30"	10/6	Veron Fledgeling, 24" ...	6/9
Frog Sprite, 24"	4/6	Veron Goblin, 17" ...	3/3
K.K. Ace, 30" ...	5/-	Veron Rascal, 24" ...	4/6
K.K. Achilles, 24" ...	4/-	Veron Sentinel, 34" ...	10/-
K.K. Ajax, 30"	6/-	Skyleada Hawk	4/6
K.K. Playboy, 20" ...	3/3	Skyleada Falcon	3/6
K.K. Orion, 23"	3/6		
K.K. Eaglet, 24"	4/-	FLYING SCALE	
K.K. Competitor, 32" ...	7/-	Aeromodels Hawker Fury, 15"	5/6
K.K. Senator, 32" ...	5/6		
K.K. Gypsy, 40"	10/6		



SKYJET 50 18 span (Jetex) Price 3/9

9 ARCADIA
COLNE
LANCS



EAGLET 24" Rubber duration Price 4/6

IT'S THRILLING!
IT'S REALISTIC!
IT'S A WINNER!

The "PHILIBUSTER"

28½" SPAN

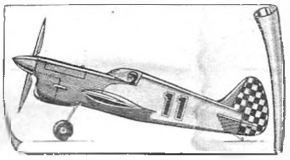
TEAM-RACER
TO S.M.A.E. SPECIFICATION

Good looks and performance usually go hand - in - hand. This model has everything! Including Top line Veron quality and completeness in a super value Kit.

23/6

Plus Purchase Tax 5/2

This Super Racer, thoughtfully designed upon practical experience will take ALL GLOW - PLUG and DIESEL MOTORS up to 5 c.c. (Inverted). Such as E.D. Mk.IV, Frog 500, Amco 3.5, etc.



Kit has Plastic Cockpit Cover. Sorbo Unpuncturable Rubber Wheels, Supersonic Spinner, Tank parts. VERON'S high quality and profusely illustrated 30 in. × 40 in. plan. All other materials—a complete kit.

THE ULTIMATE IN STREAMLINING FOR TOP PERFORMANCE!

VERON

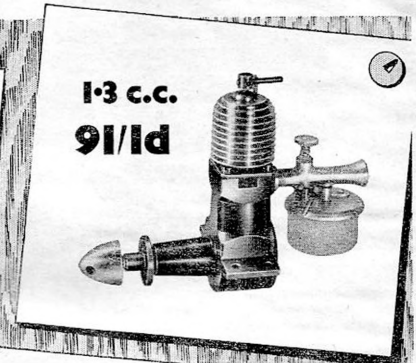
Australian Distributors:
Scientific Hobby Distributors,
350, Queen St., Brisbane, Australia.

GET THE *NEW*
VERON CATALOGUE
PRICE **6d.**

MODEL AIRCRAFT (Bournemouth) Ltd. 9c Norwood Place. BOURNEMOUTH

Phone: SOUTHBOURNE 2783

Plan— with MILLS in mind !



Your aim is to fly whenever you want to, and to achieve pertect flights.

You cannot do better, therefore than to decide right now on using a Mills. This engine is famous throughout the world as the quickest starter. Its immediate response gives you more flights and more fun.

All Mills Diesels are extremely powerful. It is of interest in C/L flying that the 1.3 c.c. (1950 type) gives an even .10 h.p. " plus " over the very wide range of 9,000 to 12,000 r.p.m. whilst the .75 c.c. and 2.4 c.c. peak .05 h.p. and .17 h.p. respectively at about 10,000 r.p.m. It will help the free-flight modeller to know that a Mills runs just as smoothly also at comparatively low speeds. In fact, the Mills Diesel is the ideal all-purpose engine.

.75 c.c. (1¾ ozs.) 60s. 9d. **without cut-out**
.75 c.c. (1¾ ozs.) 66s. 9d. **with fuel cut-out**
1.3 c.c. (3½ ozs.) 91s. 1d. " " "
2.4 c.c. (5½ ozs.) 102s. 0d. " " "
1.3 Marine Unit 99s. 7d. " " "
(including P.T.)

Mills Blue Label Fuel **3s.** large standard bottle.

(Re-fills 2s. 6d.)

Sole Distribution (Trade Only)

MILLS BROS.
(MODEL ENGINEERS) LTD.
143, GOLDSWORTH RD., WOKING, SURREY

MODEL Aircraft

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Editor: E. F. H. COSH

Consulting Editor:
A. F. HOULBERG, A.F.R.Ae.S.

Advertisement Manager:
J. V. FORBES-BUCKINGHAM

FEBRUARY 1951 VOL. 10 No. 2

Contents

EDITORIAL

The Committee of Model Aircraft of the F.A.I. which met recently in Brussels to finalise the International Model Contest Calendar for 1951 confirmed the decision made at the Stockholm Meeting to accept only four International Contests of Championship status. These as follows:—

June 16 and 17. Championship Contest for Power models in the Paris district organised by The Aero Club of France and supported by a Radio Control Contest.

July 7 and 8. Wakefield Cup Contest for the Rubber Model Championship to be held at Jamijarvi, Finland, and organised by the Suomen Ilmailuliitto.

July 29. Championship for Control-line Speed models to be held at Knokke and organised by the Federation de la Petite Aviation Belge with supporting Aerobatics contest.

Aug. 15 to 20. Swedish Cup Glider Championship Contest to be held in Yugoslavia at a venue not named at the time of going to press. A supporting contest for power models is also being organised.

The other contests on the Calendar are:—

May 13 and 14. Bowden Trophy for Pay-load Power models. Radio Control.
Power Duration to F.A.I. rules.
Organised by the S.M.A.E.

May 26 and 27. Power Precision Contest.
Speed Control-line Contest.
Aerobatic Control-line Contest.
Team Racing Contest to be organised by the Aero Club of Italy.

June 23 and 24. Speed Control-line Contests for the Salon Challenge Cup and Plymouth Cup. Organised in Paris by the Aero Club of France.

Sept. 2. Contest for the F.N.A. Cup for Rubber models to F.A.I. specification organised by the Royal Netherlands Aero Club.

Cover Story

Our cover photograph shows "veteran" modeller F. H. Boxall of the Brighton Club preparing his "Bryton Rec" for a flight in the 1950 Wakefield "100" at Fairlop.

This model holds the British Outdoor Rubber and Wakefield Class Records with a flight of 35 minutes. Model Aircraft Plan No. M.A. 67.

A PERCIVAL MARSHALL PUBLICATION

Published on the 20th of each month prior to the date of issue by PERCIVAL MARSHALL & COMPANY LTD. 23, GREAT QUEEN STREET, LONDON, W.C.2. Tel: Chancery 6681-4 Annual Subscription 20s. 0d. post paid.

Here and There

THE EDITOR COMMENTS ON CURRENT TOPICS

WINTER'S WHIMSY

Writing in the December, 1939, number of *Model Airplane News*, Bill Winter, who has recently taken over the Editorship of this American publication, makes just about the craziest proposal we have heard for some time—and that is saying something!

This is what he said :—

"Let's modernise the Wakefield. Convert it to gas. (Screams of anguish!) But it makes all the sense in the world. When Lord Wakefield sponsored this thing it must have been in his mind to foster maximum interest, and it has been proved adequately that the 200 sq. in., rubber-job, with its strict limitations on tail area, weight, and launching method is about as useful as the side-wheel steamer. Speaking personally, the Wakefield model is a challenge, a release for inhibitions, and a thing of great satisfaction, while in one piece. That's the trouble. The old men love it. They defend it to the death. The typical Wakefield team averages almost double the junior event age.

"Now suppose the new *modern* Wakefield were limited to engines, of say, .49 maximum displacement. Keep the area at 200 sq. in. That's fairly big for such engines and would tend to put some emphasis on design. Such a model would weigh at least 3 oz. if sensibly built. Perhaps the old 8 oz. gross weight rule could be carried over. For international competition, take-off could be required, but none of that wing tip and prop stuff (ouch, my finger). Overly assisted take-offs gum up more flights than they help. Limit the stab to 30 per cent. *There* is a model we all could fly, and it wouldn't be a complete push-over because cleanness of design would pay off. There would be more luck—but it would not be entirely luck. A good Wakefield model is now far over the heads of the kids in any land—as is evidenced by how that Finnish chap has moidered the opposition two years running. At present there is not a super-Wakefield model in this country, and we doubt there are more than six in the whole world."

What do we think of this brainwave? Just that if we had the equivalent of the Jim Walker Stupidity Award in this country we would without hesitation present it to our old friend Bill! Seriously, (i.e., if the writer intended us to take him seriously) he has given the game away in the last paragraph. "At present there is not a super-Wakefield model in this country [U.S.A.]," he says. There you have it—because the U.S.A. have not won the Cup since the war we must change the contest to a ½A power event! Obviously the fact that the most coveted trophy in the model aircraft world is seldom won with a lucky thermal flight (the last occasion was Dick Korda's 45 minute effort in 1939) is not popular with some Americans.

The statement that the writer doubts if there are more than six super-Wakefield models in the world is almost too fantastic to be worthy of comment—it shows such a complete ignorance of the true situation. Why in this country alone we could pick six or more Wakefield *teams* of equal merit, all capable of putting up a good show in the actual contest.

We can quite believe that at present top class Wakefield designers are as scarce in the U.S.A, as ½A motors are in Europe, for instance, and if this is so, who is to blame? What encouragement do American Wakefield enthusiasts receive from their own Governing Body? Precious little if our information is correct. The organisation of their Selection Trials was apparently a farce and whilst circumstances may have prevented the "selected" American Team from being sent to Finland last year, surely it should not have been beyond the resources of the A.M.A. to arrange for the models to have been sent over to be flown by proxy.

Our friendly advice to Bill Winter is to concentrate his Editorial efforts on getting the U.S. aeromodelling house put in order—he must have heard the one about "teaching your Grandmother, etc., etc."

MODEL AIRCRAFT OLYMPICS

The Editor(s) of our contemporary, the *Aeromodeller*, are, it seems, annoyed because in our November issue we drew attention to the more obvious snags in their Olympics scheme.

Our main criticism was that we considered that the Wakefield Trophy Contest would lose some of its present very high prestige if it was to be included with a number of other events in a kind of commercially sponsored International Week—which is apparently what is envisaged by those responsible for this Olympics scheme.

They have dismissed this view as "so much twaddle." Maybe, but we are, nevertheless, encouraged by the knowledge that our "hands off the Wakefield" attitude is shared by a very large number of modellers throughout the country. Many of these are asking pointedly—and with every justification in our opinion—why they were not given the opportunity of discussing this matter, which vitally affects the future organisation of the Wakefield

event, in their clubs and area committees before it was presented to the Council.

It is worth noting also (although admittedly it was no fault of the proposer), that this scheme came up for discussion by the Council after many of the members had left the meeting and the proposal to submit it to the F.A.I. was carried by only 6 votes to 3. There the matter will probably end, as we doubt very much whether this project will find any favour with the members of the F.A.I. Model Commission.

We must, however, thank our contemporary for drawing attention to the fact that the opinions expressed in MODEL AIRCRAFT by the Editor, or by Mr. A. F. Houlberg, do not necessarily represent the views of the S.M.A.E. Council. We thought that this was by now well known, but the more publicity it receives the better as far as we are concerned.

FESTIVAL OF BRITAIN

In co-operation with the Festival of Britain Authorities, the S.M.A.E. has made arrangements to give a series of demonstrations of C/L flying in the sports arena of the South Bank Exhibition in London. It is expected that the demonstrations will be seen by more than 200,000 people.

The Demonstration Area available is about 130 ft. × 50 ft. Due to the small size of the space available, flying must be limited to a maximum line length of 20 ft. Although the arena is rather small, there are many members of the S.M.A.E. with experience of flying on short lines (e.g. at the "Model Engineer" Exhibition) and aeromodelling has been more fortunate with regard to the allocation of space than many other sports.

Two kinds of C/L flying are envisaged: (i) unrestricted Stunt, limited only by the capabilities of the pilot, and (ii) miniature Team Races with engines limited to 1 c.c. capacity, but otherwise to Class "A" specification.

Flying demonstrations will be given on five Sundays and two Thursday afternoons and will last from 1½ to 2 hours each. The dates are as follows:—

Sunday, May 13th ... Morning and Afternoon
Sunday, May 27th ... Morning and Afternoon
Thursday, July 5th ... Afternoon
Sunday, July 8th ... ... Afternoon and Evening
Sunday, August 12th ... Morning
Thursday, August 23rd ... Afternoon
Sunday, September 16th ... Morning and Afternoon

Each person taking part will receive a pass to the whole South Bank Exhibition for the day in question, refreshments, and approximately 2s. towards travelling expenses. It is expected that demonstrators will be mainly drawn from the London area but those living at greater distances will not be precluded from taking part, and may receive larger travelling grants.

Anyone wishing to take part in these demonstrations should write as soon as possible to the Secretary of the S.M.A.E. at Londonderry House, 19, Park Lane, London, W.1, giving the dates on which they will be available, details of their experience, and any other relevant information.

CORRESPONDENT WANTED

We have had a request from one of our American readers, Robert Silvernail, 510, 50 Almer, Caro, Michigan, U.S.A., to mention that he would like to be put into touch with an English modeller. He informs us that he is particularly interested in Jetex powered models.

ROYAL AIR FORCE M.A.A. PROGRESS

At a recent meeting of the Executive Committee of the Royal Air Force Model Aircraft Association considerable progress was reported, including the establishment of the R.A.F. Championships meeting the first of which, held at Halton in September, 1950, was very successful—so much so, in fact, that a two day event is envisaged for 1951.

A trophy presented to the Association by Dr. A. P. Thurston has been allocated to the rubber championship for Wakefield specification models, and the trophy presented by this journal and known as the Model Aircraft Cup, has been allocated to the championship for power-driven models. Although competed for at the 1950 Championships, unfortunately, the cup was not completed in time for presentation by Air Marshall Sir R. Victor Goddard, K.C.B., C.B.E., at that meeting. It has, however, now been despatched to the worthy winner for 1950, Flt./Lt. E. T. Ware, D.F.C., of Royal Air Force Transport Command.

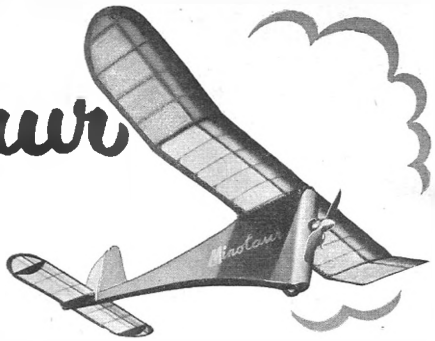
An important activity of the Association will be the investigation of model flying facilities at various Service Aerodromes with a view to holding the Championships for 1951 under the best possible conditions. Close co-operation with civilian aeromodellers and organisations was agreed to, though it was made quite clear that civilian *membership* of the Association is not possible.

This should, however, lead to certain R.A.F. model flying facilities being placed at the disposal of some of the S.M.A.E. affiliated clubs who are located close to R.A.F. Association Clubs. Close co-operation between service and civilian aeromodellers is without doubt highly desirable, and can do nothing but good to aeromodelling as a whole.

The Model Aircraft Cup

Minotaur

A POWER CONTEST MODEL



By R. A. Tromey

THE original "Minotaur," so the dictionary tells us, was a "fabulous monster" of ancient Greek times. This model being both noisy and monstrous (in shape though not in size), though far from fabulous; the name seemed appropriate.

This particular *Minotaur*, unlike the original Greek beast, was designed as a contest power model for the popular E.D. Bee 1 c.c. diesel. It has proved satisfactory in every way and offers a change as well as a challenge to the larger model. The need for a cumbersome undercarriage is eliminated, and props are saved, by fairing the sprung mono-wheel into the fuselage. The tailplane underfins give a firm three-point stance, and on its first trials the *Minotaur* left the deck with an ease that startled even the poor designer.

The climb is near-vertical, but it is on the glide that this model really scores, thanks to the wing section, which is from the well-known Swedish Sigiard Isacson series. Ratios of 7 and 8 : 1 in still air are common, and it was not long before the *Minotaur* had pushed the Ampleforth College club power duration record successively to 7 min. 43 sec. and 10 min. 31 sec, o.o.s. Later the ratio record was also smashed, when the model disappeared into cloud after 9 min. 15 sec. on a 15 sec. engine run. (Ratio 37 : 1). Needless to say, the occasion was a trimming flight prior to a national competition! The *Minotaur* was not recovered in time for the event, but when it was found it was discovered to have stayed in the air for 1¾ hours. (Work that ratio out!) In addition it had established a new club distance record of 11.7 miles.

Fuselage

First build the two slabsides of ⅛ in. strip on the plan; then join them with ply formers F1, F2 and F3, and add the remaining spacers. Next drill bolt holes in bearers and cement them firmly in place. Add bolts, and at this point bind undercarriage also in place. Now sheet the fuselage sides with ⅛ in. sheet, add semi-circular nose formers, bend ⅛ in. sheet carefully around nose and cement firmly. When you are actually fitting the engine, just cut away the necessary amount of sheeting to allow you to bolt the engine in place. It is recommended that you use "U"-bolts, if these are available, as they greatly simplify mounting of the engine. The "Bee" is mounted sidewinder fashion, with the "pot" on the port side. Before covering the fuselage, add the ⅛ in. sheet fin, noting that its base goes down level with the bottom longerons of the fuselage.

Wings

The wings are quite straightforward. When built they are all in one piece but construction is best done in three pieces—the centre section and the two dihedralled tips. The three are then joined and braced with ⅛ in. ply as shown.

Tail

The tailplane is quite orthodox and it is intended to be strong. You are not advised to deviate from the plan, by building it lighter, for two good reasons:

(1) In take-off position the tailplane supports a lot of the weight of the model.

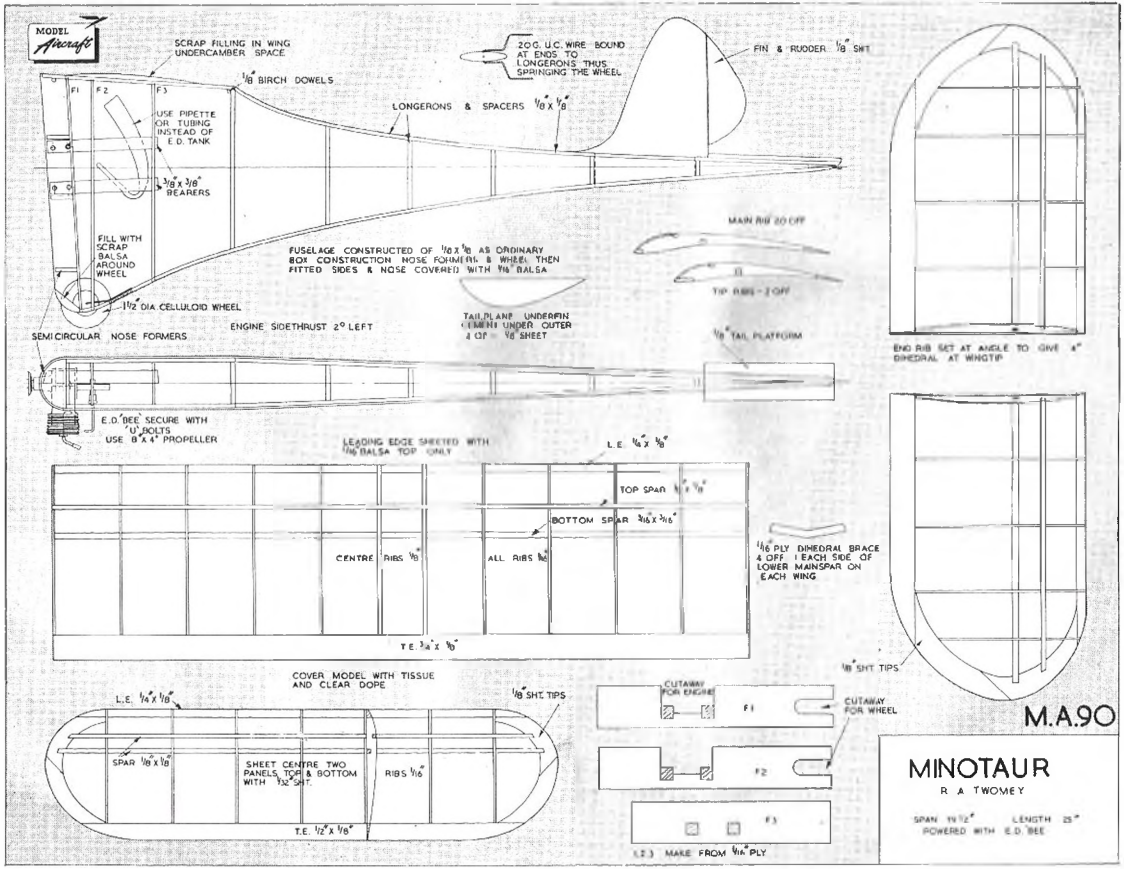
(2) If the model trips on landing, as it may easily do on rough ground, a lighter and flimsier tailplane would crack due to the upward jolt of the rudder.

Dethermaliser

A dethermaliser is a useful addition to the *Minotaur* whose layout is ideal for the tip-up tailplane type, operated either by a timer or a simple fuse. In the writer's opinion the tip-up-tail is by far the most effective method yet devised. The parachute type is *not* recommended.

Trim

As world record holder Henri Varache once said: "The first flight of a power model may also be its last"—so go easy on trimming. The *Minotaur* climbs either straight or in a wide left circle, and glides to the right, therefore, use right rudder and compensate with generous left sidethrust.


MODEL Aircraft
SCRAP FILLING IN WING UNDERCAMBER SPACE
1/8" BIRCH DOWELS
F1
F2
F3
USE PIPETTE OR TUBING INSTEAD OF E.D. TANK
3/8" x 3/8" BEARERS
FILL WITH SCRAP BALSA AROUND WHEEL
1 1/2" DIA CELLULOID WHEEL
SEMICIRCULAR NOSE FORMERS
ENGINE SIDETHRUST 2° LEFT
E.D. BEE SECURE WITH "U" BOLTS
USE 8" x 4" PROPELLER
20 G. U.C. WIRE BOUND AT ENDS TO LONGERONS THUS SPRINGING THE WHEEL
LONGERONS & SPACERS 1/8" x 1/8"
FUSELAGE CONSTRUCTED OF 1/8" x 1/8" AS ORDINARY BOX CONSTRUCTION NOSE FORMERS & WHEEL THEN FITTED SIDES & NOSE COVERED WITH 1/16" BALSA
TAILPLANE UNDERPIN CEMENT UNDER OUTER 4 OF 1/8" SHEET
1/8" TAIL PLATFORM
FIN & RUDDER 1/8" SHT
MAIN RIB 20 OFF
TIP RIBS - 2 OFF
END RIB SET AT ANGLE TO GIVE 4" DIHEDRAL AT WINGTIP
LEADING EDGE SHEETED WITH 1/16" BALSA TOP ONLY
L.E. 1/4" x 1/8"
TOP SPAR 1/8" x 1/8"
BOTTOM SPAR 3/16" x 3/16"
CENTRE RIBS 1/8"
ALL RIBS 1/16"
T.E. 3/4" x 1/8"
1/16" PLY DIHEDRAL BRACE 4 OFF 1 EACH SIDE OF LOWER MAINSPAR ON EACH WING
1/8" SHT TIPS
COVER MODEL WITH TISSUE AND CLEAR DOPE
L.E. 1/4" x 1/8"
1/8" SHT TIPS
SPAR 1/8" x 1/8"
SHEET CENTRE TWO PANELS TOP & BOTTOM WITH 1/32" SHT.
RIBS 1/16"
T.E. 1/2" x 1/8"
CUTAWAY FOR ENGINE
CUTAWAY FOR WHEEL
F1
F2
F3
1,2,3 MAKE FROM 1/16" PLY
M.A.90
MINOTAUR
R. A. TWOMEY
SPAN 19 1/2" LENGTH 25"
POWERED WITH E.D. BEE

MAKING THE MOST OF . . .

THE NEW WAKEFIELD RULES

● **The introduction of the new formulae for Wakefield Trophy models opens up many new fields for research and experiment. Some of these are discussed in this article and the possible effects on future design trends are analysed for the benefit of those preparing their 1951 designs.**

WHETHER or not everyone agrees with the new Wakefield rules is beside the point. From 1937 up until 1950 the specification has remained unchanged. Prior to then a similar *size* of model had been called for, but with a minimum weight of 4 oz. Calling for double this weight in 1937 virtually eliminated all the existing Wakefield designs from that year's competition—and considerable discussion as to how much performance would go down—and how difficult it would be to build a model *up* to 8 oz.

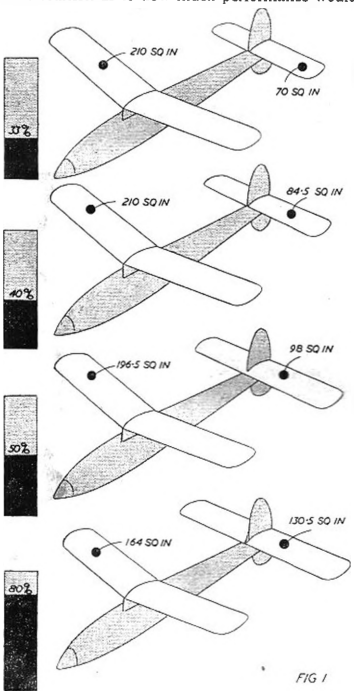


FIG 1

History has provided the answer. With the 8 oz. Wakefield it became a case of how to get *down* to the minimum 8 oz.—not build up to it. Performance *increased*, not decreased and a very fine type of contest model was produced.

The recent change in the rules will not have such far-reaching effects. In the first place the changes are small and will only rule out a few of the existing orthodox designs. Most Wakefield fliers, in fact, will find that their 1950 models conform quite satisfactorily to the 1951 rules and can stick to their existing designs, if they wish. The new rules have been drawn up with this in mind. Primarily the object of the change was to bring the specification more in line with F.A.I. model specifications, particularly as the Wakefield has such a wide appeal on the Continent.

The new rules have been criticised on the point that they open up possibilities of a Wakefield with a higher performance. Rather than a criticism this should be a factor in favour of the new rules, for the Wakefield owes much of its popularity to the fact that the specification *has* resulted in a high performance model—generally accepted as the best of any rubber driven type. Deliberately to try to *reduce* performance could have a " de-popularising " effect.

So much, then, for that. What, now, are the possibilities of improving the breed under the 1951 formula ?

Basically there are only two main changes. Wing and tailplane area is now limited on a total area basis, with no definite proportions fixed between wings and tailplane ; also fuselage length is virtually unrestricted since the minimum fuselage cross section is fixed at a new figure of just over 10 sq. in., irrespective of the length of the fuselage. How either, or both, these changes can be used to advantage is a matter of discussion.

Taking the new wing/tail area rule first, it is generally agreed that an increase in tailplane area (proportional to the wings) would be a good move. This is especially true of the parasol type model with folding propeller—a " modern " type of Wakefield which may be said to have sprung from the ultra-lightweight rubber model. Relative to the wing area, a 35 or even 40 per cent. tailplane will provide better stability with an aft centre of gravity position—and hence better overall performance. Let us concentrate on this type of model for the moment and see what can be done.

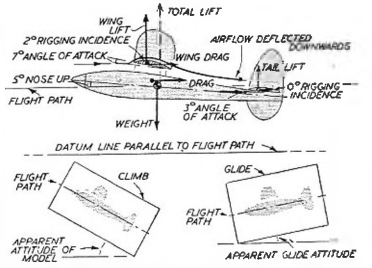


Fig. 2. This diagram gives typical airflow *conditions over the model irrespective of the* apparent *flight attitude. The diagram tilted up to the apparent angle of climb does not alter the* airflow *conditions similarly for the climb.*

First let us add all of the extra area allowed under the (new rules 294.5 sq. in total area as against the previous maximum of 210 + 70 = 280 sq. in.) to the tailplane—Fig. 1. This now gives a 40 per cent. tailplane. But why stop there?

Some two or three years ago a number of highly successful power duration models of the pylon type featured a 50 per cent. tailplane area, their designers reporting better overall efficiency and, in particular, ease of handling over conventional 35 or 40 per cent. tailplane areas. More recently this trend has spread to rubber models. An American 1951 Nationals winner featured a 80 per cent. tail.

