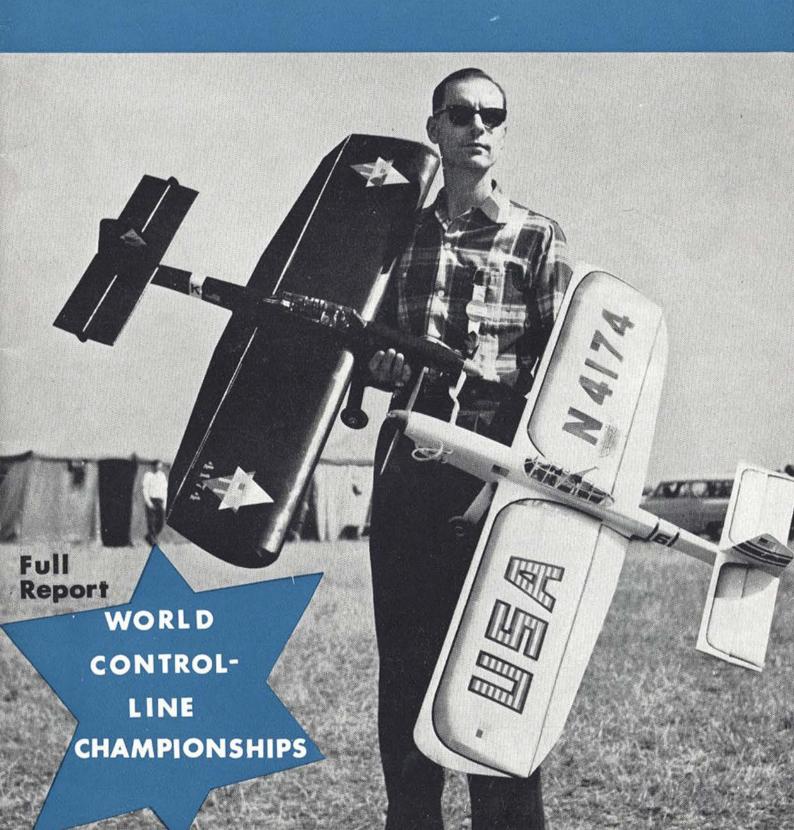
WINGS CLUB FOR BOYS INSIDE

NOVEMBER 1960

16

MODEL



ANOTHER NEW





Large 40" span free flight model specially designed for the new 049 glowmotors and ·5 diesels.

Extremely rugged, with kit featuring die-cut sheet fuselage sides, die-cut wing-ribs, formers,

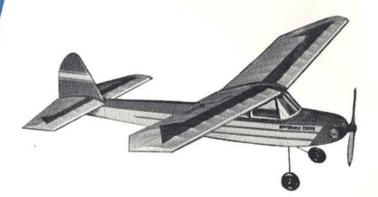
Designed by Neville Willis

inc. 19¹9

The Greatest Name

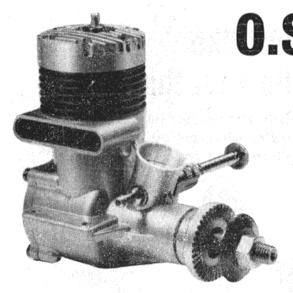


TRADE ENQUIRIES ONLY



SEE THE TRUPE AT YOUR NEAREST MODEL SHOP

in model kits



Max III Series Sensational Record Smashers

O.S. MAX ENGINES BREAK MORE RECORDS!

"CLASS III TEAM RACE"
TIME LOWERED IN THREE
SEPARATE STATE
CHAMPIONSHIPS!

VIC. 8 mins. 48.7 Secs. — MAX III .35

N.S.W. .. 8 mins. 47.9 Secs. — MAX III .35

QLD. 7 mins. 26.7 Secs. — MAX III .35!!

(Record held by M. Ware, Qld. 9 min. 16 sec. Max II .35)

Continued proof that O.S. Products hold unchallenged supremacy . . . through performance.

REMEMBER . . . APART FROM TWO WORLD CHAMPIONSHIP WINS!

- ★ More Australian Records and Titles are held by O.S. Max Engines than all other brands, including . . . ALL THE TEAM RACE RECORDS.
- Max Engines completely "swept" the Australian Nationals, with 26 wins and places . . . MORE THAN ALL OTHER BRANDS COMBINED.
- Again this year, O.S. Max Engines and RADIO CONTROL EQUIPMENT, have completely dominated all State Championships, particularly in Stunt, Combat, Class II and III Team Race, Class I Speed and Single and Multi Channel Radio Control.
- ★ For Complete Trade Price List and immediate service . . . Shopkeepers contact—

O.S. DISTRIBUTORS (AUST.) 2 Erasmus Street, Surrey Hills, Vic., Australia

Airfix Lockheed P 38J Lightning. 3/-

Just like the real thing!

Airfix kits are not just models they're exact replicas, each series to a constant scale.

Copyright photograph by permission of Imperial War Museum

There are models galore from fighters to bombers (all to the same 1/72nd scale), 00 gauge railway accessories, vintage cars, historical ships. Airfix value is unbeatable ask your dealer for the

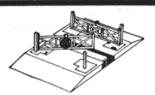
in the Airfix range! Aircraft latest list.

Nearly 100 kits from 2/- to 10/6d.



THE WORLD'S GREATEST VALUE IN CONSTRUCTION KITS

From Model and Hobby Shops, Toy Shops and F. W. Woolworth



TRACKSIDE SERIES Level Crossing 2/-.



[A259]

iv



VINTAGE CARS 1930 Bentley 2/-



HISTORICAL SHIPS H.M.S. Victory 2/-

STOP PRESS!

Latest Airfix Production



BLACKBURN N.A.39

A perfect 1/72nd scale model of the latest naval strike aircraft, with Royal Navy markings. 103" long, it has folding wings, hinged nose cone and other moving parts. 4/6

Also new: 1/12th scale model figure of 3/-BLACK PRINCE.





LTD . COMMERCE WAY . LANCING . SUSSEX

Telephone LANCING 2866-7
Telegroms SOLARBO WORTHING

This is a sort of farewell letter for a month or so, as I am off on a very extended tour both selling on the other side of the Atlantic, and seeing to my balsa supplies.

If any of you remember back to the previous letters written by other people when I have been away, they always seem to make what I would describe as highly coloured and quite untrue assertions as to my activities abroad. This time I am taking this opportunity to deny everything before I go.

On this trip I hope to get a lot of pictures in Ecuador, both of balsa trees and balsa mills, and the scenery. From these we shall make up a set of slides to lend to Model Clubs.

As a lot of new roads have been built since I was last there I am travelling by car this time, from top to bottom of the country both mapwise and vertically from the Coast to the Andes.

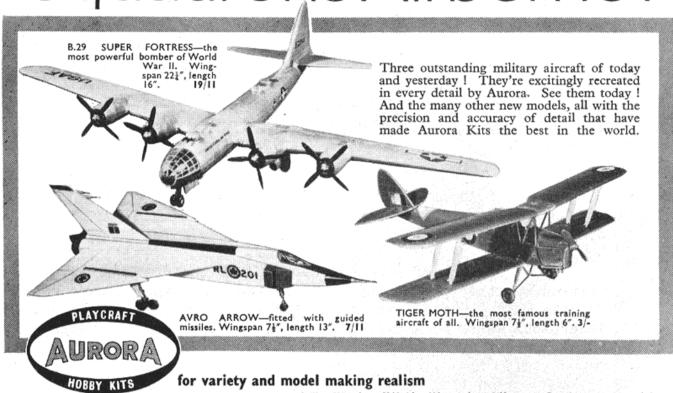
THE BEST BALSA
COMES FROM

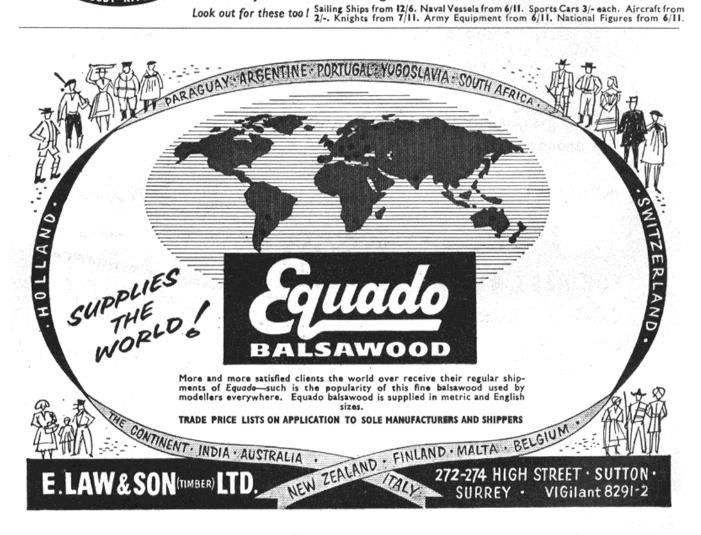


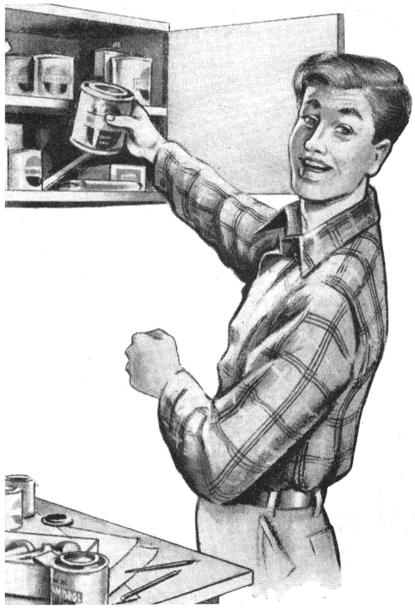
COMMERCE WAY, LANCING, SUSSEX



Squadrons Airborne!







HUMBROL

makes your masterpiece

THE HUMBER OIL CO. LTD., PAINTS DIVISION, MARFLEET, HULL. Tel: 74121.

he's reaching for his fine finish.

careful planning ... meticulously selected materials ... hours and hours of painstaking work ... how often do you pride yourself on your handiwork before you apply the final finish? And how many times does the finished effect fall short of your expectations?

.... DON'T SPOIL IT WITH AN INFERIOR PAINT—USE HUMBROL the new formula enamel, dries in 1 hour with no brushmarks needs no undercoat proofed against Diesel Fuels and light in weight ideal for finishing all types of surface. No waste too! HUMBROL comes in handy painting outfits and the popular tiny tins USE HUMBROL for a finer finish



IN HANDY TINS FROM & OZ. UPWARDS.

TOP TIPS

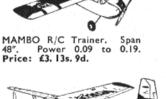
Tip No. I. Transfers that offend a matt paint scheme can be made full matt by overpainting with Humbrol Flat Finish. Stir this vigorously before use, otherwise the finish when dry will still be gloss. A semi-matt effect, if complete matt is not required, can be obtained by giving the tin only a slight stir.

Terling KITS Especially designed for Radio Control



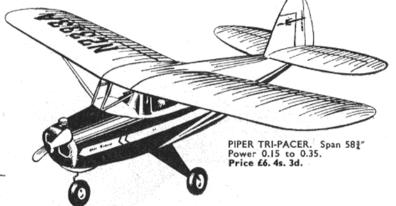
THE MONOCOUPE. Span 64". Power 0.19 to 0.35. Price: £6. 4s. 3d.







Span 45". CESSNA 180. Power 0.049 to 0.15. Price: £3. 13s. 9d.



PIPER CUB J.3. S Power 0.09 to 0.15. Price: £4.2s.3d. Span 54".



MULTI CHANNEL DESIGN WIZARD. Span 54". Power 0.15 to 0.45. Price: £6. 4s. 3d.



FAIRCHILD PT-19. Span 48". Power 0.09 to 0.19. Price: £3. 13s. 9d.

SOLE UNITED KINGDOM IMPORTERS

The illustrations feature a small selection of the "STERLING" kits available in a large and comprehensive range of scale models for Radio, Free Flight and Control Line, and Boating enthusiasts.

Step-by-Step plans and instructions. Die cut parts. Rugged and simple construction.

See these qualities Kits NOW at your local retailers.

HOLT WHITNEY & CO. LTD 13 WHITTALL ST., BIRMINGHAM 4.

AGES P.V.A. WHITE GLUE

THE MODERN VERSATILE **ALL-PURPOSE ADHESIVE**

6/6

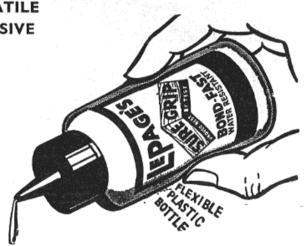
For bonding Balsa Wood, Plywood, Hardwoods and Laminated Plastics, etc.

Shear strength 2,800 lbs. per sq. in.

No. 21 2 oz. Plastic Bottle ... 4 oz. Plastic Bottle ... No. 22 3/6 No. 23 8 oz. Plastic Bottle ... 5/6

Remember there is no substitute for Lepage's!

12 oz. Refill Bottle



Non-Sticky · Quick Setting · Non-Toxic **Dries Transparent** Water Resistant Mould, Oil and Petrol Proof.



No. 121

HIGH STREET · BECKENHAM · KENT

£1 WORTH OF 1/72 SCALE 3-VIEW PLANS FOR 5/-

Having stepped up our rate of production of "HARBOROUGH" books from one every 15 months to one every six months ("SPITFIRE—THE STORY OF A FAMOUS FIGHTER" to be published early next November, and "FOKKER—THE MAN AND THE AIRCRAFT" early next May) we have decided to cease selling our well-known series of 1/72 scale 3-view plans.

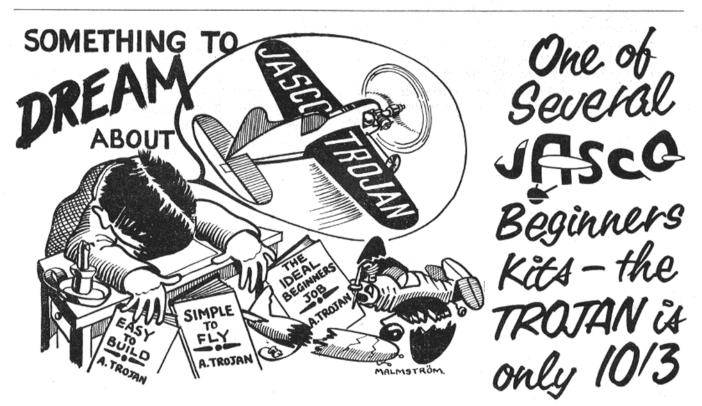
We are organising a CLEARANCE SALE, and offer a special PLAN-PACK of £1 worth of plans for 5/- post free.

Each PLAN-PACK contains plans of 40 aircraft, names as follows:—6 three-page drawings each approx. 10 in. × 23 in. Boeing B-17E (R.A.F. Fortress II). Avro Lancaster B.1. Short Sunderland 1. Focke Wulf FW 200B "Condor." Blohm & Voss Bv142. TB 7. 20 two-page drawings each approx. 10 in. × 16 in. Blohm & Voss Ha 139 B. Junkers JU 52/3 mK. Junkers 88 A-1. Messerschmitt Me 110 C.5. Fokker T.4. Fokker T.5. Heinkel HeIII HaE. Junkers A-4. Saro Lerwick I. Dornier Do215. Vickers Wellington II. Bristol "Beaufort" II. Dornier Do 17 Z. De Havilland 86 B. Vickers Wellington Ic. Bristol Blenheim I and IV. Piaggio P.32 Bis. Cant Z 100 Bis. Alcione. Bell YFM-1A "Airacuda." Martin B-26 "Marauder." 14 one-page drawings each approx. 10 in. × 7 in. Sopwith Triplane. Sopwith 5 F.1 Dolphin. Curtiss J.N.4a. Sopwith Salamander. Siemens-Schuckert DIV. L.F.G. Roland D VI a/b, Hawker Slip-Wing Hurricane (F.H.40 Mk. 1). Hawker Hurricane I (R.C.A.F. Modification). Hawker Hurricane II D. Hawker Hurricane Trainer. YAK-1. MIG-3. SU-2. YAK-4.

The above listed plans would normally cost 15/6d. IN ADDITION, we will supply a "BONUS" of 4/6d. worth of plans (OUR selection), of either 1914-1918 aircraft; or aircraft of the 1920-1945 period (YOUR choice).

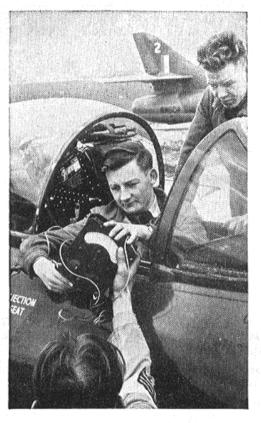
Hundreds of PLAN-PACKS have been prepared, but this offer automatically closes when stocks are exhausted. Send your order NOW! Enclose P/O or cheque 5/-, and state whether you want your "BONUS" plans to be of 1914-1918 or 1920-1945 aircraft.

HARLEYFORD PUBLICATIONS LTD. (Dept. P/MA) LETCHWORTH, HERTS.



JUNIOR AIRCRAFT SUPPLY Co. Ltd.

Kays Buildings, 129 Eastbank Street, Southport.



At 16 he's learning a trade in the cockpit of an interceptor fighter—

he's an apprentice in today's R.A.F.

The best trade training in the world

Keeping the aircraft of the Royal Air Force at peak performance is the great responsibility of the craftsmen in the R.A.F. If you are between 15 and 17 you can train as an apprentice or boy entrant to become one of these craftsmen.

In the R.A.F. you learn your trade under first-class instructors—but you've got to be good to get in.

People who are up to the R.A.F. standard are worth good money—and they get it. For example, when you are $17\frac{1}{2}$ you get £6.9.6. a week, all

found. You don't pay for food or rent so all your pay is pocket money.

Plenty of sport, good food, good friends

Sport is well-organised and you can play practically everything in the book from soccer to water polo. And when it comes to food the R.A.F. is absolutely unbeatable. You often get as many as ten main dishes to choose from, and the amount you can eat is up to you.

You will make a lot of good friends in the R.A.F.—boys who like working with or near aircraft all the time. Just like yourself.

TODAY'S TOP JOB IS THE R.A.F.



	These are the trades the R.A.F. can train you in: AIRCRAFT ENGINEERING, RADIO ENGINEERING, ARMAMENT
	ENGINEERING, ELECTRICAL & INSTRUMENT ENGINEERING, GENERAL ENGINEERING*, GROUND SIGNALLING*, MECHANICAL TRANSPORT*,
	ACCOUNTING AND SECRETARIAL, SUPPLY, DENTALT, PHOTOGRAPHY*, CATERING*, NURSING ATTENDANT*.
	Underline the ones that interest you. * Boy Entrants only. † Apprentices only.
,	Please send me, without obligation, details of training as an Apprentice or Boy Entrant.
	NAME
,	ADDRESS
	DATE OF BIRTH
,	Send the completed coupon to:-
	R.A.F. Careers Information Centre (MAC 114b), Victory House, Kingsway, London, W.C.2.

MODEL

NOVEMBER 1960

No. 233

VOLUME 19

The official Journal of the SOCIETY OF MODEL AERONAUTICAL ENGINEERS

IN THIS ISSUE

11		marin B	217
Here	and	There	31/

Economical Multi 319

Engine Tests 320

			-		
M.E.	Heron	and	M.V.V.S	. 2.5 cc.	glo

Readers Hints and Tips 323

Radio Topics 324

World C/L Championships 326

3111p3 32

Over the Counter 334

Topical Twists 335

Wings Club 336

Readers' Letters 339

Slipstream 340

Aviation Newspage 342

Plane of the Month 343

Latest Engine News 344

Club News 346

Published on the 20th of each month prior to date of issue by

PERCIVAL MARSHALL & CO. LTD. 19-20 NOEL STREET, LONDON, W.I.

Telephone: GERrard 8811

Annual subscription 22s. post paid. (U.S.A. and Canada \$3.)

Percival Marshall & Co. Ltd., 1960

Here and There

Controversial decisions by F.A.I. Officials and Jury provoke bitter arguments at Control-line Championships.

THE first* World Championships for C/L models, which is reported elsewhere in this issue, was held in Hungary and was one of the best organised events we have attended. The organisation functioned smoothly, unobtrusively, and with a strict sense of time. Literally we heard no complaints about the conduct or ability of the Hungarian officials.

Unfortunately, however, full enjoyment of the meeting was marred by the unsporting behaviour of some competitors, and the incomprehensible, inexact, contradictory, ambiguous, inept and, as it seemed to us, in some cases definitely biased decisions arrived at by F.A.I. officials and even the jury! Constant behind-the-scenes wrangling, protests and "bombshell" rule interpretations were extremely distasteful to all modellers who consider our hobby a sport, where, given an equal chance, the best man wins.

The first furore was caused when it was announced that the special speed handle must be used for team racing. In the F.A.I. Code Sportif (Sporting (sic) Code) it is clearly laid down that this handle applies to speed models only. When, therefore, it was announced that this handle must be used for team racing there was an immediate protest from fliers whose handles, although they conformed to the limits specified for team racing, did not conform to the speed requirements.

In answer to these protests H. Gillman, Secretary General of the F.A.I., pointed out that it was intended that the handle should be used for team

racing and speed, but he had in error only included it in the speed section of the rule book. The rule dealing with the handle has been out for months, yet no additional amendment relating it to team racing has been issued. Are aeromodellers supposed to read his mind? Are competitors who have travelled for several days to a contest expected to spend their well earned sleeping time scouting round for materials to make a new handle? They did, but what an incredible state of affairs!

This got team racing off to a bad start; the finish was far worse. Rosenlund's fair, clean and very convincing win had left no doubt in anyone's mind which was the best model, so the subsequent protest by Belgium that he had entered the circle to retrieve his model, after he had completed the distance, was, to say the least, shattering. That such a protest should be accepted leaves us speechless.

So incensed were the English team at this manoeuvre that they lodged a protest against the Belgians for allowing their model to collide with the British entry. Apparently this protest was ignored.

After the first round in speed it was obvious that the American monoline models were capable of speeds far in excess of anything yet seen in Europe. The Italians protested against the use of monoline, and to everyone's amazement the protest was upheld, despite the fact that the U.S. models had been passed at processing, pull tested and approved by the Hungarian officials

and further that a monoline unit had been submitted to the C.I.A.M. by America, and approved! Full marks to the Czechs for making the European bloc look foolish and for registering an effective comment by producing their own monoline models (they used orthodox models in the first round), and showing that it was not only monoline that gave the Americans their lead. This action helped considerably to prevent the complete banning of monoline at the meeting.

It was after this that the Italian top man Rossi gave a demonstration of the most unsporting flying ever seen. Pushing the lines with his upper arm (see photo) he whipped his model up to a speed just sufficient to beat Wisniewski. What he or the other members of his team who cheered the flight thought this proved, we cannot understand, as he clearly broke at least two of the Code Sportif rules. A British protest against recording the flight time, on the grounds that it did not conform to the rules, was apparently ignored.

Even the stunt contest, traditionally the most gentlemanly C/L event, was shot through with arguments. Obviously we were unable to watch every flight in its entirety so are unable to comment at first hand, but when so many competitors from several countries stated that the scores bore little relationship to the flying, then this is a weight of opinion which is not to be discarded lightly. Especially in view of a statement by a fellow countryman of one of the judges that he had not even judged a national event in his own country!

It is difficult to reconcile the F.A.I. system where the highest and lowest scores of the five judges are discarded and only the three "middle" ones counted, to any charges of bias or favouritism. However, we know at least two judges of international repute who consider that this system is not as fair as it first appears, and they think that all five scores should be counted.

An even more important innovation which they advocate is that all the score sheets should be available for

This photo clearly shows the manner in which Rossi flew to attain his winning speed. The direction in which he is looking and the sun glinting on the wires to the left of the picture, indicate the position of the model relative to his hand in the pylon, while the marks made by the wires as they press against his upper arm can just be seen. inspection by the contestants, who should be allowed to question judges as to why they had been marked up or down for particular manoeuvres. strongly support this suggestion as it is the only way in which a flier can accurately learn by his mistakes.

It is a pity that after all the hard work put in by the Hungarians that their first World Championship meeting should have been marred by these complaints, particularly as most of them should never have arisen.

We are strongly of the opinion that all countries who consider aeromodelling a worthwhile sporting hobby should seriously consider whether the expense of sending teams to World Championships, when situations such as we have just described can arise, is justified. On all broad questions of the right or wrong of rule interpretation, contest fliers know what they want, and when F.A.I. officials realise that they are there to represent the contest flier, not to act as little tin dictators, then the biggest hurdle will be crossed.

We have no wish to labour our point but for years weaknesses of F.A.I. administration have been apparent to us; also, on the part of certain officials, a national bias which is deplorable. In the past these things have been glossed over or ignored by all model magazines, but the incredible happenings in Hungary have, as far as we are con-cerned, proved to be the straw that broke the camel's back. The time has come to stand up, not only for the rights of the average flier, but far more important, for the future and integrity of international competitions.

*There is even a mystery as to whether this is in fact the first C/L Champion-Belgium announced that the meeting held there in 1958 was the first one, but A. F. Houlberg, who was at that time President of the Models Commission of the F.A.I. assured the S.M.A.E. that this was not the case. As far as we know the F.A.I. have never clarified this point.

Mystery Cover

VÉ have received several letters from readers who were rather mystified by last month's cover picture. We inadvertently omitted the caption, and our faces are suitably red!

The photo was taken at this year's Air Force Model Aircraft

Championships, and showed Cpl. Godfrey and his son Phillip with their magnificent red and silver C/L Percival Proctor.

This Month's Cover

TIGHEST individual stunt score for one flight at the recent World Championships, was put up by American Don Still flying the model held in his right hand. This pair are actually "twins"; it is just the totally different paint jobs that give them that "different" look.

