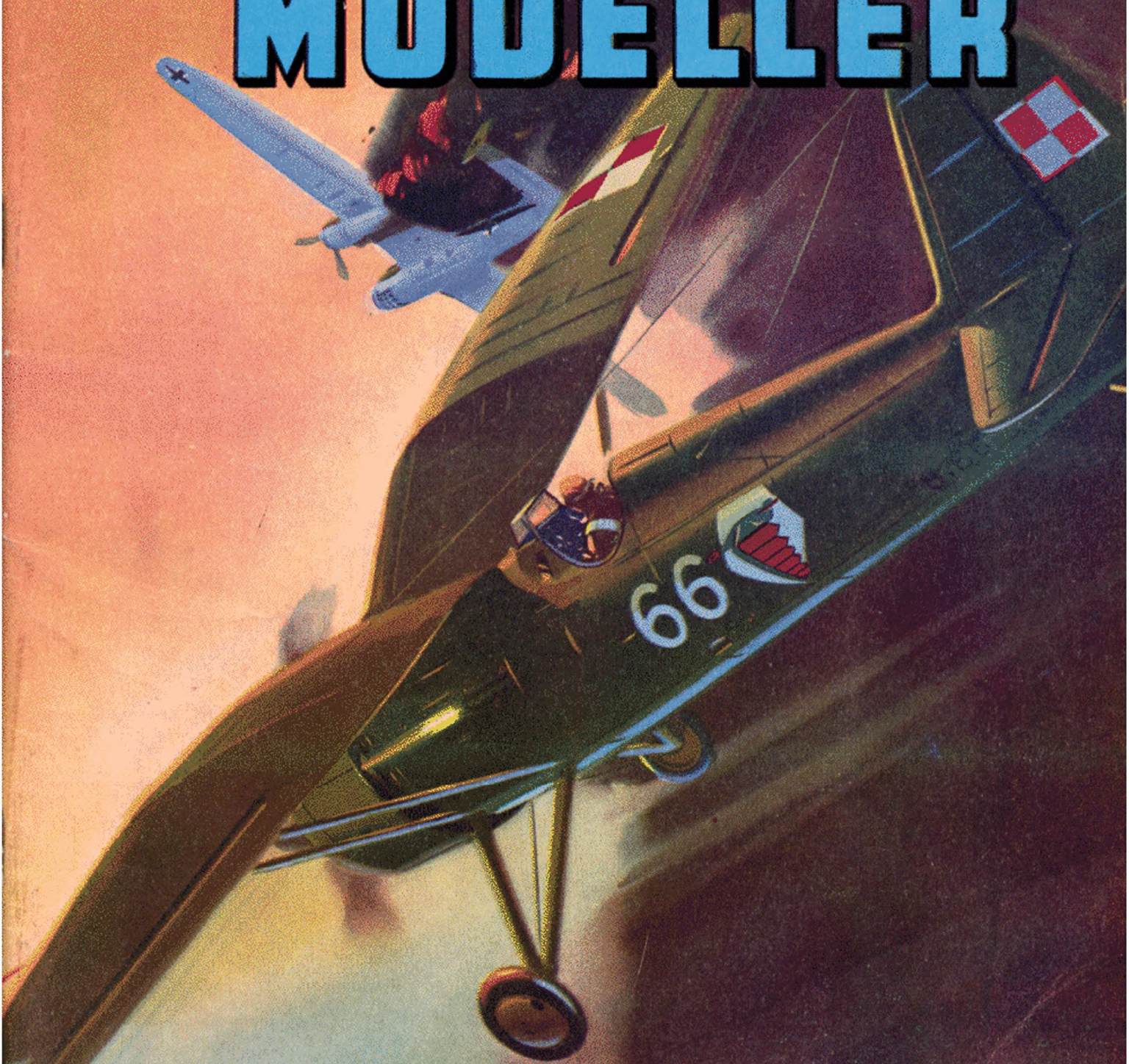


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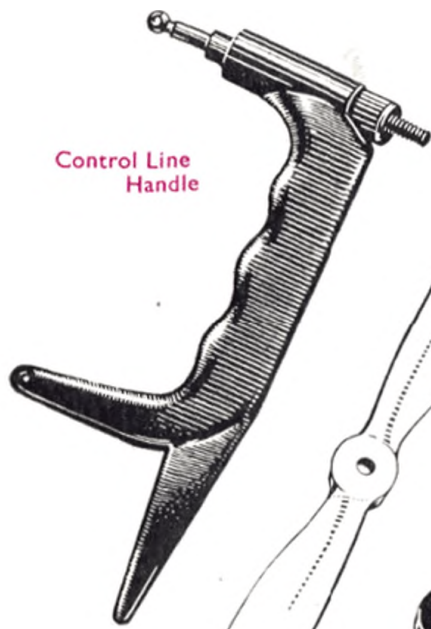


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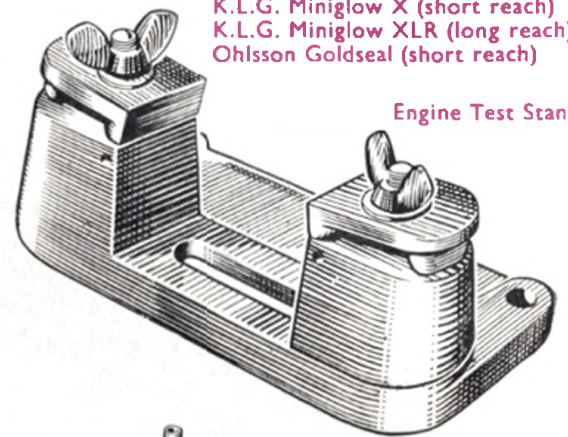
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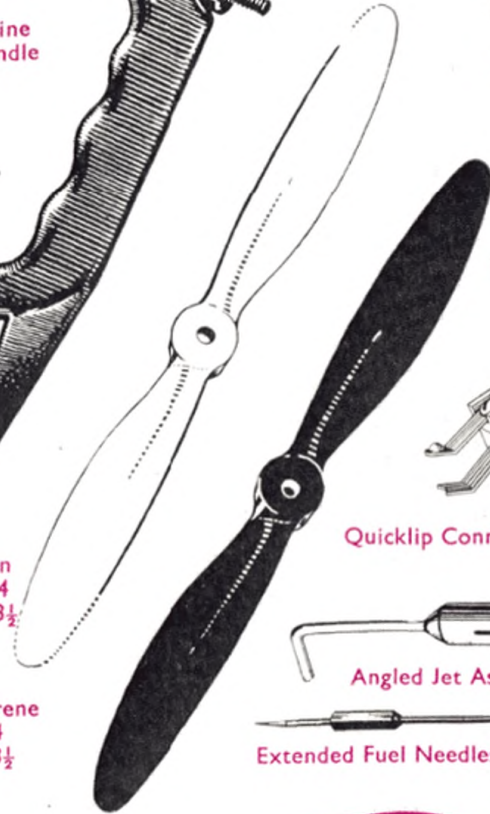


Radial Mount, to fit
Bantam and Dart



Engine Test Stand

Nylon
6 x 4
5 1/2 x 3 1/2

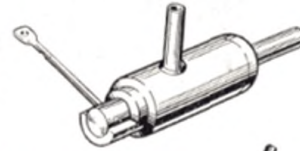


Quickclip Connector



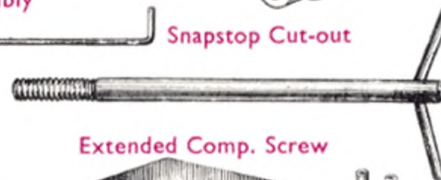
Polystyrene
6 x 4
5 1/2 x 3 1/2

Angled Jet Assembly



Snapstop Cut-out

Extended Fuel Needles



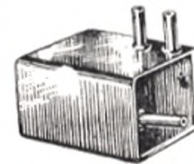
Extended Comp. Screw



30 c.c. C/L Tank

15 c.c. C/L Tank

10 c.c. C/L Tank



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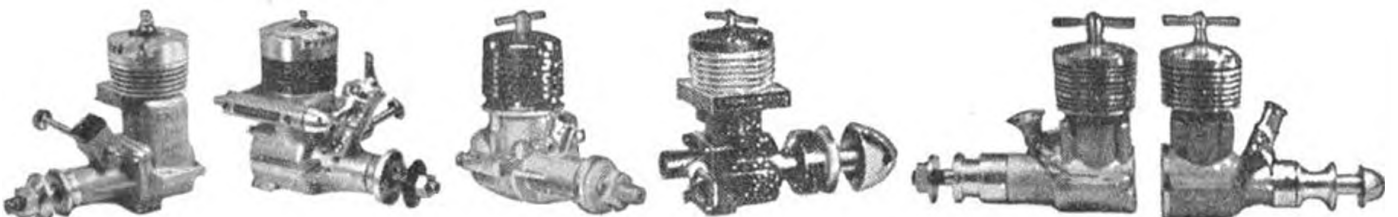
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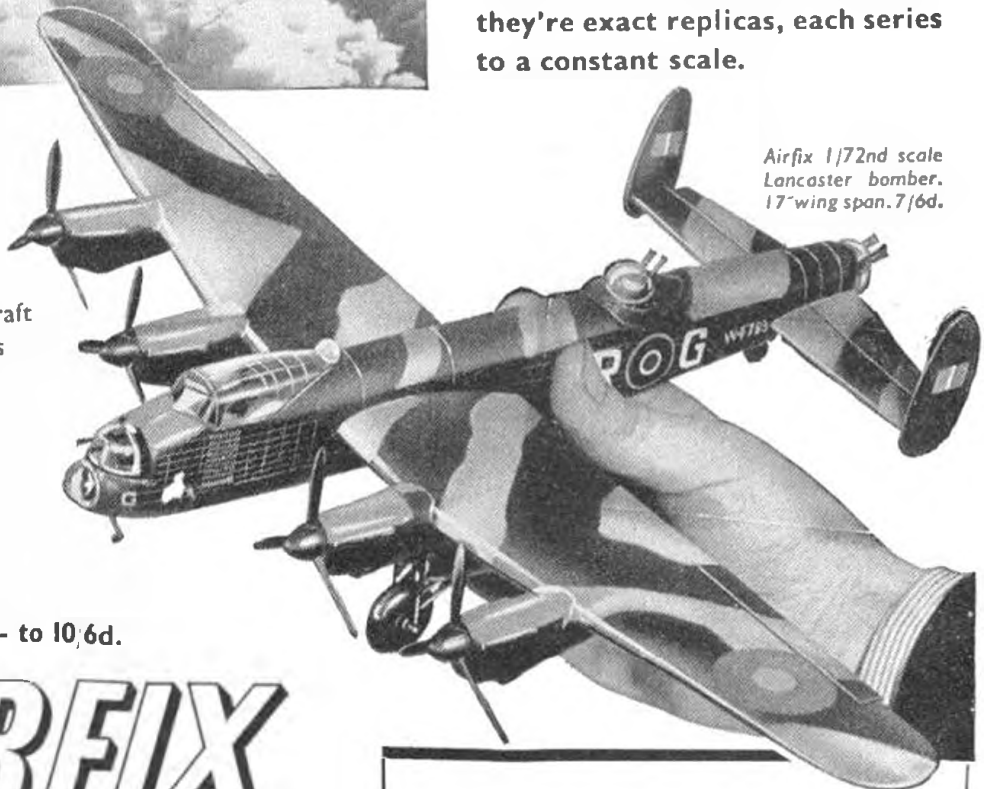
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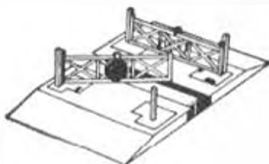
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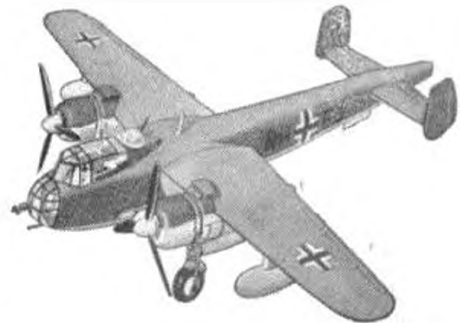
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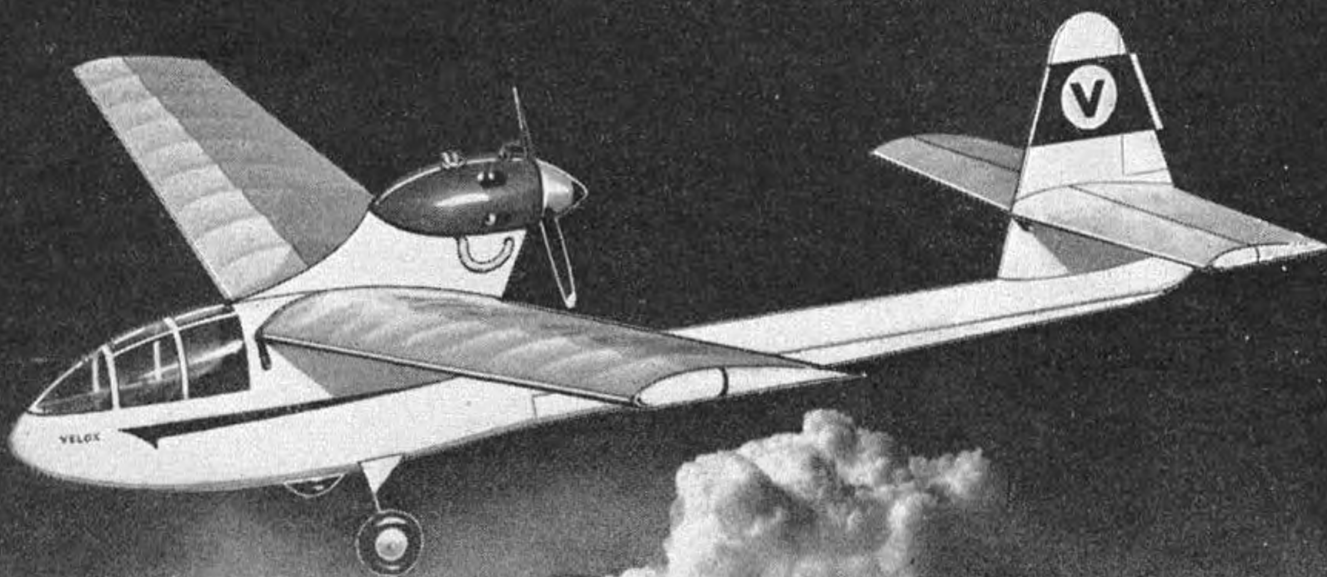
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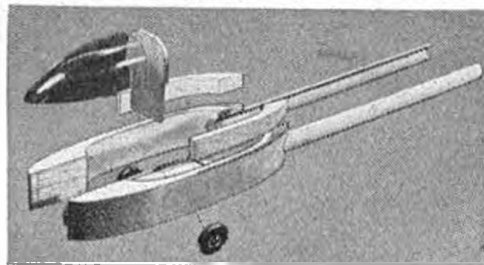
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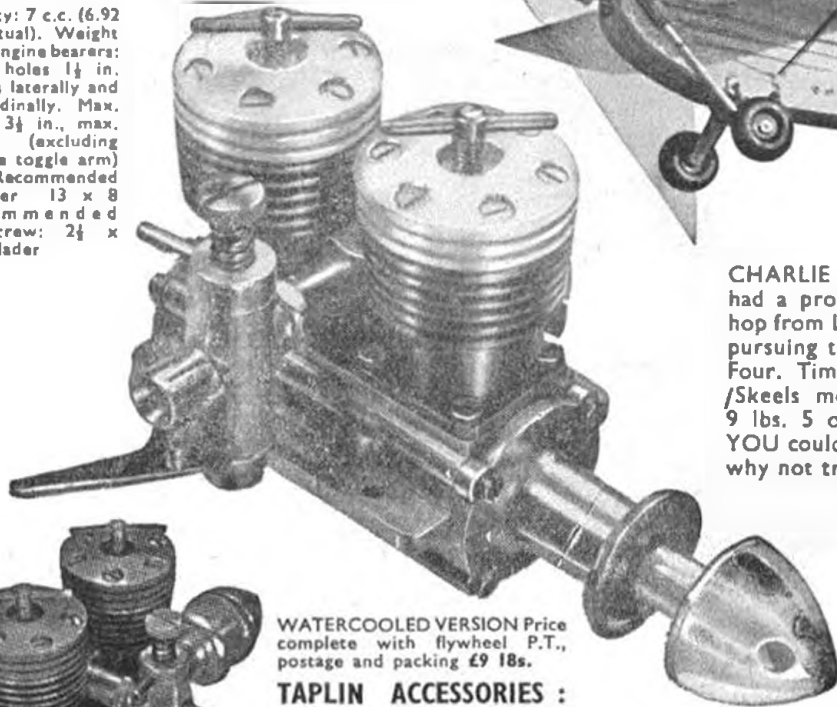
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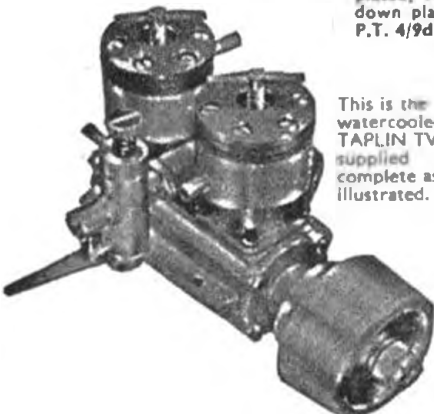
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SHEET 2 PANEL SIZE 12½" x 3" x 1/16"	colour printed -red die-cut balsa density 5-7 lb. Suit bending	PRIN
SHEET 3 PANEL SIZE 12½" x 3" x 1/16"	colour printed -red die-cut -note score lines See drawing for depth balsa density 5-7 lb. Suit bending	PRINT
SHEET 4 PANEL SIZE 12½" x 3" x 1/16"	colour printed die-cut balsa density 5-7 lb. Suit bending	
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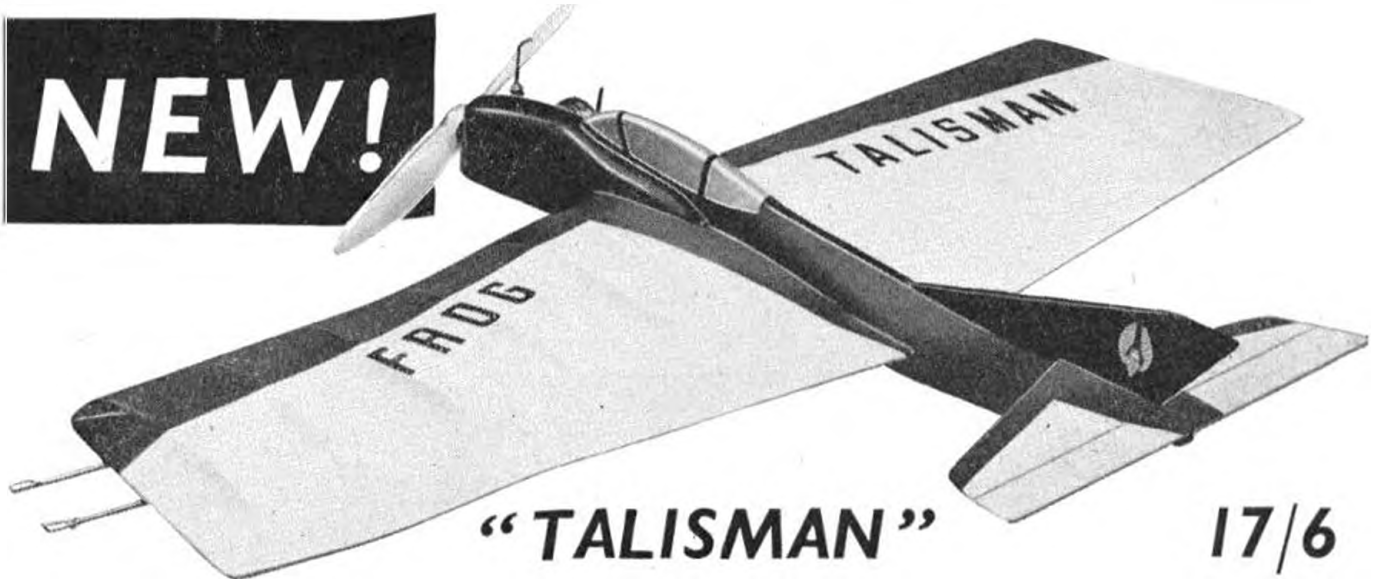
Issue No. 1 appeared on April 9th, Issue No. 2 on May 10th, providing the radio control public with a magazine of their own for the very first time. We have been amazed at the demand — over double our most optimistic expectations. For that reason the reserve stock of early numbers that we promised to set aside for late starters is looking very small. If you DID miss No. 1 or No. 2 and want them to complete your set, you must secure them immediately. Meanwhile, we are trying to make each issue a little better than the one before . . . so tell us what you want to see!

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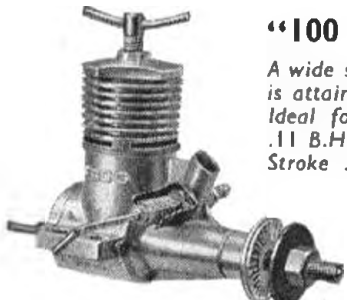
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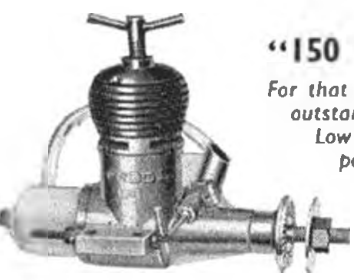
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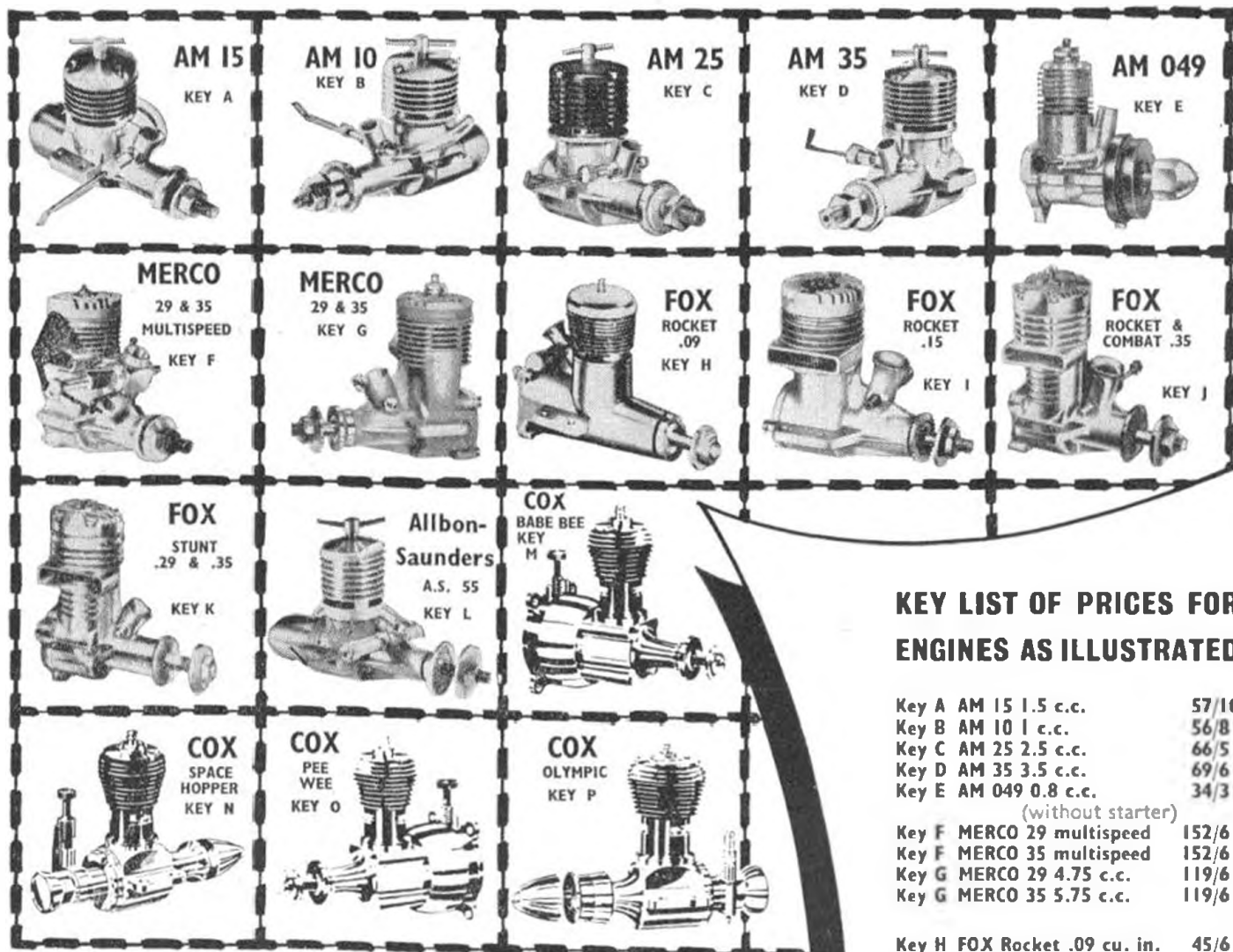
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Key E	AM 049 0.8 c.c.	34/3

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Key J	FOX Combat .35 cu. in.	183/6
Key K	FOX Stunt .29 cu. in.	141/8
Key K	FOX Stunt .35 cu. in.	141/8

Key L Allbon-Saunders 0.55 c.c. 55/6

Key M	COX Babe Bee .049 cu. in.	51/3
Key N	COX Space Hopper .049	83/3
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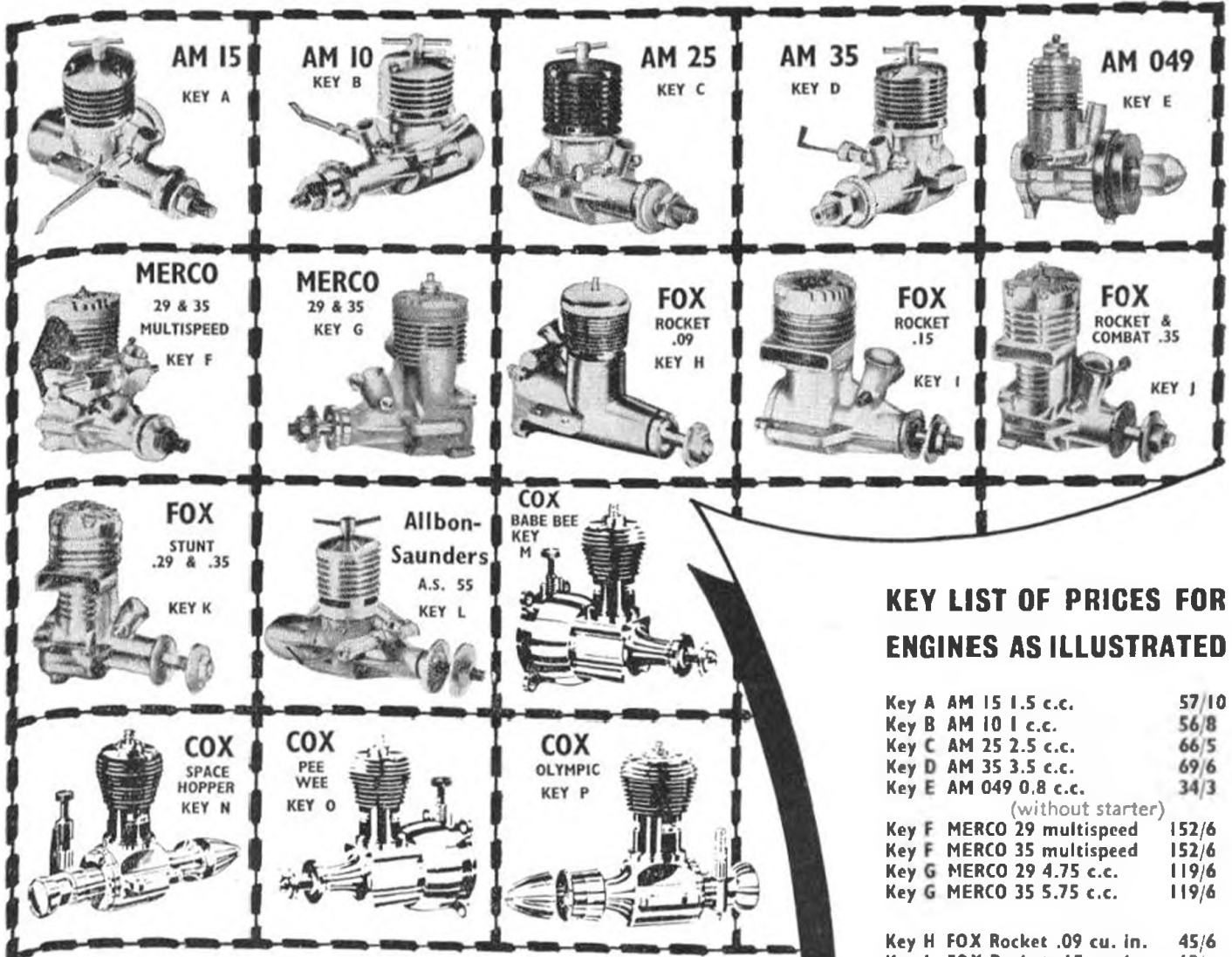
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On the Cover
Laurie Bagley's dynamic painting of Poland's gallant PZL P-11c in action over Warsaw against a Dornier 17 introduces our special feature on this interesting aircraft which we consider to be an ideal subject for flying scale.