With a folding propeller there seems to be every advantage in using a large tailplane so that the centre of gravity can be moved right back, with safety. The fact that the tailplane is then contributing a considerable proportion of the total lift has one basic advantage and one main disadvantage. It is operating at a fairly high angle of attack to give good lift—and therefore tailplane area is being used effectively as a lifting means. At the same time, however, the longitudinal dihedral or difference in incidence between wing and tailplane is reduced and with it the longitudinal stability. This means, in effect, it may be difficult to hit upon the best trim adjustment. It would be easy to go too far one way or another and have the model operating not at its best, or even on the point of being unstable where the tailplane lift takes command and forces the nose down into a dive from which there is no recovery.

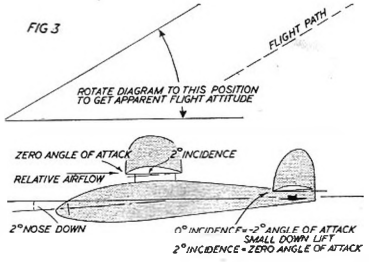
Before drawing any conclusions on the two points, however, let us first examine the airflow and force set-up on a model so rigged with a large lifting tailplane. It is the forces and airflow *under operating conditions* which is important—not the rigging incidences drawn on the plan—Fig. 2.

Typical rigging angles might be 2 degree plus on the wings and zero on the tailplane. Under climb conditions the whole model may be flying nose-up some 5 degrees, so that the operating angle of attack of the wings is now 7 degrees. This approximates closely to the actual operating conditions of a model of this type about half way on the power run—and similarly on the glide, if the *flight path* is now inclined downwards. Whatever the original set-up, trimming usually results at the wing being operated at some 7 to 8 degress angle of attack for best glide trim.

The tailplane, being rigged at zero (with respect to the fuselage) has 5 degrees incidence relative to the flight path, but this is *not* the angle of attack, for the airflow over the tail region is modified by downwash from the wings. Air passing over the wings is deflected downwards and the whole airstream in the wake of the wings so affected. At the tailplane position the downward motion of air imposed on the normal straight or translational velocity is probably about one-third of the wing angle of attack. In the case in point, therefore, the angle of attack of the tailplane is about 5 – 2 = 3 degrees, or rather less than one half of the wing angle of attack.

The first thing that is obvious is that the tailplane lift is always proportionately smaller than the wing area : tailplane area ratio. If the tailplane is one half of the wing area, for example, it will be generating less than one-third of the *total* lift. Even if the tailplane *incidence* is increased to the same as that of the wing, downwash will still give it a lower operative angle of attack under normal conditions. This, too, has brought the combination into an unstable position. Using greater incidence on the tailplane to get comparable angle of attacks on both components may produce an unstable set-up, should it be disturbed.

Suppose, for example, the model drops its nose for any reason—a gust may stall it momentarily. The wings may now assume an angle of attack of zero—Fig. 3. Under such conditions there is no downwash modifying the airflow over the tailplane which is itself operating at zero angle of attack. If the tailplane *incidence* is the same as that of the wings, neither component, in fact, is lifting at all as long as this attitude maintains. Actually the model will recover under these conditions, but slowly. Drag forces will eventually pull the nose up, when the wings assume a positive angle of attack and downwash is introduced once more to provide the stabilising longitudinal dihedral. If however, the tailplane had been rigged initially with a greater incidence, under the attitude shown in the diagram the tail would be lifting and steepen the glide still more, despite the



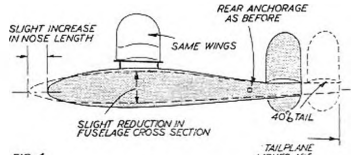


FIG 4

fact that under normal flight conditions the set-up might be quite satisfactory. If rigged with a difference in incidence or longitudinal dihedral the tailplane is lifting downwards with the wings at zero lift and the model recovers—as in the diagram.

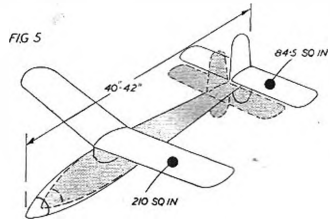
This is the problem explained in simple terms. The conclusions we can draw are that to be really effective as a lifting tailplane the tailplane wants to be of generous area to make up for its necessarily lower angle of attack under operating conditions. Also, for stability reasons, the tailplane cannot have a greater *rigging incidence* than the wings.

Returning now to our original diagram of Fig. 1, let us see what figures we get with even larger tailplane areas within the new rules. Wing and tail areas for 33, 40, 50 and 80 per cent. tailplane areas are shown. How far are we prepared to go?

On the face of it the 50 per cent. tail appears to be the logical limit. Here wing area is reduced to 196.5 sq. in. to accommodate a 98 sq. in. tail within the 294.5 maximum total area. But if we adopt a very rough generalisation we can get an "efficiency figure" for the various combinations with respect to a design where the wing alone is considered as producing all the lift and the tailplane is acting simply as a stabiliser, i.e., giving no lift under normal flight attitudes. This corresponds, in practice, to a forward centre of gravity position which has been used with considerable success on some models, particularly on the shoulder-wing type.

For our generalisation let us assume that the tailplane when used as a definite lifting means developes one half of its maximum possible lift, due to its lower angle of attack, and then sum the effective lifting areas of the various combinations

Thus, as regards efficiency, it would appear that the larger the tailplane area, proportionally, the *less* there is to gain as regards *lift*, but one which will be



offset slightly by the decreased *drag* of the smaller wings. From the stability point of view, however, we are pretty sure that a large tailplane would be desirable, on a parasol model, at least, viewing the two together that 50 per cent. area tailplane suggested as the maximum upper limit looks about right.

Tailplane area per cent.	Total "effective" lifting area
33	257
40	252·5
50	245·5
60	239
80	229.5
100	221.5
non-lifting tail, 33 per cent. wing area	220.5

We can, of course, further modify these figures by taking advantage of the new fuselage rule to increase fuselage length. Moving the tailplane further aft will increase its efficiency as a *lifting* factor by reducing the downwash effects and its *stabilising* effect by the increased moment arm. Possibly this

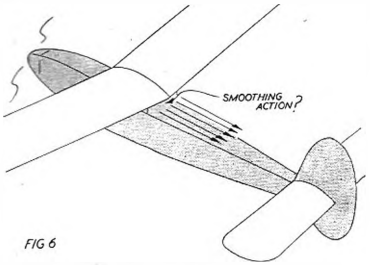


FIG 6

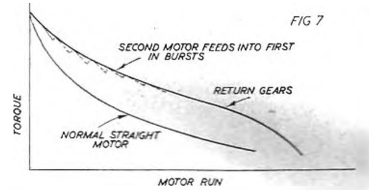
would pay better dividends than increasing tailplane area alone—Fig. 4.

Whether, now, to increase the motor length as well with the long fuselage is an open question. The parasol-folder type of model generally operates on a medium or rather short motor run, relying on rapid climb and a very flat glide to prolong duration. Long motor runs almost invariably mean a slower initial climb with a gradual tapering off towards the end of the power run. This does not fit in well with a folding propeller model for such a design is inherently under-elevated towards the end of the power run. If it were not it would stall on the glide once the propeller had folded, unless the change in trim brought about by the propeller folding is exactly counterbalanced. There is a further point, too, in that long power runs to be effective, i.e., continue to produce climb throughout almost all the power run, generally require a high pitch propeller. The conventional folder is generally of medium or fine pitch. The longer fuselage, too, will probably have resulted in increased weight, despite the smaller cross section, and the new 8.113 oz. minimum weight is still not going to allow much increase in rubber weight without an overweight model. Our "con-

ventional " parasol-folder for 1951, therefore, may well be expected to be proportioned something like Fig. 5. Whether or not the wing is mounted on wire " goalposts " or on a built-in cabin-pylon is largely immaterial to the overall picture. The latter is the modern trend with undoubted benefits in streamlining. There is still, however, something about the older method which is not fully understood.

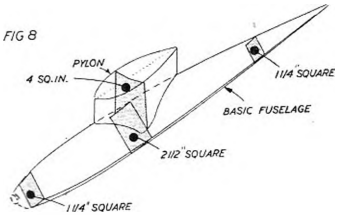
On the face of it a wing mounted at a certain rigging incidence only a short distance above the top of the fuselage should form something of an air trap between wing and fuselage—Fig. 6. Yet there is very little evidence to prove that such a model has a higher overall drag than that of a faired-in pylon design. The theory has been advanced—and it may be quite near the truth—that this " air trap " does, in fact, act like a smoothing slot and control the airflow over the top of the rear of the fuselage, preventing it breaking away and thus reducing wake drag. Almost certainly the airflow breaks away from the surface of even the best of conventional " streamlined " fuselages long before the tailplane position, the upper surface undoubtedly being the most critical.

Within the new formula, however, how about a new breed of parasol-folder? One which aims to



rival the prolonged, slower climb of the freewheeler, reach a similar height in the same time and then score out by increased glide performance. The parasol layout is quoted as this seems best suited to the folding propeller, although the high pitch and long motor run is rather foreign to it. It would have to be a twin-blade folder to get comparable height and then there would be the difficulty of operating the model efficiently at the end of the power run in, say, the 30 sec. or so before the propeller eventually folded.

There are quite a number of interesting possibilities here. Trimming the model to fly on upthrust, for example, on this part of the power run would be most effective, provided that this upthrust could be eliminated or overcome during the first part of the power run. No suitable mechanical device could be controlled by motor *tension*, but one might by motor *torque*. Or there would be the very much simpler way of starting with a tight spiral climb and opening this climb out as the power died out, finally flying straight under power. This would have the effect of increased elevation as the circle opens out. Probably the model would then glide to the left, using left rudder and right sidethrust.



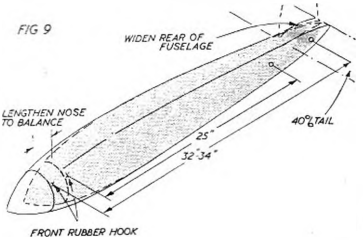
Then, what about gears? Everyone has been impressed by the performance of return gears these last two years, but few modellers have got down to experimenting with them. Just what sort of motor run do they give?

Some preliminary tests carried out by the Northern Heights Model Flying Club indicate that the torque output from such a system is maintained at a high level for a considerable period. There is not that sudden drop and then tapering away as with a straight drive. The second motor appears to feed into the first one in bursts, not uniformly. As the torque in the first motor shows signs of dropping the second motor feeds into it and maintains the torque figure. This type of power output is one which the long climb folding propeller model might well use—Fig. 7. Or do we still stick to the freewheeling type?

It would seem that the basic outline of the present free-wheelers needs to be modified but little under the new rules. Unless the tailplane is being used definitely as a lifting means there is little point in boosting its area above about 35 per cent. of the wing area. To do so will only involve sacrifice of wing area merely to gain an increase in longitudinal stability beyond that which is strictly necessary. Another 5 sq. in. on the hitherto 210 sq. in. wing and the tailplane now 79.5 sq. in. would seem to fit the bill adequately, whether this refers to a high wing layout or shoulder wing with centre section area included in the 215 sq. in. In the latter case this will give wings with a net area of around the 200 sq. in. mark which has already proved very satisfactory.

Fuselages, of course, can be slimmer. There is the possibility of the semi-stick pylon type wing mount—

(*Continued on page 64*)



DESIGNED BY

J. VAN HATTUM

"SATYR" was designed as a small sailplane model, simple enough to be used as "the beginners first contest model," yet capable of a useful performance. The small tailplane on a long lever-arm gives excellent stability and the sturdy construction makes the fuselage capable of standing up to any rough treatment—except a careless foot! Of the four prototype built, three came out below the minimum F.A.I. weight of 11½ oz.—the heavy one being the designer's!—so do not spare cement and reinforcement where it serves a good purpose.

Fuselage

First cut plan shape from ⅛ in. sheet, glue longerons along the edges and fit bulkheads and top longerons. Next mount the vertical sides from former 1 to 6. Finally put on the decking, but don't forget to fix the hardwood dowels while the fuselage is still open. Decking can be left well oversize and trimmed after cement has set. Use plenty of pins to keep sheet in place where it has to be forced into a bend. The nose block is made of three layers of hardwood, total width about 1.2 in.; the centre one being hollowed out to take trimming ballast. Nose block is glued straight on to former 1. Fit fin, when model is nearly complete so that you can check for true alignment and rigging relative to wing.

Wing

This is quite a simple constant-chord structure and all ribs are ⅛ in. balsa. Build it in three sections which are later joined by the dihedral braces. I found joining very easy when I glued one brace to the spar on the outer section and the other on the inner section: it gives more support when joining up the sections and less danger of finding insufficient dihedral after cement has set. The constructional method used in building the wing has been described in the May, 1950, issue of MODEL AIRCRAFT. Briefly, it consists in first cementing main spar and leading edge to the nose sheeting: taking good care that the distance between the two is just right to cover the nose portion of the ribs. When the spars are well in place cement the ribs to the main-spar and a short length of the sheeting. When set, pull the sheeting over the ribs and cement with plenty of pins to keep the parts in position. Take care to line up the tails of the ribs. When this job is done, fit the cap-strings—on top if ribs only—leaving the required length to provide anchorage for the trailing edge. Pay good attention to dihedral braces and local reinforcements as many a broken wing results from bad joining where large local stresses are present!

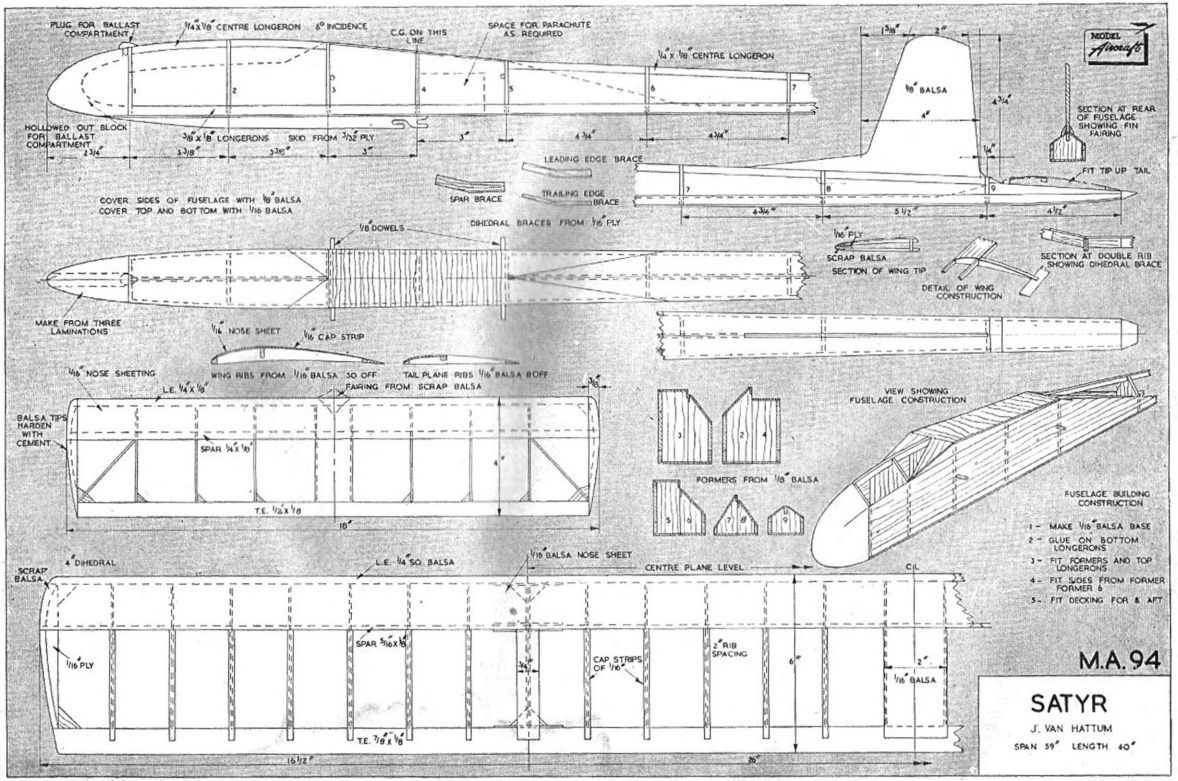
Tailplane and Fin

This is a small version of the wing and one may build this first to become acquainted with the method. The fin is just a balsa-sheet, cut to shape, sanded round the edges and very well cemented to the top of the fuselage. Note strengthening along the base by means of scrap balsa and take care that the fin sits true in relation to the wing. The same applies to the tailplane.

Trimming

To obtain maximum duration a model must be trimmed to fly at the angle of incidence where sinking speed is smallest. This means inevitably that it flies very close to the stalling angle. It is obvious that we must trim the model so that when it stalls owing to a gust, it quickly returns to its "cruising atiitude." When this is not done, the model will carry out a series of stalls, very often becoming more and more violent. This means loss of height and possibly damage. The best way to avoid this is by carrying out the following test procedure:

When the model is reasonably well trimmed and flies fairly straight, pull it up on a tow-line of 70-80 ft.


PLUG FOR BALLAST COMPARTMENT
1/16"x1/8" CENTRE LONGERON
6° INCIDENCE
C.G. ON THIS LINE
SPACE FOR PARACHUTE AS REQUIRED
1/4" x 1/8" CENTRE LONGERON
HOLLOWED OUT BLOCK FOR BALLAST COMPARTMENT
3/16"x1/8" LONGERONS
SKID FROM 1/32" PLY
COVER SIDES OF FUSELAGE WITH 1/8" BALSA
COVER TOP AND BOTTOM WITH 1/16 BALSA
SPAR BRACE
LEADING EDGE BRACE
TRAILING EDGE BRACE
1/8" BALSA
SECTION AT REAR OF FUSELAGE SHOWING FIN FAIRING
FIT TIP UP TAIL
1/8" DOWELS
DIHEDRAL BRACES FROM 1/16 PLY
1/16" PLY
SCRAP BALSA
SECTION OF WING TIP
DETAIL OF WING CONSTRUCTION
SECTION AT DOUBLE RIB SHOWING DIHEDRAL BRACE
MAKE FROM THREE LAMINATIONS
1/16" NOSE SHEET
1/16" CAP STRIP
1/16" NOSE SHEETING
L.E. 1/4"x 1/8"
WING RIBS FROM 1/16" BALSA 30 OFF
TAIL PLANE RIBS 1/16" BALSA 8OFF
FAIRING FROM SCRAP BALSA
BALSA TIPS HARDEN WITH CEMENT
SPAR 1/4"x 1/8"
T.E. 1/2"x 1/8"
FORMERS FROM 1/8" BALSA
VIEW SHOWING FUSELAGE CONSTRUCTION
FUSELAGE BUILDING CONSTRUCTION
1 - MAKE 1/16" BALSA BASE
2 - GLUE ON BOTTOM LONGERONS
3 - FIT FORMERS AND TOP LONGERONS
4 - FIT SIDES FROM FORMER FORMER 6
5 - FIT DECKING FOR & AFT
4° DIHEDRAL
SCRAP BALSA
L.E. 1/4" SQ. BALSA
1/16" BALSA NOSE SHEET
CENTRE PLANE LEVEL
C/L
1/16" PLY
SPAR 5/16"x 1/8"
CAP STRIPS OF 1/16"
2" RIB SPACING
1/16" BALSA
T.E. 7/8"x 1/8"
M.A.94
SATYR
J. VAN HATTUM
SPAN 59" LENGTH 40"

Just before release, give a gentle pull on the line to make the model stall. Now carefully observe its behaviour. If it keeps undulating in consecutive stalls, decrease the rigging angle of the wing—or, if you prefer neatness, increase that on the tailplane. Also remove a little ballast from the nose. The aim is to get the C.G. as far rearward as possible and the smallest possible difference between the angles of incidence of wing and tailplane. Carry on step by step until the model starts making a shallow dive. It would recover eventually with sufficient height and this is the point where you have passed the limit of longitudinal stability. So the next thing is to increase the difference between the angles of incidence between wing and tailplane a small amount and the model should now be properly trimmed ; that is, when stalled it should neutralise the stall in not more than three undulations. Do not be satisfied until you have obtained this kind of trim on all your models. One word of warning : when you approach the critical stage and the model tends to enter the dive, go carefully. When not done in very small steps the model may end in a vertical dive !

I have not given much detail on dethermalisers as these devices need no description. I would suggest starting with a d.t. parachute strapped to the side, but if you like neat work, carefully break a door in the fuselage behind former 4 and fit a compartment in the usual way. Reinforce the sides and corners of the opening. A tip-up tail has not been tried, but the design lends itself very easily for this type of insurance against loss.

If the model happens to fly in a dead straight line, cement a narrow tab to the trailing edge of the fin to make it circle. A model flying straight does not pick up thermals.

The New Wakefield Rules

(*Continued from page* 61)

Fig. 8. A reasonable saving in drag may be anticipated, but there is a practical minimum to the cross section of the fuselage below which rubber bunching becomes troublesome. With the average size of Wakefield motor a *minimum* nose size of 1¼ in. sq. is required and preferably somewhat larger. The mid portion of the fuselage requires at least twice this size for safety, when the cross section has already reached just over 6 sq. in. That does not leave very much area over to be accommodated in the pylon. It is a possible "minimum drag" fuselage layout, however, giving a high wing positioning.

With fuselage length no longer dependent on cross section there is a strong urge to use a longer motor, increase the fuselage length to accommodate it and derive direct benefits in the form of a longer motor run. But this may not work out that way. If you are striving for a theoretical limit, than a motor weight : airframe weight of 66 per cent. is generally accepted as about the optimum limit. At the moment most people are hard put to produce a 50 : 50 ratio motor weight : airframe weight within the 8 oz. rule. That slight saving in fuselage cross section is not going to help much, especially if the fuselage length is to be increased. Nor is that extra 1/7 oz. over the original 8 oz. minimum going to allow much more rubber. The danger here lies in adopting a long motor, increasing the fuselage length proportionately and then finding that the overall weight is very much above the required minimum. For a start, at least, it would therefore seem best to go slow in this direction, with just a few in. added as a start—Fig. 9. If the basic idea is to increase motor length then it might be an idea to increase the distance between the motor hooks rather than the overall length of the fuselage as such. Whilst it is contrary to modern practice to move the rear rubber anchorage back—possibly even under the tailplane—a larger tailplane area could be used to balance out the stability margin. The early 8 oz. pre-war Wakefields got away with it quite successfully with a 33 per cent. tail.

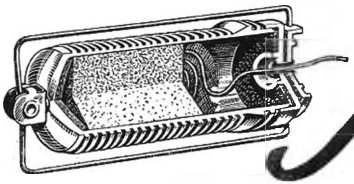
Before taking any definite decisions as to increasing motor length it would be as well to consider some figures showing how weight of motor increases with weight. Rubber varies considerably in density and so, although typical figures are given below as applying to a certain brand of rubber, other samples may work out slightly differently. The proportionate increases, however, will be similar.

	oz. approx.
Standard motor 16 strands, 42 in. long weighs	3½ oz.
Increase motor length to 43 in., motor weighs	3⅝
" " " " 44 " " "	3¾
" " " " 45 " " "	3⅞
" " " " 50 " " "	4¼
" " " " 55 " " "	4⅝
" " " " 60 " " "	5

Your airframe weight has got to be re-adjusted to these new figures. If you want to use a 60 in. motor, for example, the rest of the model complete has got to come out at not more than 3 oz., unless you feel that this extra weight is justified.

This itself is a very tricky point. Very few Wakefields do, in fact, weigh flown to the minimum. Many quite successful examples top the 9 oz. mark. But as a general rule, however, given similar conditions, the lighter model should be at an advantage. One could, for example, readily achieve a 66 per cent. rubber weight by adding enough rubber to a 6 oz. airframe, but the 18 oz. model resulting could not reasonably be expected to have a performance comparable with that of an 8 oz. Wakefield with only a 50 per cent. rubber weight. Those extra ounces have first to be carried upstairs, thus detracting from the climb and, once up there, are in only too much of a hurry to come down again with consequent harmful effect on the sinking speed.

The trouble is, with the old rules unchanged each year you could still think up numerous improvements for "next year's model." Now that they have been changed around a little the possibility of detail modifications seems endless. Probably in the end we shall find that most models look the same as last year.

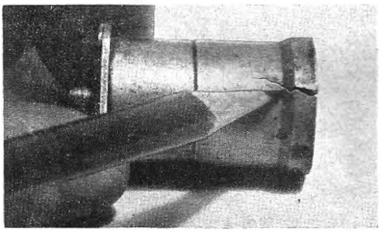


JETEX UNITS

By J. HENSON

IT is not often appreciated that the major problem facing designers of any type of rocket motor is dealing with the very great heat required to generate gas at sufficient pressures to work it.

The fuel used on "Jetex" motors generates a gas with about 5 per cent. solid deposit and about 30 per cent. steam. You have, therefore, three major problems to deal with—heat, deposit and steam, and as these all directly affect the maintenance of your motors, it is as well to understand why certain things happen to a "Jetex" motor after continual use. In the first place, the rubber impregnated asbestos washers which are made of a very high quality material and on the whole stand up to the job remarkably well, undergo disintegration of the rubber after the first firing, and the rubber sometimes welds itself to any metal surface which it contacts. There is, therefore, a tendency, after the first firing, for this washer to tear, due to the surfaces being welded to the wrong surface. It obviously does not matter if the washer welds itself to the cap, but if it does so to the annular groove in the main case, the washer may have a slight pit where the graphited rubber surface has been torn off. It does not follow, however, that the washer necessarily need be replaced, but after the first firing, it is always as well to bed the washer in by carefully removing any parts sticking to the main case, and revolving the cap under pressure so that the surface of the washer is honed smooth. This, I think, deals with the main trouble caused through heat, but it should be borne in mind, that if once a pit starts in the washer and the smallest gas leak occurs in its surface, the hot gases will drill a channel through this and eventually damage the main case, as there is a great concentration of heat on one part of the metal which gradually burns away and collapses with the internal pressure of the motor.



A badly pitted cap washer will cause a gas leak and can result in the main case cracking as shown above.

We now come to the problem of solid deposit. In some ways, this is an advantage as it tends to seal any small pits which might cause gas leaks after the first firing. It also acts as a most convenient heat insulator between the metal sides of the case and the hot burning charge, and it is no advantage to scrape too much of this deposit away, although it will eventually build up a wall of such thickness that it becomes difficult to insert the pellet. When this happens the deposit can easily be softened with water and it will probably be found necessary to clean some off after every 20 flights.

Having dealt with the main case of the motor, the cap is unfortunately a different proposition, as this deposit has a strong tendency to find its way into the threads of the screw type jets in all "Jetex" motors except the 50. It also builds up into a hard black cake round the entry to the jet itself, and after a time this appears to have a chemical action on the metal from which the jet is made, and pits and grooves are gradually eaten into it. This, of course, does not happen immediately and time is the major factor rather than continual use. If you are to have a long life from your "Jetex" motor, you should remove the jet after every few flights, wash it in water, scrubbing away any deposit that has settled on it and oil it to prevent rust, before replacing. This is especially necessary if you are likely to put your motor aside for several weeks after having used it, and I cannot emphasise too strongly the necessity for thoroughly inhibiting, (*i.e.* cleaning, taking to pieces and preserving) if this is likely to happen. Chemical action continues whether a thing is being used or not.

The third factor is steam, and this obviously will tend to cause the oxidisation of the metal used in the jets, which should be well scrubbed and cleaned (a pipe cleaner is a very useful tool), and then inhibited in oil as I previously suggested. Too much oil will probably cause a slight carbonisation, and before use, any excess oil should be wiped clear.

Where two or more pellets are used in "Jetex" motors, it has been found that the last pellet burns at a slightly higher rate than the first. This is caused through the motor being generally warmed up, and it works at a higher internal pressure, thus giving

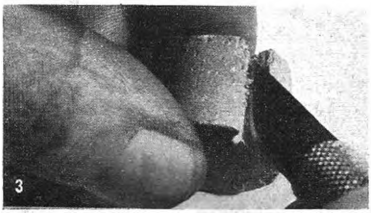
more efficiency. Some of the wise boys will deliberately allow the first pellet to burn away before launching their model in contest flying, and this is obviously an advantage where ratio judgment is being given, as the loss of motor time is amply compensated by the extra urge on the last few seconds of thrust, plus the loss of weight in fuel. There have been several attempts by people anxious to get the most out of their motors, to burn the pellet down the side, and I have actually seen a pellet which has had a groove carefully filed down the side so that the igniter wick would ignite a larger surface of the pellet than the face. This is a highly dangerous practice, and I cannot recommend it. Uncontrolled burning must obviously take place as the whole conception of the "Jetex" pellet, is that it burns steadily down from the face, and that the area of gas-producing material is never exceeded throughout the whole burning time. The manufacturers have spent many months of experimenting with the lightest and strongest motor case available to work at a given pressure, and you are, therefore, liable to damage your case and produce a most erratic thrust curve which will not in the long run, do the flight of your model any good if you adopt practices of this description.

