MODEL AIRCRAFT

WAKEFIELD ISSUE

IN THIS ISSUE

OCTOBER 1954

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- FLYING SCALE MODELS

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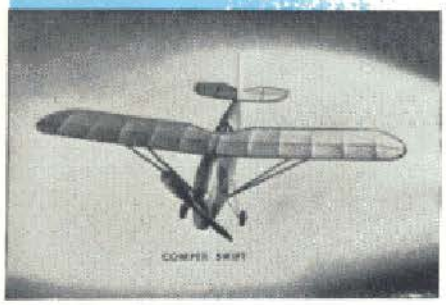

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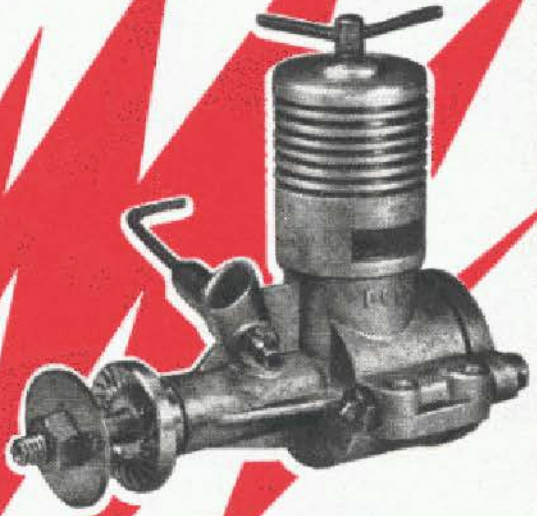

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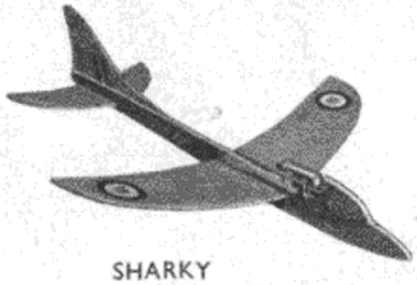

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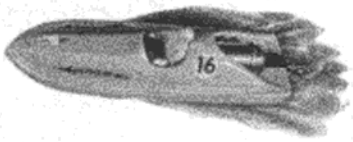

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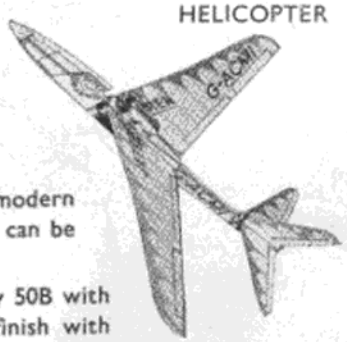

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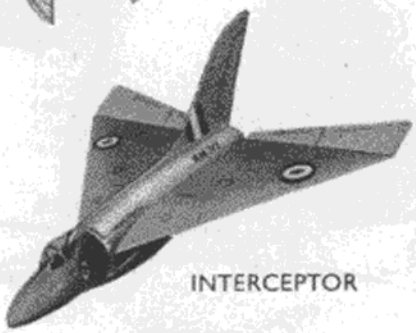

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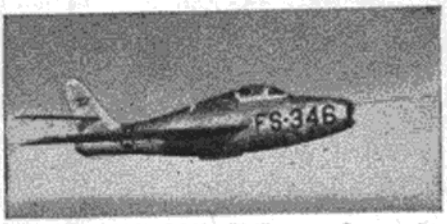

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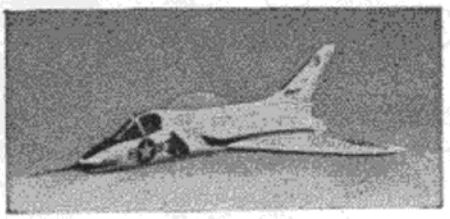

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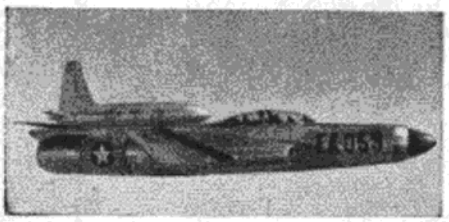

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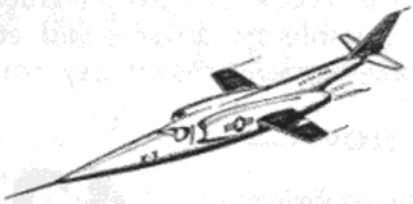

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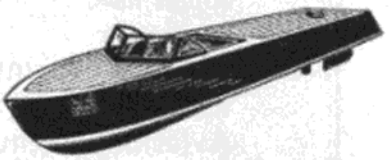

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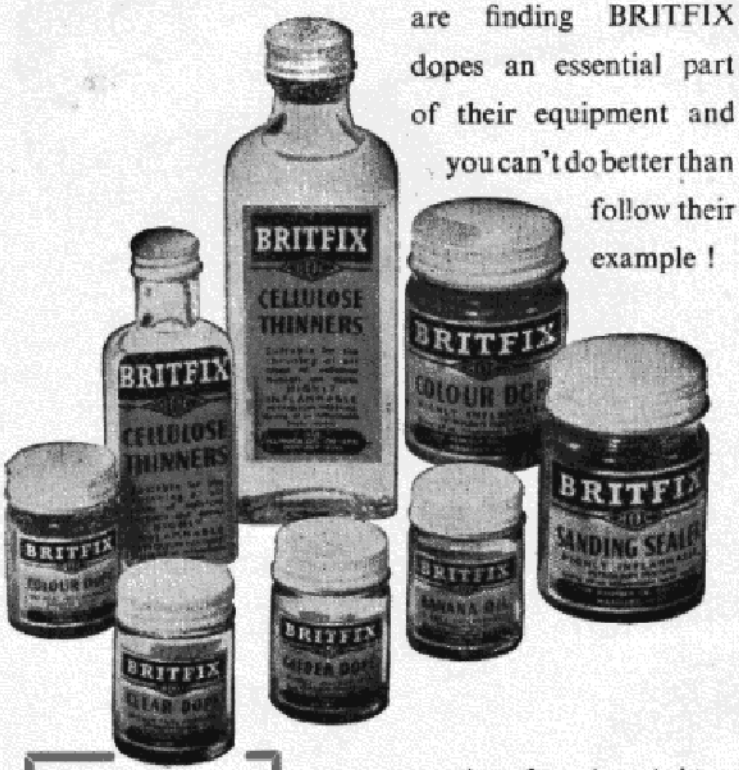

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OCTOBER 1954 No. 160 VOL. 13

Contents

EDITORIAL

The lack of support given to the recent Northern Gala by the model fliers in that area seems to call for some comment. For years Northern modellers have complained bitterly that they have not been given "a fair crack of the whip" by the S.M.A.E. All the important S.M.A.E. contests, they pointed out, were held in or near the South of England and it must be admitted that in the past there was a good deal of justification for their complaints.

To meet this criticism the S.M.A.E. Council decided before the end of last year, to hold a two-day centralised meeting in the North and they allocated eight of the Society's trophies to this meeting. The programme included a wide range of contests to suit all types of models and was as comprehensive as that provided for the Nationals.

It might have been expected that the Northern modellers would have been very pleased about this, but if they were they showed their pleasure by virtually boycotting the meeting. More than half the contestants travelled over 200 miles from the South and the amount received in entry fees was less than a quarter of what it would have been if the contests had been held elsewhere in the country.

Obviously, there must be some reasons why the majority of the Northern Area clubs, with the notable exception of the local Darlington club, took no active part in either organising or participating in this meeting. We should certainly like to hear these reasons and so we imagine would the S.M.A.E. Council. Certainly, if no satisfactory explanation is forthcoming, the Council could hardly be blamed if they decided not to repeat this unfortunate experiment next year.

Cover Story

Photographed shortly after the final round of this year's Wakefield competition is Alan King of Australia, the winner, with his model.

The trophy has now been competed for nineteen times since it was presented by the late Viscount Wakefield, in 1927, and this is the first time that an Australian has won it.

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Published on the 20th of each month prior to the date of issue by PERCIVAL MARSHALL & COMPANY LTD.
19-20 NOEL STREET, LONDON, W.1. Telephone : GERrard 8811 Annual Subscription 20s. 0d. post paid.

The World Control Line Championships

● The Royal Aero Club of the Netherlands made the bold experiment of holding the World Control Line Championships for 1954 under cover. In making this decision they were to a very large extent influenced by the appalling weather which has persisted throughout Europe during this flying season and they took this somewhat drastic step to ensure that at least the speed and team events were not " washed out."

All things considered the meeting was a complete success in spite of the high noise level and the stench of some of the " super " fuels used. The events were at least run under dry conditions and the competitors were not bothered with wind effects—with the exception of the " aerobatics " entries, of course, since this event was perforce run in the open.

The Houtrust Hall in The Hague, in which the contest was held, is normally used as a sports arena and was marked out in tennis courts on which were superimposed the speed and team racing circuits to provide a novel floor pattern. The hall actually measured 262 ft. by 137 ft. with an effective height up to the electric light conduits of approximately 26 ft., giving ample space for two circuits and sufficient height for speed work and team racing.

High speeds were achieved in the Championships Contest, R. Lutker of America reaching the record speed of 222 km. per hr. in two of his three contest flights with his 5 c.c. Dooling engined model. This was equalled by the Swede O. Ericsson, also with a Dooling engined model, in his last flight but the Championship went to Lutker by reason of his better overall performance. His flying was commendably consistent and he proved his worth as an all-round performer by gaining a close second place in the aerobatics section.

In the 2.5 c.c. class Pete Wright reigned supreme with a very creditable speed of 180 km. per hr. This was 12 km. per hr. faster than his " runner-up " E. Fresl of Yugoslavia.

While the British team did not appear to achieve anything spectacular, by consistent flying and first class team work it managed to acquire the major percentage of the trophies by winning the team race (P. Smith), the 2.5 c.c. speed event (P. Wright) and placing third in the aerobatics class (P. Smith) thus achieving the best national team performance. In addition P. Smith, by winning the team race with his model and placing third in the aerobatics and fifth in the 2.5 c.c. speed came out the best individual all-round performer—quite a good effort.

The trip by coach to Delft and round The Hague which took place on the Sunday morning as a prelude to the excellent lunch and prizegiving at the Park Hotel, proved an interesting and pleasant event.

The President of the Royal Aero Club of the Netherlands, Mr. Kolf presided and distributed the prizes, supported by the Minister of Civil Aviation, to terminate a very pleasant meeting.

As one has come to expect of the Royal Aero Club of the Netherlands, the general organisation was excellent and everything appeared to go according to plan.

(Full results and photographs in next issue.)

Model Aeronautical Conference Date

● The Low Speed Aerodynamics Research Association have now completed the details for the proposed Model Aeronautical Conference which we mentioned in the September issue. The conference will be held in the Library of the Royal Aeronautical Society on Saturday, September 25th from 10 a.m. to 5.30 p.m. The morning

The victorious British C/L team in Holland

session which lasts until 1 p.m., will be devoted to "The application of model techniques to full scale investigations" and the papers to be dealt with are listed below :

Opening discussion of work and organisation of L.S.A.R.A.

N. K. Walker, B.Sc.

(1) The Dynamic Scale free-flight model. Early work in England and U.S.A. Saunders Roe work on free dynamic models, with film and demonstration of special equipment.

W. A. Crago.

(2) The development of the L.S.A.R.A. multi-channel proportional control radio link, with demonstration and discussion of flight trial experience, with trial films.

D. W. Allen.

(3) Low speed aerodynamics and scale effects.

R. W. W. Annenburg.

The afternoon session from 2.30 will include papers on the subjects given below under the general heading "Application of full scale techniques and theory to model aircraft designs."

(1) Introduction to aerofoil characteristics at low Reynolds, numbers.

R. W. V. Annenberg.

(2) The aerofoil test work of the Model Aerodynamics Research Project.

R. F. A. Keating.

(3) The development of the L.S.A.R.A. vertical climb models.

T. W. Smith.

(4) The development of the ducted rocket power unit for models.

A. A. Judge.

(5) Model engine tests.

P. G. F. Chinn.

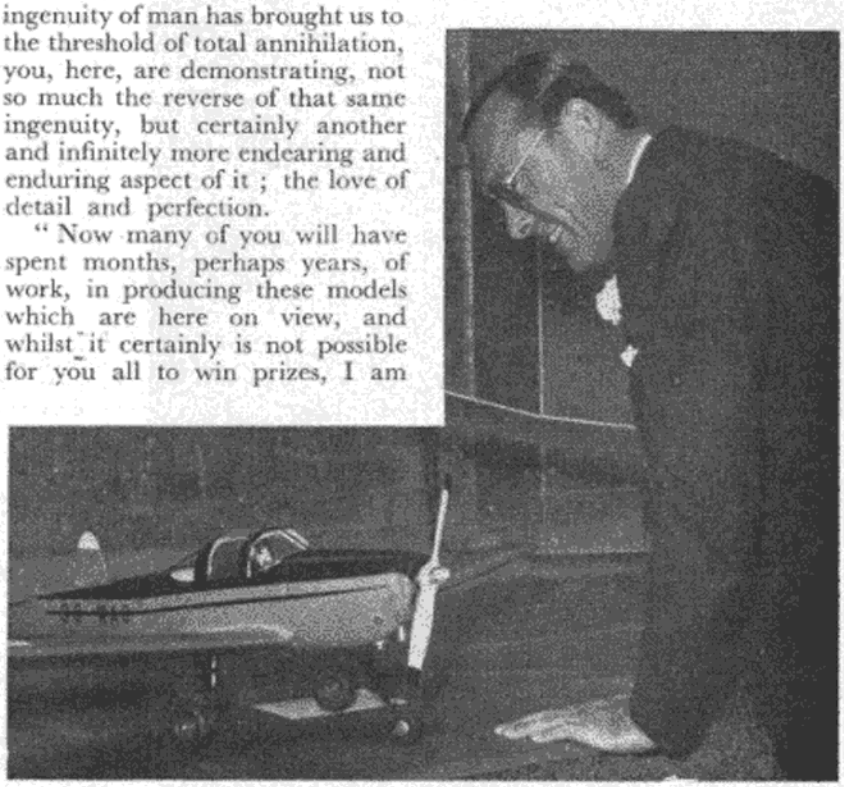
The conference fee for the whole day, including coffee, is 10s. 6d. Reports on proceedings will be issued in the L.S.A.R.A. Report Series, and may be purchased by conference members if ordered on the day of the conference.

A Royal Occasion

● Prince Bernhard of the Netherlands, who piloted his own aircraft to this country to open "The Model Engineer" Exhibition was, as might be expected, particularly interested in the fine display of model aircraft in the competition section, including five models from his own country. These were entered by Mr. H. J. H. Modderman and Mr. D. M. Smit, the former of whom had the honour of being presented to the Prince. Mr. Modderman's models won a silver medal, a bronze medal and a V.H.C. diploma and his success should inspire more of his countrymen to enter models in the future.

In his opening speech Prince Bernhard said : "The appeal of this exhibition is almost universal, because it appeals to the future grown-up in every child and to the child in almost all of us grown-ups, but beyond the mere spectator's observations of this exhibition lies something deeper. I know that the work which modellers put into their labours of love has a serious aspect and affords a stimulus to deeper reflection. It takes us, for a moment, right out of a world which is becoming oppressive by the gigantic dimensions of its uncontrolled, unmodelled potentialities. In a world in which the ingenuity of man has brought us to the threshold of total annihilation, you, here, are demonstrating, not so much the reverse of that same ingenuity, but certainly another and infinitely more endearing and enduring aspect of it ; the love of detail and perfection.

"Now many of you will have spent months, perhaps years, of work, in producing these models which are here on view, and whilst it certainly is not possible for you all to win prizes, I am sure that everyone will appreciate and admire the very high quality of your work. In fact, personally, I am glad that I am not going to be a Judge."



Prince Bernhard inspecting the aircraft models at the "M.E" Exhibition.

Correction

● The short article which we reprinted by permission from the International Radio Controlled Models Society's Bulletin entitled "Radio Control Licences" by C. H. Linsey, contained a number of errors. The corrections are listed below :

(1) 2nd column, 3rd paragraph, line 9 should read "is *half* the mean radio . . ."

(2) 3rd column, 1st paragraph, line 27 should read "to obtain the *R.F.P., divides by 2 to get the E.R.P.*, and Bob's your uncle. Thus, if the aerial current is less than 280 mA, you are all right."

(3) 3rd column, 3rd paragraph, line 2 should read "is not the same as *half* the mean R.F.P."

We thank the many readers who have taken the trouble to write and point out the errors in this article and apologise to anyone inconvenienced by these mistakes.

"THE MODEL ENGINEER" EXHIBITION

Heading picture—Prince Bernard of the Netherlands examines a model of the Gloster "Javelin," by E. J. Vine, during his tour of the exhibition immediately preceding the opening ceremony.

1. *A section of the model aircraft exhibits displayed at the exhibition.*
2. *The fine 1/50 scale model of a "Douglas D.C.6" entered by H. J. H. Modderman, of Holland, which won a silver medal.*
3. *Peter Donavour-Hickie entered this Dynajet powered C/L model of the North American "Sabre."*
4. *The Championship model of the Aircraft Section, a fine 1/24 scale model of a "Bleriot Type XI" monoplane.*
5. *This entry in the non-flying aircraft section by D. M. Smit, of Holland, is a replica of a "Tiger Moth," used by the Netherlands Government Civil Flying School.*
6. *A 1/48 scale model of a Heinkel "Volksjager," by L. J. Brock, which won a bronze medal.*
7. *A beautifully detailed model of the Cessna "Airmaster," by I. S. Cameron, which won a silver medal.*
8. *Another winning model by H. J. H. Modderman, a 1/50 scale "Sikorsky S-55" helicopter.*

1

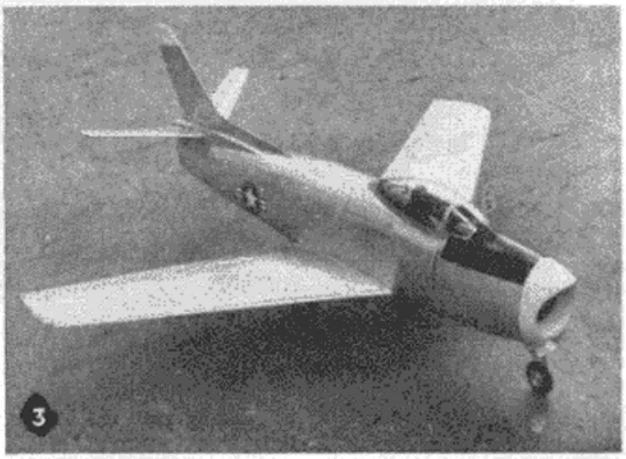
2

The aircraft models at this year's "Model Engineer" Exhibition were not quite as numerous as those entered last year, but on the whole the general standard was higher. Once again the classes for contest models were neglected and the predominant types were scale models, both flying and non-flying types. Some beautiful pieces of work were on show and the selection of pictures on these pages hardly does justice to the high standard of the winning models.

The Championship Cup was won this year by P. G. Cooksley, of Croydon, with the beautifully detailed model of a *Bleroit XI* monoplane, which was mainly constructed from mahogany and obeche. Drawings and a description of this aircraft were published in the April issue this year in our "Prototypes Worth Modelling" feature. In addition to the Championship Cup, P. G. Cooksley won a silver medal with his *Bleriot*.

H. J. H. Modderman, of Holland, who won a silver medal last year, this year entered three fine models and won a silver and a bronze medal with his non-flying scale model of a *D.C.6* and a *Sikorsky* helicopter.

The other silver medal winner was I. S. Cameron, of Ellesmere Port, with his 1/12 flying scale Cessna *Airmaster*.