AEROMODELLER incorporates the **MODEL AEROPLANE CONSTRUCTOR** and is published monthly on the 15th of the previous month by the Proprietors:

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"Guests and Hosts"

"SURELY,"—STATES THE editorial comment in March edition of the *Montreal MFC Bulletin*, "the basic relationship between organisers and contestants is that of host and guest, though do not forget that these guests *pay* to join the party." The comment arises in an expression of the editorial viewpoint that too many events are badly run and that it is in the contestants' own interests to complain to the press if they want to criticise.

What a way to abuse the amicable arrangement normally associated with the terms of Host and Guest! It is suggested that magazines are spinelessly preoccupied with casting a rosy glow over model aviation and so will not publish such criticisms, in which case, the *Bulletin* would be glad to give them headline treatment.

Now we do not feel as though we have lost any of our vertebrae though much backbitten; but we have never fought shy of publicising criticism of any organisation *whenever we deemed such to be of value to the movement*. If a club, or an area falls down on its accepted task of playing host at a rally, the first duty of the contestants affected should be to offer constructive criticism direct to the organisers. Only by such a polite and correct approach can one expect to see an improvement in contest and rally organisation. The voluntary body which has tried its best to please its guests will not want to have its news secondhand and delayed through the medium of the press, nor will it be guided into more satisfactory administration through such a diatribe.

In our experience, the great fault of all model meetings is the appalling lack of voluntary assistance in manpower to staff the events. It occurs at our Nationals, our Rallies, Galas and even in small club meetings. In our most recent memory is the sight of an Area Chairman who, having done his stint at the gate selling programmes, came on the field to help and wound up by presenting the trophies. This, at a meeting on a large airfield, with over 500

competitors, and several thousand spectators. What a grand Host! Yet there will be complaints that some people missed thermals through having to wait for a timekeeper, or could not fly their class B team racers because no such event could be programmed through lack of staff. We wonder if those who complain have ever offered their services at a model meeting?

To protect itself from the repercussions of such lapses as were mentioned in our January issue, the S.M.A.E. has instituted its contest sanctioning process as will be noted in our Calendar on page 325; but this will not by any means be an insurance for perfection in organisation, it will merely certify that the Society has approved the meeting on the basis of an assurance to meet certain requirements on the part of the organisers. Perfection will depend on the Host/Guest relationship—goodwill in fact which can only arise out of a keen appreciation of the difficulties involved. What we need is more voluntary effort, not plaintive lamentation from those who will not lift a finger to help.

Pups to Javelins

It was with special pleasure that we recently revisited R.A.F. Waterbeach, the scene of several happy Nationals, and currently the home of 46 Squadron. The occasion was for presentation of Ken McDonough's original painting depicting Sopwith Pups of 46 Sqdn. over Cambrai in World War I, as used on our cover for February issue this year. As can be seen in the photograph, the pilots of present day had a keen appreciation for Ken's artwork which will now hang in Squadron Headquarters, and Wing Commander F. B. Sowery, A.F.C. accepted it on their behalf. Since our last visit to 46 Sqdn. for preparation of Javelin I drawings, the Squadron has changed to Mk. II aircraft, and also introduced an attractive delta trio into its red and white insignia on the fin.

Camping at the Nats.

Thanks to Sgt. Brian Emmerly of R.A.F. Scampton, and his quick advice to S.M.A.E. Treasurer Harry Barker, there will be a camping site at the Nationals. Harry did not waste a minute once a possible site was located, and it will now be up to modellers to behave properly so that good relations can be maintained for the future. All roads will lead to the Lincolnshire airfield over Whitsun, and for the benefit of those who did not attend last year, we include the map for their guidance.

We understand that running water will be available on the camp site, thus eliminating one of last year's shortcomings: but the litter situation will as ever depend entirely on the camp inhabitants. Why not make it your motto—"If it could be carried there, it could be carried back home again" and so leave the field clean as it was found, and that specially applies to control line wire.



- June 5th**
 Thurston Cup (U/R Glider)
 Short Cup (P.A.A. Load)
 S.M.A.E. Cup
 (F.A.I. R/C Multi)
 Lady Shelley Cup (Tailless)
 Knokke Trophy (C/L Scale)
 Davies Trophy (Class A)
 Combat (Prelim. Heats)
 Speed

- June 6th**
 Sir John Shelley (U/R Power)
 Model Aircraft (U/R Rubber)
 Super Scale (F/F Scale)
 Ripmax Trophy
 (F.A.I. R/C Single)
 Davies Trophy (Class 1/4 A & B)
 Combat (Finals)
 Speed
 Gold Trophy (Stunt C/L)

Schoolboy entertainment

Demonstrating model flying in the packed Wembley Arena can be an awesome business; but the modellers who flew Stunt, Team race, Combat and Balloon Bursting models prior to the England v. Scotland Schoolboy International were encouraged by the vast and enthusiastic audience on April 30th. They were rewarded too, with the knowledge that their fund raising effort will help to finance the British participation at the World Championships for Control-line at Budapest in September.

My Fair Model!

Aeromodellers in the audience of "My Fair Lady", current success running at Drury Lane Theatre (and in Moscow too!) may not realise that Charles Stapley, the deputy for the leading man spends his waiting time making radio controlled models in the dressing room backstage. We can't think of a better way to pass the hours, waiting for an emergency curtain call!

New Class for Freeflight Power

Those who follow our programme for coming events will have observed that a number of rallies include special contests for 1/4 A free-flight power and we are very pleased to see these developments.

There is a wide range of ".049" engines up to .85 c.c. available and we are sure that the introduction of this small model class will be a very good thing to encourage the junior and beginner aeromodellers to try their hand at contest flying. Present power contests have tended to become the province of the prosperous enthusiast, able to afford specially modified engines. The .049 size motors are sold relatively cheaply, the cost of the model is considerably less and, moreover, we might add that the small model is also less prone to serious damage. We look forward to seeing many entries at the various rallies, the first of which will be Northern Heights Gala on June 26th at R.A.F. Halton where specially generous prizes will be awarded to encourage the class.

S.M.A.E. Results

K.M.A.A. CUP (A/2 Glider)

1 Partridge D. (Croydon)	15:00 + 1:47
2 Burrows N. (St. Albans)	13:42
3 Bishop J. (Small Heath)	13:40
4 Monks R. (Birmingham)	13:37
5 Martin (Birmingham)	13:36
6 Wade S.A. (C.M.)	13:32

GUTTERIDGE TROPHY (Wakefield)

1 Greaves D. (Leamington)	12:32
2 Roberts G. L. (Lincoln)	12:23
3 Picken B. (Wigan)	11:50
4 Wingate J. (Eng. Elec.)	11:34
5 Elliott M.P. (Southampton)	11:19
6 Rowe B. (St. Albans)	11:18

188 entries
50 entries

WOMEN'S CUP (Provisional result)

1. Miss Allsopp, S. Essex	0.18
2. Mrs. King, P. Essex	0.11

2 entries.

JETEX TROPHY (Provisional result)

1. O'Donnell, J. Whitefield	20.5 pts.
2. Pressnell, M. Essex	7.9
3. Worley, N. Southampton	2.0

3 entries.

PLUGGE CUP points

1 Birmingham	285:295
2 Croydon	274:119
3 Surbiton	273:530
4 Essex	269:001
5 Baidon	235:296
6 Wallasey	234:118

S.M.A.E. CUP (A/2 Glider)

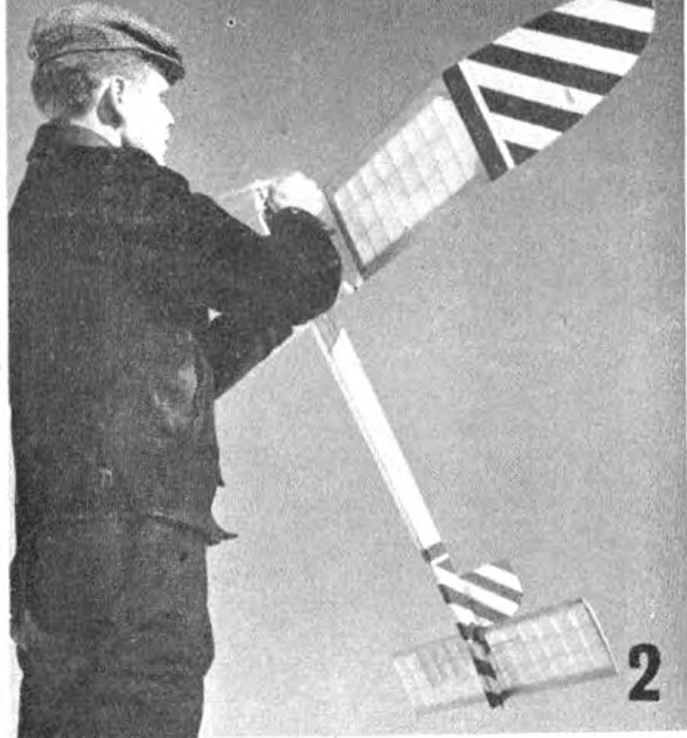
1. Tideswell, G. ... Baidon	10.00
2. O'Donnell, J. ... Whitefield	9.49
3. Lawson, P. ... Baidon	9.08
4. Beal, G. ... Mexboro'	6.56
5. Robson, A. M. ... Teeside	6.17
6. Carson, P. ... Sheffield	5.53

44 entries.

ASTRAL TROPHY (F.A.I. Power)

1. Spurr, A. W. ... Teeside	8.47
2. Wilmot, D. ... Essex	6.09
3. King, M. ... Essex	4.21
4. Cox, B. ... St. Albans	2.37
5. Robson, D. ... East Lancs.	2.11
6. Eckersley, S. ... Baidon	2.07

40 entries.



12th NORDIC Champs

reported by
R. Hyvarinen

1. Pentti Ella with his beautiful A/2s came second in fly-off due to line breaking immediately after launch. 2. Osmo Niemi flew his "PULTERI" to second place in power. Model is much admired for performance and simplicity. 3. The world-famous trio of Hansens, from left, Hans, Borge and Arne. Could do little against still-air models under prevailing conditions. 4. Rolf Hagel preparing for another maximum, reserve model in front. Note the long moment arms and double fins. 5. Sweden's well-known Rune Johansson with his beautifully made model, lost 8 seconds with his first flight to drop him to 4th place. 6. Finland's 2,700 seconds Wake-trio before the first extra flight. From left Hyvarinen, Aalto and Hamalainen



Was this the greatest ever contest? Results show terrific standard in Nordic Country flying

SINCE 1945, SCANDINAVIAN modellers have competed in the Nordic Countries Champs. thus creating the A/2 Class in the late Forties. Some years later the Wakefield and F.A.I. power classes were included in these meetings. The high standard the Nordic Country teams have produced at the World Champs. and other International meetings have in no small way been due to these annual meetings as well as the all-the-year-round flying programmes run in these countries.

For the second time the Championships were held in winter, this time over the huge frozen Lake Vasijarvi at Tampere, Finland on March 20th. Due to the unusual date, the Danes could only send three men, the world famous A/2 trio of Hansens; Arne, Borge and Hans and they were delayed by ice in the Baltic. Norway has yet to reach the International standard in Wake, so they only sent A/2 and Power teams but both the Swedes and the hosts country Finland had full teams.

An almost two mile long motor road had been ploughed to the centre of the lake, where everything including tents for models and control were ready at sunrise, as the competitors came out to trim. Events started at 8 o'clock with one hour rounds divided into three 20 minute periods for each competitor to make his flight. The sun was shining from a clear blue sky, and morning haze hung still above the ice. Beginning with a faint breeze and a temperature of about minus 2 deg. centigrade the circumstances were set for a splendid day of flying, and results were to prove it one of the finest contests ever known.

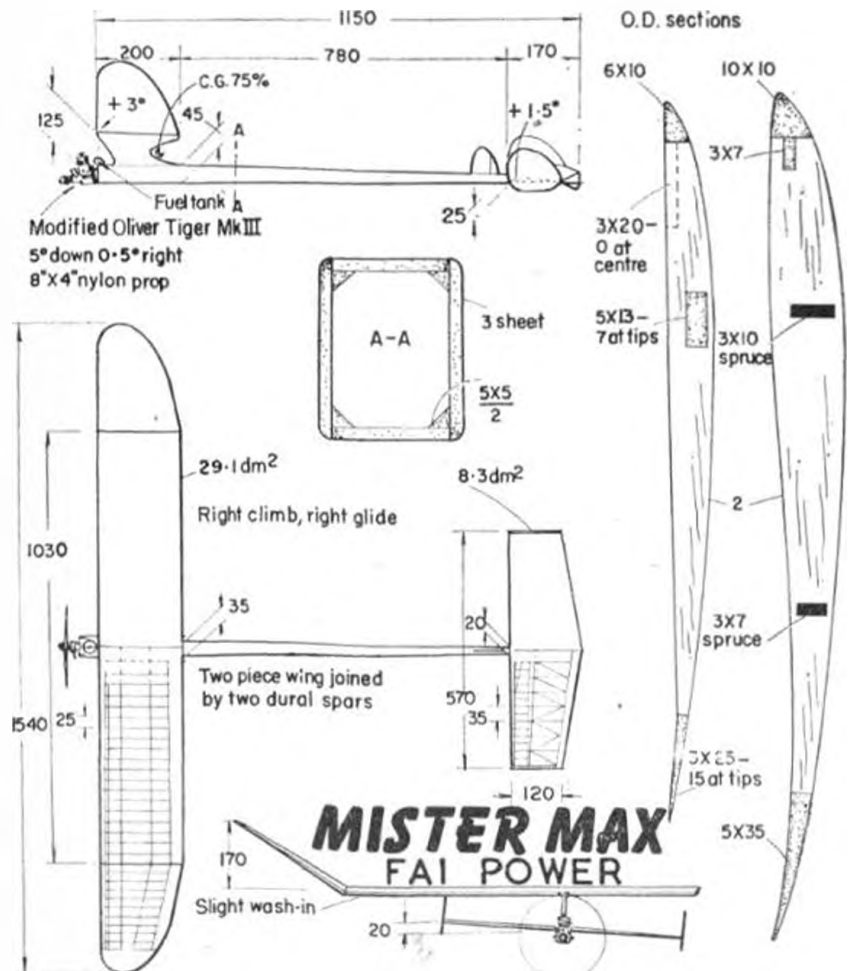
The first round saw 17 maxes for the 27 competitors including all the Finns. Thermal activity was non-existent and remained so all the day. Sometimes only very weak lift would make up to 20 seconds increase in the A/2 times. Thus the competition really gave true performances of the models, eliminating entirely the thermal lottery so common at summer time. During the second round the wind got up to 3-5 metres/second (780 feet per minute) remaining so for the rest of the day. Flyers had to make 1-1½ mile recoveries for their models, and as the ice was covered with 5 inches of snow, those without skis were quite exhausted towards the afternoon.

Rolf Hagel's winning power model at right, times were 900 + 210 + 240 + 270. Same model also won 1960 Swedish meeting with 900 + 5 x 180 seconds

After the second period the Finns were still having perfect maximums, and such conditions called for good still air models to make maximums, so it was no wonder that the Hansens were eliminated from the top places with their strong dihedralled low aspect ratio gliders made especially for the windy conditions always prevailing in Denmark. However, they were utilising the weather for trimming models to ultimate performance, but as one of them jokingly said "It isn't very economical to go trimming models abroad."

As the third period clearly demonstrated, the standard in Wakefield and Power was very high. In the Power class, only errors, such as fuel running out too early, could prevent competitors from making maxes. It would seem that the F.A.I. will have something to do with this class, e.g. limiting the motor run to 10 seconds to make some sense of the 3 minute maximum. This third period saw two Finns dropping slightly from maxes with their A/2s. Then followed a one hour break for a meal while the numerous public who combined their Sunday skiing with sightseeing the meeting, could see some fine practice towings by the Finnish A/2 experts, kiting their models overhead and holding them on the line indefinitely. Sweden's Rolf Hagel was also trimming his new 1.5 c.c. power model, which created some interesting high speed acrobatics having still to gain its ultimate trim.

The wind had dropped slightly at the beginning of the fourth period, and the maximum duration flights prevailed through to the fifth and final period with the



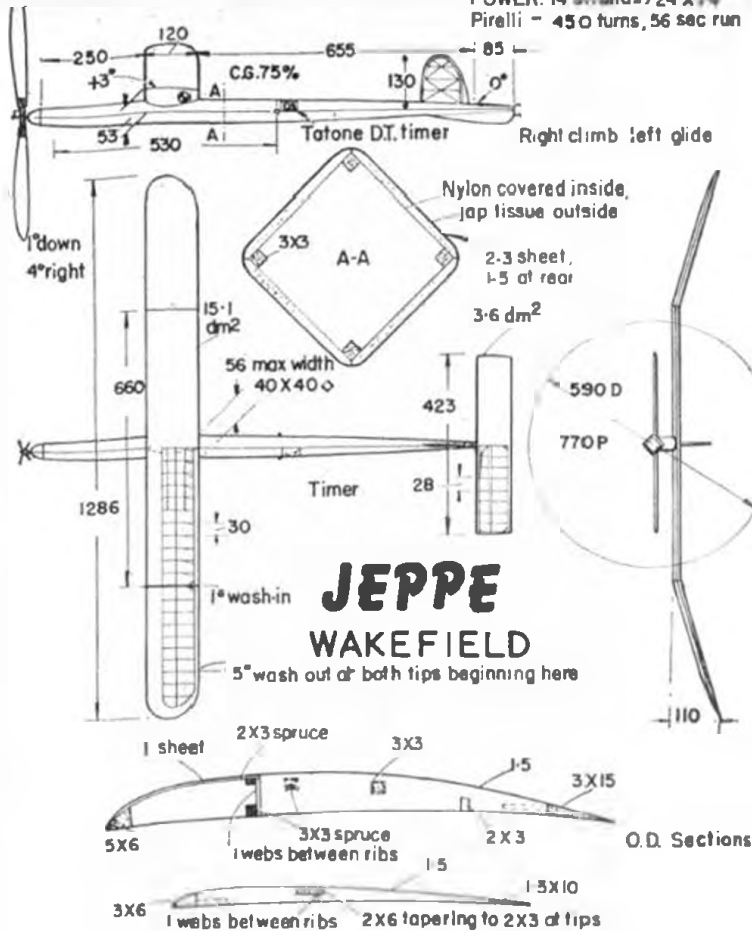
NORDIC COUNTRIES CHAMPIONSHIPS RESULTS

A/2 Glider							
1. B. Eimar (Sweden)	180	180	180	180	180	900 + 179	
2. P. Ella (Finland)	130	180	180	180	180	900 + 45	
3. M. Tahkapaa (Finland)	180	180	167	170	180	877	
4. S. Takko (Finland)	180	180	170	165	180	875	
5. A. Simonsen (Norway)	180	180	180	162	161	863	
6. N. Stovland (Norway)	179	180	137	155	154	805	
7. B. Hanson (Denmark)	120	180	165	180	148	793	
WAKEFIELD							
1. R. Hyvarinen (Finland)	180	180	180	180	180	900 + 450	
2. P. Aalto (Finland)	180	180	180	180	180	900 + 425	
3. E. Hamalainen (Finland)	180	180	180	180	180	900 + 184	
4. R. Johansson (Sweden)	172	180	180	180	180	892	
5. E. Qvarnstrom (Sweden)	180	179	165	180	180	884	
6. A. Qvarnstrom (Sweden)	180	180	171	137	180	848	
F.A.I. Power							
1. R. Hagel (Sweden)	180	180	180	180	180	900 + 720	
2. O. Niemi (Finland)	180	180	180	180	180	900 + 702	
3. I. Jokinen (Finland)	180	180	180	180	180	900 + 695	
4. S. Nurminen (Finland)	180	180	180	180	180	900 + 410	
5. B. Bulukin (Norway)	180	180	180	180	180	900 + 186	
6. G. Dalseg (Norway)	170	105	180	180	180	815	
7. C. Auner (Sweden)	78	174	180	180	180	792	
9-Men Team Totals:—Finland 8,052 secs., Sweden 7,519, Norway 4,861, Denmark 2,164.							

final result that there were 900 seconds men in every class. Bror Eimar of Sweden and Finland's Pentti Ella in A/2, all the three Finnish Wakefield flyers, Aalto, Hamalainen and Hyvarinen. Power saw five men with perfect maxes viz. the three Finns, Vienni, Jokinen and Nurininen Sweden's Hagel and Bulukin from Norway. Team placings were already solved, Finland making clear victories in all the classes and with really astounding results. A/2; 2652 seconds, Wakefield and Power each with perfect maximums of 2,700 seconds. Victory went clearly to Finland by missing *only 48 seconds* of the possible 8,100 seconds in the 3 classes (45 flights), more than 500 seconds ahead of Sweden. The Finns had every reason to be extremely satisfied with their record performance.

On the previous evening, team-managers had made an agreement on the inevitable fly-off. Both Sweden and Finland were already experienced in the new F.A.I. rule of continuing 3 minute flights and whilst for A/2 it seems to be satisfactory, in Wakefield and especially in Power it might even take weeks of continuous flying to determine the winner under good conditions. So it was decided to *increase the maximum time by 30 seconds every flight.*

The first flight decided the winner in A/2 for Ellas' line broke immediately after launch, and the model clocked a mere 45 seconds from 40 feet height. So Eimar had no difficulties in making 179 seconds to become the individual winner. In Wakefield the three Finns decided to launch simultaneously to eliminate the possible risk of lift or a downdraught. Hamalainen didn't make his usual height during the climb and with only 184 seconds he dropped aside, Aalto and Hyvarinen making 3.43 and 4.32 respectively. The second fly-off round was expected to be very exciting, because the models had been drifting to the outer limit of the timekeepers' sight at 4 minutes. Following a simultaneous launch both models were climbing very steeply all the time but despite his longer (56 seconds) motor run



**JEPPE
WAKEFIELD**

Winning Wakefield by Reino Hyvarinen made 900 + 210 + 240 seconds

against Aalto's 40 seconds Hyvarinen gained a clear edge in climbing altitude, and as the models were gliding equally well, this decided the winner. Hyvarinen made the 4 minute mark with 4:25 against Aalto's 3:35.

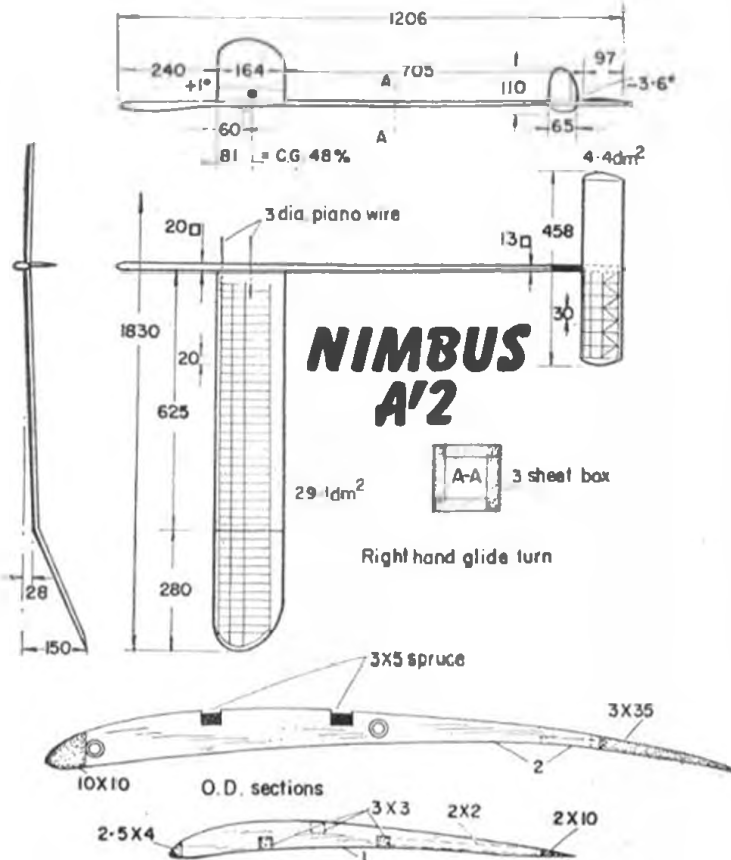
In Power, Bulukin dropped first, as his model did not recover in time after a series of stalls after engine cut-out. Next round, Finland's Nurininen dropped below the 4 minute mark, so there were only Osmo Niemi, Jokinen and Hagel to share the three top places. Niemi flew first, but somehow his model did not gain its normal altitude and he lost 18 seconds from the required 4:30. Hagel was next. His model made a fine climb, but the motor run was so close to the upper limit of 15 seconds, that it took a long time before the official timekeepers clocks had been compared to approve the flight.