Another point which is, perhaps, worth mentioning, is that the igniter wick itself has a thin copper core. This core is usually melted and blown out through the jet in the first few seconds of ignition, but occasionally a thin length of it remains in the jet orifice. It is easy to pull this away and it is also advisable to do so as it has a tendency to angle the jet stream which would produce a certain amount of side thrust where it is not wanted.

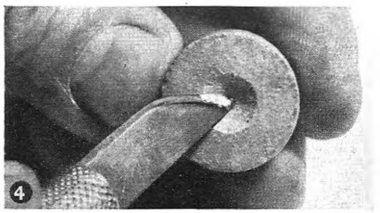
The average "Jetex" motor gives a very constant power curve, but the final question which I have been occasionally asked, is how to smooth this curve out where more than one pellet is used. In the 350 pellets, the base of one side is dished, and if the instructions are carefully followed and a little loose powder is scraped off the top of the bottom charge, a rapid take-over can be effected. In the case of the "200" motor, however, the cone or dish in the bottom of the pellet has to be cut in by the user himself. It is, however, the most effective means of keeping the power curve constant, and the practice of using a small piece of igniter wick sandwiched between two pellets is not altogether a good one as it has a tendency to give a minor explosion which does not necessarily mean rapid ignition of the bottom charge, but in most cases lifts the whole end cap for a split second and releases pressure with a resultant loss of thrust.

1. The solid deposit which forms on the inside of the case makes an insulator between the burning charge and the case. Only sufficient of the deposit should be removed to permit easy insertion of the pellet.

2. The jet orifice in the cap must be cleaned frequently, particularly the cone shaped jet entry. The cap shown on the right has become badly corroded, making it impossible to unscrew the jet for replacement or cleaning.



3. A practice which is *not* recommended. Some modellers cut a groove in the side of the charge to obtain a larger burning surface. The result is uneven burning and an erratic thrust curve.



4. Even burning can be assisted by cutting a cone in one end of the pellet. The end with the cone being placed against the flat base of the second charge which will become more readily ignited.

Team Racing

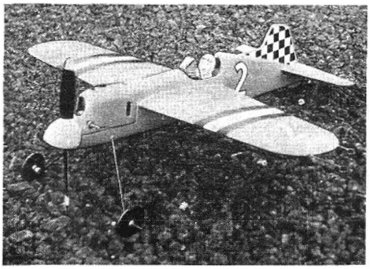
By Norman Butcher

SPEED, economy, stability, strength, these are the essentials of a successful team racer. The first two are inextricably bound together, and afford the three schools of thought which have so far made their appearance in contests. These are, briefly :—

A Racing " 29 " providing high speed and high fuel consumption ; a sport type Glo motor or a racing Diesel giving medium speed and medium consumption ; and an economical Diesel providing comparatively slow speed with exceptional fuel economy.

The first two of these have been dealt with already, at some length, in various articles but the latter seems to have been dismissed as not offering a serious challenge to the others. That this assumption is false had been proved by last season's contest results. It is obvious that every time a refuelling stop is necessary there arises a rather critical moment when a single false move can cost a team race, but once a machine is airborne and well in its stride there are only the hazards of flying four in a circle to worry about. From this it would seem the fewer the pit stops the greater the chance of victory.

With a fast model it becomes a continuous struggle for fuel economy, but when one has economy it is simply a case of finding more speed, and this can be easier than it sounds. Assuming a model does 85 laps at 60 miles and hour then by careful attention to design and choice of propeller the speed is stepped up to 70 miles per hour, the fuel consumption will probably increase slightly, but this will be more than offset by the greater speed and the lappage remains approximately the same. Next season, however, will prove which is the better course to follow.



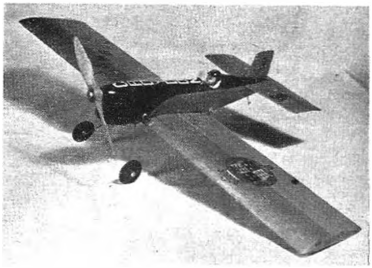
An attractive looking Class A Team Racer design by Johnny Nunn of the Barking Club.

From the design angle two things immediately assert themselves ; first the model must possess a reasonable degree of manoeuvrability, and secondly it must be ultra stable and capable of flying itself while the pilot's attention is distracted by the chaos which inevitably occurs in the centre of the circle at least once during a race.

Manoeuvrability should be solely confined to the ability to climb, dive and pull out smartly, it must in no way be sensitive to the controls because of the danger of fouling another model when overtaking.

The wing position can make considerable difference to the flight behaviour of a model, a high wing having many advantages not the least of which being that if left to its own devices the model will generally fly itself around, whereas a low wing layout tends to go into a shallow dive should the lines slacken. Moment arm is not critical, but if kept reasonably short, results in decreased weight due to a shorter fuselage and increased fuselage strength for the same reason. Short moment arms also have the advantage of giving a snappier control response, and provided the c.g. is kept reasonably well forward (about $\frac{1}{4}$ in. behind the leading edge) are no more sensitive to fly than a standard layout.

Wing planform and aspect ratio are again not critical, and can usually be made to suit the whims of individual builders. But a greater wing area than the minimum permitted can often be used with advantage, a slight increase in area having little or no effect on the speed but a decidely beneficial effect upon manoeuvrability, glide, and landing speed. A flat bottom wing section with the maximum thickness at approximately 40 to 45 per cent. gives very good results, and should be set at approximately 1 to 2 deg. of positive incidence. It was found that flying with a wing of this section at zero incidence,



"Jambon," the author's Allbon Javelin powered class "A" team racer, plans of which will shortly appear in "Model Aircraft."

slight up elevator was necessary to maintain level flight, and the resultant drag made quite an appreciable difference to the flying speed.

The average type of cowling at present in vogue seems to have been added to the model merely as an afterthought to protect the engine from the inclemencies of the weather, and to make it generally inaccessible, whereas, if properly designed, the cowling can be a help rather than a hindrance, both as regards speed and maintaining constant engine temperature.

Before designing a cowl a few practical bench tests can give a good idea of the amount of cooling necessary.

First, the crankcase, if this remains cool enough to touch after a protracted run, then *no* crankcase cooling will be necessary and the interior of the cowl can be so designed as to restrict the air flow to the cylinder head only. A cowl of this type is employed on the team racer, photograph of which appears above, the original being fitted with an Allbon Javelin. Should, however, the crankcase tend to overheat then some form of cooling duct will have to be incorporated.

Before going on to discuss team racers from a constructional angle, it might be as well to ponder the fact that of the four team race contests held in this country, all have been won by diesel powered models, the South East Area and West Essex by an Amco 3.5 and the St. Albans and Southern Counties by an E.D. 3.46. None, however, of these races provided a good comparative result, as at Brighton only one model stayed the course and of all the others only two models finished. Indeed, the only race in which all four models finished was put on by the West Essex boys at Fairlop, over August Bank Holiday, and this ended up in the most glorious mix-up it has ever been my pleasure to witness!! Since writing the above I have been informed that the West Essex Team Race was won by an E.D. 3.46, and at the Midland Area Rally, no one finished the course.

However, returning to the construction, the vital point that must be remembered is that the airframe of a team racer has to stand up to far more knocks and abuse than almost any other type of model. I remember friend Marcus's first ultra-light racer powered with a K. & B. "29": the wings of this model were covered with Jap tissue and had received one coat of dope. Under the rather damp conditions of Brighton and in spite of hurried applications, during the actual running of the elimination, of rubber bands, wire, and pins, the inner wing developed something approaching a 90 deg. wash out, and that was that!

A rigid motor mount is an essential, and this should be built up on the crutch principle as used in speed models. Engine vibration, more than anything, limits the life of a model, so avoid it at the outset. A combination of hollow log and built up sheet type fuselage construction seems to be widely used and has much to recommend it both from ease of building and strength.

Considerable experiment into wing construction has shown that *strength* for *strength* an all sheet wing built in the manner indicated on the plan shows a definite saving in weight over a tissue covered one, the only apparent drawback being that while a tissue covered wing may be fairly easily rebuilt, even after a major prang, a sheet wing cannot, an entirely new wing being necessary to make a satisfactory job. In cases where the wing is detachable from the fuselage this is all right; indeed, it is doubtful if a detachable sheet wing would sustain severe damage, its intrinsic strength being greater than that of the rubber bands holding it in place, but where the wing is built integral with the fuselage a shattered wing usually means a complete new model.

And now a few tips picked up in the "hard way" last season. First, never use wheels with detachable tyres. Twice while well in the lead and a mere six laps or so to go for any easy win I have shed a tyre on take off after the refill causing the model to turn over a break a propeller, thus losing me a contest. *Propellers*: Make sure once you have found the optimum diameter and pitch that all subsequent ones are identical. Remember that even commercial propellers of reputably the same pitch have been

Three West Essex members at their Club's Invitation Team Race held at Fairlop Aerodrome last October. (Left to right) Joe Deniz, Ken Marsh and Ken Muskutt.

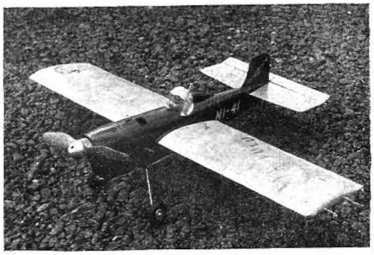
known to vary, and also make sure that the hole in the centre is an easy sliding fit over the crankshaft. *Fuel* : Always filter fuel before use and incorporate a fuel filter in the actual line from the tank to the engine.

Perhaps many would-be team race pilots have not as yet had the opportunity of flying four in a circle : do not let this worry you, provided you are sound of wind and limb ; ambidextrous ; capable of observing the position of a model obscured by a broad back and a pair of dirty corduroys ; are in possession of a current driving ; dog ; gun and fishing licence ; and are totally immune to comments upon your piloting abilities as expressed by three other equally qualified individuals, then you are assured of success !

Seriously, though, seize every opportunity to watch experienced pilots in action, observe how they extricate themselves from such difficulties as crossed lines, obstructed take-off and landing areas, etc., and remember that every emergency you have seen is one that, with practice, you can cope with yourself.

Although, as I have already remarked, there have been a mere handful of contests this year, many amusing little incidents have occured which are well worth remembering. The sight of Phil Smith and Co. at Brighton trying to extricate themselves from the tangle of control-line wire which insisted on wrapping itself round their feet, and the friendly race at Fairlop with West Essex when Marcus's and my own model were so evenly matched for speed that being on opposite sides of the circle we did not see each other for over 50 laps.

At a contest I was flying in recently the last point



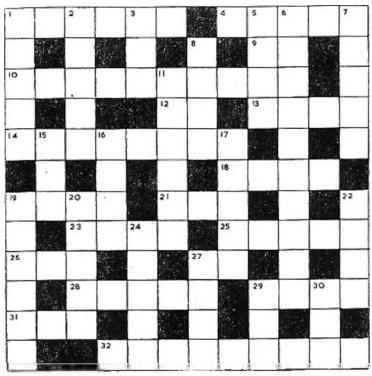
The author's well-known team racer "Lil Lulu." Powered by an E.D. Mk. IV, it usually does five miles without refuelling.

I have to make was driven home very forcibly. It is this. Read the Fyling Rules as laid down by the S.M.A.E. and *observe* them. It is not only your own model that is likely to be pranged in the event of a mix-up caused by *your* negligence. In the case in question the crash was caused by a pilot leaving the centre of the circle. At the W. Essex gala when Johnny Nunn wrote off his ship it was caused by an opposing team failing to withdraw the model from the flight path. Accidents like this can be avoided if all the competitors and their assistants really co-operate with each other, and thus enable the race to be completed without such unfortunate incidents occurring. So read those rules and remember to, "Do unto others . . ."

MODEL Aircraft

CROSSWORD

Compiled by J. C. Snell



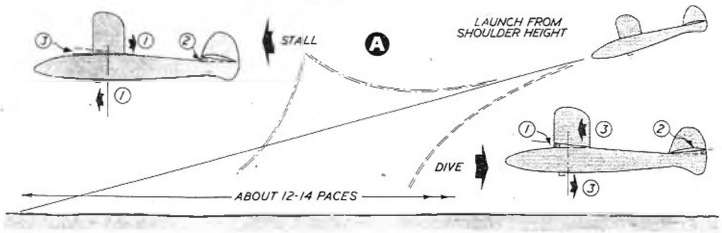
ACROSS

1. Visible ratio.
4. Fuel kept in cheeks !
9 and 12. Short aerial.
10. Engine incidence for modern F/F.
13. Not warped—honestly.
14. Mercurial Scandinavian.
18. Manx contest lies here.
19. Winning art.
21. Dapper engine.
23. Trans-Atlantic Vickers.
25. Small quantity.
26. Sailplane to follow.
27. Means, near.
28. Radio detection and ranging.
29. Protector with tail.
31. Temperacure determines time to this.
32. Flat sided fuselage.

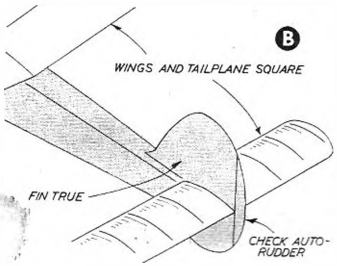
DOWN

1. Exhaustively famous engine.
2. Accent on this plant.
3. With bear, tiger—and wild.
5. Spat—no longer.
6. Seldom supplied with engine.
7. There in diesel fuel.
8. One times the chord squared.
11. Duration trophy.
15. Tornado makers.
16. Half or part scale.
17. Stylish stunter.
19. XFG 1, for example.
20. Gosling's gull.
22. A deal in weight ?
24. Small scale imitation.
27. Shortened Brabazon.
29. Useful for rise-off-snow—
30. —or this.

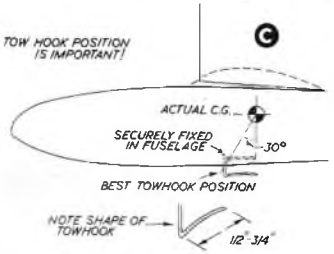
(Solution on page 103)



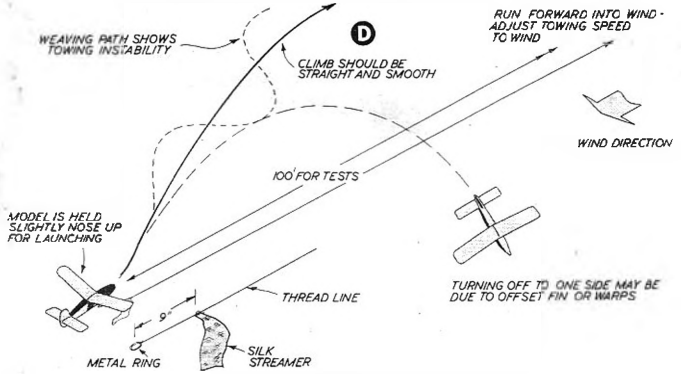
HAND LAUNCH FLIGHTS DETERMINE INITIAL TRIM AND ADJUSTMENT



OFFSET WINGS OR WARPS ARE HARMFUL



TOW HOOK POSITION AFFECTS STABILITY



RUNNING LAUNCH USED FOR HIGH START

(A) A glider is about the simplest type of model to trim. Almost any combination of wings, fuselage and tail unit can be adjusted to have a glide of sorts, but to get a model glider performing at its very best is another matter !

First, of course, before taking out the model to fly, you should check it over thoroughly for warps and alignment. Any part of the model which is not true is likely to cause trouble—even a serious crash. It is far better to spend a few minutes indoors rectifying such a fault than several hours in repairing from a crash which could have been avoided.

The initial test flights to establish the trim are made by hand launching. Since this is a check on the trim of the model it is very important to choose a calm day or evening for this. If it is windy you will not be sure whether it is the wind bumping the model about or the model itself which is not in trim. Take sensible precautions like this and you are not likely to run into any trouble at this stage.

From a hand launch from shoulder height an average glider should cover about twelve to fourteen paces before reaching the ground. The flight path should be smooth and reasonably slow, with no undulations. The three possible faults at this stage are : a sharp turn in one direction or the other ; a stall ; or a dive. Either of the two foremost will be obvious. An under-elevated glide is not always so easy to spot without experience. A lot of model gliders which appear to fly well are actually flying under-elevated or faster than they should be. Performance suffers as a consequence.

A turn is due to bad rigging, either a warp or offset wing, fin or tailplane. A stall is over-elevation ; a dive, under-elevation. There are three possible cures to each.

If the model stalls then the best method of treatment is either to move the wing backwards, or, if this is not possible, move the balance point forwards by adding weight or ballast to the nose. This is the treatment which should be tried first and is shown as No. 1 on the diagram. If this brings the wing, or balance point, into a bad position, either of the other two methods can be tried. Second cure is to increase the incidence of the tailplane by adding packing under the leading edge, a small piece at a time. Alternatively you can reduce the incidence of the wings by removing some of the incidence packing under the leading edge here or packing up the trailing edge. As a check, whichever method is used, the balance point should be no farther forward than one-third of the chord, nor farther aft than about 60 per cent. of the chord : and there should still be some two to three degrees difference in incidence between wing and tailplane.

The cure for a dive is roughly the opposite. First *increase* the incidence of the wings. Secondly, add negative incidence to the tailplane by packing up the trailing edge. Third, move the wings forward or take out some of the weight from the nose to move the balance point farther aft. Try in that order, and only one thing at a time. The same limits as above apply.

(B) Before tow-launching for the first time, check over the alignment of the model again. Tow-launching shows up instabilities or inaccuracies which are not noticed from simple hand launching. Check that the wings and tailplane are square and the fin is true. If you are using an auto-rudder—and most contest models do these days—check that this is operating correctly and returning the rudder to neutral for launching. If you are using an auto-rudder there is another point to remember, too. Trimming initially for a straight glide the model will be under elevated for circling flight, and so it will be necessary to re-trim the glide slightly after starting tow launching.

(C) The best position for the tow-hook is on a line 30 deg. inclined to the actual centre of gravity of the model. Too far back or too far forward, towline instability may be introduced, so it is as well to incorporate an adjustable two-hook position in your model, or have a number of alternative hook positions for testing. Failure of the model to tow up to the top of the line means that the hook is too far forward. In windy weather, however, it is generally considered best to use a more forward hook position than in calm conditions.

(D) Your running launch must be made dead into wind. You can then adjust the speed of tow to the wind strength. If the wind is strong and the model fairly light it may be necessary to run *towards* the model. The object is to tow the model as *slowly* as possible and get it right up to the top of the line. A lot of practice is the only sure key to success.

Some models are inherently stable on the line, others are not. If it is a design fault, there is very little you can do about it short of modifying the model, but if only slightly unstable it is generally possible to " play " the model right up to the top. This is where experience helps.

A persistent turn in one direction or another generally means a warped wing or fin, or rudder bias. A weaving path is more difficult to overcome. Increasing fin area helps in some cases, especially increasing the *height* of the fin. In others, moving the tow hook *back* has effected a cure. Some models, too, like a fast initial tow and then a slow tow—others like a slow tow throughout. If the model does get into trouble it is best to release it at once. Never let it come into the ground still on the line if this can possibly be avoided.

MODEL Aircraft

photonews


1


2

The Isle of Man Rally was one of the many events which were spoilt by bad weather last season. In between showers, however, D. R. Hughes managed to snap A. Ellis, of Elfin Motors and Liverpool modeller Bill Ford with the latter's Mercury *Musketeer* —we did not know that Bill had been bitten by the C/L bug.

The West Essex Club were more fortunate for their third annual gala day at Fairlop, and the bright summer weather enabled R. A. Adams, of New Eltham, London, to take the fine action shot seen in No. 2, which shows Bill Taylor's speed model getting under way.

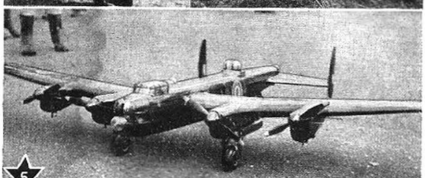
In No. 3 Jean Roberts, of the Belfast Club, is seen with the model which she flew as a joint entry with boy friend B. Millar, in the Hyland Trophy Contest, at Maydown Aerodrome, N. Ireland. We are all for this sort of collaboration—brightens up the meetings to have attractive girls like Jean around.


3

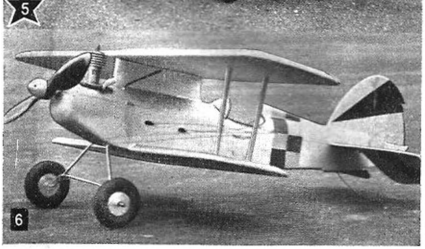

4

Harold Stevenson, of New South Wales, Australia, who appears in No. 4, is a really keen type—he builds his own "6o" motors and they must be good because he holds the N.S.W. speed record.

No. 5 shows Photonews star model of the month, the photograph being taken at the All-Herts Rally. Built by H. J. P. Briggs, of the Park Model Aircraft League, this fine *Avro Lancaster* has a span of 6 ft. 7½ in., being built to 1/16th scale. Power units are two E.D. Mk. III's and two E.D. Mk. IV's. At the time the photograph was taken it had not been test-flown—we would like to hear how it performs in the air.


5

Rugged looking E.D. Comp. Special powered stunt biplane, which is the subject of No. 6, is by the


6


7

well-known Leicester Club member, D. Stothers, whose pal, George Hull, took the photograph.

With an aggregate of 357 sec. for three flights, A. Rawley, of the Oldham Club, was a winner at a Northern Area Slope Soaring Rally, on Baildon Moor, last season, with his *Hover King*. Photograph by K. D. Coates, of Darlington.

Team racer photographs are rolling in from Photonews fans and one of the best received last month was No. 8, sent to us by H. W. Hyde, of Hampton Hill, Middlesex, who also supplied very complete data on the model (others please copy!). Named *Magical Mimico*, it was designed and built by B. L. J. Neal, of West Middlesex M.F.C. Wing area 126 sq. in.; engine, an Elfin 2.49 c.c. diesel; propeller, 8 in. × 8 in.; speed, 55-60 m.p.h.; weight, 17 oz. A shut-off valve has been fitted to cut fuel line when "full up" is given. Colours: Light and dark blue. Pilot is a 6d. Woolworth's doll, plus a little black paint for hair!

Can't keep those Leicester boys out of Photonews this month. No. 9 shows Dennis Hall with his 6 ft. span *Zephyr* sailplane, which is obviously up to his usual high standard of construction and finish.

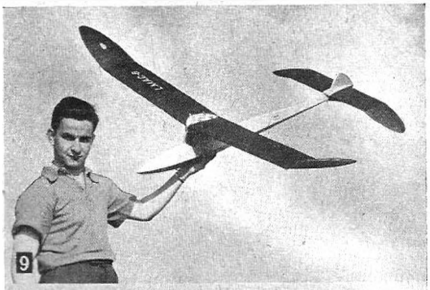
Graham Mills, of the South Bristol M.A.C., is the subject of No. 10. The model is a 9 ft. span *Windjammer*, and the photograph was taken by K. A. Farmer, a fellow member of the S. Bristol M.A.C.

Reader George Curmi lives in Malta and tells us that there are about twenty keen aeromodelling types in his district of Sliema. The photograph which he sent (No. 11) shows his young daughter doing a strong man act with his Frog Centurion. The model is attractively finished in a blue and silver colour scheme and the engine is a Frog "180" diesel. Let's have more news of modelling in the George Cross Island, George.

R. J. Blenkinsop, of Leamington Spa, evidently knows that it pays to introduce glamour into your photographs if you want to get them accepted! However, his power-duration model seen in No. 12 is also worth while looking at. The span is 56 in. and with an Eta "29" providing the urge it has, so he says in his letter, a vertical spiral climb—we hope that the glide is less spectacular!

Just to show that we have not forgotten the scale fans, our last photograph shows a nice looking 44 in. span *Macchi* 308, which was made by Les Steele, of Cardiff, from a Bill Blake plan. Powered by a 0.75 Mills, it looks just like the real thing when airborne.

And that's that for this month—All the best Photonews-ites in all parts of the world.

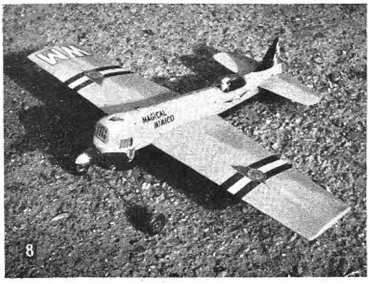

9


10

11

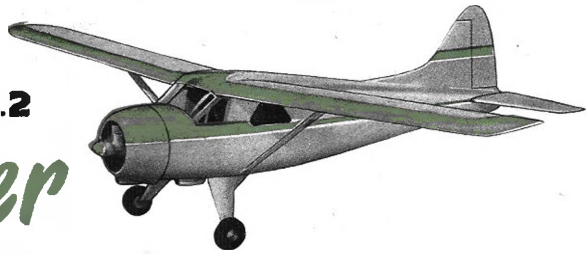

12

13



8

The D.H.C.2 Beaver



BY J. H. SHEPPARD

WHEN designing a flying scale model one has to bear in mind that even if it has a fast flying speed, as the majority of flying scale models have, it must be able to withstand heavy landings and the flying surfaces must be easily displaced in the event of a crash or hard knock. Also, it must have a practical motor installation—motor trouble is bad enough in a freelance design, but an inaccessible engine in a scale model can lead to gory propellers, cut fingers, and bad language!

The D.H.C.2 Beaver fulfilled my requirements admirably providing a model with a radial cowling which allowed plenty of room for an upright motor, a reasonably long undercarriage sprouting from an ample fuselage, and filletless wings permitting an easily detachable fixing. Above all the Beaver is a good looking aeroplane having rugged yet clean lines.

The original model was powered by an E.D. Bee though an Amco 0.87 or any other good engine of a similar capacity could manage as efficiently. Anything smaller would have difficulty in dealing with the fairly high wing loading.

The pendulum rudder was fitted to cure instability which resulted from the small dihedral angle.

The sprung undercarriage was fitted after the prototype had been flown because it was found that downwind landings on tufty ground or ploughed fields tended to tear Former No. 5 away from the fuselage sides. The installation of sorbo pads and gussets cured this and the present undercarriage will deal satisfactorily with all landings on reasonable terrain in normal weather conditions.

The weight of the original was 16¾ oz., but in spite of this, with the C.G. at about 50 per cent. of the chord, quite a slow glide was obtainable.

The model has stood up well to "cartwheel" landings, which occured before the fitting of the pendulum rudder. On one occasion half of the tail-plane became loose and began to fall off. Once clear of the locating peg it turned through 90 deg. so that it was vertical in relation to the airstream. The only damage resulting from the ensuing 50 ft. plunge to earth was a cracked rudder!

Wings

These are perfectly straightforward, but it should be carefully noted which ribs are made from $\frac{1}{16}$th in. and which from 1/32nd in. sheet. The multi-spar construction is used to minimise tissue sag and so preserve scale appearance care should be taken to bind and cement the brass tubes securely to the web between the spars.

The strut anchorage consists of a wire hook to take tensioning rubber bands and a small housing made of plastic wood into which the bevelled edge of the struts fit.