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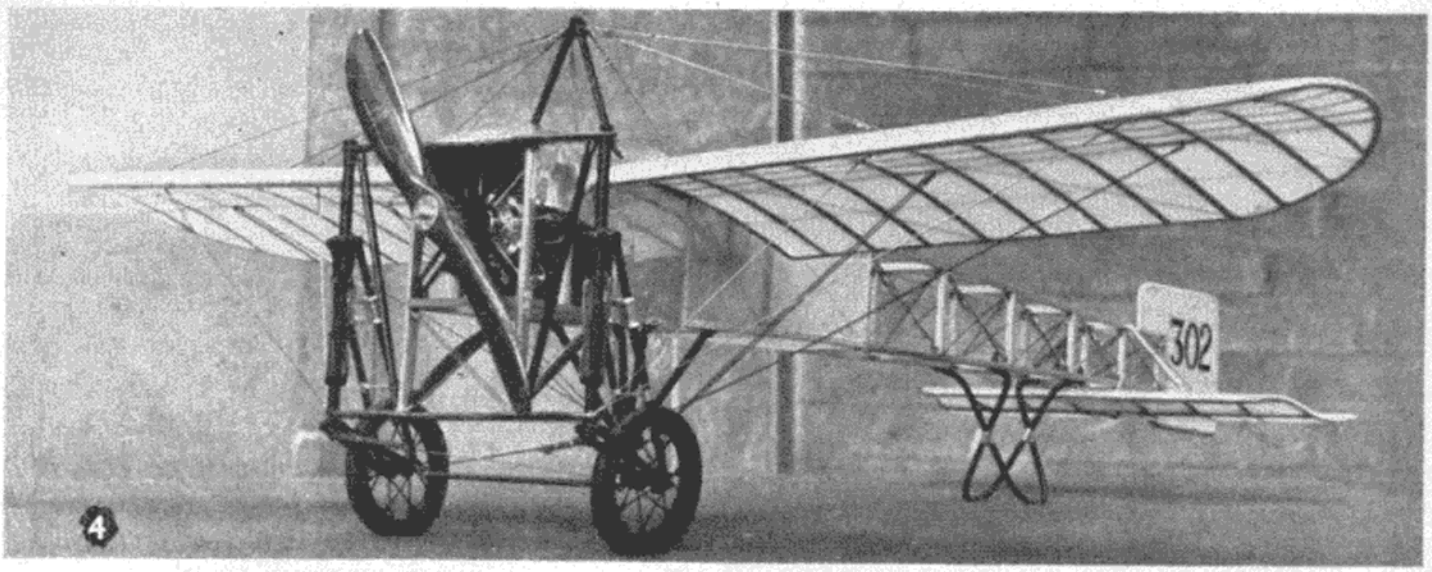

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COMPETITION RESULTS

CHAMPIONSHIP CUP
P. G. Cooksley (*Bleriot Type XI*)

M.A.T.A. CHALLENGE CUP
(For kit models)
C. H. Mills (*Monocoupe L-7A*)

"MODEL AIRCRAFT" PRIZE
(For models built from "M.A." Plans)
D. H. Jones (Harvard)

BRISTOL CUP AND READING SOLID MODEL CUP
(Not awarded)

CLUB TEAM TROPHY
K.N.V.L., Holland

RUBBER POWERED MODELS

Bronze Medal ... ... R. M. Thorogood (Wakefield)

NON-FLYING MODELS

Silver Medal ... ... P. G. Cooksley (1/24 scale *Bleriot XI*)
Silver Medal ... ... H. J. H. Modderman (1/50 scale solid model *Douglas DC6*).
Bronze Medal ... ... L. J. Brock (Heinkel 162A-1 *Volksjager*).
Bronze Medal ... ... H. J. H. Modderman (1/50 scale solid model *Sikorsky S-55* helicopter).

FLYING SCALE MODELS

Silver Medal ... ... I. S. Cameron (1/12 scale Cessna *Airmaster*).
Bronze Medal ... ... P. Donavour-Hickie (North American *Sabre*).

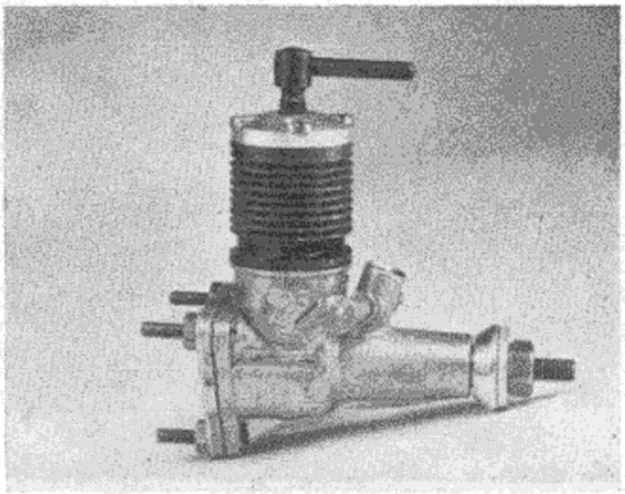

5


6


7

8

Engine Tests

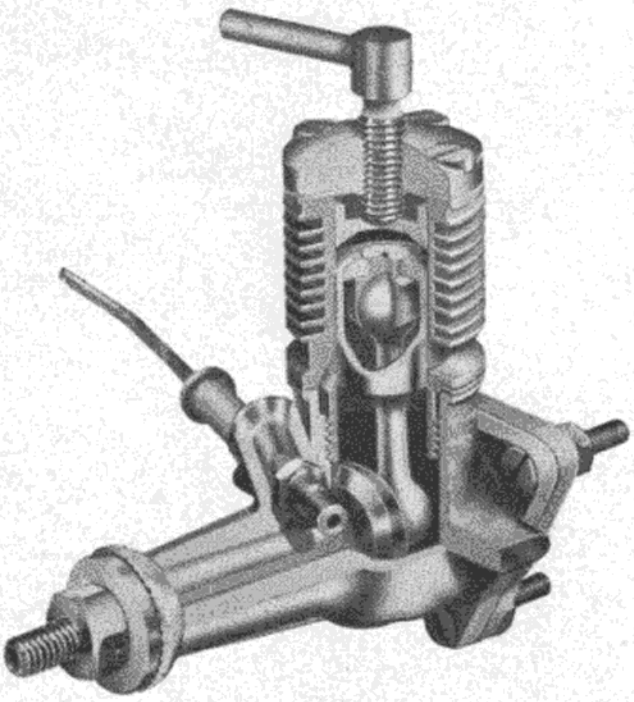


No. 64: The Super Tigre G. 25 diesel

ONE of the latest additions to the extensive range of Super-Tigre engines made by Micromeccanica Saturno of Bologna, Italy, is the G.25 diesel. This 1 c.c. unit is an entirely new model and shows little resemblance to previous Super-Tigre engines.

Briefly, the G.25 can be described as a modern shaft type rotary valve motor of medium-short stroke, a specification which, however, also fits many other existing model engines of similar size and gives no indication of the several interesting features of this new model.

Firstly, this new Super-Tigre uses an unusual cylinder port design. In this there are two opposed exhaust ports. Between them, but slightly below and entering the cylinder at approximately 45 deg., are two transfer ports. These ports are supplied via two transfer passages cut in the crankcase wall and an annular chamber formed between the crankcase and cylinder just below the exhaust flange.



Secondly, the cylinder itself is in one piece, with integral fins, and screws into the crankcase, but the cylinder-head is separately fitted with four screws. Thirdly, the piston, which is bevelled to continue the deflection of the ingoing charge into the cylinder-head, has a ball-and-socket type connecting-rod joint in place of the more familiar gudgeon-pin. This means that the piston can rotate as it reciprocates and should thus maintain a more even distribution of wear. The crankshaft, which has a generously proportioned journal, has a full disc web and, unlike most small diesels, carries a machined-in counterbalance.

Among the more practical details of the G.25 are the inclined needle-valve assembly, which keeps one's fingers well back from the prop arc, the combined radial and beam mounting and the comfortably proportioned compression lever.

Externally, the Super-Tigre G.25 may not, perhaps, be the best looking model engine, but it is well made and nicely finished both internally and externally.

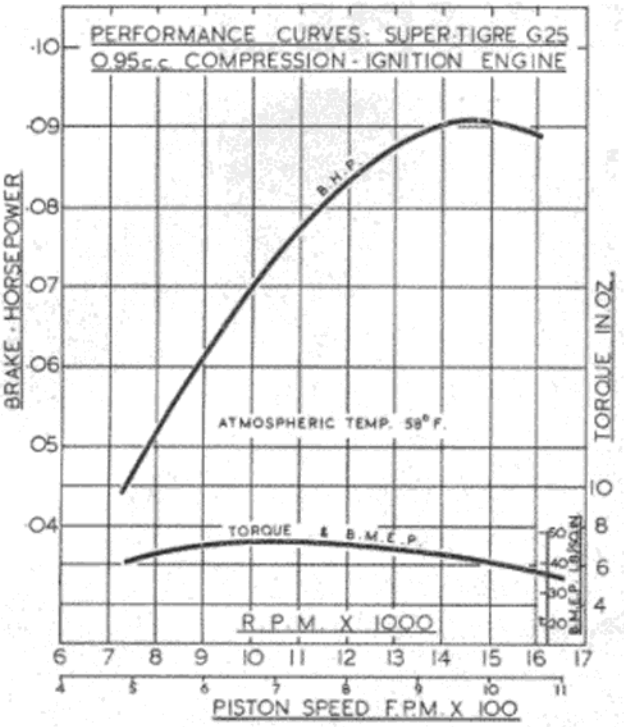
Specification

Type: Single-cylinder, air-cooled, two-stroke cycle, compression ignition. Shaft type rotary valve induction. (No sub-piston supplementary air induction.) Twin exhaust and twin transfer ports. Bevelled piston crown with matching contra piston.

Swept Volume: 0.95 c.c.
Bore: 11 mm. Stroke: 10 mm.
Compression Ratio: Variable.
Stroke/Bore Ratio: 0.909 : 1.
Weight: 2½ oz.

General Structural Data

Pressure diecast aluminium alloy crankcase with detachable rear cover secured by three machine screws and nuts. Fully machined steel cylinder, with integral fins, screwing into crankcase. Aluminium alloy cylinder head secured to cylinder with four screws. Counter-balanced crankshaft running in plain bearing. Duralumin connecting-rod with ball-and-socket small-end bearing swaged into piston



crown. Spraybar type needle valve assembly inclined to bring needle-valve stem backward and upward (right hand). Combined beam type mounting lugs and three-point bulkhead mounting.

Test Engine Data

Running time prior to test: 3 hours.

Fuel used: 40 per cent. Shell "Royal Standard" kerosene, 35 per cent. Ether B.S.S. 579, s.g. 0.720, 25 per cent. Castrol "M" (castor base) lubricating oil, plus 3 per cent. iso-amyl-nitrite.

Performance

As is usual with foreign engines, we had only one example of the G.25 on which to base our findings. However, concurrent with the G.25 test, we also ran a Super-Tigre G.26 model, which is identical in layout to the G.25, but of 1.5 c.c. capacity. Based on our findings here, which gave results much in the G.25 model's favour, we would say that our test G.25 may well be an above-average example, and/or that the G.26 was slightly below par. The specific output of the G.25 was certainly much higher.

No instruction leaflet was received with the Super-Tigre but the engine is not critical to starting adjustments and we had no difficulty in getting it started after "guesstimating" the required settings. One thing did emerge quickly from our preliminary tests. This was the fact that the G.25 did not start instantly following choking or priming; half a dozen flicks of the prop were generally required before the motor would burst into life, and it is necessary to remember this characteristic and to not twiddle the controls needlessly. The engine is not in the least *difficult* to start, however.

Under light loads (when the starting characteristics of so many diesels deteriorate badly) the G.25 is, if anything, better than under heavy loads. This Super-Tigre is certainly among the best diesels we have yet tested for its handling on small, high-speed props.

Torque testing the G.25 at first revealed little of its potential performance. As will be noted from the torque curve, the low speed performance is quite moderate, but rises somewhat at around 10,000 r.p.m., then declining only very slowly over the next 6,000 r.p.m. or so. Because this falling off of torque is so very much delayed, the G.25 reached its peak b.h.p. at exceptionally high r.p.m.—approximately 14,500 r.p.m. Thus, a peak output of nearly 0.091 b.h.p.—the best we have obtained for a 1 c.c. unit—was obtained despite the fact that torque at no time exceeded an equivalent b.m.e.p. of 48 lb./sq. in.

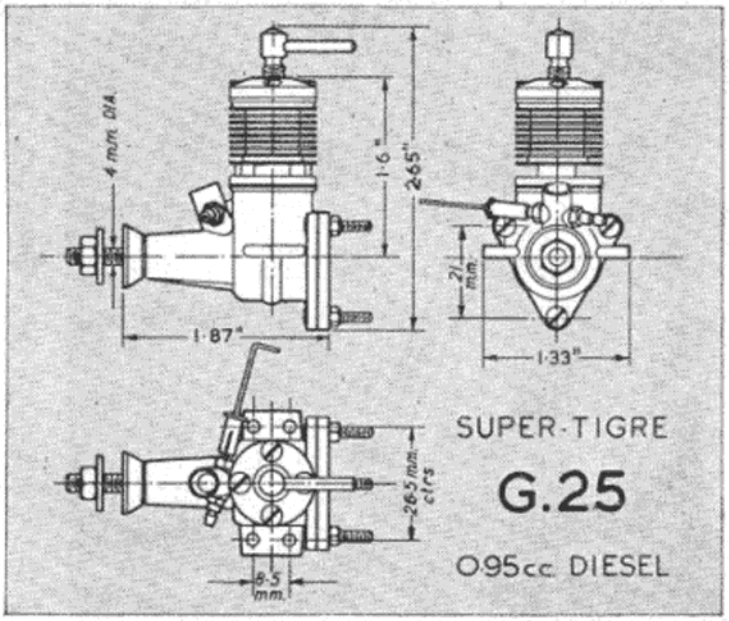
Running qualities of the G.25 were entirely satisfactory. It is definitely at its best above 9,000 r.p.m. and really comes to life at the five figure speeds.

The controls are smooth and effective in operation. Both the needle-valve and compression-screw held settings at all speeds tested. The large compression lever, though, perhaps, less pleasing in appearance than some of the smaller levers now seen on diesels, is certainly a lot more comfortable to handle. The contra-piston moves smoothly and without any tendency to seize in any position when hot.

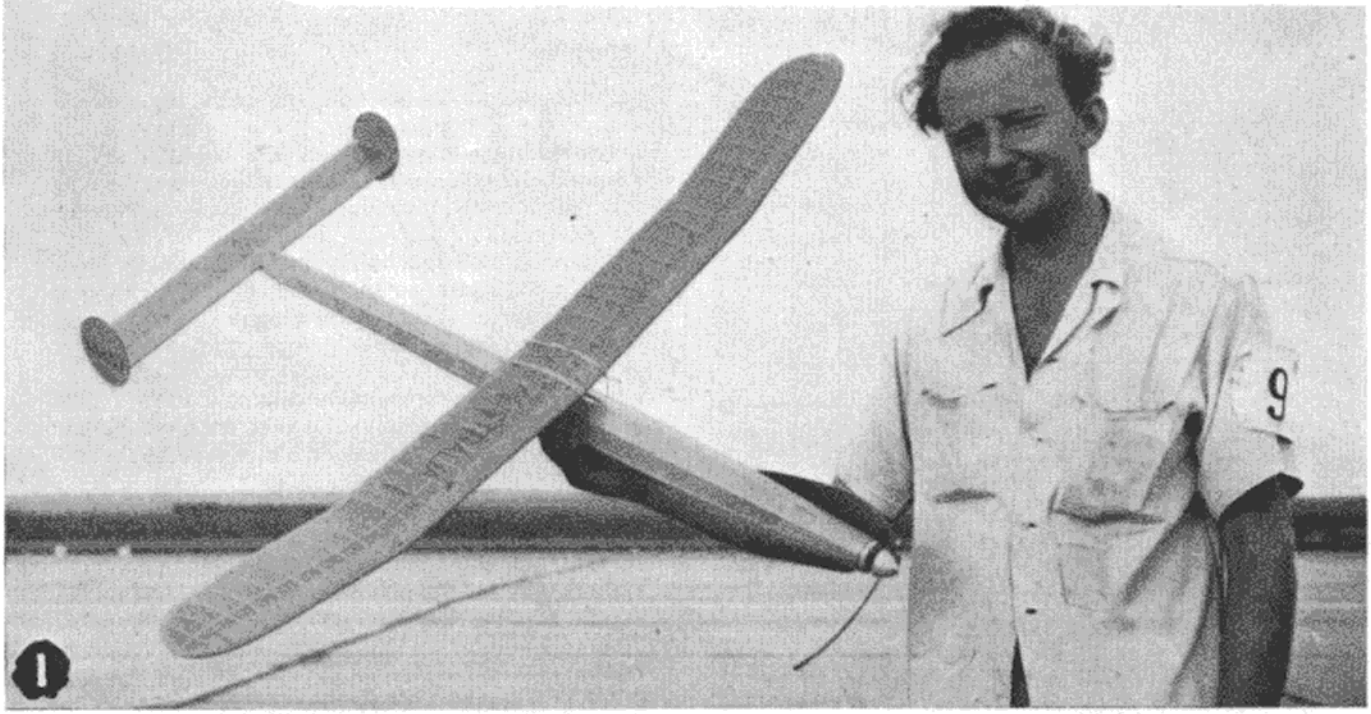
In order to utilise the Super-Tigre's good performance at the higher speeds, a prop not larger than 7 × 4 is suggested. A smaller size will be required if it is desired to run the engine close to its peak r.p.m. An 8 × 4 prop, however, can be used for non-competition type free-flight models, limiting speed to 7,000/8,000 r.p.m.

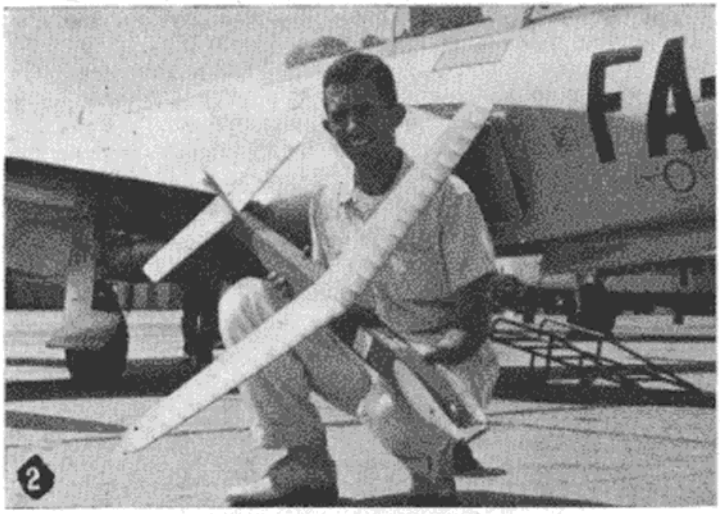
Power/weight ratio: (as tested) 0.58 b.h.p./lb.

Specific output: (as tested) 95 b.h.p./litre.



1954 WAKEFIELD and





Held at Suffolk County Air Force Base, Long Island, N.Y. U.S.A

REPORTED & PHOTOGRAPHED BY BILL DEAN

ELEVEN nations participated in the '54 Wakefield and FAI contests—which were sponsored by *Convair* and dubbed as the "World Model Air Olympics" this year—at the Suffolk County Air Force Base, Long Island, N.Y., U.S.A. Weather conditions were near perfect on both days (July 25th and 26th), with fairly abundant thermals and very little wind.

The Wakefield Trophy fell to Australia for the first time, with Alan King of Melbourne scoring five 180 sec. "maximums"—while Carl Wheeley headed the FAI results with 844 sec., to keep the F/F Power Trophy in the States for the next twelve months. Details of these designs are given on the accompanying three-views. Both *Team* Trophies also stayed in the U.S.A., with Argentina placing 2nd in Power and Britain 2nd in Wakefield team results.

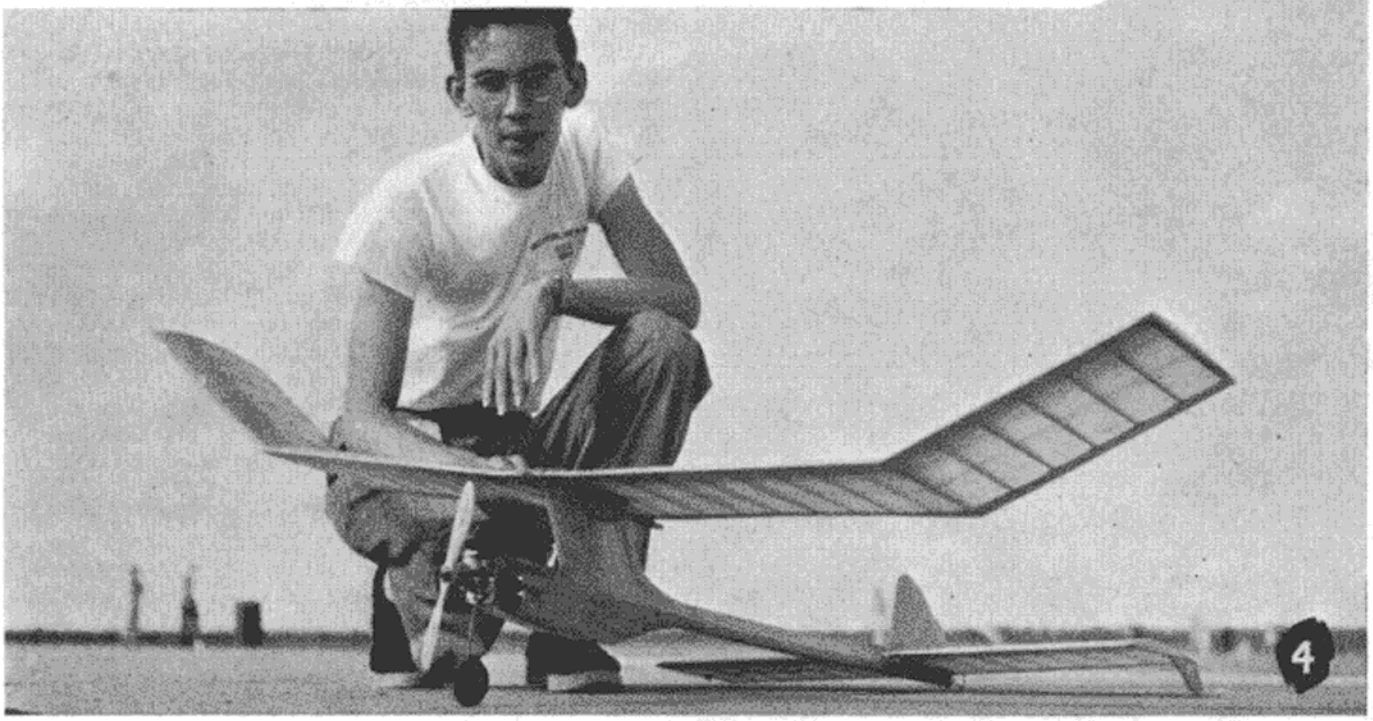
Of the 49 models entered in the two events, about a third were flown proxy by top American contest modellers—although all countries except Britain and New Zealand were represented by at least *one* team member actually in the field. The fine flying performances put up by "proxies" is readily apparent from the final results, with 2nd (Britain),

1. Alan King, 1954 Wakefield winner, with the reserve model he flew in round 5. His "first-line" model was lost in round 4.