Working Over Time

EVER since the first model went o.o.s., F/F timekeeping has depended more on good eyesight and tactful judgement than on precise recording. Few experienced timekeepers interpret the rules quite literally, and usually make some allowance for a temporary loss of visibility. Indeed there are certain unwritten laws which operate against a too punctilious timekeeper clocking off a model as it profiles out of sight on the turn. However, some confusion does exist where a model dips below the skyline to disappear against the dark background of trees. Often the model can be picked up again as it swoops over the lighter ground below, but the interval of vision loss may be quite considerable.

Understandably, many timekeepers are reluctant to clock off a model which they know to be still actively flying within the airfield limits. In some cases a timekeeper will keep his watch going in the uncertainty of the possible reaction from other observers. He might feel foolish at losing sight of the model at such a critical time, and thus be misled

into returning a false score.

This sort of situation has become aggravated by low maximum limits. Given reasonable weather conditions quite a number of 3 min. flights can be expected to terminate within the boundaries of a decent sized airfield. Where a model makes a good, decisive maximum, d/t-ing down from a high altitude, there is no problem, but with the "only just" 3 min. performer the question of near ground invisibility often arises.

Perhaps the fact that the o.o.s. rule, applied in its strictest sense, gives a definite advantage to the better performing model, says much for its logic and for its more stringent application.



ECONOMICAL MULTI

HARRY STILLINGS tells

how to get the most out of

three-channel RIC

REGULAR readers may recall my two-part series (Model Arrcraft, December, 1959 and January, 1960) "Go multi with me," in which I described my first venture into multiple control after a lengthy and fairly successful career in single-channel. I decided to try three channels first, operating sequence rudder, elevator and motor actuators. The system worked quite well, but I have modified the servo set-up considerably since then, to give selective up- or down-elevator, and fully progressive motor-speed control. With certain limitations, therefore, I now enjoy many of the advantages of a sixchannel outfit at the price of only three.

All that is needed is a good three-reed receiver (my choice was the R.E.P. Tritone which has given complete satisfaction), plus a three-channel control box and modulator unit for one's existing carrier-wave transmitter, both the latter being also available from Radio & Electronic Products at quite modest cost.

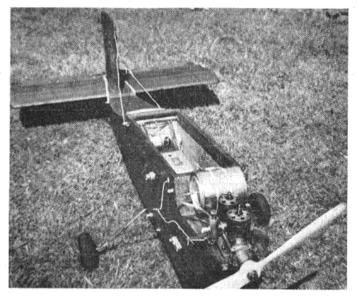
The three reeds are used for rudder, elevator and motor-speed respectively. I have retained the original standard ED self-neutralising actuator for rudder, as I have had a long experience with this form of control and I merely use the control lever in the same way as I used to do with the push-button for s/c. There are times when I find myself wishing that I had another channel to spare and no doubt that will be my next

step, but this method is a good compromise if cost has to be kept down.

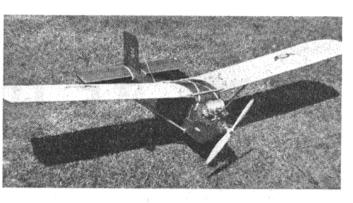
It is far more desirable to have selective elevator, for obvious reasons, and I now use a Taplin motorised actuator, which gives one position on one signal, the opposite on two, and is self-neutralising with signal-off. It is a bit on the heavy side, but can be mounted in the cabin where it has virtually no effect on C.G., and is a very robust unit with ample torque to supply reliable power for moving the elevator against slipstream effects.

I use down-elevator on one signal, up on two, as I find this the most convenient for average requirements. Incidentally, only one signal is required to move DIRECT (i.e., without intervening pause in neutral) from one position to the other; thus for a loop one gives press-andhold, giving down-elevator, to put the model into a dive; when sufficient air-speed has been built up, another pressand-hold gives up-elevator (the movement is progressive, and no intervening pause in neutral is therefore required), this position being held until the loop is completed. To prevent soaring at the end of the loop another press-and-hold gives "down" again, neutralising as again, neutralising as soon as the model has straightened out. An Immelmann (half-roll off the top) is achieved by neutralising the elevator and giving a rudder signal at the top of the loop, neutralising rudder on completion of the half-roll.

Heading photo shows writer's O/D multi model, with Taplin Twin 7 c.c. diesel. Weight 6 lb., span 64 in., all-position fuel tank from old dope tin!



Left: This view shows exterior of motorspeed linkage, also Taplin geared motor servo for elevator control, at rear of cabin.



It must be realised that if up is required direct from neutral, the elevator will go through the down position, and although the nose-down attitude is only momentary, this should not be done very close to the ground. Up can quite safely be signalled to unstick a reluctant model nearing the limit of a runway, as the brief down has little effect in these circumstances except to make the subsequent up-elevator command rather more effective—but do remember to let go as soon as the wheels leave the ground or you will almost certainly induce a stall.

The torque available from the Taplin geared motor is ample for all needs, but if there is any doubt about self-neutralising accurately, some form of spring-return to neutral may be added. I find a rubber band attached to the tip rib of the tailplane with the other end lightly stretched to a wire arm from the elevator does the trick. Whatever method is used, it should not be too strong—only light tension is required to encourage the servo to return always to exact neutral.

I am particularly pleased with the motor-speed control I have dreamed up.
This is based on the "V.I.P." type C.C.D. motor, which comes with a double gear train, plus a separate large gear wheel which must be mounted as shown in the photograph. Total reduction is therefore 180-1, giving a speed on the final drive of only 1 rev. about every $1\frac{1}{2}$ seconds, on 3 volts. If a faster speed is preferred, 41 volts gives almost exactly 1 rev. per second. Drive is by simple crank/loop, as shown, pivoting in a screwed bush fitted in the cabin side, the outer end of wire forming the arm to which the throttle push-rod is attached. A quick blip "inches" the control a fraction at a time, so that any position from tick-over to full speed can be selected, or a brief signal will move the throttle from one extreme to the other in rather less than a second.

Apart from the much greater pleasure this fully-progressive control gives for purely sport flying, its advantages for duration or distance attempts are obvious—by carefully "inching" the throttle to the right position one can keep the model at a constant height, neither climbing nor sinking, for the entire motor-run if desired. Thanks to the multiple gearing, the torque at the business end is ample to move any

Continued on page 345



FIRST announced in June this year, the M.E. "Heron" is made in the Isle of Man by Marown Engineering Ltd., a new concern under the direction of Walter Kendall, who has had a number of years in the model engine industry.

The Heron is clearly aimed at the "popular" market. Its 1 c.c. size makes it well suited to both C/L and F/F use, in a large number of popular model designs well within the capabilities of newcomers to the hobby. Its modest price and easy handling characteristics should also help to establish it with this section of the market.

The design of the Heron is essentially orthodox. It is a shaft-induction, radially ported, variable compression diesel, having a pressure diecast crankcase with integral main bearing housing and a flanged cylinder sleeve retained by a finned alloy cylinder barrel screwing into the top of the main casting. A less conventional refinement, however, is the use of a cast-iron (Mechanite) bushed main bearing. This, in conjunction with the long, hardened shaft journal used, should give an extremely long useful life. We are informed by the distributors, Messrs. Keilkraft, however, that this was not the designer's sole reason for the choice of a Mechanite bushed bearing: a well-maintained shaft fit being considered an aid to good starting by virtue of the better crankcase compression ensured.

The crankcase casting incorporates beam mounting lugs, but there is provision for alternative three-point bulkhead mounting, if desired, via the backplate mounting lugs. These latter are tapped 6 BA. The upper section of the casting is widened to accept the exhaust flange and threaded portion of the cylinder barrel which clamps the liner in position. It is sufficiently large to form an exhaust collector ring, there

being a pair of stub outlets, one each side. The piston is flat-topped and is coupled to a machined duralumin connecting - rod by a fully - floating gudgeon-pin.

The crankshaft is of the non-counterbalanced pattern and has a 0.270 in. dia. journal. The valve port is drilled 5/32 in. dia., inclined at an angle corresponding to the forward rake of the carburettor intake. It gives an induction period of approximately 155 deg., timed 55 deg. after bottom-dead-centre to 30 deg. after top-dead-centre. Drive to the prop is conveyed through a pressure diecast aluminium alloy drive hub accurately fitted to a tapered section on the shaft.

The diecast backplate has a central boss to which a neat alloy tank of useful capacity is attached by a single screw.

Tank, spinner nut and cooling barrel are all of a red anodised finish, while the castings are sand blasted matt grey. Workmanship throughout is good.

Specification

Type: Single-cylinder, aircooled, reverse-flow scavenged two-stroke cycle, compression ignition, with shaft-type rotary-valve induction.

Bore: 0.424 in. Stroke: 0.420 in.

Swept Volume: 0.0593 cu. in. = 0.972 c.c.

Stroke/Bore Ratio: 0.991 :

Weight (with tank): 2.65 oz.

General Structural Data

Pressure diecast aluminium alloy crankcase and main bearing unit with integral carburettor intake, mounting lugs and exhaust ducts. Detachable crankcase rear cover

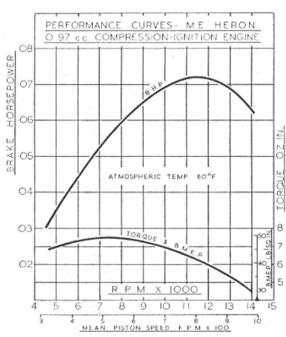
secured with 6 B.A. screws. Crankshaft of B.S.S. EN.34 63-ton steel, case-hardened, with 0.270 in. dia. journal, 5/32 in. dia. crankpin and plain disc type web and running in Mechanite bushed main Meehanite cylinder liner, flanged at exhaust port level where it is vertically located on annular seating in main casting. Liner has three radial exhaust slits and three radial transfer slits, fed from 360 deg. transfer passage. Mechanite contra piston. Mechanite flat crown piston with 1/8 in. dia. fullyfloating solid gudgeon-pin. Connectingrod machined from B.S.S. L.64 hightensile aluminium alloy. Machined aluminium alloy, finned cylinder barrel and head unit, externally threaded at lower end and screwing into top of crankcase and thereby clamping cylinder liner flange. Brass spraybar type needle-valve with right-hand control inclined rearwards. Detachable alloy fuel tank with centre screw fixing permitting tank to be rotated for inverted or side mounted installation. Beam mounting lugs, plus provision for bulkhead mounting.

Test Engine Data

Running time prior to test: 4 hours. Fuel used: Keilkraft Nitrated Diesel.

Performance

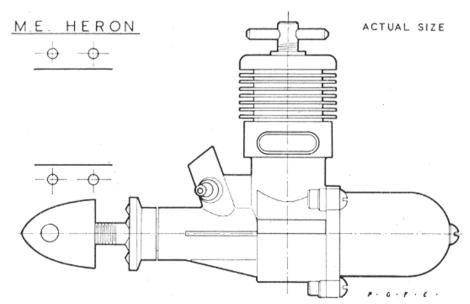
Prior to testing the Heron, we had received observations from one or two purchasers to the effect that starting was not as easy as had been expected, due, it was thought, to initial tightness in the main bearing. Particular attention was, therefore, paid to this point when running in the test Heron. However, we detected nothing to confirm these reports in our particular



engine. Starting qualities were goodnot, perhaps, the most foolproof we have experienced, but certainly among the best—and there was definitely no excessive tightness in the main bearing. After an initial running-in period of one hour, the engine was given a further three hours to make sure that it was reasonably well freed for test. The difference in performance at the end of this period was, however, negligible.

Torque and r.p.m. readings were then taken over a load range of 5,000-15,000 r.p.m. Loaded for speeds below 5,000 r.p.m. the Heron was definitely not happy and the largest practical prop size appeared to be the Keilkraft 9 × 4 nylon which the Heron turned at a little over 7,000 r.p.m. This corresponded approximately with the speed at which maximum torque was recorded. For general use an 8 × 4 would be a good choice, giving between 8,000 and 9,000 r.p.m. according to make (Stant, PAW and KK Nylon being tried), while a 7 × 4 would allow the Heron to get near to its b.h.p. peaking speed in the air-approximately 11,500 on our test engine where an output of 0.072 b.h.p. was determined.

Controls were easy to adjust and non-

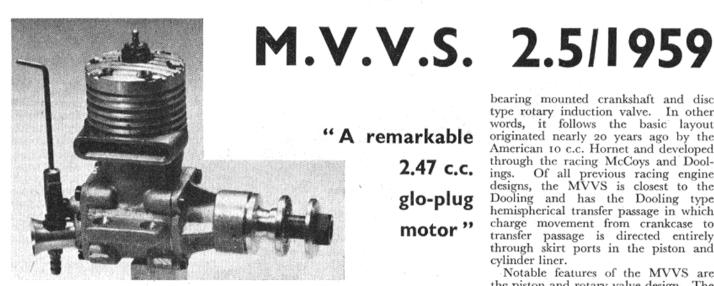


critical. The compression tommy-bar is possibly a little too short for the easiest possible manipulation, but the contra piston was a good fit and did not seize in the bore when hot, returning instantly when the compression screw was slackened off.

The Heron was not a phenomenal performer as regards power, but was a docile, well-behaved motor and should give excellent service.

Power/Weight Ratio (as tested): 0.435 b.h.p./lb.

Specific Output (as tested): 74 b.h.p./litre.



THE MVVS engines, built at the official State-sponsored Model Development Centre at Brno, Czechoslovakia, first began to make their mark in the world of modelling several years ago when Czech speed teams cleaned up several World Championship and International 2.5 c.c. speed events in quick succession, using these specially built motors.

Until 1958, MVVS motors were essentially "specials" available only to selected Czech experts and made in batches of, perhaps, no more than one or two dozen of any one particular design. In that year, however, there was a change of policy when the MVVS

25-D development of the Type 2.5/1958 diesel motor was put into small-scale production. It was joined in the following year by the Type 2.5/1959 racing glowplug motor which is the subject of our present test. The 2.5/1959 is produced in somewhat smaller quantities and is still a comparatively rare engine, seldom seen outside Czechoslovakia.

The 2.5/1959, of 2.47 c.c. swept volume, follows typical 5-10 c.c. loopscavenged racing engine design and features a lightweight, ringed, alloy piston and a one-piece crankcase and cylinder block with detachable front and rear units, comprising respectively, ball-

bearing mounted crankshaft and disc type rotary induction valve. In other words, it follows the basic layout originated nearly 20 years ago by the American 10 c.c. Hornet and developed through the racing McCoys and Doolings. Of all previous racing engine designs, the MVVS is closest to the Dooling and has the Dooling type hemispherical transfer passage in which charge movement from crankcase to transfer passage is directed entirely through skirt ports in the piston and cylinder liner.

Notable features of the MVVS are the piston and rotary valve design. The piston is remarkably light in weight (the complete piston, gudgeon-pin and conrod assembly weighs only 0.22 oz.) and has two very large ports which take up almost all the available skirt area on the transfer side. The piston head is essentially flat but has a curved and filleted baffle designed to deflect the incoming charge high into the combustion chamber on the transfer side.

The rotary valve consists of a rotor machined from cast iron (instead of the more commonly used materials-aluminium, Tufnol, nylon, Bakelite, etc.) and mounted on a steel shaft running in a long bronze bearing in the backplate. The backplate, with its inclined car-burettor intake, is basically the same as

MODEL AIRCRAFT NOVEMBER 1960

that used in an earlier model but is rotated through 90 deg. to bring the valve aperture to the bottom. The short gas passage through the backplate is nicely machined to blend the circular section at the carburettor into the 90 deg. segment at the valve aperture.

Induction timing is 45 deg. ABDC to 45 deg. ATDC while exhaust and transfer periods are 130 and 110 deg.

respectively.

Specification

Type: Single-cylinder, air-cooled, loop-scavenged two-stroke cycle, glow plug ignition. Rear disc type rotaryvalve induction.

Bore: 15 mm. (0.5905 in.). Stroke:

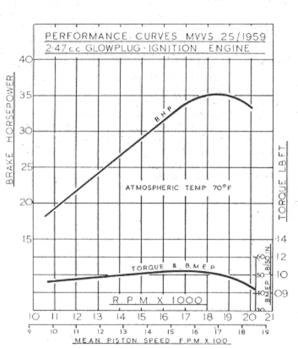
14 mm. (0.5512 in.). Swept Volume: 2.474 c.c. (0.151 cu. in.).

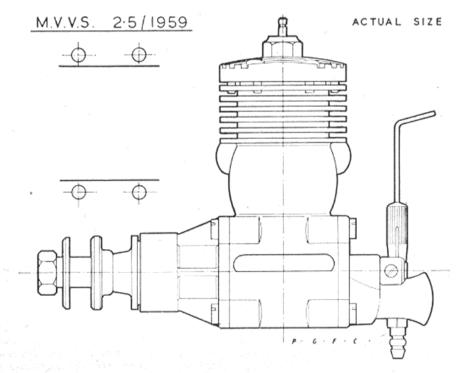
Stroke/Bore Ratio: 0.933: 1.

Weight: 5.1 oz.

General Structural Data

Sandcast aluminium alloy crankcase and cylinder block unit with shrunk-in or pressed-in cylinder liner. Detachable front housing of sandcast aluminium alloy secured to crankcase with four screws and containing one 7 mm. i.d. rear and one 5 mm. i.d. front, ball journal bearings. Counterbalanced crankshaft having machined-in crescent counterweight, 7 mm. dia. journal and 5 mm. dia. tubular crankpin. Machined aluminium alloy prop driver fitted to shaft via steel split tapered collet. Sleeve type prop nut. Sand cast rear crankcase cover secured to crankcase with four screws and with inclined machined aluminium alloy carburettor intake retained by grub screw. Cast-iron valve rotor fixed to hardened steel 3.5 mm. dia. shaft running in bronze bushed bearing in rear cover and retained by external collar and grub screw. Rotor shaft drilled for lubrication. Cast





aluminium piston with two compression rings and fully-floating 4 mm. dia. tubular gudgeon-pin having brass end Alloy connecting-rod with plain Cast aluminium alloy cylinder head with offset ignition plug and secured to cylinder block with six screws. No gaskets used-metal-to-metal joints throughout. Brass spraybar type needlevalve. Beam mounting lugs.

Test Engine Data

Running time prior to test: 4 hours (approx.).

Fuel used for test: KK-Record Super-Nitrex (30 per cent. nitromethane) plus 10 per cent. extra nitromethane.

Ignition plug used: Head modified for standard K.L.G. long reach.

Performance

The MVVS was a notably pleasant engine to handle. Unlike some small pistonring equipped engines, piston seal was good and provided really excellent starting particularly after an hour or so of running when the rings had become bedded in. The usual exhaust prime was necessary to obtain a start from cold but thereafter restarts were quickly obtained with only sucking-in. The engine is, of course, intended for operation on the hotter types of fuel and after about one hour on a milder fuel, all subsequent running was carried out on high nitro-methane content fuels.

At speeds below 14,000 r.p.m. the power output of the MVVS was quite poor when compared with several well - known production 2.5 c.c. contest engines. This was due to the unusual shape of the torque curve which reversed the common trend by reaching its peak at some 17,000 r.p.m. and falling by about 15 per cent. at 11-12,000 r.p.m. Developing its maximum torque at such high speed did, however, mean that in the region of 16-19,000 r.p.m., the MVVS developed real power-more than any-thing previously recorded in this series and just reaching 0.35 b.h.p. at 18,000-18,500 r.p.m. In other words, re-worked 6 × 9 and 8 × 4 props would be the largest practical size for C/L speed and F/F power respectively, with the preference being for 6×8 and 8×3 , or fractional variations thereon.

A rating of 0.38 b.h.p. at 18,500 r.p.m. on 45 per cent nitromethane is given by the Czech Model Development Centre for the MVVS 2.5/1959 and on the basis of our findings, this would not appear to be an unduly optimistic claim under ideal conditions. A quite remarkable

motor in every respect.

Power/Weight Ratio (as tested): 1.10 b.h.p./lb.

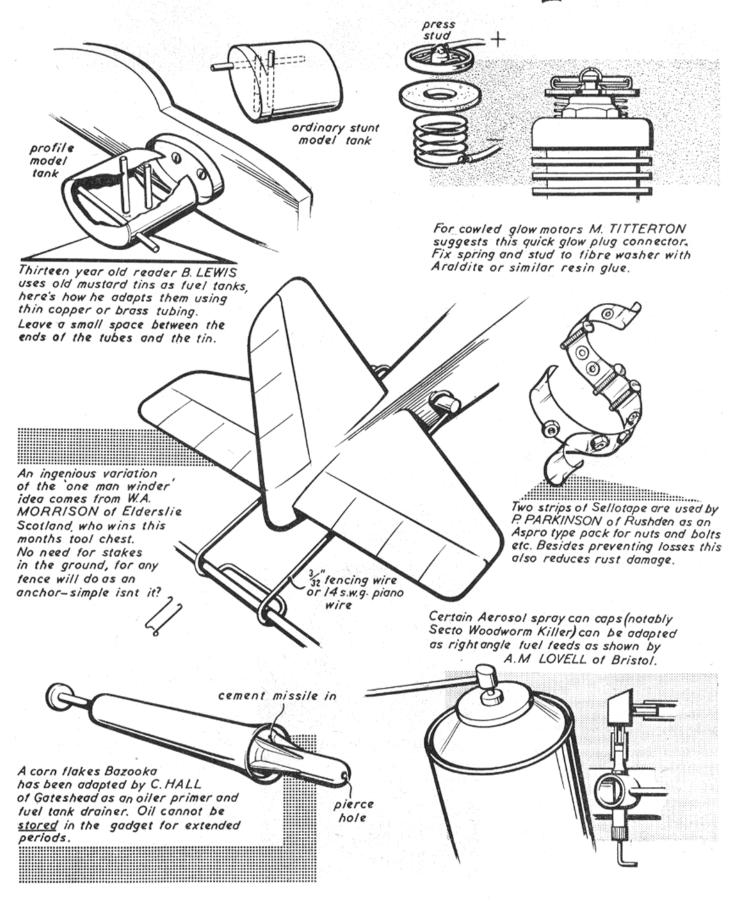
Specific Output (as tested): 141 b.h.p./

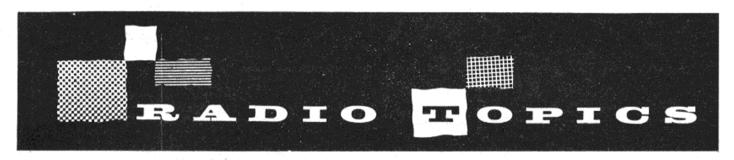
NEXT MONTH—

We make a revaluation of two long established and successful engines :-

The MILLS .75 c.c. and 1.3 c.c. DIESELS

Readers hints and tips ...





NTERESTING fact to emerge from preliminary reports on the 1960 U.S. Nationals R/G event is that the high wing design seems back in favour. Winner Doug Spreng flew a 0.45 cu. in. powered own design of shoulder wing layout, minimum dihedral and tricycle undercarriage. Ten channel equipment included steerable nosewheel control.

This could open up new design possibilities. At present British and American R/C "multi" flyers, at least, have rather tended to accept Smog Hog derivatives as the present ultimate in high wing layout, and the Astro Hog and derivatives as the "standard" for low wing design. Uproar, for instance, owes a lot to the Smog Hog. Equally, Kazmirski's world championship Orion and van den Berg's Skyduster evolved through Astro experience.

One thing is certain, though. You still need to make them large for best "multi" performance and the 0.45 cu. in. engine, when readily available, looks like becoming a standard for minimum power requirements. The old basic formula still holds good—build light and use plenty of power. There is a minimum to which you can cut down airframe weight and still be strong enough, which is why the radio control equipment boys are working on smaller, lighter units.

The Solidtronics (American) multiproportional equipment mentioned last month also featured in the American Nats. in the hands of Zel Ritchie, although not placed due to a crash (pilot error?). Currently this equipment is quoted at £245 complete in this country, delivery direct from U.S.A. We understand, however, that sole import rights have been negotiated by Ripmax Marine Accessories and that an initial delivery is actually on its way to that company.

Miniaturisation is usually confined to the equipment which has to be carried by the model, but photos right show an exception. This is a fully transistorised hand-held tone transmitter, designed and built by Eric Hook, with a size only 4 in. × 2 in. sq. Weight complete: only 8 oz.!

Circuit features an OC 170 transistor in the RF stage in a modified Colpitt's oscillator with a high C tuned circuit. Modulator incorporates two OC 72 transistors forming a 600 cycle multivibrator giving a 1: 1 mark: space ratio with true square wave modulation.

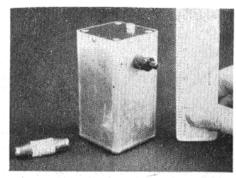
RF power output is 10 milliwatts from a single PP3 (9 volt) dry battery. Current drain for oscillator and modulator is only 12 milliamps! Both modulator and carrier are keyed simultaneously, this being possible on the type of circuit used.

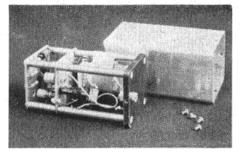
Aerial is a 3 ft. wire with centre loading coil. Range is naturally limited with the order of RF power available, but has been checked out at 200 yd. ground-to-ground. More than a bit marginal for aircraft work, perhaps, but this unit was built as an experiment and "matched" performance could probably be extended by giving more attention to receiver aerial design. This, in fact, is the next stage of development to be investigated.

Despite its small size, there is still plenty of room left inside the transmitter case—sufficient space, in fact, to accommodate a "Galloping Ghost" joystick control unit complete. If receiver aerial experiments result in increasing range to "foolproof" aircraft standards, this will follow.