Fuselage

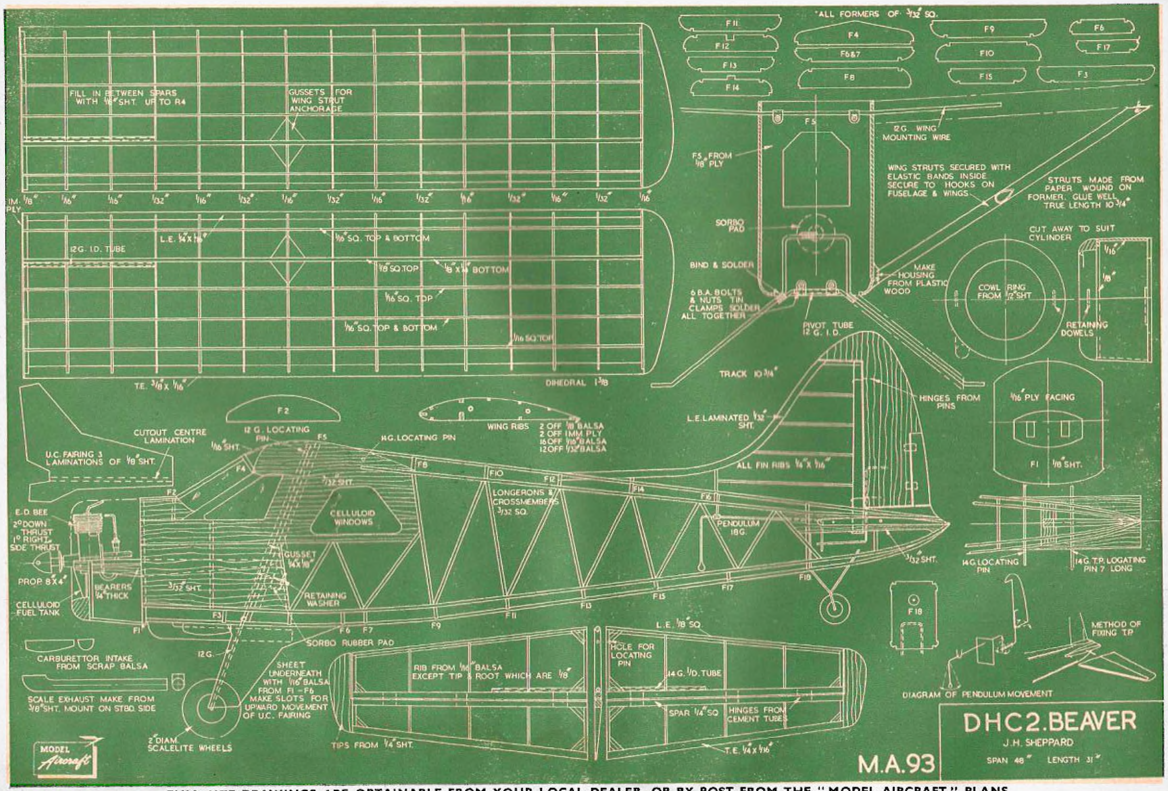
Start by building the basic side frames on the plan from 3/32nd in. sq. and 3/32nd in. sheet. When these are set, join them together with the small former stop and bottom using F5 as a means of keeping the whole job square. The undercarriage should be attached to F5 before it is installed. The sorbo pad could be made of a sorbo tyre off an old wheel. Add the engine bearers not forgetting to incorporate the downthrust.

Plank the "bonnet" and under the fuselage; also sheet the "corners" of the fuselage. These parts can be planked with single pieces of sheet as they are not compound curves; the wood should be soaked in hot water and then bound with rubber round a broom-stick and left to dry thoroughly. It will then be roughly the right shape for the corner curves. The fin outline is constructed from laminations of 1/32nd in. sheet. When the fin is completed it is cemented to the fuselage. The rudder is attached and the pendulum installed. Take care to cement the pendulum supports securely into position.

The tail-wheel strut is sewn to F18 and cemented; the rear strut is dummy and merely protrudes through a piece of 3/32nd in. sheet into the fuselage.

The wire wing fixing is soldered to two 6 B.A. nuts and bolted to F5. The correct dihedral angle is incorporated by bending the wire as shown on the plan. This fixing, provided it is made from good 12 s.w.g. spring wire, makes a very efficient wing mount, being sufficiently flexible to spring backwards, forwards, upwards or downwards to take shocks and yet being sufficiently rigid for normal flying. The undercarriage fairings are made and installed as shown on the plan.

(*Continued on page* 78)



FULL SIZE DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 23, GREAT QUEEN ST., LONDON, W.C.2., 5s. 0d. POST FREE.

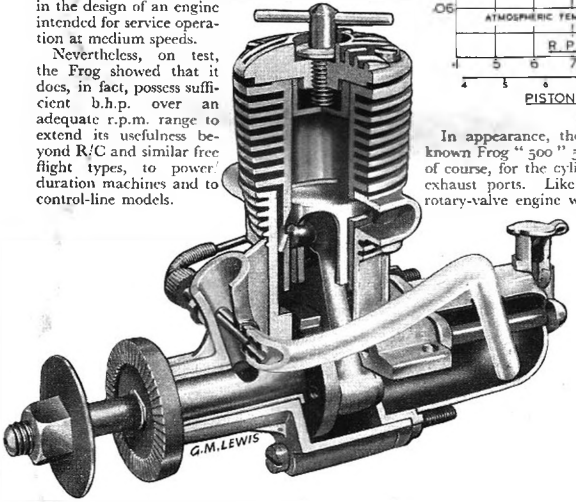
MODEL Aircraft ENGINE TESTS

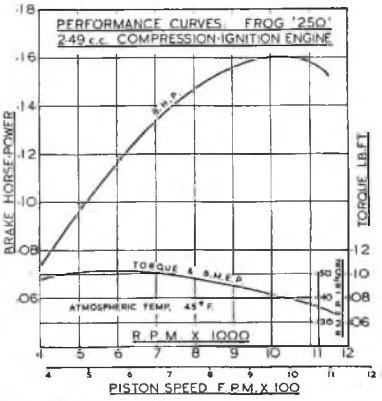
NO. 20 THE FROG "250"

NEWEST addition to the Frog range of model engines, manufactured by International Model Aircraft Ltd., to be reaching the model shops, is the model "250" compression-ignition engine. Brief details, and the first published photograph of this engine, were given in MODEL AIRCRAFT in July last.

The manufacturers state that the 2.49 c.c. "250" was designed primarily to provide a suitable unit for radio-controlled models, and it is not claimed as an ultra high-speed type, of phenomenal output. It should be remembered that, for an R/C model of, say, 400-500 sq. in. wing area and 2-3 lb. weight, an airscrew of reasonably large diameter (i.e., 11 in.) is desirable. Even if this is reduced to 10 in. with a pitch/diameter ratio not exceeding 0.5 : 1, no high-speed type 2.5 c.c. engine could reach its peak output under such a load. Thus, no useful purpose is served by aiming at very high peak r.p.m. and output, in the design of an engine intended for service operation at medium speeds.

Nevertheless, on test, the Frog showed that it does, in fact, possess sufficient b.h.p. over an adequate r.p.m. range to extend its usefulness beyond R/C and similar free flight types, to power duration machines and to control-line models.



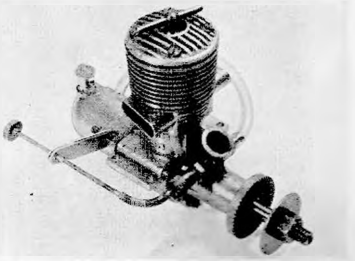


In appearance, the "250" resembles the well-known Frog "500" 5 c.c. glow-plug engine, except, of course, for the cylinder head and the use of two exhaust ports. Like the "500," it is shaft type rotary-valve engine with down-draught carburettor and extended needle-valve control, fuel being drawn from a metal tank fitted to the rear crankcase cover.

The engine is well finished and the clean, turned steel cylinder fins are especially pleasing.

Specification

Type: Single-cylinder, air-cooled, two-cycle, compression-ignition. Rotary-valve induction through hollow crankshaft. Two exhaust ports and four transfer. Flat top piston.



Swept Volume : 2.49 c.c. Bore : 0.500 in. Stroke : 0.575 in.

Compression Ratio : Variable, 10 : 1 to 26 : 1.

Stroke/Bore Ratio : 0.961 : 1.

Timing : Rotary-valve opens 15 deg. after BDC, closes at TDC.

Exhaust-port opens 64 deg. before BDC, closes 64 deg. after BDC.

Transfer-port opens 48 deg. before BDC, closes 48 deg. after BDC.

Weight : 5¼ oz.

General Structural Data : Die-cast aluminium alloy crankcase, rear cover, cylinder-head and fuel tank. Hardened steel cylinder, ground and honed. Mechanite piston and contra-piston machined from solid, ground and lapped. Hardened steel crankshaft ground and lapped, running in phosphor-bronze main bearing. Forged Hiduminium RR.56 alloy connecting-rod. Tubular silver-steel gudgeon-pin, hardened and tempered. Spray-bar type needle-valve assembly with extended flexible control. Beam or three-point bulkhead mounting. Free-flight fuel tank attached with one screw may be rotated and locked in any position or removed for C/L.

Test Engine Data

Total time logged prior to test : 2 hours at 4,000 r.p.m.

Fuel used : Frog " Powa-Mix " with the addition of 2 per cent. amyl-nitrate and 5 per cent. castor-oil.

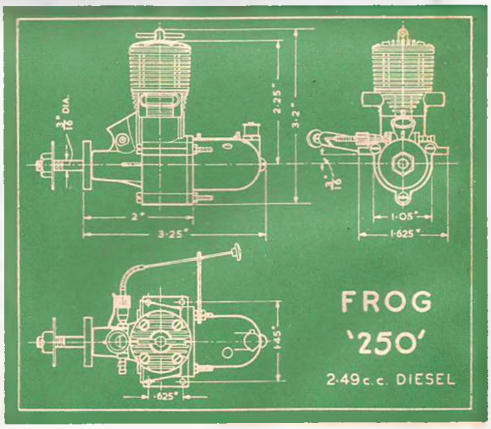
Performance

The most noteworthy feature about the performance of the Frog 250—and this applies both to the production unit under test and to a prototype engine tested some twelve months ago—it is ability to hold its r.p.m. under load. That is to say, the usual tendency of diesels, even when well run-in, to lose power as their normal running temperatures are reached is, in the case of the " 250," practically non-existent. Based on observation of the many types tested, this feature is believed to be due, primarily, to the cylinder construction used for the Frog, which employs integral turned fins on a steel cylinder and differs from the more common screwed-on finned barrel of aluminium alloy.

Starting the " 250 " is quite easy and, although priming with a few drops of fuel through the exhaust ports to secure a start from cold is advised in the maker's instructions, this was not found to be essential during the test, a cold start being quite easily obtained by simply choking the intake for two or three flicks. Through an r.p.m. range of 6,000-9,000, the " 250 " starts very readily both hot and cold. On extra heavy or light loads, hand starting is a little less easy but does not become at all critical unless very small, light propellers, intended to allow the speed to rise about 11,000 r.p.m., are used. Such a speed, of course, is well above that called for in the normal course of operational use.

The Frog runs evenly and, with nitrated fuels, is not at all sensitive to needle-valve adjustment. Above 9,000 r.p.m. it was found that the maximum compression allowed by the compression lever was insufficient to obtain even firing on normal Frog " Powa-Mix " fuel, but this was overcome by the addition of 2 per cent. amyl-nitrate to lower the required compression-ratio and no further trouble was experienced right up to the maximum speed tested. The test engine, incidentally, was fitted with two needle-valve extension clips with the diagonal slots opposed, thus preventing any tendency for the extension to vibrate out and foul the propeller arc.

For the purpose of the b.h.p. tests, the " 250 " was then run at speeds ranging from 3,500 to 11,500 r.p.m. Good, even torque figures were maintained,



equivalent b.m.e.p. being slightly in excess of 50 lb./sq. in. at approximately 6,000 r.p.m. The maximum b.h.p. indicated was .16 b.h.p., this being realised at 10,000-10,500 r.p.m.

In the course of practical tests by the manufacturers with a radio-controlled "Centurion" model, an 11 in. × 5 in. airscrew was found to be most suitable. With such a propeller the speed of the "250" is about 6,000 r.p.m. A check on the test unit with an 11 in. × 6 in. airscrew of medium blade area, yielded 5,800 r.p.m.

For free-flight contest models of around 300-400 sq. in. area and 15-20 oz. weight, a somewhat higher speed can be aimed at in order to utilise more of the engine's available output and 10 in. × 4 in., 9 in. × 5 in. and 10 in. × 5 in. propellers should be suitable. On a Stant example of the largest of these three sizes, the test engine recorded 7,900 r.p.m. For C/L work, 8-9 in. diameter and 6-8 in. pitch should be most useful, the smaller diameter, higher pitch propellers, of course, being chosen for lighter and faster types. A brief check provided 7,600 r.p.m. on a Truflex 9 in. × 8 in., 8,700 r.p.m. on a 9 in. × 6 in. and 9,000 r.p.m. with an 8 in. × 8 in.

As a matter of interest, the test unit is now being installed in a high-wing semi-scale R/C model with Aero-Trol equipment. This model has a span of 59½ in., an area of 432 sq. in. and all-up weight is 2½ lb.

Power/Weight Ratio (as tested) 0.465 b.h.p./lb.

Power/Displacement Ratio (as tested) 64.2 b.h.p./litre.

The D.H.C.2 Beaver

(Continued from page 75)

The cowling is made from 1/16 in. sheet—the front ring being from ½ in. sheet. The bottom half of the cowling is cemented to F1 and braced to the engine bearers while the top half is made detachable in order to provide access to the motor. Carve the exhaust pipe and carburettor air intake from ½ in. sheet and stick on after doping.

On the original model since the E.D. Bee is not fitted with a cut-out a celluloid fuel tank was constructed as shown and graduated. This proved to be quite satisfactory since accurate timing of engine run is not of great importance with scale models. The tank shown held sufficient for about a 30 sec. engine run. For choking, a length of wide neoprene tubing was pushed over the carburettor intake of the engine and led out of the side of the cowling.

In order that the compression lever can be adjusted without removing the cowling, a small extension may be made. It was found on the original that the engine started and ran efficiently without any adjustment to either compression or needle valve. Extensions to either are, however, easily made.

To avoid the possibility of the engine mounting nuts vibrating loose 18 s.w.g. wire clips were made to snap over the bolts just above the nuts. The wing struts are made of cartridge paper wrapped round a balsa former and cemented. They are then clear and silver doped.

Tailplane

The tailplane is of quite simple construction. The elevator hinges are made from strips of cement tube. The tips of the elevators should rub against the tailplane tips so that the elevator cannot be easily displaced.

Finishing

The wing, tail, and fin are covered with ordinary rag tissue, the fuselage is covered with double-thickness rag tissue, and given three coats of clear dope. The rest is given two coats of clear dope and the whole aircraft finished with two coats of silver dope (sprayed on, if possible). Registration letters and the top of the engine cowling are maroon in colour and a maroon stripe is painted down the fuselage sides with the aid of "Sellotape" for masking purposes.

Ailerons, doors, hatches, etc., are marked with Indian ink, which is then given a coat of clear dope for protection.

Flying

First make sure that all flying surfaces are free from warps and check the C.G. position. All being correct, choose a calm day and glide test over very long grass. Trim (by moving elevators slightly up or down) until you have obtained as slow and as flat a glide as possible.

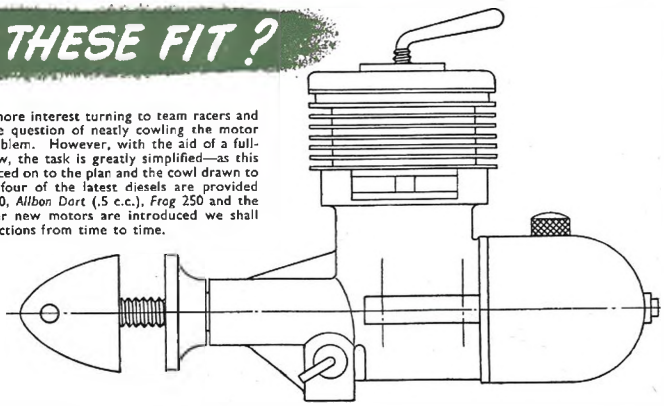
On the original model a Truflex 8 in. diameter × 4 in. pitch propeller was used. For the first power flight the engine should be throttled back until it is running slowly, or if you cannot get your motor to run slowly, use a wooden propeller and stick a piece of 1/16 in. sq. on the leading edge of the blades. This will reduce thrust and revs. If a light airscrew is used, gyroscopic forces will be minimised and the model, will therefore, be easier to trim.

Normally the pendulum rudder will tend to keep the model on a straight course, but circling flight may be obtained by adjusting the inset tab on the rudder.

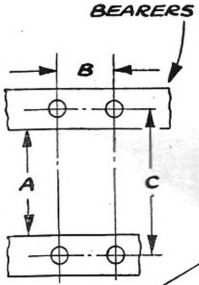
If the model tends to oscillate from side to side it is probable that there is either too much movement on the pendulum rudder or that the model has not been launched straight and a weaving motion has been started by the action of the rudder.

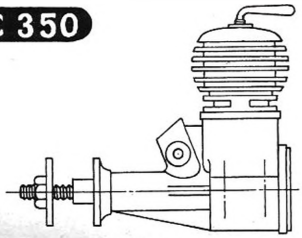
WILL THESE FIT ?

With more and more interest turning to team racers and free flight scale, the question of neatly cowling the motor is often quite a problem. However, with the aid of a full-size engine side-view, the task is greatly simplified—as this can be pasted or traced on to the plan and the cowl drawn to suit. Drawings of four of the latest diesels are provided below—the D.C. 350, *Allbon Dart* (.5 c.c.), *Frog* 250 and the E.D. 2.46. As other new motors are introduced we shall publish further selections from time to time.



D.C 350

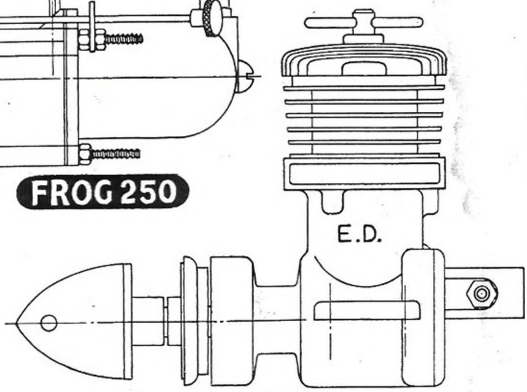




ALLBON DART

FROG 250

	A	B	C
D.C. 350	1 5/32 in.	$\frac{3}{8}$ in.	$1\frac{3}{8}$ in.
Dart	$\frac{11}{16}$ in.	$\frac{5}{16}$ in.	$\frac{13}{16}$ in.
Frog 250	$1\frac{1}{32}$ in.	$\frac{3}{8}$ in.	$1\frac{7}{16}$ in.
E.D. 2.46	$1\frac{1}{32}$ in.	$\frac{7}{16}$ in.	$1\frac{3}{8}$ in.



E.D 2·46

Prototypes Worth Modelling

No. 8 THE H.P(R)2 TRAINER

BY C. B. MAYCOCK

THE second prototype H.P.R.2. trainer differs from the first in several details but the two most noticeable are the omission of the large radius fillet at the foot of the leading edge to the fin and the fitting of an Alvis "Leonides" motor in place of the Armstrong Siddley Cheetah 17 also the cockpit enclosure has been cleaned up. It is the second prototype which is shown here in both the photographs and the three-view general arrangement.

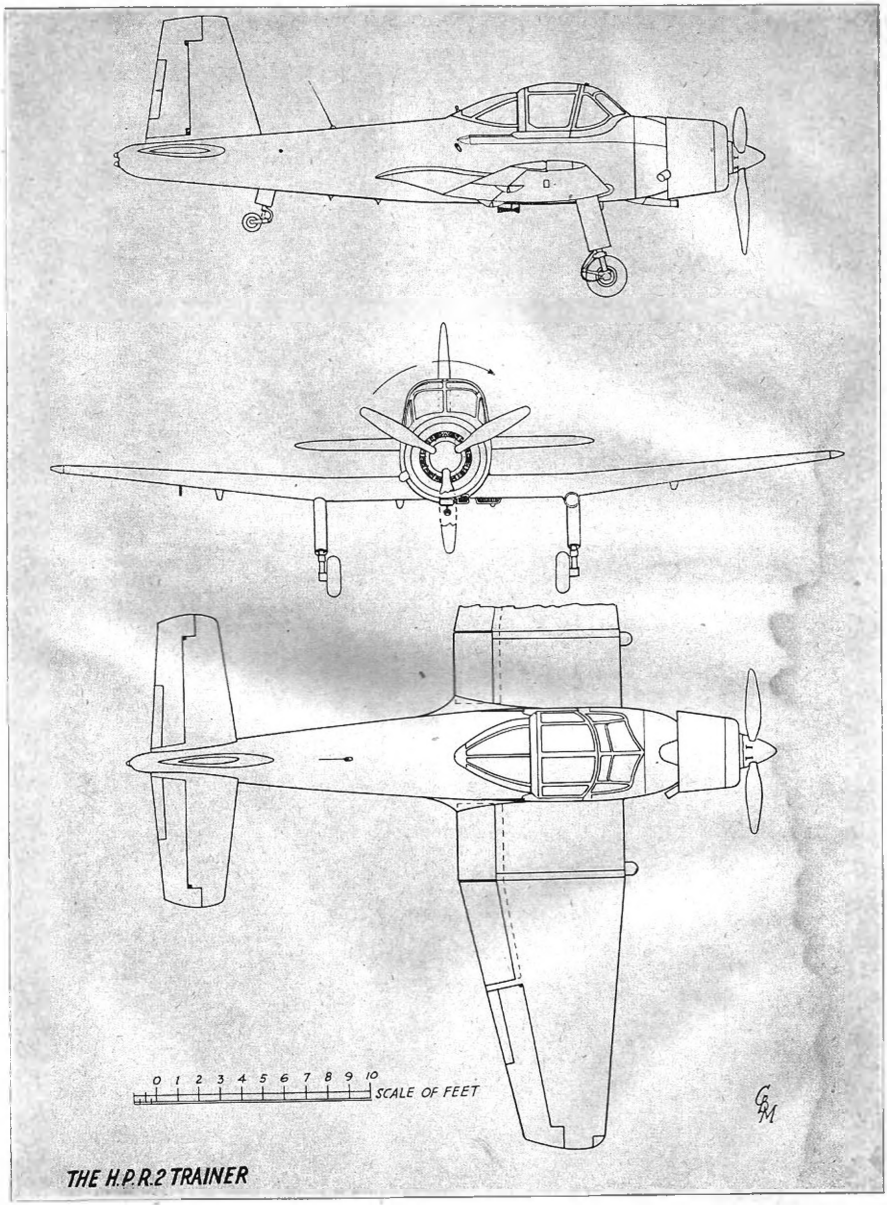
The airframe is constructed throughout of metal and is designed to suit service conditions throughout the world. It is intended for primary training. The side by side seating arrangement has been followed according to the latest specifications for trainers.

This design is interesting in that it is the first original product of Handley Page (Reading) Ltd. This prototype should form a very attractive and robust model the fixed undercarriage making for simplicity and its general layout is suited to free flight or control line.

The main dimensions are as follows. Span 37 ft., length 29 ft. 11 in.. Chord at root, 7 ft. 9½ in., chord at tip. 3 ft. 6 in.. height tail down 11 ft. 6 in., Track (Width centre to centre of wheels) 10 ft. 8 in. Diameter of airscrew 9 ft.. Span of tailplane 13 ft. 9 in.. chord at root 3 ft. 11¼ in., chord at tip. 2 ft. 9 in.

The H.P.R.2. is left in the natural metal finish with 18 in. wide trainer yellow band round the fuselage, and 24 in. similar band on both surfaces of the mainplanes just at the springing of the dihedral of the outer panels. This can be seen in the photograph. The Air Ministry registration letters are in black and positioned on either side of the fuselage and the undersurfaces of the mainplanes. The airscrew is also metal left in its natural colour and has the standard yellow tips to the blades.

(Photos by courtesy of Handley Page Ltd.)



THE H.P.R.2 TRAINER

AEROMODELLING

By Oskar Czepa

ALTHOUGH a few keen enthusiasts in Austria started to make models after the war ended, it was not until 1948 that the Allied authorities officially sanctioned the formation of model aircraft clubs in this country. These clubs were very soon started all over Austria and many regional contests were held.

Some of the clubs or groups were independent and others were attached to one or other of the political organisations. It soon became apparent, however, to leading Austrian aeromodellers, that a National Aero Club was needed to bring the movement under the control of one body and to endeavour to obtain International recognition. It was not easy to overcome the many problems involved in bringing this about, but on July 30th, 1950, at Salzburg, the Aero Club was founded and we hope that soon it will be recognised by the F.A.I., thus enabling us to be represented on that body and to take part in international events.

Power model flying has hitherto been restricted by the shortage of engines ; until recently only a few German Kratsch and Eisfeld petrol engines, and Swiss Dyno diesels were available. Recently the manufacture in Vienna under licence of a Czech motor, the "Atom 100," has been started. It is a diesel of 1.8 c.c., and is rather expensive—approximately one and a half times the price of an English motor of similar type. Attempts have been made to convert some of the old pre-war petrol motors for glow-plug operation with fair success—8-9,000 revs being obtained from an old Kratsch 10 c.c. engine. As far as power model design is concerned, some of the latest models have round, rather long, fuselages which are faired into a spinner at the nose ; very low pylon wing mounting ; wing aspect ratios of from 6 to 9 ; tailplanes of approximately quarter the area of the mainplanes and fitted with underfins. The weight of the airframes is usually the same as that of the motors.

Control-line flying has not caught on at all in Austria, although a few models of the various types have been built. The main reason for this lack of interest has again been the shortage of motors and now that these can be obtained it is probable that we shall see more control-liners being made and flown in the future.

Gliders, as I have said, predominate and, although many of these are based on German designs, the members of some clubs, and in particular my own, the Flugring Austria, are evolving designs with a "new look," as will be seen from the photographs. Up to 1945, what English aeromodellers would call slope soaring, was most popular. Now, however, gliders are almost invariably tow launched.

The Austrian glider classes are as follows :—(All to the F.A.I. loading of 12 gr./dm²). A : 0-25 dm² (Total area), B : 25-50 dm², C : 50-150 dm², D : Tailless, E : Experimental class with no loading restrictions.

The hand-launched classes are :—A : 0-50 dm² (Total area), B : 50-150 dm², C : Tailless, D : Controlled models.

The special "E" class gives wide scope to designers. Most of the models in this class have built-up profile fuselages of very small cross-section and the wing loadings are usually around 5-7 dm².

On August 13th, 14th and 15th, 1950, the first Austrian Nationals were held at Graz, Styria. The first two days were devoted to the glider contest and the last day to the power event.

The method used for deciding the winner of the glider contest may be of some interest to readers of MODEL AIRCRAFT as it was somewhat unorthodox. The main idea was to avoid as far as possible the contest being won by a lucky thermal flight and also to find the model with the best sinking speed.

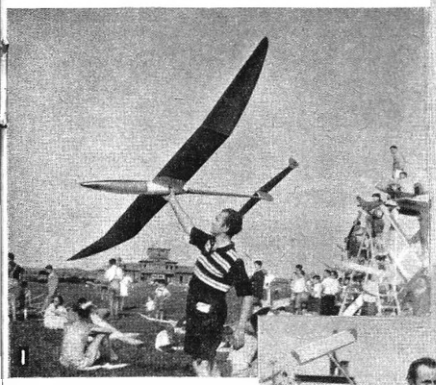
On the first day each of the 80 entrants hand launched their models five times from the 3 metre high tower which can be seen in the photographs. The flier with the best average scored one point, the second two points, and so on. The next day the models were tow-launched in the usual way and points were scored as for the first part of the contest, the flier with the lowest combined total of points was the winner. It worked out very well and eliminated the gliders which had poor sinking speeds.

This does not mean that we are very much against thermal flights—prizes were also given to the five contestants who made the best flights of the day. The best time was 24 min. by A. Kimeswenger (Wels). Aya (Linz) and J. Sperl (Vienna) made flights of 21 min. and 19 min. 30 sec. respectively. All o.o.s.

The power contest had a much smaller entry than the glider event, and was won by A. Lederer (Vienna) with a ratio of 1 : 12.4 (1 min. 59 sec. glide —9.6 sec. motor run). The maximum permitted motor run was 20 sec. On the same day, but not in the contest, R. Salzmann (Vienna) made a flight of 41 min. whilst A. Kumba with an own-design Class C model and F. Reiss with his "Geier" (see photograph No. 6) both made flights of 30 min. duration.