2. Carl Hermes and Charles Jackson's G.B. model.

3. Manuel Andrade proxy-flying Alan Lim Joon's Australian entry.

POWER CHAMPIONSHIPS

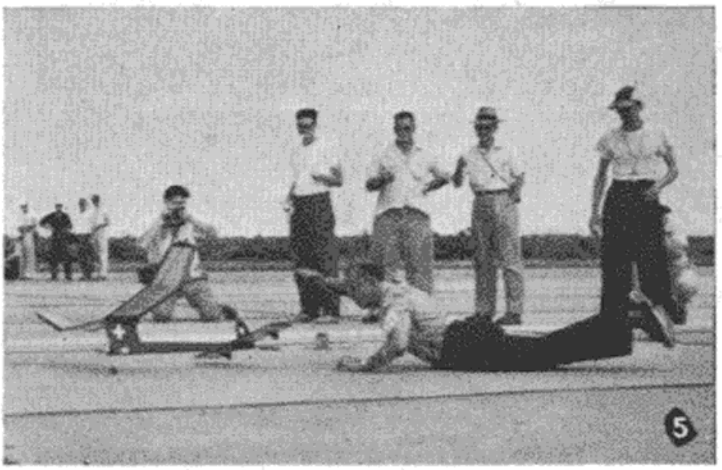


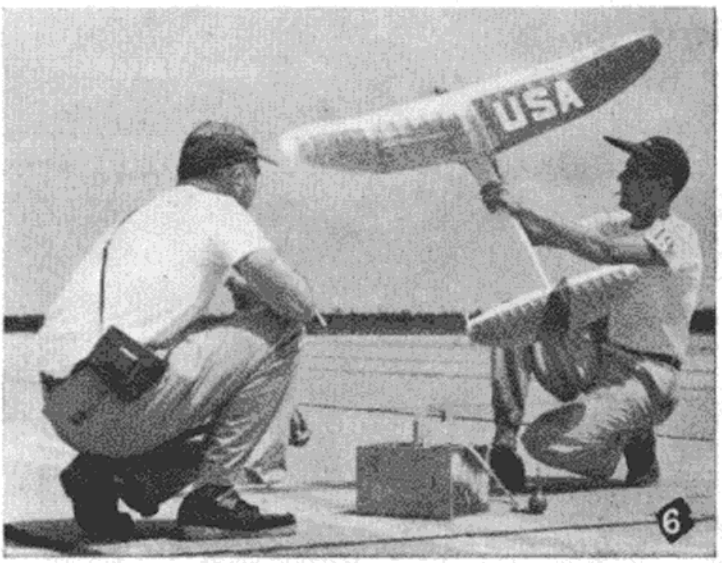
3rd (Australia), 4th (New Zealand) in Wakefield, and 4th (Britain) in FAI Power all being secured by the American boys.

Even after making allowances for a natural prejudice in favour of the British entries, our teams' chances of victory in both contests looked very promising right through to the final rounds. In the FAI event on the first day, our American namesake Bill Dean (of Winchester, Mass.) handled Johnny Gorham's Elfin 1.49 job as though it was his very own. He had three maximums and 119 sec. up on the score-board as the final round came up—only to be put out of the running by a choked jet which cut the motor run to about 4 sec. and gave a 5th round flight time of only 64 sec.

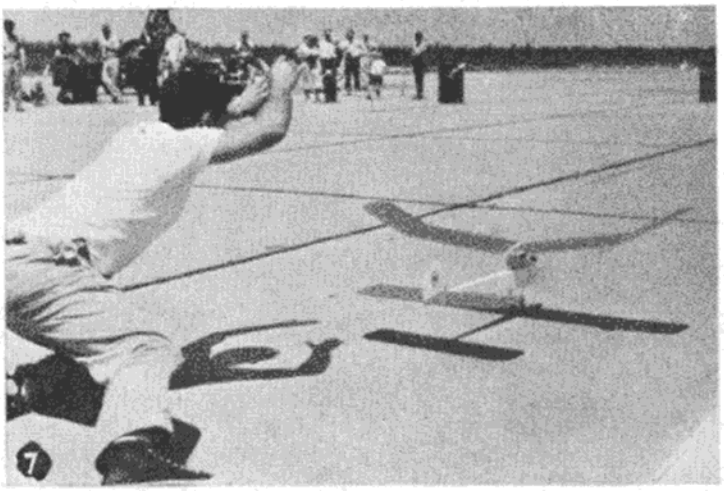
In spite of Silvio Lanfranchi officially representing Switzerland in the contest, we couldn't help but think of him as " still British "—and when he finally took 2nd place (with four maximums and 173 sec.), as far as we were concerned it was definitely an Anglo-Swiss effort! Dave Kneeland, last year's winner, was placed third this time, after becoming enmeshed in the king of all downdraughts on his last round flight, in which he needed 163 sec. to win, and only managed to chalk up 101.

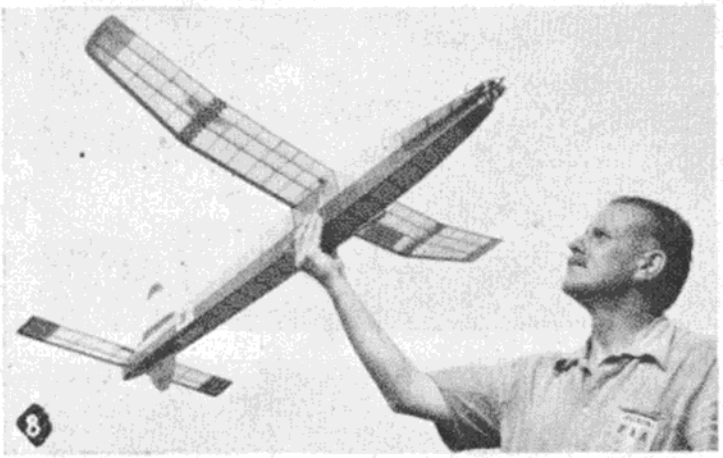
Unfortunately, the three remaining British F/F entries (belonging to Upson, Moulton and Buskell) did not fare at all well. These models were all flying fine on the evening before the contest and the proxies appeared well satisfied with their contest potentialities. However, on " the day," a string of mishaps plagued the American fliers, and the net result was that none of them was able to put up

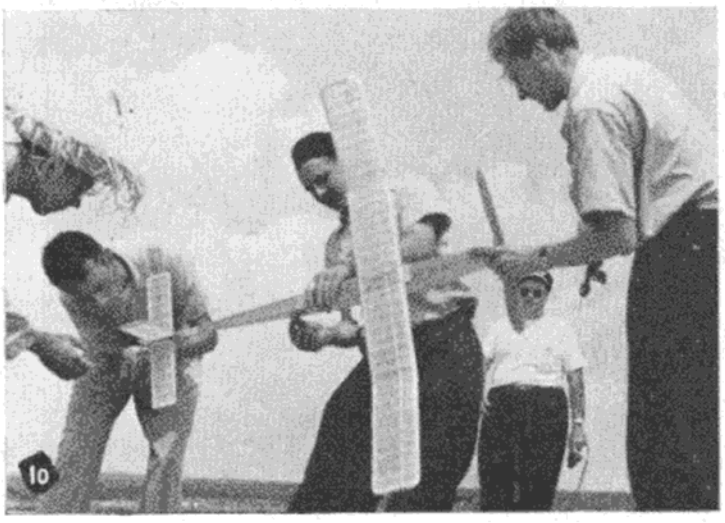




4. Carl Wheeley . . . The Power Winner!
5. Silvio Lanfranchi launching in the last round.
6. Dave Kneeland, last year's Power winner placed third.







flights in *all* five rounds. We won't dwell on the sordid details, but on one flight, Moulton's d/t tailplane operated under power and on another, the crankshaft in Upson's diesel sheered during starting operations.

At the Wakefield on the following day, it was wonderful to see Alan King's precise flying with his well-proportioned models—as he put up four maximums with his number one model, and then carried on to record yet another 180 sec. with his spare job in the last round. Back home in his native Australia, Alan is one of the top men in contest flying, having been their National Champion in '51, '52, '53 and runner up this year !

Our own Charles Jackson would have been very happy if he could have seen the efficient way in which '53 U.S. team member Carl Hermes handled his diamond-fuselage entry. Carl started off with a 146 sec. flight, then ticked off four easy maximums to place close behind King. The other British models placed 11th (Rockell), 19th (O'Donnell) and 23rd (Dubery).

It should be stressed that 16-year old Hughie O'Donnell's 19th place was gained on only *four* flight times. Close to the end of the last round, his motor snapped as the nose block was being eased into place—with the result that Cliff Montplaiser and his helpers had to carry out a lightning repair job. Coming out to fly with only two or three minutes left before the close of the contest, in the excitement Cliff " followed through " as he released the model and the flight was disqualified.

We wish there was space to include the many pleasant things the American proxies had to say about the British entries—the workmanship, the well detailed flight instructions, the way the models were packed and so on. However, condensing what they told us, it all added up to something like this: "We liked your models ; we did our darndest to flatten the opposition ; we would have liked to send you back at least one of the trophies and it's our sincere hope that the *next* British team will be able to attend all of the '55 Championships—wherever they may be held."

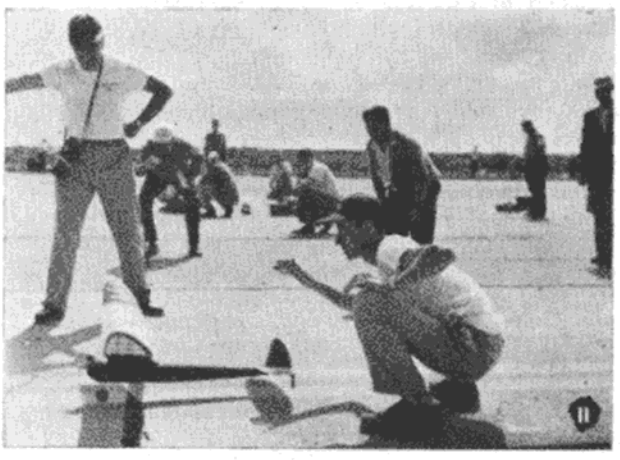
7. John Tatone (U.S.A.) releasing his entry.

8. Fabi Mursep (Argentina) with his model.

9. Bill Dean proxy-flew for John Gorham of G.B.

10. Arne Douglas Blomgren (Sweden) winding.

11. Ray Lagermeier launching his U.S. team entry " Zeek."



1954 WORLD RUBBER CHAMPIONSHIPS

INDIVIDUAL RESULTS FOR THE WAKEFIELD CUP

		1	2	3	4	5	Total
1. King, A.	Australia	180	180	180	180	180	900
2. Jackson, C. *(Hermes, C.)	G.B.	146	180	180	180	180	866
3. Joon, A. L. *(Andrade, M.)	Australia	180	143	180	180	180	863
4. Upton, J. *(Reich, G.)	N.Z.	180	180	180	124	180	844
5. Dunham, R.	U.S.A.	120	175	180	180	180	835
6. Blomgren, A.	Sweden	180	146	180	128	180	814
7. Joyce, P.	Canada	180	180	141	180	125	806
8. Mursep, F.	Argentina	152	169	120	180	180	801
9. Baxter, D.	U.S.A.	180	180	177	180	81	798
10. Gillespie, W.	U.S.A.	123	138	180	180	150	771
11. Powell, W. *(Quermann, D.)	G.B.	103	152	154	180	180	769
12. Mayes, C.	Canada	180	180	141	79	180	760
13. Ranta, S.	Canada	102	180	180	114	180	756
14. Hakansson, A.	Sweden	118	180	147	180	126	751
15. Wilson, D. (*Naudzius, E.)	N.Z.	107	180	98	180	180	745
16. Debatty, R.	U.S.A.	121	161	111	180	165	738
17. Leone, A. *(Hatschek, R.)	N.Z.	107	180	84	180	180	731
18. Bobkowski, A.	Guatemala	112	101	131	180	180	704
19. O'Donnell H. *(Montplaisir, C.)	G.B.	171	180	168	180	—	699
20. Altamirano, C.	Argentina	157	180	180	—	180	697
21. Benauidez, E.	Argentina	140	180	180	180	—	680
22. McKenzie, D.	Canada	154	95	129	117	180	675
23. Dubery, V. *(Kolb, J.)	G.B.	128	157	180	95	73	633
24. Pardo, J. *(Vargo, L.)	Guatemala	42	53	180	142	180	597
25. Miyoshi, K.	Japan	28	25	180	116	180	529
26. Colombo, E.	Argentina	77	70	180	88	—	415
27. Macauley, F. A. *(Colson, S.)	N.Z.	51	—	158	40	—	249
28. Pellecer, O. V. *(Renaud, L.)	Guatemala	—	—	34	—	180	214

* Proxy.

TEAM AGGREGATES FOR THE F.M.A. CUP

1. U.S.A.	2404	6. Australia	1763
2. G.B.	2334	7. Sweden	1565
3. Canada	2322	8. Guatemala	1511
4. N.Z.	2320	9. Japan	529
5. Argentina	2178		

1954 WORLD POWER CHAMPIONSHIPS

INDIVIDUAL RESULTS FOR THE F.M.A.F.O.M. CUP

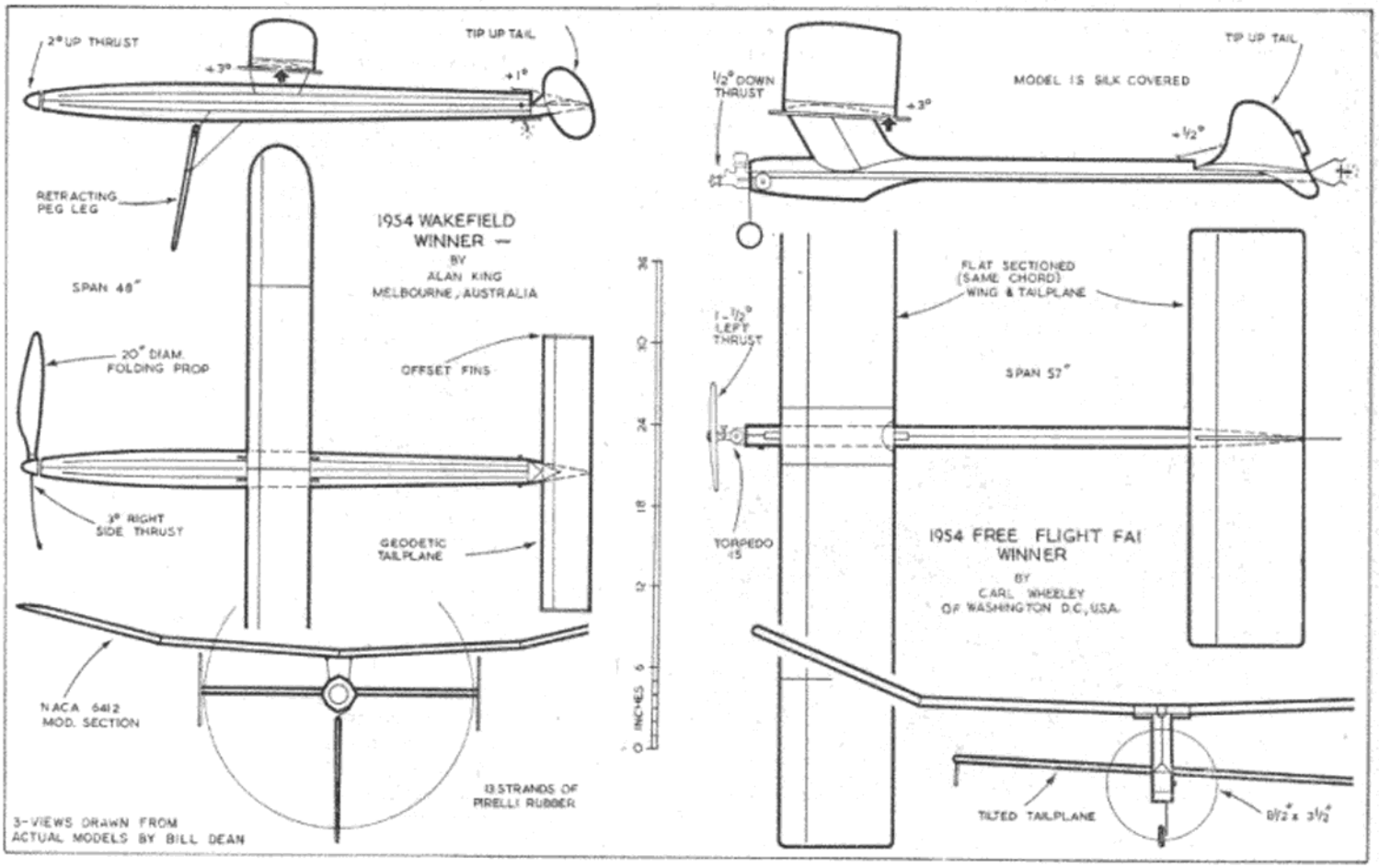
		1	2	3	4	5	Total
1. Wheeley, C.	U.S.A.	180	135	180	180	169	844
2. Lanfranchi, S.	Switzerland	180	118	180	173	180	831
3. Kneeland, D.	U.S.A.	180	180	142	180	101	783
4. Gorham, J. *(Dean, B.)	G.B.	180	180	119	180	64	723
5. King, A.	Australia	180	92	148	60	180	650
6. Stajer, F.	Argentina	112	92	180	138	107	629
7. Etherington, W.	Canada	180	180	88	—	180	628
8. Meduri, J.	Argentina	47	151	180	94	130	602
9. Hagel, R. *(Hakanson, A.)	Sweden	113	180	48	80	180	601
10. Lastra, O.	Argentina	62	72	101	180	180	595
11. Tatone, J.	U.S.A.	102	180	—	115	180	577
12. Lagermeier, R.	U.S.A.	—	—	180	180	180	540
13. Bousfield, K.	Canada	180	180	—	26	65	451
14. Upson, G. *(Parmenter, F.)	G.B.	105	—	—	125	180	410
15. Quevedo, J.	Guatemala	76	112	57	126	34	405
16. Hillicoat, F.	Argentina	34	54	69	68	169	394
17. Mackenzie, R.	Canada	51	33	180	51	75	390
18. DeCosio, C.	Mexico	88	180	—	—	—	268
19. Graves, J.	Canada	—	86	—	63	94	243
20. Moulton, R. *(Elgin, J.)	G.B.	120	—	48	—	—	168
21. Buskell P. *(Hager, F.)	G.B.	—	—	—	—	—	—

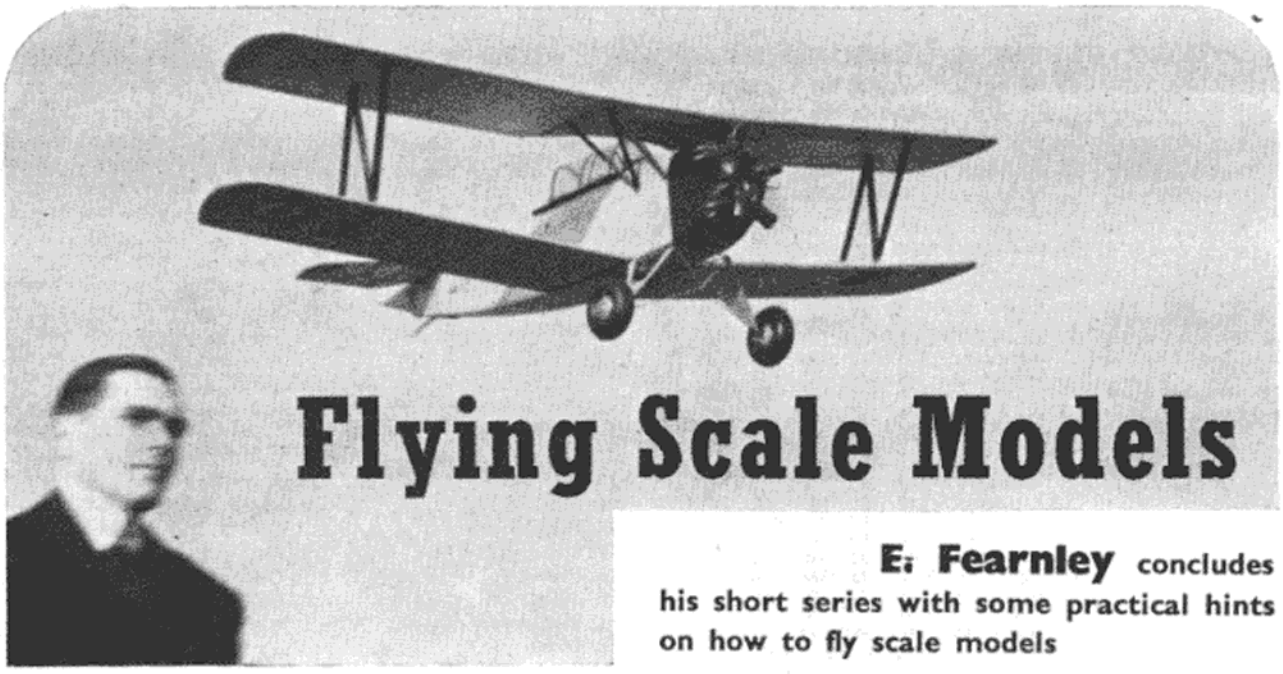
* Proxy.