Deac nickel-cadmium accumulators are obviously finding favour, despite the fact that they are a bit pricey. Recharging can present something of a problem, however, for although they

Below: Eric Hook's fully transistorised handheld tone transmitter. It measures only 2 in. sq. by 4 in. high and weighs 8 oz. A brief description is given on this page.





are robust enough to take a bit of abuse in the way of applied current, optimum charging rates should be adhered to for most consistent performance and maximum life. Following are recommended charging rates for the disc type cells:

charging duration

		citatging	autation
		current	of charg
		(milliamps)	(hours)
50 DK		5	
100 DK		10	
150 DK		15	
225 DK		22	
450 DK	and D	45	14
451 D		45	
900 D		90 .	
***	•		

Easy enough to remember—just take the first two figures of the code number as the charge current in milliamps. The same values also apply to recommended (maximum) discharge current in milliamps (equivalent to 10 hour rate). Charging voltage required is 1.35 to 1.50 volts per cell (series connection).

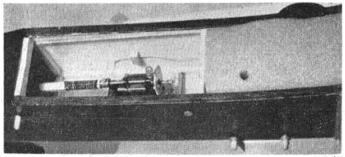
We have a Deac charger ready to evaluate and will give circuit and constructional details in an early issue.

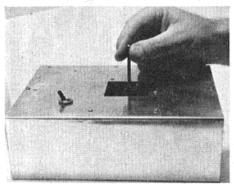
One of the few examples of a complete "Galloping Ghost" hand-held transmitter—in fact the first *integral* hand-held unit we can recall having seen ourselves—is shown opposite. Size is 9 in. × 7 in. × 3 in. and weight approximately 3 lb. Aerial is 3 ft. long, with centre loading coil.

The RF section is based around a 3A4 valve and 400 cycle modulation provided by a 3V4. The pulser consists of two transistors operating standard Ripmax relays—incidentally proving that special high speed relays are by no means essential for successful operation of the "Galloping Ghost" system. The carrier is on continuously and modulation is keyed by the pulser. Battery voltages 1½ and 90, with 6 volts for the pulser. RF power output half a watt.

The "Galloping Ghost" system—is, in fact, probably the most practical approach yet to the "poor man's multi," capable of providing selective and fully proportional rudder and elevator controls. Rudder and elevator are connected by mechanical linkage and both are continually operated. Variations in signal are then employed to make the system "dwell" in corresponding control positions. The "waggle" associated with the constantly oscillating control surfaces is not necessarily too apparent and on the glide, in particular, often not noticeable.

NOVEMBER 1960 MODEL AIRCRAFT





"Galloping Ghost" achieved considerable popularity some years ago but of recent date seems largely to have been forgotten. However, there seems to be a considerable revival of interest in the North Kent area and Dartford Heath has seen several new projects along these lines appear during the past month or so.

On the commercial equipment side British manufacturers have at last got down to productions of world standard (as the world championships proved), and we are getting the British engines to match. What of the kit side? Well, we still suffer in variety, perhaps, and lag in the larger sizes and the more elaborate productions. Mercury's Galahad is one of the few new "home" R/C kits to appear for some time. Of course, if you really want a kit of a bigger job you can now buy American, German or Scandinavian.

American kits, naturally, offer the widest and most attractive selection, and we have had a few in to examine recently. Frankly, we were shocked. Whilst these comments cannot be taken to apply to all, the general production was well below the average British kit standard and the wood selection in many cases frankly atrocious. Even in quantity of materials the value does not compare—especially after H.M. Customs have taken their whack on the way in. Either American kit standards are slipping, or we have advanced considerably over the past few years. A bit of both, perhaps.

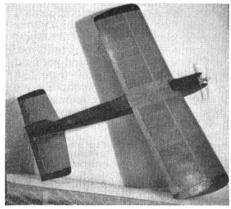
Cheapest source of "squeeze bottle" tanks we have found to date is Woolworths, where they come in various sizes, opaque and semi-transparent. If you want it quick and simple—and don't mind it being crude—you can get away with a bored cork in the end

Above: "Galloping Ghost" servo installation. Right: the control surface linkage. Left: the unique integral hand held G.G. transmitter.

carrying the two tubes. The flexible line with weighted end inside the tank needs to be something other than ordinary plastic fuel tubing, however. This hardens and stiffens under the action of fuel. Make it from neoprene tubing which is now available in this country, if not from all model shops.

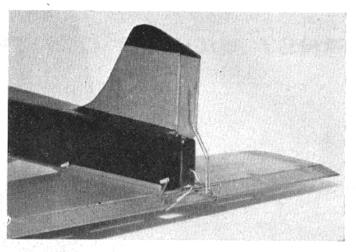
That hardy perennial cropped up again in a recent reader's letter—can you recharge ordinary dry batteries? Yes, you certainly can, but before making elaborate plans on this score, first consider whether it is worth it or not.

We did a considerable number of experiments on this score several years ago and found that with properly matched charging equipment (simple and easy enough to make), you could definitely boost performance of pen cells and similar sizes of batteries. Average output voltage was improved and also capacity, a single pen cell having a useful "life" of some 30 to 40 cycles.



Above: in this photo the proportions of a typical "Galloping Ghost" equipped model are shown to advantage. There appears to be a revival of interest in this control system.

On multi-cell batteries gains were less apparent, but recharging could still extend battery life over a number of cycles. Main scope, however, appeared to be for treatment of servo batteries and the like (dry cells). Since accumulators are more favoured these days for such duties, we doubt that a dry battery charger would have "universal" appeal.



However, if there is interest we shall be pleased to give full details in a later issue.

We get quite a number of "gadget" items from readers, none of which we have so far published. The reason is not that we want all the editorial space for ourselves (far from it!) but because electronics — and particularly systems-is a precision science and "bent tin" contact arms and "Meccano" type constructions are not our idea of what is wanted—and so we do not pass them on. Bench rigs can be really crude—and work. But something much better is required in a model which, after all, represents a fair investment in time and cash to get to flying stage. Optimism in hoping that something will work is no substitute for proving that it " will work under all operating conditions and making sure that both the design and workmanship are consistent with the requirements for continued. reliable operation. Boiled down this is just a plea for details of proven gadgetryplease?

A good friend of ours in the full size aircraft industry—and not a modeller—was once asked to judge a "design quality and concours" exhibition.

"How are you going to go about it?" we asked.

"Easy!" said he. "I'll pick out what obviously look the best of the models and give the prize to the one with the least number of external rubber bands holding it together!"

On a practical basis, we are sure he could not be more wrong. We have used cemented-on tailplanes and found them far less reliable than the usual practice of rubber band mounting provided proper keying is provided for alignment). And the same with wings. Now, finally, we are convinced of the same truth with undercarriages. All wire or cantilever light alloy, if it is strapped on with bands it can be wiped off in a really heavy landing without tearing half the guts out of the fuselage. And the fuselage, complete with radio installation, is a major time-consumer in any radio model.

Hungarians excellent hosts for

FIRST WORLD CONTROL-LINE



- Britain tops Team Race team results
- U.S.A. team supreme in Speed and Stunt
- Individual placings subject of considerable controversy

Report and photographs by Norman Butcher

WHEN it was announced that Hungary was to run the first World Championship for C/L models it promised to be a first-class meeting, and that promise was more than fulfilled. Two new circles with superb surfaces and comple tewith safety netting, team race lap clocks electrically operated direct by the lap counters, timekeepers' box, etc., were especially prepared at Budaors aerodrome on the outskirts of Budapest, while part of the original control tower building had been redecorated and was used as a dining room for all competitors, visitors, and officials throughout th e meeting. Everyone was luxuriously housed in hotels in the centre of Budapest its elf, and coaches were available as transport between the town and the aerodrome.

Many competitors had arrived several days early in order to test fly and get used to the conditions, which throughout were almost perfect. The British team had also hoped to arrive in time to put in some practice flights, but were in fact among the last to arrive. This was due to a rather unfortunate combination of circumstances. Tr avelling by boat to Ostend they were met by a Mercedes coach which they were to share with the Belgian team, but as the coach was being run-in it was limited to a



Heading photo shows the building in which the competitors were fed. Flying is Dr. fed. Flynda Geza Egervary, top placed of the Hungar-tunt entries. Tarmac area was used for stunt when special circles were occupied with T/R and speed.

Left—the presentation of the T/R team awards with I. to r., the Hungarian, Brit-ish and Czech teams. speed of some 35 m.p.h., and this, allied to some

with the heavy list of entries it was obviously going to be a crowded three days, but the organisation, although unobstrusive, was well up to scratch and there were no hold ups or delays. Stunt was run on all three days, with the first two rounds of speed on the first day, the team race heats on the second, and the last speed round and team race final on the third. round and team race final on the third.

Promptly to the advertised time of 9 a.m.

march past of competitors, each team preceded by its National flag, was held, followed by a speech of welcome from Antal Reti, of the Hungarian Aero Club. Then to the serious Hungarian Aero Club. Then to the serious business of flying.

First flights of the meeting in both stunt and

speed were by the American fliers Palmer and Lauderdale, and each in its way was an eyeopener. However, it will be much too confusing to try and describe each event simultaneously so I will deal with them separately, and what better than to start with the marathon (43 fliers allowed three flights of 8 min each) costration. allowed three flights of 8 min. each) contest . . .

The entry list for this event read like an international "Who's Who?" of stunt fliers and although from the start the American team were hotly favoured both for individual and team honours, there were plenty of not so dark horses who could upset these predictions.

A very marked air of expectancy greeted the appearance on the circle of the first competitor, that doyen of the stunt arena, Bob Palmer, flying the latest development in his line of Thunderbirds. To say that the flight was disappointing would be unfair, but such is Palmer's reputation that we had expected perfection and instead were just shown a superb flight! He was also under the handican of heirs first more of also under the handicap of being first man off and anyone who has ever judged stunt knows that it takes at least two or three flights of a contest to "warm up" and settle to the routine. From the competitors' viewpoint it is often helpful to observe the pattern and scoring of other fliers and in this connection it is interesting to note from the results just how many fliers, especially those not used to the F.A.I. schedule, did in fact improve on their first scores in the second and third rounds.

Before even a quarter of the entry had made their first flights it was obvious that there was not going to be much in the way of points between any of the top ten when the final results were announced.

The Belgian favourite and winner of last year's Criterium d'Europe, Grondal, flew fairly early and was the first person to score over

1,000 points. His familiar Nobler, neatly decorated in blue and white, appeared to me to fly appreciably slower than the majority of models, which may well have been a reason for his consistent and very high scores

First British team member to fly was Dave Day, who was below his usual form, and was, in fact, suffering from an obscure form of fuel feed trouble. He was followed by Frank Warburton who was the consistently top scorer of our boys, as Ray Brown's rather distinctive flying was obviously not what the judges wanted. In fact, Ray used vast quantities of fuel in prac-In fact, Ray used vast quantities of fuel in practice in an effort to "open out" his manoeuvres to the accepted size, and he was not alone in this. Immediately following the first contest flights I observed leading experts of various national-I observed leading experts of various national-ities departing to quiet parts of the aerodrome to put a polish on their manoeuvres having noted the type of flying that was gaining high marks. I was, however, amazed at the large number of fliers who made the most elementary mistake of all—not placing their manoeuvres exactly opposite the judges; this, in spite of the fact that they several times moved their position in order to give competitors every advantage from the changes of wind (really breeze) direction. The flights of the remaining Americans, Wooley and Still, were eagerly awaited and were, in fact,

and Still, were eagerly awaited and were, in fact, far more impressive than their scores would indicate. However, it was the well-known Hungarian expert Geza Egervary, who was the first to beat Grondal's score, and it seemed as if he would top the list for the first round until the Italian Compostella who flew later managed

the Italian, Compostella, who flew later, managed to beat him by a mere three points.

The second round started promptly at 9 a.m. next morning and it was soon apparent that the majority of fliers had learned a lot from watching the previous day's flying. With the notable exception of Compostella and Egervary, who both dropped a considerable number of points. both dropped a considerable number of points, scores showed a general increase.

This was most noticeable among the American

team, and now we were seeing the standard of flying we had anticipated—not only superb individual manoeuvres, but an integrated pattern which gave an overall impression of a planned

flight.

Only Grondal could match these flights and it is of interest to note that he, in conjunction with at least 50 per cent. of the competitors, acknowledges the years of research into stunt design in the U.S.A., by using an American designed model. In addition, the remainder of the entry, with the exception of one Rumanian, one Polish and one French design, which were diesel powered, and a 10 c.c. Micron powered ultra lightweight Monacon entry, whose wing collapsed during a contest flight, clearly showed a trans-Atlantic influence in their aerodynamic, if not their outline, design.

Having now had an opportunity to study the flying techniques, I had a close look at some of the models. Without doubt the most beautifully designed and finished model was that of Steve

flying techniques, I had a close look at some of the models. Without doubt the most beautifully designed and finished model was that of Steve Wooley, which, with its spatted undercarriage set well outboard in the wing, looked as good in the air as it did on the ground. Although more angular, Don Still's Fox 25 powered models (see cover photo) were extremely well finished, and featured instruments cause crew, etc. in (see cover photo) were extremely well finished, and featured instruments, guns, crew, etc., in their Stuka type cockpits. Indeed, the general standard of finish was good, the "dumpy" Russian models with their elliptical wings and extremely thick sections being neatly lined in coloured jap tissue over their yellow jap silk covering. There were, inevitably, a few "rough," or perhaps it would be fairer to say, well-worn machines in evidence.

It was in this round that Dave Day suffered a premature engine cut before he had fairly got started on the schedule and wisely decided to use his reserve model for his last flight. Frank Warburton spoilt a superb flight, that would have scored well over 1,000 points, by forgetting his reverse wingover, while in spite of, or perhaps because of, intensive practice, Ray Brown made his lowest score.

By dint of a prompt start and the minimum

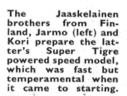
his lowest score.

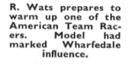
By dint of a prompt start and the minimum delay between flights we were well into the third round before flying stopped for the day, and by now the results were pretty well a foregone conclusion, with Grondal in a virtually unsasailable position. However, Still made a terrific effort and with a magnificent flight returned the highest single score of the meeting, but it was still six points short of what he needed to win and so except for a few tailenders who to win and so except for a few tailenders, who could not affect the top positions, the contest

The overall standard of flying was without

The Australian team, Brian and Betty Hor-Brian and Betty Hor-rocks, get organised for Brian's first flight, His flying with a "Nobler" was not to the standard we know with his big "49" model.

To make sure there was no "chopping and changing," all motors were electrically engraved with an identifying number processing. during









doubt the finest yet seen in Europe, if proof is required just look at the closeness of the marks down to twentieth position—and it is a pity that the authority of the judging should have been questioned so loudly and consistently in so many languages! Everyone who watched the flying has his own opinion of who was the best pilot, and arguments are likely to continue for years whenever modellers meet, but with the marks of the top men so very close, is it possible to single anyone out and say there is the champion?

Speed

Unlike stunt, and to some extent team racing, speed events do not depend upon anyone's judgment—the results, ignoring whipping, etc., are determined against a stopwatch—so although there are arguments they are unlikely to be indeterminable. There were, however, indeter-minable arguments in this contest—just how fast would the American models have gone if they had put in one perfect run?

For years we in Europe have looked forward For years we in Europe have looked forward to seeing top American speed fliers in action to find out whether their models were really as fast as was claimed, or whether it was just a freak of the American climate that made these speeds possible. Let me state at once that Wisniewski proved beyond doubt that given a good run on the 0.014 monoline permitted by the F.A.I., he has a motor/model combination that is capable of speeds around the 160 m.p.h. mark!

It was still quite chilly when Bob Lauderdale came out to make the first flight in speed, and, indeed, the weather on this first day for rounds one and two of the speed event was very "up and down" as regards temperature—the sun only having to be obscured for a few minutes for there to be a marked chill in the air. marked contrast to the following days, which were very hot, while, throughout, the wind was extremely light and variable in direction.

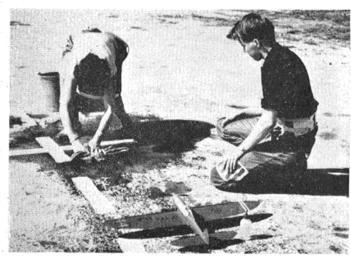
For this first flight Bob was using one of the new Super Tigre Jubilee motors, and, in common

with his team mates, a pen bladder tank. This latter caused some surprise as in Europe the pressure tank is now considered superior, it not being necessary to "find" the exact needle setting for each flight. Using an extremely neat portable starter, the motor fired almost at once, and while Lauderdale ran for the centre Wisniewski tuned the motor. The time for this flight was 222 k.p.h. (138 m.p.h.), even though the motor did not at any time sound to be com-pletely "in." I believe that it was this flight, the very first in the contest, which was faster than any of the Italian models were capable of without whipping, and with an Italian motor, which laid the grounds for their subsequent protest about the use of monoline.

This is not the place to consider the question of monoline, and our views on the controversy at this meeting are contained in "Here & There," but it might be as well at this stage, to clarify a few points. It is claimed that it is impossible to whip with monoline as to do so would kink the handle so that when a control movement was given it would cause the line to swing, rather like a skipping rope. Broadly, this is true, but I particularly noted that the technique

- Grondal poses with his model after winning the stunt contest.
- Bernhard and Leitzmann pose for photographs before the start of the final.
- Bob Lauderdale and Jim Nightingale mix up a drop of the "hard stuff."
- The Warburtons, father and son, at the processing. That's Ray Brown's model appearing from the left.
- O. Gaevsky, of Russia, prepares for a speed flight.
- Dave Balch warms up for his first team race heat.
- Italians Stevenato and Ugo Rossi crank up Cesare Rossi's model as he waits in the pylon.
- 8. Frank Warburton with his repaired reserve model which he crashed practis-
- Mind me combs! Ken Long has his "number plate" installed by an official.

Kiell Rosenlund. Sweden, waits patiently as Hungary's answer to Mrs. Mop answer to Mrs. Mop gives the circle seg-ments a good "do-ing" with scrubbing brush and cloth.



aimed at both by the Americans, and later the Czechs was for the model to be put "in the groove" before the pilot entered the pylon, after which no control movements should be necessary. As the best control position seemed to be at full "down," the bobbin was at the furthest point of the handle and thus it would have been possible to lead (or whip) the model. However, I must emphasise that at no time did I see any monoline user flying other than with

the most scrupulous fairness.

With Lauderdale setting such a cracking pace at the start, the next few flights seemed tame by comparison, until Rudi Beck, who as well as flying in speed had borne the brunt of much of the organisation of the meeting, and whose efforts require the highest praise, returned a fine 215 k.p.h. Actually, this was rather touch and go for as he went to start up, the prop came loose, and when he eventually took off the motor cut after a few laps. However, using his second attempt he refuelled and returned a perfect run at the time stated. Throughout, the Hungarians, who were using "hopper" tanks, had this trouble—the motor either cutting the Czechs with a very similar tank design had no trouble at all, neither did they "twiddle" with the needle valve. It was simply a case of start up and let go for a perfect motor run each

consistency of their times.

As last year's Criterium d'Europe winner,
Ugo Rossi's first flight was watched with great
interest. Flying at a level 4-5 ft., extremely
fairly, he returned a time of 219 k.p.h., which I
would consider to be about the maximum—
and a very creditable one—the model is capable
of without assistance.

which doubtless accounted for the extreme

and a very creditable one—the model is capable of without assistance.

Shortly after this, Nightingale came out to fly, and as he was using a Wisniewski motor the excitement was pretty intense. Both these fliers prepare for each flight in a similar and methodical manner. First the model is taken to the line check and passed, then two parts of the fuel are mixed together—clear critically these fuel are mixed together—clear originally, these then turn brown, then, just as they are due to fly, a further ingredient is added, whereupon the fuel turns black and the pen bladder is filled. Immediately the flight is completed the model is taken from the circuit and the motor is run on a "run-up" fuel of some 50 per cent. nitro methane, 10 per cent. nitro benzine, 15 per cent. oil and 25 per cent. methanol, to clean it out. Wisniewski allowed several competitors to put a tachometer on the motors running on this fuel, and his own engine turned 22,000 r.p.m. on the $5\frac{\pi}{8} \times 11$ in. flying prop! This is terrific but on the competition fuel it was at least several thousand revs up and it would seem that this brew is so potent that it stresses the engines to their limit, as at least four pistons and several

con, rods were used up during the contest.

Nightingale's time of 227 k.p.h. was the fastest yet, and his motor run was definitely on the lean side so when Wisniewski appeared with his own model the circle was crowded with spectators. As the motor burst into life and was tuned the crowd, who until then were closely gathered round, showed a marked reluctance to stay in its proximity. The take off was fast, the acceleration phenomenal, and the parts of the circuit where there were no safety fences After two or three laps Wisniewski had it levelled out and was in the pylon going at a speed that was not far, if at all, short of 160 m.p.h., but after three laps the motor went very lean and the last seven laps of the timed kilometer were slow. Even so, the official speed was 230 k.p.h. (143 m.p.h.). Afterwards the motor was "solid" and when it was dismantled the piston crown looked as if it had been knocked in with a hammer! Needless to say, the remaining flights in this first round were an anticlimax although many were by our standards unput although many were, by our standards up until then, good. We were hoping for better things in round two after lunch, but it was not to be.

round two after lunch, but it was not to be.

Hardly was the round started before it was learned that the Italian team manager, Barthel, had protested against the Americans' use of monoline, and that the protest was accepted. This brought flying to a complete halt and the circle, with its dozens of animated discussion groups, looked like Hyde Park Corner on Sunday morning. What the outcome would have been we don't know—George Benedek offered the morning. What the outcome would have been we don't know—George Benedek offered the we don't know—George Benedek offered the use of his workshop to convert the models to two-line, several team managers threatened to withdraw from the contest, several more contented themselves with an emphatic statement of their opinion of a jury who could accept such an absurd protest—but Czech team manager, Znedek Husika, acted. He told his team members to fly their own monoline jobs. After a meeting later in the day the jury announced meeting later in the day the jury announced that monoline flights would be recorded but no results would be announced until after the C.I.A.M. meeting in October. As the results were, in fact, announced at the conclusion of the contest we have no idea what the next move will be.

With flying once more under way, Sladky was the first of the Czechs to use monoline, improving on his first round speed by 5 m.p.h.; unfortunately, the model settled in a fixed oscillation, but Sladky held it until the 11th lap when

it bounced for a delightful shaft run.

For his second flight Lauderdale used his Number 2 model which was fitted with Craig Asher's Howler 15, a photo of which appeared in our September "Latest Engine News." Unfortunately, this motor suffers from a delayed action needle which makes it extremely difficult to tune on the ground and he only returned 174 k.p.h. Nightingale and Wisniewski also had rough runs and neither could improve on

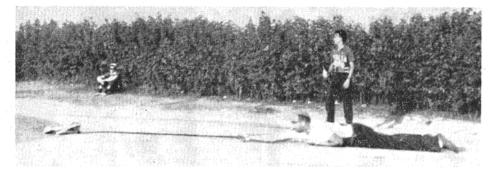
had rough runs and neither could improve on their first times. In contrast, Rossi's engine sounded superb, but could not match Wisniewski's in that first flight for "note" or revs., even though he was using a thinned down 6×8 against the American's $5\frac{5}{8}\times 11$; however, by dint of a helping hand he improved his speed to 227 k.p.h.

There was now a full day's rest before the last round of the contest on Saturday morning and we hoped that Wisniewski would be able to sort out his motor and fulfil the terrific promise of that first flight. However, we were due for a disappointment, as in spite of hours of due for a disappointment, as in spite of hours of work hand-lapping in pistons, etc., the motor just did not want to know. Lauderdale reverting to his Super Tigre managed 204 k.p.h., but it was Nightingale who had the worst luck. After was Nightingale who had the worst luck. After rather a long time spent tuning the motor on the ground he took off and completed eight terrific-ally fast laps, when the motor cut through lack









bove: U.S. team member Phil Edwards sent this shot of Darryl Dolgner. For details see caption 5 below.

Left: reading from top to bottom we have: Wisniewski releasing Lauderdale's model for its first flight.

"Pop" Edwards with the Cox Olympic team racer.

Geza Egervary taking the strain as his stunt model is pull tested.

Sirotkin, watched by Skurskij, of Russia, preparing his angular, but beautifully finished, stunt model.

It was in this round that Rossi put up his winning flight and made himself the most unpopular man at the meeting. Whipping the model up as fast as he could he entered the pylon and got so far ahead of the model that he was literally pushing the wires with his shoulder (see photo in "Here & There"). Thus he broke at least two of the Code Sportifules and should have been disqualified forthrules and should have been disqualified forth-with, but, and this is the only criticism I have of the organisation, the Hungarians did not have an observer at the circle to watch for such conduct.

I have made rather a point of Rossi whipping so it must be pointed out that he was not the only person doing it. Literally 90 per cent. of the fliers whip the model frantically until it is really going (or they crash it, as Toth did in his first flight), they then enter the pylon, still whipping as much as possible and nothing can whipping as much as possible and nothing can be done because in speed whipping is not banned. However, in this last flight Rossi was shortening the radius of his lines and it is on that score he merited disqualification. Speed should be the cleanest of all C/L events and if whipping were banned it would go a long way towards preventing much of the ill will that exists.

In this unsatisfactory manner the contest ended. It will long be remembered as the one in which although the best man didn't win at

least he had a model which he proved was capable of a speed that no European entry could approach, whipping or not, if only he'd had one good motor run.

Team Racing
With the introduction of the no whipping rule, and warned by the large number of disqualifications at last year's Criterium that high flying would not be tolerated, the behaviour throughout this event was of a far higher standard that I had considered possible. In only one respect did certain pilots "try it on," and this was by flying left handed. When one is piloting with the left hand it is a simple matter to whip, or to be more accurate, lead the model without in fact appearing to do so. I do not know whether there were any official complaints, but it is significant that the eventual winner, Bernhard, who flew left handed in both heats, changed to using his right hand for the final. to using his right hand for the final.