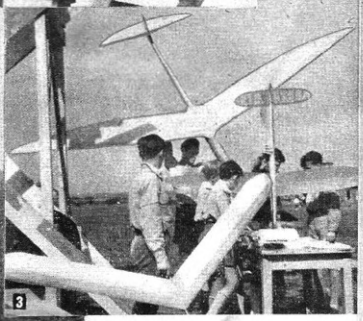
I hope that I have been able to give the readers of MODEL AIRCRAFT some idea of our aeromodelling activities; we in Austria always read with very great interest the reports of British events which appear in this journal and the writer looks forward to being able to report again in the future on our efforts to make aeromodelling even more popular in Austria than it is at present.

IN AUSTRIA



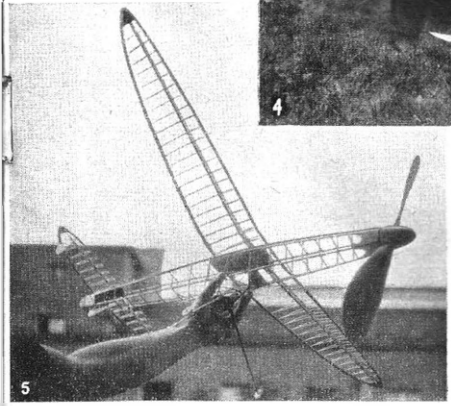
1. R. Spitz with his "Kudibus" which won two second place awards.

2. A. Lederer launching the class B "Wolkchen." He gained third place in the hand launch contest, but was unlucky in the towline event. In the background H. Jansa with his class B "Wolkchen" model which won first place in the H/L Contest.

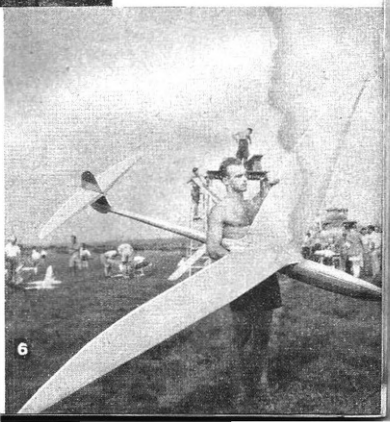


3. The scene at the control point during the elimination event. The "Start Tower" can be seen on left of the photograph.

4. E. Jedelsky of Vienna, a leading Austrian aeromodeller, with his winning class A glider.



5. A Wakefield, designed by the author and built by A. Lederer, which has yet to be test flown.



6. Fritz Reiss, the builder of this class C "Geier" sailplane, which was designed by E. Jedelsky.

Topical Twists

Is Another World Watching Us?

Feeling that the advent of weird flying machines into our atmosphere is a serious competitive threat to the model aircraft movement we have invited Professor Moonshine, the well-known astronomer, to answer some important questions :

Q. Why are Flying Saucers so shaped ?

A. To enable them to make a round trip.

Q. At what time of day is one most likely to observe these machines ?

A. Immediately after closing time.

Q. Can they sustain flight for longer periods than aircraft belonging to this world ?

A. Yes, with the possible exception of Russian Duration Models.

Q. Aerodynamically speaking, have they anything in common with our own model aircraft designs ?

A. Only with power duration models, in that they, too, look like nothing on earth.

Q. Is there any truth in the rumour that the bodies of little men have been found beside a wrecked machine ?

A. No, this story originated from a team race pile-up.

* * *

Featured in this journal, a few issues back, was a very ingenious folding wing glider. The idea of the folding wing glider is not, however, a new one. This was amply demonstrated at the last Nationals.

" Always the same old stuff at these meetings, never anything new ! "

If Found . . .

Most of us, I feel, are apt to regard the plastering of " If Found " labels on our beauteous models as a disfiguring, but necessary, evil ; and contrive to site such excrescences on the most unobtrusive part of the model's anatomy. But now and again the eye is boggled by the sight of a large and livid label emblazoned with the mysterious phrase : " Experimental Model." Which appears, more often than not, on the sort of model that looks about as experimental as an old fashioned spinning wheel.

Now, while we in the model world are apt to treat this form of pretentiousness with a certain amount of sardonic amusement, I often conjecture on the feelings of the layman who happens to discover this portentous phrase peering at him through his rhododendrons. Surely his immediate reaction would be to smuggle the precious flying machine into the best bedroom. Lock, bolt and bar the door, and then ring—no, that would be a too risky procedure with something upon which the future security of the country might rest—well, contact the owner by some dark and secret means. After which he would await with tremulous excitement the arrival of high government officials and M.I.5 Agents ; to be followed by a bountiful reward and possibly the B.E.M. or some equally meritorious award in recognition of his patriotic action. You can imagine his humiliating disappointment when the ownership of the model is eventually claimed by a pimply faced youth in a " Sloppy Joe." who brightly offers him a cement caked half-crown. In my view he'd have every justification in jumping on the model, and the pimply faced youth too.

* * *

The Brighter Side

That pauperised individual, the aero-modeller, must now, it seems, make some contribituion to the National Exchequer through the agency of Purchase Tax on kits and engines. I, personally, greet this news with mixed feelings, as the increase in prices might well restrain Aunt Tabitha from presenting me with yet another Catapult Glider Kit next Christmas.

* * *

Fortune Afloat

Recently in the news has been the story of an epic voyage across the Pacific on a Balsa raft. It can now be disclosed that this great feat was due to a Columbus-like error in navigation. Actually, the crew's idea was to float the raft to England, where, at the current reigning prices of Balsa, they could have flogged it for a princely sum, or, perhaps, exchanged it for a luxury yacht.

* * *

News from our Northern friends indicates that *several* new Wakefield designs for 1951 are already under way. This will indeed make a welcome change from last season's effort.

I understand that many Wakefield enthusiasts, seeking improved performance, have been tickled by the idea of the feathering propeller.

* * *

Now that most fuselage shapes have been tried : slabside, chopper, suitcase, etc., I am thinking of introducing the new Spoon shape. This, no doubt, will cause quite a stir.

By Pylonius

Fred Deudney

writes on

SPEED TOPICS

I SHOULD like to express my thanks to Harold de Bolt for his most interesting letter (see page 89 Editor) I was naturally pleased (and surprised) to find that I had caught the attention of someone who really counts in modelling circles " over there " and that he should give us in this country the benefit of his views and experiences is a gesture that we British speed fliers appreciate.

I say *we* fliers—I happen to be one too, and there's no calculating machine in my workroom either. The " paper work " is a sideline and it stays home when I go flying ; the difference between me and the others is that I do a lot of tall thinking and weird sums just to see if I can make some sense out of the extraordinary variety of contradictory happenings, beliefs, and assertions that crop up in our intriguing hobby. This leaves me at a disadvantage, if anything, since I thus have less time for building and flying, which count for more than anything where successful speed flying is concerned.

Back in 1948 the first " specialised models " were appearing in ever-increasing numbers, we were getting beyond the sport-model and developing performance jobs—stunters which " did the book " or fully fledged speed models which were intended to go fast. After stunt flying, I became interested in speed and have since become so almost exclusively, and I found like so many others that my speeds were way down the scale. Obviously we were all comparative beginners, we hadn't the " know-how " and couldn't honestly expect to hit real speeds straight off. The difference was so great, though ; the modeller accustomed to thinking in terms of model design, trim and finish where performance was concerned naturally looked to the model for the reason—quite a problem in view of the outward similarity and, in some cases, a motor of the same type as the American counterpart. At that time I naturally wondered how models could be improved, I saw possibilities of better streamlining, reduction of bulk and weight in published designs appearing in American magazines. I wondered whether the wing areas were anywhere near the optimum point where further clipping would increase drag, or whether they were already too small. What about low drag aerofoil sections, thick or thin wings, higher aspect ratios ?

E. Wallis of Surbiton with his ETA 29 powered speed model which clocked 111.1 m.p.h. at the London Area C/L Championships.

Finally, the penny dropped. It turned out that the line drag, so often taken for granted, was a major factor. I believe now that my figures are too high, but not greatly so. The vital point remains firmly established—those figures show the order of horse power required for line drag alone, so that the power required at American speeds is very high, regardless of how well streamlined the model is, and how efficient its propeller. The second important point is that this power is so high that it must represent a considerable proportion of the total engine output ; in other words, the drag of the model is only a fraction of the overall resistance to motion offered by the model and its control lines. I suggested a figure of roughly one third, so that 30 per cent. difference in model drag makes only 10 per cent. difference to total drag. This in itself leads to the conclusion that the aerodynamics of the model are of considerably less significance than is often supposed—a fair copy of an American design should have aerodynamically a *potential* performance almost as good as the original, even if less highly finished ; indeed it would take an impossibly large increase in model drag to account for even part of the difference in

performance between similar designs which is found when comparing " theirs " with " ours."

The Necessity for High Power

My contention is that the very high speeds simply *cannot* have been achieved without a very high power output, because no matter how much you cut down model size and drag you are still left with the high power absorption of the lines. This fact can explain more than anything, the broadness of the gap between the familiar top speeds in America and our own, because we are in a different region of speeds, apart from a few rare exceptions. I am not trying to belittle the achievements of the men who have made these speeds in America ; far from it, I recognise their ability and fully appreciate the fact that they are out and out experts in the broadest sense of the term. Whatever advantage they may have had over the average fellow in engines, they have gone all out to get that last m.p.h. by sheer skill and modelcraft—the *degree* of success is a direct measure of their expertness. All that I am trying to say is that they *could* not get up to that high region of speeds without a first class power unit which really motors ! It doesn't follow that *anybody* can follow suit with a sufficiently powerful motor, because the mark of the expert is the ability to apply his skill to every factor involved and to develop the best from what he has.

Engine Performance

Mr. deBolt has got me wrong when he quotes me as saying that the difference is all due to " hopping up." It's very difficult to come to any rigid decision in the matter without first-hand knowledge ; I've read everything bearing the remotest connection with speed flying that has appeared in American and British model magazines for the last two years and more—I've read between the lines, too. There's always been some air of mystery about the business, in spite of denials by manufacturers.

Now, I agree that racing motor manufacturers have developed their designs virtually to the ultimate as far as commercial production limitations will permit and I appreciate that quite a few high speeds have been set with stock motors ; in other words, that drastic alterations, opening out of ports, polishing, etc., are not essential modifications without which the motor cannot perform. I have personally tested stock motors (of the non-racing type with lapped piston, etc.) and found 60 per cent. difference and more between apparently identical motors ; with some types, it is common knowledge among dealers and modellers that in every batch there are a few which are markedly below average in output. At the same time there is often the odd one which is way up in performance over all the others. We've all seen it on the field and at the contests, time and time again—in stunt, team racing, free flight, similar designs with similar motors show extremes in performance. Published engine tests show the same thing ; stock motors, after running in, giving 50 per cent. difference in maximum power. Hard facts these, not " guesstimations " from the exhaust sound, or rough r.p.m. readings from a vibrating reed revcounter. Mr. Chinn's regular articles in MODEL AIRCRAFT are of a high technical standard rarely encountered in a " hobby " magazine—his report of 68 per cent. difference between two particular motors (November issue) is a sobering thought.

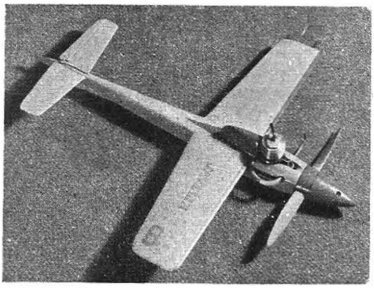
Precisely the same state of affairs exists with the racing motors. Tolerances seem to be much the same as for the lower rated types and it often seems true that the racing motors tend to be " all or nothing " in performance—they're either exceptional or indifferent. At one time before we were generally " wise " to this characteristic of all model engines, we thought that the mere possession of racing features, such as light alloy piston with rings, ball bearing shaft, rotary valve, etc., must guarantee racing performance. With no home produced jobs originally and few even now, an American racer sold by name alone ; this to a considerable extent, is still true. Circumstances are very different here ; we can't pick and choose, we either order a British motor or contrive to get hold of a " Black Market " American one, by devious means. It's a matter of circumstances, in that where we buy *a* motor the American modeller can pick *the* motor and it stands to reason that the fellow who flies speed is at least going to be careful to get a good average job, if not

THE AUTHOR . .

Fred Deudney, B.Sc.(Eng.). Grad.R.Ae.S.—known to Fair-lop-ites as " Fredney." Modelling continuously for the last 11 of his 22 years. Two years as a Scientific Officer at R.A.E. Farnborough, and a participant in L.S.A.R.A. activities, have given him a more technical outlook, but this has not prevented his building successful models. Says a non-flying theorist just would not survive in West Essex. Main interests free flight and speed, a firm believer in systematic development of models, a la Copland Wakefield.

Holds current Class IV Speed Record and is determined to improve on it next season. Other interests : motor cycling and Danny Kaye.

Cyril Shaw helps fellow member of the Zombies Club with his Nordic RG 10 powered model at the West Essex Gala.



Cyril Shaw's class I winner at the S.E. C/L Championships. Speed 72 m.p.h.

the pick of the batch. The matter of numbers of modellers is quite a point, too, since we are comparatively few, and so, consequently, is the number of engines in circulation among the regular speed fliers. Racing engines are very expensive compared with the weekly pay packet ; few fellows could afford to buy and discard till the extra hot one turned up, even if the opportunity arose.

As I see it, we differ in two things ; what we start with and how we use it. The latter is a point of all-round technique ; we're edging up our speeds with the same motors as we acquire the know-how, but the former is what accounts for the gap. I've seen American racing motors with a performance that *could not possibly* give a good speed, but some have turned in excellent performances. There just aren't many of them, good or bad.

I am prepared to believe, in fact I am convinced by Mr. deBolt's first-hand information, that a selected stock motor where everything happens to be just right can turn up an exceptional performance in the right hands. With such a motor, the beginner would find it hard to drop as low as our *best* speeds, in many instances, though. The limit of speed lies with the motor, and if you have one which by reason of those almost undetectable faults of workmanship cannot give the necessary power, then no matter how clever a flier you may be, or how much you perfect model and propeller, you will never get all the way to record speeds.

Achieving Peak Engine Performance

Mr. deBolt tells us that he has yet to notice any great difference in engine performance due to " hopping up " in the general sense ; fair enough, but he obviously makes sure of his basic motor. The standard motor nowadays can be little improved by porting details, etc., and if the workmanship is just so, it is capable of record performance in the right hands and in the right model. This he has found to be so and has told us (other authorities have said the same). He hits the nail on the head when he tells us that his reworking is to improve on the fits and workmanship, to finish where the factory left off—he carefully selects a piston to fit the bore of his particular motor with the exact clearance which his long experience tells him is right, he replaces ball races con-rod, gudgen pin, etc., to get a perfect fit. In short, he makes a thoroughly workmanlike job of things in order to produce a real specimen of precision machinery, he reworks his motor, not in a sense of altering its features appreciably, but in making a perfect engineering job of it in order to realise its potential performance. He acknowledges the importance of all the little details, he builds up an engine which can perform like the prototypes, because he appreciates the limitations of mass production, where the differing size and finish of components is sufficient to make a great difference to the peak performance which depends so much on precision of fit and finish of properly matched parts.

But do not infer from all I have said that I consider speed flying to be an engine versus engine contest. Far from it ; speed is still a modeller's business, where specialisation and experience really count. Those American records get passed around, they're continually edged up, and with the fliers pretty well on a level in having achieved near maximum power, the different speeds are the differing degrees of near perfection in the true allround sense. Flying technique, the continual testing improving and developing which form the essential " cut and try " process by which the modeller achieves his goal. The importance of co-ordination of the factors involved is borne out by Mr. deBolt's experiences which he quotes—and with his contest record, he should know !

Comparison of Speeds

I think the best group for comparison is our Class IV, American Class " B "—not just because I favour the 29's, but because there have been more entries in this class than any other at our recent contests. The best " Top Three " results yet were recorded at the London Area Meet on October 22nd.

First was Fred Guest at 117 m.p.h. (Dooling "29"), second place went to an Eta " 29 " model at 112 flown, I believe, by a Mr. Wallis, and yours truly came in third at 109.0 with an Ata " 29."

At the Knokke C/L meeting the Swiss team used a geared hand winder for starting.

Allan Inge (Left) assists fellow Zombies club member Arthur Vicarage to refuel his Speedwagon at the West Essex Gala at Fairlop last summer.

Some of the other potentially fast fliers ran into trouble of one sort or another ; talking things over, it was pretty clear, however, that quite a number of us have been getting in sufficient regular flying to give us a good idea of the limits of our own particular model plus engine combination. I am well aware of the odd surprise performance that can come along, but I think I know my job well enough to put the limit speed at about 112—*with everything just right* ; a perfect needle setting, timing commenced at the ideal instant when the motor has " come in " so as to avoid the slower last laps which I can hear and feel if I'm a little too late in signalling, and so on. I haven't got there yet, but I feel there is just that much more possible with everything working together ; so far as contests are concerned my top is nearer 105-109, and 120 m.p.h. is right out of the question. I may be wrong, and I'm working an an improved model for the same motor so as to find out.

The corresponding American " local contest " speeds at the Flying Bison's Record Trials are enlightening ; 121.6, 118.4 and 116.1 for top three at one contest, 118.4, 116.9 and 100.6 at the other, the top speeds in each event being set by a 14 year old flier. The speed of 116 in Class " C " by 9 year old Tom Tomeser (who clocked 102.7 in Class " A " at the Plymouth Meet) is also worthy of mention. All credit to them for these speeds, but they can't be supermen at such an early age. It wasn't their long experience in propeller selection or superiority in workmanship that put them above our usual speeds attained by the few fliers who have edged up our contest speeds by about 20 m.p.h. over the last two seasons—they must have had a head start with the stock motor. The question of fuel should not be overlooked ; lack of a good selection of the heavily nitrated fuels which are invariably used in U.S. speed practice, and lack of a readily available choice of glow plugs to suit, is obviously a handicap to us.

If these results are a cross section of the general situation among American clubs (and we have every reason to believe so, merely by comparison with their experts, including leading light Harold deBolt) then I can only accept that we are lacking in engine power. If we fly the same type models, it's the only explanation. Our speeds have gone up noticeably in the last season, partly by sheer practice and experiment, but also by the fact that the " better " motors are getting into circulation among our fliers. There are so few of us, by comparison—it's possible that quite a few of the " hot " engines are among those which haven't got flights in.

To quote an example : Pete Wright, of St. Albans Club, has flown consistently throughout most of the last season at speeds of 102-105 with his own design using an Eta " 29." At the London Area event, he flew a new model, the *Circulator* (designed by Lew Mahieu who set a speed of 137 or so with the original) and clocked 102 m.p.h. The model was a masterpiece, a potential exhibition winner in workmanship and finish ; Pete knows his motor, his propellers and settings, and flies his models " on rails." No doubt he'll get up to 105 and more, but aiming for 120 + is like flogging a dead horse. A further clue comes from Mr. Guest's performance. I know that he has had to work for that speed ; earlier in the season he flew the same motor at well below 100 m.p.h. and is now clocking 118-122 on tests. A standard motor, untouched internally, it is currently run on an undoped fuel (plain methanol and castor oil) ; at the contest in question he used a larger propeller than any other " 29 " flier, but the *higher* revs were absolutely unmistakeable. His was the only Dooling " 29 " flown ; there will be far more of them at next year's sessions, however, including the one I should have wangled by then, provided it can outturn my present Eta. I'm taking a chance, it will be a random engine from a source as yet unknown, but the few I have seen so far have all been exceptionally well made, as far as inspection from " outside " would show so it seems I must have one to keep in the running. If it's good, the rest is up to me as a modeller.

By the way, I dropped the " Science, etc. " title ; I couldn't stomach it any more than my clubmates, since the mere mention of the word evidently arouses extreme feelings among the majority of practical modellers who have found so little connection between real modelling and what usually follows this ominous word.

Results of the " Flying Bison " Record Trials, New York, 1950

		September 17th	October 1st
A	1st ...	118.35	120.27*
	2nd ...	109.75	108.43
	3rd ...	105.88	104.65
B	1st ...	121.62	118.42
	2nd ...	118.42	116.88
	3rd ...	116.12	100.55
C	1st ...	128.5	128.57
	2nd ...	111.11	116.12
	3rd ...	107.78	112.5
	1st ...	162.54*	138.46
	2nd ...	136.32	126.76
	3rd ...	130.43	124.13

* National Records by Harold deBolt

Correspondence

● *The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters*

LETTER FROM HAROLD deBOLT

DEAR SIR,—Once in a great while, I read an article which arouses my interest to a marked degree. "Science and the Speed Model," by F. E. Deudney, in the September MODEL AIRCRAFT is one of the few. I liked it very much and trust that there will be more like it in the future.

I do think Mr. Deudney struck the right note when he said that the difference in the amount of power obtained from the engines has a great bearing on the speeds; however, I also think that he was wrong when he said it is all due to "hopping up" etc. Personally, all of my engines have been "reworked" to a considerable extent by myself in my own home workshop, but I have yet to notice any *great increase* in power due to this work. Actually, what it is done for is to improve upon the workmanship of the factory and to finish where they left off. This increases the life span of the engine considerably and reduces the chance of breakdowns at a contest. The idea is to maintain the correct "fits" so that the engine will stay at its peak for a considerable period of time instead of dropping off quickly as the engine wears in. In this way, you have a unvarying source of power that allows you to make tests with the same amount of power available for each test instead of dropping off of power with each flight, as the engine goes by its "peak."

In analysing the success of various speed fliers in this country, the one thing in common that they all seem to do is to carry on a tremendous amount of test flying. When a problem presents itself to them they go to work on it until they can make flight after flight without the same trouble occurring again. By process of elimination, they eventually have a near-perfect machine which is the only type of model which will fly really fast. Personally, I believe that this is the one great difference between speed fliers, provided, of course, that they both have the same type of equipment.

Off hand, it would appear to me that the main trouble with the English speed fliers at the moment is lack of co-ordination between the various component parts of the models, provided, of course, that their equipment is up to par as far as design and quality is concerned. For instance, the best propeller in the world is of no use if the rest of the model does not match it! Speaking from my own experiences, I can remember many times when my speeds were low and the trouble was traced to exactly this cause. This past season has provided several examples of it among our local fliers as well as myself.

A good example is my class "D" model which was clocking well over 150 m.p.h. at the end of the '49 season. I made several improvements in it during the winter and yet I could not get it over 145 m.p.h. for the life of me, until recently. When I finally got everything working together it went as I thought it should from the beginning, 162.54 m.p.h. for a new record! My class "A" model was another example, it closed the '49 season with a record of 128.54 m.p.h. I built a new one for the '50 which was considerably smaller in size and flew it all year getting 113 m.p.h. as its tops. When I put the engine back in the old model, I got 118 m.p.h. and a new record on its first flight! Since then I have had it turn 120.27 m.p.h. on the second flight using a propeller more adaptable to the larger model. So it would seem to me that there is an awful lot to be had by just getting the "right combination" of the various items involved. It certainly has been proven time and time again.

Aeronautically yours,
New York, U.S.A. H. deBOLT.

WAKEFIELD TEAM SELECTION

DEAR SIR,—I feel that I must fall out with your correspondent (anonymous, I notice) who put forward the idea of a partly preselected team for the Wakefields. The three men named, whilst they are exceptionally good fliers, are prone to make mistakes and errors of judgment like any other contest fliers, being only human.

The solution, I feel, lies in the present system of elimination to select the final too and then two centralised eliminators to determine the team, the aggregate of these two centralised eliminators to count. The latter "finals" to be held, one in the south (please, not the Fairlop Motor Cycle speedway!) and one in the north.

Class B cert. minimum qualification would be a very interesting restriction.

Yours faithfully,
Whitefield, Manchester. E. G. CURRINGTON.

DEAR SIR,—This club is very perturbed over the continued "plugging" of the method suggested for the selection of the Wakefield Team, i.e., by a selection committee. It is noticed from the December issue of MODEL AIRCRAFT that this idea now seems to have some official backing. It is sincerely hoped that this is not the case. (It is not.—Editor.)

The Wakefield is a contest for individuals and the International aspect merely emphasises this. The present method of selection seems to be very fair—it gives the "has-beens," "never-wasers," the "up and comers," and the flyers who fly for the sheer love of the sport, a chance to make the grade. To suggest that the "man in the news" should be given just that extra time and peace of mind to build a "flat air" machine, is carrying things a bit too far. Had the teams of the past consisted of these so-called experts, this country would still be waiting to get its name engraved on the trophy. Most people who have won before have been modellers who have come on the scene unheralded—they have just been good flyers. The names of Chesterton, Judge, Ellila, Cahill, Korda, Allman, Light, and Fillon come to mind. Most of these have now slipped into obscurity on the Wakefield front. It is sincerely hoped, therefore, that the spirit of competition will continue and that those people who are shouting for a fixed team think again. Perhaps, after all, they are only the "back-seat drivers" who always know what to do yet never do it themselves.

Yours faithfully,
E. C. CRUMPLIN, *Hon. Secretary.*
Swansea Aeromodellers' Club.

OVER THE COUNTER

NOTICE TO RETAILERS

Since the introduction of our " Over the Counter " feature, the heading photograph has not been identified with any particular model aircraft retail shop. In future we intend to include from time to time photographs of model shops together with a brief history of the firm concerned.

We should be pleased to consider from model shop proprietors photographs taken in their shops for inclusion in this feature.

CONTROL-LINE speed flying has not, as yet, achieved the same wide popularity in this country as it did in America some three years ago. Round about 1947-8 speed was *the* model aircraft topic in the United States, whereas it has never shown signs of reaching a similar level of interest over here.

Speed control line flying is a specialised branch of the hobby. It demands a quite different approach and even the constructional methods are different. Which came first, the chicken or the egg, we are not prepared to argue, but the speed control line modeller is the worst catered for by the kit firms. Whether this is because there is not the interest to justify large scale kit production of this line, or whether the absence of numerous kits has restricted interest, is debatable. The fact remains that there are very few control line speed kits available.

What these lose in numbers they more than make up for in quality. The *Speedwagon* kits, for example, produced by *Mercury Models* are recognised as amongst the finest speed designs in the world. These designs, of course, are by the American expert Harold deBolt who has been a consistent record breaker and contest winner in his own country. Not only that, other fliers have won many awards in America with the Speedwagon series. The Mercury kits of this series, built under licence, are identical to the American products and, in fact, in our opinion, superior in *quality*. We have had the opportunity of examining both *American* and *Mercury* kits of the same *Speedwagon* models.

We have wondered why it is, therefore, that Speedwagons have not put up an impressive contest record in this country. We may be in error on this point, but we do not believe a Speedwagon has won a single major event over here. Yet we believe the Speedwagon is a serious contest threat in any of its respective classes.

Possible the reason is that the *Speedwagon* is rather a tricky model to handle. It flies the " opposite way round " for a start, and is rigged to have minimum line tension for maximum forward thrust (and hence speed). It really needs an experienced flier, therefore, to get the best out of this design. As far as we can judge, however, the experienced fliers all prefer to build their own designs, very much on the orthodox or " Californian " style with slim fuselages and hood cowling.

The *Speedwagon* is an unorthodox design and should be treated accordingly. We know of several people who have made the mistake of converting it to an anti-clockwise flight circle. It *is* a mistake for the layout is based on generating stabilising forces at speed in a *clockwise* circuit. Make the model fly the

RIPMAX LIMITED

39, PARKWAY, CAMDEN TOWN, LONDON, N.W.1.

Started in February, 1949, by C. A. Rippon (centre figure in heading photograph) and Max Coote (left), the firm of Ripmax Ltd., have since made great strides.

C. A. Rippon, well known to modellers as " Rip," has been a model aircraft enthusiast for more than forty years and a member of the trade for twenty-five years. He actively participated in the founding of the S.M.A.E., of which he is a Fellow.

Max Coote has been a modeller for over ten years and is now Technical Secretary of the S.M.A.E. Together they have aimed at giving a personal service to their customers and to live up to their slogan : " No problem too large, nor order too small, the Ripmax Service is the same for all."