It exceeded the 4:39 mark and Finnish hopes were now on Jokinen, but his elegant model did not make its best climb and it returned only 4:05 so making Hagel well-deserved winner with his original, long, three finned "Mister Max". Thus the toughest ever Nordic Countries meeting concluded as the sun was descending to the horizon. The organisers had made everything function correctly and deserved all praise. Competitors were also satisfied with the day, although all had not experienced their best day, Finland demonstrated that, for the third year in succession it is the leading country in free flight among the Nordic Countries. In 1958 Finland won everything in rain and strong wind, 1959 saw a strong thermal competition where the Finns took 6 of the possible 7 victories and now they gained 5 of 7 possible.

Sweden was also satisfied with the two personal victories, and Norway showed itself to be fast making its way up to the leading acromodelling countries in the Northern Hemisphere.

Continued at foot of opposite page

Bror Eimar's winning A/2 made 900 + 179 being also the winner of the 1960 Swedish Winter meeting with 900 seconds



**NIMBUS
A'2**

Right hand glide turn

O.D. sections

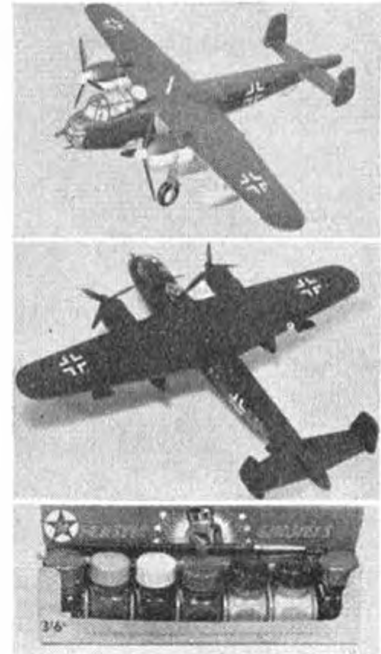
TRADE NOTES

TWO VERY IMPORTANT developments in the field of model finishes are announced this month. Foremost is the introduction of "Pli" clear dope, supplied in Aerosol pressurised cans with a special spray nozzle which had to be developed for use with our quick drying dopes. The photograph above shows how we tested it on the *Yeoman Bantam Cock* and we must say that for ease of application, smoothness of finish and quick results, there seems nothing to beat this ideal spray finish. One or two tips are advisable. Firstly, to be careful not to overlap spraying at the extremities of the subject, in other words, stop spraying as you near the tip or root. Also

after spraying, invert the container and press the button for a quick blip. The button is removable so that the nozzle can be cleaned, and we are assured that, dependant on the reception of this initial clear dope (by no means an ordinary dope, as the smell will indicate), colour dopes will follow. Our view is that its greatest advantage is the even application which is a great warp eliminator.

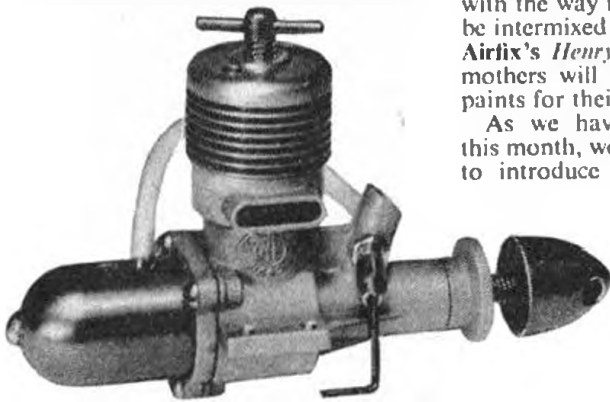
Second new line is the introduction by Hamilton of a new Thixotropic enamel paint for plastic models. These non-spill packs are sold in sets of six colours, plus thinners, complete with brush for 3s. 6d. and we were specially pleased with the way in which colours could be intermixed even on the subject of *Airlix's Henry VIII*. A good many mothers will bless Hamilton's Jelly paints for their non-spill qualities!

As we have no "Motor Mart" this month, we are using this column to introduce the .97 c.c. *Heron*,

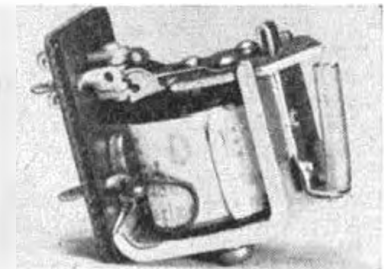


Right: *Airlix Dornier 217* in advised colour scheme, and below, in our matt photographic black non-reflective finish. Makes a fine model. Below it are the very useful non-spill Thixotropic "Craft" enamels by Hamilton.

produced by Marown Engineering of the Isle of Man. It has sparkling sand-blasted crankcase and red anodised machined parts. We tested the motor on typical sport flying size props., getting 8,000 R.P.M. on an 8 x 4 and 10,000 on a 7 x 4. and must comment that it is one of the easiest starting diesels of our acquaintance. Price is 47s. 3d.



Left, the new .97 c.c. diesel, the M.E. *Heron* from the Isle of Man. Is easy starting, and very attractive in finish. Right, E.D.'s Bleep relay with fixed contacts, ideal for all home-built sets. Sells at 24/-.



Nordic Champs (continued)

As to the models, beginning with A/2, it was very interesting to see three A.P.S. "*Sans Egal's*" being well flown on the Finnish soil by their Norwegian owners. As they said, the design is gaining a great popularity in Norway. The Finns were using highest aspect ratios and small pylons in their models (made for inserting D.T. Timers in the fuselage). The winning model by Eimar of Sweden was three years old, but is just beginning to gain victories including the Swedish winter meeting with 900 seconds. The models of fairly simple construction having silk covered two piece wing joined together with two wires going through the slim fuselage.

In Wakefield the Swedes were using minimum sized compact models with small props and short motor runs varying from 32 seconds in the Qvarnstrom brothers models, to 43 seconds by Rone Johansson. The Finns were however taking advantage with their longer and

higher aspect ratio winged, big-prop, models having motor runs from Aalto's 40, Hamalainen's 46 to Hyvarinen's 56 seconds. The latter's model, winner of numerous competitions, has a 4 year old prop and wing. He was the only Wakefield flyer using a clockwork d/t timer.

All power models were using the common pylon, the Norwegians having the lowest pylons. Hagel and the Norwegians had two piece wings for transportation. Common engine choice was the modified Oliver Tiger Mk. III, one flyer had Webra Mach 1 and another was using Enya 15D. Osmo Niemi's *Pulteri*, which will join the A.P.S. plan range was admired for two reasons, being the most straightforward and simplest construction, and also for having a really fine performance. As the Swedes said, his model went up like a "train on rails", so steady and effective was its spiral climb. Hagel had the most original designs, his magnificently built winning model was featuring double fins and a third fin for auto-rudder operation also using a clockwork d/t timer.



Specifically designed for easy yet true to scale construction, this one-eighth scale fighter from W.W.I. by Brian Barton is ideal for 1cc to 1.5cc

Bristol Monoplane Scout

A TYPICAL EXAMPLE of British procedure for dealing with a new and advanced type of aircraft that will outclass all others, was displayed in 1917 when R.F.C. squadrons were eagerly awaiting delivery of the Bristol Monoplane Scout in France. The Monoplane, first flown in 1916, then having a maximum speed of 132 m.p.h., with a 110 h.p. Le Rhone rotary engine, was highly manoeuvrable and very aerodynamically clean for its time. These features of the aircraft were altered very little in the production version and the design appeared promising especially to the pilots in France who had "got wind" of the aircraft's performance. But despite this the Monoplane was only ordered in small numbers and did not even see service in France on the Western Front, but was relegated to duties in the Middle East that did not warrant an aircraft of such quality. Many reasons have been given as to why the Monoplane was rejected for use on the Western Front, one being that the ban imposed on monoplanes in 1912, was still present in the minds of some when the type was considered for acceptance into the R.F.C. (The ban was imposed after a number of accidents involving structural failure with Morane Monoplanes, and was never quite forgotten until the Spitfire and Hurricane had flown and were proved safe and successful). The official reason, however, was that the landing speed was too high (at 49 m.p.h.!) This in turn was thought to have been created to hide the unwanted publicity that a certain high ranking officer obtained through his lack of skill, resulting in the crashing of one of the Monoplane prototypes. Knowing we British, this may well have been the reason!

The service that the Bristol Monoplane *did* see, in the Middle East, was in Mesopotamia in the hands of 72 Squadron, and in Macedonia with 17 and 47 Sqdns. A few were also sent out to Palestine, but other than the capture of the towns of Kifri and Kirkuk from the Turks in May 1918, the Bristol Monoplane Scout did not contribute greatly towards the success of the Allies in the First World War, and after the War had ended, what appeared to be a most successful single seat scout

aircraft and by some, was thought would gain complete air supremacy for Britain, disappeared unnoticed from the service scene.

Our model, scaled down to one-eighth size (in keeping with many of our other W.W.I. subjects) from 30ft. 10ins. to 46ins. span incorporates all the details of the full-size, such as scale ribs, stringers, Vickers gun and downward vision panels at the wing roots.

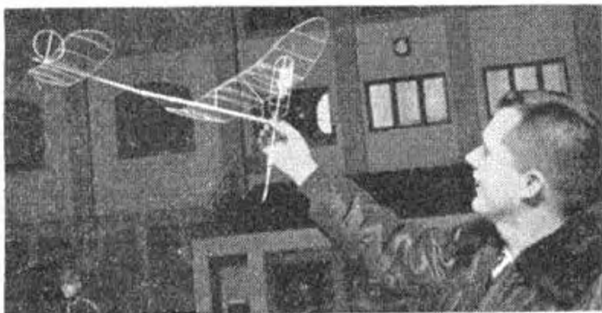
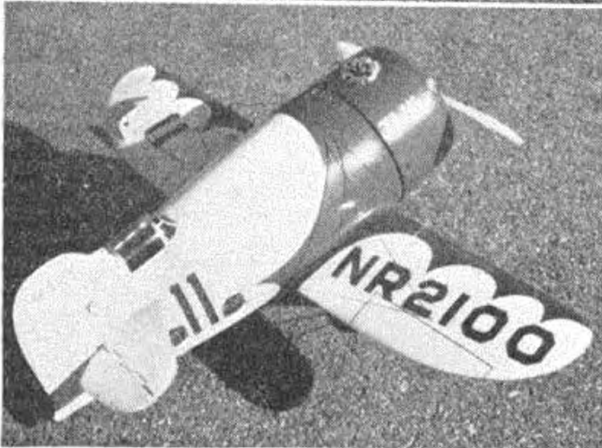
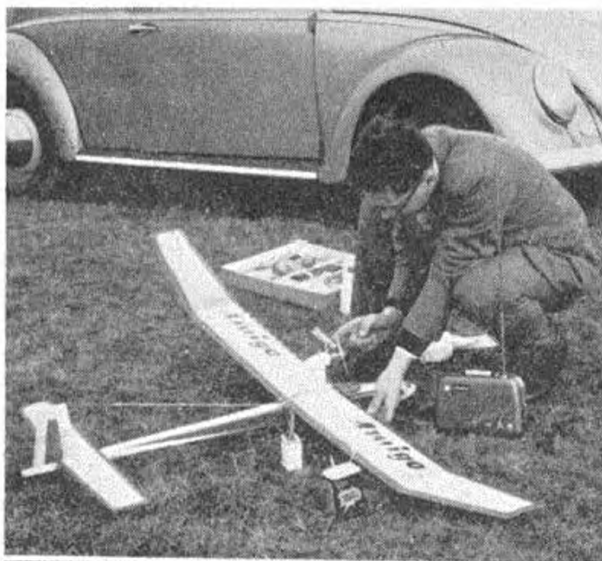
The aim was to obtain a realistic model with relatively light weight construction methods to reduce wing loading and so get true scale appearance in the air. Stringers on the fuselage are disposed to obtain correct effect, and with the muffled note of the 1 c.c. or 1.5 c.c. engine behind that large spinner, the Bristol Monoplane is as near as one can get to being a perfect replica of the full size. Flying speed is slow, and stability such that it will recover from any dud launch or gust upset.

It is also remarkably easy to build. Designer Brian Barton is one of the most prolific model builders of our acquaintance, and likes building so much that he is continually engaged in making ranges of Astro Hogs, Smog Hogs and the like for lazy radio control flyers. So when he wanted to create this scale model for his own flying enjoyment, he sensibly applied his accumulated experience of kits and plans from all countries to produce a building system that almost qualifies for beginner status. Moreover, it is quick construction, and abbreviated stage by stage information is included on the plan.

The multi-stringered circular section fuselage is built around a horizontal crutch, first made over the plan view. By applying half-formers and lining up with master stringers, the torpedo like fuselage is soon taking shape. Cowling is not at all involved, and the only part likely to bog down the novice is the large spinner. While it might not be a scale model any longer, the Bristol Monoplane could very well be flown without the spinner if need be.

Wings are one-piece with ingenious seating on the fuselage for knocking-off in the event of a crash, and the transparent sections for pilot downward visibility

WORLD NEWS



FIRST EVIDENCE we have of model kits existing in the U.S.S.R. comes from Chaim Shniorson of Tel-Aviv, Israel, who sent us the plan from a control-line trainer outfit for 1.5 to 2.5 c.c. It's a solid wing profile type, and Chaim tells us that though punched parts are not of expected quality, the kit includes everything needed.

More details are coming through from Brazil, where, despite proximity to the source of supply, balsa is a hard-to-obtain item, most work is out of kits, and modellers are in some ways regarded as heroes. At S. Bernado, the centre of Brazil's automobile industry, there is a 74-member club, while figures for Rio are said to be 300 modellers, with 500 in Sao Paulo and 200 in Belo Horizonte. We now have the completely detailed results of the South American Championships held at Rio last October, the well-prepared 11-page summary giving full information on all winning models as well as organisers and time-keepers. From this it is evident that American and Japanese engines predominate, in particular, Fox and Enya products. Team Racing follows the A.M.A. class for 5 c.c., but Speed is limited to the F.A.I. 2.5 c.c. size, leading speed being 156 k.p.h.

Suggestion from Cec Tate in the "Airfoil" newsletter from Toronto Balsa Beavers in Canada is a form of tank pressurising without resort to crankcase tapping. This is by means of a loop of copper tube either passing across the exhaust port or around the hot part of the cylinder, and connected to an otherwise blanked-off tank. Idea is that air in the tube will expand and feed fuel to the carb under pressure. In the same newsletter comes a new excuse for the combat boys: "It was running fine till the bellcrank made a sudden trip to the wingtip!"

On March 27th, a week after the fantastic Nordic Champs reported on pages 296/7/8, the third Finnish Championships took place over ice 28 inches thick at Hango. Conditions were perfect, with no wind, and temperature enough that competitors were in shirt-sleeves over the snow-covered lake. In consequence, model performances were even higher than ever and in the A/2 class two competitors gained 900 secs. for the fly-off. Yet once again, for the third time in succession, Pentti Ella had to be satisfied with second place, being beaten on this occasion by a 14-year-old protege of the renowned Markku Tahkapaa. The first eleven contestants had more than 870 secs. in this event, which gives one a clear view of the expert standards.

In the Wakefield fly-off Pentti Aalto pipped Reino Hyvarinen, who had won the previous meeting held three weeks before (and in which he knocked up the grand total of 2,637 seconds by flying in all three F.A.I. classes, including no less than 14 maxs — some effort for one day of model flying!).

But the main feature of all these Finnish Championships is the F.A.I. power class. In the second meeting on March 6th, there were four in the fly-off with Sandy

From GERMANY, at top, an Amigo, the A/2 glider kit by Graupner, fitted with a power pod. We predict a keen following for this model now we have seen plans. For three-channel with elevators it has tail at rear of rudder and a novel elevator trim connected to rudder movement. This is one prototype on test. Gee Bee racer is to 1/16th scale for a Fox 15 by J. A. Wilson of Overland, Missouri, U.S.A. Small, light frame is essential for high power to get good elevator control on the "Flying Barrel", this 18½-inch version flies at 70 m.p.h. Also from the U.S.A. is Bud Wolfe's Class B microfilm Canard pusher, a stable flyer which Bud, Vice-President of Chicago Aeronuts, is about to launch in their Armoury hall. Canards bounce off girders — says Bud. Bottom, from GERMANY is a neat low-wing R/C by Bernhard Middeldorf of Osnabruck, is single-channel for Webra 3.5 c.c. Bully, 58-inch span and Graupner Mikroton Rx

Pimenoff going to 331 secs. on a final unlimited flight to beat Osmo Niemi and Hyvarinen, while at the third meeting there were no less than eight in the fly-off out of a 17 entry!

The time set for the fly-off was five minutes; but four managed that although two, including Pimenoff, had fractional over-runs and eliminated themselves. That left Osmo Niemi and Ilmari Jokinen to decide, with the maximum increased to six minutes. Niemi's "Pulteri" managed this all but four secs. to gain 356, against Jokinen's 331. There is a strong Finnish view that 10 seconds engine run is the next move to prevent these continual fly-offs, although who of the old-rule brigade would have foreseen current F.A.I. models making such high times when the rules were first announced? Pulteri is, as already announced, to be included in our Plans Service shortly.

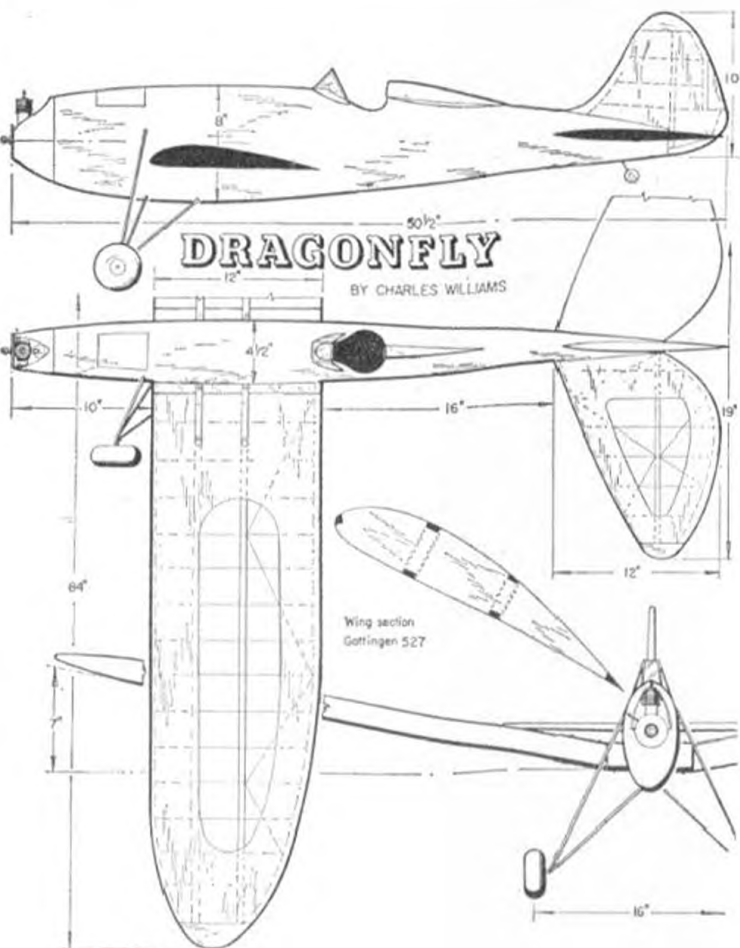
As many TV viewers were able to see in Britain, the German eliminations to pick their International team for the Radio Control Championships was held at Hirzenhain over Easter. Karl-Heinz Stegmaier, who appeared on the TV screens, placed first with a high gross total of 4,255 points in two flights, but was actually

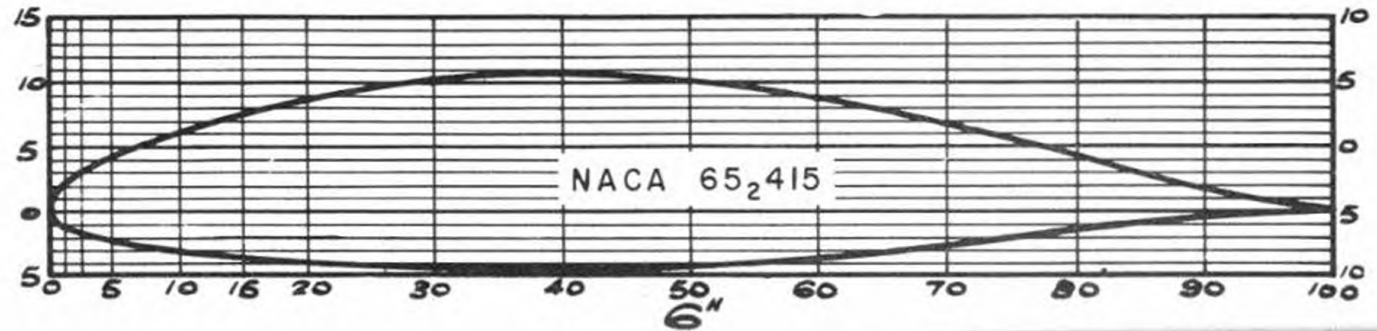
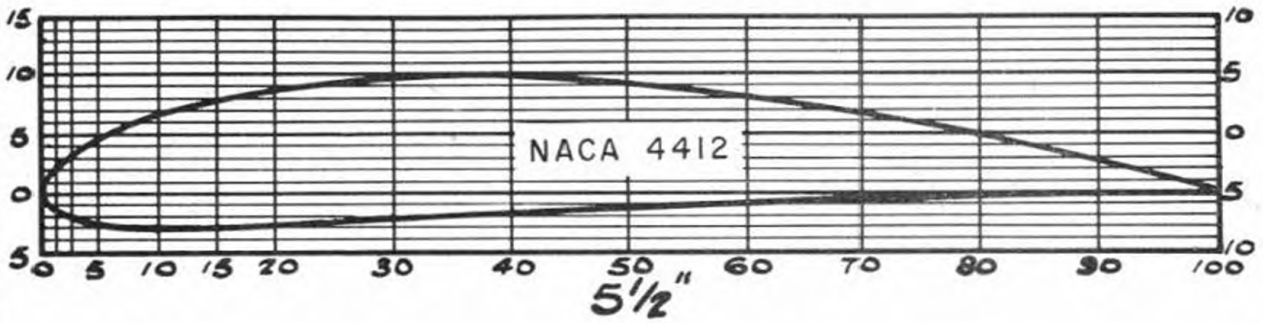
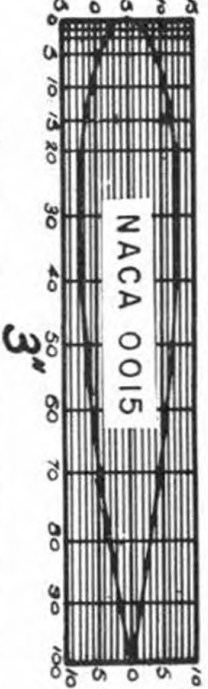
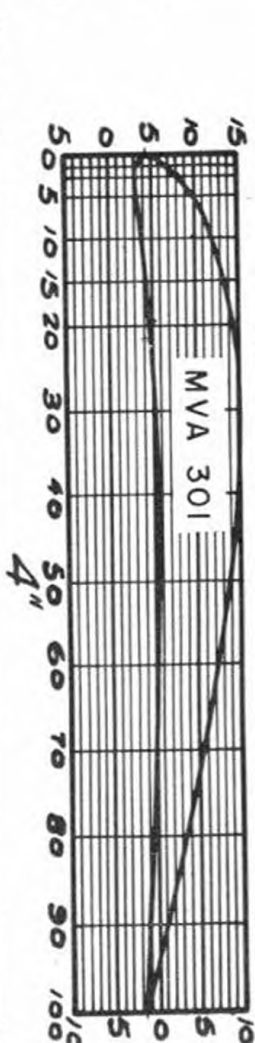
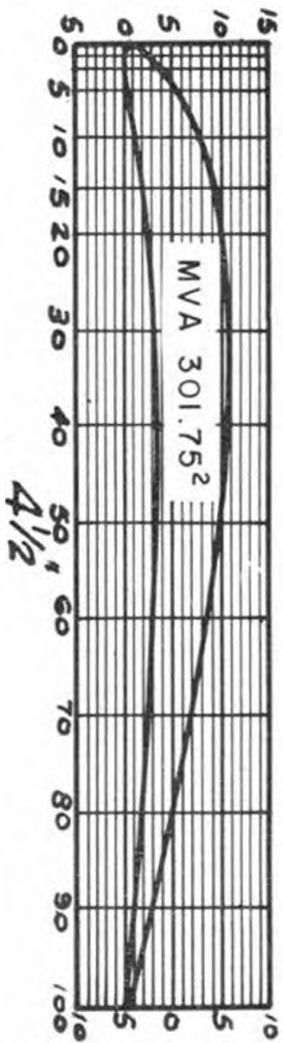
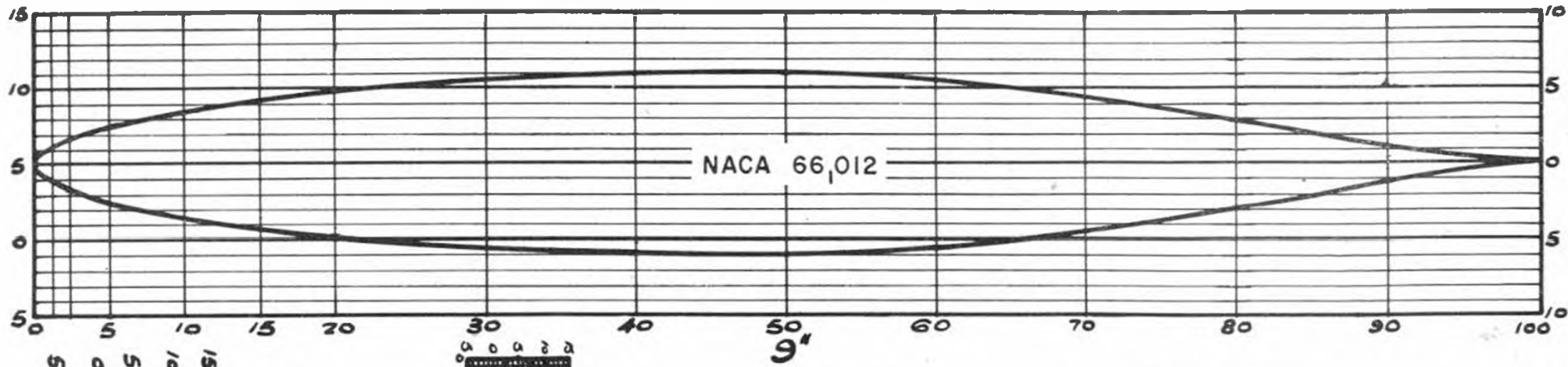
beaten by Gustav Samann in the second round, although Gustav was not quite himself for the first flight. Most noteworthy event was said to be Samann's advance since the International last year. Third place went to Hans Gast and the competition was limited to two competitors for power and one for glider per area. In the latter class, Hans Schumacher gained a big lead with 1,056 points against next man, Klaus Holighaus's 814.

It is with much regret, though we wish him all success in his new job, that we learn of Bill Winter's departure from *Model Airplane News* as of Easter. Bill's Scrap Box and M.A.N. at Work gossip features have become the European's insight into U.S.A. comment on domestic and international modelling, and we know that all his regular readers will miss his inimitable style. Bill has also been responsible for much of the radio control development in the world, though he would be the last to lay such claims, through his regular promotion of new ideas and wise editorial direction of radio matters, many of the advanced designs for compound and multi-control coming from his own work-bench albeit anonymously. We hope he will continue to be a modelling contributor between whiles when not too involved in new duties with *Flying* magazine.