This was the event in which our main hopes lay and we were soon off to a good start when

lay and we were soon off to a good start when Ken Long and Les Davy returned a fine time of 4:57. However, they were rather dashed when Mike Smith and Dave Balch, who were regularly turning in around 4:40 at home, could only manage 5:38, but revived remarkably with Gordon Yeldham and Charley Taylor's 4:45.

Needless to say they did not all fly one after the other, but as with the other contests heat followed heat with the minimum delay and even less officialdom. Early heats were very disappointing, the times all being way outside what one would expect at a World Championship. In fact, only three filiers were inside the four minutes in the first round—Long and Yeldham, who I have already mentioned, and the hotly favoured Swedish filer, Kjell Rosenlund, whose magnificent 4:39 was the fastest time in round one.

one.

The Belgian Bernhard was drastically undercompressed and could only manage 6:18,
while none of the Hungarians could break 5 min.
The Americans readily confessed that in team
racing they were there to learn, and had little
hope of beating the European experts, although
in the event they did not disgrace themselves.

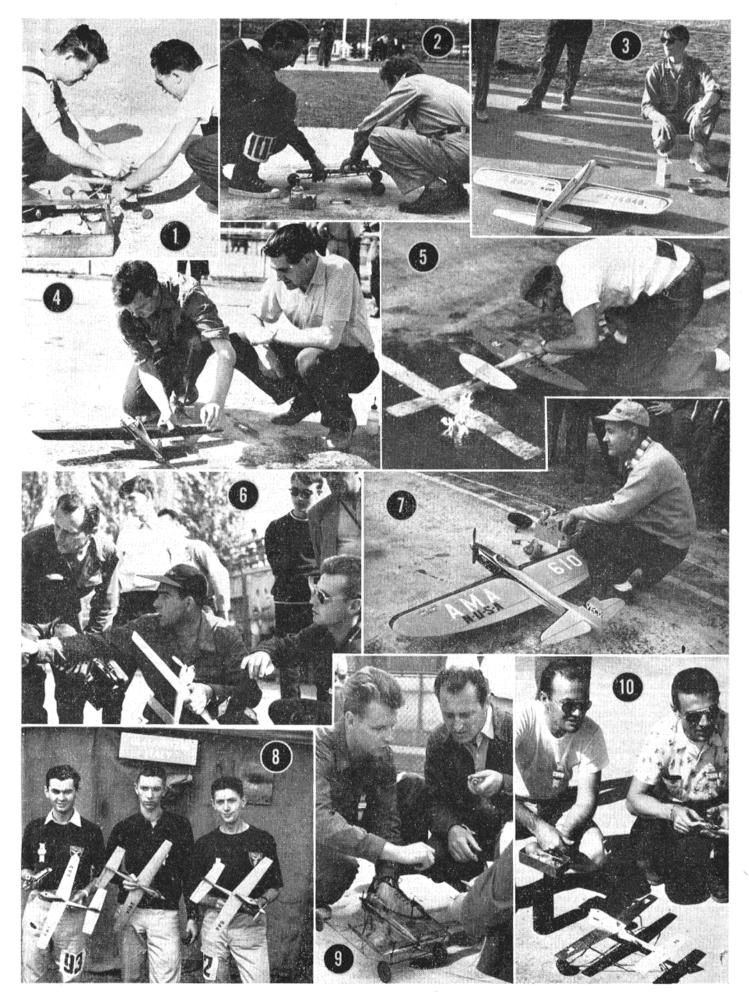
Notaerthy among their models was the only

Noteworthy among their models was the only

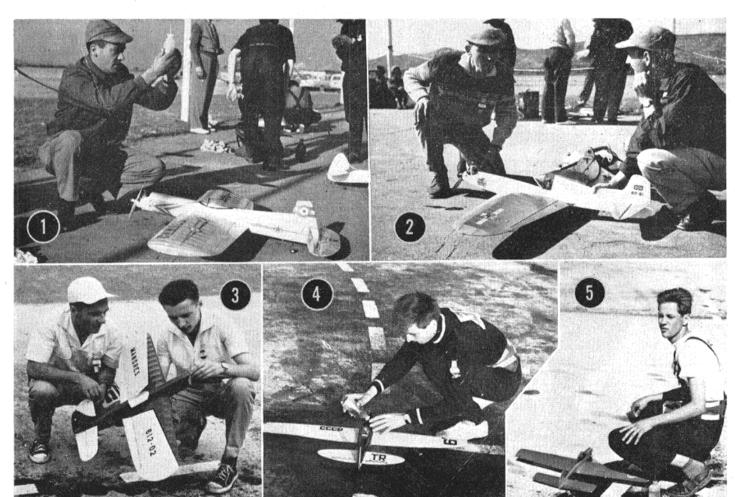
CAPTIONS TO PHOTOS RIGHT

- Rudi Beck (right) and Gyula Krizma start up for their team mate Imre Toth who is waiting in the pylon.
- The only woman competitor, Elvira Purice, of Rumania, waits at the pylon as her two brothers start her model, which was diesel powered.
- Steve Wooley with his beautifully finished model mentioned in the text.
- Gordon Yeldham with British team manager, Dick Edmunds, just before the start of the final.
- There's a light back there, boy! Just There's a light back there, boy! Just about everything possible happened to American Darryl Dolgner in his last heat. At the first stop the model "ran in," but Darryl's 6 ft. 4 in. plus the model "fishing rod" j-u-s-t managed to rescue it. At the next stop the motor coughed and set fire to the pool of fuel on the ground. Undismayed, with cigar still jutting at belligerent angle, Darryl moved forward a couple of feet and carried on flicking to finish the heat in

- 9:30 amid the loudest applause and cheers of the meeting.
- Mind that line! Sladky, Pech and Koci had good cause to look worried because it was only one 0.010 in. line that Pech was using for his record attempt after the meeting, and now someone was standing on it. Fortunately, it held for the subsequent flight which was a new world record at 244 k.p.h.
- Bob Palmer looks quite happy and relaxed as he waits to make his first flight.
- The Italian speed team Cesare Rossi, Stevenato and Ugo Rossi, pose with their models in front of the Italian tent one of which was provided for each country.
- Czech speed flier, Jaraslav Koci, and Joseph Sladky, discuss a technical point during the preparation of the former's delta model.
- Jim Nightingale and Bill Wisniewski, with the latter's model. He is holding the motor with half pan in his hand.



NOVEMBER 1960 MODEL AIRCRAFT



glo-plug motor yet seen in an international team race. This was the Cox Olympic used by the Edwards father-and-son team and it was used most efficiently having the laps, although not the speed, of the best diesel models, while the pit work of "Pop" Edwards was first class. He carried the starting battery in his pocket with the leads running down his arm to contacts on thumb and forefinger, while a stout glove on his starting hand enabled him to stop the motor when it started backwards.

In round two, after lunch, Ken Long was a

In round two, after lunch, Ken Long was a few seconds slower than in his first heat, but Dave Balch was way off form. Gordon Yeldham was drawn to fly with Bernhard and one of the Italian entries and as soon as the heat was under way it was obviously going to be fast. Shortly before the first pit stop was due the Italian model touched Bernhard's as he was overtaking, breaking the Italian's prop. Yeldham's motor cut a few laps later and as Taylor was bringing the model in Bernhard came over was bringing the model in Bernhard came over very low, whereupon Taylor touched down earlier than intended and the model rolled under the Italian's lines, wrenching the handle from Taylor's hand. When Bernhard landed it was announced

when Bernard landed it was announced that there would be a re-run, which seemed fair until we learned that Yeldham was out—disqualified for hitting the Italian. Just or not, this was accepted, and in the re-run the Italian crashed within a few laps, leaving Bernhard a clear run to return 4:35—the fastest time of the meeting.

Rosenlund was unable to improve on his first time but even so no one else could approach the leading times, which left the final on the following day to be fought out between Bernhard, Rosenlund and Yeldham, these being the three fastest heat times.

On the team side we were in a strong position with only the Hungarians within striking distance. If their last man, Simon, could better 5:03 then we would just be pipped at the post, but fortunately (for us!) the model was released undercompressed, which left us the comfortable

The final was the last event of the meeting and the excitement was intense as the 5 sec.

- Compostella, who led the stunt in the first round, checks how much fuel he has put in the tank for his second flight.
- Ray Brown, assisted by Ken Day, prepares for his second round flight.
- Souliac and Bador, of France, with one of the few diesel powered stunt models at the meeting.
- Russian team race mechanic Krasnoruckij
- Hungarian all-rounder Gyula Simon with his team racer which was beautifully finished in polychromatic blue.

count down was given. Promptly at the whistle count down was given. Promptly at the whistle three engines burst into life and the final was on. Rosenlund definitely had a slight edge of speed over Bernhard and Yeldham, but the models were very evenly matched, and this far it could be anyone's race. As the lap "clocks," approached the time for the first pit stops it was Yeldham who was first in and as the model was making its landing approach the heat situation was repeated—Bernhard came over low forcing was repeated—Bernhard came over low forcing Taylor to "bounce" the model. Fortunately the prop was intact, but the monowheel undercarriage wire was bent back. Hurriedly Yeldham tried to straighten this but it was too strong and as he released the model it "ran in," completely out of reach, even with the aid of the "fishing-rod"—a bamboo cane with wire extension which team manager Dick Edmunds had brought

which team manager Dick Edmunds had brought along against just such a contingency.

This left Bernhard and Rosenlund just as in the final of last year's Criterium, but this year Rosenlund did not make any mistakes (last year he broke a prop stopping the model) and to the finish he lead by a narrow but convincing margin. Imagine the consternation, therefore, when it was announced that he was disqualified for alleady entering the circle to retrieve the for allegedly entering the circle to retrieve the model. Arguments and protests being of no avail, Bernhard was announced the winner

and in this unsatisfactory manner the meeting

with the contest over we were treated to some very good demonstration flying. First Bob Palmer flew the A.M.A. schedule with an accuracy that brought a wellearned round of applause, then he and Don Still put on a show of hair then he and Don Still put on a show of hair raising formation stunting and when Palmer's motor cut Don did some magnificent low level flying, running the wheels of his model along the ground and going straight up into a wing-over, etc. While to stress the general interna-tional friendliness that prevailed we saw Horrock's tional friendliness that prevailed we saw Horrocks flying Palmer's model, Still flying Brown's model, which he pronounced excellent, and various other experts having an exchange pilot scheme.

scheme.

After lunch the awards were impressively presented to the appropriate National Anthems of the winners and a fanfare of trumpets. Then followed an interesting full-size air display, with balloon bursting, parachute dropping, etc., after which everyone returned to Budapest to prepare for the banquet which was to be held at the Army Officers Club.

This turned out to be a delightfully informal

This turned out to be a delightfully informal affair at which further awards were made and souvenirs, pennants, transfers, badges, etc., were

refreely exchanged between the competitors.
Thus ended the first World Control-Line Championships, It was a memorable meeting on many counts, even excluding all the arguments, but the things I think I will remember most are the forbearance of the American team in refusing to complain or enter protests in the face of, what appeared to me to be, deliberate provocation. Rosenlund's stoic acceptance of his disqualification in the team race, which, coming on top of his disqualification last year, at the Criterium d'Europe, on equally dubious grounds, must have been doubly hard to bear, and last, but by no means least, the "mechanical" smoothness with which the meeting ran.

Our Hungarian hosts had obviously expended considerable time and energy in the pre-contest organisation of this event and were rewarded with a meeting which was a model of efficiency and the yardstick against which future contests must be measured.