TEAM AGGREGATES FOR THE FRANJO KLUZ TROPHY

1. U.S.A.	2204	6. Australia	650
2. Argentina	1826	7. Sweden	601
3. Canada	1712	8. Guatemala	405
4. G.B.	1301	9. Mexico	269
5 Switzerland	831		

THE WINNING MODELS





Flying Scale Models

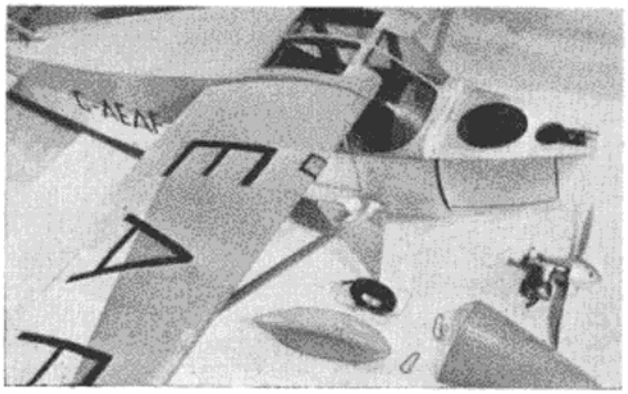
E. Fearnley concludes his short series with some practical hints on how to fly scale models

THE first in this series last month was rather a sticker-out-of-necks effort for me, but I hope the contest boys will take it in good part.

Let's get down to the question of *flying* scale models, for this is where most come unstuck. My opinion is that a model's future as a flier is cast as soon as a plan is pinned on the board. Most builders of scale stuff worry so much about the details of the scale effect, that they forget about the flying side until the fatal day they test-fly. Believe me, it's no good being an armchair modeller with this type of model. The best advice I can give at this stage is—during the building session, go out and fly a plane if you have one, just to keep you in touch with the purely practical side of the game. It keeps your sense of proportion.

A nasty landing or two, and you will rush home and put another brace on the undercarriage of the part-built job, just to be sure. In scale work it pays to be sure. That is why I like this section of the hobby. The factor of safety is more like full scale design, and skill in designing is so much more necessary. Each piece of wood must play its full part efficiently.

There is much talk of whether a model is suitable for scale modelling. I have found that the modern diesel engine allows structures of good strength/weight ratio to be fitted to a wide range of designs. Within very wide limits, if a model has a wing or wings of reasonable area, allowing a loading of about 6-10 oz./sq. ft. in a medium-sized model, a tail of fair percentage and a moment arm sufficiently long, wheels in a fair forward position and if possible good nose area for spiral stability, then if it is designed right, it will fly every time—provided the builder realises that you can't have the penny and the bun. If you want a mass of detail, the loading will be beyond the safe limit, and the extra weight is parasitic—it doesn't add strength. A fast model is quite safe if the weight is put into strength. My Foster Wikner *Wicko* (M.A. plans service) takes off at almost 40 m.p.h., with a hot Elfin in it, because I have trimmed this model out for windy flying with a fine angle between wing and tail, and carefully adjusted thrust line to propel the model straight into the wind. It will still glide in quite slowly though, and it takes quite a knock to worry this model.



Nose details of the author's Foster Wikner "Wicko."

Let us assume that you, the perfect modeller that you are, have just finished your scale job, taking care in building strength where it is needed, and keeping the weight down where it isn't. It is smart, looks like a real plane, but detail has not been carried to excess. There it stands in its new coat of dope as yet unmarked by stale fuel, with a faint aroma of dope still in the air. You have reached the danger point. Once you get on the field, it will be in for a penny, in for a pound, so now is the time to do a little vetting before the worst happens.

Waste (if you can use the word!) a whole night checking over the set-up of the plane. Better still, waste also the day you were going to test fly, which is too windy really but you would have risked it, fool that you are!

Take out the plan which you think you have finished with, and check by every means in your power whether the wings and tail are lined up as they should be. The longitudinal dihedral—the angle between wings and tailplane—is vital, so make twice sure of this. Is the rudder dead straight, viewed from the nose? Are the surfaces free of warps? If not

remove by heating over a fire and twist against the warp, holding until it cools to trueness.

Now comes the main worry of any power flier. The thrust line. This must be right, or disaster will be your future. It must also be possible when you get to the flying ground to be able to adjust this thrust both downwards and sidewards as necessary. Provide for this *now*. Washers can be used under the motor lugs to provide this in one direction, while elongated bearer holes are useful for movement in the other direction. It is my policy to put on too much down thrust with washers before first flights, for added safety, and this can well be done now. It can do no harm, and may save a nasty stall later. The average model will want side thrust to the right (viewed from the top) to counteract torque and the resulting spin to the left in flight. If it is stated on the plan, be exact. If nothing is stated, it may vary between 2 and 5 deg., although one model I had with a warped fuselage would only behave when 10 deg. of side thrust was added ! So if more or less than the designer has stated becomes necessary, don't shoot him, it may be your own fault !

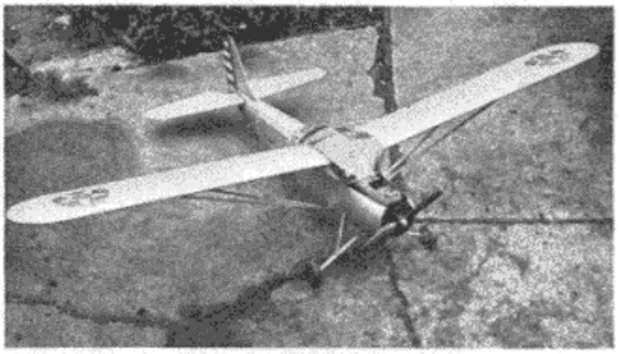
You are now about ready for the field. Apart from fuel, it is as well to take :— clean rag, pliers and/or spanners for the bearers, small screwdriver, plasticine or lead weight material ; various scraps of wood in varying thicknesses will be useful if provision is made for packing wings or tail, etc., and pins are also useful. A small cement tube will be needed, not for repairs, we hope, but to fix the packing in place before it is lost. If your wing struts, etc., require threading with elastic bands, a wire hook is desirable.

If it is dead calm we can start. If it isn't, wait till it is. Evening is the best time. One fundamental fact must be understood. The model has two states of flight : the power flight, and the glide. The glide *must* be right before power is applied, and any settings made to give a good straight glide *must not be altered for power*. Provided that the glide trim is set, alterations from then on to give good power flights are confined *only* to alterations in the thrust line, and nothing else ! Whatever any " expert " tells you, this is a law of trimming a scale model which must never be broken.

Start then with gentle hand launches over long grass. Keep this procedure up until you are satisfied that the model is giving a straight glide, without veering one way or the other, using rudder trim. If the model is not gliding well, adjust the tailplane up or down by about 1/32 in. at a time until as flat a glide as possible is attained, or add or take out weight in nose or tail. Secure this packing, and pin the tail so that it cannot slip during power runs.

A runway is an asset at this stage, for I prefer to r.o.g. for scale tests. Motor revs. are kept down to taxi-ing speed at first, and if the model veers to the left or right, check firstly a poor undercarriage, and secondly the right thrust line setting of the motor.

Repeated turns one way on these dummy runs is a warning. I failed to take this myself recently, being human, and results were vicious left turns in the following flights, with some removal of the wing tips on the runway. If the model goes reasonably



A sixty-four inch span " Vultee Vigilant " by Eric Fearnley.

straight up wind, with tail up, there is every hope of a good flight with more power. If you have taken my previous advice with down thrust, the model will not stall under more power, and it may be that some of this thrust can be removed to give better climb, though caution is the watchword here.

If this advice is carried out, the model will fly pretty well from the word go, for the glide is guaranteed first, and power flight is kept in its proper place by judicial use of down and side thrust *before* it does the damage.

Without the luxury of a runway, hand launches are of course the only alternative. Use your long grass again, and keep the power down to power-glides at first, after which the rules apply. At all times watch for a steep turn in flight or on the runway. Any turn at all is best to the left with a normal model, but the wider the radius the better at first.

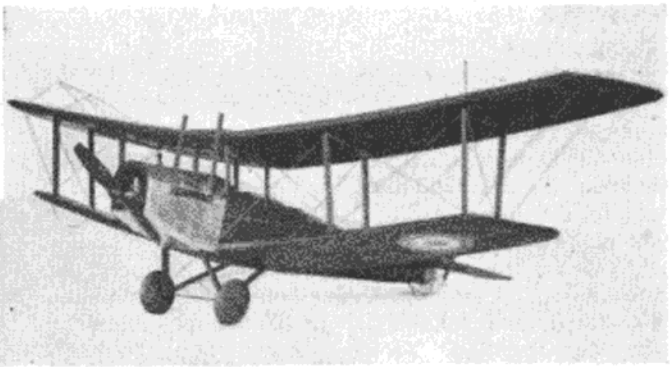
Final warning. Fix all your bits and pieces properly when the model flies well, for the next time. The elation at having a well trimmed model flying around is apt to make one forget this !

If I have helped some of the less experienced scale modellers, I will be happy. I think the ranks of scale modelling are widening all the time, and I hope I have dispelled some of the dismal Johnnies who are pessimistic about this type of flying.

There's plenty of fun in scale flying, and some satisfaction can be got from the knowledge that it is one of the most exacting sections of the hobby both on the board and field. There aren't many cups for it, but plenty of good flying, and you are less likely to fall out with your friends away from contests, where tempers get high at times !

The plans of Fearnley's " Wicko " were published last month.

THE CURTISS JENNY



A free-flight scale model for ·5 c.c. engines by

P. M. H. Lewis

MANY pilots of the Great War remember the Curtiss *Jenny* with its 90 h.p. Curtiss OX-5 V8 motor as the aircraft on which they learnt to fly. It was in use at both British and American schools and continued to be flown on barnstorming tours in the U.S.A. for many years, providing thousands of first flights and exhibitions of wing walking and aerial trapeze acts. The span was 43 ft. 9 in., length 27 ft. 1 in. and top speed approximately 70 m.p.h., all-wood construction being used with fabric covering.

The original model is powered by a Frog 50.

The Fuselage consists of $\frac{1}{8}$ in. sq. hard balsa. Two frames are built on the side view, one above the other. When dry, separate them with a razor blade and join with cross pieces, working from the rear towards the nose. 18 g. wire centre-section struts are now bound and glued in place together with the undercarriage vees which are shaped from one piece of wire. Add the tailplane struts and tailskid also from 18 g. wire. The semi-circular $\frac{1}{16}$ in. sheet formers are next cut and cemented in position and faired with $\frac{1}{16}$ in. sq. stringers. $\frac{3}{8}$ in. × $\frac{1}{4}$ in. hardwood bearers are drilled and bound with thread to prevent splitting. Cement them in position to accommodate the motor in use, the rear ends passing through slots in the $\frac{1}{8}$ in. sheet bulkhead. The fuselage from the nose to the rear cockpit is covered with $\frac{1}{16}$ in. sheet, a soft block being shaped and hollowed out to cover the top of the motor bay. $\frac{1}{16}$ in. ply front plate is pinned and glued to the bearers and the space below the motor bolts is filled with a piece of 3/32 in. sheet hinged with tape to provide access for mounting. The centre-section struts are faired with 3/32 in. sheet and the 18 g. axle bound and soldered to the vees.

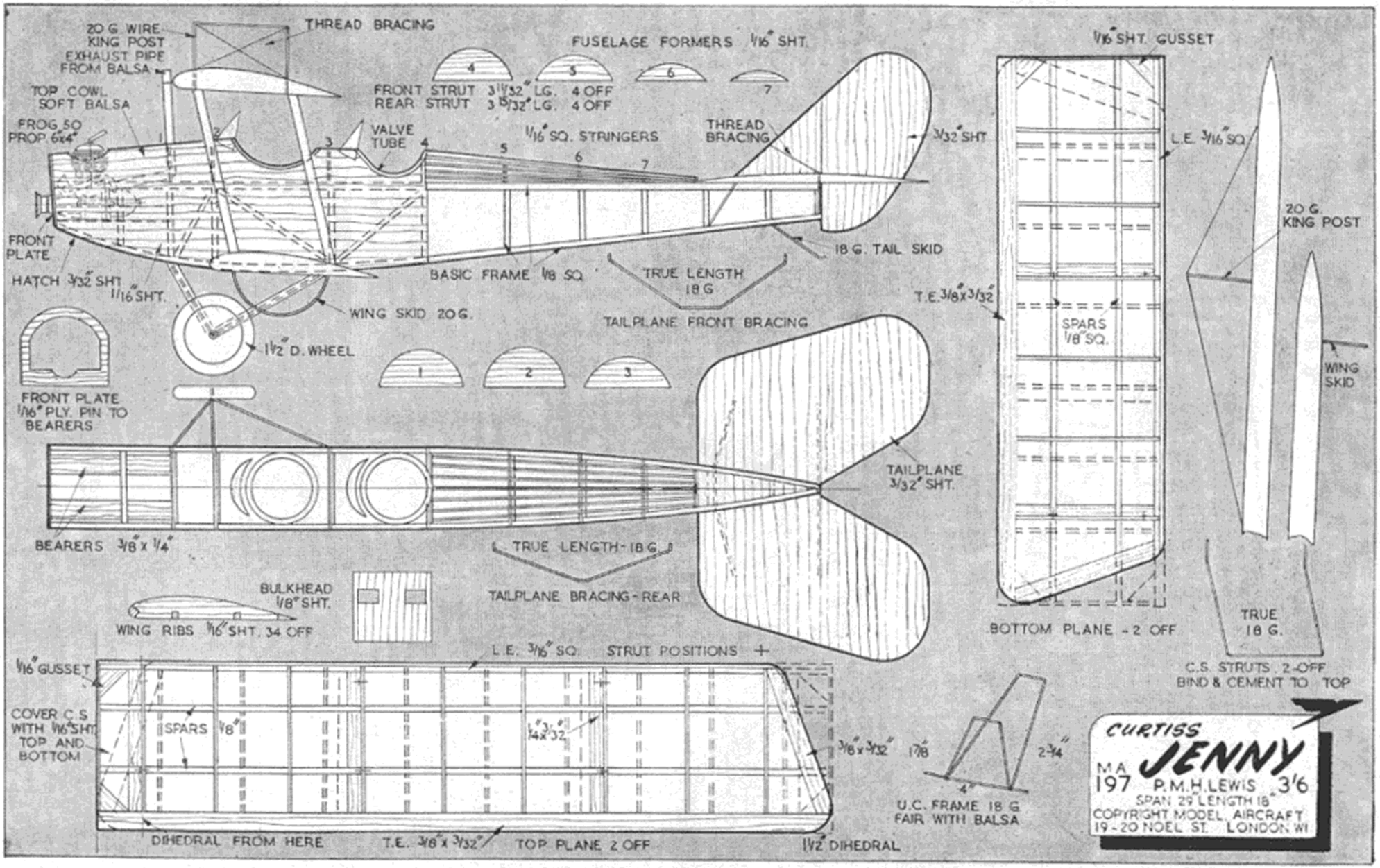
Wings. Pin the $\frac{3}{16}$ in. sq. leading edge and $\frac{3}{8}$ in. × 3/32 in. shaped trailing edge in place for the top wing which is built in one piece. The two spars consist of $\frac{1}{8}$ in. sq. hard balsa. The required number of $\frac{1}{16}$ in. sheet ribs should now be cut and cemented in their respective positions. The wing tips are of the same material as the trailing edge. $\frac{1}{4}$ in. × 3/32 in. braces are fitted as shown to accommodate the interplane struts and the centre section is covered above and below with $\frac{1}{16}$ in. sheet. Crack the wings outboard of the centre-section and set and glue for correct dihedral, fitting corner gussets to strengthen the joints. Port and starboard lower wings are completed in the same way, the root ribs being set for dihedral angle. In addition, $\frac{1}{4}$ in. sq. blocks are fitted to take the interplane struts.

Tail Unit. Horizontal and vertical tail surfaces are cut from 3/32 in. sheet to the outline shown and are then sanded to streamline section. If necessary, butt-joint to obtain the required width of sheet, the grain running as shown.

Covering. The entire model is covered with heavy-weight tissue and water-sprayed. When dry, three coats of clear dope are applied. All upper and side surfaces are then given one coat of matt green dope, the under sufaces of wings, fuselage and tail being left in the natural colour or cream-coloured. Red, white and blue roundels are placed above the upper and below the lower wings and on each side of the fuselage together with red, white and blue stripes on the rudder, blue forward and red aft.

Assembly. The *Jenny* is now ready for assembly and the tail surfaces are first glued in place, followed by the top wing and then the lower wing panels. When thoroughly set, cut the interplane struts to length and point the ends. They are now firmly cemented in position. The 1½ in. dia. celluloid wheels are retained by a soldered washer and the nose forward of the centre-section struts is covered with tin foil glued on. Rubber valve-tubing is fitted round the cockpit edges and celluloid windshields slotted into the top decking. Bracing wires are represented with dark grey shirring thread suitably tensioned. 20 g. wire wing tip skids and kingposts are pressed into the struts and the exhaust pipes and engine details are added with balsa. The motor is bolted in place and a 6 in. × 4 in. propeller fitted.

Flying. Add weight to the nose or to the tail as indicated by gliding tests over long grass and adjust power flights with down- and side-thrust as required in conjunction with the rudder.



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 19-20, NOEL STREET, LONDON, W.1, 3s. 6d., POST FREE

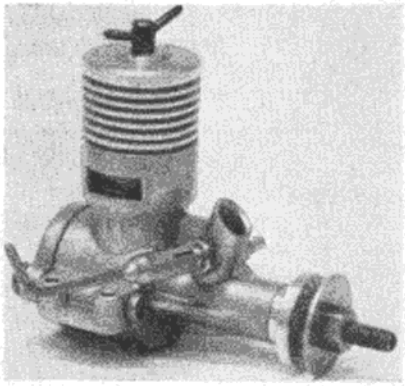
OVER THE COUNTER

A new diesel engine with a future, called the Merlin, is in production by **Davies Charlton,** and is shown in the accompanying photograph. It is of 0.8 c.c. capacity and is being produced primarily for export, as the choice of the engine size to fall in the popular 049 American class indicates. The engine is a neat unit which weighs about 1¾ oz. and stands less than 2 in. high. As the illustration shows it can be either radially or beam mounted, and features an angled needle valve to keep the fingers clear of the prop. Initially, before we conduct proper engine tests, it is safe to say that the Merlin is easy to start and possesses a lively performance. Priced at 47s. 6d., this new engine should be a winner.

* * *

The latest addition to the **Jetex** range of prefabricated flying scale models is a 9¼ in. span Douglas *Skyray*. The kit, which builds into an attractive flying model, is designed for the 50B unit with augmenter tube, and comprises moulded and precut parts to the usual high standard associated with the Wilmot Mansour productions. The kit and a finished *Skyray* are shown in the illustration at the bottom of the page. The access hatch for the 50B unit is secured by the new and ingenious "hatch catches." The kit is now on sale at model shops and costs 10s. 6d. including tax. Two further models in the same series, the *Super Sabre* and *Skyrocket* will be ready very shortly and employ the same "tailored" methods of construction. On the stocks for production later this year is a larger model of the Gloster *Javelin* which will be powered by the Jetmaster or Scorpion units.

A handy little thirty-two page booklet packed with information and hints on how to tackle gluing problems is published by Leicester, Lovell & Co., the manufacturers of the well-known **Casco** glues. The index on specific applications for



the glues starts with Archery and ends with Whitewash, and covers in an informative and well illustrated style a whole list of uses between, many of them unusual and interesting applications. The booklet can be obtained by sending in the coupon enclosed in a tin of Casco glue.

Peter Smith, of Croydon, announces that the prices of **Bondaglass** cloth and resin are now reduced. This is due to price cuts by the manufacturers of the raw materials. The Bondaglass No. 1 kit, which is recommended for starters, now contains 72 sq. in. of glass cloth in addition to the glass tape and resin it contained before, and is repriced at 5s. 0d. plus 10d. purchase tax. The prices for glass cloth and resin which can be obtained separately are also reduced and are now, for resin (including catalyst) quantities of 2, 4 and 10 oz., 2s. 6d., 3s. 9d. and 7s. 6d. respectively. The glass fibre cloth 3 sq. ft., 3s. 0d. and 6 sq. ft., 5s. 0d.