Below: Charles Williams' Dragonfly is obviously not a new design; but with a re-styled undercarriage and less dihedral it offers an elegance that is lacking in current low wing efforts. Do you know when it first appeared? See foot of next column for the date. Right: Of modelling interest is the Spitfire XXII mounted in flying attitude outside Air Force Memorial House in Perth, W. AUSTRALIA. Enthusiasts raised £1,000 to buy the airframe and have it shipped from England. Picture came from Harold Jones whose Avro 504K from A.P.S. plans is seen in centre. Model has a Mills .75. Bottom is a Chicago Aeronauts novelty, the BOO-BOO hat, awarded each month to the man who makes the biggest bloomer of the month. It's painted bright pink in Day-Glow

The Dragonfly was published in "Flying Aces" of March, 1938





A new service for aeromodellers AIRFOIL GRIDS

— by Jim Baguley

THERE ARE MANY aeromodellers who would plot their own choice of airfoil section; but for the fact that they find the procedure of creating percentage grids too tedious. For example — who can admit that he enjoys making a grid for an 8½-inch chord section, divided into the required percentages in length and height?

Jim Baguley has prepared a set of grids ranging at convenient and popular size intervals over 25 chords from 3 to 14 inches length. A facsimile of the print we can offer from his original (price 3/6) is shown above, and a few actual size samples are reproduced opposite, with interesting airfoils drawn in as samples. Ordinates for these airfoils are given below, and for the benefit of those who have no knowledge of the subject (there is an excellent chapter on it in *Contest Model Sailplanes*, price 5/-) we will now run through general procedure of plotting an airfoil.

Study of the ordinates below will show that stations are quoted for the upper and lower airfoil contours at % chord positions. Thus the chord, or length of the airfoil has to be divided into tenths, and further broken down to twentieth parts for the first stages. Again, the same % chord is used in the vertical plane, only more finely divided to lines every 1% chord apart.

The chord line of the airfoil may be such that lower surface ordinates are "minus" dimensions, below the zero (0) line, especially in the case of the symmetrical airfoils. In such cases, one should use the zero line reading from the right side of the grid in our examples, see NACA 66012 which is drawn about the mid-line. Another case may have all ordinates for both upper and lower surfaces well above the base or chordline, for example, MVA 301 drawn on our 4-in. example. Note how the lower surface is well above the zero line. Also in the case of non-symmetrical airfoils such as NACA 4412, the lower surface extends only for a matter of almost 3% and we can use the zero-line reading from the left side of the grid.

Using either zero line, the grids will accommodate practically any airfoil likely to be used for models. A first-class example of the usefulness of printed grids is our provision of ordinates at normal stations at normal stations for NACA 65,415. Many of the later NACA sections have unusual ordinate positions, not using simple stations but breaking the chord down to different percentages for upper and lower surfaces at most involved stages. We were able to interpolate these "awkward" ordinates on the 6-inch grid, and having drawn the airfoil by connecting all the plotted points, could then read off reasonably accurate plotting points for the table below.

Similarly, if you have your own favourite "French curve" airfoil, which always works well but can only be drawn by you with one particular curve and at one chord, then the airfoil can be laid out

over a grid, and ordinates composed for any other airfoil chord. It's easy to make your own series of Joe Bloggs' XYZ foils this way!

To join the plotted points, use proper drafting curves, and a hard pencil to make a thin line. Alternatively, varied coloured ball-pen ink can be used so that the one grid may be re-used time and time again without too much confusion. Provision of so many chords on our sheet of grids will allow for most situations from large wings to small tailplanes.

The airfoils chosen for examples each have a particular interest and are introduced to help your modelling.

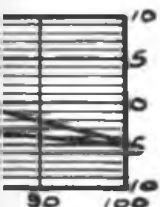
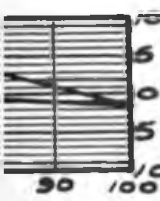
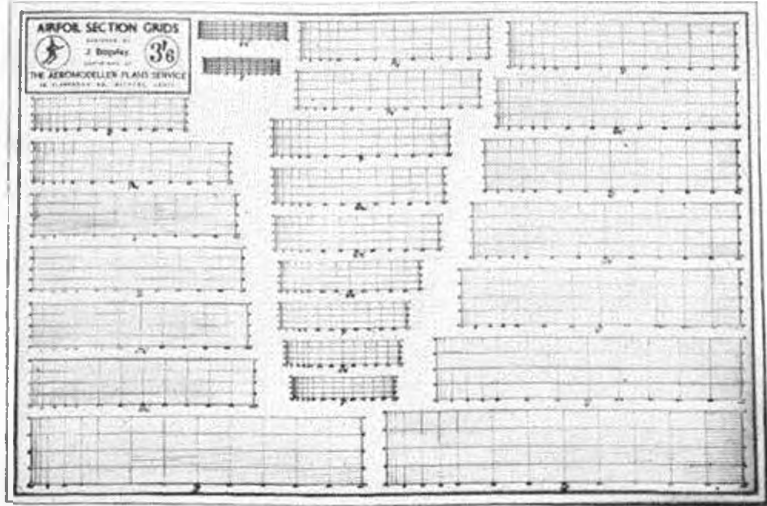
NACA 0015 on 3-in. chord is a good 15% thick symmetrical airfoil for radio control or control-line and is advised too for tailplanes on rudder only R/C models in conjunction with NACA 4412 (5½-in. chord) on the wing. This airfoil also suits free-flight sport power models, having good lift/drag ratio, and operating up to high angles before stalling.

A/2 glider enthusiasts already know MVA 301 (4-in.) but may not be familiar with the modified version MVA 301.75². These two airfoils are to be advised for gliders of all types, and also in the case of MVA 301, for free-flight contest power designs.

At 5-inch chord, NACA 0012 is a popular choice for tailplanes when not required to be lifting, and also on wings for faster flying C/L and R/C aerobatics. It contrasts with NACA 66012 which, although of similar thickness ratio, is a later section with a strong following for aerobatic models in the U.S.A. Small centre of pressure movement and low drag are its assets and it has been used in several of Harold de Bolt's designs. It may yet appear on a certain "Uproar".

Finally, the airfoil which has been taken very much to heart for its outstanding laminar flow properties and ability to operate up to almost 20 deg. angle of attack as well as giving excellent lift/drag ratio. This is the current choice for full-size sailplanes and has also been mentioned in connection with the man-powered aircraft researches. NACA 65,415 offers thickness for stout section spars, and might well be considered for model purposes, slope soaring in particular.

Copies of the airfoil section grids are available through AEROMODELLER Plans Service price 3/6 plus 6d. postage.



%CHORD	0	1.25	2.5	5.0	7.5	10	15	20	25	30	40	50	60	70	80	90	95	100
NACA 66,012	0	1.358	1.808	2.496	3.037	3.496	4.234	4.801	5.238	5.568	5.947	5.965	5.588	4.515	2.944	1.234	-.474	0
NACA 4412	0	2.44	3.39	4.73	5.76	6.59	7.89	8.80	9.41	9.76	9.80	9.19	8.14	6.69	4.89	2.71	1.47	(-13)
NACA 0012	0	-1.43	-1.95	-2.49	-2.74	-2.86	-2.88	-2.74	-2.50	-2.26	-1.80	-1.40	-1.00	-.65	-.39	-.22	-.16	(-13)
NACA 0015	0	1.894	2.615	3.555	4.200	4.683	5.345	5.737	5.941	6.002	5.803	5.294	4.563	3.664	2.623	1.448	-.807	-.126
NACA 65,415	0	-1.894	-2.615	-3.555	-4.200	-4.683	-5.345	-5.737	-5.941	-6.002	-5.803	-5.294	-4.563	-3.664	-2.623	-1.448	-.807	-.126
NACA 0015	0	2.367	3.268	4.443	5.250	5.853	6.682	7.172	7.427	7.502	7.254	6.617	5.704	4.580	3.279	1.810	1.008	-.158
NACA 65,415	0	-2.367	-3.268	-4.443	-5.250	-5.853	-6.682	-7.172	-7.427	-7.502	-7.254	-6.617	-5.704	-4.580	-3.279	-1.810	-1.008	-.158
NACA 65,415	0	2.27	3.13	4.30	5.28	6.12	7.54	8.58	9.37	9.93	10.55	10.08	8.73	6.70	4.28	1.84	0.80	0
NACA 65,415	0	-1.30	-1.70	-2.24	-2.65	-2.98	-3.53	-3.95	-4.23	-4.44	-4.54	-4.20	-3.47	-2.60	-1.50	-0.50	-0.20	0
MVA 301	4.3		8.3	9.9		12.0	13.4	14.2	14.7	14.9	14.7	13.9	12.5	10.8	8.6	6.2		3.5
MVA 301	4.3		3.1	3.3		3.7	4.2	4.6	4.9	5.2	5.4	5.3	5.2	4.9	4.3	3.8		3.2
MVA 301.75 ²	0.70	2.70	3.90	5.50	6.70	7.60	9.10	9.90		10.60	10.50	9.80	8.50	6.90	5.00	2.90		0.20
MVA 301.75 ²	0.70	0.00	0.00	0.50	0.90	1.30	2.10	2.60		3.20	3.40	3.30	2.90	2.40	1.80	1.00		0.00

AIRCRAFT DESCRIBED Number 101

Poland's greatest fighter

described by J. B. Cynk and
drawn by Z. A. Datkiewicz.



WHEN HITLER'S FORCES invaded Poland at dawn on September 1st, 1939, the weak and ill-equipped Polish Air Force had to face alone the whole might and fury of the Luftwaffe. Outnumbered by its adversaries by 9 to 1 and provided with obsolete aircraft it fought defiantly against enormous odds losing in 17 days of hectic combat 333 machines out of its first line strength of 430 aeroplanes. In spite of the great disparity in number and quality of aircraft the Polish Air Force put up an incredible fight and the most spectacular aspect of its war activities was the destruction by Polish fighters of 126 raiders with 10 further "probables" and 14 badly damaged. This constituted 33 per cent. of the total losses of the Luftwaffe in the Polish Campaign.

The mainstay of the Polish fighter force was the PZL P-11c gull wing single-seater, and to the guns of this completely obsolete, but remarkably sturdy and aggressive little beast fell to the quarry the first Luftwaffe machines in the World War 2. Long due for replacement the P-11c was weakly armed and slower than the great majority of German aircraft, not excluding bombers, but its excellent manoeuvrability, combined with fantastic skill and determination of Polish pilots compensated all the other shortcomings making the machine a dreaded opponent and elusive target to hit. The excellent flight characteristics of the P-11 earned the aircraft great popularity among the people who flew it, and the war proved that the fighter was able to take extraordinary amount of punishment with no ill effect.

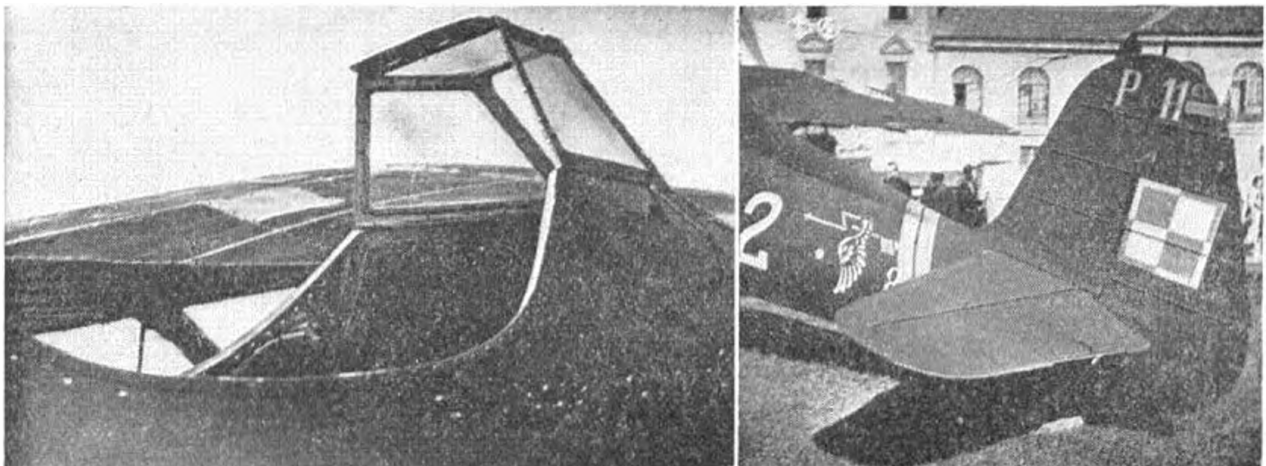
Out of 15 fighter squadrons having 10 aircraft each—constituting the Polish fighter force on the outbreak of war, 12 were equipped with the P-11c and the remaining three with earlier P-7, which was by then completely useless as a fighter, and did not play any significant role in the air combat. With the war approaching, the first-line units of the air force, organized in peace-time in six Air Regiments, were re-grouped to meet operational demands of the Polish H.Q. The four P-11c equipped Warsaw squadrons—the famous No. 111 "Kosciuszkowska"

Squadron, No. 112 "Fighting Cocks" Squadron, No. 113 "Owls" Squadron and No. 114 "Swallows" Squadron—reinforced with No. 123 Squadron flying the early P-7s, formed the Pursuit Brigade the main objective of which was the defence of Poland's capital. The other ten fighter squadrons were attached to various land armies with tasks of defending army's regions and providing fighter protection for army's operations. On August 30th and 31st fighter squadrons were moved from their peace-time bases to improvised combat airfields and kept in readiness. On September 1st at 7.50 a.m. P-11s of the Pursuit Brigade engaged 100 aircraft in a furious assault directed against Warsaw. They scattered the raiders and many were driven back before reaching the city, releasing their bombs over the countryside. The story repeated itself in the afternoon, when the smaller Luftwaffe formation was successfully intercepted. In the savage fights of that day 14 German aircraft were turned into burning wreckage by the gullwing warriors of the Pursuit Brigade for loss of 10 own machines and 2 pilots killed. From September 3rd bomber formations dispersed when approaching Warsaw and were more difficult to encounter. In the first six days of air battles the Brigade knocked down a total of 42 raiders for loss of 37 own aircraft.

However, as the Campaign progressed, the number of heroic defenders of the Polish sky melted quickly. Deprived of any warning system, having no replacement for destroyed aircraft, lacking fuel, spares and all the essential supplies, they could not offer for long any effective resistance to the German air armada, and on September 17th, when the Russians attacked Poland's rear, the airworthy remnants of the Polish fighter force, 38 P-11 and P-7 machines, were evacuated to Rumania.

After the fall of Poland one P-11c, belonging to the No. 121 "Winged Arrows" Sqdn. of Army "Krakow", was preserved by the Germans in the Berlin War Museum. The machine survived the war and was taken over by Polish authorities. After remaining for over 10 years in storage, it was shown in public during the National

Cockpit and tail details of the preserved P-11c now in Warsaw after being on exhibition in Berlin. Authentic 121 Squadron "Winged Arrow" insignia can be seen stencilled on rear fuselage. Fine corrugations on surfaces are visible on original photographs





PZL P-11 fighters of 113 Squadron warming up their engines at Warsaw Okęcie airport. Closest to the camera is a four gun P-11c, with two P-11a behind it and then more P-11c's. Line up below shows the purposeful, if outdated lines of the aggressive P-11, surely a fine modelling subject for flying scale?

Aviation Days in 1957 and on many other subsequent occasions, wearing the original 1939 markings and colour scheme.

The P-11c was a very outstanding piece of engineering. Its most distant ancestor was the revolutionary Pulawski's P-1 all-metal fighter of 1929, which served as a prototype for international fighter formula of the early thirties, being copied by several countries throughout the world. The machine was the first to employ the characteristic Pulawski-wing, designed to provide perfect visibility for fighting. On the basis of P-1 design two lines of development were pursued in Poland. One produced the radial powered P-6 and -7 prototypes with circular section fuselages, and the other followed the exact pattern of the in-line Vee engine powered, rectangular fuselage P-1, resulting in P-8 and P-9 prototypes and P-10 project. As the Bristol radials were eventually chosen for production in Poland this second line of development was abandoned and the Jupiter powered P-7 was ordered into production. Some 150 machines of this type were completed, first entering service in 1932. The improved Mercury powered development, P-11a, followed P-7 on production lines, and 50 examples of the export

version, P-11b, were manufactured for Rumania. The P-11c superseded the earlier fighters, entering service in 1934/5, and a total of 250 P-11s of all marks was completed by the PZL. The ultimate development of the Pulawski wing fighter line was the cannon-armed P-24 of 1933, but this machine was by-passed in favour of more advanced cantilever low wing monoplanes, and produced for export only—for Bulgaria, Greece, Rumania and Turkey. Unfortunately the intended replacements for P-11, the P-38 "Wilk" twin-engined two-seat fighter and P-50 "Jastrzab" single-seater, did not come up to expectations, and with the war approaching the improved P-11c with Mercury VIII engine was re-ordered into mass production as a stop-gap measure. The machine, known as "Kobuz", was to be built at the PWS factory and the first deliveries were expected in the middle of 1940.

The P-11c was an all-metal high-wing braced monoplane with the patented Pulawski-wing built in two halves, each having greatest depth of section at bracing-strut attachment, with inner ends sloping down with thinning section to fuselage attachment points. Wing, of modified Polish "Bartel 37/11a" aerofoil section, was built up of duralumin framework and covered in most part with corrugated duralumin sheet and on less highly stressed remainder with "Electron" metal. Long, narrow-chord ailerons were used also as flap gear for slow landing. The fuselage was a stressed skin duralumin structure of oval cross-section. Tail unit, with cantilever fin and braced tailplane, was a duralumin and "Electron" structure, similar to the wing. The divided side-Vee type landing gear, with oleo-pneumatic shock-absorbers concealed inside the fuselage, was an ingenious design of exceptional strength. The standard power plant was the 620 h.p. PZL (Bristol) Mercury VI nine-cylinder radial engine. Main fuel tank of 320 litres (70.3 Imp. Gal.) capacity, carried in fuselage, was droppable. Armament consisted basically of two 0.3 cal. KM Wz 33 guns, with 500 rounds each, in sides of the fuselage, firing through airscrew, but some 25 per cent. of the P-11c aircraft were provided with an additional two guns, with 300 rounds each, fitted in wings and firing outside the airscrew. 27 lb. fragmentation bombs could be carried under wings. Equipment included R/T radio, camera gun, oxygen installation etc.

Dimensions: Span 35 ft. 2 in.; length 24 ft. 9½ in.; height 9 ft. 4 in.; wing area 192.7 sq. ft.

Weights: Weight empty 2,443 lb.; weight loaded 3,505 lb.

Performance: Max. speed at 18,040 ft. 242 m.p.h. Climb to 16,400 ft. 6 min.; to 26,240 ft. 13 min. Service ceiling 36,080 ft. Range 503 miles.

DATA INDEX

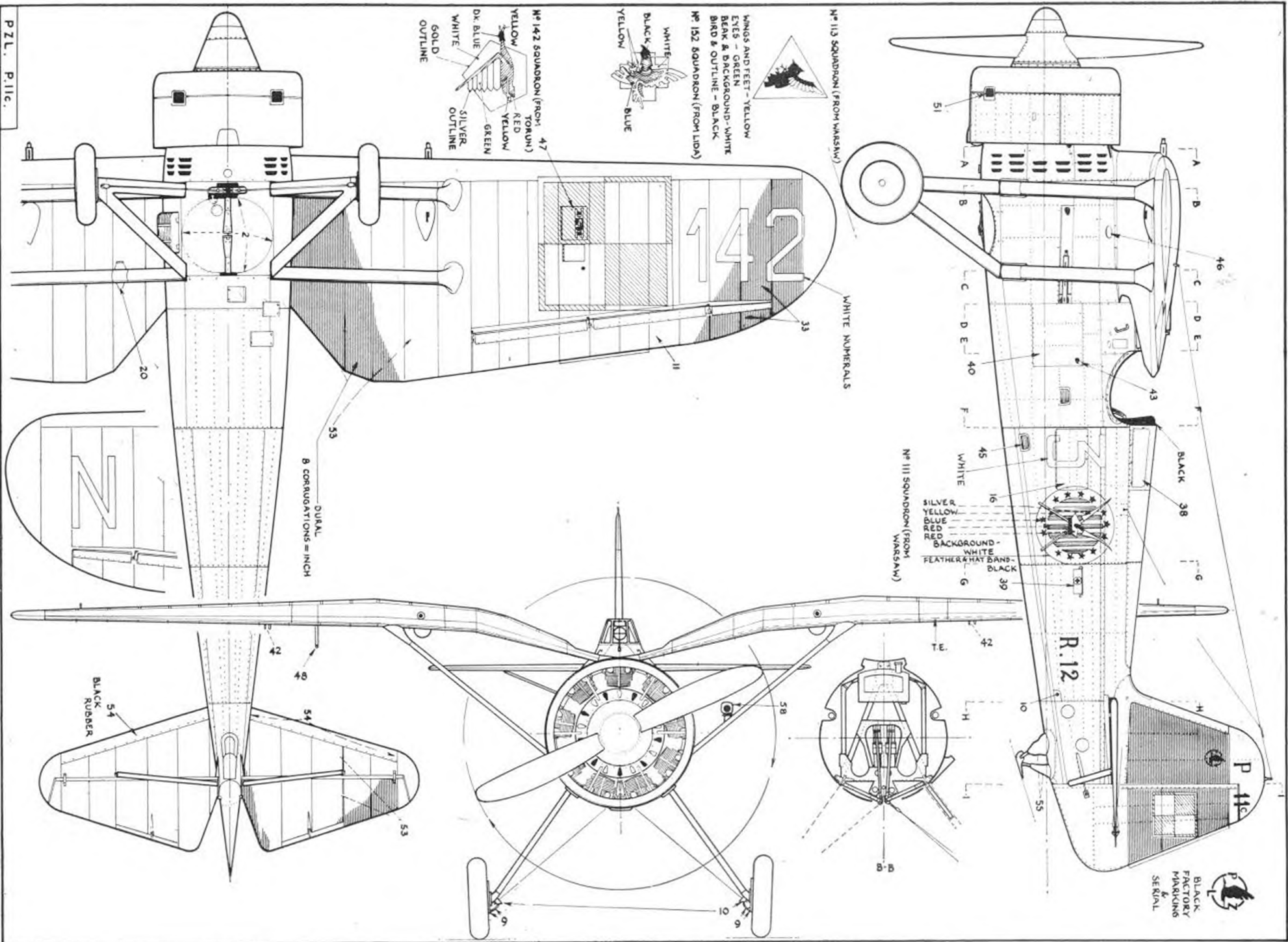
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|---|----------------------------------|--|
| 1. Mirror | 22. Harness Tension Control | 44. Elevator Trim Gear |
| 2. Fuel Tank | 23. Boost Control | 45. Foot Rests |
| 3. Hand Grip | 24. Throttle | 46. Fuel Inlet |
| 4. Compass | 25. Radio | 47. Bomb Rack (12½KG) |
| 5. Boost | 26. Fuselage Guns Trigger Button | 48. Air-Speed Indicator Pitot |
| 6. Fuel Pressure (Benzyna Cisnienie) | 27. Wings Guns Trigger Button | 49. Venturi |
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| 8. Oil Temperature(out) (Smar Temperatura) | 29. Fuel Header Tank | 51. Exhaust |
| 9. Brake Drum and Cable | 30. Rudder Pedals | 52. Exhaust Collector |
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| 11. Fuel Gauge (Paliwo) | 32. Ammunition Box | 54. Rubber Covering to Prevent Damage by Shell Cases and Links |
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| 20. Clock | 41. Air Intake Control | |
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| | 43. Opening for Very Pistol | |

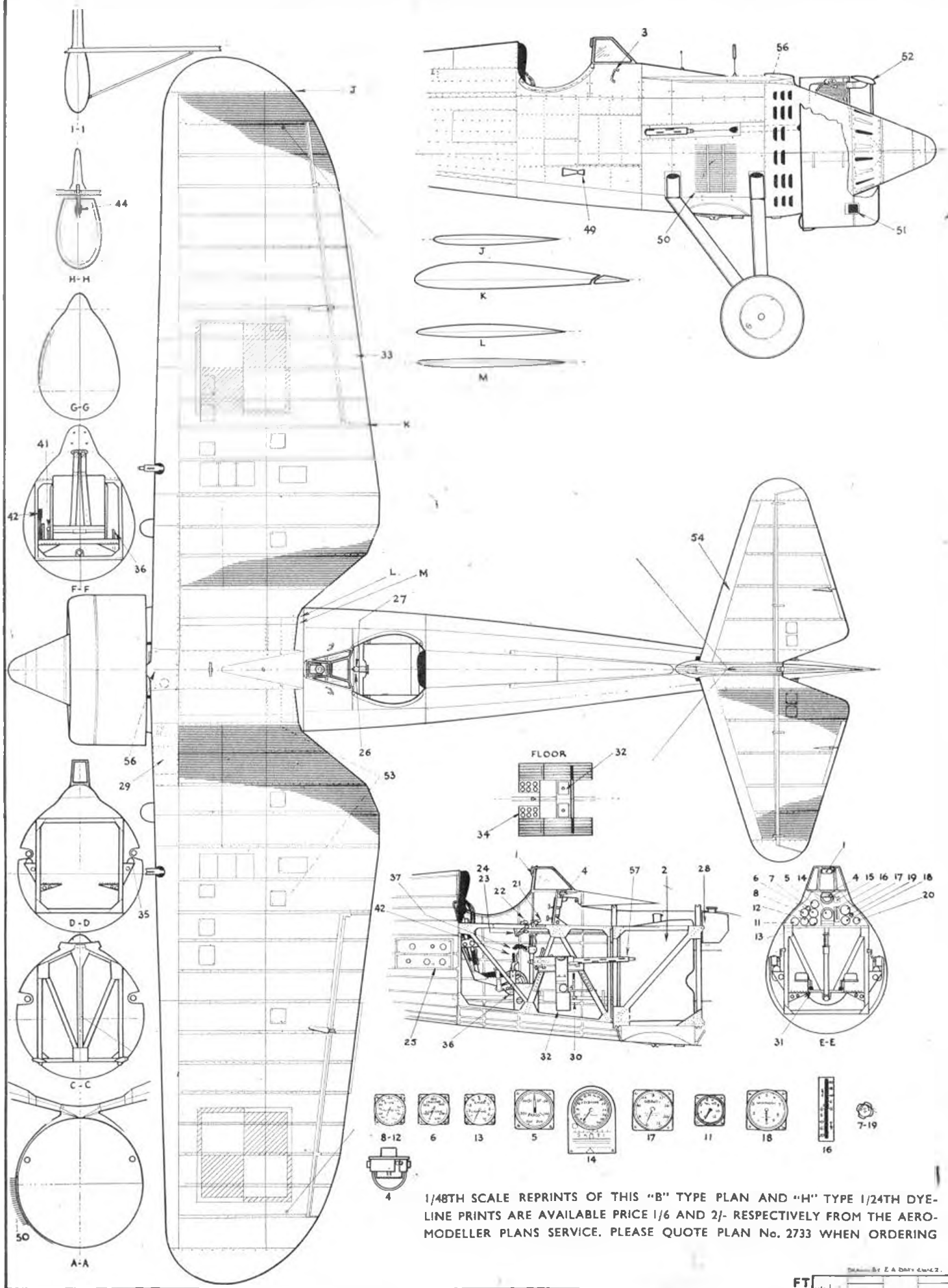
CLOUR SCHEME

Olive Green (similar to Post Office Telephones vehicles) overall — except lower surfaces of wings and tailplane which were Light Blue-Grey.