135

~	~~	\sim	^	\sim
}		Final	5:06	I
3	phts	2nd	4:35	4:49
*	Flig	1st	6:18	4:39
}			:	:
{			:	:
}			:	:
			Belgium	Sweden
}	e		:	:
}	Ra			:
}	am		:	:
. S	Te		rnard-Lietzmann	ork-Rosenlund
			1. Be	 Bjc
		tal	1.2	9.9
Ш		Total	207	206
<u>~</u> <u>~</u> ₃		3rd	1048.6	1062.0
***	Flights	2nd	1022.6	1004.0
-		1st	1008.6	993.3
{			:	:
. }			:	:
~~~			Belgium	U.S.A.
\{\{\}	¥		:	:
\\ \{\}	Stunt		:	:
	•		<ol> <li>Grondal, L.</li> </ol>	Still, R.
3			-	7

$\sim$	~~	~	$\sim$	~	$\sim$	$\sim$	~	$\sim$	~	$\sim$	$\sim$	~	$\sim$	~	$\sim$	~	$\sim$	$\sim$	~	$\sim$	~	$\sim$	$\sim$	$\sim$	$\sim$	~	~	^	~	^	<u></u>	~		^	$\sim$	^^	^	<u></u>	^^		~	_	^	^		^^			^ ^	
	Final	2:06					ī											- 1					-										2.5	236	0	777	226	204	210	0	211	203	200	192	195	188	179	0	173	200
Flights	2nd	4:35	4:49	5.05	5:03	5:01	5:03	5:04	5:18	5:19	5:28	0.6	6:02	5:33	5:52	5:59	6:20	6:12	6:21	6:23	6:46	0.30	6:56		7:17	7:10	7:31	8:22	9:42			Flights	) and	227	219	213	213	174	213	208	213	200	202	202	00	181	180	175	171	170
Flig	İst	6:18	4:39	7.57	2:00	5:19	5:36	5.00	2.03	5:24	6:07	5:30	5:38	5:49	]	5:53	6:03	00.0	6:28	7:05	1	00:00	7.42	7:02	90:9	1	7:27.8	Ŧ.	9:54	Eight entries returned no score.)			1	219	230	213	213	222	208	215	0 8	196	192	000	007	0	180	165	162	142
		:	:	:	: :	:	:	:	: :	: :	;	:	:	: :	:	:	:	:	: :	:	•	:			:	•	:	: :	•	rned no					:	:	: :		:	:	:	:	: :	:	:	: :	:	: :	:	:
		:	:	:	: :	:	:	:	: :	: :	:	:	:	: :	:	:	:	: :	: :		•	:	:	: :	:	:	:		:	es retu				;	:	:	: :	:	: :	:	:	:	: :	;	:	: :	:	: :	:	:
		:	:	: :	: :	:	:	vakia	vania	vakia	:	;	:	: :	:	:		Vania	: :	:	:	:	: :	: :		,: ,:	: 1	: :	:	it entri				:	:	: :	· ·	:	: :	:	:	:	: :	:	:	: :	:	: :	:	:
	•	Belgium	Sweden	England	Hungary	Hungary	Kussia	Czechoslovakia	Austria	Czechoslovakia	Belgium	Russia	England	Italy	Sweden	Hungary	Austria Czechoslowakia	Germany	Sweden	Germany	Germany	Dulgaria 11 C A	Monaco	France	Bulgaria	Italy	U.S.A.	France	Rumania	type. Eigh					Α	U.S. A.	Czechoslovakia	. A.	Czechoslovakia	Hungary	:	Russia	ia : :	Hungary	and	len	len	Germany	Bulgaria	aria
9		:	: '	: :	:	:	:	:	: :	: :	:		:	: ;	:	:	:	: :	: :	:	:		: :	: :	:	:	:	: :	:	bold t				Italy	U.S.A.	U.S.A.	Czec	U.S.A.	Czec	Hun	Italy	Russia	Russia	Hun	Kussia	Sweden	Sweden	Ger.	Bulg	0
Race		:	:	: :	:	:	:	:	: :	: :	:	:	:	: :	:	:	:	: :	: :	:	:	:	: :	: :	:	:	:	: :	;	nes in		ed	E.	:		: :		* :	: :	:	:	:	: :	:	:	: :	: :	: :	:	:
<b>Team</b>		:	:	: :	: :	:	tenko	:	: :	: :	:	: <	1s, C.	: :	P	:	;	: :	: :	en	:		: :	: :	:	:	:	: :		(Winning times in bold		Speed	-	:	:	: :	:	:	: :	:	:	:	: :	:	:	: :	: :	: :	:	:
F		mann	und	101	:	:	contra	011	3	: :	lai	skij	cdward	ızza	senlun	:,	rr mrks	Inina	erg	3-Lenz	: ;	۸٥,	ete	:		01			ice, F.	(Winn				:	:	: :	:	:	: :	:	:	:	M.	:	:	: :	: :	: :	:	:
		Bernard-Lietzmann	Sjork-Rosenjund	Davy-Long	Kun-Azor	Beck-Frigyes	Skripcsenko-Kontratenko	Kossi-Stevanato	Bugl-Billes	Drazek-Trnka	Macon-Grondal	Sirotkin-Skurskij	Edwards, PEdwards, Smith-Relch	Veronesi-Lavazza	Soderberg-Rosenlund	Simon-Kelen	Koggi-Kirchert Votynka-Komirka	Post-Lutkat	Enquist-Kjelberg	Schnorrenberg-Lenzen	Oswald-Malik	Paunov-Topalov	Aubertin-Follete	Rosello-Fabre.	Vlajcsev-Tinev	Cantelli-Amerio	wats-Adams	Rador-Souliac	Purice, SPurice, F.					Rossi, U.	Wisniewski, V	ech, Z.	Koci, J.	anderdale, B	Sladky, J.	eck, R.	Rossi, C.	Natalenko V. T.	aszilosenko,	oth, I.	Jaevsky, O. n Jaaskelainen. K	jellberg, O.	Martinelle, B. Rosello, G.	Ziegler, G.	Kacskov, K.	injust, C.
			4,4	. 4	5.	9.		o o	10:	Ξ	12.		4.4	16.			20.		22.		24.	25.		28.	٠.	30.	31.	33. I	Τ.	η,				1.	25	24	5.	9,1	. 00		10.	17.	13.	14. T	.91		2 6 7 8		25.	ic
	Total	2071.2	2000.0	2043.0	1996.2	1965.6	1965.2	1954.2	1952.0	1950.6	1945.3	1931.9	1803.6	1892.9	1883.9	1859.2	1837 3	1819.6	1817.9	1805.3	1802.3	1764 6	1757.9	1650.3	1637.3	1574.6	1338.6	1402.2	1245.2	1230.9	1044.6	996.3	9.986	825.6	756.9	630.9			029	672	699	626	516	513	428	.: 179	175	÷CT ::		000
	3rd	1048.6	1040.6	1042.0	976.3	986.3	911.6	0777.0	934.0	996.3	0.986	985.3	920.0	939.3	947.6	856.0	903.3	872.0	894.0	952.3	930.3	336.0	891.3	849.0	456.0	162.6	843.0	767.6	575.6	0.010	513.3	371.6	154.0	339.0	283.6	253.0				::	:		•	:	:	: :	:		Race	
thts	P	9.0	2.5	. 0	.2	e; 3	0.0	20	0	5.3	.3	200	3.0		5.3		2,4	. "	ε.	0.0	0.0	0 66	<u>ښ</u>	0.	<u>د</u> :	0,4	0.4	'n	0.0	200	ا در	0.	0.	j m	0.	0		Pood	3	: :	:	:	:	:	:	: :	:		_	
Flight	2nd	1022.6	1004.0	1001.0	.086	979.3	25	950	913	955.3	959	976	800	946	936.3	939.3	9710	921	901.3	845	800.0	87.7	734.3	269	794	781	701.6	604	669.0	594	531.3	470	387	363	53.0			Cno	7	kia.	:	:	:	:	:	: :	:	:	Team	
	1st	1008.6	953.0	997.6	1015.5	956.0	9,44.0	982.6	1018.0	0.806	611.0	946.6	0.476	943.6	935.6	921.6		898.0	916.6	853.0	855.0	803.3	866.6	801.3	840.3	793.6	7326	634.6	0.5	505 6	466.0	526.3	598.3	462.3	470.0	Rumania 306.3 Rest two flights only count for total)			4 5 1	Czechoslovakia	taly	Hungary	Kussia Sweden	Bulgaria	Rumania	France	Germany	Austria	•	Engload
		:	:	: :	:	:	:	:	: :	:	:	:	:	: :	:	:	:	: :	:	:	:	:	: :	:	:	:	:	: :	:	:	: :	:	:	: :	:	only co	S Carry			5:-			0.0	7.	∞ c	.0	=::	17:		1
		:	:	: :	:	:	:	:	: :	:	:	:	vakia	:	vakia	vakia	:	: :	:	:	:	:	: :	:	:	:	:	: :	:	:	: :	:	:	: :	:	Giobte,								6,165.9	784.1	,636.7	5,602.9	5,564.1	863.3	3 VCV
		Belgium	10.5.A.	U.S.A.	Hungary	Belgium	Belgium	Fuoland	Italy	Hungary	Germany	Australia	England Czechoslovakia	Germany	Czechoslovakia	Czechoslovakia	Kussia	Italy	Finland	France	Italy	Germany	Russia	England	Sweden	France	Austria	Austria	Finland	Monaco	France	Poland	Monaco	Kumania Poland	Rumania	Rumania Rest two	243.454		O MIN H H	<b>KESOLIS</b>				:	::	::	::		: :	:
u		:	:	: :	:	:	:	:	: :	:	:	:	:	: :	:	:	:	: :	: :	:	:	:	: :	:	:	:	:	: :	:	:	: :	:	:	: :	:	:				S		+		:	: :	:	: :	:	: :	:
Stunt		:	:	: :	Ö.	:	:	:_	; ;	:	:	:	:	: :	:	: •	E. A.	: .:	: :	:	:	:	: :	:	:	:	:	: :	:	:	: :	:	:	: -	:	:			•	Y		Stunt		:	: :	:	::	:	: :	:
S		Grondal, L.	Palmer R	Woolev. S.	Š	ietzmann, G.	Macon, G.	Warhinton F	Compostella, L	Ordogh, L.	,	Horrocks, B. J.	Brown, K.	Doring, U.	Gabris, J.			Contini. F.	Ruokolanti, P.	Souliao, S.	Orsini, O.	Oeweld G	autyko, A. N.		Soderberg, C.	Bador, B	Bugl, F.	er, A	Raulio, H.	Bartoli, C.	Fabre, L.	Walicki, J.	aro, H.	Nowakowszki.	Ariton, G.	κ, Κ. :				EAM		21		.A.	Hungary	Czechoslovakia	Germany Italy	ia	and	
		Ξ.	2. Still 3. Palr		Ξ.			o. Siro		_	• 4 7		4. Bro	_	_	٦.	7.	. 7	_	3. Sou		Sound Oeur	-	28. Day		30. Bad					37. Fab				12. Arit				1								5. Gern 6. Italy		<ol> <li>England</li> <li>Finland</li> </ol>	
									-	-			-	-	-		- 0	4 CV	· (*)	m3 6	N F	30	a mi	$\sim$	COL	12.0	n N	· m	en e	e	200	en.	ern v	- 44	100	- 1											_		-	- 2

												.,	`	. ,	-	_	_	_		7		-		_	_		_		_	
1	2nd	227	219	213	213	213	174	213	213	208	213	208	200	202	202	0	0	181	180	171	175	0	171	169	147	154	134	148	0	
-																														
1	Ist	219	230	213	227	213	222	220	208	215	0	209	196	192	0	200	0	0	180	0	165	162	167	153	154	0	128	0	0	h.)
				٠,		٠.		١.	١.	١.																		-		k.p.
				•		•	Ţ	•		•		•	•	•			٠	•	•			-	٠			•	•	٠		П
		:	:	:	;	:	:		:	:		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:		times in k.p.h
																														A
		:	:	ia .	:	ia.	:	:	ia	:	:	:	:	;	:	:	:	:	:	:	:	:	:	:	:	:	:	•	;	ype.
		٠.		vak	:	vak		:	vak													:								ld t
			:	oslo	,	oslo			oslo	ary		ary	· ·	m	ary		, pr	ü	u	e	any	ria	ria.	ria.	nia.	rs	nia.	u	nia.	n bo
		taly	J.S.A	zechos	J.S.A	zechoslova	J.S.A.	taly	zech	gun	taly	nng	ussi	ussi	Hungary	ussi	nlar	sweden	weden	rance	Jermany	<b>Bulgaria</b>	ılgaı	ulgaria	`umani	Austria	Rumani	weden	tuman	ies ii
		Ħ	$\supset$	O	2	Ö	0	Ħ	O	Ξ	Ħ	Ξ	~	~	Ξ	×	í,	Ś	Ś	Ξ	O	B	ñ	ñ	æ	Ā	æ	Š	Ž.	g tin
,		:		:	:	:			:	:	:	:			:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	nning times in
,					٠.				į,					١.																Win
-		•	•	•	•	٠		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•		٠	•	•	•	•	_
				:	:		:	:	:	:	:	:				:	:	:	:	:	:		:	:	:	:	٠.	:	٠.	
			٠.				~						H.	ž		ij	Υ.						Ī			٠,	•			
			ki, /	:	le,	:	le. E				:	ġ	>	ıko,	:	ö	en,	o	'n,		٠	×.	Ą.	:		:	٠.	四己		
		j	ews	Ż.	inga	-	rda	0,0	ν,	Z.	ij	na,	enk	oser	.:	ķ,	slain	erg,	inelle	ó	r,	0,	ev,	ò	щ	Д.	i, T	at,	>,	
		tossi.	Visniewsk	sch.	ight	oci;	ande	efan	adk	sck,	ossi,	rizsma	Jatalenk	aszil	oth,	aevsk	aaskel	jellberg	artii	sell	iegler	acskov	ajcs	nev,	rrice	igl,	ikos	iqui	Marcu	
		~	۶.	Ã.	Z.	×	Ä	St	S	ğ	×	×	Z	Š	Ĕ	Ö	Ja	×	Σ	ž	Z	ž	>	Ë	ď	B	ž			
		_	7	3	4	3	9	1	œ	6	10	Ξ	12.	13.	14	15.	16.	17.	18	19	8	5	25	23.	24.	25.	26.	27.	28	
9.986	6.1	5.6	6.9	6.0					670	67.7	2099	909	209	416	213	428	195	170	175	24				sec.	:	:		:	:	
86	9	82	75	63																				350	954	166	112	83	1161	×.
						-							ì		-				: :					٠	5	5	~	=	=	1200
_	Ú.	-		-		. 1																								



There are two new kits from Keilkraft this month, both aimed at the less experienced builder. The first is a simple 30 in. wingspan tow-line glider called the Conquest. We first saw this model during the Keilkraft trade fair in Manchester earlier this year (see photo) and we were impressed by its the rest of the parts, is fully die-cut. The kit includes a finished stunt tank and is good value at 24s. 6d.

The latest addition to the Airfix series of 1/72 scale plastic kits is the N.A.39 Buccaneer. This ambitious model,  $10\frac{1}{2}$  in. long, embodies the largest

number of working bits and pieces of any Airfix kit to date. The wings fold, the nose hinges, the bomb-bay rotates, the nosewheel retracts, and the arrester hook can be lowered. All this of course, means that more than average care is required during assembly if a neat model is to result. The N.A.39, however, is a satisfying model to build, the accurately moulded components go together very well and the

difficult to reproduce characteristic lumpiness of Blackburn's design is faithfully reproduced by this 4s. 6d. kit.

If you think that the Airfix Buccaneer is just about the ultimate in movable parts, take at look at the latest French Heller product—the Dassault Etendard IV.

better than most plastics, and begins to take advantage of the vast possibilities presented by this material, most of which have not yet been fully exploited by manufacturers.

The mouldings are very finely produced, having crisply reproduced detail, although requiring some rather careful "flash" removal before assembly. But the really outstanding feature of this Heller kit is the number of bits that can be moved. The rubber-wheeled undercarriage is fully retractable (including the well doors) and is held down by small springs.

The dive brakes operate, wingtips fold, cockpit opens and the arrester hook can be lowered. Most of these operations are carried out semi-automatically, being actuated by nylon threads which pass over a rotating drum concealed in the removable rear fuselage!

One criticism concerns the instruction sheet, which has been literally translated from the original French. Some of the terms are so confusing that it might almost have been better to have left it in French! This short-coming is to some extent compensated for by the extensive, and very explanatory, tone drawings which illustrate various stages of construction.

The only other observation we would make concerns the transfers which are not up to the high standard of the rest of the kit, although of higher quality than most French-made transfers.

Dealers will be particularly pleased with the high quality of the very colourful box which is so important in these competitive days and retailers may order supplies from B. J. Ward Ltd., 130, Westminster Bridge Road, London, S.E.I.

This is not a model for the beginner but will provide hours of satisfaction for the more experienced builder who is looking for a kit that he can really take his time over.

The price is 14s. 3d., and if you cannot wait until your local model shop gets one in stock you can order your Etendard from Model Aircraft Supplies oduct—the Dassault Etendard IV. Ltd., 29, Old Kent Road, London, This 1/50th scale model, goes one S.E.1, but don't forget the 9d. postage.



straightforward construction and attractive appearance. It is recommended to club secretaries as an excellent first model for new members. Price is 7s. 11d.

The second model, the Snipe, is a neat 40 in wingspan high wing cabin power model for engines of under I c.c. It is an ideal beginner's power model and its scalish appearance allied with tough, simple construction, will appeal strongly to the Sunday morning "fly for fun "brigade. The Snipe costs 19s. 9d.

Both kits feature fully die cut parts of high quality balsa, each part being clearly printed with its identifying number.

A new 32 in. span stunt trainer and combat model for 2.5 c.c. motors, also makes its debut this month, in the shape of the Firebird.

This model looks like an enlarged version of the Firefly, which is now a well established beginner's favourite, but the new model has combined flap and elevator linkage and in the air the Taloncharacteristic type wingtip shape is very apparent.

One of the most attractive features of the Firebird is the very tough construction, the profile fuselage is reinforced on both sides with thin ply which, like

### M.A. SPECIAL CHRISTMAS NUMBER

Unbelievable as it may seem, the festive season is once again with us and highlights of our special Christmas fare, in the next issue of MODEL AIRCRAFT, include a GRAND PRIZE COMPETITION for all readers, photographs, drawings and building instructions for John Simmance's SUPERB FREE FLIGHT SOPWITH SNIPE—the magnificent full size two sheet drawings for which will be available from our plans service, two pages of Pylonius' unique humour in a SEASONAL TOPICAL TWISTS, part 2 of the new series on MODEL JETS and DELTAS, and to catch your eye a photographic cover in FULL COLOUR.

ALL THIS AT OUR USUAL PRICE OF Is. 6d.

## TOPICAL TWISTS

by PYLONIUS

Safer by Tube

We have come a long way since the days when rubber models were laboriously wound up by finger (about 10 yd.). They are now laboriously wound up by more sophisticated means, the most spectacular of which is the tube method. The general idea behind this ingenious and impressive system is to protect the fuselage from the explosive impact of a motor which has been given maximum turns plus one.

The process begins with the partial dismantling of the model. After which a specially trained assistant carries out some long and involved operation in the region of the rear motor peg. When this is completed the tube itself is surgically inserted into the throat of the hapless model. Now things begin to warm up, with a whole new batch of gadgetry coming into play. And, long before the winding up process even starts, you begin to feel that it might have been quicker to have built a new fuselage after all.

I suspect, however, that the whole operation is nothing more than a piece of showmanship. I base my suspicions upon the fact that the experts who go in for this sort of thing are using unburstable rubber. The winder upper might begin to feel the strain after the first thousand turns, stopping to wipe the sweat and glycerine from his fevered brow, but the motor is game up to the last turn his knotted up arm can put on the

Goodness knows where they get hold of the stuff, certainly not from my liquorice dealer.

**Inching Out** 

That extra inch or two might make the winning difference in a beauty contest, but is not likely to affect the result of a competition involving the other flighty type of model. Such, in effect, is the heretical opinion expressed in our editorial columns. For some reason, known only to any intelligent person over the age of 10, the model plane, with its weird projections and contorting curves, does not lend itself to accurate measurement of its vital statistics. Indeed, all too often the designer is out to get his full moneysworth, and the statistics then become suspiciously over vital. This is where we get the borderline case, in which the offending model is subjected to such a curious mauling by the processor that you begin to wonder which, in fact, is the borderline case.

Perhaps we have been blinded with science for too long, and the time has now come to have the scales removed from our eyes, as it were. Of course, some basic rules will have to apply, to eliminate the entry of toy balloons and guided missiles. With the field wide open we might have to cope with the odd Super Tigre powered chuck glider or the 10 ft. microfilm glider, but this should only add to the fun of the fair.

Just a word of warning, however, by throwing the slide rule wallahs out of work, we might leave an aching gap in the jobs-for-the-boys agenda. Some other sinecure will have to be found for them, and merely to hand them out the armbands and usher them on to the contest field will add seriously to congestion. Already the flyers have to fight their way through the masses of officials, and a few more might cause a complete seize-up.

**Hobby Corner** 

If you are the methodical type of builder who believes in the right tool for the right job, then you will be tickled pink with the latest line in workshop kits now offered for sale. I forget what it contains, but I have a vague idea that it includes all those bits and pieces which we chaotic types could never find even if we knew how to use them. I know for a fact that my own junk room-cum-workshop would make short work of swallowing such fancy ironmongery into its dim corners. Usually the only tool to hand is that good old standby, the razor blade. I know it is a sad admission to be so dependent on this antiquated weapon in a hobby which has become so technical, but I took it up on the understanding that this was the only tool required and I refuse to compromise with any new fangled gadgetry.

Of course, it is not likely that the razor-blade-only-operator will ever get into the expert top 10. You only have to glance at the workmanship and appearance of the leading experts to realise that the razor blade is the least part of their equippage.

But, if my work room is a shocker, it has nothing on my so-called repair kit. All too often I bow my head in shame at the sight of the tidy and well-stocked kit of the methodical modeller. Rubber bands graded according to size and thickness, and laid out in neat bundles of 10; fuel jars arrayed in order of potency; d/t fuse coiled up in easi-feed dispensers; and cutting tools lined up with surgical precision. And all this kit-proud paraphernalia contained in a huge chequered box, wittily inscribed with sundry instructions, "Kick here to open, etc."

By way of comparison I checked over the sticky contents of my own ex-army haversack to compile the following dim inventory: six empty cement tubes; half a jar of congealed dope; 1949 Nationals programme; two dozen assorted rubber bands embedded in cake of cement; dog licence; one pair of broken pliers, and six saw-edged razor blades. The remainder of the rubble defies identification.

#### Worn Out

At one time the modeller was readily distinguishable from most any normal member of the community by the eccentricity of his dress. Possibly the only exception was a tramp. His modern counterpart, though more approachable from upwind, still clings to one or two of the traditional emblems. Perhaps



"Are they beatniks dad?"

the best known of the surviving relics are the O'Donnell and the braces Pimplet. Posner We could mention one or two others, like the Fuller shirt and the Boys' shorts, but generally the modeller of today matches his dress to his peculiar obsession. For instance the glider enthusiast likes to conform to the T shirt and plimsoll rig for his athletic antics, while the power boy will identify himself by

his bulging sports jacket and "through the hedge" hair do. We could elaborate by indicating the beatnikish ensemble of the Combat type and also the V.I.P.-ish get-up of the multiradio gentry, but the list is almost endless.

The only new item of apparel causing any puzzlement is the bowler hat, now to be seen touring the rally areas. The wearers, quite unarmed, apart from the odd guitar, roam in packs of three or four. No one seems to know who they are or where they come from, although I have heard one or two suggestions as to a suitable destination.

My own pet theory is that they are retired modellers, following a time-honoured tradition of getting themselves bowler-hatted. This is a departure from the accepted form of farewell equipment, which is either a high powered sports car or a nifty blonde, and, in some enviable cases, both.

#### Tail Twists

I read that "the large majority of the public are completely ignorant of the fact that modelling exists."

No wonder they sell all those deaf aids.

It seems that the bloke who invented the aeroplane did it so thoroughly that subsequent flying machine inventors couldn't have had much to live for.

The Crystal Palace boys now hold their meeting in the All Saints' School. I know at least one club which wouldn't have the nerve to meet under such a well behaved name, but then you know what they say about people who live in glasshouses...



OR most of you in Britain this is the Winter Term. When you went back to school after the summer holidays the trees were green and the evenings long; and when you break up again you will be thinking urgently of Christmas. What changes we see in these three months!

Some of you will no doubt be hoping to form a model aircraft club at school. The Winter Term is not, of course, the flying season—but our hobby extends through the

whole year, and the dark wet evenings are an invitation to build.

This is therefore the perfect time for pioneering. Those who have joined the Wings Club can bring in their friends until the school has a group of enthusiasts all wearing the same badge and bound by the same sensible rules. It is then easy to establish a

Now listen to C. D. Morgan of Brodawel, Llanbister, Llandrindod Wells. "I was wondering," he writes, "if you could give me some ideas and assist me to build up a model aircraft club in the prep school to which I go. As most of the good modellers left last term, I thought that I might start a club with the aid of my friends, to stop aeromodelling dying out completely in the school-which would be a pity, as we have a good flying place in the school grounds.

"It may be rather surprising to receive a letter on this subject at the present time of year as aeromodelling is usually carried on in the summer months, but in our school

the hobby is mainly pursued in the two winter terms."

From what I have already written about the winter uses of our hobby, you will know that I am not at all surprised by C.D.M.'s letter. What help can I give him? Well, I shall be glad, if he wishes—but only if he wishes—to write to his headmaster, housemaster or form master explaining the aims of the Wings Club; so far, headmasters (sensible people, on the whole) have been approving and co-operative. But everything depends upon the boys themselves. Are they sufficiently interested to form a club?

It is astonishing what a Wings Club badge will do. Schoolboys are always curious about other boys' badges, and the Wings emblem is bound to draw attention in any place where it is spotted for the first time. One badge quickly becomes two badges, and the two then have double the effect. I do not know what the opposite of a vicious circle may be, but we invariably discover it when the Wings Club badge is displayed.

C.D.M. now knows what to do. The badge, I think, will do the rest, if there is any hope of continuing the aeromodelling at his school.

ALAN WINTERTON

#### WINGMEN WRITE

Five shillings is paid for every letter published and a further 5s. for a picture.



I am enclosing a photo of myself with my Frog Tempest which was built by my friend and by myself.

I am nearly 16 and only interested in C/L models and especially in stunt. I have a Merco Stunt 35, and an O.K. Hothead, two Frog 2.49's and an Enya

Yours sincerely, Wallasey, Cheshire. BILL EVANS.

#### PEN-PALS WANTED

Peter Nixon of The Brampton, 87, Scratchface Lane, Bedhampton, Hants., is 14 years old, and interested in most types of aircraft model building, particularly C/L. Peter has not built many models but would like to hear from other boys of his own age in Australia or America and perhaps exchange magazines, etc.

Richard Walton is 11 years old and builds gliders and C/L models. He would like to correspond with fellow Wingmen living in England or Scotland. Richard's address is Spot House, Westgate, Bishop Auckland, Co. Durham.

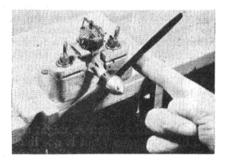
#### Peter Chinn's

#### ENGINE TIP

#### for Wingmen

MICK, reliable engine starting is something which requires practice. If you have just purchased your first engine, don't be discouraged if you have difficulty in starting it, with certainty, every time. You will probably find that it will take several days for you to become used to the technique of starting.

Starting technique involves many factors, but much can depend on the correct choice of propeller, especially



with engines not equipped with spring starter devices. Usually, engine manufacturers give recommended propeller sizes in their instruction leaflets, but these are often intended to extract maximum, near-maximum, power (i.e. smallish props running at high speed) and, especially in the case of diesels, may not give the easiest starting. For diesels, a relatively large diameter and fine pitch will give the best "flywheel effect" for easy starting.

The following is a list of suitable "easy starting" prop sizes for popular small engines. If you are experiencing difficulty, check your engine against the diameters and pitches given below (diameter first).

Cox Pee-Wee	$5\times3$ or $4\frac{1}{2}\times3$
E.D. Baby	$7\times3 \text{ or } 6\times4$
A-S 55, D-C Dart	$7\times4$ or $7\times3$
E.D. Pep, Mills 75,	, ,
D-C Merlin, Frog 80	$8 \times 4$ or $7 \times 4$
D-C Bantam, A-M	,
049, Frog 049, Cox	
049	$6 \times 4 \text{ or } 6 \times 3$
E.D. Bee, D-C Spit-	1 3
fire	$9 \times 3$ or $8 \times 4$
A-M 10, Frog 100	3 3 1
Mk. II, Mills 1.3,	
E.D. Hornet	$9\times4$ or $9\times3$
D-C Sabre, Frog 149	$9 \times 5$ or $9 \times 4$
Frog 150R, PAW	3 - 3 - 1
1.49, A-M 15, E.D.	
Super-Fury	$9 \times 6$ or $9 \times 5$
Fox og, Fuji og	$8 \times 3$ or $7 \times 4$
Enya og, O.S. Pet og	$8 \times 4$ or $8 \times 3$
, ,,	1 3



#### WORKBENCH—Basic construction—continued

A^N important job which is often poorly carried out by newcomers to the hobby is the sheet balsa covering.

Properly carried out, sheet covering adds tremendous strength to the air-frame, but there are several pitfalls for the unwary. To begin with, as many of you will by now have realised, balsa wood comes in many different weights and textures. The hardest wood is many times heavier than the soft variety. Sheet covering consumes a large quantity of balsa, and unless great care is taken in choosing the lightest wood (consistent with strength requirements), the resulting increase in the model's weight may completely destroy its flying performance.

Another point to bear in mind when selecting sheet for covering is, that whatever weight of balsa is eventually chosen, make certain that the wood used for wing covering is as near as possible identical for both left and right wings. If heavy wood is used on one wing and light on the other, the finished model will be very difficult to trim for stable

flight.

The photographs this month show the various stages of sheet covering the front part of the wing of a Keilkraft Junior 60. The construction is quite typical, and our methods may be applied to a wide variety of models,