OFFICIAL BRITISH SPEED CLASSIFICATION

Class	Motor Capacity	Line Length	Record Distance	Laps	Present Record	Holder	Model	Motor
I	0-1.5 c.c.	35 ft.	¼ mile	12	80 m.p.h.	R. Scott	Tinilyte	Elfin 1.49
II	1.51-2.5 c.c.	35	"	12	83.3 m.p.h.	D. W. Frier	—	Elfin 1.8
III	2.51-3.5 c.c.	52½	"	8	89.10 m.p.h.	J. G. Carter		
IV	3.51-5 c.c.	52½	"	8	107.1 m.p.h.	F. Deudney	—	Eta 29
V	5.01-8.5 c.c.	70	"	6	118.42 m.p.h.	C. A. Shaw		McCoy 49
VI	8.51-15 c.c.	70	"	6	132.4 m.p.h.	N. G. Taylor	Lazybones	Dooling
VII	Jets	70	"	6	133.3 m.p.h.	R. Stovold	Own design	Dynajet Redhead*

*American

other way round and opposing forces are set up, reducing both efficiency and line stability.

As to the kits themselves we have nothing but praise for their very fine quality. *Mercury Models* did, in fact, concentrate on control line models when they first started producing kits. Apart from Law's *Orbit*, which is no longer in production, they are the only firm producing speed control line kits in this country at the present time. Two more models coming into this category have been produced. There is the Halfax *Sabre* which was an early Class 1 model comparable to the Orbit and *Keilkraft's* original *Hornet*. The latter was a large model produced in the very early days of control line flying. It was, in fact, ahead of its time in this respect and would no longer be reckoned as a contest contender in present speed control-line work. It, also, has not been in production for some time.

We are surprised in a way that neither *Veron* (Model Aircraft Bournemouth) or *Keilkraft* have produced anything in the speed control line official classes. Both are firms with an excellent record in the control line field. No doubt they have not considered the potential market large enough to justify production, although it is significant that both have been active as regards team racers.

International Model Aircraft are another firm which, we know, were flying a prototype speed control line model at one time. This was for the Frog 100-160 motors but they, too, obviously felt that conditions did not justify production. Currently they have a team racer project in hand most probably for Class B and based around the Frog 500.

The one "record" model in the kit list is Cyril Shaw's *Midge*. Powered by an Allbon Javelin this model set up the figure of 72 m.p.h. at Brighton, Easter, 1950. This, in fact, completes the "speed" kits, all the other models being team racers.

Team race rules have been published previously. Interest in this type of model (and competition) only really started in 1950 and rules for the forthcoming season have been drawn up in the light of last year's experiences. Two classes have been established to accommodate virtually all motors up to 5 c.c. capacity.

Team racing is very much more "open" than speed work. To most eyes the models, too, having to be semi-scale, possess a more pleasing appearance. But possibly the most attractive feature is that you do not need a "hot" racing motor for top performance.

Speed contests and speed records have largely gone to the fastest and most powerful motor in the respective classes. In America, for example, where competition is very severe, certain motors virtually rule the respective classes. The Dooling 61 commands the "60" class; the McCoy 49 the "49" class; the Dooling 29 the "29" class; and the McCoy 19 the "19" class.

Competition has generally been less severe in this country and so the odd "under-size" motor occasionally comes through. But as a general rule racing motors for each class are invariably the top capacity in that class and eventually, as competition gets closer and closer, one motor in each class stands out as the leading power unit. It is not uncommon,

BRITISH RACING MOTORS
(As at December, 1950)

Class I	Induction C.R.	Induction R.D.	Class II	Induction C.R.	Induction R.D.	Class III	Induction C.R.	Induction R.D.	Class IV	Induction C.R.	Induction R.D.	Class V	Induction C.R.	Induction R.D.	Class VI	Induction C.R.	Induction R.D.
Elfin 1.49 ‡	×		E.D. Mk. III *‡	×		Amco 3.5 *‡	×		Yulon 29 †	×		Yulon 49 †	×		Nordec RG 10 †		×
Allbon Arrow †	×		E.D. IISeries II*†‡		×	E.D. Mk. IV‡		×	Frog 500 †	×					Nordec RG 10 Special†		×
Allbon Javelin‡	×		Elfin 2.49 Mk. II‡	×		Eta "19"†		×	Eta "29"†		×				Nordec R10*		×
Mills II ‡			Mills 2.49‡	×		D.C. 350‡	×		"K" Vulture‡	×					Nordec R10 Special*		×
			Frog 250‡	×											Rowell*†		×

C.R.—Crankcase rotary valve. R.D.—rotary disc induction.

* Spark ignition
† Glow plug
‡ diesel

SPEED AND TEAM RACER KITS
Compiled to December, 1950

Class	Span(ins.)	Model	Designer	Manufacturer	Price	Motor
Speed III ...	12	Speedwagon 20	H. deBolt	Mercury Models	12/6	Amco 3.5, E.D. III
,, V ...	15	,, 30	,,	,, ,,	14/6	Yulon 29, Frog 500, Eta 29
,, V-VI ...	20	,, 60	,,	,, ,,	29/6	Yulon 49, Nordec
,, I ...	12	Midge	C. A. Shaw	,, ,,	5/6	*Javelin*, Arrow, Elfin 1.49
,, I ...	18	Orbit	—	E. Law & Sons		*Mills II*, Javelin, Elfin 1.49
,, I ...	18	Sabre	J. T. London	Halfax Models	16/6	*Mills II*, Javelin, Elfin 1.49
Team A ...	24	Ranger	W. A. Dean	E. Keil & Co.	—	Elfin 1.49, Javelin, Elfin 2.49, etc.
,, A-B ...	24	Midget Mustang	P. C. Smith	Model Aircraft (Bournemouth)	21/-	Amco 3.5, All motors 1-5 c.c.
,, B ...	24	Mk. I	J. Nunn	Mercury Models	17/6	*Frog* 500, 2.5-5 c.c.
,, B ...	20	Scout	W. A. Dean	E. Keil & Co.	22/6	*Eta* 29, Amco 3.5, Yulon 29, Frog 500
,, B ...	25½	Philibuster	P. L. Smith	Model Aircraft (Bournemouth)	—	Amco 3.5, 2.5-5 c.c.

then, to find the first ten places in a competition all going to that same motor.

This has a certain restrictive influence on the development of speed control line flying, espcecially in this country where relatively few manufacturers have deliberately set out to produce racing motors. As things stand, the Dooling 61 and Dooling 29 could undoubtedly top the British Classes V and IIIb respectively. The serious competitors in these classes who have not got a Dooling, or the means to obtain one, are therefore at a disadvantage with regard to other modellers who may have been more fortunate.

Speed flying is not sufficiently advanced in this country to give even the top British motors in the other classes, which are based on British capacities. There have not been enough contests to formulate any true average performance. We have therefore listed in the table currently available motors for speed work of the maximum size permissible in each class. If any generalisation at all can be drawn it is that in Classes I and II the diesel would appear to be superior to glow ignition.

Now the team race model is in a different category. Performance here is based on overall flight speed over a certain distance. The fast motor will give a high *flying* speed, but at the same time will have a higher fuel consumption. This means that it may have to land and refuel several times during the course of its competition flight. A smaller motor in the same model will not fly it as fast, but the *overall speed* may be directly comparable on account of the lower fuel consumption and consequently lesser number of re-fuelling stops. Tank capacity is limited to a maximum size in each class, irrespective of the size of the motor being used. For Class A models a maximum capacity of 15 c.c. is allowed. For Class B, 30 c.c.

This means that there is every possibility that any motor coming within the capacity limits for the two classes can be used successfully. Again we have little previous data or results to go on, but in time no doubt certain motors will show up in each class as having the best speed/fuel consumption ratio. The Amco 3.5, for example, already shows signs of being able to fly a Class B team racer as fast as most 5 c.c. motors and have a lower consumption figure than the larger motors.

In our list of team race motors we have included all those motors currently available . This includes 20 possibilities for Class A and 10 for Class B, quite a different story to the "speed motor" table. We have not included the under 1 c.c. motors as we feel that these would, in all probability, underpower the 70 sq. in. minimum wing area model required for Class A. Currently the team race modeller has the choice of five team racer kits, two by Phil Smith, two by Bill Dean and one by Johnny Nunn. Phil Smith, *Veron* designer, needs no introduction to control-line fans. He is probably the most successful team race flier to date and his designs are always attractive as well as being most efficient. His original team racer design, the *Midget Mustang*, proved its worth by winning the first contest in which it was entered and then demonstrated that a team racer can still have quite a stunt range by looping and flying inverted! Possibly it is significant in view of our earlier remarks that Phil Smith seems to favour the Amco 3.5 for his models. The *Midget Mustang* prototype, and his latest, the *Philibuster* were both Amco 3.5 powered. The *Midget Mustang* is really a Class A-B model for it

MARKET SOURCES (December, 1950)

Article	Manufacturers
Speed Model Kits	Mercury Models (4), E. Law & Son, Halfax Models
Team Racer Kits, Class A ...	E. Keil & Co. (1), Model Aircraft (Bournemouth)
,, ,, ,, Class B ...	E. Keil & Co. (1), Model Aircraft (Bournemouth), (1), Mercury Models
Propellers	Stanc (full range), Tru-Fio (full range), Frog (limited), E.D. (limited), Zenith
Tanks	Keilkraft, Mercury (15 and 30 c.c.), Veron, (15 and 30 c.c.), Warneford (Speed and 30 c.c.), F. Guest
Fuels: Glow Plug	Mercury (5 and 7), Frog (Redglow), Barron (Super Glo), Roadway, Z.N.
Diesel ...	Mills (Blue Label), Frog (Powamix), Mercury (3 and 6), Roadway
Spark Ignition ...	Mercury (2), Z.N.
Lines	Mercury, Keilkraft, Laystrate, Drome
Swivels	Mercury
Speed Charts	Shaws Model Aircraft Supplies

TEAM RACE MOTORS
(as at December, 1950)

CLASS A	Capacity	Type	Induction
E.D. BEE	1 c.c.	diesel	rotary-disc
FROG 100	1 c.c.	diesel	crank-rotary
MILLS II	1.3 c.c.	diesel	sideport
ALLBON ARROW	1.5 c.c.	glow	crank-rotary
ALLBON JAVELIN	1.5 c.c.	diesel	crank-rotary
ELFIN 1.49	1.5 c.c.	diesel	crank-rotary
FROG 160	1.66 c.c.	glow	crank-rotary
FROG 180	1.66 c.c.	diesel	crank-rotary
ELFIN 1.8	1.8 c.c.	diesel	crank-rotary
E.D. MK. III ...	2 c.c.	diesel	crank-rotary
E.D. II SERIES 2 ...	2.46 c.c.	diesel or glow	rotary-disc
ELFIN 2.49	2.49 c.c.	diesel	crank-rotary
MILLS 2.49	2.46 c.c.	diesel	rotary-disc
FROG 250	2.49 c.c.	diesel	crank-rotary
REEVES H.18	1.8 c.c.	diesel	—
E.D. COMP. SPECIAL	2 c.c.	diesel	sideport
SUPER HURRICANE	2 c.c.	diesel	—
" K " KESTREL ...	1.9 c.c.	diesel	—
" K " TORNADO	1.9 c.c.	glow	—
" K " FALCON ...	2 c.c.	diesel	—

CLASS B	Capacity	Type	Induction
AMCO 3.5	3.5 c.c.	diesel or glow	crank-rotary
E.D. MK. IV	3.46 c.c.	diesel	rotary-disc
ETA 19	3.26 c.c.	glow	rotary-disc
D.C. 350	3.5 c.c.	diesel	crank-rotary
YULON 29	5.0 c.c.	glow	crank-rotary
FROG 500	5.0 c.c.	glow	crank-rotary
ETA " 29 "	5.0 c.c.	glow	rotary-disc
" K " VULTURE ...	5.0 c.c.	diesel	crank-rotary
D.-C. WILDCAT II ...	5.0 c.c.	diesel	sideport
ALLBON 2.8	2.8 c.c.	diesel	sideport

will take any motor of from 1 to 5 c.c. The *Philibuster* is somewhat larger and intended for Class B.

The two Keilkraft team racers designed by Bill Dean represent a different approach. The *Scout* is a re-design of the original biplane control line model of the same name. Fitted with a more powerful motor—the original was test flown with a Forster 29—it became an excellent Class B team racer. The thrust line was lowered and a revised cowling fitted, whilst a Skystreak-type cockpit canopy was fitted faired back into the fin to improve the afterbody appearance.

The latest model—the *Ranger*—has been designed as a Class A team racer around a " middle-size " motor—the Elfin 1.49. It is suitable for all motors of from 1 to 2.5 c.c. Wing area at 88 sq. in. is higher than the minimum required by the rules.

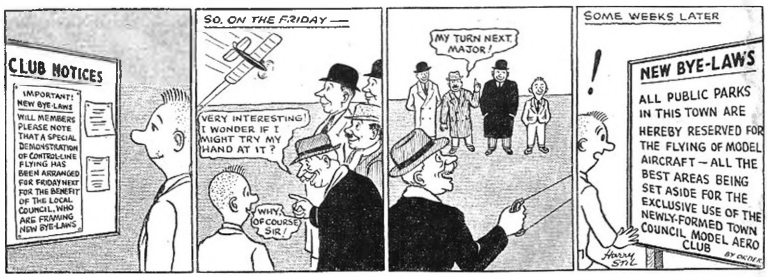
The *Ranger* incorporates many pleasing design features. The cowling has a radial-type appearance with the motor mounted upright and full enclosed. The fuselage profile, in fact, is rather reminiscent of the American Wedell-Williams Thompson Trophy races of the mid 1930's. Wing is of blunt elliptic planform, rather like a Thunderbolt, with a similar, but lower aspect ratio tailplane. The undercarriage is sheet metal cantilever in keeping with current American practice. 6 B.A. screws bolted to the ends of the legs forming stub axles for the 1½ in. diameter wheels.

Finally, the only other team racer kit currently available, the *Mercury Mk. I*. In appearance this is a more functional design than the *Veron* or *Keilkraft* models and is based around the limits of Class B, taking any motor of from 2.5 to 5 c.c. The prototype was test flown with the Frog 500.

Constructionally all five models demonstrate different practice, the *Mk. I* being the most robust with hollow log fuselage underbody and planked or sheeted top. Planking has been reduced to a minimum and this is probably the easiest model of the five to build. All-up weight is quoted as 18⅜ oz.

Without a doubt more team racers will be coming on to the market during 1951. The purchase tax question has not helped manufacturers at all and may possibly result in some delays or modifications to their planned production programme for the new year. Some reorganisation and revision of current productions may even be necessary to comply with the requirements of current legislation. Team race fans, however, should be able to look forward to a good year. Manufacturers are inclined to look more favourably on this type than any other control line model.

KEEP OFF THE GRASS ! **By Harry Stil**



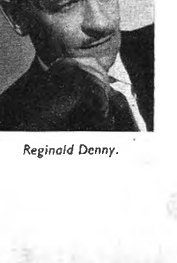
● WE HAD a night away from the building board recently and went to the theatre to see "Larger than Life." Heading the cast was that debonair Hollywood actor and modeller—Reginald Denny—and after the final curtain we went round to the stage door and sent in a note requesting an interview with the star, on behalf of MODEL AIRCRAFT. Five minutes later we were shaking hands with Mr. Denny and after a few preliminary remarks about the show the talk soon drifted round to aeromodelling. We spent almost an hour discussing the actor's modelling activities—covering as far back as the early thirties, when he first became attracted to the hobby.

Denny's introduction to modelling was through his efforts to help a young enthusiast adjust his rubber job. Apparently it was a case of the blind trying to help the blind, because the model promptly spun in and was completely wrecked. Denny promised the youngster that he would build him another and immediately wrote off to a New York manufacturer for a kit. After building his first model, he became keenly interested in the hobby and soon had a club started in Hollywood. He persuaded many of his friends to take up aeromodelling and before long someone suggested that he might as well go into the business, as he was spending most of his time building models anyway. And so, *Reginald Denny Industries* was started, with Denny designing the models and a leading model draughtsman preparing the plans. In a short time the firm had grown into one of the largest kit concerns in America and old hands still remember those popular kits and the reliable *Dennymite* motor of the thirties.

In 1934, Denny became interested in radio controlled models and two years later he had learnt enough about R/C to put on a demonstration for Army officials. It all went off extremely well and the model did just about everything except outside loops—only its designer being aware of the fact that it was out of control for something like 80 per cent. of the time. Nothing daunted, Denny and his partners built three other improved designs and these were much more successful. But by this time, the experiments were costing thousands of dollars and further development had become too expensive for *R.D. Industries* to bear alone. As a result, little further work was carried out until early 1939, when out of the blue, a contract was received from the U.S. Army to build three experimental R/C target models. A new company was formed—*Radioplane Co. Inc.*—with Reginald Denny as vice-president. The specifications laid down for these first three target planes were as follows: Wing span 12 ft. 5 in.; 5½ h.p. engine; speed 70 m.p.h.; rate of climb 500 ft. a min. and duration 1 hr. In addition, landings within ¼ mile of the take off point (without undue damage) were essential. All three models came up to these requirements and passed their Army acceptance trials in June, 1940.

Thousands of target aircraft were made by the Radioplane firm in World War II and these provided valuable training for both Army and Navy anti-aircraft crews. Official designations were: Army "O.2" and Navy "Target Drone Denny." Models were improved greatly and subsequent speeds of more highly powered designs were: 85 m.p.h. (6 h.p.), 103 m.p.h. (8 h.p.), 140 m.p.h. (22 h.p.), 180 m.p.h. (35 h.p.) and finally 250 m.p.h. with a 60 h.p. engine. Present day target model experiments are secret, but it is known that multiple jet designs capable of 500 m.p.h. plus, are already flying.

We asked the actor if many other members of the Hollywood film colony went in for modelling and he told us that Jimmy Stewart and Henry Fonda are two of the keenest enthusiasts. In fact, they both often use the Denny workshop for their building activities. Joan Fontaine was initiated into the art of model building by Denny and she has several successful models to her credit. We must pass on the story of Denny's attempt to set up a duration record just before the last war. A special model was built and a six-hour capacity tank fitted on top of the fuselage. After the model was launched, the timekeepers and the actor took off in a *Taylorcraft*, determined to keep it in sight at all costs. In a short time, the engine vibration of the model dislodged the fuel tank, which slipped forward and altered the balance. This brought the model's nose level and prevented it from gaining any more height—until finally it flew into the



Reginald Denny.

side of a mountain range, 107 minutes after the take off. The original intention had been for the model to drift over this high country into an adjoining desert, where thermals should have kept it in the air for several hours after the fuel had been used up.

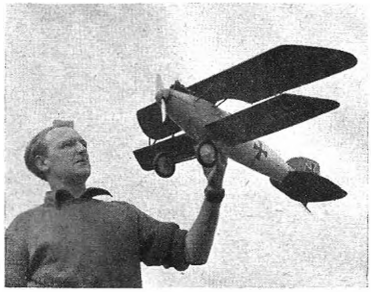
Reginald Denny was born in this country and served in the Royal Flying Corps during the first World War. At 58 he is tall, distinguished and has a pleasent easy-to-get-on-with personality. When he recalls some humorous episode in his model-making career, his face creases into that likable grin so familiar to cinema fans of the last 20 years. Denny has three children and in addition to aeromodelling, is also interested in painting and sailing. At the time of writing, he no longer has any commercial interest in the hobby. His parting remark was that he is looking forward to building models again, when he gets back home, "just for the fun of it." We know just how he feels—our own ambition is to retire about 1990 and then get down to some really serious modelling!

★ ★ ★

● WE ALREADY have about a dozen titles by Ron Warring on our workshop bookshelf and his latest volume entitled *Power Duration Models* (Percival Marshall, 6s.) makes a welcome addition, as free flight has always been our favourite type of model and this is the first book to deal exclusively with this branch of the hobby. Ron is well known for his ability to collect and collate vast amounts of tabular matter on design and this time he really lives up to his reputation. In the Introduction he estimates that without the inclusion of the tables in this book, something like 1,200 pages would be required to get across the same amount of information. As it is, valuable data on 150 different F/F models has been condensed into 100 pages—40 pages consisting of tabular matter. The main chapters cover the general history and design of free flight models, and the period dealt with is from 1938 to the beginning of 1949—with the emphasis on post-war designs.

In the first tables, models are grouped into sections under the following titles: pylon; developed pylon; cabin pylon; cabin; high and shoulder wing; low wing—and the source of data stated (kit, magazine, book, etc.). After this, all models are listed in ascending wing area sizes and the main details of each one recorded—including such information as weight, tailplane area, wing and power loading. The next set of tables really goes into detail and it's just a question of reading off the information you require on any particular model—from the aspect ratio to the fin area. Further tables give typical wing area/engine combinations and such vital data as C.G. position and even trimming adjustments. Finally—construction, material sizes and component weights, etc., are all dealt with. In fact, these tables are so complete, it would be possible to draw up any particular model with reasonable accuracy without even referring to outline drawings.

To sum up, we consider that this is a book to appeal to every free flight fan and that Ron Warring and the publishers are to be complimented on presenting the accumulated experience of the world's free flight designers in such a compact and useful form.



Bill Steemson and his 1/9th scale Albatross D3. Span 39½ ins. Engine—mills 1.3 Scale tail surfaces

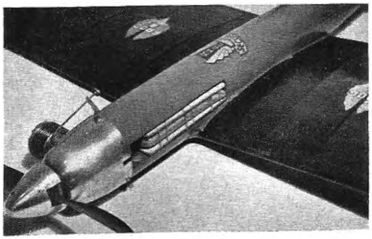
★ ★ ★

In Brief

● POWER FLYING restrictions (including R/C) have now been relaxed in the British Zone of Germany and we hear that a new model magazine is in the process of being launched. Other news from Germany is that a new "Aero Club" has been formed—with Wolf Hirth, the well-known glider pilot, as president. . . . A well-known manufacturer informs us that he is considering going into production with special tanks and wheels for team racers. A small (Class A) T.R. pilot may also be produced. . . . P. E. Norman's latest F/F scale models are the *Fokker Triplane* and the *Bristol Bulldog*—and a fine sight they make in the air too. P.E's models are really tough, usually weigh several lb. each and if anything gets in the way it's not the models that get damaged. . . . Ever completed the installation of a canopy or celluloid windshield, then carelessly smeared cement or dope across it? If so, use *Hendon "W" Finisher* to polish it clean again. . . . We never realised just how much smoke they manage to pack into those Jetex cartridges until we tried flying in fog recently. The smoke nearly choked us and hung around long enough to show the exact flight path of the model. . . . The sheet aluminium type undercarriage—first introduced on American team racers—is ideal for use on certain types of F/F scale models, particularly the Cessna 140, 170 and 195. Use 16 gauge aluminium on a *Dart* powered model—or better still, dural. . . . Don't forget to mark the ailerons on that new team racer. Use thinned down black dope and apply with a ruling pen. . . . Ron Warring has a 15 oz. R/C model powered with the *Allbon Dart*. Span is 36 in. and wing area 216 sq. in. Radio is by the Hook brothers and conventional rudder control is fitted. . . . Aerol Engineering may bring out a new Elfin of about 0.5 c.c.

ACCENT ON POWER

By P. G. F. Chinn



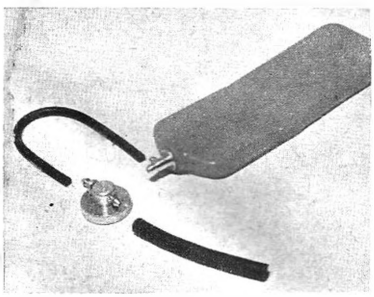
A modified " Musketeer " by G. Davie of the Norwich Club showing the Jim Walker pressure-tank installation.

The Jim Walker Fuel Regulator

A POPULAR fallacy is the one which assumes that increased complication means decreased reliability. In i.c. engine development, alone, the past 50 years are sufficient to show that the demand for greater performance, accompanied by greater reliability, has only been achieved by more complicated design, illustrated by the multiplicity of parts in the modern product and by the specialist scientific knowledge applied to individual components.

The model aeroplane engine, however, despite recent great improvements in performance, has remained relatively simple, due, primarily, to the advantages of scale effect on materials which virtually rules out questions of structural failure provided that material sections are not excessively reduced in the interests of weight reduction.

Nevertheless, model aircraft engines, in general, cannot be regarded as completely reliable under the conditions which they are frequently required to operate—notably for control-line models—and the recently introduced Fuel Regulator made by the Jim Walker A-J Aircraft Company of Portland, Oregon, U.S.A., is an honest attempt to " simplify by complication " the operation of model i.c. engines in control-line models, particularly aerobatic types.



The complete Regulator and pressure-tank showing the interconnecting tube and short tube to needle-valve.

As is well known, the difficulties experienced with the smooth functioning of engines in stunt models are almost entirely dictated by shortcomings in the method of supplying fuel to the engine. However carefully the fuel tank is located, acceleration, deceleration and centrifugal force, both in a horizontal and vertical plane, all affect the pressure at which the fuel reaches the engine, and any variation in pressure beyond certain relatively fine limits will upset carburation and will cause loss of power or complete cutting out. (To a lesser degree, aeration of the fuel within the tank may cause similar trouble but this can be minimised by good tank design and, in the case of the balloon type tank is entirely eliminated.)

Therefore, any system aimed at the regulation of fuel pressure at the jet, is an obvious step in the right direction.

The most positive method of achieving such regulation would, of course, be by means of a governed mechanical device, such as a metering pump which would deliver fuel at a constant rate and remain unaffected by variation in pressure on both the delivery and suction side. Against such a device, however, are greatly increased cost and weight.

A lighter and cheaper alternative is suggested in some kind of valve, situated between the fuel tank and carburettor jet, to adjust the fuel flow to the requirements of the engine. This is the principle of the Jim Walker Fuel Regulator.

The Regulator is quite small and the complete system, including special tank, only weighs about an ounce when installed. The Regulator itself can be seen, in one of the accompanying photographs fitted to the writer's Frog " 500." It is of machined duralumin and consists of a body, carrying outlet and inlet connections and a spring-loaded ball-valve to the latter, and an outer cap housing a diaphragm and pressure-plate. The inlet union incorporates a filter.

Operation is as follows. When fuel is drawn by the engine, pressure in the chamber of the Regulator is reduced, causing the diaphragm and pressure plate to move forward and causing a small spigot located

in the centre of the pressure-plate to open the delivery-valve, thus admitting more fuel. The delivery-valve remains open, automatically adjusted to the consumption requirements of the engine.

Should there now be any slight reduction of pressure in the delivery from the tank, the diaphragm and pressure-plate will be drawn farther forward, opening the ball-valve further and thus admitting a greater supply of fuel to restore the pressure demanded by the engine. Similarly, if the delivery rate from the tank increases, pressure on the diaphragm will cause this to move back, withdrawing the spigot and thus restricting the amount of fuel entering the Regulator.

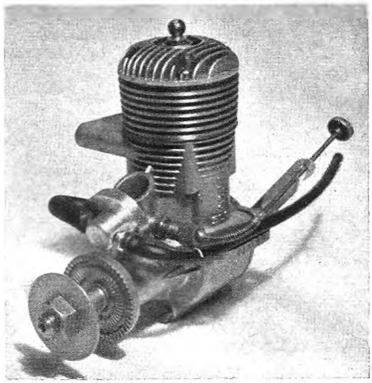
The fuel tank supplied for use with the Regulator is of a simple pressure-feed type. It is of plastic material and has been likened in appearance to a rubber hot-water bottle. The "stopper" end of the "bottle" contains a non-return valve, to which an extended filler tube is fitted, and a delivery nozzle for connection to the Regulator. The complete outfit can be seen in the photographs, including tank and Regulator with long interconnecting tube and the short tube for coupling to the engine.

To pressurise the feed from the tank, the latter is simply clamped between two plywood plates by means of rubber bands. The system, of course, excludes the possibility of air in the tank or fuel line, although, on filling a newly installed tank for the first time, a certain amount of air will, of course, be trapped. This is easily released as the tank is filled, by holding up the nose of the model, opening the needle-valve to its fullest extent and rotating the propeller while the carburettor intake is covered. Although the tank is quite sizeable, the fact that its position relative to the needle-valve is not at all critical, will generally simplify its installation in the fuselage considerably. In any case it can be shortened by folding back part of its length, and still provide sufficient capacity to enable a 5 c.c. stunt model to go through the complete S.M.A.E. schedule.

The position in which the Regulator itself is mounted, is rather more important, since it controls the amount of fuel flowing from the tank only by means of the rate of flow from it to the engine, and if this rate is either accelerated or decelerated by centrifugal or gravitational forces, the benefits of the Regulator may be lost.