The authors wish to acknowledge the considerable assistance of Benedykt Dabrowski who supplied material for the drawings

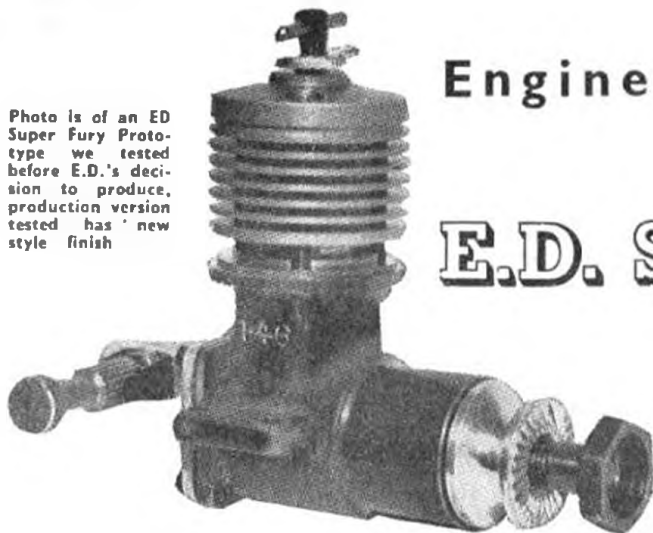
1/48th drawings overleaf ▶





1/48TH SCALE REPRINTS OF THIS "B" TYPE PLAN AND "H" TYPE 1/24TH DYE-LINE PRINTS ARE AVAILABLE PRICE 1/6 AND 2/- RESPECTIVELY FROM THE AERO-MODELLER PLANS SERVICE. PLEASE QUOTE PLAN No. 2733 WHEN ORDERING

Photo is of an ED Super Fury Prototype we tested before E.D.'s decision to produce, production version tested has new style finish



Engine Analysis No. 72

by R. H. Warring

E.D. SUPER FURY

Refined version of the popular 1.49 c.c. diesel has disc induction and many race-bred features

THE ORIGINAL E.D. "Fury" appeared in 1958 and whilst being an extremely pleasant engine to handle did not give the power performance to be expected of a ball-bearing motor of "racing" layout. E.D.'s new engine designer, Gordon Cornell—who joined the firm in 1959—has obviously put in a lot of work to remedy this position, resulting in the "Super Fury" version which has a number of major changes and considerably pushed up the potential of this compact, sturdy power plant.

Main change is that the original reed valve induction has been dropped in favour of rotary disc induction, calling for an entirely new backplate. Cylinder transfer porting has been modified internally and the appearance of the engine has been changed by the elimination of the two exhaust stacks, although these are being retained on the marine version (air-cooled engines with exhaust stacks can be supplied to special order).

Other modifications include replacing the hardened

connecting rod with an alloy rod, an entirely new piston a modified needle and different hub unit—the latter an obvious "aeromodeller's" touch, as is the locking lever fitted on the compression screw as standard.

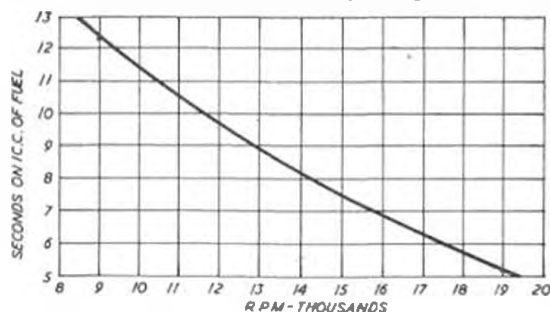
The crisper performance has been obtained at some expense of handling characteristics, calling for more precise adjustment of the needle at the upper end of the speed range; but the "Super Fury" still remains an easy engine to handle, starting readily and running consistently when properly adjusted. For normal handling the compression lock is probably more of a nuisance than a virtue—but a very useful device for locking a setting once familiar with the engine and using only one particular propeller size (and a favoured item amongst team race enthusiasts). Handling has been further improved on the later production models to give very fine adjustment—the engine will run from about 2 to 7 turns open and a "tick over" can be obtained by adjustment of the needle and compression, if required. This is quite unlike the original "Fury" which flooded readily on less than a turn on the needle opened past the normal running setting.

The first engine tested was a pre-production model on which the rear crankcase unit was machined from solid (replaced by a die-cast unit on the production model), and also differing in a number of other details. The crankcase casting was in magnesium alloy, subsequently being changed to LM2 aluminium alloy and given a sand-blast finish on the final production model, as also used on the 1960 series E.D. Bec announced last month.

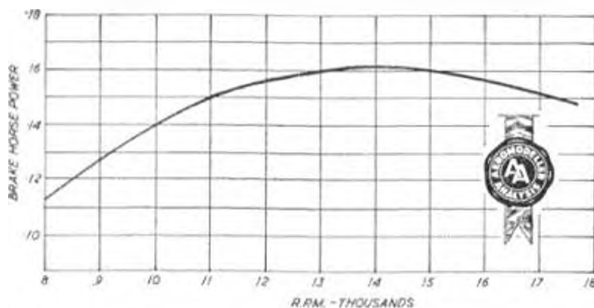
At this stage considerable development took place with regard to piston weight, the final design arrived at being what could be termed "medium" weight with a truncated cone inner shape and conventional conical top. Other details which are being altered from the first production motors include an increase in the crankshaft seal length and stronger lugs and cylinder bolt bosses.

Power output is extremely good, putting the Super Fury in the top performance class for 1.5 c.c. motors. On the pre-production model, tests realised a peak B.H.P. of around the .16 mark at 13,000. The production model subsequently tested gave a slightly higher figure, peaking at around 14,000 r.p.m. although the designer claims a higher figure still of .185 b.h.p. at 16-17,000 r.p.m. Certainly the propeller-r.p.m. figures he obtained at the upper end of the speed range were higher than those we realised on test, possibly because our test engine was not fully run in.

Cornell's own recommendations for running in are that one half to one hour's running time is necessary to



Fuel consumption above, Power curve below



bed down the cylinder which can give an increase in r.p.m. of as much as 1,000 with any particular propeller load. The shaft assembly takes longer, with a gradual increase in performance. A tip Cornell also passes on is that after a lot of running time the performance can often be improved by the fitting of a new connecting rod.

The main intention with the Super Fury has been to mass-produce an engine which gives a consistent good performance over a wide r.p.m. range, but at the same time can still produce a "racing" output if required. In its present state, too, the top end performance can be improved by tuning, so possibly there may be a tuned version coming along at a later date.

Best propeller sizes would appear to be those giving between 12,000 and 13,000 static r.p.m.—a Trucut 7 x 6 with thin blades being particularly recommended for Class ½A team racer, with a Tornado 6 x 9 (or equivalent) for maximum speed (92 m.p.h. has been claimed). In general, however, the Super Fury seems happiest on the rather heavier (plastic) propellers for normal running.

Little difference in performance was found with different fuel in our test mixtures although the manufacturers recommend E.D. "Economic" fuel for general running, whilst E.D. "Super Zip" is stated as giving superior performance under operating conditions in a model (although static r.p.m. figures are similar). Using the latter fuel, manufacturer tests have reached 21,500 r.p.m. on a 6 x 4 and economy improved to 14-18 secs. per c.c. according to adjustment.

Fuel consumption figures obtained on test with "straight" diesel fuel are fair to good, although bench test figures of this type are not always reliable. For example, fuel consumption on static test can be reduced still further with added nitrobenzene, but flight performance is poor with this additive. Amyl nitrate additive also appears to have a marked effect on fuel consumption in the case of the "Super Fury", with performance improving up to 4 per cent. added nitrate. Fuel consumption on flight test, in fact, appears to be "reasonable" rather than low, but from the time-saving point of view in team racing the re-starting characteristics of the hot engine are very good.

Some considerable degree of vibration was experienced on certain propeller sizes on the pre-production test model and the question of balance was the subject of considerable development work. Modifications introduced include strengthening the shaft, altering the

mounting lugs, lightening the piston and making the cylinder more rigid. Extensive crankshaft balancing experiments were also carried out and the final form adopted of a plain disc was found to give the best performance on the "Super Fury". Production models, as a consequence, appear relatively free of vibration troubles, particularly in normal installations.

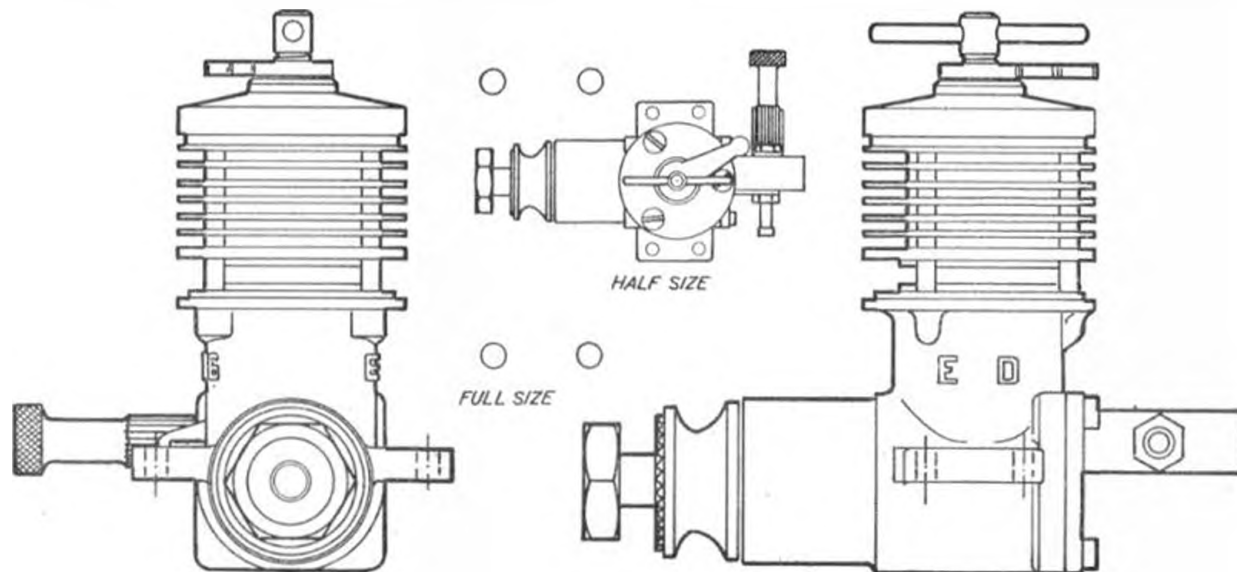
The new rotary rear-disc intake comprises an integral crank-case backplate and intake tube opening into a triangular, diverging port. The rotor disc is of moulded Bakelite, with the usual triangular cut-out. The backplate is relieved to give lower friction and make the disc self-surfacing. The disc is mounted on a plain steel pin moulded integral with the Bakelite.

The rotor disc has two alternative pick-up holes, corresponding to alternative fitting positions for the backplate so that this unit can be mounted with the needle horizontal or vertical, as desired. If the backplate is removed for any reason, it is important to remember to re-engage the right hole, as otherwise the timing will be incorrect—the disc holes being marked "H" for horizontal needle mounting and "V" for vertical. The engine will run equally well in either direction with the needle either horizontal or vertical, this feature being adequately covered in the instruction manual.

Modification to the cylinder consists of "barrelling" the outer cylinder walls to open into the three transfer ports located immediately below the exhaust ports. The cylinder is located merely on the three stub pillar sections, held down by three screws passing through the cylinder jacket and seating without a gasket. Timing of the production engine is shown in the diagram overleaf and differs from the earlier versions by virtue of the modified con. rod length, etc. There is no substantial sub-piston induction.

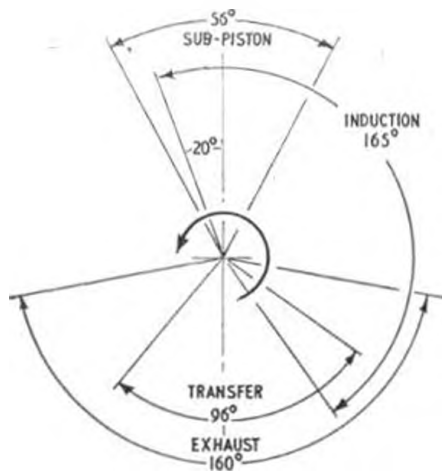
The new type propeller nut (team racer pattern) is a distinct advantage, since it fits a standard ¼ in. diameter hole in a propeller hub and a broken propeller cannot jam on the crankshaft threads. This screws onto the threaded length of the crankshaft and is finished with a large diameter nut face. The aluminium alloy crankcase casting is sand blasted to finish. The cylinder jacket is machined from light alloy and anodised dark blue. The new type propeller driver is also machined from light alloy and polished. Essentially, the "Super Fury" has

continued overleaf



E.D. Super Fury

TECHNICAL DETAILS



Port timing

PROPELLER—R.P.M. FIGURES		
Propeller		r.p.m.
10 x 4	Trucut	6,000
9 x 4	Trucut	8,800
8 x 6	Trucut	8,400
8 x 4	Trucut	11,500
8 x 3	Trucut	11,700
7 x 5	Trucut	12,000
7 x 4	Trucut	13,500
7 x 3	Trucut	15,500
6 x 6	Trucut	13,400
6 x 3	Trucut	16,400
8 x 4	Stant	11,400
7 x 6	Stant	12,200
7 x 4	Stant	13,600
6 x 5	Stant	15,400
9 x 6	Frog Nylon	8,000
8 x 6	Frog Nylon	8,400
8 x 4	Frog Nylon	11,300
7 x 6	Frog Nylon	13,000
7 x 4	Frog Nylon	15,000
6 x 4	Frog Nylon	19,000 plus

Test fuel: Mercury No. 8
AEROMODELLER Plans Service Power
Coding "F".

SPECIFICATION
Displacement: 1.49 c.c. (.092 cu. in.)
Bore: .500 in.
Stroke: .462 in.
Weight: 3 ounces
Max. power: 162 B.H.P. at 14,000 r.p.m.
Max. torque: 14 ounce-inches at 10,000 r.p.m.
Power rating: 11 B.H.P. per c.c.
Power/weight ratio: .043 B.H.P. per ounce
Material Specification
Crankcase: LM2 aluminium alloy pressure die casting
Cylinder: hardened steel (55 Rockwell). Ground and wet honed bore
Piston: cast iron
Contra piston: hardened steel
Connecting rod: RR.56 light alloy forging—heat treated and tumbled
Main bearing: 1/2 x 1/2 x .196 in. front ball race: 1/2 x 1/2 x 7/32 rear ball race
Induction: rear disc, rotary (moulded Bakelite)
Prop. driver: light alloy (dural)
Cylinder jacket: light alloy (dural, anodised blue)
Needle valve: brass thimble
Compression locking lever: brass, cadmium plated
Manufacturers: Electronic Developments Ltd., Island Farm Road, West Molesey, Surrey. Price £3/15/3 (incl. P/T)

Continued from page 311 ended up as quite a different—and virtually new design—compared with the original "Fury".

Altogether the "Super Fury" represents a really potent little power plant which develops a top class performance for its size. It is also an extensively developed engine with a particular emphasis on control liner performance (and team racer application in particular). It should

certainly be capable of quite outstanding performance in Class 1/4A, as well as making an excellent free flight engine held to somewhat lower operating r.p.m. on larger diameter propellers. For a basic price of no more than the standard Fury at £3 3s. 9d. plus 11s. 6d. Purchase Tax, this race-bred motor is remarkable value, having as it does, refinements of special needle valve assembly, forged con-rod, rear disc and ball-race supported shaft.

IMPORTANT PATENTS

Yet another masterpiece by the late Jim Walker (yet to appear in commercial production)

2745608 N. W. WALKER
APPLN. DATE 2.5.52.

This invention is a further variation on the familiar theme and offers

a line storage handle in the form of a substantially O shaped reel having one diametric bar to afford a hand hold. The wires are stored around the

periphery, which is channelled and are anchored at diametrically opposed positions indicated at 12 and 13 in Figures 1 and 2.

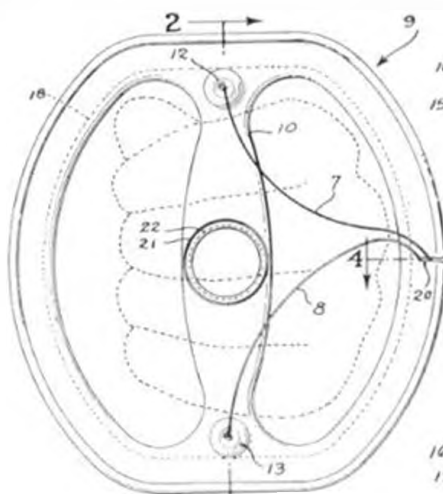


Fig. 1.

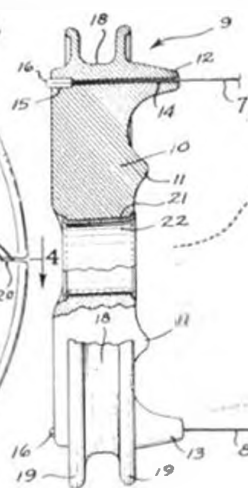


Fig. 2.

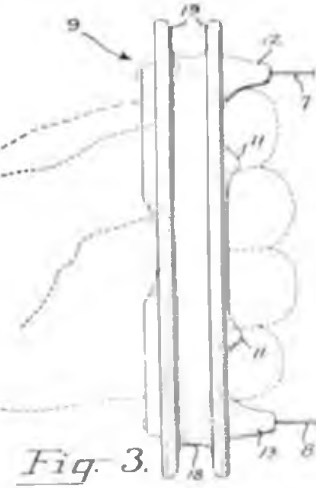


Fig. 3.

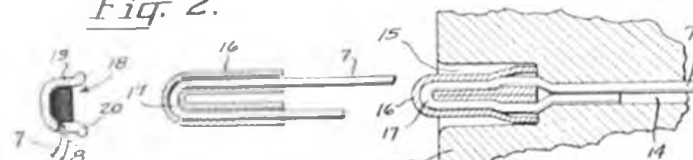
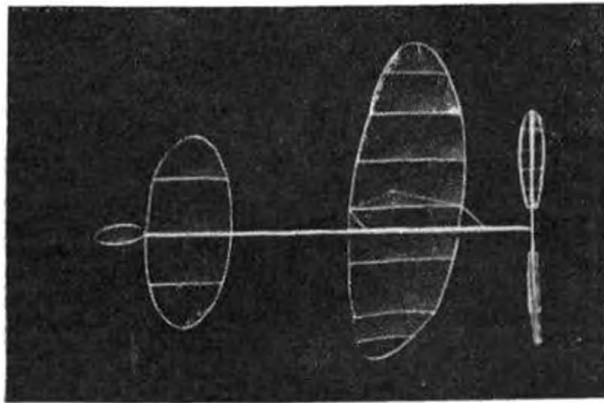


Fig. 4. Fig. 5.

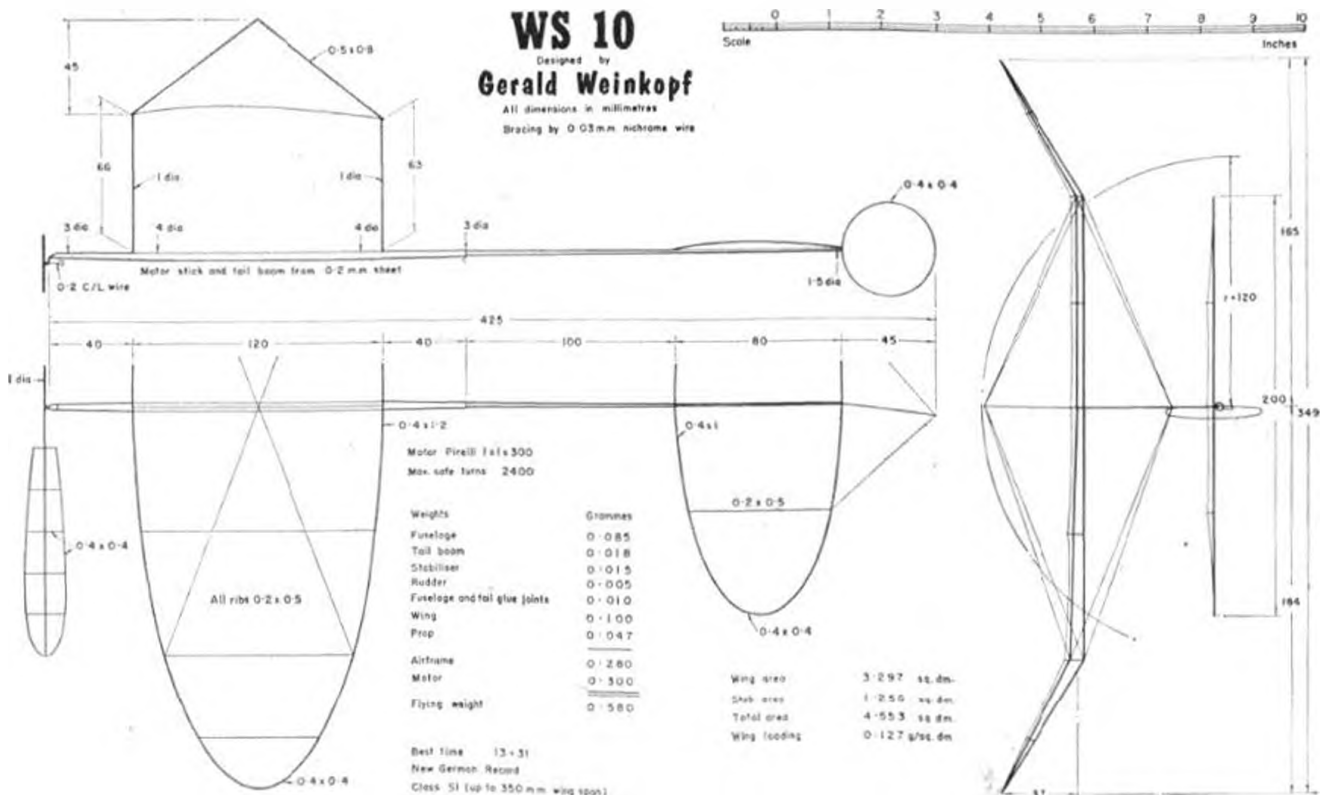
Fig. 6.

Indoors (UNDERGROUND)

WHATEVER THE equivalent phrase in German, Gerry Weinkopf paid no attention to the old song "Don't go down the mine daddy" on January 7th, when he established a new German class S1 (up to 13 3/4 inches wingspan) record of 13 : 31, some 600 feet *underground* in a salt mine. Gerry and his friends Manfred and August Rudle, travelled to Kochendorf near Neckarsulm for "Operation Salt Cellar", taking with them a plentiful supply of models and four inflated balloons for retrieving stuck



flights off the "ceiling". The card box of balloons is seen entering the mine lift in photo, top right. Once down in the cavern, the first move was to try out the subterranean weather with some old rubber on the model. Then followed consecutive flights of 11 : 40, 12 : 25 and finally the 13 : 31 record. For this flight, new rubber was used, and then only 1,800 out of a possible 2,400 turns were applied. After a fast climb, the little model cruised about 9 feet below ceiling height (*underground effect?*) and eventually landed with 120 turns left. Other pictures show Gerry (in natty protective headgear) winding up for the big effort, and the model in flight. Scale drawing below shows the larger of the two wing halves, front elevation giving relative semi-spans. A few actual size prints of this drawing can be obtained, price 3s. 6d. for those who have difficulty in scaling up ellipses. For this excellent report on a novel and apparently successful venture, we are indebted to Karl-Heinz Denzin.



How to catch 'em

This revealing feature provides an object as a hobby for youth



AT SOME STAGE in its progress every model club seems to be faced with the same old phenomenon; the case of the missing members. Of the 15-20 keen aeromodellers who generally form the average model club, only a hard core attend club meetings regularly. Reasons are manifold; some move, some get fenced in by the female population, others succumb to the lure of the television set; anyway these "enthusiasts" are lost for their clubs and if they are not in time replaced by others, the clubs have had it and disappear.

If these events occur repeatedly, and unfortunately they tend to do so, they are no longer a problem of the individual clubs concerned, but they become problem No. 1 for the model movement as a whole. While some clubs may be able to keep their members or even increase their number by organising a recruiting programme for Junior members, helping them while building and test flying their new models, etc., the majority of clubs everywhere seem to suffer badly from the acute problem. Good as individual measures may be, they are no final solution, as they are only locally effective and thus inherently limited.

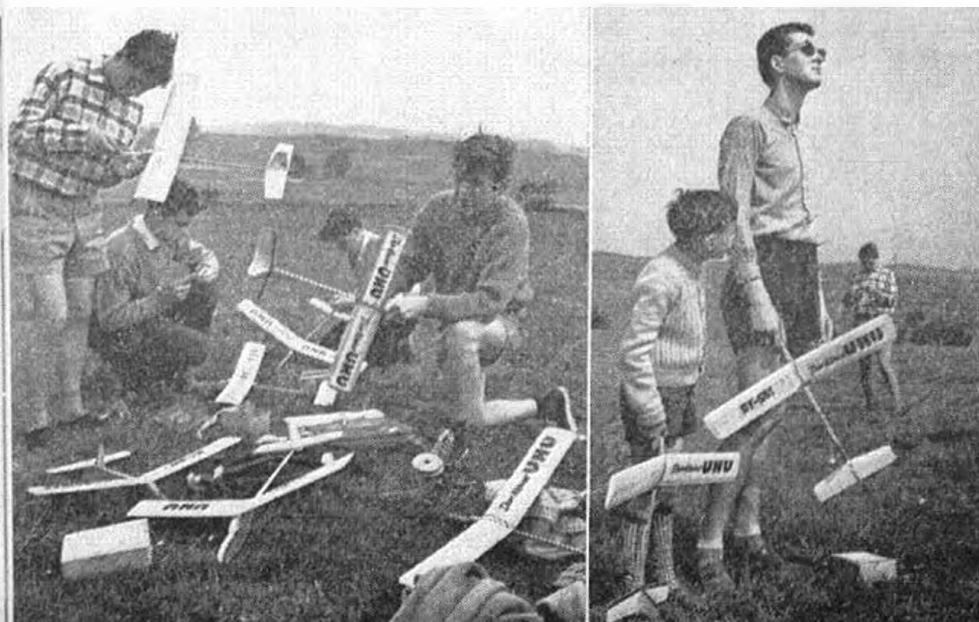
The German model movement had to face this problem in the period following World War II. When a German Aero Club was formed in the early fifties, there was wild enthusiasm everywhere and aeromodelling had a truly remarkable comeback. We were extremely lucky in being able to round up a number of old timers, whose experience and routine helped to get things humming again in a surprisingly short time. Performances and numbers of aeromodellers increased steadily, international competitions were won and everything looked real dandy—for a while. After the bonfire of initial enthusiasm had burned down however, it soon became apparent that something very important was missing. Sure, we had a number of experts available, capable of holding their own in international competitions and giving other chaps a good run for the money, but this was a comparatively small group of experts, uncomfortably small in fact. What we badly needed were large numbers of new,

young club members, the raw material for future experts, the men who would take over, when the old-timers stepped out. The M.F.K., the German counterpart of the S.M.A.E., dug into this problem and tried to find the answer to the questions: what makes an aeromodeller tick, why does he want to build models, what types does he prefer, what does he see in a model? The M.F.K., in fact, tried to find possible ways and methods for "marketing" aeromodelling and to "sell" that hobby of ours to the poor unsuspecting youth.