both large and small.

It is most important that all sheet used for covering should be sanded smooth before fixing it to the structure. Lay the sheet on a flat board and, with a sheet of fine grade sandpaper wrapped around a sanding block, remove only sufficient material to smooth out any saw marks that remain on the sheet surface. Most balsa today comes already sanded to some degree, but it often benefits from a further light sanding to remove any slight roughness that remains.

The Junior 60 wing is 5 ft. span, and  $\frac{1}{16}$  in. sheet balsa is used to cover the area between the upper spar and the leading edge. The curvature of the wing ribs is always greatest at this

point, and to avoid splitting the sheet it should be pre-curved to the rib shape. The easiest way to do this is to moisten one side of the sheet with a little water. The wood will expand on the moist side and assume a curve—this process is clearly shown in Photo 1.

Fixing the sheet to the frame used to present a major problem when only ordinary balsa cement was available. The adhesive dried so quickly that by the time the cement had been applied to the whole framework to be covered, the first part had started to dry! Even if the sheet could be fixed in place before the cement set, it was often distorted by the considerable shrinkage produced by most balsa cements.

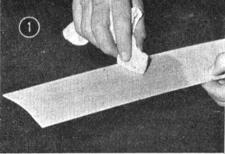
Happily we can take advantage of the great strides that have been made in adhesive research during recent years. The P.V.A. type of glue is the answer and is supplied by most of the leading cement manufacturers. Both LePages and Humbrol supply a P.V.A. glue; the latter, known as Britfix "55" White Adhesive, is being used in Photo 2. P.V.A. glues are white when wet but become clear when completely dry. They do not shrink appreciably and, therefore, do not pull the balsa out of shape. They set in about 20 min. and this allows plenty of time to place and fix the covering in position. Drying is complete in about one hour.

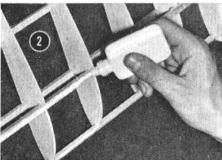
The sheet must be held in place with pins as shown in Photo 3, until the glue is dry. It is important with P.V.A. that the two surfaces to be joined are held in close contact with each other until dry, as this adhesive will not fill up gaps as

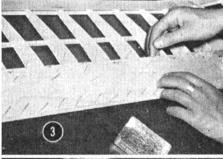
readily as balsa cement.

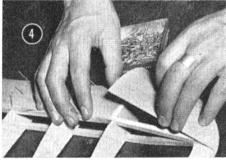
The wing tips must usually be covered separately, since balsa is almost impossible to bend in two directions at once. The joint between the separate sheets is important, as, unless it is well made, it will invariably fracture after a hard blow.

Photo 4 shows how the main wing sheeting is chamfered at its outer end so that the tip sheeting can be over-









lapped in a similar manner to the spar joint illustrated last month.

When everything is quite dry, the sheeting should be very carefully sanded, particular attention being paid to the points where it meets the main structure, such as at the leading edge and wing tip. Take particular care not to weaken or deform the sheeting by sanding away too much wood over the wing ribs, etc. This is why we stressed the importance of sanding the outside of the sheet before fixing it in position.

Although sheeted, the wing should still be entirely covered with tissue, even over the wood. Besides adding a great deal of strength to the sheeting by "bonding" the wood fibres together, the tissue helps enormously to prepare the wood surface for a really good smooth paint finish. This, of course, is another subject and will have to be dealt with in another Workbench

feature.

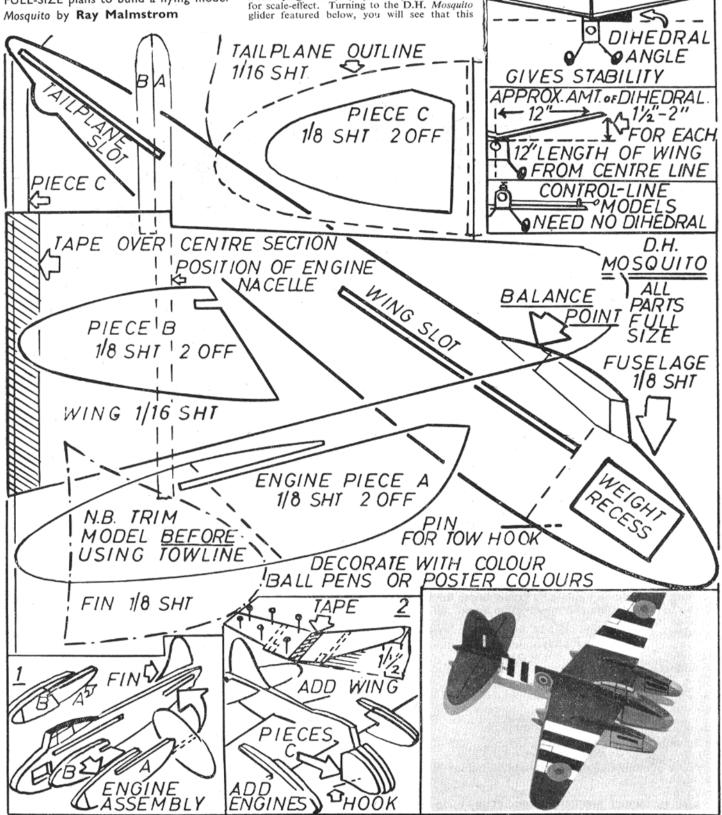
-	Dear Alan Winterton, I would like to become a member of the Model Aircraft Wings Club. With this coupon I enclose a postal order for I/- to help cover the cost of the badge transfers and membership book. All membership applications must be on this form. Name in full.
ļ	(Underline christian name normally used)
l	Address
i	
	Date of birth
l	School or College
	Name of other club or clubs to which I belong (if any)
	Send to—MODEL AIRCRAFT WINGS CLUB, 19-20 NOEL STREET, LONDON, W.I.



# Model in Tip

A special instructional feature for wingmen on the dihedral angle, with FULL-SIZE plans to build a flying model Mosquito by Ray Malmstrom THE dihedral angle (or the upward slope of the wings from the centre section) plays an important part in keeping your F/F rubber or engine driven model steady in the air. It prevents side slips, rolling, steep banks, and bad behaviour generally in what is known as the "rolling plane." Therefore check from the plan that your model has the correct dihedral, and also that each wing has the same amount. The amount of dihedral to be built into a model is approximately 1½-2 in. for every 12 in. of wing length (half the overall span) measured from the centre line. Control line models do not require any dihedral angle as the lines stop the model from trying to roll, C/L jobs only have dihedral for scale-effect. Turning to the D.H. Mosquito glider featured below, you will see that this

11 in, span model has  $\frac{3}{4}$  in, dihedral under each wing tip. This profile sheet model is easy to build, and can be painted, as our original model, in the colours of a *Mosquito* of the Allied Expeditionary Air Force. The model can be launched by hand or with a tow-line catapult. This consists of 10 ft. of  $\frac{1}{8}$  in, strip rubber and 20 ft. of thread, with a paper clip tied to the end. The line is anchored to a  $\frac{1}{16}$  in, dia. dowel rod pushed into the ground, Build and balance your *Mosquito* carefully, test over long grass, and you'll find, like its big brother, it is full of "get-up-and-go."





# LETTERS

#### to the Editor

#### Experts only—

DEAR SIR,-I am not happy about contest aeromodelling at present, for although the standard of flying has never been higher, fewer and fewer people are sharing the awards. Model development has become slow, and beginners are finding it very hard to break into contest flying. The present rules are partly responsible for this.

In my specialty, stunt, perhaps a dozen people flying big "35" jobs take all the places at all the meetings, no matter if they are in Scotland, Kent or Cornwall. The small local meeting went out when the average modeller could afford a car and distance ceased to be a problem. Today, even an experienced pilot who takes up stunt must practise for many months before he can hope for a third at a minor event.

All major stunters look alike and any conventional low-wing monoplane of about 55 in. wingspan, 600 sq. in. wing area, with a longish nose and a medium to long tail moment, weighing 40 to 50 oz. for a stunt 29 or 35, is easily capable of the schedule. Therefore there is little incentive to experiment. This type of model is strictly for the expert, it is expensive to build and fly, noisy, hard to transport and easy to damage. Most modellers would do better with a small simple diesel job and a lot of practice.

I think one solution to the problem of encouraging beginners to enter contests is to split stunt into two classes, say "precision stunt" and "experts-barred stunt." One of the reasons for the great post-war aeromodelling boom was that a beginner could easily and cheaply build a model and fly it in contests with some hope of success. Experts-barred events will produce these conditions again.

Precision stunt should be as tough as we can make it—three square horizontal eights, multiple hourglasses, inverted point-down triangles, horizontal and vertical triangular eights (two triangles

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.

with a common base line). This would put us out of line with International stunt, but when America alone had the harder schedule she produced the best stunt planes and pilots in the world. Our models would have to improve and we might break out of the present

For "experts barred stunt" I suggest something like the old schedule without the squares, and the models restricted to 45 in. span and 2.5 c.c. Those ineligible for such a class could be selected from the contest results of the last few years and fliers winning say, two events in a season would also become "experts." Such experts would be a

good source of stunt judges.

The present schedule has details I dislike. Points for realism are stifling originality, full design points should be given to the designer of a model, whatever the quality of the design may be, and no points to anyone else. Too and no points to anyone else. thick lines are required; only the first attempt at each flight should qualify for starting points; there are no concessions for multi-engined models. Stunt judging is very much an art, yet contests have been won by a single point. A fly-off is needed to settle places when scores are within 10 points.

Team racing presents a similar situation. While the F.A.I. class cannot be changed, the other classes could be made more difficult and an experts-barred class introduced. The obvious way to make a race harder is to make it longer, so how about a 100-mile "B" Team Race at the Nationals? This would demand a new level of skill, reliability and strength. There should be more encouragement for development, monoline might be permitted and the semiscale rule should be clarified especially in regard to monowheel undercarriages.

Experts-barred events are less easy in team racing than in stunt, for here the motor is very important. An :049 class with no restrictions would become the preserve of some limited production, specialised, expensive engine, as have all the other classes. Such motors must also be banned. One way might be to specify a few cheap British engines and make it a condition that winning and placing engines are impounded and sent to the

makers for a check that they are in standard condition.

The model specifications would be strict to give a strong, simple model, and the following might be used for an .049 class: lines 42 ft. 10 in., wing area 55 sq. in. minimum, wingspan 20 in. maximum, minimum weight 8 oz.,

two 11 in. dia. wheel undercarriage, external lead-out wires, universally available nylon propeller to be used (tips may be clipped, no other modifications).

Speed must always be an expert's class, and in combat the junior's eye and quick reflexes seem to balance the old hand's experience. In fact the problem is not persuading beginners into combat, it is keeping them out until they can handle a model safely.

Well, there we are. Let's create more simple events for the new boys and give them a chance by banning the expert and specialist equipment from these contests, and at the same time set the old hands a challenge that will test them and their models to the limit.

Finally, in this Olympic year, is it not time we had a stunt event at the Olympics? The old objection that the contest must test the man and not the machine does not apply to stunt flying.

Yours faithfully, NOEL FALCONER.

R.A.F. St. Mawgan, Cornwall.

#### Pity the poor old timekeeper

DEAR SIR,-F.A.I. Team Racing is, happily, becoming very popular. But poor timekeeping and lap-counting is proving a source of continual irritation.

Having done quite a lot of timing and counting, this season, I would like to voice a few conclusions I have come to.

Lap-counting and timing should only be done from alongside the segment from which the model originally started. If all the timekeepers sit together, then how does one timekeeper know when the model passes a segment say one-third of the circuit away from him?

Staying by the relevant segment and pit-man also has another use; he can check his model's lappage with you at each pit stop. This helps the pit-man and is surely no infringement of the

In a close finish, where two models are credited with times less than I sec. apart, then the result should be recorded as a tie as most ordinary stop-watches are only accurate to about ½ sec. in

At the next F.A.I. meeting G.B. should submit that the 30 sec. count-down should be reduced to 10 sec. A lot of engines get cold in 30 sec.

Yours faithfully, KEVIN LINDSEY.

Hayes & D.M.A.C.

The Editor welcomes letters for {publication on any subject, but { preferably of "newsy," topical interest or controversial nature. S Address is "Model Aircraft," 19/20, S Noel Street, London, W.I.



## SLIPSTREAM

# An International class power model of 'basic' construction

### **Designed by Brian Cox**

A HIGH performance power model of very simple construction, Slipstream is capable of putting up times as good as many of the more complicated models which are seen today. During the development of the design two main factors were kept in mind, they were, high performance and simplicity of construction. This latter is of prime importance if you wish to develop a design through a series of models but have only a limited amount of time for building.

Development

The original Mk. I was built in May, 1956, and was for an Elfin 1.5 c.c. It had a wing of  $52 \times 6\frac{1}{2}$  in., and a 40 per cent. tail on a  $2\frac{1}{2}$  wing chord moment arm. It flew very well but had a few weak points in the airframe which were duly strengthened when the Mk. II was built. Two of these were built and were flown during the seasons of '56 and '57. One of these models took second place in the '56 Frog Senior with 12.00 + 2.14 and the other took second at the South Midland Rally at Cranfield flying under strong gale conditions. Both had a fairly thin flat bottom wing section which gave a fast stable climb, the large wing area giving a reasonable glide.

The first of the 2.5 c.c. versions was built in January, 1958. This was virtually a scaled up version of the Mk. II with a wing of 60 × 7½ in., and a 35 per cent. tail on a three chord moment arm. After seeing Draper's F.A.I. models at the 1956 World Champs. I decided that the flat bottom section could be retained without detriment to the glide! This first Mk. III had an Eifflaender 2.5 fitted, which was soon followed by a second one for an Oliver. This performed much better, having a better climb. This model was flown at the 1958 Nats., putting up over 11 min., and it also took second place at that year's Devon Rally.

As the Team Trials loomed up in the contest calendar the Mk. IV was built.

This had a greatly strengthened airframe with L.E. sheeting on both wing and tail. The aspect ratio of the wing was also reduced for structural reasons. The new wing, using the same section, was  $56 \times 8$  in. also the tailplane was reduced in size a little. This model was a little over area and to suit F.A.I. ruling had to weigh 27.5 oz. Engine fitted was an Oliver, and to aid recovery at the top of the climb an auto-rudder was incorporated. However, I must have collected some gremlins on the way to Hemswell for an air leak developed in the fuel cut-out which did not help matters when using an auto-rudder! At the second trials with a new cut-out fitted the Mk. IV put up an easy 15 min.!

The latest model in the series to be built is the Mk. V. This is geometrically the same as the F.A.I. Mk. IV with lighter construction although the leading edge sheeting was retained because I think this was in some way responsible for the very good glide of the Mk. IV.

As an experiment thread turbulators were fitted to both wing and tail but gave poor results, in that the stall was very sharp. Although the thread was of the right diameter for the Reynolds'

Below: Brian Cox holds two "Slipstream" development models. The latest version is shown in the heading photo.



Number of the wing its position may have been incorrect (2 per cent. chord). Due to lack of time, further work with turbulators has not yet been carried out. Because this is a fairly large model I think it is important that a really good motor is fitted, e.g. Oliver, Eifflaender, Frog, Enya "15," Rivers or similar. For open events a 3.5 c.c. motor could be fitted very easily, the model being very docile to trim.

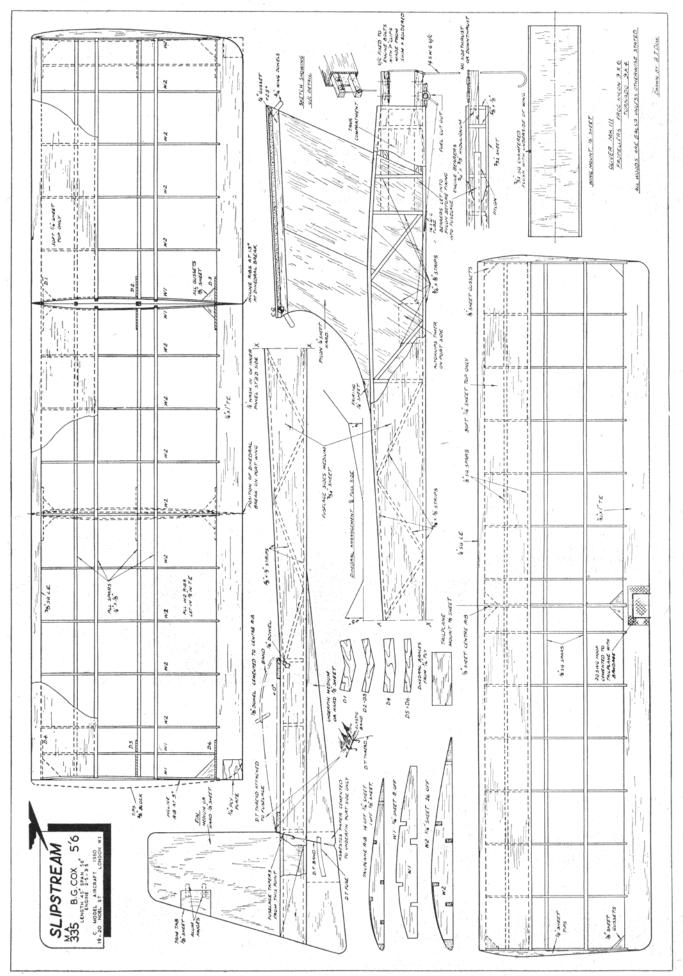
#### Construction

To anybody who has built a power model before, the construction is ultrasimple.

The fuselage is built flat on the plan with the engine-bearers let into the pylon which is cemented together before fitting in the fuselage. With the pylon, bearers, and 10 c.c. tank installed the second fuselage side is put on, after which the fuselage can be removed from the plan and the rear and under fin added. These are cemented together first and then slotted into the rear fuselage. The fuselage is covered with lightweight Modelspan and the flying surfaces with heavyweight. The whole model is given two coats of clear dope after water shrinking wings and tail.

Flying

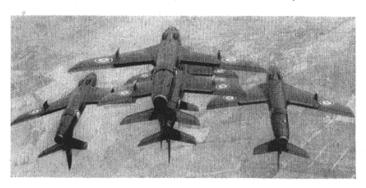
The model climbs in a steep right-hand spiral with right glide. Hand glide to trim, and adjust turn by tailplane tilt. With wing warps checked try a 10 sec. run at about half power. Correct immediately if there is any tendency for the inside wing to drop. This can be done with the trim tab. If the climb is too tight it can be opened out by increasing tailplane incidence by small increments at a time. A flat climb is usually best cured by increasing wing incidence. With the power trim sorted out final adjustments to the glide can be made with ballast in the tail, and tailplane tilt for trim. Having trimmed for full power do not trim glide by altering any incidence settings!



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 19-20, NOEL STREET, LONDON, W.I, PRICE 5s. 6d., POST FREE

## AVIATION NEWSPAGE

By J. W. R. Taylor



Left: an unusual photograph of III Squadron Hunters which are the subject of our first news item this month.

TREBLE ONE SQUADRON, the greatest aerobatic team of all time, will have given its final display as Fighter Command's No. 1 demonstration unit by the time this issue of Model Aircraft is on the bookstalls. Instead of the famous all-black Hunters (above) its pilots will soon be flying Lightnings. Its place in the limelight will be taken next year by No. 92 Squadron, another Hunter unit.

Shall we ever see an aerobatic team in Lightnings? To date, public appearances by No. 74 (Tiger) Squadron, first to fly these supersonic fighters, have been restricted to fly-pasts in close "finger four " combat formation; but it did not start to re-equip until this summer. The tremendous success of No. 111 Squadron was made possible by the Hunter's superb stability and handling qualities in manoeuvres performed at between 180 and 450 m.p.h.; and we could hardly expect the Mach 2 Lightning to match this. However, the R.A.F. has seldom failed to fly formation aerobatics in its standard high-speed fighters since the days of the Sopwith Snipe. Almost the only exceptions were, surprisingly, the two greatest piston-engined fighters of all, the Hurricane and Spitfire.

BETTER BEECHCRAFTS are made possible by a new modification kit produced by Volpar Aviation of Pacoima, California, which enables all models of the twin-engined Beechcraft 18 to be converted to a tricycle undercarriage configuration. Although this involves the installation of a new truss support structure inside the centre-section, it can be done without removing the wings from the fuselage or stripping off any of the wing skin.

The mod. moves the main wheel

units 4 ft. aft of the normal position and adds a completely new nose, increasing the fuselage length by 28 in. The cabin floor ends up only 38 in. above ground level at the door, and overall height is reduced to 9 ft. 2 in., enabling the aircraft to fit in hangars with low roof clearance.

Use of a tricycle gear permits much lower approach speeds and greatly improved braking, as well as easier and safer touch-down and taxying. The aircraft will turn on a 4 ft. radius of the inside wheel.

YOU TOO can have a U-2, claims French amateur designer-pilot René Fournier of Cannes, builder of the little of underwing steel-wire skids. Construction is all-wood, with plywood skin. A 25 h.p. converted Volkswagen engine gives a top speed of 100 m.p.h. and endurance of well over three hours at 56 m.p.h.

FISHY STORY from Aer Lingus is that they flew some 600 Englishmen to Ireland on special Viscount services to do a spot of angling. Between them these sporty characters are reported to have caught 21½ cwt. of fish, which were promptly thrown back after being weighed. All of which sounds an awful waste of time.

YET ANOTHER OLD-TIMER still going strong is the Junkers Ju52/3m of the Swiss Air Force, illustrated below. In superb condition, despite its age, it is representative of the fully-operational version, with an open gun position above the rear fuselage.

There is a structure of some kind under the fuselage, between the main undercarriage legs, where Luftwaffe Ju 52/3m bombers of the thirties had an open bucket-shape gunner's station. Unfortunately, it has not been possible to discover whether the Swiss aircraft retains this feature, or whether the structure serves some other purpose.

NOISE ANNOYS people living round airports, and it's not exactly popular with the airlines. For example, to compensate for the loss in thrust

Right: a very interesting new French powered sailplane, the Rene Fournier R.F.01.



R.F.o1 monoplane illustrated above. At first glance it looks a fairly conventional single-seat cabin monoplane, but those long-span (36 ft. 9 in.) wings enable it to double as both a sporting aeroplane and a training sailplane, with power off.

Another feature shared with the cruise-glide Lockheed U-2 "spy plane" is the centre - wheel - and - balancer undercarriage. In the R.F.o1, this consists of a retractable monowheel in the bottom of the fuselage and a pair

caused by the 21-tube sound suppressors fitted to its turbojets, a Boeing 707-120 uses about 500 gallons of extra fuel on an average coast-to-coast flight across the United States.

The cost of the fuel is not great, but its weight of 3,250 lb. means that it takes the place of 13 paying passengers. Working this out at tourist rate fares and at one-round-trip-a-day frequency, the annual cost of keeping the engines quieter is more than \$1,000,000 per aircraft.

Right: the new tricycle undercarriage Beechcraft. Below: a Junkers 52/3m of the Swiss Air Force.







A LTHOUGH it made its first flight towards the end of August, well before the kick-off at this year's S.B.A.C. Display, the little aeroplane illustrated on this page was not seen at Farnborough. This is understandable, for G-EBHX is the rebuilt prototype of the D.H.53 single-seat lightplane and made its original first flight over 37 years ago, in September, 1923. However, it would hardly have looked more antique than some of the aircraft that were there for the umpteenth time.

G-EBHX, then named the Humming Bird, was designed and built to take part in the Daily Mail light aeroplane competition at Lympne in October, 1923. The object of the contest was to encourage private flying, and the rules stipulated that engines must have a capacity of not more than 750 c.c., to keep down costs. As a result, G-EBHX and its sister, G-EBHZ (named Sylvia II), each had a Douglas flat-twin motorcycle engine of this size. They did not win, but the D.H.53 was the most practical aircraft entered and was the only one to receive a production contract.

Somebody came up with the bright idea that a few farthings might be knocked off the income tax if the R.A.F.

did some of its training and communications flying on ultra-light aircraft of this kind, so eight were ordered by the Air Ministry. Even with a more powerful 698 c.c. Blackburne Tomtit inverted V twocylinder engine, giving 26 h.p., they still had a very

limited performance and were of little use as Service aircraft; but they were great fun to fly.

Down at the Central Flying School at Upavon, F/O D'Arcy Greig (later famous as a Schneider Trophy pilot) used to amuse himself by flying along the main road behind a car and waiting

for the driver to wave on the imaginary motorcycle, before flying low over his head. His colleague, F/O H. R. D. Waghorn (1929 Schneider Trophy winner) had his D.H.53 modified for inverted flight and is reported to have flown it through a hangar one day

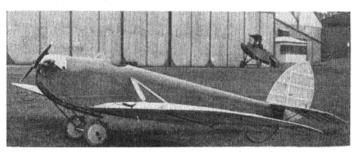
when he saw that the doors were open at both ends, nearly decapitating the Chief Flying Instructor, who happened to be inside at the time.

The first six R.A.F. machines carried the serial numbers J7268-J7273 and were standard D.H.53s. The other two, J7325 and J7326 (the latter fitted with

a 32 h.p. Bristol Cherub), were fitted with a pylon structure for experiments in the use of airships as flying aircraft carriers. Piloted by Sq. Ldr. R. A. de

Haga Haig, J7326 (fitted with the rudder from J7326) was dropped successfully from the airship R33 on December 4th, 1925. Haig managed to re-engage the trapeze structure after a brief flight, although he broke his propeller in the process.

All eight of the R.A.F. D.H.53s ended up in civil markings, and five more were built, of which three went to Australia, one to Czechoslovakia and one to Russia. All had Tomtit engines and G-EBHX was also re-engined with a Tomtit in 1924, at the same time changing its name to L'Oiseau Mouche. It was piloted a great deal by Sir Alan Cobham, who made one particularly interesting flight from the de Havilland aerodrome at Stag Lane to Brussels, including a non-stop hop of 150 miles from Lympne to the Belgian capital. The trip took four hours, at a cost of less than 10s. for fuel and oil.



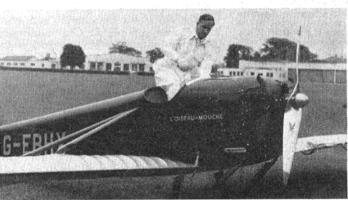
Heading photo shows the rebuilt "Humming Bird"
Above: the same machine in its original form with Douglastengine.

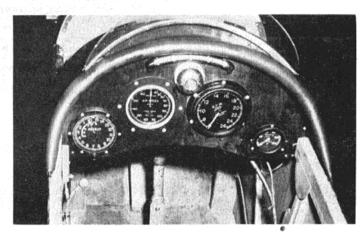
G-EBHX was discovered by the Shuttleworth Trust in a back garden at Eastrey, Kent, in 1955. All that remained were the fuselage, wings, port aileron and undercarriage. There were no engine, engine mountings, tail unit, controls, tanks or instruments. None of the original drawings existed, so the missing parts were re-designed and built at the D.H. Technical School. The engine now fitted is a 40 h.p. A.B.C.

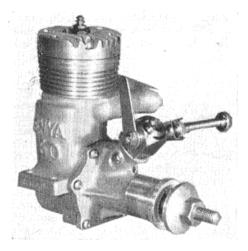
Data: Span, 30 ft. 1 in.; length, 19 ft. 8 in.; height 7 ft. 3 in.; wing area, 125 sq. ft.; weight empty 326 lb., loaded, 565 lb.; max. speed, 76 m.p.h.; cruising speed, 60 m.p.h.; rate of climb, 225 ft./min.; range, 150 miles.

Top left: one of the R.A.F. machines. Below left: the rebuilt G-EBHX. Below: the very neat instrument panel.









SINCE news of Merco's intention to produce a 0.49 cu. in. R/C engine has already leaked out, Bill Morley has kindly given us permission to quote some provisional details of this new project which, obviously, is going to be of great interest to multi-channel R/C enthusiasts.

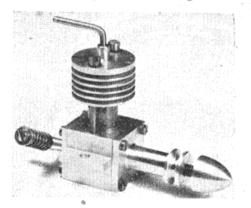
The engine will be a crankshaft-induction job with the shaft mounted in two ball bearings. The races, incidentally, will be of a type for which the manufacturers approve speeds up to 20,000 r.p.m. (This, we might add, is in contrast to the bearings used in many production engines, which are often running, at b.h.p. peaking speeds, beyond the loadings for which they were designed.)