It is, therefore, essential that the Regulator should be fitted in such a position as to eliminate or minimise such effects. For stunt work, this means mounting the unit so that the diaphragm is upright and at right-angles to the centre-line of the fuselage, and in such a position that it is centred, in line, laterally and vertically, with the carburettor jet, such as the installation shown on the Frog "500." An alternative position would be to mount the unit behind the cylinder, again lining it up with the needle-valve. For speed models, where centrifugal force is only active in a horizontal plane, it would be practicable to mount the Regulator immediately above the carburettor on a rear disc-valve engine.

To test the effectiveness of the Jim Walker Regulator in practice, a friend of the writer has installed the complete system, with Frog "500" unit, in a



The Jim Walker Fuel Regulator fitted to a Frog 500 engine.

Mercury Musketeer model, which has previously flown with various tank installations and on Frog "500," Yulon "49" and Yulon "30" engines, with varying degrees of success. Although, due to the deteriorating weather conditions and to pressure of other activities, only brief tests have so far been carried out, impressions gained have been good, and on the first test flight, the engine, two-stroking evenly through manoeuvres and level flight, showed marked improvement on an earlier tank installation. The engine was tuned to maximum revs before release on each occasion.

There are certain incidental advantages to the use of the Jim Walker outfit. When re-starting the Frog warm, for example, it was noticed that choking was not necessary, due to the fact that the fuel cannot run back into the tank when the engine is stopped. Operation, too, is generally a little cleaner since the tank does not overflow. For filling, incidentally, pressure is required to open the check-valve, and a "Wesco" pump can was used for this purpose. When the engine is stopped, any fuel remaining in the system neither floods the engine nor drains into the model but remains effectively checked by the two ball-valves, even though the needle-valve may be left open.

Naturally, a certain amount of care must be exercised, and a few simple rules observed, if complete reliability of the system is to be expected. Firstly, the fuel entering the tank must be absolutely free from any foreign matter likely to prevent the Regulator ball-valve from seating properly. The majority of proprietary blended fuels are clean, the appearance of "sediment" in castor-base fuels being generally creditable to slight curdling of the castor, or to the precipitation of certain additives which may be present in the lubricant, but fuel which is free from dirt when it leaves the maker's bottle may not

be so when it passes through the filling apparatus, and, if a pump can is used, this should be most thoroughly cleansed before use.

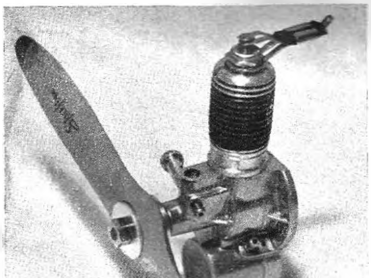
Should dirt enter the Regulator, this may stick under the ball-valve, causing it to pass to much fuel. On the other hand, if the inlet filter should clog, insufficient fuel will reach the Regulator. Conversation and correspondence with enthusiasts who have tried the Jim Walker system, would seem to confirm that the question of absolute cleanliness in operation is an important one and, to play safe, it is probably as well to fit another (Mercury type) fuel filter in the filler tube. Incidentally, those fuel mixtures, used by some British modellers, containing nitro-benzene, should not be used in the Regulator as they have a delcterious effect on the diaphragm material.

Technically, the Jim Walker system is undoubtedly the best solution to the fuel feed problem yet devised. Only intelligent operation should be required to prove its effectiveness.

The Anderson 0.045

Recently the writer has had the opportunity of inspecting and trying out one of the latest of the American "$\frac{1}{2}$A" Class motors: the 0.045 cu. in. Anderson "Spitzy." The "$\frac{1}{2}$A" or "AA" Class, which covers engines up to 0.49 cu. in. (i.c., about 0.82 c.c.) has gained tremendous popularity in the U.S. during the two years since the K. & B. Company first entered the field with its 1 oz. 0.02 cu. in. "Infant-Torpedo." In addition to these two firms, two other old established model engine manufacturers are also producing "$\frac{1}{2}$A" engines: the Herkimer ("O.K.") works of New York and the Atwood Company in California. The Ohlsson people, from whom advance information was received some two years ago, however, have not yet put their "$\frac{1}{2}$A" model on the market.

The Anderson, at the moment enjoys the distinction of being the least expensive of the group and currently sells at $4.45—about 32s. This is all the more remarkable when one remembers the high dealer and distributor discounts allowed in the U.S. Despite its moderate cost, however, the "Spitzy," like the big 10 c.c. "Spitfire," is exceedingly well finished.



The .045 cu. in. (.75 c.c.) Anderson, showing the prop and glow-plug connector with which the engine is supplied.

At approximately 0.75 c.c., the Anderson corresponds to our Mills 0.75 diesel. As has been frequently mentioned in these articles, it is the writer's contention that no advantage is to be gained by employing g.p. ignition as opposed to c.i. in the very small capacities and, nothwithstanding the worthy qualities and excellent value of the "Spitzy," the soundness of the policy of British makers in retaining the diesel for the small sizes seems to be amply borne out. The Anderson, like all small g.p. engines, must be run at high revs. i.e., at least 10-12,000 r.p.m. to achieve its best performance, but its output does not equal that of the Mills 75. Its power/weight ratio is probably as good as that of the Mills, since it is considerably lighter, but, for power/duration work, the British engine would appear to offer the better performance, particularly as a propeller of more efficient diameter can be used.

Like the Mills, however, the Anderson is well suited to the beginner. It starts easily and its docility is even better than the diesel It employs an annular port, shaft rotary-valve layout and has a small free-flight tank integrally cast with the bottom of the crankcase. The clean, polished exterior which can be seen in the photograph is matched by an equally good internal finish.

Meet the Contributo rs

R. A. TWOMEY

Has been making model aircraft for five years and whilst at school was Secretary of the Ampleforth College M.A.C.
Now a member of the Cardiff M.A.C.

At present in the R.A.F. undergoing training as a Pilot.

Interested in all types, but finds Wakefields the most difficult to cope with.

Held British H.L. Glider Record 5 : 46.6 in 1947 and won the I.C.I. International Trophy for Jetex in 1949 with a flight of 9 : 54 o.o.s. Longest flights to date : Sailplane, 2 hr. 30 min. (22 miles) ; Power, 1 hr. 15 min. (11½ miles) on 15 sec. engine run.

Has a keen rival in his younger brother who held a British Record two years ago when 13 years of age.

NORTHERN NOTES

★ GOOD MORNING/AFTERNOON/EVENING (delete word inapplicable) to one and all, and a very happy New Year to you too. This being the generally accepted time for making those well kept New Year Resolutions, may I offer a few suggestions, which may or may not be of use to some of the leading lights in the Areas.

To the Area Committees. To put on bigger, better and brighter contests during the season, and to find some sort of prizes from somewhere.

To the Northern Area Sec.—To answer all letters promptly, to see that no-one is left off the mailing list and not to spoil that nice brief case by carrying ham sandwiches therein.

To the Area Treasurers.—To allow no tick, not to accept any rubber cheques and to guard the Area Funds like a cat would a new litter.

To all Club Secs.—To prime the club members into taking an intelligent interest in the affairs of the Area, to ensure that at least one delegate attends all Area Meetings, and to see that every member of the club gets a look at the Area News Sheet.

To Club Comp. Secs.—To persuade all the fliers in the club to enter as many Area Contests as is possible, and to prepare a neat list of entrants from the club at each meeting and present same en bloc (together with the necessary fees) to the Area Comp. Sec. early in the day of Area Contests.

To all Timekeepers.—To swot up the rules and instructions to timekeepers and to buy a new pair of glasses.

> > >

★ I SPENT an enjoyable afternoon with the members of the York club the other Sunday, this club has just had an extensive re-organisation of the officials and committee with what might appear to be some good effect. During the winter season the club is running a points competition, one comp. each month for four month, 3d. each month entrance fee, the winner to take the kitty, with an added amount from the club funds. To encourage the junior and less experienced fliers there is a maximum of 125 sec. each flight, and altho' that might appear very low to some, it's no easy job to keep ticking up over two minutes flight after flight under wintry conditions. On the day I was there, about 16 members flew on a very dull and misty afternoon and about five made maximums on the first round with several others very close to it. Conditions deteriorated rapidly during the second round, however, the last flight being visible for only about 50 sec. These conditions will, no doubt, aid the York Comp. Sec. on future occasions, since all the entries will be fighting to fly whilst they can still see! The rumour that Owd Sam really means to have a bash next year was borne out by the fact that he was in there fighting with a new power job and altho' these were its maiden flights he put up an impressive performance, in fact, in spite of the fairly calm conditions, he managed to lose it on a 12 sec. engine run. The model, was well up to Sam's usual high standard of construction and appeared to be a cut down version of the well known "Civy Boy" Frog 250 powered and very aptly named (at least so I thought) the "Spivy Kid." If these first flights are any criterion this model is going to go places next season. I was pleased to note too that the York club has some keen and promising juniors, notably young Roy Hodgson and Mike Steele. They are both excellent builders and handle their models with confidence and no doubt with a little help from the elder members and a little more experience they will be figuring well up the competition lists next season.

Before leaving the York club, I would like to print their club ditty, the cracks therein could be made to fit members of almost any club.

At Much Flying on the Drome
The modellers all go there to try their planes out,
At Much Flying on the Drome,
They've put barbed wire all round to keep the draught out,
And if it is too windy, or its raining cats and dogs,
They're in the club house telling jokes like Oriental W.O.G.'s.
All dressed up in their berets and their York M.A.S. togs
At Much Flying on the Drome.

At Much Flying on the Drome,
If Sam is there he always runs a fiddle,
At Much Flying on the Drome,
We bods with raffle tickets he will diddle,
And if we raise objections, or we try to get away,
He perseveres and follows us and makes it last all day,
And if we have a bob at all, he always makes us pay,
At Much Flying on the Drome.

At Much Flying on the Drome,
Some people always come without their model,
At Much Flying on the Drome,
Week after week up to the drome they toddle,
There's old man Cross with Slickers four, all standing in a row,
He always brings them up, but very seldom has a go,
We think he only comes up to the drome to say "Hello"
At Much Flying on the Drome.

At Much Flying on the Drome,
Keith Buckham went and built a Nordic glider,
At Much Flying on the Drome,
The first time out the poor lad went and tried her,

She caught a great big riser and quickly gained some height,
And tho' he chased her 'cross the drome, she soon went out of sight.
So he popped into the local, and came back nearly tight,
At Much Flying on the Drome.

At Much Flying on the Drome,
Trev Heselwood started on a new one,
At Much Flying on the Drome,
Last time he came up here he went and flew one,
He put on slight left rudder, but she still went to the right,
The circles decreased rapidly until they got too tight,
and that's the reason he went home to start another kite,
At Much Flying on the Drome, who's got the winder,
At Much Flying on the Drome, forgot the timer,
At Much, two-three-four, Flying on the Drome.

With many apologies to Mr. Murdoch & Co. and to our long suffering readers.

➢ ➢ ➢

★ AT THE December meeting of the N.A. Committee the Council delegate gave brief particulars of the new competition programme, which by now of course will have been studied with interest by almost every one in the Area. In view of the size of the programme it was suggested that it be passed to the Comp. Sec. to study and that he report to the Committee meeting in February with tentative arrangements for the season. I would also suggest that he be given the necessary authority to purchase the following since by the look of things he's going to need them :—

One wheel, for putting shoulder to,
One pair socks, for pulling up.
One wall, for putting back to,
One belt, for tightening,
One set sleeves, for rolling up,
One best foot, for putting forward,
One stone, for not leaving unturned.
One special effort, for making,
One digit, for extracting
And one special prayer, for offering up.

Seriously though, the programme is a big one, there are five Area meetings to arrange, and it is with this in mind that the Committee decided to devote the February meeting to the discussion of the 1951 Comp. Programme. Now this is one of the things that is going to affect your club, and naturally the Committee want to try and arrange things to please everybody : but I would point out that they cannot do this unless they have your club's point of view. Now will you, just this once, because I ask you, see that your club has a delegate at this meeting. It will be no good your grumbling because some of the events havn't been arranged to suit you, if you and your club have had no hand in the arrangements. Don't let us be like we have been in previous years, leaving everything to the faithful few, let's all muck in and make OUR area the biggest and best in the country. Writing this makes me think of the song "I begged, I pleaded" and I expect it will have about as much affect on some of you as a drop of rain does on Mount Everest. Well all I have to say is if you don't turn out and help, may your rubber perish, your winder rust, your tow line break, your tissue slacken and your timer stick.

Incidentally, besides the normal competition arrangements and the organisation of the Area Knock Out Trophy, the poor Comp. Sec. is being saddled with the running of a League scheme in the Area for Team Racing. The general idea is for this to be on the lines of the Football league, i.e., each club participating will meet each other club twice, once at home and once away. This is going to be an ideal arrangement for every club in the Area to see how all the other clubs live, and ought to do a lot to weld the Area into one big united whole. *BUT*, it presupposes that every club will be interested in team racing, a supposition which, I fear, will not be borne out in practice. In any case, if you are interested, and want to have a go in this affair, will you perlease let the Comp. Sec.,'or the Area Sec. know quickly, now, at once, without further delay. And conversely, if you couldn't care less, a polite card to that effect would be more than appreciated by our Charley Boy.

Finally, it is more or less certain that the Wakefield and Nordic Finals, and the International meeting at Whitsun will be held at Cranwell. What a chance for neighbouring clubs to muck in over transport, and ensure a good crowd to cheer the N.A. lads on to victory.

Advertisement

WANTED. Large manger, suitable for use by three or four large dogs. Apply with full particulars and photograph if possible to MESSRS. DING, DONG AND SPINNER, c/o this column.

➢ ➢ ➢

★ IN VIEW of the proposition carried at the A.G.M. of the Council, by which some of the hard working officials of the Council, will be deprived of any further gestures of appreciation of their efforts, it would seem that the purveyors of champagne and loaners of suitable slippers are in for a thin time next season. Whilst sympathising with the officials concerned, I would point out that there is no need for them to feel deprived of the good things in life, since they should be able to enjoy many a succulent repast on the large amount of tripe that is served up for their edification at the Annual General Meetings.

➢ ➢ ➢

★ HAVEN'T I been a nice good tempered little boy this month ? No binds or grumbles, in fact just a nice chatty (chatty being the supreme adjective) column. Must be the result of all those nice Christmas presents you have sent me, gratefully acknowledged herewith.

The King's English . . . Leon Cortez.
Large bottle prussic acid . . . anon.
Cut throat razor . . . Leeds M.F.C.
Revolver . . . Peter Stringer.
Bullets and suggestions . . . Sylvia Bell.
One piece rope, but no ideas . . . The Editor.
Cheerio lads, get 'em up there ! !

From the S.M.A.E. and the CLUBS

REPORT OF S.M.A.E. COUNCIL MEETING HELD AT LONDONDERRY HOUSE, PARK LANE, LONDON, W.1., ON SUNDAY, NOVEMBER 26th, 1950 at 11 a.m

The following were present :— Messrs. A. F. Houlberg (Chairman), R. F. L. Gosling, D. A. Gordon, H. W. Barker, S. D. Taylor, C. S. Rushbrooke, M. A. L. Coote, K. J. A. Brookes, E. F. H. Cosh (London), F. Mason (Midland), G. Foden (E. Anglia), D. Salloway (N. Western), B. A. Messom (Northern), W. W. Lowery (S. Wales), J. S. Bishop (Western), R. C. F. Day (Southern), H. G. Hundleby (S. Midland), J. M. Taylor (W. of Scotland), D. F. Scoffham (Royal Aero Club) and S/Ldr. E. D. Cable (Royal Air Force M.A.A.).

S.E. Area Council Meeting

In view of the deficit incurred in respect of the 1950 event and a reference in the current S.E. Area News Sheet to a proposal to hold a further meeting in 1950, the Secretary was instructed to draw the S.E. Area Committee's attention to the Council's recent decision re sanctioning Area Rallies, etc. Messrs. A. F. Houlberg and H. W. Barker agreed to attend an E.G.M. of the S.E. Area Committee to be held on December 2nd.

Northern Heights M.F.C.

The Secretary referred to the many letters which he had received concerning the action of certain members of the above-named club at the Society's Annual General Meeting. The Chairman read a letter which he had received on the same subject. After a short discussion a proposal was carried that members of the Council should not accept invitations to any of the Northern Heights Club's functions for the time being.

Royal Aero Club and the Aeromodeller

Mr. D. F. Scoffham stated that the Royal Aero Club took strong exception to the implication contained in a recent *Aeromodeller* editorial that the Club had failed to give the S.M.A.E. its full co-operation and support. He added that the Secretary General, Col. R. E. Preston, desired to know the views of the Council concerning the editorial in question.

A short discussion ensued and the following proposal was passed. "That the views expressed in the *Aeromodeller* editorial do not coincide with those of the Council."

1951 British Nationals

The Secretary reported that the Western and South Wales Areas had agreed to organise jointly the 1951 British Nationals and the Council confirmed the proposed venue, Fairwood Common Aerodrome, Near Swansea.

Area Resolutions

London Area :—

(1) "That the Council refer back to the resolution sent in by the above Committee some time ago regarding the Electrical Timer for Speed Control Line Contests and hurry up the matter."

It was explained that the use of electrical timing was not at present required by the F.A.I., as was anticipated earlier. The Technical Secretary undertook to endeavour to speed up the provision of suitable equipment.

(2) "That a definite ruling be published on the question of broken tow-lines in S.M.A.E. Competitions."

The Council decided a broken tow-line shall be considered the responsibility of the contestant, and that where a broken tow-line occurs, flights of over ten seconds shall be recorded as flights. In the event of the breakage being caused by a fouled line no flight shall be recorded.

(3) "That accurate speed charts for Speed Control Line be published by the Council, either in the 1951 Handbook or as separate leaflets. The above charts to be recognised as official."

It was agreed that the Technical Secretary should prepare an accurate speed table in the metric system. One copy to be sent to each club and further copies to be available at 6d. per copy.

(4) "That in addition to the Competition Programme questionnaire, any alterations or amendments to contest rules suggested by sub-committees shall appear on Council agendas and submitted to Areas at least two weeks before S.M.A.E. Council Meetings, so that all delegates can be instructed by areas how to vote. The Council shall then ratify or nullify such alteration or amendment."

The Council agreed that where practicable this proposal would be carried out.

(5) "That members of S.M.A.E. sub-committees shall be nominated and elected by national postal ballot."

This proposal could not be accepted as in accordance with the Society's Articles of Association such sub-committees are appointed by the Council.

Northern Area

It was alleged by the N. Area delegate that there had been instances where flights made in an S.M.A.E. contest had been also included in the results of another S.M.A.E. contest held on the same day.

The Council decided to draw attention to the fact that in the event of two S.M.A.E. events for the same type of model being held on the same day, separate flights must be made for each contest.

Finance

The Treasurer's statement of accounts was accepted and showed a balance in hand of £1,472 1s. 4d.

Mr. Barker stated that 158 members attended the Dinner and Prize-giving, 115 tickets being paid for, the remaining tickets being presented to the prize-winners' guests. The dinner a/c showed a deficit of £70 10s. 10d. and it was agreed to debit the cost of the prize-winners' tickets against competition expenses.

Mr. Cosh informed the Council that he had taken up with the Manager of the Hotel Normandie complaints concerning the high cost of refreshments, but had been unable to obtain any satisfaction. He suggested that next year's function be held at the Horse Shoe Hotel, Tottenham Court Road, London, W.C.1., where a provisional booking had already been made, subject to the Council's confirmation. This was agreed to.

S.M.A.E. Prize-winners' Badges and Diplomas

Mr. Cosh stated that delivery of the new Prize-winners' Badges had been promised for early in the New Year. They would be a small S.M.A.E. Badge surrounded by a laurel wreath and would be in silver gilt (1st), silver (2nd), and bronze (3rd). He was thanked for dealing with this matter and also for producing the new diplomas which were now available for distribution.

Records

The following records were ratified : Tailless Glider T.L., A. R. Lucas (Port Talbot M.F.C.), 22 min. 31.5 sec. ; A/2 Glider H.L., J. R. Done (Liverpool M.A.S.), 27/8/50, 3 min. 25.0 sec. ; J. G. Joyce (Leeds M.F.C.), 10/9/50, 3 min. 40.0 sec. ; Power-driven Tailless, W. Poile (Country Member), 2 min. 09.6 sec. ; Lightweight-Rubber Monoplane, J. O'Donnell (Whitefield M.A.C.), 7 min. 12.0 sec. ; Control-Line Speed, Class 1, R. Scott (St. Helen's M.A.C.), 80 m.p.h.

The following record applications were recorded : Control-Line, Class IV, F. Guest (Country Member), 116.9 m.p.h. ; Lightweight-Rubber Biplane, J. O'Donnell (Whitefield M.A.C.), 2 min. 53 sec. ; Lightweight-Power Tailless, P. B. Wyatt (Ipswich M.A.C.), 2 min. 15 sec.

Merit Certificates

These were awarded to the following : Class C and International, J. A. Gorham (Ipswich). Class B. No. 350 Hepworth, J. (West Yorks), 359 Richmond, J. S. (Wolves), 361 Wyatt, P. B. (Ipswich), 384 Brodie, D. G. (Erdington), 392 Jackson, R. A. (Knutsford), 407 Wrigley, A. (Prestwich), 426 Royle, J. (Littleover), 432 Firth, R. (York), 433 Buzzard, R. E. (Wavertree), 434 Lucas, J. McG. (Port Talbot), 435 Hanson, M. L. (Solihull), 436 Longstaffe, A. J. (Belfairs), 437 Bishop, M. M. (Solihull), 438 Hudman, J. (Birmingham), 439

S.M.A.E. 1950 CONTEST PROGRAMME

Mar. 25th (Easter)	**GAMAGE CUP.** Unrestricted Rubber. D/C.	
	PILCHER CUP. ,, Glider. D/C.	
April 15th	*ASTRAL TROPHY. F.A.I. Power Duration Area.	
,, 15th	**RIPMAX TROPHY.** Radio Control. Area.	
,, 15th	**S.M.A.E. CUP.** A2 Glider Eliminator. Area.	
May 6th	*WESTON CUP. Wakefield Eliminator. Area.	
,, 6th	**HALFAX TROPHY.** Unrestricted Power/ Ratio. Area.	
,, 13th & (Whitsun) 14th	**BOWDEN TROPHY.** Power/P.A.A.-Load. International.	
	POWER CONTEST. Power/Duration.	
	"**AEROMODELLER" R/C TROPHY.** Radio Control. Cnetralised. (Venue to be announced.)	
May 27th	*K. & M.A.A. CUP. A2 Glider Eliminator. Area.	
,, 27th	**GUTTERIDGE TROPHY.** Wakefield Eliminator. Area.	
June 10th	**PREMIER SHIELD.** Wakefield Eliminator. Centralised.	
,, 10th	**A2 CHALLENGE CUP.** A2 Glider Eliminator. Centralised. (Probable venue—Cranwell.)	
July 1st	*"**MODEL ENGINEER" CUP.** U/R Team Glider. Area.	
,, 1st	**WOMEN'S CUP.** U/R Rubber/Glider. Area.	
,, 1st	**POWER CONTEST.** U/R Power/Duration (.01-1.5 c.c.) Area.	
,, 15th	**KEIL TROPHY.** U/R Power/Ratio. Area.	
,, 15th	**LADY SHELLEY CUP.** Tailless. Area.	
,, 22nd	**C/L SPEED.** { Odhams Press	
,, 22nd	**C/L SCALE/STUNT** { National C/L Meeting. (Venue to be announced.)	
,, 22nd	**TEAM RACE** {	

THE BRITISH NATIONALS

Fairwood Common Aerodrome, Swansea.

Aug. 5th	"**GOLD" TROPHY.** C/L Stunt.
,, 5th & 6th	**C/L SPEED.** C/L Speed.
,, 6th	**THURSTON CUP.** F.A.I. Glider.
,, 6th	"**MODEL AIRCRAFT" TROPHY.** F.A.I. Rubber.
,, 5th & 6th	**S.M.A.E. R/C TROPHY.** Radio Control.
,, 6th	**SIR JOHN SHELLEY CUP.** F.A.I. Power/ Duration.

INDOOR NATIONALS

,, 19th	Free Flight—Stick H.L.	Probable venue —Manchester
,, 19th	,, ,, —Fuselage H.L.	
,, 19th	,, ,, —Unorthodox.	
,, 19th	R.T.P.—Class A & B	
,, 19th	,, —Speed	

Sept. 2nd	*FARROW SHIELD. U/R Team Rubber. Area.	
,, 2nd	**JETEX CONTEST.** Ratio. Area.	
,, 2nd	**SCALE POWER.** Power/Duration. Area.	
,, 16th	**BRITISH CHAMPIONSHIPS.** Rubber/ Glider/Power. Centralised.	
,, 16th	**TAPLIN TROPHY.** Radio Control. Centralised. (Venue to be announced.)	
,, 30th	**DAVIES TROPHY.** Team Race League Finals. (Venue to be announced.)	
Oct. 7th	**U.K. CHALLENGE MATCH.** Rubber/ Glider/Power. Centralised. (Scotland.)	
,, 14th	"**FLIGHT" CUP.** Unrestricted Rubber. D/C.	
,, 14th	**FROG JUNIOR TROPHY.** Unrestricted Rubber/Glider. D.C.	
,, 28th	**HAMLEY TROPHY.** Unrestricted Power/ Duration. D/C.	

Notes

* Indicates Flugge Cup events.

The Indoor Nationals on August 19th will be organised by the N.W. Area at Manchester. The *Daily Dispatch* Rally at Woodford will probably be held on the following day.

The Ripmax Trophy event will constitute an eliminator for the International R/C Contest on May 13th and the R/C contest at the Nationals.

The Astral Trophy Contest on April 15th, will be an eliminator for the International Power event on May 14th.

In the British Championships on September 16th, selected entries from each area will compete.

Teams from England, Scotland, Wales and N. Ireland will compete in the United Kingdom Championships on October 7th. The event being held in Scotland this year.

New Contest Rules

"No flight" increased to 10 sec.

Five minutes maximum rule to apply to all duration contests.

Timekeepers not permitted to time members of their own clubs in centralised or Area Centralised events.

Hand-launching optional.

Registration numbers need not be shown on models.

Watches to be stopped when flight reaches 5 min. maximum.

In the event of a tie with maximum scores an additional flight to be made with no time limit.

The **MODEL AIRCRAFT CONTEST CALENDAR** will again be featured in our Club News section during the coming season. Now that the S.M.A.E. Contest Programme has been announced we strongly advise clubs who intend to organise rallies to decide upon the dates of these without delay. Early publication of the dates of these events in the Contest Calendar will avoid them clashing with other fixtures.

Miskin, F. (York), 440 Grayson, G. (Sheffield), 441 Dowdeswell, A. E. (Glevum), 442 Buckham, K. A. (York), 443 Falwell, G. J. (Solihull), 444 Hope, R. B. (York), 445 Nelson, W. (Sheffield), 446 Hulme, J. D. (Knutsford), 447 Caveney, A. (Knutsford), 448 Bennett, W. (Prestwich), 449 Theobalds, V. R. (Norwich), 450 Chinn, J. J. (N. Norfolk), 451 Coulling, N. F. (Sevenoaks), 452 Mason, E. N. (Sevenoaks), 453 Giffin, M. (Sevenoaks), 454 Simpson, A. U. (Timperley), 455 Sicel, M. (York), 456 Seymour, G. C. (Cheadle), 457 Shanks, W. A. (Lanark), 458 Coley, M. (Erdington), 459 Harrison, J. G. (Cheadle), 460 Wells, J. E. (Chichester), 461 Spurr, A. W. (Stockton), 462 Taylor, R. (Bolton).

1951 Wakefield Cup Contest

It was confirmed that the 1951 Wakefield Cup Contest will be held on July 7th-8th, 1951, at Jamijarvi, Finland.

1951 Contest Programme

Capt. S. D. Taylor presented the draft programme for 1951 which he had prepared from the results of the questionnaire. He pointed out a number of anomolies had been created by the voting and that it would be impossible to put into effect all of the proposals which had received a majority vote as a number of these were contradictory.

The programme was discussed at some length and subject to slight amendments was ratified. The Competition Secretary was thanked for his work in collating the questionnaire results and producing the programme. (For details of dates, etc., see M.A. Contest Calendar.)