To this purpose numerous questionnaires were filled in. The ensuing screening of the material yielded quite a number of interesting facts and ideas. These in turn prompted those in charge of this affair to start a first nation-wide attempt to promote model flying. Henry Nannen, Managing Editor of the illustrated weekly *Der Stern* ("Star") was contacted and talked into sponsoring a decentralised model competition. This particular weekly was chosen for two reasons; it was read by a large number of boys and girls, and Henry Nannen, being a pilot himself and bitten by the aviation bug, seemed the most likely prey for the persuaders. He was, as it turned out.

A special design competition was held in order to find a suitable model for this contest and eventually, a rubber powered semi-scale cabin model was selected, designed by Willi Hartmann, one of our Wakefield experts. As required by the rules of the design contest, the model featured quite modern assembly methods, all balsa construction with keyed, interlocking parts, ready bent landing gear, plastic, free wheeling prop., etc. While all this is common practice today for kitted models, it certainly was most advanced at that time in our country. The plans, too, were quite novel with their exploded views, featured for the first time in Germany, and their stage by stage pictures of the building sequence.

The "*Sternchen*", as the model was christened after the youth column of Nannen's weekly, was kitted by the well-known Graupner concern; at that time the only manufacturers willing to take the risk of financing the production of quite a large number of kits, of which nobody knew for sure whether they would be sold or not. Though the actual number of kits manufactured has not been made public, it is quite interesting to note



Heading: Prizegiving at a "Lil UHU" meeting with Deutsche Aero Club Models Secretary Heinz Pempe in centre and winners examining their awards. At left, keen preparation of the Little UHU glider which is capable of surprisingly high performance despite small size. In photo at immediate left, we have the long and short of it among competitors who come from the age group up to 16 years old

young

by HANS JUSTUS MEIER

lesson in the promotion of Aeromodelling in Western Germany

that the same kit is *still* in production today. Conservative guesses have it that some 10,000 kits were sold in 1954, while more optimistic ones speak of double and even treble that figure. In addition, Henry Nannen printed 50,000 "Sternchen" plans for those participants who did not wish to buy a kit. These plans were given away free. Demand for the kit was such that a well-known hobby shop at Hamburg sold the first batch of 50 kits in less than one hour.

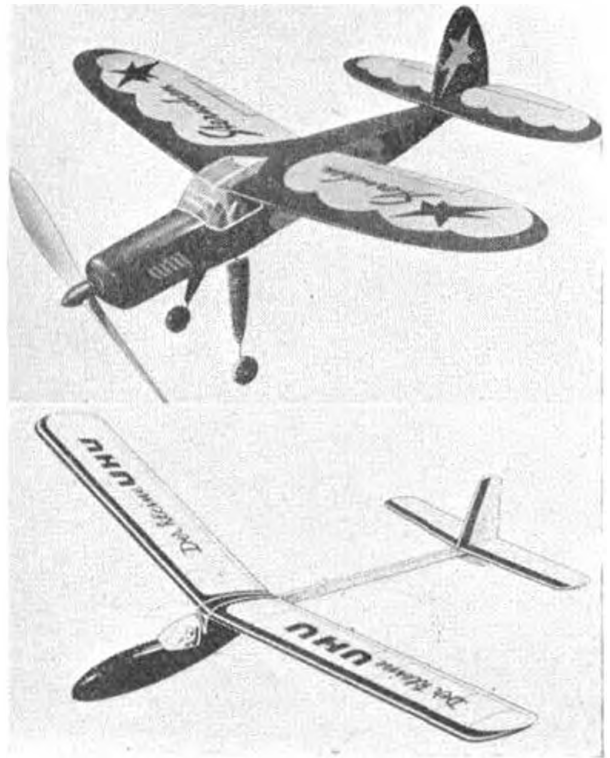
The time table of this contest gives an indication of the work involved and the close co-operation required. Closing date for the design contest was February 28, 1954. On the same day the M.F.K. selected the Hartmann design from a dozen entries and handed it over to the manufacturer for kitting. On May 15 the "Sternchenpreis der Luefte", as the contest was named, was announced in both the official organ of the German aero club and the youth column of the *Stern*. Three weeks later (June 6) the contest rules were published with lists of hobby shops, where the kits could be obtained, plus a well written feature about the model in *Sternchen*, detailing among other things, the valuable prizes waiting for the winners. These prizes were as high as DM. 3,000 (approx. £280), 2,000 and 1,500—for the top three, with numerous kits, engines, etc., as additional prizes for the runners up. The next two issues (June 13 and 20) brought more information and pictures to consolidate the idea. Closing date for forwarding the results of the decentralised competitions (durations had to be verified by club members, teachers, boy scout or youth group leaders, etc.) was June 28. After this date the results were evaluated at the editorial offices of the *Stern* and the highest scoring participants were invited to a final contest, to be held during the German Model Flying Nationals at Brunswick. The eventual winners happily went off with their prizes, third place being won by a pretty little girl, Barbara Freitag.

The surprising success of this first attempt towards getting German youth model-minded, inspired a large-scale operation for repeated and continuing promotion of model flying.

The idea of a rubber powered model was dropped, as it had proved to be too difficult to adjust by those who had neither help nor prior experience of some kind. Similarly no attempt was made to re-enlist Nannen or to find another press concern as sponsor for future events of this kind, as this would have meant having the event again covered by one weekly only, instead of the whole press.

After much careful preparation, the next nation-wide youth contest was organised, this time under the title "der klein UHU" (little UHU). UHU, as everybody probably knows, is the brand name of a popular modelling cement. In 1956 the Fischer Bros., owners of the UHU concern, were invited to sponsor this event, which they most generously did that year and in the following years as well.

Like the AEROMODELLER "Golden Wings" contest and the Sternchen competition, the UHU Wettbewerb is open to boys and girls of up to 16 years of age. It is held annually in a period of from six to eight weeks and requires assembly of a standardised glider model by the participant, either from kit or plan.



The two kits thus far used in competitions described, Sternchen above and "Lil' UHU" below

This model "der klein UHU" is a small and simple glider, highly pre-fabricated, with pre-shaped and pre-notched leading and trailing edges, die-cut ribs and tail surfaces, etc., requiring very little time and skill for its assembly. Only part requiring paper covering is the dihedral wing. Design of the model was by Werner Thies, while Graupner engineered it for kitting. Used for four consecutive years and contests, the model has had its full share of criticism, mainly for alleged constructional weaknesses. As a pod and boom design, it certainly possesses the inherent weakness of this type, which likes to shed its tailboom on hard landings, but as it is made of pine in this case, the tail-snapping is eliminated and the model stands a lot of abuse. In the writer's opinion, it is a sound and reasonable attempt to solve the beginner's model problem. This seems to be born out by the fact that *lil' UHU* has found quite a number of fans, who use it for the most diverging purposes. Alfred Ledertheil, Editor of *Flug und Modelltechnik* built a giant-sized powered version, others equipped it with magnet-steering and used it for slope soaring, still others copied or "modified" it. Rumour has it that the bird is flown behind the "iron curtain" and that contests are held on quite similar lines in Austria and other countries, using the same model.

As in the case of the Sternchen model, precise sales figures are not available for the *lil' UHU*, but since participation started with approx. 20,000 in 1956 and is said to have surpassed 23,000 in 1959, this easily adds up to some 90,000-100,000 kits sold in the period, although the actual number is probably still higher.

In the beginning the organisers had some trouble in selling this promotion scheme idea to the press. Editors apparently did not like the idea of free advertisements for brand-names, since all reports mentioned names. By now, these objections have completely disappeared

(continued on page 317)



SKIP

SHOEBURYNNESS, NEAR Southend, Essex, has its own answer to the flying ground problem in the form of miles of "sand" which are exposed for some five hours when the tide is out. This provides ideal conditions for modellers who want to operate flying boats, as the shallow waters left as the tide recedes, make R.O.W. and subsequent recoveries possible for all agile persons.

"Skip" has been designed to take advantage of these conditions. Stability on landing, and protection to engine were considered of prime importance and these are provided in the twin float layout and Gull wing which in the event of nose-overs, supports the model with engine above the sands. Powered in the original by a D.C. "Bambi", which supplies adequate power for flying, a "Pee Wee" installation is included for any one wanting R.O.W. performance. A plug in land-plane under carriage is optional and the model is stable without an undercarriage at all.

A NOVEL GULL-WING FOR BAMBI & PEE-WEE ENGINES

by D. C. MacVean

Cut out sides to lines shown on plans, marking former positions and fixing $\frac{1}{8}$ sq. strip to rear of F3. Cut out formers marking position of wing tongue on F3, and fitting engine "plate" support to F2. Cement formers F2, 3 and 4 to fuselage sides, keeping top of fuselage sides level. Add remaining formers and engine bearer "plate". Ply wing tongues are fitted next, set to the slope angles as marked on F3 and bearing on top of fuselage sides for alignment. Run cement fillets to secure tongues.

Next, construct the undercarriage tongue box by

FULL SIZE COPIES OF THIS $\frac{1}{4}$ SCALE REPRODUCTION ARE AVAILABLE PRICE 4s. 6d. INCLUDING POST FROM AEROMODELLER PLANS SERVICE. QUOTE PLAN WP 758 WHEN ORDERING.

SKIP
DESIGNED BY
D.C. MacVean.
A SUBSIDIARY OF
THE AEROMODELLER PLANS SERVICE
18, CLAREMOUNT RD., BAYFORD, HERTS

REQUIREMENTS

1 Sheet of 12 1/2" x 3 1/2" (305mm x 89mm)	1 Sheet of 1/8" (3mm) Ply
1 Sheet of 1/4" (6mm) Ply	1 Sheet of 1/2" (12mm) Ply
1 Sheet of 3/4" (19mm) Ply	1 Sheet of 1" (25mm) Ply
1 Sheet of 1 1/4" (32mm) Ply	1 Sheet of 1 1/2" (38mm) Ply
1 Sheet of 2" (51mm) Ply	1 Sheet of 2 1/2" (64mm) Ply
1 Sheet of 3" (76mm) Ply	1 Sheet of 3 1/2" (89mm) Ply
1 Sheet of 4" (102mm) Ply	1 Sheet of 4 1/2" (114mm) Ply
1 Sheet of 5" (127mm) Ply	1 Sheet of 5 1/2" (139mm) Ply
1 Sheet of 6" (152mm) Ply	1 Sheet of 6 1/2" (165mm) Ply
1 Sheet of 7" (178mm) Ply	1 Sheet of 7 1/2" (190mm) Ply
1 Sheet of 8" (203mm) Ply	1 Sheet of 8 1/2" (216mm) Ply
1 Sheet of 9" (228mm) Ply	1 Sheet of 9 1/2" (241mm) Ply
1 Sheet of 10" (254mm) Ply	1 Sheet of 10 1/2" (267mm) Ply
1 Sheet of 11" (279mm) Ply	1 Sheet of 11 1/2" (292mm) Ply
1 Sheet of 12" (305mm) Ply	1 Sheet of 12 1/2" (317mm) Ply

FOR PEE WEE INSTALLATION

FOR LAND PLANE VERSION

WING

1/8" sheet Ply

1/4" sheet Ply

3/4" sheet Ply

1" sheet Ply

1 1/4" sheet Ply

1 1/2" sheet Ply

2" sheet Ply

2 1/2" sheet Ply

3" sheet Ply

3 1/2" sheet Ply

4" sheet Ply

4 1/2" sheet Ply

5" sheet Ply

5 1/2" sheet Ply

6" sheet Ply

6 1/2" sheet Ply

7" sheet Ply

7 1/2" sheet Ply

8" sheet Ply

8 1/2" sheet Ply

9" sheet Ply

9 1/2" sheet Ply

10" sheet Ply

10 1/2" sheet Ply

11" sheet Ply

11 1/2" sheet Ply

12" sheet Ply

12 1/2" sheet Ply

making a box $2\frac{1}{2}$ in. long to suit width of float tongue, halving it lengthwise and mitre join which is glued and assembled over a piece of squared wood, having lines squared across two adjacent faces. (See sketch on the plan.) When dry, reinforce boxes with tissue or silk, doped on, and build into fuselage. Then trim boxes off to line of fuselage. Top sheeting is of $\frac{1}{2}$ medium balsa and a Spitfire type clear canopy is fitted. Rubbing the canopy over sandpaper held on the fuselage facilitates fitting. Dope fuselage top black in the area under canopy. A soft balsa block nose is added, covering the removable cowl with silk and doping heavily before hollowing out to suit the engine. Addition of a quantity of Balsa cement to the dope provides a suitable filler, which enables the greater part of the cowl to be cut away.

The fin is next, being cut to fit onto the rear of F-7 and be sandwiched by the rear fuselage sides. Fit soft block to sides of fin at end of fuselage into which can be cemented lead balancing weights when trimming. Cover fuselage with lightweight tissue doped on, and tissue the underside of fuselage.

Cut all wing ribs to shape shown, cutting to length when fitted. Build inboard and outer wing panels over plan (note differing length of top and bottom spars). Sand ribs to fair in with trailing edge.

Assemble each wing over the plan by cementing dihedral brace between top and bottom spars. Check alignment by squaring up line of L.E. from plan below.

The tailplane is a straightforward flat plate type, tissue covered on both sides.

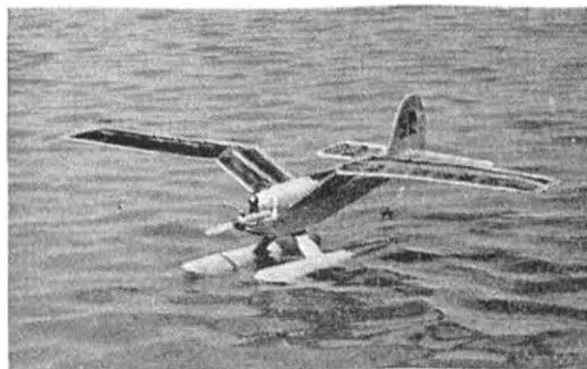
Mark out float formers and cut to dotted line forming also, the upper and lower keel slots. Pin down the upper keel along its line on the plan and fit the formers, pinning through the waste, and ensuring that F11 is vertical. Cement in the lower keel and sheet the bottom of floats with $\frac{1}{2}$ in. medium balsa. Remove from building board and sand formers to finished shape. Fit the $\frac{1}{8}$ in. ply float tongues, cementing around F11 and checking alignment with a scrap piece of parallel sided balsa as shown on front view of plan—pinned to upper keel. Floats are sheeted using $\frac{1}{2}$ in. medium balsa slotted, to fit tongue. Sheetting is made easier by wetting the sheet and running through fingers to give suitable curvature. P.V.A. type glues are really useful here, giving a generous glue line along edge of bottom sheeting to fix sides. Add soft block to nose and tail of floats. Tissue cover the sheeted part of the floats lapping well around bottom-

Catch'em young (cont. from page 315).

and the events have been very well covered by the press in the past two years.

In order to make the most of the programme, the organisers not only carefully analysed the problem, planned and ran these four contests, but they evaluated them when they were finished. In a nutshell, the following points are vital ingredients of a possible formula for similar future projects:—

- (1) Find a suitable, easy to build, quick assembly glider with forgiving flight characteristics.
- (2) Find a generous concern as sponsor for the programme.
- (3) Select a reliable manufacturer for kitting the design, with ample production know-how and capacity.
- (4) Work out a stringent time-table, which can and must be strictly maintained.
- (5) Contact the Press continuously and make sure that these people report periodically about the contest and what is going on, till it is held. Illustrated weeklies and youth magazines are most useful in this respect. (We had photographic and, of all things, even painting contests in connection with the UHU Wettbewerb, yielding quite unexpectedly a new crop of would-be Picassos as a by-product.)
- (6) Do not select a model magazine as sponsor for the following reasons:
 - (a) other model mags will not publish reports about the contest, thus severely limiting its propaganda range and value;



Ready for action as in heading photo or at rest as above, "Skip" bears the lines of a pre-war fighter

side junction. Block ends are best given a couple of coats of dope "stiffened" with balsa cement.

Wing roots are faired into the body by fitting 1 m.m. ply ribs over tongue and gluing in when wings are offered up. Pack out with hard balsa and L.E. and T.E. and cover top and bottom with $\frac{1}{2}$ in. balsa.

Cover model with lightweight tissue giving two or three coats of 50/50 dope thinners. The original had a spray coat of colour added. Finish off with fuel proof all over, including wing end undercarriage tongues, which gives them the necessary tightness when fitted into their boxes.

Ballast the model as necessary to position C.G. as shown. Test glide over grass to get tailplane trim correct, then cement-in packings. The original as built had slight engine offset to starboard and flew on power without further adjustment. Under "Bambi" power "Skip" should pull away into a steady left-hand climbing turn. Landings back on to water are most exciting as, having a fair gliding speed they are characterised by a skip up into the air after the initial touch down and then a stable settling back on to water.

"Pee Wee" performance needs a more cautious approach to powered flight and enables "Skip" to R.O.W. easily under favourable conditions, offering a really sparkling free flight performance—just the thing to while away those pleasant holiday hours by the seaside this summer.

(b) readers of model mags are model builders in most cases. We are not after them, but after youth who have no connection whatsoever with aeromodelling as yet.

- (7) Make sure that the clubs know all about the scheme at the earliest possible date and that you get their full support. They'll benefit from their help by gaining lots of new members.

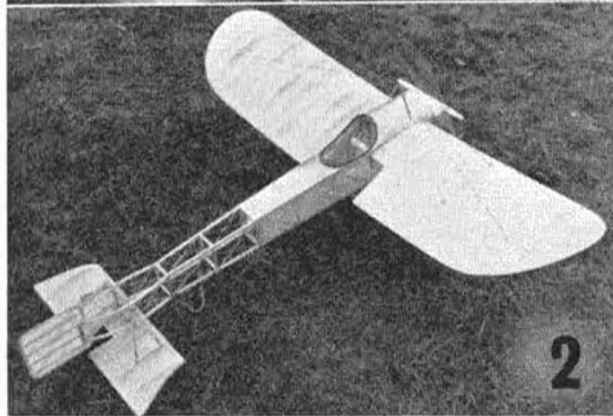
Summing up the results once more, we find that:

- I. Participation increased rather steadily from 1956-1959, starting with perhaps about 20,000 and reaching 23,000 plus last year.
- II. The number of clubs, local groups, etc., which organised these decentralised contests, increased from less than 300 to almost 530 in 1959.
- III. Local attendance dropped in most cases. This must be attributed to the extremely low German birth rate in the closing stages of W.W. II, which influences the numerical strength of the age groups concerned. That figures I and II increased, in spite of this handicap, is ample proof of the success of this scheme.

A sceptic might, nevertheless, raise the question whether the expenditure of some £1,500 per annum and so much effort is justified, considering the fact that annually not more than some 20,000 to 25,000 new prospects are attracted to the hobby. The answer is quite simple: Just compare these figures with that of the organised modellers in your country, remember that even A.M.A. membership has never exceeded them and you'll know what a wonderful hobby potential these, maybe 25,000, cement-smearing and balsa-butcherer youngsters are.

MODEL ★

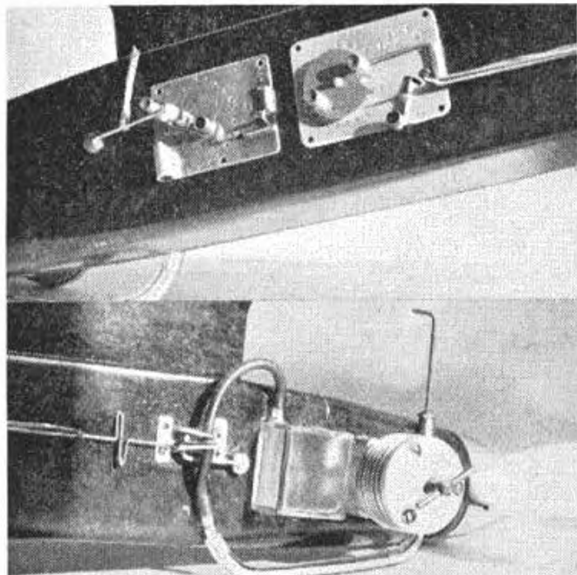
★ NEWS



Ooh! How OUR "Plastikiticisms" feature has raised a Hornet's nest of letters on the editorial desk, and we might add, with many readers leaping to the defence of the plastic kit manufacturers! One good tip that arises from the postbag is that transfers can always be deglossed easily by rubbing them over with steel wool or flourpaper before water-sliding them. Anyway, one reader who is independent of the quarrels is J. Palmer of Croydon, and to him we award the title of "Model of the Month" for his magnificent Bristol Beaufighter seen above. This is no plastic, but a 1/72nd scale balsa model taken with the camera at low angle, 24 in. from the model, and a realistic wash background 6 in. behind the model. The picture was taken by Thomas Cutts and deserves equal credit for a high standard of work. Hooray for a genuine solid model Mr. Palmer.

Modelling is often used in Physical Therapy, and as a relaxing medium in hospital convalescence; but we bet the staff of Llangwyfan Hospital, Denbigh, N. Wales, were more than surprised when patient J. P. Childs started work on his 65 in. Mercury Aeronca for radio control (see picture 1)! Model was completed, thanks to use of a spare bed, and will soon be flying with an E.D. Racer 2-46 diesel.

Picture 2 shows a Bleriot Monoplane made from the A.P.S. plans by John H. Wilcox of Croydon. It gained a Commended Diploma at the National Models Exhibition this year, and now awaits a suitable runway for rise-off-ground test flights. Another model of contrasting design and considerable test flight experience is John O'Donnell's "Pendleton Fault" Mk. II, using a new fuselage for old wings. This power model has also won Concours d'Elegance awards, and Brian Bowers' group of three photos, 3, show us some of the interesting detail. Note how two Tatone timers are used and are

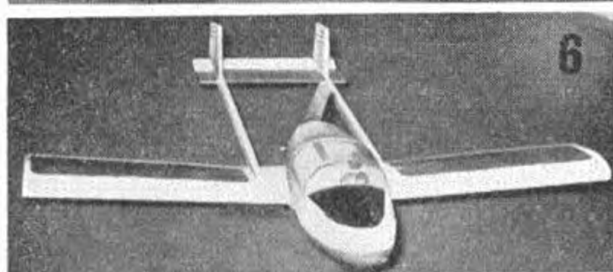
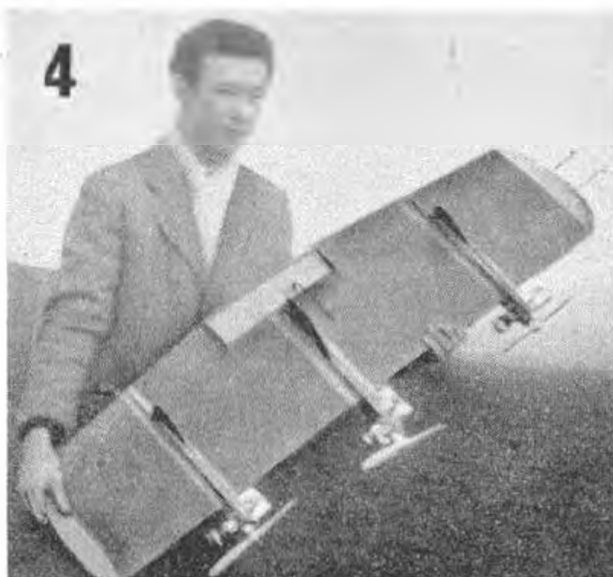


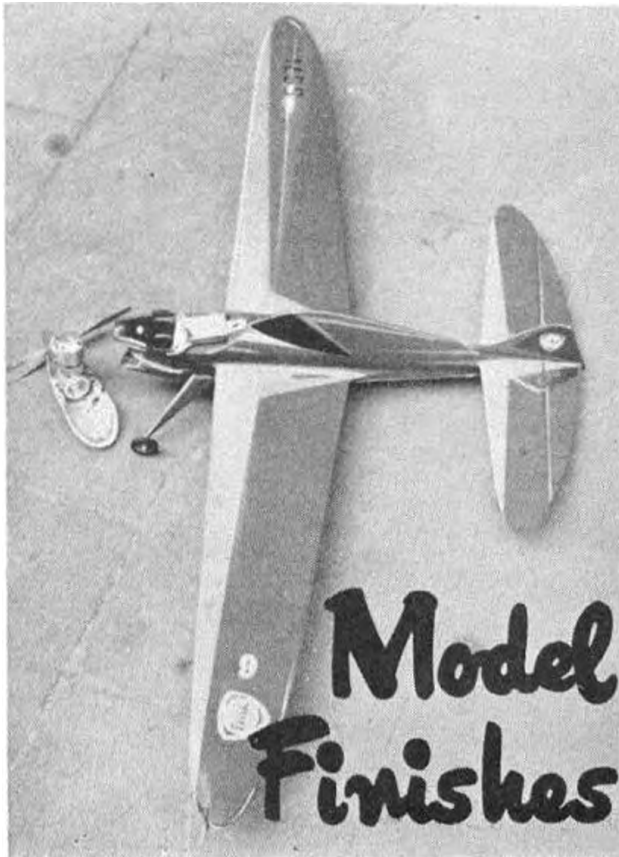
seen in the upper, port side view. The front one apparently operates the fuel shut-off by tripping a wire that connects through the fuselage to the strangler on the other side (see photo of the starboard side). Fuel comes from the rear of the transparent tank to the P.A.W. 2-49. The auto-rudder also comes into action for the glide as the motor cuts. Rear timer is for dethermalising.

The "Falcons" of East Acton contributed to the triple engined control-line wing in 4, held by the new club sec., A. Gorsuch. This 45-ounce, four foot model of 890 sq. ins. area has a pair of F.D. Racers and a P.A.W. 2-49 (central)—it is said to be fast and steady, yet as manoeuvrable as some combat models—should also be fair game for a set of silencers! In the next photo 5, is G. Franklin's "Astrofire", a camouflaged variant of the popular A.P.S. "Astro-Hog" with Mr. Franklin's attractive Spitfire-like alterations. It has an O.S. Max. 35 Multi-speed and Octone Rx., with Bonner Duramite servos on the elevators and ailerons and a spring centreing stalled Mighty Midget for the rudder. As Mr. Franklin says: "Take offs are a dream—all that is now needed is for me to learn how to fly it".

Model with quite a story, is Michael Creedon's 1/8th scale Tawney Owl. This 36 in. span control-line model in 6 is built after the same manner as the 24 ft. full-size aircraft which was designed by Michael's father and built at Stapleford Tawney in Essex, hence the name. Unfortunately, although the c-line model flew perfectly with an A.M. 35 driving a 7½ in. pusher prop., the full-size encountered some difficulty on its test flight with a Porsche 75 h.p. flat four, but we hope that the two-seater will soon be airborne again.