* * *

The Model Shop, Newcastle, announce a 26 in. span glider that is designed especially for the beginner. Called the Keelbild *Gemini*, it is of straightforward construction with a cut-to-shape balsa fuselage and tail unit. The wing is of usual construction, tissue covered, and is detachable for easy transporting. A model of this description should prove ideal for the beginner as when it is reasonably built it has a sound performance. The price is 6s. 0d. Another kit in the Keelbild range is a rubber powered model of the Supermarine Schneider Trophy winner.

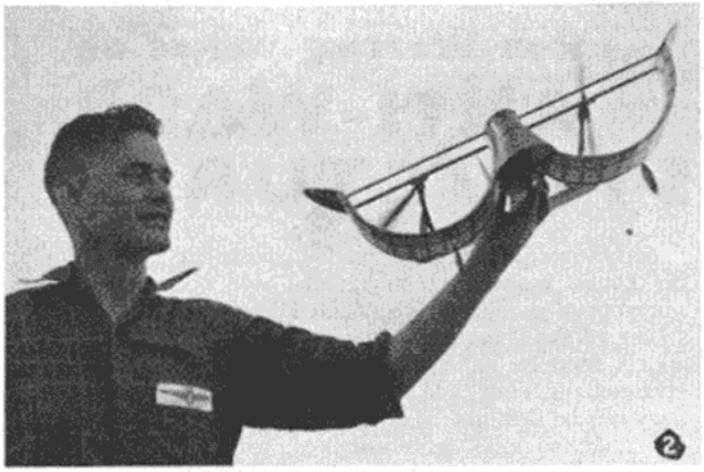
* * *

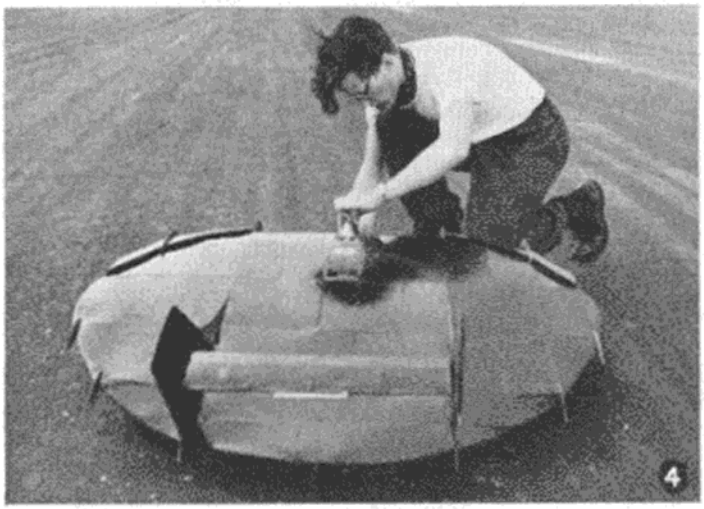
Dr. Good—Fellow A.M.A.

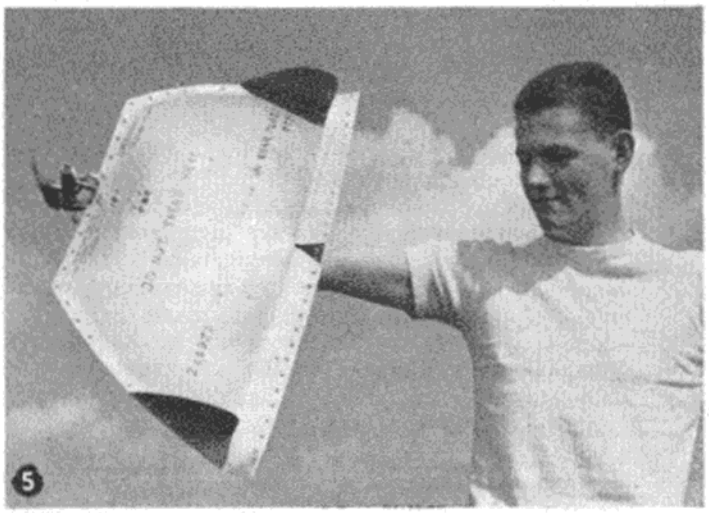
Dr. Walter Good, who has probably done more than any other single individual in America to foster the development of radio control in that country has been awarded a life membership and Fellowship of the (American) Academy of Model Aeronautics. It was, in fact, largely due to his efforts that United States radio modellers have been granted licence free transmitting facilities, as in this country.

R.A.F.M.A.A. CHAMPIONSHIPS

An outstanding feature of this year's Royal Air Force Model Aircraft Association Championships, held at Horsham St. Faith, Norfolk on August 14th and 15th, was the originality and inventiveness displayed by the majority of the entrants. These qualities were particularly in evidence in the event for unorthodox models which included almost every conceivable type of flying machine and some which were decidedly "out of this world." There were helicopters, autogiros, canards, deltas, a balloon—in fact the lot!—and yet their ingenious designers managed to get them airborne, much to our amazement and (we suspect) their own also in some instances!







1. F./Lt. Robertson added to a "Met" balloon a basket fully equipped with pilot, deerstalker and blunderbuss.

2. Cpl./Tech. Edwards of St. Athan entered this channel-wing model.

3. F./Lt. Coutts-Smith won the concours and was 2nd in free-flight scale with this Luscombe.

4. A arge size in flying saucers by Cpl. Tundall of Abingdon.

5. J./Tech. Parkinson's "model" was mainly a Meteor fairing panel, but it flew!

6. An impressive tandem-wing effort by Sgt. McHard of Wellesbourne-Mountford.

A FINE EXAMPLE OF GEODETIC CONSTRUCTION BY JOHN O'DONNELL

Ron Warring writes on

ANTI-WARP STRUCTURES

CONVENTIONAL model airframe structures are quite prone to distortion after covering and doping—a process generally known as warping. Some " natural " warps are not necessarily harmful to a model's performance and may, indeed, give certain desirable aerodynamic characteristics. Wing warping, too, is often used as a method of trimming power models, particularly as increasing the rigging incidence of one wing, or giving it wash-in, has been found extremely effective in giving extra " lift " under power (to counteract propeller torque) and increased " drag " on the glide to give a natural circle in the opposite direction.

Warps, used deliberately in this manner are part of normal trimming methods—just as the use of wash-out on wings is a stability feature. To be properly effective, however, these must be *controlled* warps—their nature pre-determined and *fixed*. The danger resulting from unanticipated warps is that they may not be of the kind required (or beneficial to performance) and may vary in magnitude from time to time, with changing effects on trim. Unwanted warps may be corrected on covering wings, etc., e.g., by steaming or heating to soften the doped covering, twisting true and holding in the " true " position until set, but such remedies are not always permanent. Generally the unwanted warps tend to creep back in again.

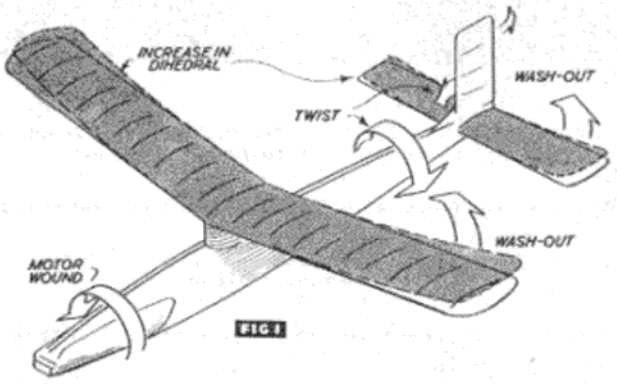


FIG. 1

Structures which warp readily are to be avoided on contest models (which have to hold a trim) and on types of models which are at all critical on trim. Many of the " natural " warps can be tolerated on sports models, or corrected by other means (e.g. trimmed out), but even in such cases their appearance may not be desirable. There is, in fact, a good case for studying the possibility of using anti-warp structures on all types of free-flight models.

The " natural " warps associated with conventional model airframe construction are detailed in Fig. 1. The components chiefly affected are usually the wings and tailplane. The fin may also be subject to twisting if a lightweight structure is used. In the case of the fuselage, only in rubber models is lack of rigidity likely to be noticed where the whole fuselage tends to twist under the torque of a wound motor, causing the tail unit to rotate out of line with the wing.

The common warp associated with most wings is a bowing upwards or tendency to produce an elliptic dihedral, with a consequent increase in the effective dihedral angle. From the aerodynamic point of view this is quite a *good* feature for it is generally better to have too much, rather than too little, dihedral on any free-flight model. Unless the wing structure is " balanced " chordwise, however, almost certainly this bowing will be accompanied by twisting —generally resulting in the trailing edge bowing upwards more than the leading edge because it is less resistant to bending than the other (deeper) spars. As a result the tip portion of the wing becomes twisted to assume a smaller angle of incidence than the centre, i.e., the wing tips assume wash-out—again a desirable aerodynamic feature on most models.

With a plug-in wing the result is rather more complex. Wash-out tends to warp into the tips and also the *root* section so that the whole wing panel suffers a continual change in incidence from root to tip, first increasing, then decreasing. Once more this has not proved harmful on contest models,

provided the warping effects are not unduly exaggerated.

Covered tailplane structures tend to react in a similar manner—bowing upwards to a dihedral angle and also washing-out or twisting. Fins, being symmetrical in structure, are usually less prone to bow or bend but, if lightly constructed, particularly susceptible to twisting. Here, of course, a twisting effect is most *un*desirable.

"Natural" wash-out is not necessarily permanent. If a wing is pinned down flat after waterspraying and doping and not removed until dry it may appear flat and true at this stage. But within a day or two it is most likely to show a distinct warp, unless an anti-warp structure is used. During an ageing period of at least a week a new, unsupported wing may undergo changes of this nature which may then be regarded as fairly permanent.

If the structure has little warp-resistance, however, further changes may occur from time to time—more "bowing" and twisting in a warm, dry atmosphere (particularly on exposure to sunlight); slackening off and a decrease in wash-out in a damp atmosphere. Only small changes of this nature are needed completely to upset the trim of a finely adjusted contest model particularly on the tail unit components. Such effects can largely be overcome by the use of anti-warp structures.

The essential requirements of any anti-warp structure are that it must resist both bending and twisting, and also produce no appreciable weight penalty. Obviously, if weight were of no great importance, a rigid structure could be produced simply by increasing the number and size of the spars used, employing more rigid materials throughout. It is also emphasised that *bending* resistance must be considered as well as torsional (twisting) resistance as the one can affect the other to a marked degree.

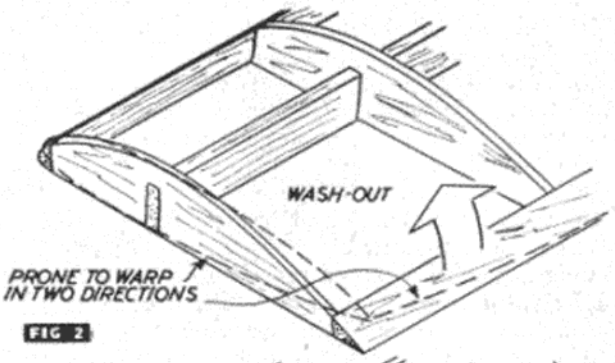


FIG 2

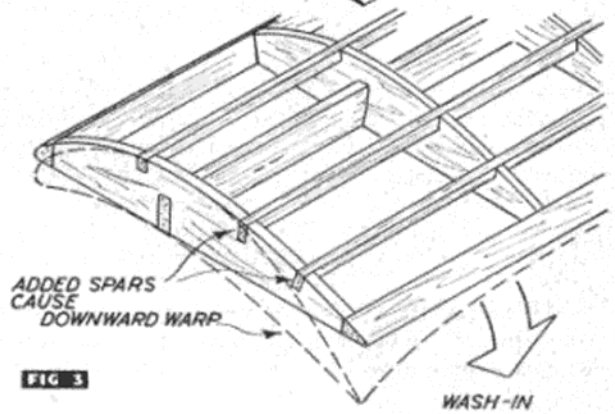


FIG 3

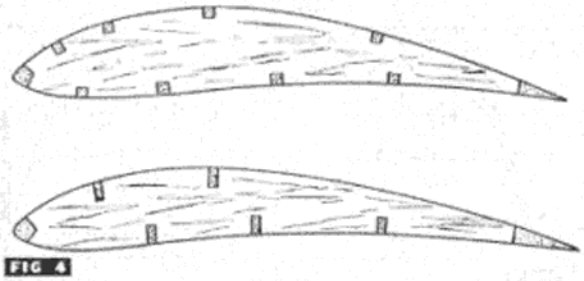


FIG 4

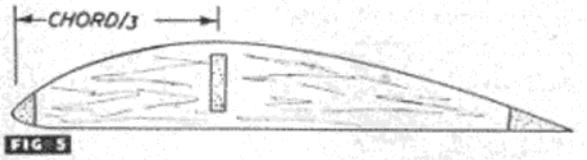


FIG 5

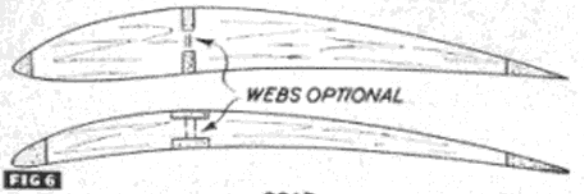


FIG 6

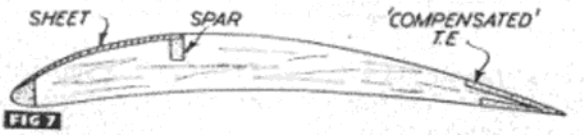


FIG 7

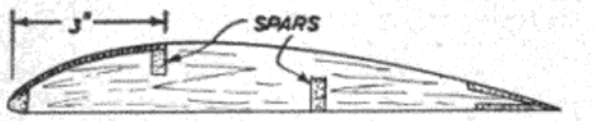



FIG 8

Resistance to bending is largely dependent on the size and location of the spars. By considering the two together we can also use spar location to offset twisting effects. For example, starting with the simple monospar wing section of Fig. 2, we know that this has a tendency to warp upwards, as shown exaggerated in the diagram. Additional spars located on top of the section, as shown, will resist this effect strongly. Since these spars also carry a good proportion of the bending load, the size of the original mainspar can be reduced accordingly, so that only the same *volume* of wood may be used for the multi-spar arrangement.

It is very easy, though, to overdo this effect. In an attempt to make sure that the wing will not warp upwards more spars are added to the top surface as in Fig. 3, when the resulting structure will almost

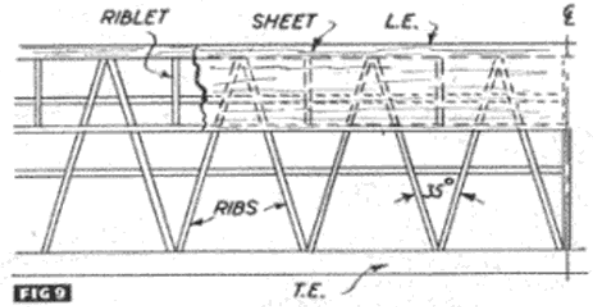


FIG 9

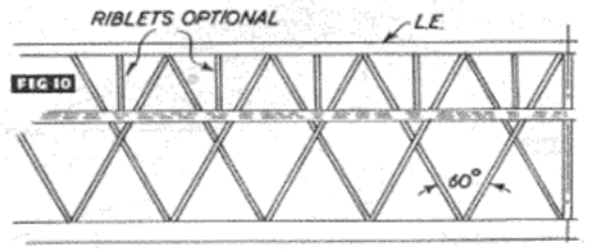


FIG 10

NOTE: VARIOUS SPAR SYSTEMS SUITABLE

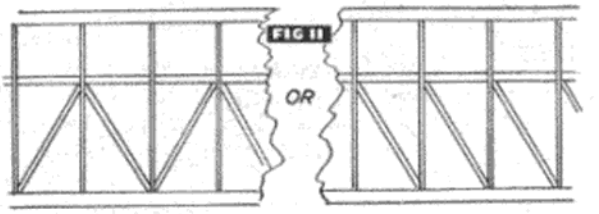


FIG 11

certainly warp in a *downward* bow, giving appreciable anhedral to the trailing edge and slightly less to the more rigid leading edge. The tips will now have wash-in or an increase in incidence, which is bad aerodynamically.

The answer to this is that although multi-spar arrangements can be used to give a structure resistant to bowing the spars must be balanced about the section if the component is to remain *flat*. It is difficult to give general rules on this point for spar sizes and location will depend to a large extent on the quality of the material used for the spars and the relative sizes of leading and trailing edges. Two typical arrangements are shown in Fig. 4, both using about the same total spar cross section as that of a normal single- or two-spar system, with spar sections about balanced, top and bottom. Note particularly the positioning of the rear top spars supporting the trailing edge against warping.

Multi-spar wings are light and rigid—excellent for small models (wing area up to 200 sq. in. and maximum weight 8 to 10 oz.) but are apt to be weak locally. Similar rigidity with increased local strength means an increase in spar section throughout (with increased weight) or the adoption of a different type of structure.

Concentrating on maximum resistance to bending, a very deep spar is desirable. Locating this through the centre of the ribs (Fig. 5) is better from the "balancing" point of view than the usual method of slotting it into the bottom of the ribs. Better still, we can use less total spar section and arrive at a similar strength by utilising the full depth of the section and using two small spars (Fig. 6). Vertical placement of the spars is most suitable on thicker sections. "Flat" top and bottom spars are the logical choice with a thin section. If necessary, further strength can be given at very little increase in weight by introducing webs between the spars to prevent their buckling under strong bending loads.

For greater strength we can concentrate on stiffening the nose section by sheet covering, dispensing with one of the spars and arriving at the section shown in Fig. 7, which is particularly suitable for light Wakefield size wings and smaller power models. Larger wings may require an additional mainspar with, possibly, a built-up trailing edge to give adequate trail edge section without an undue increase in weight (Fig. 8A). The alternative arrangement of Fig. 8B is also to be recommended for power model wings.

Now whilst these various spar systems give good resistance to bowing they lack even the resistance of the multi-spar wing to twisting, using conventional fore-and-aft rib arrangement. Diagonal bracing, as in Fig. 11, will help to overcome this defect and produce a rigid, anti-warp structure, albeit at the expense of increased weight due to the added spars. Also, there is the danger that, unless used with a sheet covered (rigid) leading edge, diagonal bracing may produce a wing structure with the defect of the "overbalanced" multi-spar wing—a tendency to warp downwards.

Geodetic or Warren-girder rib arrangement offer a far more satisfactory arrangement. Provided the minimum pitch angle shown in Figs. 9 and 10 are maintained, torsional resistance is exceptional. Both systems, of course, give a rather distorted chordwise section, but this effect can be minimised by the use of riblets and/or leading edge sheet covering. Using riblets only, Warren-girder construction gives the truer wing section and is a somewhat easier structure to design and build around any wing spar system. From the mechanical point of view, geodetic is the more rigid. Both are more difficult to build than a conventional wing (taking up to twice as long) and require slightly more rib stock, but if materials are carefully chosen, final weight need not exceed that of a conventional wing of similar overall strength. There is virtually no comparison between the warp-resistant properties of either of these systems and a conventional wing structure.

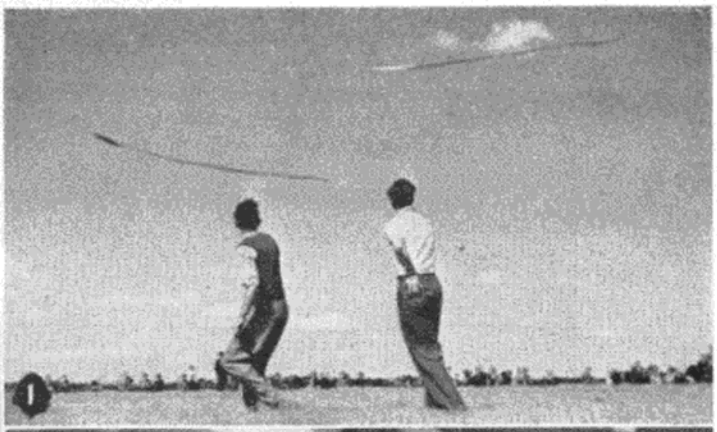
If an anti-warp structure of the geodetic or Warren-girder type does not remain true after covering and doping, almost certainly it is because an "unbalanced" spar system has been employed, allowing excessive bending to take place. Such a warp, however, will be virtually unchanging, once aged. Lack of rigidity in twisting is an indication of too low a pitch angle employed in setting out the ribs.