Festival of Britain

Mr. Brookes, the P.R.O., informed the Council of the arrangements which had been made with the authorities for control line demonstrations to be given on the Thames South Bank Site. Eleven such demonstrations would be given on seven days during the season. There would be no static displays.

Daily Herald National Control-Line Meeting

The P.R.O. stated that he had been into negotiation with Odhams Press Ltd. who were considering sponsoring a National C/L Meeting at one of the London Sports Arenas, possibly Wembley Stadium, during the Festival of Britain celebrations. The Council decided to suggest July 22nd, 1951 for this meeting and thanked Mr. Brookes for his efforts. Details will be published as soon as a final decision has been made.

Reimbursement of Officers' Expenses

The Council considered the proposal passed at the A.G.M. and decided to allocate the following reimbursements for 1950: Hon. Secretary, £50, Hon. Treasurer, £50, Hon. Comp. Secretary, £25.

Applications for Affiliation

Applications from the following clubs were accepted: North Birmingham M.A.C., Seniors 6, Juniors 7, fee 32s. 6d.; Glasgow Barnstormers M.F.C., Seniors 22, Juniors 6, fee 71s. 6d.; Glasgow M.A.C., Seniors 37, Juniors 2, fee 105s.

Registration Numbers

The Council decided to delete from the rules governing the flying of power-driven models the rule making it compulsory to have registration numbers on these models.

F.A.I. Licences

It was agreed that these could be issued or renewed in future for periods not exceeding five years at the usual fee of 1s. per annum.

Area News Sheets

The P.R.O. requested Areas to send a copy of their News Sheets direct to him, *in addition* to the usual copy sent to Londonderry House. They should be addressed to: K. J. A. Brookes, 22, Grosvenor Road, St. Albans, Herts.

The meeting concluded at 6 p.m. with a vote of thanks to the Chair.

WEST ESSEX AEROMODELLERS

Winter time seems to be testing time for models to be used in combat next season.

Two A Class T/R models have made their bow with good results.

The Rubber Section of the Club are going ahead with new methods, for coming contests, but owing to several of the rubber boys being called up for H.M. Forces it leaves that section a bit bare.

We have made quite good friends with local radio "hams," who have promised to make us walkie-talkie sets for use in recovery of lost R/C models.

After giving a R/C demonstration to radio hams with several of the Club's R/C models, they promised to help in any R/C problems we might have, and would let us have advanced knowledge of R/C that would help. We are very grateful.

The W.E.A. Gala for 1951 will be fixed for June 17th, with the usual good time and weather (we hope) for all modellers.

We are to have a discussion (London Clubs please note) on "If We Lose Fairlop."

Many thanks go to MODEL AIRCRAFT for its service to modellers. May it continue in 1951.

YORK M.A.S.

The club has wasted no time since its new Committee went into office. Ron Firth, its new competition organiser, announced a Winter Points Competition running from December—March with a decent voucher for the winner. Unlike last summer's Points Competition, Max flights are limited to 125 sec. (with fly-offs when necessary), this lines up the glider and power classes and gives all a more equal chance. The same model must be used *each* month but can be varied month to month, and two flights allowed fortnightly.

A first class reference library is being compiled by Mr. Miskin on businesslike lines, and the service is *gratis* to members. A separate evening is being provided for re annual prize-giving in the form of a dinner and social evening early in the New Year, thus giving the A.G.M. more air to breathe. Some good flying has been put in during the still-air (?) season and the Club's power record is being steadily pushed up. What we have seen so far at Clifton Aerodrome in recent weeks paints a rosy picture for next year's Competitions. Best of Luck boys for 1951 and keep 'em flying !

BELFAIRS M.A.C.

After plodding through the past season minus flying field and clubroom, we managed to place 17th in the Plugge Cup. However, we now have the use of two school halls and a large expanse of land about six miles north of Southend. Senior champion for the season was D. Willmott, with J. Hume junior champion. P. Field, as usual put up a good all-round show, gaining 4th place in the Hanley Trophy and collecting the British F.A.I. Hand-Launch Sailplane Record. P. Treadaway has been very successful with his own design semi-scale stunt job, powered by an Elfin 2.49.

The bods are well away building for the 1951 season and there appears to be quite a leaning towards Wakefields and A 2s.

CHINGFORD M.F.C.

The above club held its 14th A.G.M. in December, the Secretaryship was again left under the able control of Mr. Hand.

It was decided that discussions would be held on Club nights to help the Junior members. Ray Ferguson (¼ pint) is still progressing his "Moonrakers" Elfin 1.8 Stunt, C.I. job. The latest goes like a bomb, literally. Any bods wishing to join would be welcomed on the Club night any Friday, at Wellington Avenue School, Chingford Mount.

WHITEFIELD M.A.C.

The club held a very successful exhibition at the local Odeon Cinema, during the fortnight November 13th-25th, and a well-arranged display of models was seen by several thousand people.

Outdoor flying has not been neglected and the best flight in the past month was J. O'Donnell's 3:45 with a 3 ft. glider, the day before winning the club glider contest held on December 3rd. This contest was flown in several inches of snow ! and a 2 min. flight limit (introduced because of the small field and built-up surroundings) was ineffective due to visibility being very poor for most of the contest (wind and snow !). Winning time was 248 sec. (3 flight agg.), runners up being M. O'Donnell (189 sec., 2 flights only) and R. Woodhouse (172.5 sec.).

M. O'Donnell's power job, lost after 25 minutes in September has been returned after being out for 10 weeks. Damage was confined to covering and a broken tail. The engine started with no trouble !

EASTBOURNE M.F.C.

Although the Club had a fairly successful season, influenced no doubt by the weather, the Annual Dinner surpassed expectations with its lavishness, much to the surprise of certain members from the Brighton Clubs.

This was fitting in view of the fact that it also marked the Club's coming-of-age, among the guests being one of the original founder-members of the Club, who was flying in Eastbourne before Chairman H. J. Towner arrived in the town.

The Season finished on a note of great hope for the future, especially now that the Eastbourne Corporation have agreed to the Club's request for a Control-line ground, and granted a six month trial period on ground allocated in one of the Parks.

It might be added that these concessions have been obtained only after the Club's rigid adherence to a Gentleman's agreement not to fly in Public Parks or spaces for approximately 18 months, upon the authorities rejection of their first application. The second application was again made through the proper channels, though it must be said that the Club's deputation was well-briefed regarding Home Office recommendations on this very vexed problem.

WOLVES M.A.C.

To finish the season the club attended the Black Country Sub-Area Free Flight Rally held on October 24th. We took seven out of the first nine places, winning outright both glider and rubber.

We placed 14th in the Plugge Cup this year—just 14 places below where we shall place next year.

There has not been a very great interest in the club in indoor modelling this season, the only thing that has really got going well is indoor speed and so far the club record stands at 36.94 m.p.h. over 10 laps and is held by Pete Coxall.

Five of our members are building the "Slap Map" a Nordic designed by J. O'Donnell of the Whitefield M.A.C. and J. S. Richmond and D. Hill have their own new Nordics well in hand.

A 2.49 Elfin power model designed by D. Hill and built by P. Hardwick has been putting up ratios of around 12 to 13 : 1 in calm, damp conditions.

WEST OF SCOTLAND AREA

The new West Scotland Area was formed at a Meeting in Prestwick, held on September 23rd. Following on this two later meetings have been held and the Area is well on the way. Officials are : Chairman, D. G. Hodinott, Ayr, Vice-Chairman, J. C. Macarthur, S.A.S. Secretary, W. D. Jardine, 22, Thomson Street, Kilmarnock, Treasurer, R. Burns, Stewarton, Comp. Sec., W. Hunt, Glasgow, assisted by T. Simpson, Barnstormers. Mr. Taylor of the Barnstormers Club is the Council Delegate.

After a suggestion by the Treasurer had been considered and the views of the other Scottish Areas taken, a Challenge to the Clubs in England, Wales and Northern Ireland to fly a United Kingdom Challenge Match in 1951 has been issued to the S.M.A.E. and accepted. The event is to be for a team of Rubber models, Gliders and Power Ratio models, and the first of what we hope will be an annual affair will be held in Scotland on October 7th, 1951, at Heathfield, the Royal Naval Station adjacent to Prestwick Airport. The Challenge has the full support of the South East Scotland Area, but so far the North East has refused to have anything to do with it.

We expect to settle a lot of arguments about the relative flying conditions of Scottish and English weather, at this do, as October is the very edge of the end of the season up here, and you boys down South might need your snow boots !

Any S.M.A.E. Country Members living in the West of Scotland are asked to get into touch with the Area Secretary.

M.A. CROSSWORD SOLUTION

1 A	S	2 P	E	3 C	T	■	4 A	5 P	6 P	L	7 E
R	■	O	■	A	■	8 A	■	9 A	E	■	T
10 D	O	W	N	T	11 H	R	U	S	T	■	H
E	■	E	■	■	12 A	E	■	13 T	R	U	E
14 N	15 O	R	16 S	E	M	A	17 N	■	O	■	R
■	R	■	E	■	L	■	18 I	S	L	E	■
19 T	R	20 I	M	■	21 E	L	F	■	T	■	22 L
R	■	23 V	I	24 M	Y	■	25 T	R	A	C	E
26 I	G	O	■	O	■	27 B	Y	■	N	■	A
O	■	28 R	A	D	A	R	■	29 S	K	30 I	D
31 D	R	Y	■	E	■	A	■	K	■	C	■
E	■	■	32 S	L	A	B	S	I	D	E	R

1951 WAKEFIELD TROPHY RULES

1.—The competition shall be open to all nations, whose teams shall consist of not more than six individual competitors.

2.—The contest shall be for fuselage rubber-driven models, the rubber motor or motors of which must be enclosed, and the fuselage or fuselages must be fully covered with a maximum cross-section which is not less than 65 cm² (10.015 sq. in.). In straightforward cases the maximum cross-section will be the actual largest cross-section of the fuselage. In complex cases where the intersection between the surfaces and the fuselage is difficult to determine exactly, the maximum cross-section taken will be that lying between the two vertical parallel planes which are tangents to the largest circle which can be inscribed in the largest transverse section of the fuselage.

3.—The following conditions must be complied with regarding the area of the surfaces and the weight of the model. (a) The surface must not be less than 17 dm² (263.5 sq. in.) or more than 19 dm² (294.5 sq. in.). The surface to consist of the total surface of the wing(s) and that of the horizontal stabilising surface(s) measured as the orthogonal projection of the surfaces on to the horizontal plane in their normal flying position.

In the case of wings or empennages attached to the body of the machine the surface taken will include the complete centre of the fuselage(s), the normal contour lines of the surfaces being supposed extended until they meet the plane of symmetry of the machine in plan view.

The competitor must supply templates on suitable paper showing the wing surfaces (both wing and stabilising surfaces) and the exterior contour and dimensions of the maximum cross-section of the fuselage, to enable a speedy check to be made for compliance with the rules, without being obliged to work out the surface areas immediately.

(b) No model shall have a total weight of less than 230 grammes (8.113 oz.).

4.—The model, including the propeller(s), must be constructed by the competitor. Gearboxes (when used) must also be constructed by the entrant, with the exception of the gear wheels. Commercial timer units may be employed.

5.—Each model must rise from the ground from a standstill, entirely under its own power, transmitted by the propeller(s) and no push is permitted. Models when starting, may only be held by the propeller(s), and by the wing-tip. Holding the model for release by any other part shall lead to immediate disqualification from that round.

6.—No part of the model shall become detached during its flight.

7.—Each competitor can enter only two machines, but he may use their components in any combination he desires, provided the machine still complies with the regulation applying to the contest.

8.—Models shall be check-weighed prior to each round.

9.—Each entrant will be allowed three flights during the contest, the aggregate duration of the three flights to be recorded as the entrant's score.

An attempt of 10 seconds or under will constitute a "no flight" but only three such attempts for each round will be allowed. In the latter event the highest "no-flight" time shall constitute the recorded time for that round.

10.—In each of the three rounds, five minutes (300 seconds) will be the highest time recorded.

At the end of the third round any competitors having the maximum score of 15 minutes (900 seconds) shall fly off a fourth round in which no time limit of duration will be imposed.

In the event of the model being lost or irreparably damaged in the third round a reserve model may be employed for the fly-off.

11.—The timing of any flight shall terminate when the model touches some solid object or passes out of the sight of the time-keepers, the time-keepers remaining at the point from which the model is released.

Two officially appointed time-keepers must be employed, each having an approved stop-watch. The mean value of the reading of the two watches shall be taken as the actual and recorded duration. No binoculars, telescopes or other magnifying aids shall be used by the time-keepers to observe the model in flight, but coloured, tinted, or normal corrective spectacles are permitted.

12.—When called by the judges each model must be ready for flight within three minutes or the competitor will be liable for disqualification from that round.

13.—Minor adjustments or repairs, but no replacements other than rubber motor(s) and/or propeller(s) may be made between competition flights.

Repairs or trial flights may only be made with the consent of the judges, and after each repair the model must be re-weighed and re-checked, and must then possess the same characteristics as originally.

14.—A competitor entering this competition thereby agrees that he is bound by the regulations herein contained, and by any special rules which may hereafter be issued in connection with this competition.

15.—The winning nation shall be that which has in its team the individual competitor attaining the highest aggregate duration of flights.

16.—The judges' decision shall be final.

17.—The winning nation will hold the Cup for one year.

CRYSTAL PALACE M.A.C.

The club held its Annual General Meeting and Dinner on Saturday, November 18th, with the President, Mr. Cooley in the Chair. All members and their guests were present, and the proceedings ended with an interesting and very clever conjuring act by Mr. Spark.

The official business of the Club followed the dinner. After the financial report had been read by Mr. Lister, seconded and carried unanimously. There were speeches by the President and Mr. Mendy the Chairman.

The President expressed his pleasure to see the Club prospering and to find members still as enthusiastic as ever. He welcomed this latest development of the social side of the Club as a most encouraging sign.

The Presentation of the Advertizer Cup was made by Mrs. Neale of the Crystal Palace Advertizer to Mr. Ben Mendey who won most events this past season in spite of very poor flying conditions which generally prevailed.

The thanks of the Club were charmingly expressed to Mrs. Suters by a presentation of some beautiful glassware in appreciation of her efforts to make members welcome in her home which is now the regular meeting place on Monday evenings.

There was a display of model aircraft amongst which were some competition winners. Each model showed a high standard of design, building and finish.

The thanks of the Club go to all who, in any way, helped to make the evening the great success that it proved to be.

WEST YORKS M.A.S.

We are now getting settled down to our winter activities. These consist mainly of Sport flying, although one of our members, Mr. Pickles, put up a good time in the hand-launched Nordic A2 Glider class with his "Norseman" by turning in a flight of three minutes and forty-nine seconds in very poor weather conditions. We hope to be able to claim this time as a British record for this class, as we notice the previous one is three minutes forty seconds.

During the past year we have had some quite good contest results, being in the finals of the North Eastern knock-out competition and being beaten by only fifty five seconds. We hope to do better next year. As usual it was our two ace fliers Mr. Farrance and Mr. Preston who won all the honours for West Yorks.

WINCHESTER M.A.S.

The Fourth Annual General Meeting of the Society was held on November 14th, 1950. Reports on the Society's progress during the last twelve months were presented by the Officials. The election of officers resulted in Frank Shawyer remaining as Chairman and Ray Lewis as Treasurer and Peter Ivory being elected Secretary. Bill Childs was elected Competition Secretary.

St. Michael's Hall in Canon Street, Winchester, has been hired for the Society's Winter Meetings. These will be fortnightly starting at 7.30. The dates are February 13th and 27th; March 13th and 27th.

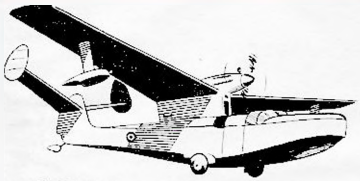
CHANGES OF SECRETARYSHIP

Coventry Dist. M.A.C.—G. Ginns, 51, Macaulay Road, Wyken, Coventry.

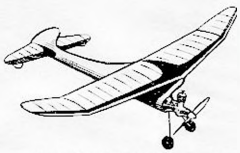
Stirling M.F.C.—P. Russell, "Benview," Fallin, Stirlingshire, Scotland.

"PLAN" YOUR SUMMER FLYING NOW!

TO MAKE MODELLING EASY FOR YOU, HERE IS A WINNING SELECTION OF FULL SIZE PLANS FROM 'MODEL AIRCRAFT'



M.A.83 SEAGULL ... 5/-



M.A.57 THOROBRED ... 2/9

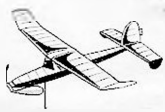
M.A.54 PERCIVAL MEW GULL C/L ... 2/9

Over 100 Plans to choose from

POST COUPON TODAY FOR

FREE CATALOGUE

M.A.25 THE CHAMP ... 4/6



M.A.31 GAMAGE CUP WINNER ... 4/6

M.A.47 HUMMING BIRD 4/-

M.A.40 HAWKER FURY 3/3
Scale stunt C/L for 1-2 c.c. engines by R. Warring.

M.A.55 FLY'S EYE ... 4/6
Power duration model for 1/2.5 c.c. engines by J. B. Knight.

M.A.63 1949 WAKEFIELD CUP WINNER 5/6
Outstanding model by present cupholder Aarne Ellila.

M.A.67 BRYTON ROC 5/-
Record holding rubber model by F. H. Bowell.

M.A.68 GUILLOTINE ... 4/6
Nordic A/2 Class Sailplane by Phil Gaulmont.

M.A.71 CHALLENGER 5/-
Semi-scale power model for 2-2.5 c.c. engines, by J. A. Newton

M.A.74 MILES MAGISTER 7/6 (Two Sheets).
Scale free flight model for 1-2 c.c. engines by E. R. Biggs.

M.A.75 HOWARDS HATCHET ... 5/-
Pod-and-Boom type contest sailplane by J. A. Howard.

M.A.76 ACE OF DIAMONDS 3/3
Lightweight rubber driven model by R. A. Twomey.

M.A.77 THE TWISTER ... 3/-
Stunt control line model for 1-2 c.c. engines by C. A. Bates.

M.A.78 HESTON A.O.P. 5/-
1/8 scale model for .75-2 c.c. by M. M. Gates.

M.A.79 THUNDERBOLT 4/6
C/L scale model for 1.3-3.5 c.c. engines by P. M. M. Lewis.

M.A.80 SMOOTHIE ... 4/6
High performance Wakefield by N. Standing.

M.A.81 HYPERIAN
Nordic A/2 Sailplane by J. Holt.

M.A.82 MUSTANG ... 4/-
Free flight rubber driven scale model by N. Gregory.

M.A.84 GEE MAC ... 3/-
Class "B" team racer by B. M. Evans.

M.A.85 SCRAM ... 3/3
Lightweight competition rubber model by L. Barr.

M.A.86 HARVARD ... 5/-
Scale stunt C/L model for 5 c.c. engines by T. Wardell.

M.A.87 KLING 4/6
A tailless glider by P. C. Koorn.

M.A.88 RED LIGHTNING 3/3
Class "B" team racer by B. M. Evans.

M.A.89 TINIFLYTE ... 2/-
Winning class I C/L speed model by A. Gray.

M.A.90 MINOTAUR ... 4/6
Power contest model for engines by R. A. Twomey.

M.A.91 MOONCREST 2/9
... driven biplane by R. Malmstrom.

M.A.93 D.H.C.2. BEAVER 5/-
Free flight scale model by J. Sheppard.

M.A.94 SATYR 5/-
59 in. span sailplane by J. van Heerum.

ANS DEPT.
EAT QUEEN STREET,
.ONDON, W.C.2.

e send me a free copy ur catalogue of plans and working drawings

.....

.....

.....

MODEL Aircraft CLASSIFIED ADS

Private, 3d. per word. *Trade*, 6d. per word. Minimum 18 words. Box No 2s. 6d.
Copy matter and replies to Box No's. to be addressed to "Model Aircraft" Advertisement Department, 23, Great Queen Street, London, W.C.2. Telephone: Chancery 6681-4.

YOU CANNOT READ THIS without realising the value of this column as an advertising medium for your "Smalls." Send us a note of your Sales or Wants for inclusion in the next issue.

AMERICAN MAGAZINES. One year supply, post free. "Model Airplane News," 25s. ; "Popular Mechanics," 32s. ; "Flying," 28s. 9d. For full list send stamp to—WILLEN LTD., (Dept. 22), 101, Fleet Street, London, E.C.4.

MERCURY COSSOR R/C unit with Mk.11 receiver in perfect condition. Best cash offer or will consider part exchange.—Box No. A1234, MODEL AIRCRAFT Offices.

"MODEL AIRPLANE NEWS," America's leading monthly magazine. One year's subscription, 25s. Specimen copy, 3s. American magazine catalogue, free.—HOBSON, 79, Southbrook Road, Exeter.

FOR SALE. Pocket size Zeiss Nettar 515. 6.3 lens. Up to 1/00 second. 16 exposures, 120 film. Hundreds of photographs taken with this camera have appeared in "Model Aircraft," "Aeromodeller," "Model Aviation," "Air Trails," "Flying Models." £9.—BILL DEAN, 249, Melfort Road, Thornton Heath, Surrey.

A NUMBER OF NEW UNUSED AMERICAN MOTORS for sale at list prices plus duty. S.A.E. for list.—WARRING, 10a, Hayne Road, Beckenham, Kent.

PRINTED NOTEPAPER. Your address and telephone number printed on best quality writing papers. Colours, styles and prices to suit all. From 5s. 6d. per 100 sheets or 8s. per 100 double sheets, post free. Envelopes extra. Printing proof supplied on receipt of 1s. deposit. Write JENDEN PRESS, c/o 37, Alldridge Avenue, Hull.

MODEL Aircraft

CONDITIONS OF SALE

This periodical is sold subject to the following conditions:—That it shall not, without the written consent of the publishers, be lent, resold, hired-out, or otherwise disposed of by way of Trade except at the full retail price of 1/6d., and that it shall not be lent, resold, hired-out, or otherwise disposed of in mutilated condition or in any unauthorised cover by way of Trade : or affixed to or as part of any publication or advertising, literary or pictorial matter whatsoever.

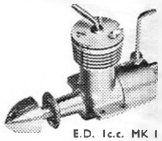
Printed in Great Britain for the Proprietors by ELECTRICAL PRESS LTD., Cordwallis Works, Maidenhead, Berks, and published by PERCIVAL MARSHALL & Co. LTD., 23, Great Queen Street, London, W.C.2.
Registered for transmission by Magazine Post to Canada including Newfoundland.

E.D. PRODUCTS, ACCESSORIES & SPARES

E.D. DIESEL ENGINES

E.D. 3·46 MK IV

	£	s.	d.
E.D. Mk I " Bee " 1 c.c. diesel engine	2	7	6*
E.D. Mk. II 2 c.c. diesel engine	2	15	0*
E.D. 2 c.c. competition special diesel engine	2	17	6*
E.C. Mk. III 2.49 c.c. diesel engine	3	5	0*
E.D. Mk. III (Series 2) 2.46 c.c. racing engine	3	12	6*
E.C. Mk. IV 3.46 c.c. diesel engine	3	12	6*



E.D. 1c.c. MK I

E.D. MK I & MK III (MINIATURE) RADIO CONTROL UNITS & COMPONENTS

	£	s.	d.
E.D. Mk. III " Miniature " R/C Unit	7	19	6
E.D. Mk I three valve R/C unit *Complete less Batteries*	14	10	0
E.D. Mk. III Transmitter and Aerial	4	12	6
E.D. Mk. I Escapement : clockwork; ...	2	7	6
E.D. Special miniature hand Transmitter	5	0	0

	£	s.	d.
E.D. Mk. III Receiver plus 4-pin battery socket and plug, 2-pin phone socket and plug, potentiometer and On/Off switch	3	0	0
E.D. Mk. III. Escapement		18	6
E.D. Mk. I Transmitter and Aerial ...	4	17	6
E.D. Mk. I Receiver	7	15	0

M.I. E.D. MAGNETO

For two stroke or four stroke engines up to 30 c.c. Dispenses with the old coil and battery system

MI/ED Magneto complete 4 10 0

MI/ED Unit Magneto ... 2 15 0

E.D. TIMERS

A clockwork timer, weighing under 1 oz. Total run 50-60 secs. 7oz. pull ... 12 6*

E.D. FUELS

Blended with the correct proportion of ether and ready for use.

E.D. " Standard " fuel 3s. per bottle

E.D. " Competition " Fuel 3/6 per bottle

E.D. KIT SETS

AEROCAR

E.D. " RADIO QUEEN "

" CHALLENGER " HYDROPLANE

	£	s.	d.
E.D. " Radio Queen " aircraft kit set	3	18	6
E.D. " Challenger " hydroplane kit set	2	2	6
E.D. " Aerocar " Kit set	2	2	6

Challenger C/L aircraft complete with engine *(ready to fly)* 4 7 6

CLUTCH UNIT

	£	s.	d.
E.D. Mk. III and Mk. IV clutch unit, complete	2	2	0
E.D. Mk. II C/S clutch unit complete as above plus taper insert	2	5	0

ORDER THROUGH YOUR MODEL SHOP

PROPELLERS

		£	s.	d.
E.D. Plastic Propellers	9½" diameter x 6" pitch free-flight		2	11*
" " "	8½" diameter x 9" pitch control		2	8½*
" " "	7½" diameter x 6" pitch free-flight		2	3½*
" " "	6½" diameter x 7" pitch control		2	3½*
" Hydulignum Propellers	7" diameter x 7" pitch free flight		5	0*
" " "	8" diameter x 4" pitch control		5	0*
" " "	9" diameter x 9" pitch free-flight		5	7½*
" " "	10" diameter x 5" pitch control		5	7½*

* Prices marked thus include purchase tax.

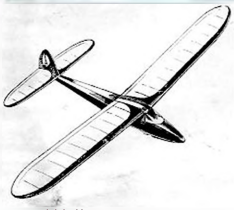
E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD

DEVELOPMENT ENGINEERS

1223 18, VILLIERS ROAD, KINGSTON-ON-THAMES, SURREY, ENGLAND.

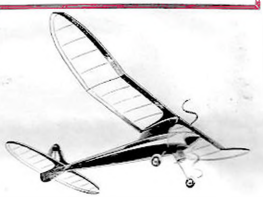
FROG TRADE MARK SUPER CONTEST MODELS for 1951

These new FROG Models and engines are the result of months of careful experiment by FROG designers, A. A. Judge, C. T. Buffery and J. R. Vanderbeek who, between them, have almost 60 years practical experience of designing good models. Only FROG Kits are thus ensured of the very best in design and production—insist — on them ! !

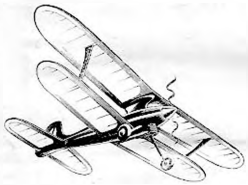


"DIANA" — A NEW 36" span sailplane kit—equally suitable for beginner or expert.

"POWAVAN" — the last word in power duration models. Climbs way over 2,000 ft. per min. with a FROG "100"

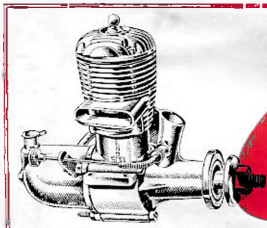


"FOX" — NEW ! ! A 40" span "Simple-to-build" pylon duration model for up to 1.5 c.c. motors. "FOX" features ready formed fuselage shells.



"FIREFLY"—36" span, biplane —with a 1 to 1.5 c.c. motor it flies well in any weather.

"WITCH" is a new "semi-streamliner" 36" span, rubber powered and perfect for contest work.



The FROG "500" has been acclaimed as the finest 5 c.c. motor ever! It revs quite happily at 4,000 r.p.m for test flying—and screams up to 15,000 at a touch of the throttle. A perfect example of British precision engineering.

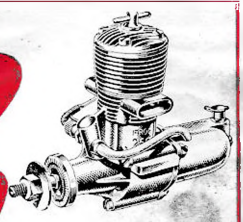
FROG TRADE MARK

POWER PLUS MOTORS

"500" HOT COIL

"250" DIESEL

The prices of these items may be obtained from your local FROG dealer



Another new FROG Super Diesel—for all types of Free-flight or Control-line models. Speed range of 2,000-10,000 r.p.m. Results have already proved our claim that the FROG "250" is the finest British diesel ever produced.

International Model Aircraft Ltd.
MERTON · LONDON · S.W. 19. ENGLAND.
Makers of "Frog" Super Flying Models & Engines.