Our bevy of young ladies in the photographs below offer an interesting contrast in models, beginning with S. F. Newman's 76 in. span semi-scale "Weihe" sailplane, held by his wife in picture 7. This high aspect ratio model from Bexley Heath has shown great promise as a slope soarer, like the full-size. Next, in 8 is an Avro 504K from the A.P.S. plans and fitted with a D-C Bantam. This calls for 2½ oz. ballast in the nose, making all-up weight 13 ounces, but flights are so good that builder A. Witherup of Newton, West Kirby, would like to congratulate designer Ray Booth. Lastly, in 9, what might be thought to be a "Skiffler" is actually D. K. Pearson's A.P.S. Thunderbolt painted in the style of the other model. Power is a Fox 35, and daughter Gillian is a keen photo poser for dad from Melton Mowbray.





HOW MANY OF us, I wonder, have ever admired the beautiful high gloss finishes to be seen on many Team Racers and Speed Models? Perhaps many are of the opinion that such a finish is far beyond amateur capabilities and that the owners of these models must have access to high pressure spray equipment, and doubtless some of them have. However, such a finish *can* be obtained with the minimum facilities, if one is prepared for hard work.

It has been said that the final finish is only as good as the finish underneath and this is very true. The first stage in producing a good finish is to see that the model is sanded smooth all over with no saw marks or scores in the wood surface. It is quite amazing how these

seemingly innocuous flaws have the capacity to still show after a considerable number of coats of sanding sealer have been applied.

A coat of tissue paper applied first makes a great difference, as it will remove the worst of the wood grain in one operation, and it will add considerably to the strength of the model. Also, it seems to bind the sanding sealer and helps to alleviate surface crazing or cracking.

After this has received a good sanding down with fine grade sand paper or wet and dry paper, more coats of sanding sealer should be added. There is no rule for the number of coats but just keep going, sanding between each coat until a good finish is obtained. Generally seven or eight coats are a minimum. A strong light close to the work at all times is very valuable, as it will help to show up any flaws which otherwise might not be apparent. It also helps to put just a small amount of colour-dope in with the sanding sealer as this will aid detection of any small flaw or grain mark which might otherwise go un-noticed. At this point the importance of sanding between each coat of grain-filler cannot be stressed too greatly and one must use a very fine grade paper. One can use a fine garnet paper which is gradually allowed to become more and more clogged and eventually finishes up as no more than a fine smooth piece of paper which does no more than slowly polish and smooth the surface.

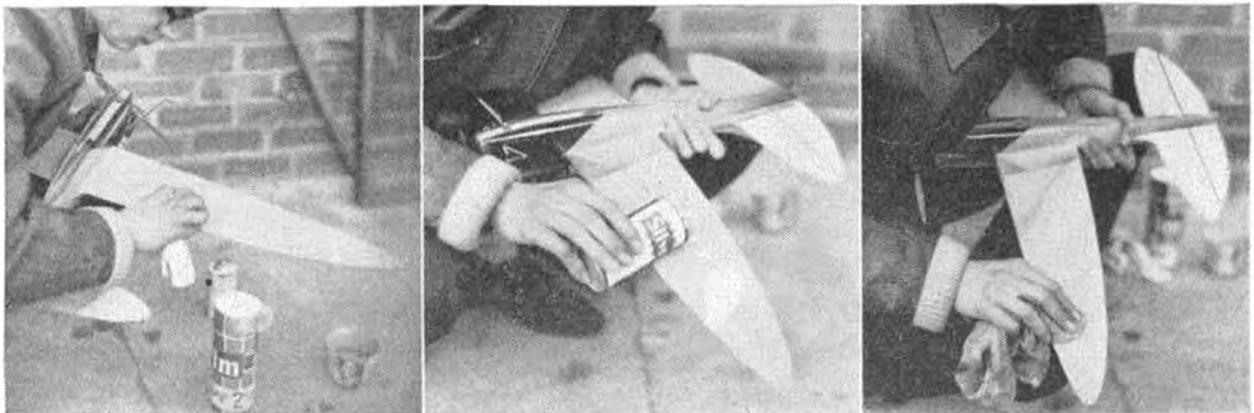
Finally, give the whole model one thick coat of sanding sealer, this is allowed to dry and harden for at least 48 hours. Cellulose is brittle and will crack unless it is

HINTS AND TIPS ON OBTAINING THAT EXTRA GLOSS — by R. Blake

"plasticised". To do this, one simply adds a few drops of castor oil to the dope, this will impart the necessary give and flexibility. Whilst this does not entirely deal with crazing in one stroke, it helps to a very great extent. However, care should be exercised for, if too much castor oil is added, the dope will refuse to dry and one will be left with a "goocy" mess. Be cautious and use five or six drops of oil in a 1s. 6d. commercial jar. On a recent model the author has tried rubbing down with a rubbing compound of "Vim" household cleaner and water before applying the colour dope. Polishing in this manner hardens the dope and there is definitely no substitute for "elbow-grease".

continued on page 323

Heading shows maestro Bernard's Startiger which has influenced T.R design this year both in shape and finish as indicated by pictures below of the Author's model being processed. Left: Vim abrasive for rubbing down. Centre: Silvo polish applied and Right: final rubbing.



DEAR SIR,

In answer to Henry J. Nicholls's comments in our April edition, I feel that you have mistaken the Belgian view.

The cancellation proposition does not come from F.P.A.B., although *MODEL AVIA* magazine is edited by F.P.A.B. The magazine has complete liberty to publish editorial opinion, as well as including official information. The new rules are to be used in Belgium this year, and we feel it quite democratic to propose a new vote rescinding the existing decision.

Why should we disagree with the anti-whipping rule?

- Consider the situation where a model engine overheats during overtaking, it would be necessary to whip to complete the overtaking procedure for reasons of safety.
- When the engine stops, it is necessary to put the model in the hands of the mechanic as soon as possible, and the only way to do this is by whipping which is authorised for one lap only. Actually, team racers are now so fast that it is necessary to brake with rapid movement of the elevators, fastest models are thus actually handicapped.
- Sometimes whipping is difficult to discern. It will rest on the judgement of the referee to say whether whipping does or does not take place.
- If whipping were to be allowed everyone could make use of it and all chances are equal.
- Whipping is not incorrect. It is part of the sport and is not forbidden in stunt flying. Team racing is not pure speed, it is "One plane and two men". The ability to start the engine is a personal ability and when some people speak of strong arm tactics, they should be reminded that there are also strong leg tactics.

Finally, let us comment on this prodigious oke, this immense stupidity,—the new handle! We prefer not to comment too much on this subject, and the result is yet to be awaited. There is a considerable increase in risk of danger and such a handle does not prevent any whipping.

To close our letter it should be said that no minutes of the meeting were circulated before the 1959 meeting of the C.I.A.M., and in consequence no instructions were given to the Belgian delegate for voting, and he is in any case a free flight specialist.

P. DELFELD, Editor

MODEL AVIA, Brussels.

(M. Delfeld is correct in saying the handle will not prevent whipping. What happens in the great majority of cases when the pilot angles the handle at 45 deg. or holds it horizontally? But, as now pointed out to us by F.A.I. Delegate H. J. Nicholls, the new handle is applied under regulation 4.6.4. for speed models only—Ed.)

DEAR MR. EDITOR,

I have read with interest the letter from my F.A.I. colleague Mr. Nicholls, addressed to you in your April issue.

The question of whipping was not on the agenda for the meetings of October 24-25, 1959. Consequently I consider that a delegate had no right to take sides on an important question without referring it back to his Aero Club. That is, therefore, the reason that I abstained from the voting which followed the discussion. This decision was not made democratically, but on the contrary it is arbitrary from the fact that only the members of the commission decided it.

I would, moreover, inform you that the President of the C.I.A.M., Mr. Roussel, did not express his views because he was not able to. All he did was to warn the meeting of the difficulty of forbidding a thing which was not clearly defined and, on the other hand, he emphasized that the controller of a competition was sufficiently empowered to disqualify a competitor if he executed a dangerous manoeuvre, such as by whipping.

READERS' LETTERS

Mainly on the subject of whipping

Personally, I am not satisfied with the definition of whipping, as when the arm of the competitor and the lines are not in a continuous straight line.

Meanwhile, dear Sir,

I am,
Herstal,
Belgium

Yours,
M. BIENVENU.

DEAR MR. EDITOR,

Following the letter from Mr. Nicholls which you published in your April, 1960 number, we have to advise your readers that Belgium is represented at the hub of the F.A.I., which comprises the National Aero Clubs, by the delegates of the Royal Belgian Aero Club.

In that which concerns the C.I.A.M., our delegate is our administrator and executive committee member, Mr. Albert Roussel. The latter being, at present, President of the above-mentioned commission, we have designated Mr. Maurice Bienvenu, Secretary of the aeromodelling commission of our aero club.

It is not possible under this arrangement to make propositions to the F.A.I. except through our official delegates.

In the meanwhile,

We are Sir,

Brussels,
Belgium.

Yours,
M. FRANCHOMME,
Aero Club Royale de Belgique

Following receipt of these important statements from persons of authority in Belgium, we considered it only fair for the delegate representing Great Britain to be given the opportunity of making a reply, which follows.

DEAR SIR,

Having read the letter from M. Bienvenu in reply to my letter which you published in your April issue I now have every sympathy with him as it is evident that he went to the F.A.I. October meeting of the C.I.A.M. without having seen the full agenda which was issued by the Secretary General of the F.A.I. to all Aero Clubs prior to that meeting.

There were two propositions in the additional memorandum to that agenda: one by Finland on page 5 and another by Great Britain on page 6 relating to whipping in team racing. They were as follows:

Page 5. FINLAND—

Whipping in a team racing competition

We suggest that during team racing whipping should be prohibited, and that the flight of the competitor who has been found to whip his plane should be immediately disqualified.

In the following we point out the reasons which have made the above-mentioned suggestion necessary:

(This was followed by a detailed three-hundred word explanation as to why Finland considered whipping to be undesirable in team racing.)

Page 6. GREAT BRITAIN—

That whipping should be abolished in team racing

Comments: From our experience over the last ten years we have found that a fully competent judge has no difficulty in detecting whipping and that there is, therefore, no reason why this dangerous practice should not be abolished.

When the matter was considered by the C.I.A.M., the two propositions were considered together and it was apparent that all delegates who spoke on this issue had come to the meeting properly instructed as to how to vote. The fact that the vote was unanimously in favour of these propositions was the point I made in my original letter.

Furthermore, as this proposal was one which entailed an alteration to competition rules it would have been out of order for the Chairman to accept it for consideration had it not been on the agenda.

HENRY J. NICHOLLS,
S.M.A.E. F.A.I. Delegate.
This correspondence is now closed—Ed.

Thanks to K-K

DEAR SIR,

May I express my thanks to KeilKraft in your columns. Having only one hand, I found difficulty in bending undercarriage for "Pacer" and "Ranger" models, and couldn't find anyone to help me.

I wrote a letter to KeilKraft, and asked them to bend the undercarriages for me, and to my delight, this morning back came the undercarriages bent to enable me to finish the models above. Noting your article last month "Revisiting KeilKraft", I read that nothing is too much trouble for Eddie Keil, and now I am sure.

I wish all the model firms would have the u/c's bent—in my case it would be a boon. Some of the later KK kits such as "Demon" and "Halo" which I have already purchased do incorporate this for which I am greatly relieved.

Once more thanks to KK, and may they flourish.

J. CLARKE.

Swansea, Glam.

New T/R class?

DEAR SIR,

Over the last few years the .19 cu. in. and 3.5 c.c. engines have taken on a new and most imposing look. This has no doubt been due to the requirements for combat, and their suitability for stunt and free flight, as well as for radio work.

It would seem to me that to complete the field and for the sake of improving the breed, that there is a genuine need for a .19-3.5 class for T/R. I feel that either the current F.A.I. models or the "B" type models would be suitable; which would, no doubt, be decided as matter of convenience.

G. A. KOOPMAN.

Workshop, Notts.

Croydon

DEAR SIR,

Shortly after the closing of Croydon Aerodrome, I wrote to the airport authority to ask if permission for flying models on the aerodrome could be given. The permission was refused, perhaps for a very good reason, but no reason was stated.

Living near the aerodrome, I am tormented by the most violent feelings of envy whenever I pass by and see this expanse of ideal flying field, complete with runways, totally deserted! Even though the nearest available flying-field is not too far away to rule out its use entirely, to have this perfect ground so near and yet so far is quite painful (and lack of spare time for travelling even for two hours limits the number of flying trips possible for a busy person very seriously).

As most aeromodellers must appreciate this situation, having known hardships through the shortage of flying fields, and as many local aeromodellers, and perhaps some clubs must be concerned about this particular ground, perhaps with your help, and perhaps that of some of your readers, we might be able at least to discover the reason for the refusal, and so set my mind and surely many others at rest. Can you please help? The granting of permission to fly is probably too much to hope for, but at least we would know why.

Of course I appreciate that use of the airfield might be restricted in time by the development of the area, indeed this might be the reason for the refusal, but it would be such a help to know the exact position.

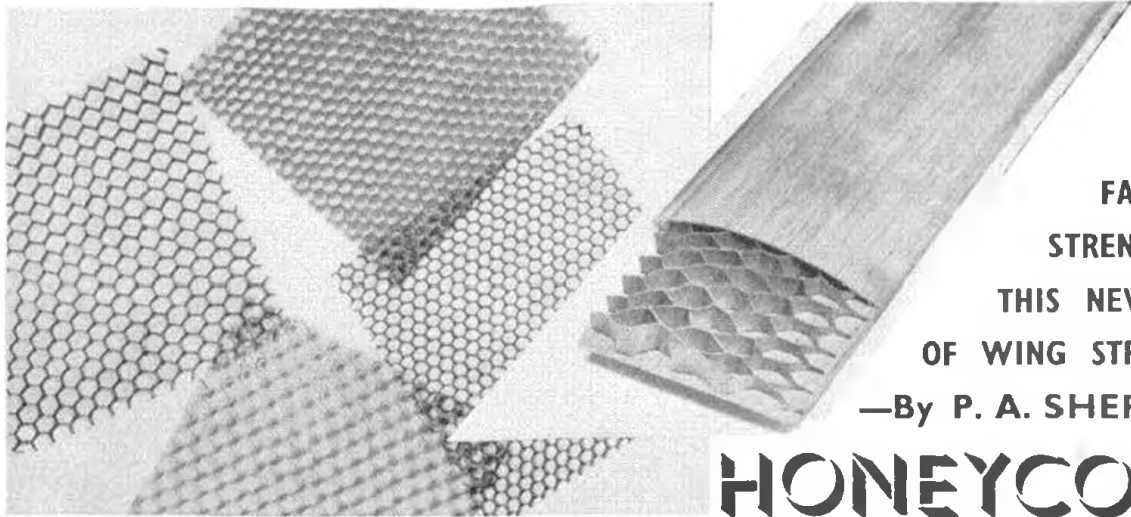
Purley,

Surrey.

Our enquiries have, thus far, drawn a blank

—Ed.

M. WINSTANLEY



FANTASTIC
STRENGTH IN
THIS NEW TYPE
OF WING STRUCTURE
—By P. A. SHEPHERD

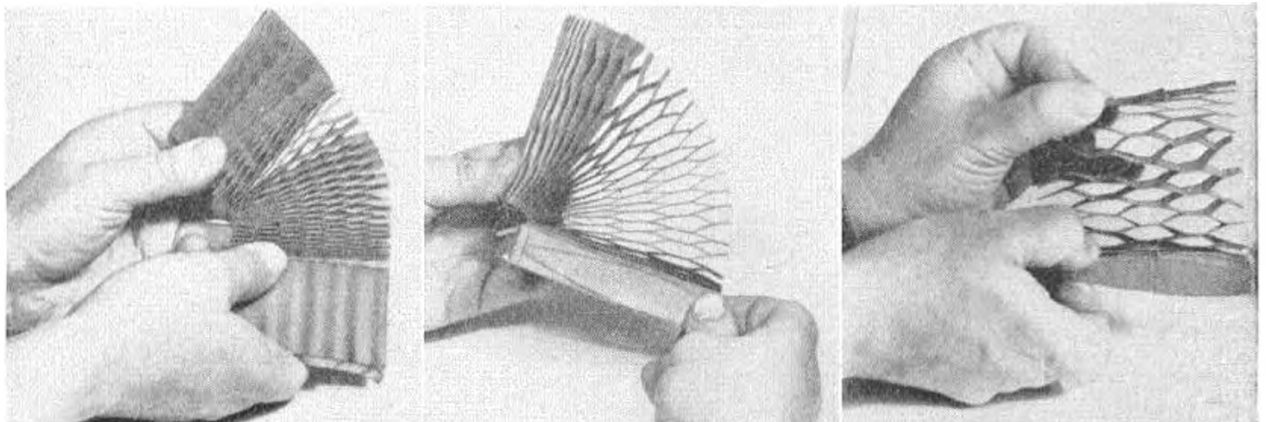
HONEYCOMB

ARE YOU SEEKING a method of constructing wings that is cheap, very strong and quick? These last three things are not usually closely associated, but it is hoped to show that this *is* possible in the following method. Wings described are especially suitable for radio models, large gliders, and control-line types.

In the full-size aircraft industry the same principle is known as double skin honeycomb construction and is used for floors, doors and other components. With a core in aluminium foil, honeycomb structures form much of the Vickers Vanguard control surfaces. Basis of the model version is .009 in. Kraft paper honeycomb manufactured by Dufaylite Developments Ltd., of Boreham Wood, Herts. It is available in thicknesses ranging from a quarter of an inch to six inches and with hexagons from three-eighths to 1½ in. wide in sheets measuring 36 x 12 in. (expanded). These compress to 1 in. x 1 in. x 18 in. rather like a paper garland, it also expands like a paper garland and whilst it is compressed the required aerofoil profile may be drawn on the end and the "block" sanded to shape (Fig. 1).

Next stage in construction is to expand the honeycomb so that the hexagonal cells are approximately equal in size. It should be noted that during this operation the material contracts by one-third in a chordwise direction and due allowance should be made for this. The brown paper core should then be pinned to the building board in the stretched state.

Heading shows rigid "Dufaylite Honeycomb" in impregnated materials and inset, Mr. Shepherd's test sample which we can assure readers, will stand up to a car running over it, or a 16-stone heavyweight tramping on it! Below, a block of "Dufaylite Honeycomb" centre: with symmetrical rib marked on face for shaping, and at right, shaped for covering with sheet.



Next job is to apply the upper and lower skins. 1/32 in. thick balsa should suffice for most wings up to about 48 in. span or in certain cases up to as much as six feet.

Since balsa is normally obtainable in 4 in. wide sheets, as the maximum, wings of greater chord than 4 in. should have a stringer of about ¼ in. x 1/32 in. balsa let in flush with the surface to enable two balsa sheets or more as required to be joined to give maximum strength (Fig. 2). The skins can then be glued in place and pinned to the board until dry. Best adhesive has been found to be Aerolite 306 with the resin applied to the wood skin and the hardener to the honeycomb. A very close second to Aerolite is LePages P.V.A., this is certainly easier to apply, particularly if run on the edges while honeycomb is compressed to the block stage, before pinning down between surfaces.

When the wing skins and honeycomb are dry and hard, the leading edge strip should be glued in place and after the whole assembly is well and truly dry the wing may be subjected to a "standing upon" examination to test it! One test specimen has had a weight of seventeen stone on it (the heaviest man we could find!).

Optimum size to give maximum strength with lightest weight for our purposes seems to be a honeycomb size of ¾ in. or 1 in. across the flats of the hexagons. Anything smaller than this pushes the weight up.

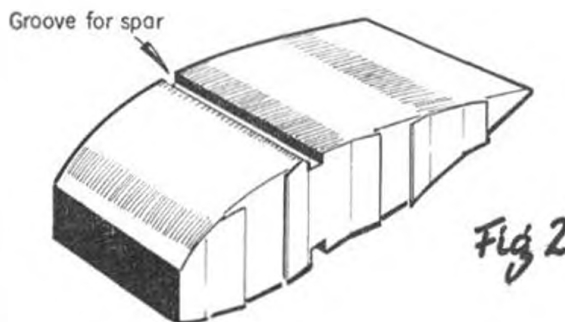
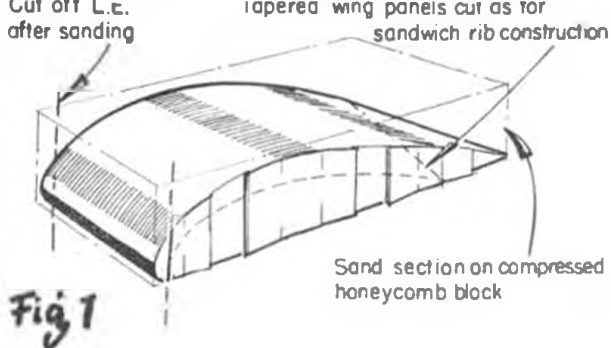
Bee keepers who keep extra large bees may welcome any left overs!

Price varies with the size of the hexagons and the thickness, the smaller the honeycomb the higher the price and, of course, the thicker material carries the higher price. As a general guide the size required for model building would cost as little as 2½d. to 5d. per sq. ft. (expanded) dependent on thickness ranging from ¼ in. to 1 in. depth.

Test pieces indicate that wings under about 36 in. span may be slightly heavier than conventional methods of construction; but the strength is *incomparable*. A honeycomb with leading and trailing edge of balsa but tissue-covered and doped would give good results with excellent airfoil maintenance, superior to many standard surface spar methods.

Undercambered or symmetrical sections are no more difficult to make than the popular Clark Y with its flat undersurface.

Try a double skin construction and amaze yourself. Think of a C/L model which will last a couple of seasons with ease and remember that this form of construction lends itself to components other than wings — why not fuselages, cowlings — even model boxes?



Model Finishes *(continued from page 320)*

We can now start to consider the application of the final coats of colour dope. It is always well worth while to work out one's intended colour scheme in advance. If it is intended to use a two or more tone colour scheme, work out where the colour lines are positioned. It is general practice, especially when using a spray-gun, to cover the model first with the light coats and go on to the progressively darker shades. This invariably leaves a small ridge where the darker shades have been superimposed on the light. While this in no way spoils the finish, it seems to be quite pointless when it can be so easy by masking each coat separately and mating up the colour lines. When applying the colour dope, the rule that five thin coats are better than one thick one should be followed. However, it is here that one begins to think that all the good work before has been in vain, because, if a brush is used it is a sure bet that some brush marks will show, or, if using a hand operated low-pressure spray-gun, the surface takes on a pock-marked orange-peel effect and even progressive thinning will not entirely remove it. Keep going on until the entire model has been given an adequate number of coats. One may wonder where things went wrong, all that careful rubbing-down now seems to have been of no avail.

The answer is quite simple. Go to the local hardware shop and buy a tin of Brasso. Find some rags and one is ready to start. Strictly speaking, Brasso is a polish and the label instructions state to polish before the liquid has completely dried on the surface. It also says that Brasso is designed to polish brass, copper, zinc, steel and pewter, but it's darned good for team-racers as well! The important point is not to use it as a polish at first. If one does so, the same flaw marks become brighter and show up better! It is necessary to use it as a liquid abrasive. Simply pour on to the surface to be treated and rub well into the dope. Brasso removes the excess

and a smooth hard surface appears, albeit somewhat dull—then just pour on more Brasso, smear it lightly on the surface and briskly rub off almost at once. As well as smoothing and polishing, Brasso also seems to harden the dope well and the model can now be fuel-proofed, unless you have used the new enamels which are resistant to diesel fuel. These can be rubbed down in the same way, but ordinary fuel-proofer needs a little bit more hard rubbing to smooth it right down. Just one word of warning. When rubbing the dope down, as soon as a smooth surface is obtained, STOP! If one doesn't, it is right back to colour doping again, as it is quite amazing how quickly the Brasso will go through seven or eight coats of dope. If using a two-tone colour scheme, have no fear of rubbing down straight over the two colours, for any smear marks are easily removed in the final polishing.

It is a lengthy business and involves quite a lot of hard work and friends may ask if it is all really worth the time and trouble. Whether it is or not, is really up to the individual, but the reduction in surface drag will pay dividends, plus the fact that one can be justly proud of the model. That is reward enough in itself.

Footnote:

Nery Bernard produces a magnificent finish on his models as has been noted in our reports on the Belgian model meetings. He uses sanding sealer (not dope) until all the grains are filled. Then his entire model is covered with light Modelspan (with sanding sealer again). He further uses sanding sealer until he obtains a glass-like surface. Between each coat the sealer is rubbed down with No. 400 paper (emery cloth). Then a number of cellulose paint coats are applied. Each coat is rubbed down, even the last. Then the model is polished with metal polish until the desired finish is reached. The entire work takes approx. three weeks and polishing of the last coat alone may ask up to three evenings . . . need we add more?



WHAT A SPATE of news from the Midlands (as well there should be with the large numbers of airfields in their area), but to whom do we owe the credit for fixing R.A.F. Wellesbourne-Mountford and Wigsley for the lads? Those who do the spade work never get the "mentions" but always have to carry the cans when the lads misbehave. So respect these centres which offer so much to Midland modelling prosperity. In London area, all is not lost. Mike Bassett tells us that there's a possibility of getting R.A.F. Kenley as the area C/L venue. This hitherto apparently neglected site (for modelling) may favour those south of the river, but it certainly lacks London something it seriously lacks.

South Eastern

ISLE OF THANET M.A.C. is holding its rally (Ramsgate C/L Rally) on August 14th this year. Events will be F.A.I. and "B" T/R, Combat and Stunt. Venue for this will be Jackey Baker's Sports Grounds, and for the sake of those aeromodellers who were disappointed with last year's site, the grounds are flat, and over five acres in area. Street plans of Ramsgate can be obtained free of charge from the secretary: M. Robinson, 21 Winterstoke Crescent, Ramsgate, Kent (please enclose S.A.E. not smaller than 3½ in. x 6 in. At the moment the club is preparing for a display, for World Refugee Year, which will be held on May 29th. Money is to be raised by selling programmes and by raffling kits, etc.

Contrary to the usual winter of little activity NORTH KENT NOMADS M.C. have been kept busy this winter in assisting Charles Dance and Wally Skeels in their R.C. world record attempt. The club congratulates Charles and Wally in the efforts they have made on their own account and also the publicity they have attracted to the Model Aeronautical world.

A full competition programme for the coming season has been planned and the boys are looking forward to challenging the Northwood Club to a home and away flying contest — why don't we hear more of these?

New Gillingham club is PIRATES M.F.C. At the moment interest is mainly C/L combat and stunt, with T/R a close third. On Sunday, March 13th, they had a combat session with the "Medway" boys. *Peacemaker's* Rivers 3-5-powered, and *Oliver Tiger Black Ghosts* were the main entries. Pete Lucus of Medway won in a well-fought final. Membership of the Pirates is seven. Any keen modellers in the district wishing to join should contact L. Bennett, 17 Eva Road, Gillingham.

North Western

The EAST LANCASHIRE M.A.C. recently held a *Concours d'Elegance* competition. The judging was by J. O'Donnell and B. Eggleston, who were kind enough to give some of their valuable spare time. More is the pity that other members did not feel it worth supporting. In all, some 15 models were entered, the eventual winners being P. Verity's "Sans Egal" in the Senior Class and S. Locke's "Dixielander" in Junior.