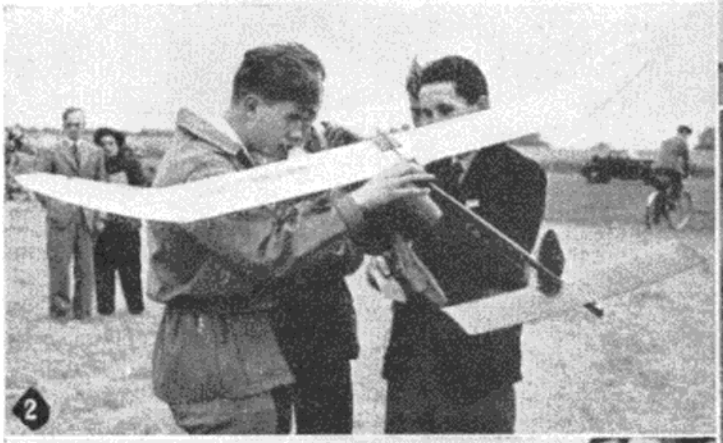
With a properly balanced spar arrangement—and this applies particularly to geodetic structures—a wing or tailplane will remain absolutely flat through-

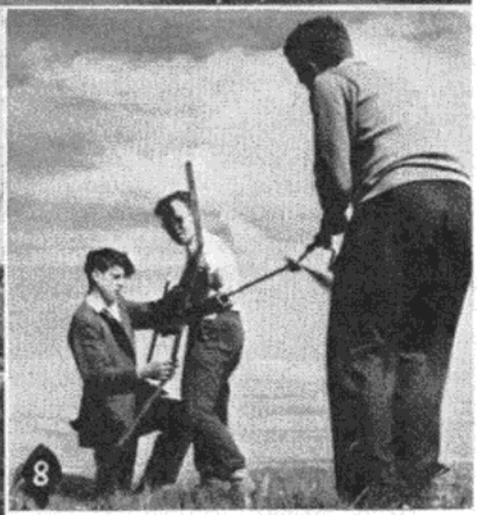
(*Continued on page* 414)

NORTHERN GALA

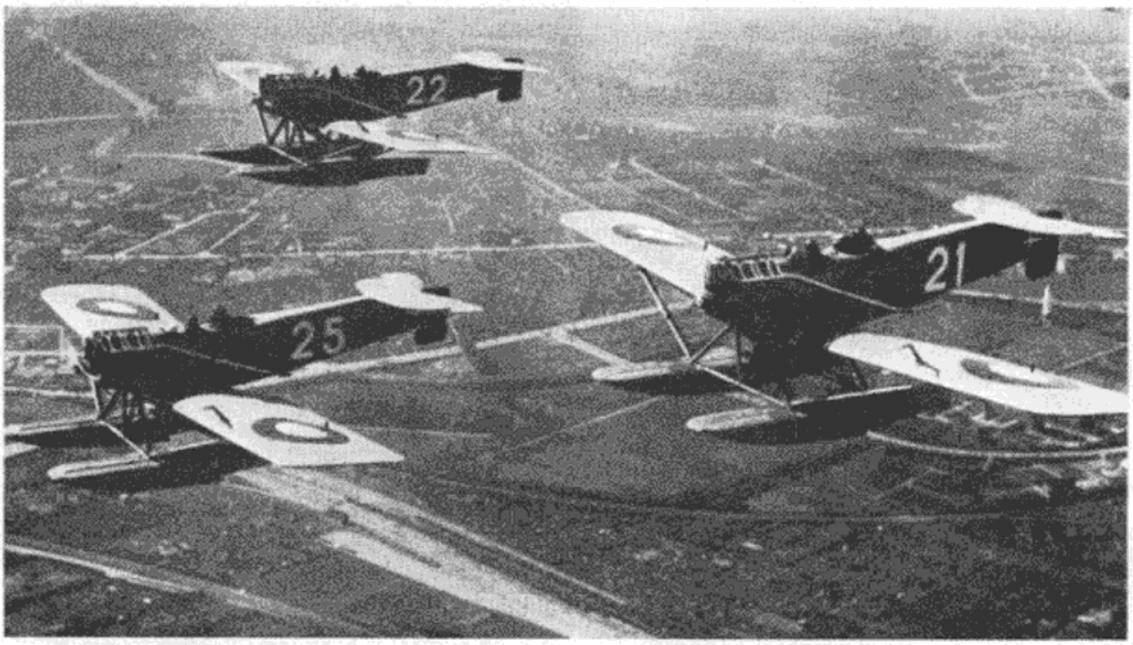
Held at Croft Airport • Nr. Darlington







1. C. Taylor (W. Essex) and R. Perkins (Meanwood) in the combat event.
2. Karl M. Webster (R.A.F. Halton) prepares to fly in the Challenge Match.
3. The Oliver Tiger powered Class "A" winning model from the Belfairs Club stands whilst a "write-off" burns in the background.
4. Ken Glynn, of Brixton, prepares his model to fly in the P.A.A. load event.
5. Sid Allen taxying his radio controlled model in the Ripmax Trophy.
6. J. A. Heads from the Novocastria club adjusts the compression screw on his E.D. 2.46 powered model.
7. Silvio Lanfranchi flies in the power event.
8. Jimmy Venn, of Cheadle, winds, assisted by Hughie O'Donnell and A. Anderton.



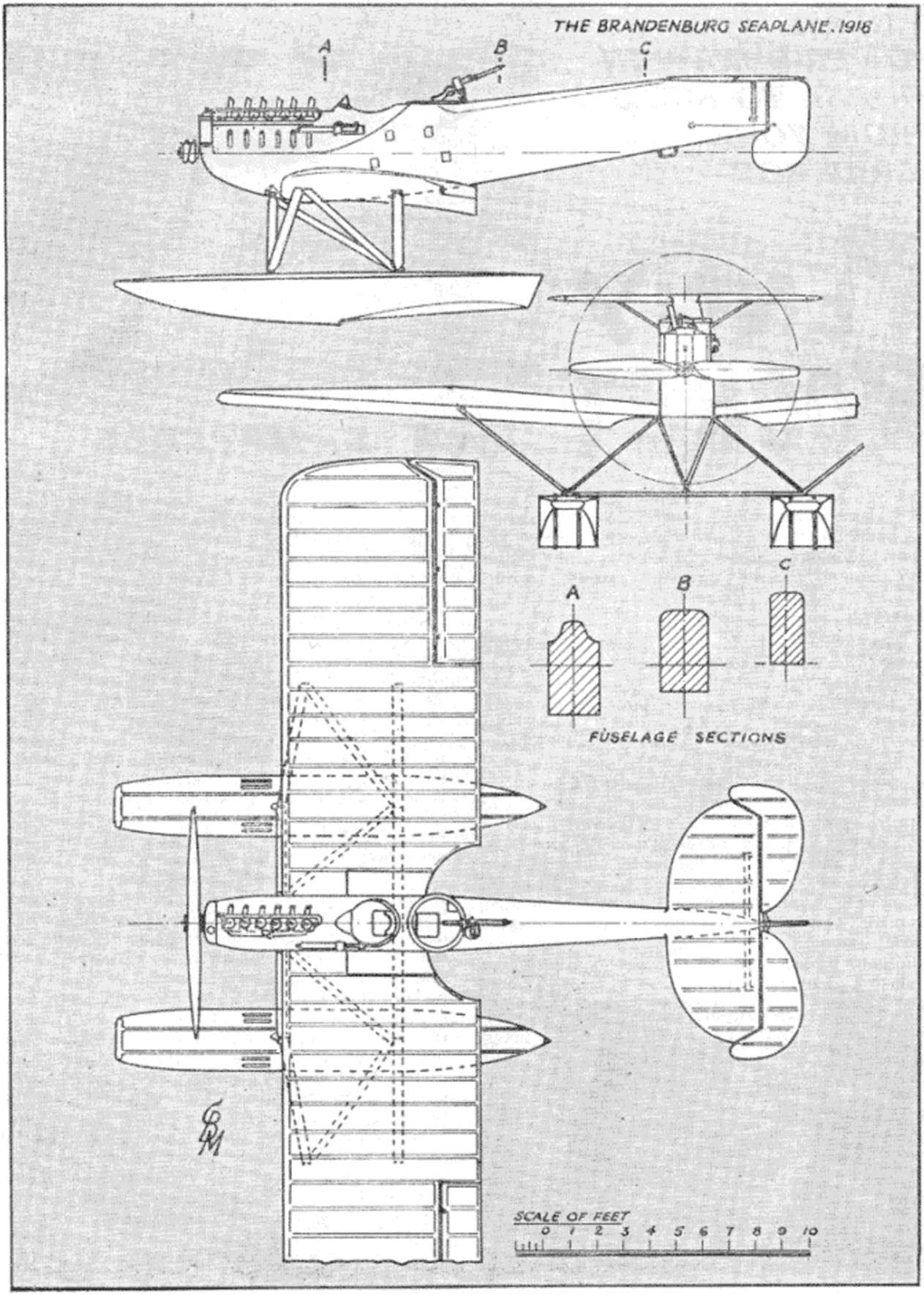
Prototypes Worth Modelling

No. 46 The Brandenburg Sea Monoplane . . . . . by C. B. Maycock

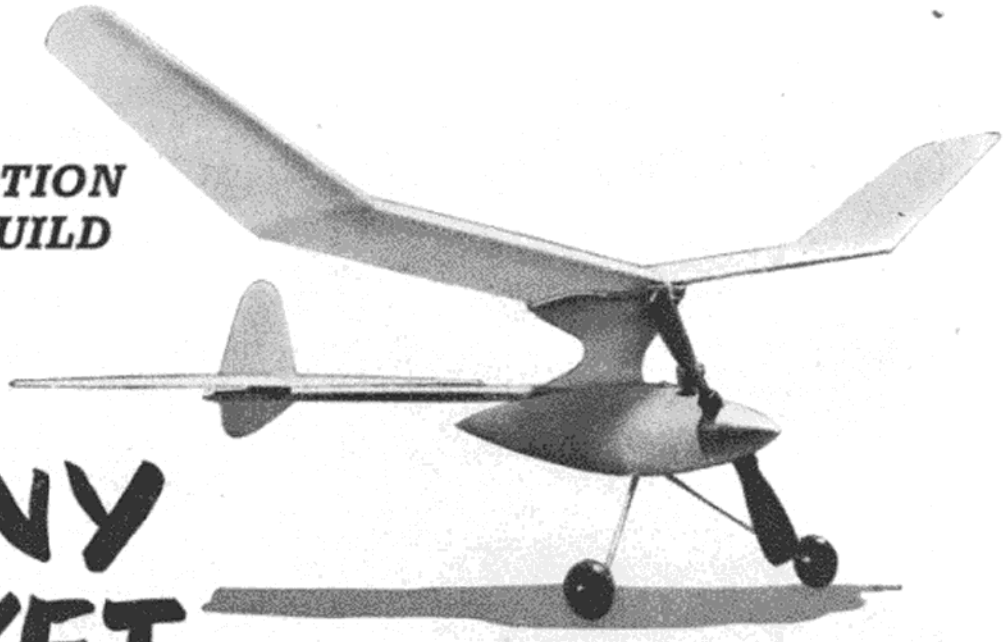
DEVELOPED from the highly successful biplane of similar lay-out, the sea monoplane of 1918 was one of the chief German answers to the incursions of the R.N.A.S. flying boats based on Great Yarmouth and Felixstowe. When the weather permitted they used to sit on the water and wait for our flying boats to show up. They had a good rate of climb and the disposition of the tail eliminated the usual blind spot for the rear gunner who was armed with a single Parabellum machine gun on a ring mounting. The pilot had a fixed Spandau machine gun mounted on the port side of the fuselage. With a 175 h.p. Mercédès motor the Brandenburg had a top speed of about 109 m.p.h. at sea level. The German seaplane ace Christiensen was identified with Brandenburgs and operated from stations at Borkum, Nordeney, and Heligoland. They were used also in escorting U-boats through allied minefields and to guard slower reconnaissance machines. One Brandenburg was forced down in Danish territory and was inspected by allied technicians there. The Danes were impressed by the design and after the war they adopted it for their naval air force. It was built by the Royal dockyard and designated H.M.1. Three of these machines are shown in our photograph.

Wings were of wood, fabric covered, and wire-braced internally. The tail unit was similar in construction with the tailplane mounted direct on to the top longerons. A two bladed wooden airscrew had brass sheathed leading edges. The engine had metal panels surrounding it which extended to the pilot's cockpit. The fuselage was slab sided, constructed of ash longerons and spruce struts and internal wire bracing, the whole was fabric covered aft of the panelling forward. Twin floats were carried on a steel tube chassis which also incorporated the wing bracing. Perhaps the most distinctive feature of the Brandenburg was the underslung rudder and swept up rear fuselage. This configuration gave the desired uninterrupted field of fire rearwards. Colouring details were generally as follows : Upper surfaces and side surfaces, a dark sea green similar to Heinkel green of world war II ; undersurfaces, pale grey, pale blue or very pale green. As these machines were introduced in 1918 they bore the straight armed black cross fully outlined in white. The rudder was white and carried a full width black cross. Floats and bracing struts were painted the same colour as the upper surfaces. Some machines had a slightly different camouflage scheme in that the upper surfaces were blotched in a lighter colour to represent the changes in light on the surface of the sea as seen from above.

The span was 35 ft., and the length 25 ft. 11 in. Built by the Hansa & Brandenburgische Flugzeugwerke A.G., Brandenburg, these machines came from the drawing boards of the design team led by Dr. Ernst Heinkel. The colour scheme of the Danish machines illustrated was French grey all over, with the full chord roundel of the Danish Royal Navy, viz. red ring with a white centre (like a French roundel without the blue centre dot). On the sides of the fuselage was the machine number in white and on the rear fuselage and overlapping the rudder the Danish Naval ensign, a white cross on a red ground. The vertical white arm of the cross was placed at the sternpost and the trailing edge of the red rectangle was swallowtailed.


THE BRANDENBURG SEAPLANE. 1916
A
B
C
A
B
C
A
B
C
FUSELAGE SECTIONS
SCALE OF FEET
0 1 2 3 4 5 6 7 8 9 10

A NEAT POWER-DURATION MODEL TO BUILD FROM YOUR SCRAP BOX



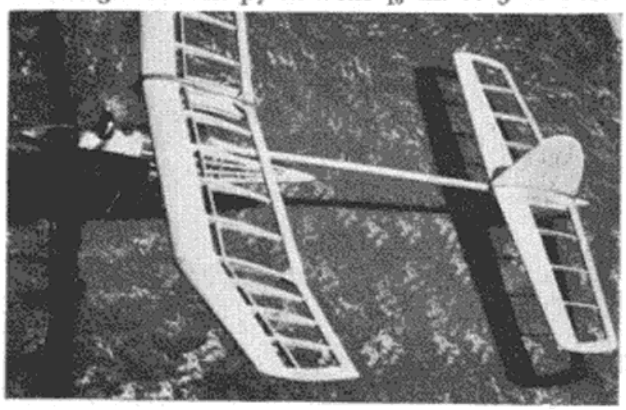
PENNY ROCKET

by A. E. HATFULL

IF you have a balsa scrap box it might be a good idea to take a look through before commencing to build the *Penny Rocket*, because if you have any short (10 in. approx.) lengths of balsa of the section size required, this is an opportunity to use them up.

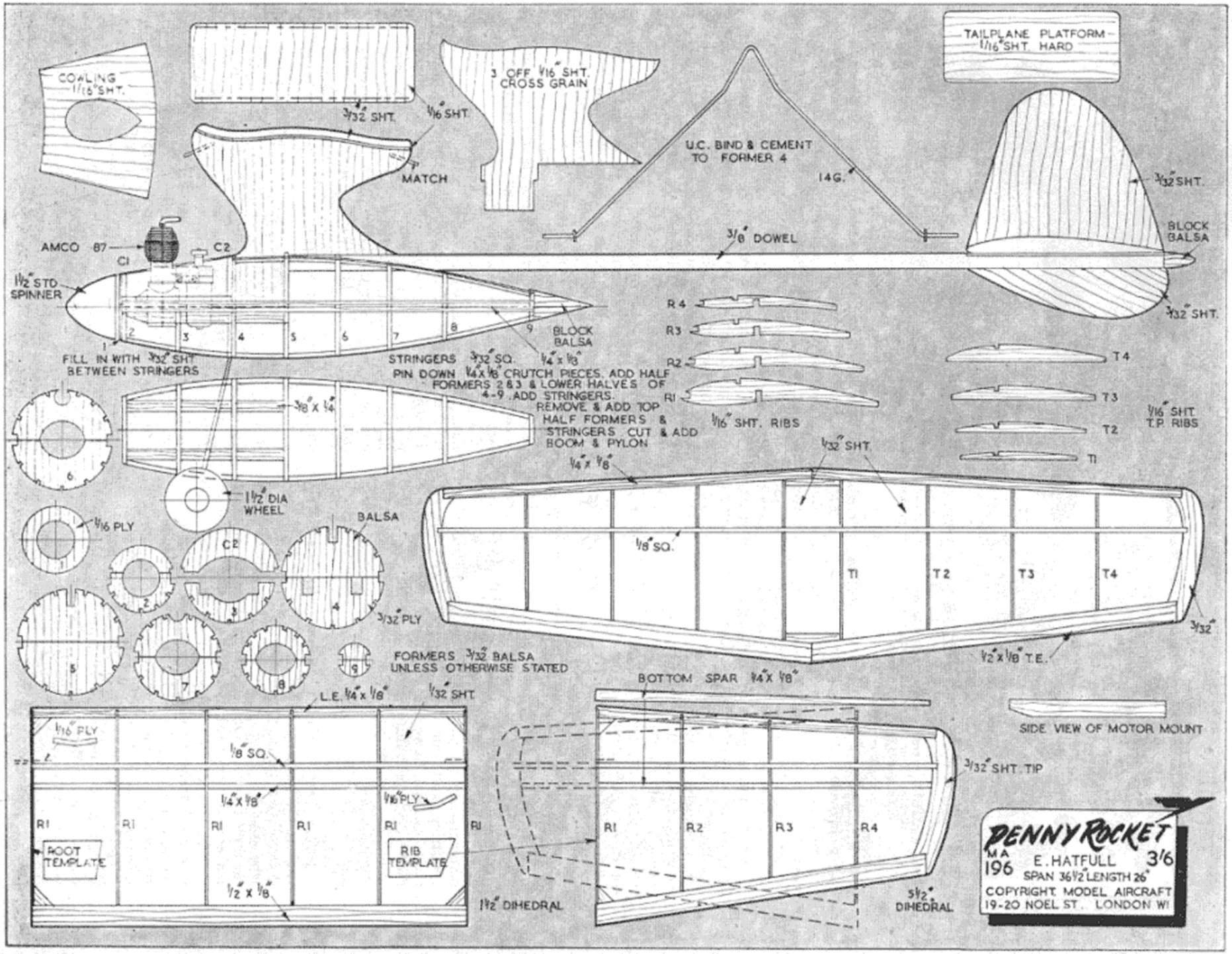
Fuselage

The fuselage is built on the "crutch" principle using the half formers as the spacers. The lower half is built first. Pin down the $\frac{1}{4}$ in. × $\frac{1}{8}$ in. crutch sides over the position shown on the plan. Cut the motor bearers from $\frac{3}{8}$ in. × $\frac{1}{4}$ in. hardwood, rub cement into them then, when dry, pin in place over the plan *upside down* and packed up off the plan with $\frac{1}{8}$ in. thick packing. Bend the u/c wire to the outlines shown in front and side views, then bind and cement firmly in position on the lower half ply former 4. The half formers 2, 3, and the lower halves of formers 4, 5, 6, 7, 8, and 9 may be cemented in position. When they have set, add the 3/32 in. × 3/32 in. stringers. Remove from plan then cement the top half formers in place. Cut the boom to length from $\frac{3}{8}$ in. wooden curtain rod or similar, sand-paper smooth and cement into holes provided in formers 6 and 7; also cement well to 5. Cut the pylon from $\frac{1}{16}$ in. × 3 in. sheet



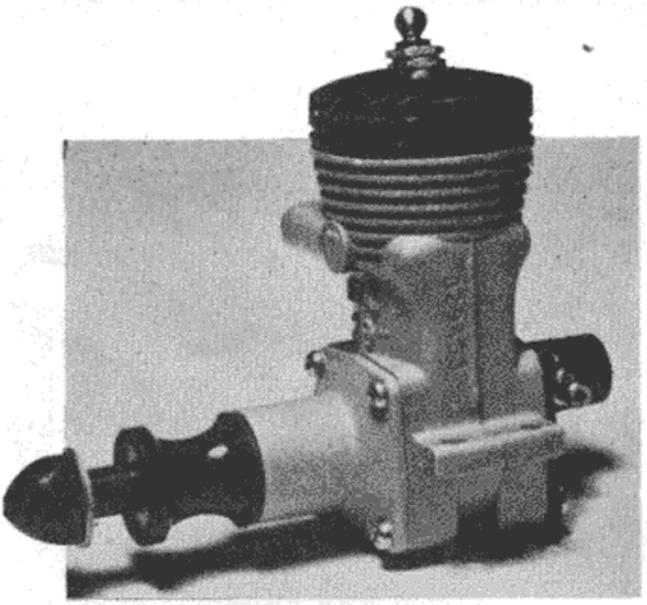
using 3 laminations having the grain crossing; round off the front and rear edges with fine sand-paper. Apply cement liberally to slots in 4 and 5 and to all mating surfaces of the pylon, then press the pylon into position. Add all the top side stringers. Locate the engine on the bearers and drill through the flange holes into the bearers, press four 8 B.A. bolts upwards through the holes and solder a short length of wire into the slots of each pair of screws; this prevents their turning when tightening the nuts on top. Mount the wheels on the axles and solder washers on to retain them. Plastic wheels were used on the original, 1$\frac{1}{2}$ in. dia. × $\frac{5}{8}$ in. wide × 1/32 in. (general thickness) plastic. Fill in between stringers and formers 2, 3, and 4 on the underside of the nose and between the top stringers and the pylon on each side using scrap 3/32 in. sheet balsa, sand-paper smooth and flush with stringers. Make two fuel drain holes fore and aft of former 3. File a flat on the boom to receive the tailplane base then cement the latter firmly in position, check for squareness by "sighting" from the rear. Cement balsa blocks on to the rear face of former 9 and the tail end of the boom, sand to a smooth shape. Sand-paper the sub fin to a streamline section and cement to the boom, running a fillet of cement along each side. Cement the $\frac{1}{16}$ in. sheet wing platform to the top of the pylon cracking if necessary (fill in cracks with plastic wood after). Make a plastic wood fillet along each side of the wing-platform-to-pylon join and sand to a smooth radius. Cut out and cement the two wing runners in place on top of the platform. Apply cement to sharpened matchsticks and press into pylon. Cement ply former 1 to former 2, tap two short pins through into the ends of the motor bearers. Place C1 and C2 in position and cement 3/32 in. × 3/32 in. base stringers into notches provided. Cut out sheet cowl, wrap over C1 and C2, trim if necessary then cement in place. Sand-paper

(*Continued on page* 414)



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 19-20, NOEL STREET, LONDON, W.1, 3s. 6d., POST FREE

THE NEW ENGINES



A pre-production example of the latest improved Eta 29, shortly to be available. This model has a higher, yet flatter peaked b.h.p. curve than the previous IIIc series.