The Merco 49 will be of the loopscavenged type and (a good move this, we believe) will revert to an aluminium piston with rings—probably two, possibly three. Bore and stroke will be

 $0.880 \text{ in.} \times 0.804 \text{ in.}$ 

The speed control system will be the same as that fitted to the Merco Multispeed 35, i.e. a barrel type carburettor throttle with air-bleed idling adjustment and adjustable throttle stop, coupled to a flat-plate exhaust restrictor. The Merco throttle has been well proved in practice and is, unquestionably, one of the most finely made and effectively operating throttle units on any R/C engine at the present time.

Having regard to the fine reputation established by the Merco 35 over the past year, the 49 should be well worth waiting for. One thing we must make clear, however, is that this engine will



# LATEST ENGINE NEWS

By Peter Chinn

definitely not be in production until next year—so please don't burden the manufacturers with enquiries about it!

Incidentally, this seems to be a good opportunity to mention that Merco users had gained, up to the beginning of September, 15 wins and places in major British contests this year.

In a recent letter, Leroy M. Cox, president of the L. M. Cox Manufacturing Co. Inc., of Santa Ana, California, tells us that the special rotary-valve model Olympic engine, which aroused so much attention at Cranfield, was purely an experimental model and will not, in fact, be produced.

This engine, seen in one of Woody Blanchard's two World Championship entries, was one of a small batch representing an interim stage of development of what will be a new Cox contest 2.5 c.c. motor. Roy Cox tells us that this latter engine will be of superior performance to the experimental model seen at the World Championships. Tooling is now being built and it is expected that the engine will be on the market at the end of this year or early next year.

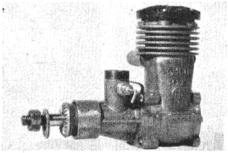
Talking of Cox engines, we have lately been running some tests on the o.8 c.c. Space-Hopper 049, the successor to the famous Thermal-Hopper which has acquired such an impressive contest record over the past few years in Half-A F/F and speed events. The manufacturer's claims for the Space-Hopper do not suggest a power output substantially exceeding the Thermal-Hopper's potential, but, rather, that high performance standards are more closely maintained by average production examples than was the case with the earlier engine.

This may well be so, but we can only comment that our Space-Hopper, purchased in the normal way from a retail

Heading picture shows the 10 c.c. Enya 60TV, the throttle equipped version of the well-known Enya 60. The throttle is of the barrel type.

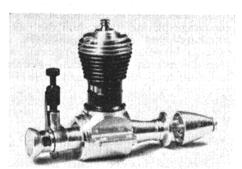
Left: the 0.2 c.c. Dragonfly diesel. This and its 0.1 c.c. brother are the smallest model engines currently available.

Below: an example of the Russian Kometa MD-5 engine. This is an exact copy of the earlier type Italian Super-Tigre G.21 5 c.c. motor.



dealer in the U.S., proved to be quite a bit more powerful than our original Thermal-Hopper received direct from the factory. On one of the new KK nylon 6 × 3 props and Super-nitrex fuel, the Space-Hopper maintained a steady 17,000 r.p.m. and topped 19,000 on a 5 × 4. This puts it head and shoulders above any of the small glow engines currently manufactured in the U.K.—in fact, it represents a horsepower output approximately double that of the average of four British glow 049's tested . . . Perhaps we can look forward to high-performance British 049's if and when Half-A contest flying becomes as popular in Britain as in the U.S.A.

Despite its high performance, the Space-Hopper is one of the easiest starting engines we have ever handled. Thermal-Hopper starting was good but the Space-Hopper is even better. The smaller crankcase volume of the Space-Hopper may be partly responsible here. The new crankcase is for beam mounting and, as on other current Cox engines, is machined from extruded aluminium-alloy bar, there being no castings in the



The Cox Space-Hopper, successor to the Thermal-Hopper and by our tests, an even better performer than the stock T/Hopper. A close resemblance to the Cox .15 models will be noticed.

engine at all. The engine is of very attractive appearance and, one scarcely needs to add, is to the usual Cox high standards of construction and finish. Weight is fractionally lower than for the Thermal-Hopper at 1.3 oz. Bore and stroke remain the same at  $0.406 \times 0.386$  in. giving a swept volume of 0.0499 cu. in. or 0.817 c.c.

Other new small engines in the U.S. are the Herkimer Cub .049R and .06R, also a new low-priced Cub under the .049A designation. This latter has the existing .049A type crankcase but with the shaft-valve intake removed and replaced by a nylon rear tank/carburettor unit with reed-valve, as on the Cub .024 announced earlier this year. It will sell at the same very competitive price as the .024—\$3.95.

In contrast, the .049R will retail at \$6.95 and appears to be based on a modification of the .049B type crankcase with its combined beam and radial mounting lugs. This engine, too,

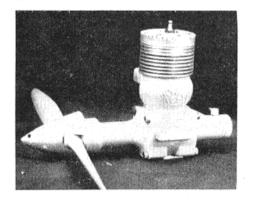
NOVEMBER 1960 MODEL AIRCRAFT

replaces shaft rotary with reed valve induction, but without the rear tank unit: a normal type carburettor is fitted to a screw-in rear crankcase cover. The .06R (the only U.S. 1 c.c. motor at the present time) is basically the same as the .049R. These two models are evidentally intended for the contest enthusiast.

Herkimer, incidentally, are the only American manufacturers still offering diesels—the o.8 c.c. .049D and 1.2 c.c. .075D.

The two smallest engines now currently manufactured since the withdrawal from production of the 0.15 c.c. D-C Bambi, are the 0.1 and 0.2 c.c. British-made Dragonfly diesels. These little-known engines are hand-made jobs sold by Henry J. Nicholls Ltd. We have one of the 0.2 c.c. jobs: it weighs  $\frac{7}{8}$  oz. and is just a trifle bulkier than Cox's Pee-Wee.

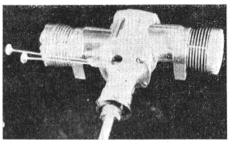
The interesting thing about the Dragonfly is that it is a disc rotary-valve motor. It is almost certainly the smallest



disc valve motor ever built. The disc is a mere  $\frac{3}{8}$  in. dia., as is the disc web of the little crankshaft. Both are of hardened steel. Shaft diameter is 5/32 in. and the crankpin is 5/64 in. dia. The method of mounting the prop driver is novel: this screws onto the threaded portion of the shaft.

No castings are used in the construction of the Dragonfly. The crankcase is machined from solid aluminium and is square in section with a separate flangefitting front bearing in which the shaft runs direct, no bushing being used. The backplate is similarly fitted and each unit is secured by four screws. one-piece carburettor body screws into the backplate. The cylinder liner has a flange just above its base and seats on the top of the crankcase. It is surmounted by a large diameter, generously finned jacket, two long screws being used to hold the entire assembly to the crankcase. The liner has two opposed exhaust ports

Left: the Howler 0.65, a big American oneoff racing special built by Craig Ascher, of Cincinnati, who made the 2.5 c.c. Howler engine illustrated in our September issue. Below: a little-known large Japanese engine, the Sky-Queen 0.99 twin, which is of 16 c.c. capacity.



and a single internal transfer flute. The ½ in. dia. piston has an alloy insert carrying the gudgeon-pin coupling it to a steel connecting-rod.

An intriguing feature of the Dragonfly is the pretty little 4 in. dia. alloy prop supplied with it. This, for some strange reason—on our engine at least—has its aerofoil section reversed, i.e. the thin "trailing" edge actually leads.... Or was the designer influenced by LSARA laminar-flow sections of a few years ago?

At least three examples of the Russian Kometa MD-5 glowplug engine, which we first described and illustrated in our April, 1958, column, are at present in the U.K. Opinion of their performance seems to differ widely: one owner claiming "very good," another "mediocre" and the third "useless." The Kometa is, of course, the twin ball-bearing, ringed-piston, shaft-valve, 5 c.c. motor that is a direct copy of the early type Super-Tigre G.21. It is, incidentally, one of three engines featured in a book of engine plans issued by the Russian DOSAAF organisation. The book, which has 20 pages  $17\frac{1}{2}$  in.  $\times$ 111 in. also features the 10 c.c. Super-Tigre G.24 racing engine and the Russian MK-24. This latter is a 9.85 c.c. (22 × 24 mm.) water-cooled marine diesel with disc-valve induction, twin ball-bearing shaft and radial porting. An output of 0.65 b.h.p. at 7,300 r.p.m. is claimed for it. In the same book, the author rates the Kometa at 0.5 b.h.p. at 16,000 r.p.m. and quotes the Super-Tigre factory claim of 1.4 b.h.p. at 17,000 for the G.24.

# ECONOMICAL MULTI

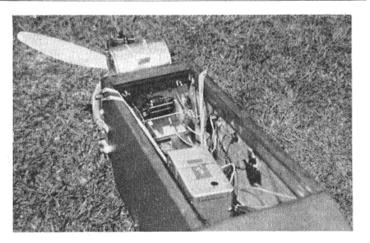
Continued from page 319

throttle control one is likely to encounter. All three servos are fed by the same battery, with negative common. I add one cell to a 4½ volt flashlamp battery, giving 6 volts for the rubber-driven rudder actuator; the existing  $4\frac{1}{2}$  volt tag is used for the Taplin elevator servo; and a third tag is soldered to the middle cell to give the required 3 volts for the motor servo (or you can use the 41 volt tag if the rather faster movement is not objected to). Wiring-up is quite straightforward, although the Taplin servo uses all three relay connections—
"back," armature, and "make"—as per instructions supplied with the unit. One advantage of the changes made is that I have now been able to revert to  $\frac{1}{8}$  in. rubber for the rudder actuator, thus preventing binding or skipping through excessive tension.

It will be noticed that I am now using the Taplin Twin 7 c.c. diesel engine, and find this a beautiful motor in every respect. The speed range really has to be experienced to be believed—from scarcely more than a car-type tick-over to full revs, with never a miss or any sign of hesitation. Starting is simple and unfailing every time, once the knack is mastered (the "feel" of two compressions is a little odd at first), and synchronisation of the cylinders is soon second nature. Although heavy, with low power-toweight ratio, the T.T. will fly models

of average weight through all manoeuvres, but only if full advantage is taken of the high torque at the lower end of the power curve. This can only be achieved by using a large prop, of 12 or 13 in. dia.

After spending a small fortune in wooden 13 × 8 props, which invariably broke every time the model sat down on our local common, I have now solved the problem with an American Tornado 12 × 6 nylon, which is a beautifully made airscrew and almost un-



"V.I.P." geared motor for engine-speed is mounted at front of cabin, with crank/loop from largest gear. R.E.P. "Tritone" three-reed RX. Note generous dimensions of American "Tornado" 12 x 6 nylon prop. breakable. This is obtainable from Henry J. Nicholls, 308, Holloway Road, London, N.7. This prop really brings out the best in the T.T., and is extremely efficient. The flexing which may be noticed when starting the motor disappears as soon as it is running smoothly (at any speed) and it becomes a perfect disc, rapid changes of speed notwithstanding.



SOUTHERN COUNTIES R/C RALLY
This was held at Middle Wallop, in almost ideal conditions; very little wind and bright sunshine for most of the day. Competition started at 10.30 with Single Channel; outstanding flight was that of M. B. Fellows with a score

of 860.3.

The multi event, starting at 2.30, was interrupted at 3.30 for a 30 min. demonstration by rupted at 3.30 for a 30 min. demonstration by the Army Air Corps (whose main training centre is Middle Wallop), by a D.H. Chipmunk, an Auster, an Alouette helicopter and a Lancashire Prospector. The multi competition finished at about 5 o'clock, best flights being by Ed Johnson and Paul Rodgers. An amusing note was struck by Owen Griffiths, whose Smog Hog deconciled a new laid eag with a streamer attached dropped a new laid egg with a streamer attached, the idea being to hit the spot marking the spot landing, but he came nearer to hitting the judges; unfortunately down elevator stuck on later in the flight and the model crashed into the car park.

the car park.

Attendance at the rally was very good, there being about 250 cars present, each carrying three or four people on average. One good point was the crowd's behaviour when asked over the P.A. not to leave litter; when they had gone home there were only three pieces of paper to be seen left on the grass. Good show and thank you.

The prizegiving was at 6 o'clock, the prizes being given away by the Station Commander's wife. Competitors in multi and single received prizes down to sixth place and in intermediate

prizes down to sixth place and in intermediate down to third; with the multi and intermediate class winners receiving a cup and trophy respectively to be held for one year.

All things considered, a good day was had

RESULTS
Single-Channel: 1. M. B. Fellows. 2. S. J.
Wood. 3. R. B. Norris.
Intermediate: 1. E. Falkner. 2. S. J. Wood.
3. B. J. Wood.
Multi-Channel: 1. E. Johnson. 2. P. Rodgers.
3. D. Walker.

GLEVUM M.A.C. Several of our members travelled_down to Woodbury Common for the Devon Rally, but we were without luck this year. Keith Hickman, second in the Glider last year, was again our most successful member, placing fifth after a poor first flight made in the rain. Johnny Blackford in his first contest since completing National Service had trouble trimming his new Heat
Wave, for the Power event, whilst Dereck
Harper lost his Torpedo 15 powered model
on his first flight in the same contest. Elton Drew
didn't lose a rubber model on the common for

didn't lose a rubber model on the common for the first time in five years—the wings folded on a trimming flight!

At the Area Rally held at Colerne we had a field day in Power. Andy Gaunt placed first and Dereck Harper third (should we mention that there were only three entries!?).

The club Gala Day was for once blessed with reasonable weather, though the wind, whilst not strong, was in a very unco-operative direction, necessitating 2 min. maximums. The number of entries was very disappointing; only nine members made entries, despite the fact that the club trophies were at stake. The best supported contest was for the Glevum Trophy Open Glider, Dereck Harper coming out top with a total of 546 sec. The Rubber, with only four entries, resulted in a win for Elton Drew with

This beautiful O.S. powered "Gipsy Moth" seen landing at the Southern Counties R/C Rally, uses 4 channel "Orbit" equipment and belongs to J.Morton (second left) Winchester.

538 sec. The Power event was somewhat of a

fiasco-only one entrant.

During the winter months Dennis Bannister is running a course on radio. The idea is that any member will be able to construct a standard receiver under the guidance of Dennis. Transmitters will follow later. The first meeting proved immensely popular; in fact no more members can be accommodated at present.

WESTON CONTROLINERS

We would like to thank members of the Northwood Club, who "put up" some of our competitors in the Cranfield Rally. This rally was felt by all to be one of the best this season, even though our only success was in the stunt event, where D. Christopher came second with his well-worn Sea Hawk. The combat boys were all knocked out early.

The club has been able to use R.A.F. Locking

for Sunday flying and as this is a very suitable flying ground the turnout has been steadily increasing, with frequent visits from modellers from Bristol and Taunton.

CROYDON & D.M.A.C.
The Croydon Glider Gala attracted an entry of 44 at Chobham Common. The quiet was of 44 at Chobham Common. The quiet was broken by the odd squeaky winch and singing towlines and the only concession to a normal Sunday was the Surbiton power team trimming for the Keil Trophy. Large gliders were the order of the day, eight- and ten-footers being scattered round Surrey like chaff in a 10 knot breeze. The wind increased during the day from breeze. The wind increased during the day from an out-of-the-common time of about 8 min., to four or so in the afternoon. As usual, this was (by design) a non-profit making contest and the transly wingers were as follows:

.. 11.27

Best three of four flights counting.
Finally, congratulations to Dawn and John
Blount on their recent marriage. The remaining
handful of bachelor Croydon aeromodellers are
looking distinctly hunted and panicky of late.

#### CONTEST CALENDAR

Oct. 23rd †Croydon Gala, Chobham, Power. Open and 0.049. ,, 23rd Cambridge M.A.C. Slope Soaring, Ivinghoe Beacon. (Details in

Club News.)

,, 30th Blackheath Gala (see club report.) Nov. 20th †Croydon Gala, Chobham, Open Rubber.

†S.M.A.E. Sanctioned meetings.

RECENT RESULTS
Area Championships, R.A.F. Wigsley.
Total

1.	Midland Area				102.12
2.	Northern				91.06
3.	North Western				89.21 81.50 81.38
4.	East Midland				81.50
5.	South Midland				81.38 2
	Only five	areas	compe	eted.	

BLACKHEATH M.F.C.
The Blackheath Gala will be held at Chobham Common on Sunday, October 30th, commencing at 10.30 a.m. Contests will be for U/R, Rubber, Power, Glider. Entries are 1s. 6d. per competition. For further details contact: P. Crossley, 11, Broadfield Road, Catford, S.E.6.

LARNE M.F.C.
The Ulster C/L Nationals were held at Maghaverry, a disused airfield near Lisburn, Northern Ireland.

Northern Ireland.

The day started with combat with the entry around the 20 mark. The winner was M. Linnett of Belfast with M. Doyle, Belfast, and D. Reed of Larne, second and third respectively.

½A Team Race: This event was run simultaneously with the combat, the speeds were rather low at around 65 m.p.h., but the competition was keen and the winner was G. Dixon of Belfast with a time of 7.15

After a five minute shower the F.A.I. T/R was held. The team of J. McGalliard/W. Blair, of Larne M.F.C., won easily with a time of 5.27, using the Oliver Mk, III.

Stunt produced some fine models but few

Stunt produced some fine models but few seemed able to make their glow motors perform. The winner was L. Blair of Larne flying a Rivers 3.5 powered Calamity Jane.

In general the contest suffered from lack of

support but it is, nevertheless, hoped to make it

an annual event.

WHARFEDALE & D.A.

Fourteen of our members were on the road to Cranfield for the South Midland Gala before first light. This year no farm buildings blocked our way and we all arrived safely and on time. There is a jinx on the Cranfield journey for Whorfedale. Wharfedale.

However, once we started practising the gremlins really got stuck in, as Norman remarked as he burnt the remains of his class "A" model, as he burnt the remains of his class "A" model, but he assured us it had done two perfect loops before the inevitable splat! Baxter/Horton's "B" model had an argument with a little F/F sport model; as the lines parted and "Old Faithful" cartwheeled down the runway, the F/F mod. just shuddered and went merrily on

its way.
We think Long/Davy's class "B" model was we think Long/Davy's class "B" model was our nearest to getting in a final but this 6-40 class "B" business is quite a problem. Wharfedale prefer contests with semi-finals, and a lot more clubs agree, but we admit it is a lot easier on the organisers having only one round, especially when they finish at about 8 p.m. But we have no room to grumble, Cranfield was root our day.

we have no room to grumble, Cranfield was not our day.

Northern Gala, on September 4th, was our turn at organising T/R events and both circles fortunately ran very smoothly with no major arguments or delays. We would like to thank all competitors for their co-operation in helping us to keep on schedule. We apologise for forgetting our burette and the weather...! We have some emulsion paint lined up for next year, so you will at least be able to see where you are if it rains again. "Move back to what line?"

We will be interested to hear of any constructive criticism in order to improve next year's Northern.

Northern.

ENFIELD & D.M.A.C.
The past few weekends have proved quite busy

for us as far as rallies go.

At the South East Gala, most successful were Class "B" boys, Ray Tuthill and Don Walker, who came first doing 120 m.p.h. with a standard

E.T.A. running in.

At Cranfield the same team came third in class "B" after the motor had a shaft run in one of the heats, 2 in. of prop keeping the model just airborne to run the tank out—the motor is now run in.

The following week, two car loads of club members travelled up to York for the Northern Gala. Frank Stevens was unlucky to have the fuel needle come unsoldered, which put him out in the early stages of the final after a good start; the needle is now being brazed.

HALIFAX M.A.C.
Our C/L section, after being somewhat in the doldrums as regards entering contests, decided to enter the Northern Gala en masse. One competitor, who shall be nameless, entered the ½A Team Race, brought his model, fuel and lines, but left the engine at home!

Two of the Speed enthusiasts, Alan Heptonstall and Brian Hollingworth, raised a few eyebrows

(and blood pressures) by flying an 8 in. span speed job, powered by a modified Fox .15!

At the moment the main interest in the club

at the moment the main interest in the club is centred upon all classes of Team Racing, with one member being interested in R/C. During the past few weeks he has been defying the elements with a Merco .35 powered *Uproar*. On one occasion the model got out of range, flew a mile throttled back, bounced off a house roof and was recovered undamaged !

WEST BROMWICH M.A.C.
At the third Midland Area Championships the combat flyers took top honours for the second time this year. Mike Kendrick was first, Dave Summers second, and Les Newman third. At Cranfield things did not go at all well and all the combat artists from our club were eliminated. combat entries from our club were eliminated in the first round. In spite of this we have gained three firsts, two seconds, and two thirds in several combat events so far this season.

CARDIFF M.A.C.

Encouraged by ideal conditions Cardiff club control-liners had an enjoyable competition at Pengam. Stunt went to A. Hill (Razor Blade O/Tiger) with E. Button (Gazelle PAW 1.49) and A. Jones (Razor Blade O/Tiger second and third). third).

Combat was won by A. Hill but was a very tame contest flown in too gentlemanly a fashion.

DAGENHAM M.A.C.

The trip to Cranfield was an eventful day for ourselves and the Hornchurch club, even though they were not placed in any of the events. To start the day, one member left his combat model on the pavement when catching the coach, two others changed from one pick-up point to another, and were left behind. On the way home the coach had to be towed off of the MI with fuel pump failure, when the replacement coach finally reached home it was nearly 3 a.m. Cor what a day!

COSMO A.M.C.
We recently visited the Sidcup Gala at R.A.F.
Kenley and several of our younger members
entered the ½A and Combat, but were all unplaced mainly due to inexperience. We were
pleased to note, though, that our ½A racers were
equal to the best in the air. equal to the best in the air.

We also gave a C/L demonstration at the B.O.C.M. (Erith) Ltd. gala day, which was well received by the spectators, who thought the mid-air collision in combat most amusing! Incidentally, this is our first prang in a demonstration this year, which says much for the boys' flying, especially the juniors.

Our most promising junior is young Howard who is only just 12 years old and is showing the seniors how to stunt with a 2.5 Rivers/Peace-maker. His building is also first class.

Our winter programme is now getting into its stride with a series of lectures and talks on club nights.

HORLEY M.A.C. We put on a display at an air display at Fairoaks aerodrome before about 10,000 people. Mike Smith flew his well-worn Chipmunk and there was some attempt at combat with P. Green and P. Darton flying *Peacemakers*. More recently we gave another display at Copthorne, a local with the combat was a combat with the combat with the combat was a combat was a combat with the combat was a combat with the combat was a combat was a combat with the combat wi village fete, which, as usual, was extremely successful. The highlight was a scramble to see how many planes could be got into the circle at once. There was quite a combination with the Chipmunk, a K & B 19 powered Pedro, a Merco 35 own-design job, and a Veco 19 Peacemaker!

Mike Smith has been quite successful recently with his excellent series of A/2s called Auturus I to V. Although we are a comparatively new club we have quite a selection of engines and models. The newest additions are a couple models. The newest additions are a couple of E.T.A. 15s.

For enthusiasts in the Horley area we hold

meetings on Friday nights and Sunday mornings and all enquiries should be made to the secretary, M. G. HEAVENS, "Paddock View," Meath Green Lane, Horley, Surrey.

PETERBOROUGH M.F.C.

PETERBOROUGH M.F.C.

The day before the Cranfield Rally three of our members were called upon by the secretary to help give a display at a Red Cross fete a few miles out of town. So having thrown a few models and gear in the back of the van and collected another bod who happened to be passing on his bicycle, they set off to give a display that nobody knew anything of until about an hour before it was advertised to take place! an hour before it was advertised to take place!
Although arranged at very short notice the display went off well and was very well received.

The next day 32 members piled off to Cranfield, most of these being spectators. Of the three who did enter, Jim Wright (F/F comp. sec.) came second in Open Glider with a score of 8.50 sec., and has since been trying his hardest to sell his prize which nobody else wants!

In Combat, Ian Duffy reached the quarter finals and Mick Fountain (Pen) was knocked out in the second round after a hard fought bout.

The following Sunday was the date fixed for the club Combat Comp. which saw the same two bods fighting it out in the final with Ian Duffy finally becoming the winner. The most spectacular part of the afternoon was when "Pen" Fountain went through the rear window of an A.35 van instead of his opponents streamer.

DUMNAGH M.A.C.

DUMNAGH M.A.C.
We recently held a C/L Rally at Newgrove House, Raheny. The Class "A" race had an unusual finish, B. Cahill's F.A.I. class racer finishing second to the maestro T. Morelli, who also carried off Class "B," B. Rafter placing second. We foresee some drastic changes in M.A.C.I. soon!

HAYES & D.M.A.C.
Continuing our most successful season in
F.A.I. T/R, Mike Smith and Dave Balch took
first and third places at Ramsgate; we got three
models into a three-model final. Result was first,
Mild Smith Back D. Result was first,
Back D. R. Balth in Back Mike Smith, second, Dave Balch, third, Pete Kilner and Graham Rivers. Semi-finalist at Sidcup, Dave Balch, pulled off a surprise win in ½A team race with his eight-year-old Elfin and a model of similar vintage. John Taylor and Dick McGladdery have recently raised the club 5 c.c. speed record to 130 m.p.h. with a fibre glass-panned model. A Fox 29R did the pulling the pulling.