POULTON, BLACKPOOL AND FYLDE M.A.S. continues to thrive, although some members seem to have deserted it temporarily (we hope) to take dancing lessons. Club's stand at a recent hobbies exhibition in Kirkham aroused a good deal of interest, all types of models being displayed. Control-line remains very popular. R. Hayward was flying his "Footprint" for the first time when the tailplane detached itself, with obvious results. More recently C. Copple's new *Topscore* got well and truly "trimmed" when it landed in the path of an advancing motor-mower.

Southern

WORTHING MODEL AERO CLUB (BALD EAGLES) activity has been prolific throughout the winter months, the recent interest in combat having grown and plenty of entries this year in the various contests

CLUB NEWS

can be expected. At the Southern Area Gala at Tangmere last month, the weather was in their favour. Combat was won by Newell of Woking, Bunstead of Worthing being second.

U.S.A.C.'s rally at Goodwood racing circuit on April 3rd was unfortunately rained off, the combat victor having to be drawn out of a hat. Prize this time went to N. Tidey of Worthing. R. Bayliss lost an Enya-powered *Junior* 60 the other week, and any person finding such a model around the South Coast will be rewarded on its return. Membership now stands at about 25, the most for some time, and acquisition of new premises at Lancing, with a canteen, has been largely responsible for this.

EAST GRINSTEAD M.F.C. have formed a new club in Horley, which runs in close association with E.G.M.F.C., having at present about a dozen members, mainly interested in C/L. They had a stand at the annual Round Table Hobbies Exhibition which did a lot of good as far as publicity was concerned. At least one member has already started to repeat last year's performance of making long-distance, D T-less glider flights. Most interesting model that has appeared recently is Colin Greig's ducted fan scale F104 *Starfighter*.

London

On March 28th the combat boys of KENTON AND NORTHWOOD M.A.C. flew against their counterparts of the ENFIELD club. Some entertaining flying was seen from both teams, and the final score was two wins each and two draws. All but one of the models used were wings and most of the engines *Olivers*.

The main CHINGFORD M.F.C. interest is combat, most popular model being the A.P.S. *Razor Blade* powered by anything from AM.25 to Rivers 35, the latter of which they can now boast four. To keep in practice a combat competition is run each month, the last two winners being J. Noe (AM.25) and S. Holland (Rivers 35). Interest at club meetings seems now to be in Cox Pec Wee, etc., R.T.P. flying, to the annoyance of the older bods in the club.

DARTFORD M.F.C. regret that this year they cannot hold their annual C/L rally due to circumstances beyond their control. They are, however, putting on two flying displays one of which is for Messrs. Vickers-Armstrong Ltd.

NORTHERN HEIGHTS M.F.C. announce the 1960 Gala date as Sunday, June 26th. New item on the programme will be ¼A power for .049 (.8 c.c.) engines, c'mon the tiddlers! Queen's Cup will be F.A.I. power.

Many of the keen ST. ALBANS M.A.C. types went to Chobham on April 10th for the Astral and S.M.A.E. Cup. Despite the strong gusty wind which blew all day, five members flew in the Astral but with little success. Three models were badly damaged, one model was lost, but the other survived the gale. Nobody flying power had more than one flight, top time was B. Cox with 2:37 off 11 sec., O.O.S. Lack of recent club news from ST. ALBANS does not mean any lack in club activities, in fact club is eagerly awaiting for this year's contests to see if they can repeat 1959 successes. They have made a very good start to 1960 with M. Burrows, a comparatively new member to contest flying, clocking up 13:42 in the first A/2 eliminators on March 20th. This gained him a well-deserved second place. Main interest at the present moment is A/2 and power, both open and F.A.I. To help boost rubber flying, the club is pleased to welcome back Bruce Rowe to the fold after serving in the R A F. for two years. August 7th will see a Gala at Chobham, classes being as follows: *Open Glider, Power, Rubber, F.A.I. Power, Open Power (¼A), Radio,*

Single Channel. Trophies will be awarded to each class and S.M.A.E. rules to apply.

Latest HAYES AND DISTRICT M.A.C. Free Flight competition was for open power. It resolved into a battle between a super climb from Jim Baguley's latest Enya 29-powered monster, and a very much slower ship pulled by an old Arden 199 but with a superb glide, flown by John Hancock. The tortoise won! At 27th A.G.M. and Prize-giving some 39 of the 58 total membership attended. A new post was created, and given to Dick McGladdery (Chairman, Secretary and Treasurer to a C/L Subcommittee). His main duty is to seek a permanent Control Line Site for the club on the lines suggested in a recent AERO-MODELLER article. For the first time ever the control line flyers have taken the two club overall championships from the P/F dept. Dave Balch became the Senior and John Brailsford the Junior club champions.

COSMO A.M.C. members are flying regularly in Danson Park, Bexley, on Sunday mornings in spite of the soggy state of the ground. Irving Ella is creating quite a stir with his engine pressurised tank in his "Oliver" stunt job. Junior, Ronald Armitage, has won an A.M.10 in the twenty questions quiz gaining an average of 65 per cent. and beating seniors. One of the club's instructors, S. Robinson, has been chosen to fly in the Wembley Demonstration in balloon bursting and is first reserve in the stunt flying, after a fly-off in appalling wind conditions.

East Midland

GRANTHAM D.M.A.S., now known as GRANTHAM SOCIETY OF MODEL ENGINEERS, and only formed a few months ago, now has membership of 38 and is very fortunate to have two flying fields. Much interest is being taken by club members to the day when the *Enya Flying Sleeper* takes to the air.

Northern

TEES SIDE M.F.G. had a good day at R.A.F. Rufforth York for the Gutteridge F.A.I. Rubber Eliminator with top area place for A. M. Robson with 11:07, and third place T. B. Chambers at 10:45. R. M. Swindon was second in the supporting open glider event and M. Sutherland second in the open power. All results were disappointing in the K.M.A.A. F.A.I. Glider as the boys tend to fly gliders as a side-line!

East Anglian

IPSWICH M.A.C. activities over the last three months have included four lectures on building and flying and a film show attended by nearly 60 members and friends. One member, a diehard, actually took part in the K.M.A.A. and S.M.A.E. competitions! Despite gale force conditions, he was awarded top time for the area. "Gadge" Gibbs is club's latest member turning up each time he comes into the Ipswich area.

South Western

S.W. R.C. M.E.S. held their first club rally of the season at Winkleigh on Easter Sunday, being favoured with perfect weather. After the long winter lay-off, there was a spate of minor troubles, but no disasters. Some excellent flying was put up by Ken Sturdy (South Chard) with his rudder-only "Rattler" (beautiful straight ROGs!) Brian Wear (Honiton) with o-d s.e. job, (highest flight of the day), Terry Beale (Polperro) including first-ever flight of new "Houdini" low-wing speedster, and Hugh Price (Paignton) whose old Bowden *Meteorite* performed well, especially excellent landings on the tarmac. Courney Gill (Paignton) won an impromptu spot-landing contest, and Don Rouse (Totnes) produced a beautiful semi-scale 7-footer which unfortunately suffered minor damage on take-off, preventing flight. Graham Gissing (Plymouth) landed his "Gasser" on a liargar roof (unintentionally!) and was retrieving it when the rally ended—he may still be there!

Midlands

Members of **BILSTON M.A.C.** started the competition season by organising the combat event in the first of four meetings, held to determine area championships, everything ran smoothly and the 28 entries were soon dealt with. At the second meeting under adverse weather conditions (mainly a 60-70 m.p.h. gusty wind!) with only a dozen entries, the joint area champion, Roy Crosswell, was first, John Oxford second, and Roy Ratcliffe third. This result puts club on a level pegging, with West Bromwich and the results of the next meeting should prove most interesting. With two displays of flying, a full club programme, rallies and local inter-club meetings, members look forward to an interesting flying season. Recently an invitation film show and refreshments were presented in the local British Legion Hall by **CRESWELL M.F.C.** Of interest were model A C films, taken at various rallies by R. Ray. Several models were on display including C.L. stunt, free flight sport, and several Junior 60s, intended for R.C., which incidentally is a new trend in the club. Several new models are on the Board including an O.D. Canard 1 c.c. (Mk. II) by R. Ray. Mk. I Canard came to an unfortunate end on a demonstration flight to members of Welbeck College, after showing very good promise, and astounding all who saw it. Also on the board of S. Poole (Club Sec.) is an O.D. 2.5 c.c. Autogyro. Club have enrolled several new members during the past few months, almost doubling membership; so anyone interested should contact S. Poole (Club Sec.), 8 Wood Avenue, Creswell, Nr. Worksop, Notts.

Out of a number of designs **LEICESTER M.A.C.** have chosen to include Leicester's "Griffon" in the club badge. The lads are helping the Blind Dog Appeal Fund at Loughborough Aerodrome on June 4th, with a flying display. Club records now stand at: Open Rubber, 12 min. 30 sec.; Power Duration, 2 min. 29 sec.; Jetex, 1 min. 39 sec.; Radio Control, 11 min. 30 sec.; Sailplane, 13 min. 30 sec.; Chuck Glider, 54 sec.; Indoor Speed, 75 m.p.h.

There is now a strong swing from combat to team-race evident in the **WOLVES M.A.C.** This was seen at Wellesbourne-Mountford on March 20th when S. Skiff and J. Hardcastle won Class A (flying and pitting respectively) with the latter's model. At the same competition, Brian Horrocks came 2nd in stunt (losing, we are told, on appearance only) and on March 27th at the Jaguar Works Brian successfully flew in stunt to outstrip his rivals for first place. Brian, as everyone should now know, favours (with good cause) a slower speed than other competitors seem to want and he is now finishing a new colossus for the Nationals.

Over the past few years the **SMALL HEATH M.A.C. (BIRMINGHAM)** has risen in membership to become one of the largest clubs in the Midland Area. There is a keen interest in all fields of the hobby and in the current competition season club are hoping for a good showing.

At the **WELLSBOURNE** rally, J. Bishop who is now the Midland Area Secretary, gained first place in the A2 event, while B. Brown placed third in the C.L. stunt. First annual C.L. rally the club organised was held at the Jaguar Cars sports ground on March 27th. The meeting was quite successful despite rather cold and windy weather conditions. This first meeting was restricted to stunt only owing to the rather limited space available, but in future years with the return of R.A.F. Wellsbourne as a venue, other events will be included. The results of this meeting were: first, B. Horrocks; second, D. Day of Birmingham; and third, E. Burke of Outlaws.

First three comps of the season that **OUTLAWS (CANNOCK) M.A.C.** held were all marred by high winds. At the first Area C.L. Championship Meeting best F.A.I. team racer to date pranged whilst doing 45 laps at 85 m.p.h. (standard Oliver) and stunt boys could do no better than 6th and

7th due to troublesome engine runs. These problems were overcome in time for the Small Heath Stunt Rally at Jaguar Sports Ground, Coventry, the following week and Eric Burke placed 3rd and Roy Lackley 5th in gale force wind that served to eliminate all but nine of the twenty entries. Two weeks later the wind was even stronger and the second Championship meet was "blown off" to a later date.

WEST BROMWICH M.A.C. recently attended the first of the Midland Area control-line championships at R.A.F. Wellesbourne-Mountford, near Stratford, along with members of Bilston and Wolves M.A.C. Contest was the first of a series intended to decide the area champion for each of the respective events. The combat boys excelled themselves; Mike Kendrick, Dave Summers and Les Newman were first, second and third respectively.

BRIERLEY HILL AERONAUTS' second club competition of the season was chuck glider held on March 27th. It was won by Cliff Webb followed by Peter Bowen. Now that R.A.F. Wellesbourne is available for use they hope to run F.F. comps. Considerable interest in F.A.I. class is being shown. One club plea to fellow modellers, "Please don't stand under these heavyweights when they D.T."

A new Club has been formed in Shirley, Birmingham, called the **SHIRLEY MODEL GROUP**. The Club has 17 members, mainly aeromodellers, but with some railway types. The main pastime is control line flying but there are several free flight models as well. Founder and head of the Club is Mr. Dennis J. Keen. **CHESTERFIELD SKY-LINERS M.A.C.** activities have been gradually increasing since the beginning of the year, in preparation for the 1960 season. Free flight and radio control are more prominent this year, and the latter is increasing in its numbers. There are now five radio jobs in the club, *Electra*, *Waveguide*, *Junior 60*, *Gasser*, and one *Uproar*. On March 19th, trimming for the Area comp. at R.A.F. Wigsley was at its climax. Mr. B. Tearne smashed an Enya 15D powered *Creep*, which after the engine run, forgot about the glide! Bad luck again struck Mr. Tearne on the day of the Wigsley comp. as his Cox Olympic *Creep* disappeared O.S. on a seven second engine run, minus D.T. ("It's only a test flight"—famous last words), D. Mellors, with a Wehra 2.5 powered *Dixielander*, did well. After two 3 min max's and a frantic hours' search for the 'plane after the second flight, it turned on its side on take off, and took a close look at the runway!—needless to say the tailplane and engine were intact. In glider Mr. Tearne was doing well with his *Inchworm*, which incidentally, broke the nylon line on the second flight and also achieved two max's. On his 2nd flight however, the D.T. fuse went out (fuel-soaked) and was finally retrieved two and a half hours later, six miles away. Later the above-mentioned *Creep* was found about twenty miles away, near Newark, fortunately, intact.

Ireland

On March 6th **DUNLAOGHAIRE M.F.C.** held its first Open Power Contest in the Phoenix Park Dublin. The A.P.S. *Eureka* carried the day. P. Healy came first with his Torp 15 powered *Eureka*, B. Harpur second, Alag X3 powered *Eureka*, T. Morelli third with his F.A.I. model (Oliver Tiger).

Competition rules of the **MODEL AERONAUTICS COUNCIL OF IRELAND** have been completely re-written in basic English to discourage the "loophole laddies" and now include 1/4 A TR and RC single and multi. Judging by local progress these latter may be used around 1962! To remove a possible temptation to fiddle, the use of *U-Reely* and similar handles has been banned for TR and speed. Ex-patriate member, John "B. Boy" Thompson, working in Italy, was piped by 40 secs. for the Power Championship over there, but has been suitably rewarded with an automatic

For Your Diary

May 15th*

Dagenham Rally (combat). Pre-entry to 27 Bell Farm Avenue, Dagenham.

May 29th

Scottish Nationals, Kirkcaldy (control line).

June 25th - 26th

P.A.A. Festival (rules as in this issue), Abbotsinch, Paisley.

June 26th*

Northern Heights Gala, all classes F F including 1A plus Combat.

July 3rd*

Clywd Slope Soaring, N. Wales

July 2nd - 3rd

R.A.F.M.A.A. Championships (all classes), R.A.F. Debden.

July 10th

Scottish Nationals, Abbotsinch, Paisley (free flight).

Enfield Rally (team race, A, B, stunt, speed, combat).

August 7th

St. Albans Gala, Chobham Common, open glider, open power, open rubber, F.A.I. power 1A open power, radio (single channel).

August 14th

1960 Devon Rally*

Woodbury Common, nr. Exmouth.

Scottish Gala, Abbotsinch.

Ramsgate C.L. Rally, Jackey Baker's Sports Ground, F.A.I. and B class T R, combat, stunt.

August 28th

South Midland Area Gala (all classes), Cranfield.

September 11th*

Croydon Gala, Chobham Common, open glider.

September 18th

Caledonia Shield, Lanark.

September 25th

South Coast Gala, R.A.F. Tangmere, all classes F.F., R.C. and C.L.

October 23rd*

Croydon Gala, Chobham Common, open power (including separate 049 class).

November 20th*

Croydon Gala, Chobham Common, open rubber.

* Signifies S.M.A.E. Sanction

place on the Irish team for Cranfield—we hope he can afford a new bowler hat for 1960!

Scotland

First free flight competition of the **KIRKCALDY M.A.C.** for the coming season, was held on April 10th. The day brought with it frequent thunder showers borne on a strong west wind, blowing straight for town! Test flying began with about fifteen assorted models for the open power and open glider, but due to weather, it was severely cut down to eight entries. D. Martin and A. Morrison were winner and runner up respectively for both power and glider. Power event was run on a ratio principle (dividing the flight time by the engine run in seconds) but winning time for the glider event was a total of 5 mins. 52 secs. Mr. Ferris lost his glider entry on a test flight, it disappeared over the town still rising, with no D.T. The Kirkcaldy club held a practice meeting for the team-race men on March 26th. Classes flown were A, 1/4 A and B, entries being of a good standard, and giving keen competition to the team-race "specialists". There was only one entry in the Class B but twelve aircraft were entered between the "A" and 1/4 A classes. Winner was A. Morrison, the competition secretary. A class was an all senior event with an assortment of "home tuned" specials and two "Oliver Tiger" powered aircraft. A. Morrison just managed to snatch the lead from Mr. Ferris who damaged his plane in a bad landing, making it a double victory.

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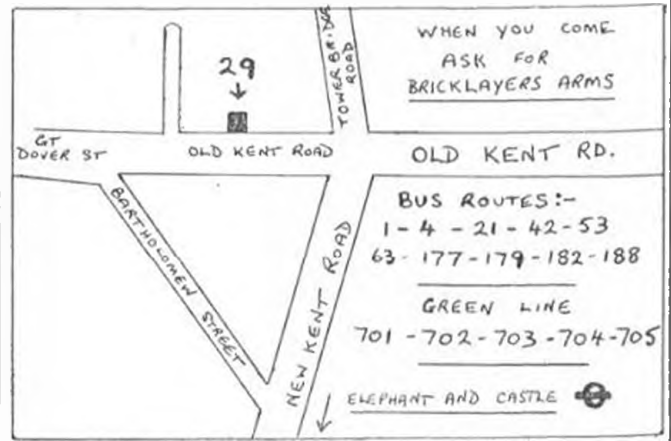
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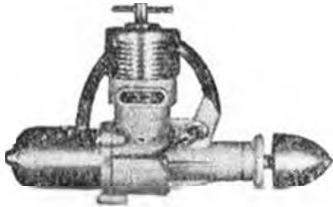
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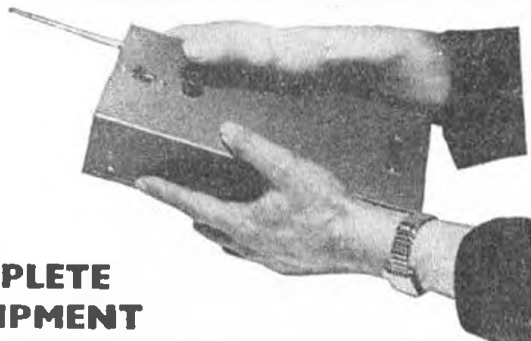
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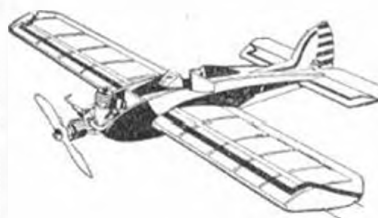
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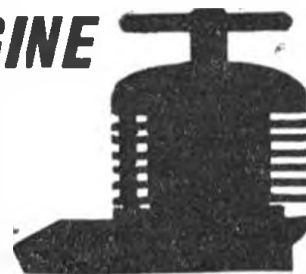
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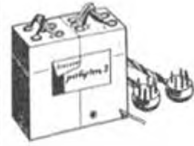
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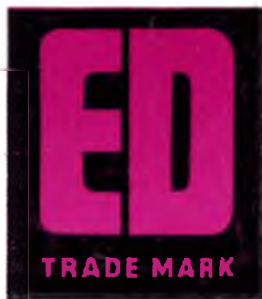
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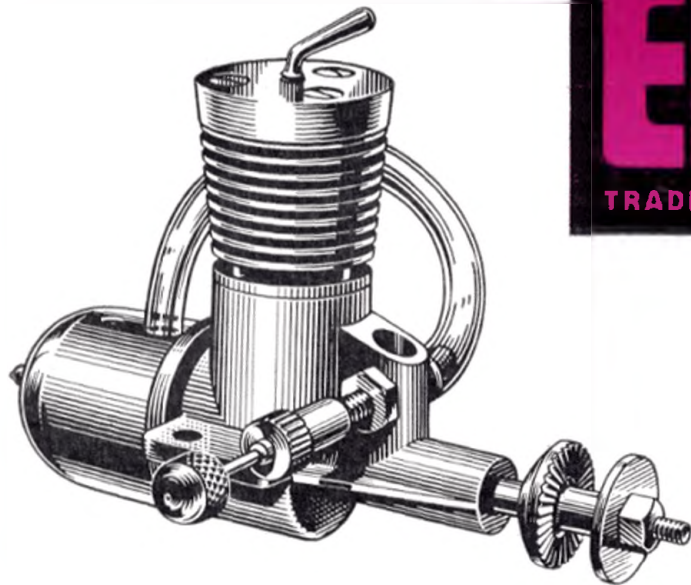
Put "PEP" into your models

WITH THE NEW



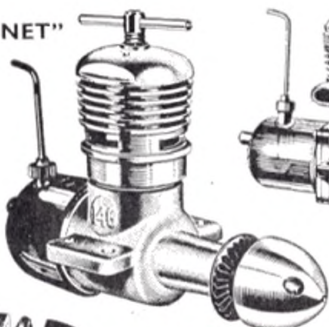
"PEP"

• 8 c.c. DIESEL

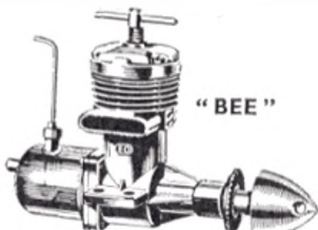


Ask for a "PEP", it's the top quality, top value and the lowest priced small diesel obtainable. Insist on a "PEP", no plugs or accumulators required, easy to start and gives an astonishing performance. When you buy a "PEP" you will be the proud possessor of a first class engine backed by the usual E.D. Guarantee. Like all E.D. Engines, it's easy to fit, simple to operate and IT'S ALL BRITISH.

"HORNET"



"BEE"



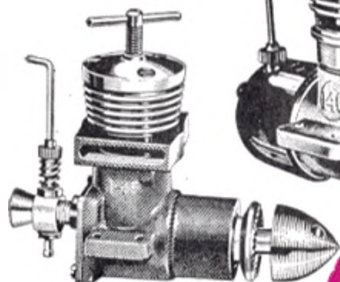
Specification :

Stroke: 0.375 in.
Bore: 0.410 in.
Height: 1 7/8 in.

Length: 2 1/2 in.
Width: 1 1/2 in.
Weight: 1 1/2 in.

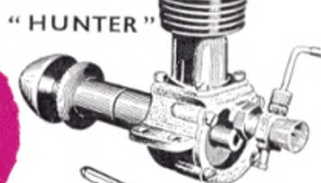
Crankcase Unit: Light Alloy L.N.2.
Pressure Diecasting.

Piston: Mehanite.
Crankshaft: Hardened Steel.
Con Rod: Hiduminium.
Cylinder: Hardened Steel.
Main Bearing: Bronze Bushed
Spraybar: Brass.
Tank: Aluminium.

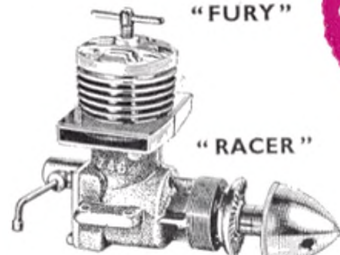


"FURY"

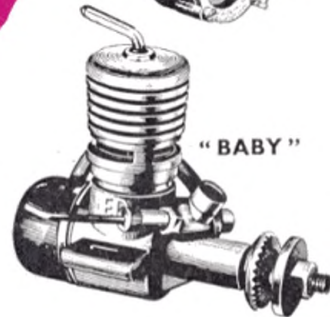
ASK FOR
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"E.D."



"HUNTER"



"RACER"



"BABY"



"COMP. SPECIAL"

E.D. New type Multi-Channel RADIO CONTROL UNITS

These new models, produced after months of experiment and exhaustive flying tests, are the most advanced Radio Control Units available and up to the traditional standard of high quality and value always associated with E.D. Products.

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The E.D. Range of Engines also includes :

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E.D. 2.0 c.c. "COMP. FURY"
"SPECIAL"
E.D. 3.46 c.c. "HUNTER" E.D. 2.46 c.c. "RACER"

Air cooled and Water Cooled versions of all models available.

Illustrated Folders giving full details of all E.D. Equipment including Engines, Spare Parts, Radio Controls, Mechanisms etc., are free on request.

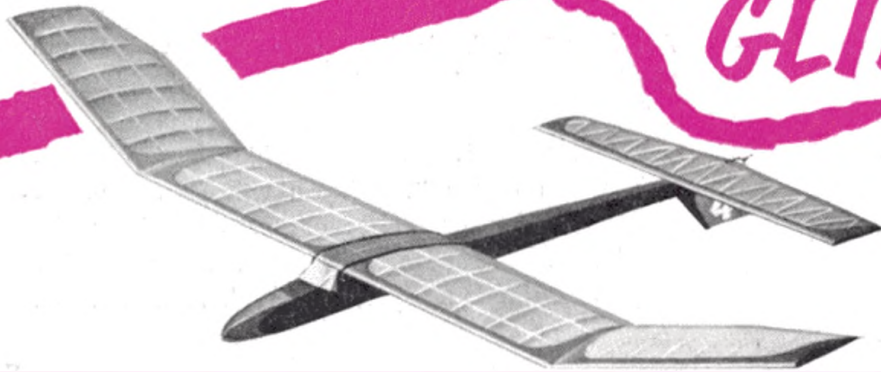
E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD
DEVELOPMENT ENGINEERS
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Great Fun

FOR A SMALL OUTLAY!

A Keilkraft glider will give you hours of building and flying fun!

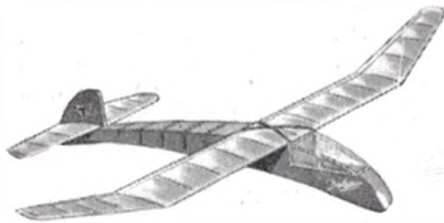
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CAPRICE

The beautifully clean-cut lines of this 51 inch span contest sailplane will appeal to all glider enthusiasts. The kit contains ample highest quality materials, including die-cut parts for easy building.

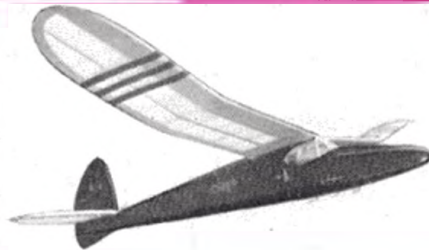
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DOLPHIN

Easy-to-build towline glider with a performance to please even the most critical. 30 in. span.

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Featuring crash proof plug-in wings, D/T tailplane and automatic rudder. 64 in. wingspan.

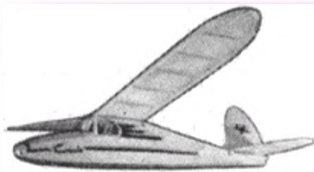
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TOPPER

Advanced design with a butterfly tail, and capable of extremely high performance. 40 in. span.

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CUB

Snappy little beginner's model that flies very well indeed. Neat design that is simple to build. 24 in. span.

3/9



CADET

Ideal beginner's model. Simple, strong construction, and very easy to trim. 30 in. span.

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NOMAD

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4/6

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