ACCENT ON POWER

by

P. G. F. CHINN

THERE was a time when the opening of each new flying season would be heralded by a crop of new products from the engine manufacturers, but nowadays it is seldom that we find more than two or three new British models appearing during the year. This, of course, is for very good reason : generally, our engines are satisfactory and many manufacturers prefer to continue with existing models of known reliability and reputation, rather than produce a new model which may have little more than the novelty of being new to recommend it—although one or two makers do, of course, still count on the latter as a selling point.

Much the same situation exists in the U.S.A., but, elsewhere, where the model industry is often less stable, we are still seeing odd engines of no particular merit pop up at frequent intervals—generally turned out by small independent concerns which, if the engines do not succeed commercially, quickly go out of business again. Most countries have one well established producer of model engines, however. In Italy, for example, it is the Micromeccanica Saturno, producers of the Super-Tigre range ; in Holland it is the Veenhoven Typhoon concern ; in France it is Moteurs Micron ; and in Norway, the firm of David-Andersen Motor.

In Germany, while the Webra is the big selling engine, the industry still has many " comings and goings," plus two or three other, smaller, producers who appear to have established a reasonable market for their engines. Only in Japan does the range of makes and types rival the variety offered by Britain and the U.S.A. Total Japanese production is probably a good deal more than we have hitherto believed, for increasing numbers of Japanese engines are to be found in the southern hemisphere and a few are now even finding their way to importers in Europe.

However, let us start nearer home. So far as Britain is concerned, much attention has been claimed, due to the fact that it is the smallest engine yet built for quantity production, by the new Allbon Bambi. It has, however, already been fully dealt with in MODEL AIRCRAFT. Messrs. Davies-Charlton, the makers, are also planning another new (competition class) model. Another northern-built engine, the Elfin, which has remained substantially unchanged for four years, is expected to appear in revised form, having a ball-bearing crankshaft in place of the present cast-iron bearing.

In our opinion, however, the big interest item this year, particularly where competition enthusiasts are concerned, is the Oliver Tiger engine, two new models of which have just been introduced : the Tiger Mk. 3 of 2.5 c.c. and the 1.5 c.c. Tiger Cub. We received the very first two production examples of these from John Oliver only a day or two after their completion and have had them on test during the past few weeks.

Writing about model engines is not without hazard. One criticises a product and the manufacturer may rise up in wrath and demand the blood of all and sundry ; alternatively, one praises something else and an indignant letter is subsequently received by the editor from a rival manufacturer. Therefore, it is not without full appreciation of the possible consequences that we take this step and declare our opinion that the Olivers are the best engines in their respective classes made in Britain and (backed up by the fact that we have tested *every* 1.5 c.c. and 2.5 c.c. engine of note, British and foreign) unsurpassed in performance by any engine produced anywhere.

Before we start to qualify these remarks, let us add that the Olivers cost £6 0s. 0d. for the 1.5 c.c. and £6 10s. 0d. for the 2.5 c.c., as against £2 10s. 0d. to £4 0s. 0d., for most other engines of similar capacity. This means, of course, that, primarily, they will be of interest only to those concerned with obtaining first-class competition performance and, therefore, can make little impact on the popularity of the mass produced engine. Quality costs money and the Oliver gets its performance, not from any magic design features, but largely from painstaking hand finishing and fitting of parts.

The Oliver engines, produced by J. A. Oliver Engineering of Nottingham, are not a new product. They have been made for some seven years but,

until recently, have been confined mainly to the model car racing world. The engines were, in fact, specifically designed as 2.5 c.c. class model racing car engines and incorporated twin shaft drive and a horizontal cylinder. In this field they have enjoyed very considerable success, both at home and abroad. The Mk. 2 aero unit and a 1.5 c.c. car engine subsequently appeared and, from these, the two engines with which we are now dealing, the Tiger Mk. 3 aircraft unit and the Tiger-Cub aircraft unit, were derived.

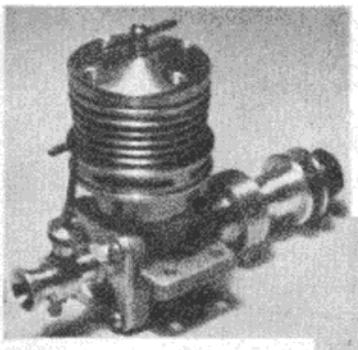
The Mk. 3 is, of course, a shaft valve, twin ball bearing diesel. A stroke/bore ratio somewhat higher than average is used, bore being 0.550 in. while the stroke is 0.625 in. The crankcase is a sand casting in LAC.113B alloy and is shot blasted to produce a very pleasing finish. The crankshaft is casehardened on the crankpin only and runs in $\frac{3}{8}$ in. × $\frac{7}{8}$ in. inner and $\frac{1}{4}$ in. × $\frac{5}{8}$ in. outer, ball journal bearings. A connecting-rod of the hiduminium alloy RR.56 is used. The carbon steel cylinder sleeve is cyanide hardened, ground, lapped and Delapena honed. Piston and cylinder are Brico cast-iron and are also Delapena honed after grinding.

The cylinder has circumferential ports and the finned cylinder barrel, which is machined from high grade alloy bar, fits over the upper part of the cylinder liner and secures the assembly to the crankcase by means of four long screws. This type of construction is, of course, to be preferred to the more common approach of a screwed-on barrel. An extended prop drive collet, employing a tapered split sleeve on the crankshaft and a sleeve nut are used, as on many high-grade racing engines.

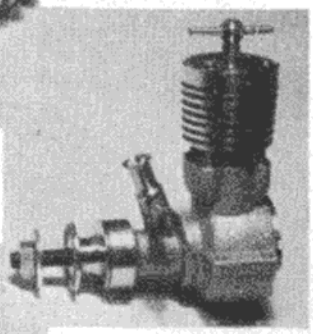
The material specifications of the 1.5 c.c. model are, in most respects, identical to those of the 2.5 c.c. model. Both ball-bearings, however, are $\frac{1}{4}$ in. × $\frac{5}{8}$ in. and a sleeve nut is not used. Stroke of the engine is the same as that of the 2.5, and with the bore reduced to 0.430 in., the stroke/bore ratio is at the unusually high figure of 1.45/1.

Both engines are beautifully finished internally and externally and are a delight to the eye. The cylinder finning, for example, is highly finished, as are the prop driver and carburettor, and there are pleasing refinements, such as the ball headed compression screw with its tommy-bar neatly silver-soldered in position, instead of the usual, sometimes rough, pressed-in fit.

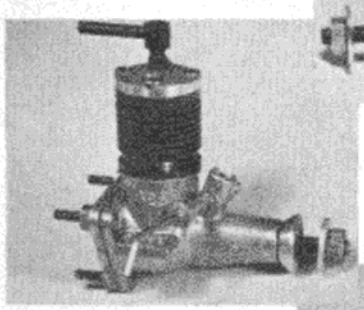
The manufacturer issues a set of modifications to enable the engine to be tuned for still greater performance. These consist, mainly, of slight alterations to transfer passages and to the induction timing and lightening the piston. These modifications can also be performed to special order by Oliver Engineering at extra cost. However, they are not recommended to team-racing enthusiasts because of the engine's increased fuel consumption and greater sensitivity to compression settings when so tuned. For speed work (and for power duration where models can handle such power) the extra modifications should be well worth considering, despite the already high power of the unit. Stock Mk. 3 units are checked out



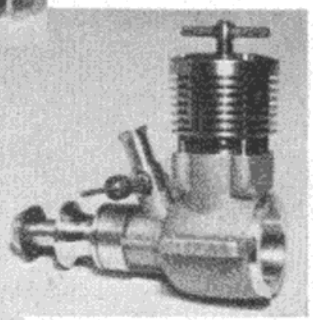
The latest version of the hand-built Miles 5 c.c. marketed by E.D.'s.



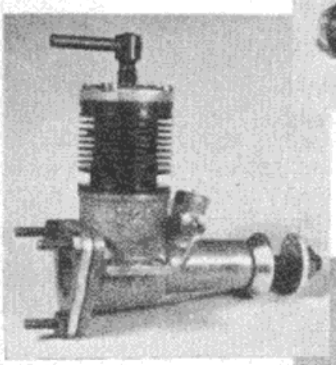
The Oliver Tiger-Cub has the best performance yet realised in the 1.5 c.c. class.



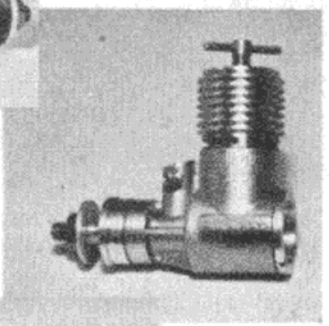
The Italian Super Tigre G25 1 c.c. diesel engine which precedes the G22 Baby Tiger.



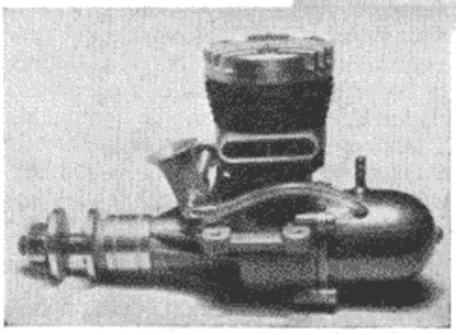
The new British-made Oliver Tiger Mk. 3 has been reduced in weight and is a superbly made unit of unsurpassed performance in the 2.5 class.



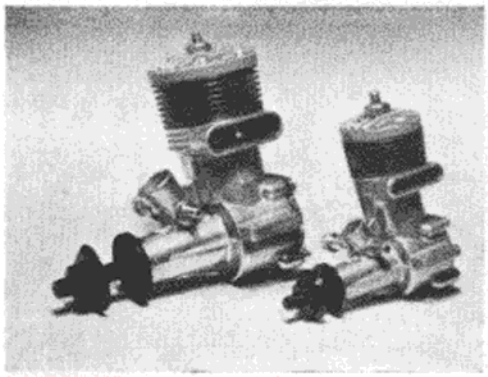
The latest addition to the well-known Super Tigre range, is the 1.5 c.c. G.26.

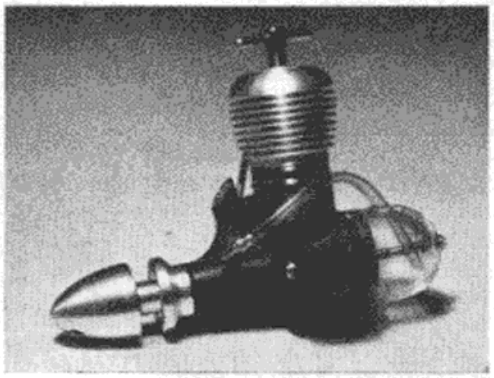


The 1954 model Typhoon R.250 from Holland—a ball-bearing crankshaft is used.



The latest improved version of a Japanese engine that is becoming widely known: The O.S. 29.





Left, the latest K. & B. engine, the Torpedo 35, bears a strong resemblance to the smaller, well-known 15 model.

Right, the Berlin-built BWM motors are now made by Manfred Gocking, who is concentrating production on this 250D model.

at 12,000 r.p.m. and the recognised modifications will increase r.p.m. under the same load by 750 to 1,000 r.p.m.

Our own two units are perfectly standard in every respect but are, nevertheless, more powerful than any 2.5 or 1.5 previously handled. High power has not been gained merely by extending the power curve to a very high peak r.p.m. At 10,500 r.p.m., for example, the Mk. 3 reached an output almost equivalent to that of a well-known 3.5 c.c. engine and the speeds under load over the whole r.p.m. range were roughly ten per cent. up on average 2.5 c.c. engine performance which, of course, is equivalent to an increase in b.h.p. of around 30 per cent. The 1.5 was also better than any previously tested 1.5 (particularly below the peak) despite the fact that the makers have not concentrated on extracting maximum power from this particular model but have, instead, aimed at achieving above-average fuel economy for T/R work.

The Oliver engines, due to their robust construction and the use of such refinements as ball bearing shafts, plus increased material sections essential to adequate heat dissipation and structural stiffness in a high-performance unit, are a little above average weight, but in current Mk. 3 models this has been reduced to $5\frac{1}{2}$ oz., while the Cub is $3\frac{7}{8}$ oz. These, of course, are by no means excessive for contest models, where rules are framed around the engine capacities rather than weight.

Another new engine, an example of which has been received in advance of its release date, is the K. & B. Torpedo 35. Lew Mahieu, who (if memory serves correctly) is the only man to have held four U.S. National speed records simultaneously (then using McCoys) and who is now sales manager of the K. & B. concern, airmailed us one of these engines for test and opinion.

The photograph shows the unit alongside the now well-known Torpedo 15 model. A close family resemblance will be noted. The 35 is, in fact, patterned more closely on the 15 than on the 19 and 23 and bears even less resemblance to its only slightly smaller brothers, the 29 and 32. This is evident, particularly, in the cylinder design which uses the thin section fins featured by the 15 and the cylinder secured to the crankcase only at the front and back. Four more screws secure the head to the cylinder.

The 35 is intended for aerobatic C/L work, a field at present largely dominated in the U.S. by the Fox 35, and most of the features accepted as desirable in a stunt engine are incorporated. The engine has the compact appearance and heavy shaft design common to the other Torpedo models and should prove a popular addition to the range, not only with stunt flyers, but with the many users of class B Torpedo engines who want an engine that will enable them to compete in class C free-flight events with the same model design.

Another medium-large capacity glowplug engine which we have lately received from afar was the new model of the O.S. 29, which was sent to us by the makers, the Ogawa Model Mfg. Co., in Japan. We first described the O.S. 29 about two years ago in these pages, when we found the engine powerful and pleasant handling. The new model embodies a slightly different crankcase casting with better lugs and webs and shows improvements to detail finish. The O.S. is unusual in that it is of the circumferential port type, unlike most 5 c.c. glowplug engines which are generally of the two-port loop-scavenged type.

Nearer home, the Miniatuur-Motorenfabriek Typhoon of Amsterdam have just produced an improved 1954 model of their R.250 twin-ball-bearing 2.47 c.c. International class engine, which is a development of the original plain bearing 2.47 Typhoon that was featured in the Engine Tests series a year or two ago. The R.250 now uses a different method of securing the prop drive collet, which is now locked in position with an Allen screw in place of the locknut on the shaft previously used. This engine, with the German Mach 1 (see last month's Engine Test) and the latest Italian Super-Tigre G.20, constitutes the main Continental challenge in the International class.

The new Super-Tigre G.20, incidentally, reverts to a lapped piston in place of the ringed aluminium type formerly used and it was with an engine of this type that Amato Prati, flying at the Giornate Aeromodellistiche Ambrosiane meeting at Milan, set a new class I speed record, which, if accepted by the F.A.I., will stand as a new world record. A speed of 190.47 km./hr. (118.35 m.p.h.) has been claimed, which is nearly 18 m.p.h. faster than Prati's former Italian record (also Super-Tigre) and a very substantial increase on the present American held record with the Torpedo 15.

(*Continued on page* 411)

INDOOR NATIONALS

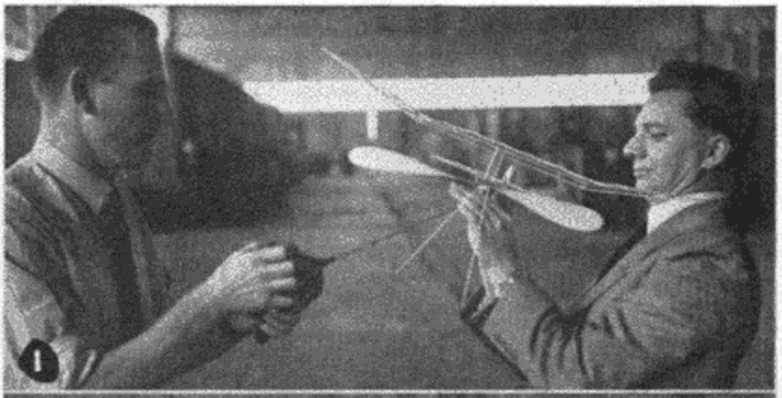
held at R.A.F. Cardington, Beds.

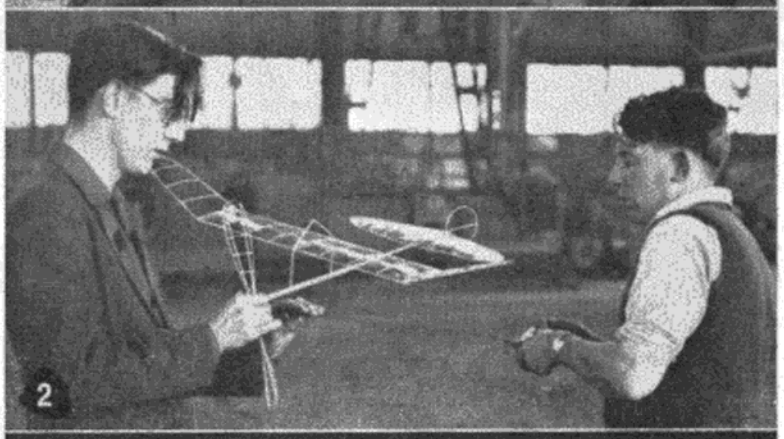
Those of our readers who attended the Cambridge Team Race meeting could have hardly imagined a greater contrast than a visit on the same day to the Indoor Nationals, not far away, at the R.A.F. Station at Cardington, Bedfordshire. In the between-the-wars years, Cardington was always associated with airships and there still exist the two vast balloon sheds that used to house the R.101 and her sister ships.

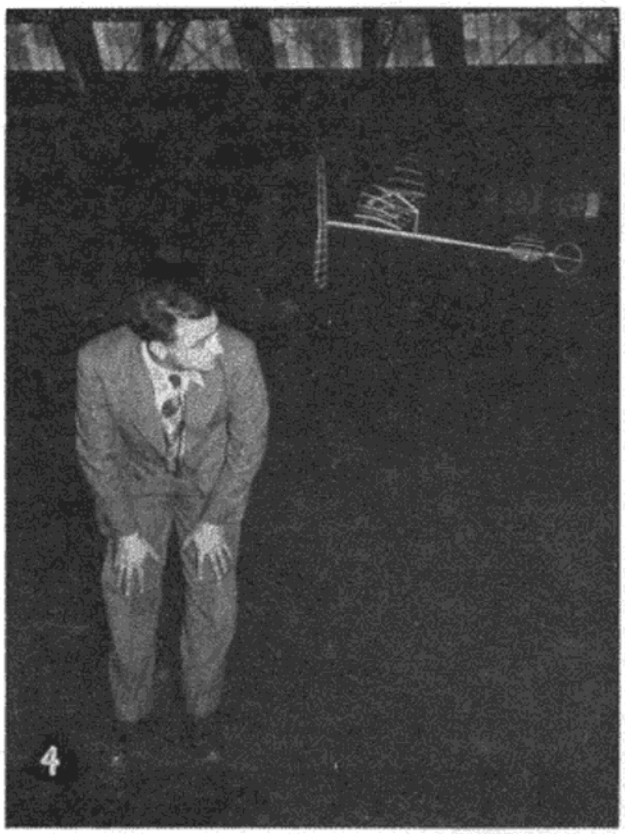
More than 200 ft. high, these hangars are an ideal venue for the microfilm brigade, and while thunder crashed outside and the familiar rain drummed on the roof, we watched those incredibly frail creations floating around in true still air conditions, spiralling directly overhead for durations undreamed of ! It was like being in a cathedral, and anyone thoughtless enough to move at more than creeping pace was liable to be spoken to sharply (in a stage whisper of course: the atmosphere has that influence !)

The event was a most restful change from the usual hectic contest, and the quite different design problems involved are certainly worth more study than they at present receive. We look forward to further events of this nature.