Kevin Lindsey is busy on a rather unorthodox

jet speed job based on an O.S. Mk. II pulse jet.

NORTHWOOD M.A.C.

Our Combat team of P. Perry, R. Pratt and P. Tribe have been extremely successful in the last three rallies attended, coming first at Sidcup. second at Ramsgate and first, second and third at Cranfield.

Once again they would like to thank the organisers of these rallies for the smooth running of the events.

## THE NORTHERN GALA

FOR the first time for some years, the Northern FOR the first time for some years, the Northern Gala failed to attract the usual brilliant sunshine, and the weather during the day could only be described as mixed. Nevertheless, some 400 competitors and a large crowd of spectators enjoyed a very good day's flying. Activities seemed to be taking place in every corner of the field, and for once the organisers coped with the usual crop of "free lance" control liners, keeping them well out of the way of F/F competitors and spectators alike. spectators alike.

No doubt the most outstanding performance No doubt the most outstanding performance of the day was by Chris Olsen, who, with two flights in the Aeromodeller R/C Trophy, amassed a total of 4,416 points. Both flights were an impeccable presentation of the schedule as it should be flown; the second flight being completed in a heavy thunderstorm!

In another corner of the field the 24 fliers in the United Kingdom Challenge match were quietly making their flights, resulting in England

two U.K. captains check over their models prior to the contest,



gaining the victory this year by 13 points to 11. A pity this event does not attract the full complement; it could be much more interesting than the now usual two-hander. Poole, Illsely and Lennox all recorded triple max's for England in this event.

About 100 control liners were hard at it all day long, and even the heavy showers failed to delay the programme, the finals in each class taking place exactly to time. Most of the competitors, and certainly the organisers, welcomed the clearing up of the Class A rules situation; this court is one of course, we to the EAL rules event is now, of course, run to the F.A.I. rules and schedule

The F/F Glider, Power and Rubber fliers had some quite good conditions in parts of the day, and many excellent flights were seen, with the result that two Glider, five Power and nine Rubber competitors took part in the mass fly-off at 6.30 p.m.

RESULTS

United Kingdom Challenge Match
England, 41.31; Scotland, 28.35
England, 45.15; Scotland, 35.27
Scotland, 27.03; England, 21.10 Power Rubber Glider England won the match by 13 pts. to 11 pts

U/R Glider (103 entries) .. 9.00+2.10 .. 9.00+1.37 1. G. Cameron ... 2. M. Proctor ... 3. G. M. Hutton ... Baildon Baildon Wallasey

Hamley Trophy U/R Power (107 entries) Eng. Elec. . . 12.00+6.10 Letchworth 12.00+5.05 T. W. Smith G. Castell .. 12.00+4.42 3. B. Eggleston Baildon

Caton Trophy U/R Rubber (63 entries)
1. D. Poole .. B'ham ... 12.00 + 7.32 1. D. Poole ... 2. H. Tubbs ... 3. U. A. Wannop ... .. 12.00 + 6.46 .. 12.00 + 6.33 Baildon C.M.

P.A.A. Load (15 entries) 1. A. Collinson ... 2. P. Muller ... Baildon 4.53 3.55 3.40 Surbiton Wakefield A. Farrar Class \( \frac{1}{2} A \) T.R. (26 entries)

1. D. W. Nixon ... Hi

2. R. Sleight ... Hi

3. A. Laurie ... No Hinckley 10.20 Hayes .. Novocastria 12.38 Class A T.R. (54 entries)
1. W. Haley . . Th Thornaby 6.04 T. Pasco 3. A. Wallace Stanley 6.49 Class B. T.R. (27 entries)
1. W. Haley ... Thornaby 1. W. Haley 2. J. Watson 3. P. Drewell 8.15 8.48 .. West Essex 9.02 Aeromodeller Trophy Multi R/C 1. C. H. Olsen .. C.M. ..4,146 pts.

Nield making some hasty adjustments to the u/c of his Radio model after a dicey attempt at take off.



#### RIVERS—AN INTERNATIONAL SUCCESS

Modellers throughout the world are proving the Rivers diesels the TOP engines in their class. Precision built to the highest engineering standards—reliable—easy starting and FULL of power!

Contest successes achieved with RIVERS DIESELS continue to mount, month by month. You too can move up into the winners' circle with a RIVERS!



British Nationals Class AT/R Argentina Nationals FAI power

Ramsgate Class A T/R Enfield Class A T/R Sidcup Class A T/R RAF Championships Combat* Ramsgate, Combat



British Nats. R/C multi* RAF Champion-ships, Combat*

Ramsgate Class A

* These successes with the 3.5 c.c. Silver Arrow. Al! the others achieved with the 2.5 c.c. Silver Streak, standard version and tuned version.



FOR RELIABILITY AND TOP PERFORMANCE YOU MUST CHOOSE A RIVERS

2.5 c.c. SILVER STREAK (Mk. II) ... £6.5.8

.. £8.15.8 Works tuned version. 3.5 c.c. SILVER ARROW £6.5.8

A. E. RIVERS (SALES) LTD., N. FELTHAM TRADING ESTATE, FELTHAM, MIDDX. 'Phone: FELTHAM 6551 'Phone: FELTHAM 6551

Benelux - new





The 'Super 60'latest and greatest development from Benelux. This new outstanding gear system provides smooth action-no jumping, no slipping. Super 60' has 4 or 5 gear ratios and up to 10 speeds with double chain wheel.

PRICE 70/-

uper

CYCLO GEAR CO. LTD., ASTON, BIRMINGHAM 6.

BENELUX

#### RADIO & ELECTRONIC PRODUCTS

G. Honnest-Redlich EXTENDED PAYMENTS

A Selection of R/C Equipment to suit all Models and Pockets

AVAILABLE ON **EQUIPMENT FROM** £ 15

COMPLETE EQUIPMENT "REPTONE"

Unit construction with Plug-in batteries and Motorised Compound Unit construction with Plug-in batteries and Motorised Compound rudder actuator. Extension socket fitted for further control. NO wiring. NO fuss. NO installation worries. NO trouble! Ideal for beginners. Complete with transmitter (hand held and neat in size)—at £15 8s. 0d. the whole outfit—this for a tone set! UNBEATABLE Value—nothing more to buy for PERFECT single channel R/C!
"UNITONE" single-channel tone. Hand-held transmitter £9/3/-21 or Receiver.

£9/6/6 5-oz. Receiver ... Simultaneous operation.
Transmitter and matched 10-oz. Receiver ... Crystal controlled trans-£11/6/6 £50/-/-... £31/17/3 mitter and 8-oz. Receiver KITS "AEROTONE" Receiver, Single or multi-channel "tone"

"AEROMODELLER" Receiver, Single-channel "carrier"

"PRINTED CIRCUIT" Carrier transmitter. Pre-tuned ...

"MODULATOR" tone generator

"P.C." and "Modulator" combined are suitable for the "Aerotone."

All Kits are pre-assembled and contain all finished components.

44 SHEEN LANE, MORTLAKE, S.W.I4

Tel: PRO 9375 Mail Order Service S.A.E. for price lists

# AVIATION BOOKS

We specialise exclusively in books and magazines on every aspect of aviation, together with photographs and plans of aircraft. Thousands of new and secondhand books and nearly a quarter of a million magazines in stock. First class postal service. Send 1s. stamp for catalogue. Books bought, sold and exchanged.

We are only open to callers on Saturdays, from 9 a.m. to 6 p.m. Trolley bus 629, 641, Green Line bus 715 pass the door. Tube to Wood Green, then trolley.

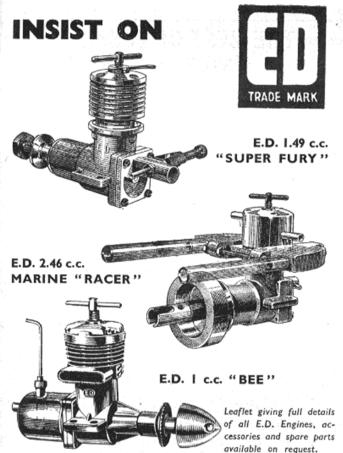
BEAUMONT AVIATION LITERATURE 2a, Ridge Avenue, Winchmore Hill, London, N.21

# **SERVICE** in the



old tradition

Your Model Aircraft can reach your breakfast table on the day of issue, regularly and unfailingly through the post, if you take out an annual subscription. Send your name and address to Subscription Dept., MODEL AIRCRAFT, 19-20, Noel Street, London, W.1, with remittance of 22s. U.S.A. and Canada \$3.00.



# the finest equipment for the model maker!

Top quality guaranteed equipment specially designed to make the most of your models and improve their all round performance.

#### E.D. DIESELS

Illustrated are the latest additions to the famous range of E.D. Engines. The "SUPER FURY" and the "BEE" are both having enormous successes while the 2.46 c.c. "RACER" Marine Engine is in great demand by model boat builders.

Air-cooled or water-cooled versions of all models are available.

#### E.D. MULTI-CHANNEL RADIO CONTROL UNITS

Entirely new equipment produced after months of experiment, research and exhaustive flying tests. They are the most advanced Radio Control Units available and are up to the traditional high quality and value always associated with E.D. Products. Write for full details.

ELECTRONIC DEVELOPMENTS (SURREY) LTD., ISLAND FARM ROAD, WEST MOLESEY, SURREY.

# **HARROW**

#### THE MODEL SHOP 9 PINNER ROAD HARROW

DIESELS	S.A.E. LISTS			
E.D46 c.c. Baby 2 17 0	Dart .5 c.c 3 4 10			
E.D8 c.c. Pep 2 3 0	Merlin .75 c.c 2 4 7			
E.D. I c.c. Bee 2 17 0	Super Merlin .75 c.c. 2 13 0			
E.D. I.49 Fury 3 19 0	Spitfire I c.c 2 13 0			
E.D. 2.46 Racer 3 19 0	Sabre 1.5 c.c 2 13 0			
E.D. 3.46 Hunter 3 19 0	Rapier 2.5 c.c 3 17 9			
A.M. 10 I c.c 2 16 8	Enya 15 6 1 3			
A.M. 15 1.5 c.c 2 17 10	ME Heron I c.c 2 7 0			
A.M. 25 2.5 c.c 3 6 5	Taplin Twin 7 c.c 8 12 0			
A.M. 35 3.5 c.c <b>3 9 6</b>	D. A. Drabant 2.5 6 7 0			
Mills P.75 c.c 3 3 10	Merco 29 5 c.c 5 19 6			
Mills S.75 c.c 3 10 7	Merco 35 6 c.c 6 3 0			
Mills 1.3 4 15 9	Cox Pee Wee 2 2 8			
Frog I c.c. Mk II 2 13 6	AM 049 Glow 1 19 6			
Frog 1.49 Vibramatic 2 12 11	Fox 099 1.6 c.c 3 0 0			
Frog 150 Mk. 11R c.c. 2 13 2 Frog 2.49 Ballbearing 3 16 10	Fox 15 2.5 3 12 0			
Frog 2.49 Modified 4 12 6	Frog Viper I.5 4 0 3			
Frog 3.49 BB 3 19 2	Frog Venom I.5 2 18 0			
Frog 3.49 Bearing 3 19 2	Allbon A.S.55 2 15 6			
Bantam .75 c.c. Glow I 14 10	Cobra (Glow) 1 19 6			

ALSO IN STOCK, KEIL KRAFT, MERCURY, FROG, JETEX, VERON, PERFORMANCE CONTEST KITS, THE NEW REPTONE TRANSMITTER RECEIVER £15-8-0

### KING CHARLES

announce the

# FABULOUS NEW DUX TWIN

46-inch POD & BOOM GLIDER WITH ALTERNATIVE POWER POD INCLUDED

All parts accurately die cut from Balsa

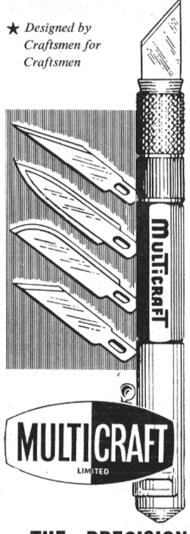
POD CASING IS RESIN PLASTIC

PRICE 49/FOR THIS 2-IN-1 KIT

### KING CHARLES SPORTS CENTRE

22, King Charles Street, LEEDS I

Telephone: 26611

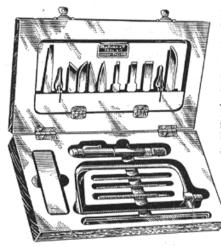


# cut above the rest

Beautifully made, perfectly balanced for ease and comfort in use, the Precision Cutter makes light of all cutting and shaping problems. Four scalpel-sharp blades are safely stowed away inside the handle when not in use-out of harms way, protecting the fine cutting edges.

Price 6/6 complete. Spare set of 4 blades 2/-

#### THE **PRECISION** CUTTER THE MAJOR KIT



A de luxe home craftsmen tool set that is a complete workshop in itself precision tools for every cutting, shaping or modelling The kit is iob. fitted into a handsome polished beechwood presentation case.

Complete 45/-

Other modelling Kits from as little as 6/9d.

Multicraft Kits, Tools & Accessories are available from leading Dept. Stores, Hardware & Hobby Shops.

#### MULTICRAFT LTD.

35, CLIPSTONE STREET, LONDON, W.I.

#### get on THE BEST OF TERMS with ROLAND SCOTT LTD. Mail Order **Specialists**

One-fifth deposit—balance in 6-9 or 12 months

Examples: VECO THUNDERBIRD and MERCO 35

41/6. Balance in 6 monthly payments of 32/-.

GRAUPNER SATELLIT and TAIFUN HUR-

RIKAN 1.5 c.c.

Deposit: 36/-. Balance in 6 monthly payments of 28/6.

E.D. BLACK PRINCE/ARROW 6-unit

Deposit: 130/-. Balance in 12 monthly payments of 47/6.

REP REPTONE UNIT

Deposit: 61/-. Balance in 12 monthly payments of 24/-.

D.C. TORNADO TWIN 5 c.c. GLOW

Deposit: 46/-. Balance in 9 monthly payments of 24/-.

A letter or phone call (Bolton 7097) will bring you full details and a quote for your requirements.

★ FULL SERVICE ON ALL R/C GEAR ★ GET ON OUR MAILING LIST TODAY FOR NEW ITEMS

CALL, WRITE OR PHONE

### THE SHOWROOM OF THE NORTH "147" DERBY STREET, BOLTON

Branch Showroom: 97, RAILWAY ROAD, LEIGH

★ TRY R.S. FOR RELIABLE SERVICE ★

Model Aircraft
Engine Tests

by P. G. F. CHINN

This book makes available for the first time in one volume, a means of comparing the performance of the world's leading model aircraft engines, as assessed by the world's foremost engine expert Peter Chinn. The word "test" does not adequately describe the detailed manner in which the author examines the design, construction and performance characteristics of each engine. These are essential items of information for potential buyers and for that reason alone, this book will be invaluable to the model aircraft enthusiast. A full-size view with mounting dimensions, a performance graph and photograph is given for each engine.

5s. from your bookseller or model shop or Ss. 4d. post paid from us. (U.S.A. and Canada \$1.25 post paid.)

PERCIVAL MARSHALL

19-20 NOEL ST., LONDON, W.1

# MODEL AIRCRAFT SUPPLIES LTD

29, OLD KENT ROAD, LONDON, S.E.1. Tel.: HOP 3482

#### REPTONE OUTFIT

Complete £15.8.0 or on easy terms R.E.P. 4 Channel Outfit to order only S.A.E. for further details

Model Aircraft and Aeromodeller Plans in stock New Frog SE5a 32/6
New Frog Talisman 17/6
Frog 150 'R' Engine 53/6
Kit and engine post free together

#### READ POPULAR FLYING

The monthly magazine of the Popular Flying Association, the founding and representative body in the United Kingdom of amateur constructors and operators of ultra light and group operated aircraft. Subscription £2, magazine included. Specimen copy 1s. 6d. from The Popular Flying Association, 19 Park Lane, W.1.

# THE LATEST IN PROPS!!!

UNBREAKABLE NYLON

 $10 \times 6$ ,  $10 \times 4$ ,  $9 \times 6$ ,  $8 \times 6$ ,  $8\frac{1}{2} \times 6$ 

# ALL THE SAME LOW PRICE

3/- each

Also highly-polished wood props for the free flight and radio fan.

ALL PROPS BALANCED FOR TOP PERFORMANCE

## SOUTHERN HOBBIES LTD.

113 WESTERN ROAD, BRIGHTON

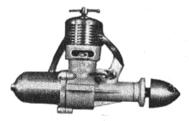
Tel.: HOVE 33881

# DEAC—The Modern Battery Lightweight, Cheap, Crashproof, Rechargeable 1.2 volts, 4s. 4d.; 3.6 volts, 16s.; 4.8 volts, 20s. 11d.; 6 volts, 25s. 11d.; 7.2 volts, centre-tapped at 3.6, 31s. 5d. DEAC Charger, mains operated, 20s. 6d. (7.2 volt battery weighs 3 oz.) Full instructions

Ed JOHNSON (Radio Control), Larkhill, Wiltshire, England

# M. E. "HERON" 1 c.c. DIESEL

HIGH QUALITY AT LOW COST



★ EASY STARTING

COMPLETE
WITH:
TANK,
SPINNER,
NUT &
WRENCH.

47|3 inc. P/T

MARINE VERSION

... 64/11 inc. P/T

Distribution:

Home—E. KEIL & Co. Ltd. Export—MODEL EXPORTS Ltd.

Manufactured by:

### MAROWN ENGINEERING LIMITED

GLEN VINE :: :: ISLE OF MAN

# YOUR BEST MODEL SHOPS

#### Readers

YOU CAN DEAL WITH THESE MODEL SHOPS WITH COMPLETE CONFIDENCE

#### Retailers

ADVERTISE ON THESE PAGES TO REACH THE LIVE MODELLERS IN YOUR TOWN



#### BIRMINGHAM

Tel.: Northern 5569

## The Model Mecca

204-206, WITTON ROAD, 6

A 100% Modelling Shop. Aircraft Kits, etc.

Trix "OO" L.M.S. Co. "O" gauge. 5 and 5a buses pass door

WRITE, PHONE or CALL

#### **BRISTOL**

# The Model Airport

51, COLSTON STREET

Get your supplies from the leading M.A. shop in the town

#### BIRMINGHAM

### Ballard Bros.

FOR ALL MODEL SUPPLIES
133, SCHOOL ROAD, BIRMINGHAM

Not just specialists—enthusiasts !

#### **BURTON UPON TRENT**

Tel.: 4055

# W. & E. Bucknall

(W. A. THORPE) 98, STATION STREET

Stockists of all the leading makes of kits, engines, etc. Post orders from surrounding districts promptly handled

#### BRADFORD

Tel.: Idle 1335

### Swaine's

13 & 15, THE GREEN, IDLE, BRADFORD

Aurora, Frog, Revell, Airfix, E.D., Keilkraft, Humbrol IDLE MODELLERS NEED SWAINE'S

#### CARDIFF

Tel.: 52906

# Bud Morgan

THE MODEL AIRCRAFT SPECIALIST 22/22a, CASTLE ARCADE

SEND 4d. IN STAMPS FOR MY PRICE-LIST

#### BRIGHTON

Tel.: Brighton 27963

## Arthur Mullett Ltd.

16, MEETING HOUSE LANE, BRIGHTON

World wide Mail Order Service Radio control, boat and aircraft specialist. Personal and dependable service at all times

#### **COVENTRY**

Tel.: 4070

# The "Enterprize" Variety Stores 19, FAR GOSFORD STREET

21, BRIXHAM DRIVE, WYKEN

If it's advertised within it's obtainable from Coventry's No. 1 Hobby shops.... Full mail order service by return. S.A.E. for free lists.... "Plastics" our speciality. Also at 59, Long Street, Wigston, Leics.

#### **BRIGHTON**

Tel.: Hove 33881

### Southern Hobbies Ltd.

113, WESTERN ROAD, BRIGHTON

The model shop of the south coast

#### DARTFORD

## Modern Models

49-51, LOWFIELD STREET, DARTFORD, KENT

Whether you call or whether you post, we claim we've got more stock than most

#### YOUR BEST MODEL SHOPS-CONTID.

**GLASGOW** 

Tel.: Central 5630

Caledonia Model Co.

478, ARGYLE STREET, C.2

THE engine repair specialists. EVERYTHING for the enthusiast, with personal attention from GEORGE LEASK, A.M.I.B.E.

LONDON, S.E.4

Tel.: Tideway 6292

Model Supplies

328, BROCKLEY ROAD, S.E.4

Agents for Revell, Airfix, Keilkraft, Mercury

GUILDFORD

Tel.: Guildford 2274

E. Pascall (Guildford) Ltd.

105, WOODBRIDGE ROAD

Stockists of all leading makes. Personal Service for all Modelling Enthusiasts

LONDON, S.W.20

Tel.: LIB 3062

Model & Tool Supplies

604, KINGSTON ROAD, RAYNES PARK. LONDON, S.W.20

Fine range of aircraft, boats, trains and accessories

HARROW

Tel.: HAR 0387

The Model Shop

9, PINNER ROAD, HARROW, MIDDX.

Stockists of many foreign engines and specialists in mail order. Wide range of kits always in stock

LONDON, W.2

Tel.: Paddington 8827-8-9

THE COMPLETE MODEL SHOP

Burleigh's
303, EDGWARE ROAD, W.2

All your wants supplied by return BURLEIGH, OF EDGWARE ROAD, LTD.

HOUNSLOW

Tel.: Hounslow 0041

Poulton's Model Shop

79, HIGH STREET HOUNSLOW, MIDDX.

Model aircraft, boats and trains. No charge for technical advice, engine runs or radio checks

LONDON, W.4

Tel.: Chiswick 0858

Jones Bros. of Chiswick

56, TURNHAM GREEN TERRACE, W.4

I min. Turnham Green Station (Dist. Line) THE SHOP WITH THE STOCK OPEN SATURDAYS 9 a.m.-6.30 p.m

**IPSWICH** 

Tel.: 51195 h

East Anglian Model Supplies

37, UPPER ORWELL STREET, IPSWICH

Keilkraft, Veron, Mercury. Frog, Skyleada, Plastics, Boats, Engines, Solarbo, etc. Full postal service—Home or Abroad

LONDON, N.W.I

Tel.: GULliver 1818

Ripmax Limited 39. PARKWAY, CAMDEN TOWN, N.W.I

THE RADIO CONTROL SPECIALISTS

All Requirements stocked PLUS Personal Mail Order Service

LONDON, N.7

Tel.: North 4272 |

Henry J. Nicholls Ltd.

308, HOLLOWAY ROAD, N.7

M.A. enthusiasts' complete stockist. Britain's No. 1 Model Shop. H.J.N. will be pleased to see you

LUTON

Tel.: Luton 7858

**Aeromodels** 

59. WELLINGTON STREET

Model Aircraft and Railway Specialists

LONDON, S.E.I

Tel.: Hop 3482

Model Aircraft Supplies Ltd.

29, OLD KENT ROAD, S.E.I

The oldest established model aircraft shop in London. Personal service with satisfaction

MANCHESTER

Tel.: Blackfriars 3972

The Model Shop

13, BOOTLE STREET, DEANSGATE

We have EVERYTHING in stock for the aeromodeller: Kits, Engines and Accessories

#### YOUR BEST MODEL SHOPS-CONT'D.

**NEWCASTLE** 

ESTABLISHED 1924

The Model Shop

(NEWCASTLE UPON TYNE) LTD.

BLENHEIM STREET, Tel.: 22016

NEWCASTLE UPON TYNE, ENGLAND

Pioneers of modelling with 33 years' experience . . .

Our Expert Staff are at your Service

ST. HELENS

Tel.: St. Helens 3972

George Webster (St. Helens) Ltd. THE MODELLERS' RENDEZVOUS, 37, DUKE STREET, ST. HELENS, LANCS.

All leading makes of kits, engines, etc., in stock. Mail order by return.

Aircraft List 6d., post free

**OXFORD** 

Tel.: 42407

Howes Model Shop

LARGEST STOCK IN THE MIDLANDS
CALL, WRITE OR PHONE
9-10, BROAD STREET
Mail service by return

SUTTON

Tel.: Vigilant 8292

E. L. S. Model Supplies

272, HIGH STREET, SUTTON, SURREY

Surrey's Hobby Centre. By return Postal Service
Complete stock of all M.A. requirements

READING

Tel.: 51558

Reading Model Supplies

I HOSIER STREET, READING, BERKSHIRE

Radio Control Specialists for ALL R.E.P. Equipment

WATFORD

Tel.: Watford 3522

H. G. Cramer Ltd.

172a, HIGH STREET, WATFORD

The leading stockist in the area

The Ideal Gift Book

# THE WORLD OF MODEL RAILWAYS

by JOSEPH MARTIN

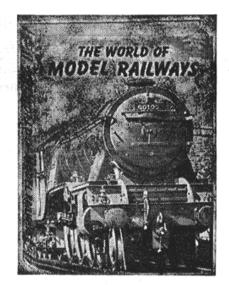
12s. 6d.

Illustrated by ROY SCHOFIELD of Model Railway News

EVERYONE knows of some youngster who possesses a proprietary train set and has a yearning to extend it and add to its interest. The "old hand" is aware that this presents many problems, more especially as each step forward has to be made as simple as possible and yet interesting enough to hold a boy's attention.

Yet this has been done by Joseph Martin in THE WORLD OF MODEL RAILWAYS. He has skilfully interwoven constructional data with many interesting facts about railways past and present and has presented the whole in thrilling narrative form. Intermingled with the text are a great many explanatory drawings and diagrams and 28 pages of black and white and coloured plates.

This book appeals directly to the young reader's imagination by relating the model to the full-size railway. He is shown how to work out his problems in terms of actual railway practice. The careful directions given take him in easy stages right through to the completion of a really fine layout, while at the same time ensuring hours of exciting reading. This is the ideal gift book. From your bookseller or model shop, price 12s. 6d., or 13s. 6d., post paid from the publishers (U.S.A. and Canada \$3.00 post paid.)



PERCIVAL MARSHALL, 19-20 Noel Street, London, W.I

# CLASSIFIED ADVERTISEMENTS

Advertisements, with remittance, should be sent to Classified Advertisement Department, Model Aircraft, 19/20 Noel Street, London W1, at the latest by the 25th of the month preceding publication date.

Private 3d. per word, Trade 6d. per word; minimum 12 words. Use of Box No. 2s. 0d. extra. Displayed Classified Advertisements (including Situations Vacant): 35s. per single column inch (column width 27in.).

The Advertisement Manager reserves the right to refuse or suspend advertisements without giving any reason. No definite date of insertion can be guaranteed, and, although every care is taken to avoid mistakes, we cannot be held liable in any way for printing errors or omissions. Receipt by the publishers of advertiser's "copy" for publication implies acceptance of these conditions by the advertiser.

Whilst every care is taken to exclude advertisements from doubtful sources, no responsibility can be accepted by the publishers for the bona fides of advertisers.

#### **FOR SALE**

Stop Watches from 52/6 (Wrist and Pocket), ex-Government. 12 months' guarantee. Send S.A.E. for list. Genuine Bausch & Lomb 7 × 50 Binoculars, £3 deposit and terms over 12 months, or £26 10s. cash.— Dept. MA, UNITED TECHNICAL SUPPLIES LTD., 29, Tottenham Court Road, W.1.



#### 21 Pint **FUEL CARRYING TANKS**

For Model Aircraft Hermetically sealed screwdown filler cap and fine bore delivery spout (also capped): holds 2½ pints. Made from rigid heavy gauge steel.

CARRY ALL YOUR SPARES 51-

Equipment, tools etc., TO THE RALLY in this strong steel carrying box. (Ex Gvt.) 27" x 7½" x 7½". A boon to all Model Aircraft enthusiasts. (If sent 3/6 extra).



MARBLE ARCH MOTOR SUPPLIES LTD., 286-302 CAMBERWELL ROAD, LONDON, S.E.S.

Special Pirelli-made expressly for Wakefield aeromodelling. Genuine top quality & in. in 17-oz. hank direct from Italy. Remit I.M.O. value 22s.—EDGARDO SADORIN, Via Assietta 25/11, Milano 10/3 (Italy).



Team Race Outfit, Voodoo with Enya 15D, Lines, Handle, Squeeze Bottle, Props, £6 10s.—SMITH, Chesterton Cottage, Three Gates Lane, Haslemere, Surrey.

MODEL AIRCRAFT ENGINEERING SERVICE REPAIRS REBORES ACCESSORIES Repairs, etc., on foreign motors a speciality.

(Enya, O.S., Fuji, Fox, Veco, K. & B., etc.)

REBORES—All diesels or cash.

DAVE MORGAN, 6a, 6 & 8, Loch St., Orrell, Nr. Wigan, Lancs.

16 mm. Steky Precision Sub-miniature still camera, size  $2\frac{3}{8}$  in.  $\times$   $1\frac{5}{8}$  in.  $\times$   $1\frac{5}{8}$  in., with standard and telephoto lenses, complete with leather cases. Takes standard 16 mm. movie film-12 exposures for 3d., speeded shutter, flash synchronised, two film casettes. Firstclass condition, £10.—Box No. 9769, Model Aircraft Offices.

#### **PUBLICATIONS**

Fascinating Floating Saucer Experiments. "Driving Whirlwinds," by Robert Morison, 2s. 9d., post free.—Lew Singer, 3, Kent Road, Acton Green, London, W.4.

American Magazines. Year's subscription "Model Airplane News" 39/-. Full catalogue free. WILLEN LTD. (Dept. 5), 9, Drapers Gardens, London, E.C.2.

#### MODEL AIRCRAFT ENGINE TESTS

by PETER CHINN

Now on sale

price 5s.

#### LATEST "MODEL AIRCRAFT"

### PLANS CATALOGUE

Now 56 pages and gives details of 423 drawings published in "Model Aircraft" up to the April 1960 issue.

- * A new section lists the wonderful new Model Airplane News plans imported from the U.S.A.
- ★ Solid scale plans now reclassified into World War 1 and 11, and country of origin.

6d. from your model shop or 10d, post paid from MODEL AIRCRAFT, 19-20, Noel St., W.1



you can't do without

# stop watches

Used for the World Championships, Smiths Stop Watches are renowned for their split-second accuracy and unique dependability.

CLOCK & WATCH DIVISION

Sectric House, Waterloo Road, London, N.W.2

Showrooms: 179 Great Portland Street, W.1

# MODEL AIRCRAFT SUPPLIES

29 Old Kent Road, London, S.E.1 Tel: HOP 3482

#### "HELLER" Imported Plastic Kits

TRIDENT		 12/-
VÉRONIQUE		 12/-
COLÉOPETÈR	E	 12/-
PARKA	,	 14/3
CARAVELLE		 14/3
VAUTOR		 14/3
ENTARD IV		 14/3
FOUGA MAGE	ESTER	 14/3

POST 9d, each model

Trade Enquiries to:-

B. J. WARD LTD 130 Westminster Road, S.E.1.

Tel: Waterloo 6416-7

# GAMAGES

for the WRENN FORMULA 152'
MOTOR RACING SET

A completely new and original design in model motor car racing. Developed after 2 years of extensive tests and research. Tremendous power coupled with reliability and long life. In genious/design allows easy replacement of parts subject to wear.

Cars reach a scale speed of up to 250 m.p.h. Road holding is excellent and the cars can be tuned to suit individual requirements.

The car bodies are moulded in unbreak-

able nylon, and are finely detailed.
Initially 2 cars are available.
The formula 1 Cooper and the renowned Ferrari. The set also includes 8 curved sections, 8 straights, and 2 Hand Control Units complete with leads.
Complete in attractive storage

ONLY £6/15/6

1961 MODEL & TRAIN BOOK

Gamages Best Seller—132 Pages Packed with details of Aircraft, Trains, Boats, Cars, Steam Engines, etc., and all the latest Plastic Kits, including prices, available at Gamages Model Department. This is STILL the latest and finest ONLY fedition to date.



GAMAGES, HOLBORN, LONDON, E.C.4 HOL 8484

# SPECIAL OFFER TO READERS OF MODEL AIRCRAFT!



PLASTIC KITS

YOU PAY ONLY 6d. POSTAGE ATHOS - PORTHOS - ARAMIS
The 'Three Musketeers' in all
their glory! 9 inches high.

**AURORA** 

7/11 each figure 23/9 set of three

It's a must! Contains over 500 Models, showing a tremendous range of models by

AIRFIX • REVELL • AURORA
 KITMASTER and many others

REVELL



BOAC ROLLS-ROYCE 707
Sleek replica of this latest 500
m.p.h. jet airliner
Wingspan 11½".

8/6

Here's what to do!
Just send your name and address
and enclose 6d, stamp or P.O.
for Catalogue and free details
of the EXCITING ROCKETEERS CLUB.

BELWYNN LTD (Dept.

27 Watford Way, London N.W.4



In the last five years more people
have changed to Senior Service than to any other brand.
Senior Service gives you the true taste of Virginia tobacco.
Well made, well packed —

you get all the fine flavour.





wheels, tank parts, transfers. All accessories and fully detailed instructions.



# "BATTLE OF BRITA





FOR REALLY HOT PERFORMANCE USE THE **NEW IMA VENOM OR VIPER ENGINES!** 

Made in England by INTERNATIONAL MODEL AIRCRAFT LTD.