1. *Bob Copland winds before making a record breaking flight.*
2. *Phil Read (Birmingham) holds for Ray Monks.*
3. *Malcolm Young launches his model in the hand launch competition.*
4. *Reg Parham, gently, oh so gently, ducks out of the path of his model.*







RESULTS

3 Flight Contest

1.	R. Copland	58 : 57
2.	P. Read	56 : 00
3.	R. Parham	52 : 29
4.	R. Monks	52 : 20

Individual Flights

P. Read	21 : 09
R. Copland	19 : 59
R. Parham	19 : 19

RECORDS

R. Monks	Fuselage H/L	10 : 36
R. Monks	Fuselage R.O.G.	10 : 37
R. Copland	Stick R.O.G.	14 : 22
R. Parham	Stick H.L.	21 : 12

The Beecraft " Honey Bee " on a test flight.

Aviation NEWSPAGE

BY J. W. R. TAYLOR

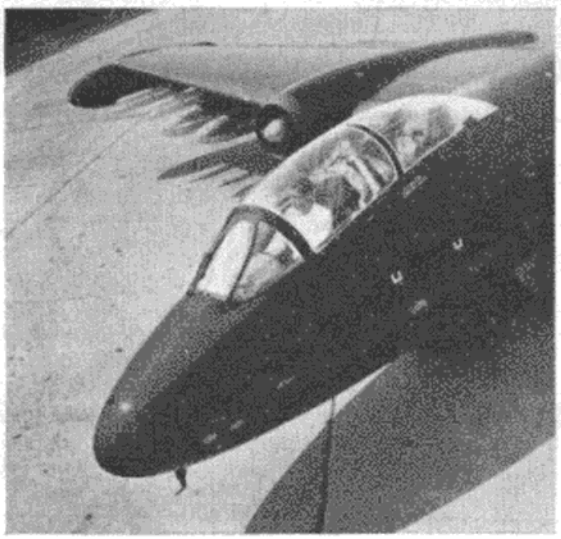
First sign of official encouragement for **AMATEUR AIRCRAFT BUILDERS** in Britain is the Ministry of Transport and Civil Aviation's decision to relax Certificate of Airworthiness requirements for privately-operated aircraft not exceeding 1,200 lb. all-up weight, with a maximum engine power of 75 h.p. and stalling speed of not more than 45 m.p.h.

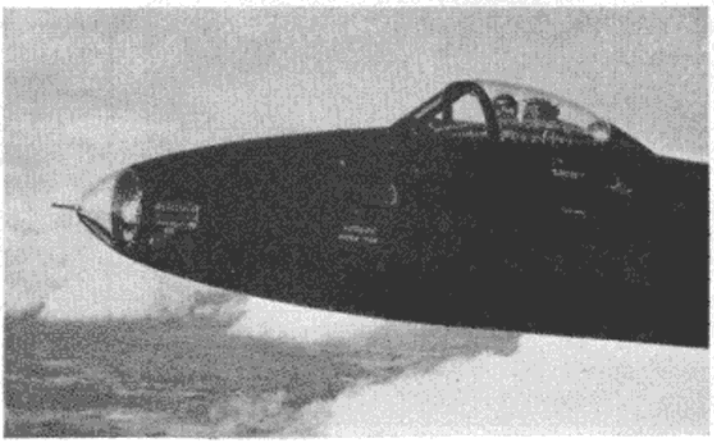
Provided the aircraft are built to a design approved by the Popular Flying Association and constructed under the association's supervision, they can be awarded permits to fly, and so avoid expensive annual C. of A. renewal. Only conditions are that they must not be flown outside the U.K. or over populous areas, used for aerobatics, flown at night or in bad visibility ; and they must be covered by third-party insurance. Details can be had from the P.F.A., Londonderry House, 19, Park Lane, London, W.1.

☆ ☆ ☆

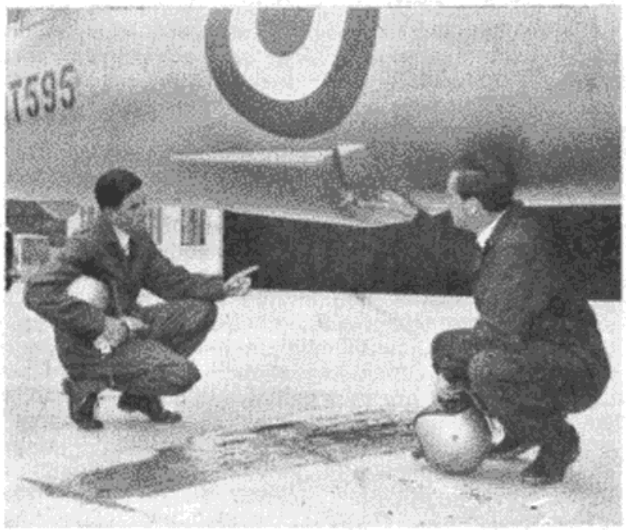
The little **HONEY BEE** lightplane (*above*) is as sweet as its name and the sort of aircraft that every home-builder dreams of. Unfortunately, it costs dollars ; but its designers, Beecraft Associates of San Diego, California, hope to market it in kit form at considerably less than the $3,000 cost of a completed *Honey Bee*.

Powered by a 65 h.p. Continental engine, it is a safe, spritely little aircraft, with a top speed of 120 m.p.h., range of 240 miles at 110 m.p.h. and power-off stalling speed of 45 m.p.h. Despite its all-metal construction, it has an all-up weight of only 860 lb. and requires only 500 ft. of runway. The prototype, which has the U.S. equivalent of our C. of A., is a single-seater with the pilot housed in a " control





" Canberra " variants. On the left is a close-up of the new cockpit on the American-built B-57B version, with the crew in tandem seats. Below is the latest R.A.F. Mk. 8 " Canberra " night-intruder.



Hugh Merewether and Frank Bullen, Hawker test pilots, examine the new fuselage dive brakes now fitted to production Hunters.

tower " cockpit, ensuring all-round visibility. Wing span is 28 ft., length 16 ft. 10 in., and height 7 ft. 8 in.

☆ ☆ ☆

The **DE HAVILLAND D.H.110** two-seat all-weather fighter, under development for the Royal Navy, now has a one-piece all-moving tailplane in place of its original fixed tailplane and movable elevator. It is the first British aircraft fitted with this type of tail, which improves manoeuvrability at transonic and supersonic speeds. During its second flight after modification, it exceeded the speed of sound.

☆ ☆ ☆

The clear-view blister hood on English Electric's new **CANBERRA B Mk. 8 NIGHT INTRUDER** makes this classic jet-bomber look more fighter-like than ever. Idea is to give the pilot an even better all-round view during low-level raids in search of " targets of opportunity " deep inside enemy territory. The whole fuselage forward of the wing has been redesigned, with the pilot's cockpit offset on the port side, and the navigator totally enclosed inside the fuselage, forward of the pilot and within easy reach of the bomb-aiming position in the nose.

Powered by a late mark of Avon turbojet, the *Canberra* 8 normally carries an armament pack under its fuselage, controlled by the pilot, and a variety of underwing weapons. But it is a dual-purpose aircraft, and can also be used for the *Canberra's* normal role of high-altitude bombing, with an internal bomb-load replacing the armament pack.

A hint of what the Mk. 8 can carry under its wings is given by newly-released pictures of its American counterpart—the B-57B *Night Intruder,* developed from the original *Canberra* B.2 by the Glenn L. Martin Company. They show eight 5 in. high velocity rockets and four napalm tanks mounted under the wing-tips, in addition to eight wing-mounted .5 in. machine-guns and a heavy bomb load carried on a specially designed rotating bomb-door.

Other major changes in the B-57B, which is in big-scale production for the U.S.A.F., include a lengthy cockpit hood, housing the two-man crew in tandem ; substitution of two Wright-built Sapphires for the usual Avons ; and additional triangular speed brakes on each side of the rear fuselage, which work in conjunction with the regular finger-type dive brakes above and below the wings.

☆ ☆ ☆

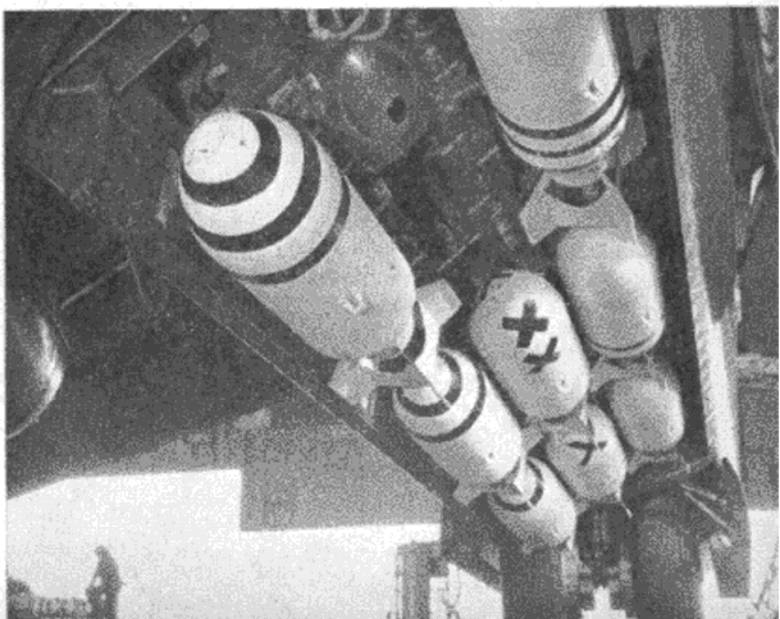
UNBROKEN RECORDS—Every Saturday evening a small package is flown from Hollywood to New York by Trans World Airlines *Super Constellation* ; switched quickly to a T.W.A. transatlantic *Constellation* outward bound for Paris ; transferred there to an Air France air liner and speeded down to Nice. Every Tuesday at noon, the package is opened in the Radiodiffusion Francaise broadcasting studio at Nice and within seconds listeners are able to hear the latest " Hit Parade No. 1 " American gramophone record. Ain't flying wonderful ?

A different kind of record was produced by **SILVER CITY AIRWAYS** on July 27th, when the Bristol *Freighters* and *Superfreighters* used on its vehicle ferry service crossed the English Channel 222 times—an average of one take-off or landing every 89 seconds between 8 a.m. and 7 p.m. This one day's traffic was five times greater than that flown in the whole of 1948—the air ferry's first year.

☆ ☆ ☆

V-BOMBER DIMENSIONS, just off the secret list, give the wing span of the Avro *Vulcan* B.1 as 99 ft., its length as 97 ft. 1 in. and height 26 ft. 6 in. Similar figures for the Handley Page *Victor* B.1 are : span, 110 ft. ; length, 114 ft. 11 in. ; and height, 26 ft. 9 in.

The rotating bomb-bay for the new B-57B opposite is here shown on test in a Martin XB-51. The one-piece door has the bombs mounted on the inside, and rotates to bring them outside for releasing.



Letters

Readers Answer Rutter

DEAR SIR,—I was dumbfounded, dismayed, deflated and devastingly depressed by the views expressed by Mr. Rutter and published in your columns recently. For far, far too long the sport and scale fliers have been walking about beneath the huge legs of the contestman, at officially sponsored contest-ridden rallies, up and down this fair land of ours. Creeping about with their dream-children tucked furtively under the folds of their museum-piece raincoats and held lovingly against their perspiring bosoms, forced to seek for dishonourable graves, usually conveniently dug for them by a dirty great contest job that had decided it ain't gonna fly no mo'!

It is precisely on this matter of the amount of attention paid to the contest-minded aeromodeller that the S.M.A.E. has come very near to the brink of crisis. It and the model magazines (here and abroad) have in the past given far too much attention and space to competitions, plans of contest winning models, "blind 'em with science" articles, pages on dear old so-and-so winning the World Chuck-glider Championships, and have neglected the vast heaven-fearing, intelligent, tolerant, friendly multitude of aeromodellers who fly models, not for chromium plated (or even silver) pots, but simply and solely because they love flying model aircraft, and that seems to me to be as good a reason as any for following our grand hobby.

No, let's have more not less of these sports and scale models, plans, photographs and descriptions of all kinds, every kind. Let's find out what will fly and what won't! Let's experiment and through the model magazines let's hear about it. Give birth to that seeming freak, and bless you! We may yet save the aeromodelling movement by our exertions and give something to the full-size laddies by our example.

I confess that I am a designer, builder and flier of what you would describe as "cranks"! Mr. Rutter, sir, some people might well call me a super-crank, in fact, but you see, like many thousands of my fellow-aeromodellers, I've been doing it for a long time, over 28 years in fact, and my, what grand fun it has all been.

Yours faithfully,

Hardwick, Cambs. RAY MALMSTROM.

DEAR SIR,—Having just read Mr. K. F. P. Rutter's letter in your August issue, I wish to express my full agreement with the remarks in your editorial note. I feel that the arguments he uses, interesting as they are as a revelation of a fanatical contest flier's mentality, should be condemned in no mean terms. I refer in particular to his use of the word "functional" as applied to models. Contest flying is a kind of game, while the design of the "models" used is functional in being directed to the sole purpose of winning by maximum duration of flight for a given power and motor run. However, the word "functional" suggests a purpose that is in some way useful, as distinct from that of a model in the strict sense, which performs no useful function. The truth is that there is no antithesis between "functional" and "non-functional" in aeromodelling, but there are two quite distinct sides to the hobby, each with its own claim to attention, and your editorial note explains that these demands have been fairly met. Scale modelling of aircraft, so far from having any "crankness" about it, is practically a hobby in itself, calling for considerable skill in construction and flying, and affording great satisfaction to the enthusiast on that account, and so is likely to become increasingly popular. I myself am a comparative novice, but from time to time in recent years I have watched the flying on Chobham Common, and, in answer to Mr. Rutter's remarks about keenness, I can say that most of the really keen fliers there, the real experts, are the scale modellers. These chaps are really pioneers who will be followed in time by the majority of those taking up the hobby, as their skill and expertness develop, and you are very right to have given a lead in your paper.

Yours faithfully,

Woking, Surrey. P. M. W. BUTLER.

The Northern Gala

DEAR SIR,—May I through your columns express a few remarks with regard to the Northern Gala held over the August Bank Holiday?

I would first like to say a big thank you to all the people who helped us, particularly the members of the Darlington Model Aircraft Club, who turned up in full force and did everything from being general runabouts to running events, who chased models, manned the gate, marshalled the car park, put tents up, and took tents down, worked throughout as general labourers, electricians and ablutions squad, and cleared up all the rubbish afterwards, leaving the drome absolutely spotless.

Also to the Southerners who also manned the gate, ran events and generally ran about for us, and to the S.M.A.E. Council members present, and to the Gentlemen of the Press who rolled up their sleeves and worked, and also to the unknown spectators who offered their services and their transport so willingly.

Also to the other members of the Northern Area Committee and to the "loyal few," members of Northern Area Clubs.

But may I also express my bitter disappointment in the poor support given to the Gala by the Northern and North Western Areas.

The disgraceful response from my own Area is almost beyond believing. Many N. Area clubs not only did not attend the Gala, but previous to it, completely ignored urgent appeals sent to them for help in running the various events.

Since when has it been customary to expect your guests to do the chores when they visit you for the weekend?

A final thank you to all the competitors who didn't complain when the main P.A. was burned out, and when events started late because there wasn't a soul to run them.

Black marks to the bod who wanted a private room for his model, the one who expected some of our already tired out "labourers" to chase after his model, the motor-cyclist who saw no reason why he should put his machine in the car park, the two Team Race officials, who, when they found there was some work to do, walked off the drome and left my husband to carry on running the Team Race single-handed until the Huddersfield boys put down everything and saved the event, and to the thoughtless competitors who went out of the drome and trampled through cornfields, angering neighbouring farmers.

These are the days when the Society is finding it increasingly difficult to find keen types within the aeromodelling movement willingly to cope with the adminis-

tration, the contest and rally organisation and the general running about in each area . . . *is there any wonder?*

Sheffield, 5. FREDA SHIRT (MRS.), *Northern Area Comp. Sec.*

Facts on Fuels

DEAR SIR,—The letter from Mr. R. D. Harrison in your September issue merits a detailed reply. May I deal with the outstanding points?

Fuel formulae have not been neglected by any means. Hundreds of differing blends have been tried, and most of them found wanting in one respect or another, in the course of the formulation of the established commercial fuels. The best fuel for the average modeller is not necessarily the one that gives peak performance. Every fuel must have a certain margin of safety, and a low rate of engine wear and easy starting are two essential qualities.

Some current commercial fuels are based on a 30-40-30 formula, or approximately that, but not all.

It would be interesting to know what conditions obtained for Mr. Harrison's "extensive practical experimenting." My own experience has shown that even under the best available conditions of laboratory control and with the assistance of a highly qualified fuels technician from one of the largest oil companies, it is by no means easy to so reduce the outside variables as to be able to draw accurate conclusions on fuel qualities. The accurate estimate of rate of engine wear without running engines for hundreds of hours is extremely difficult and demands expensive and delicate equipment.

All the facts in Mr. Harrison's letter about calorific values, oil content, ether content, and their effect on power output have been covered in articles from time to time in the modelling magazines since diesels were first introduced into this country.

As for unburnt oil being ejected from the exhaust ports, I should hope so! Lubricating oil should, under normal running conditions, pass through the engine unchanged and maintain its lubricating properties throughout the process. Otherwise it just isn't doing its job.

Redex is included in at least one commercial fuel and the proportion of lubricating oil has been correspondingly reduced; so this is hardly an innovation.

Modellers mixing their own fuels will naturally effect an economy. They are not concerned with bottling and distribution costs. But there are many modellers who are not in a position to obtain materials of the same quality and uniformity as the commercial blenders and they certainly do not control the blending proportions anything like as accurately.

An important point that Mr. Harrison has failed to appreciate and has apparently ignored, is that every type of flying demands a different type of fuel if absolute peak performance is to be the criterion. But fortunately only the keenest competition fliers are concerned with these conditions. For free flight where the engine run is not more than 30 sec. including starting time and the engine is well cooled, the proportion of lubricating oil can be very much lower than in, say, a team racer where the engine run is considerably longer and the motor is cowled in. Hence the necessity for a reliable commercial fuel to be a compromise and have that factor of safety mentioned earlier in this letter.

This is really a very complicated question and I cannot do justice to the subject in a letter, but I would close on a note of caution and remind your readers that if they want to blend their own fuels, don't take chances. Better be safe than sorry. It is not worth ruining your engine for the sake of a few extra revs. In the course of the last eight years my staff and I have handled hundreds of used engines, many of which were ruined through having been run on unsuitable fuel for the job. The lesson is obvious.

Finally, may I say that I am rather surprised that you, sir, as Editor of MODEL AIRCRAFT, should be so out of touch with current developments as to head Mr. Harrison's letter with the caption "New Angles on Fuels." Is it really so new?

Yours faithfully,

London, N.7. HENRY J. NICHOLLS.

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

THE NEW ENGINES

(*Continued from page* 406)

The Super-Tigre manufacturers also have a diesel 2.5, the Type G.23, and the two latest models we have tried from this noted Italian factory are the G.25 and G.26. The 1 c.c. G.25 is described in this month's Engine Test report and is an interesting and powerful engine. The G.26 is of virtually identical design but of 1.5 c.c. capacity.

One British firm which has never been able to keep pace with the demand for its high quality products is Messrs. Eta Instruments Ltd. Our photograph shows a 29 unit which has been factory-rebuilt to the latest improved specification. Production units to this specification will be available later this year. According to makers' tests, late production model 29's have been giving around .65 b.h.p. at 15/16,000 r.p.m. The new model will give a slightly higher output but the peak of the curve will be flattened somewhat, giving a wider range of useful performance. The Eta 29 is, of course, a glowplug ignition racing type engine of 4.87 c.c. capacity. It uses a disc type induction valve, ringed aluminium piston and twin ball bearings.

The German B.W.M. concern—Berliner Werkstatten fur Modellmechanik—previously under the direction of Horst Freise, has now been acquired by its former works manager, Manfred Gocking. Production is largely being concentrated on an improved version of the B.W.M. 2.5 c.c. shaft-valve diesel, known as the model 250D, and this is being exported to most European countries and to the U.S.A.

We have one of these motors and, while it displays no radically original design features, it is soundly made, sensibly laid out and of quite pleasing appearance. A conventional ("Arden" type) 360 deg. porting system is used. The carburettor has a steeply inclined spray-bar which permits the adjusting stem to be raked sharply back from the prop. Delivery from the rear mounted transparent tank is then taken care of by a right-angled feed. The crankshaft has a separate (brass) prop stud and the crankdisc has lightening holes drilled either side of the crankpin to assist balance.

CAMBRIDGE TEAM RACING

"Expect sunny periods with occasional showers," warned the weather forecasters, on Sunday, August 8th. The inevitable "showers" turned up right enough in East Anglia and on two occasions deluged the university city of Cambridge. But to give the Clerk of the Weather his credit, for the most part, he poured benevolence on team racing fans and spectators at the Cambridge Team Racing Rally. From early morning until mid-afternoon the giant 200 ft. "Pye Radio" television mast looked down at a sunlit scene on the "Pye" sportsfield, on which the big attraction, which is now firmly established with the team racing fraternity, took place.

Nearly 60 entries were received, and at least this number again just laid in the pits.

The first heavy half-hour downpour came in mid-afternoon and gave competitors and organisers a much-needed break. Although, to an extent it necessitated modifications to Combat rules.

Racing continued apace—again in fine weather—until early evening, when the many hectic, class "B" heats, culminated in a glorious four-in-a-circle battle between Muscutt (West Essex), Taylor (West Essex), Cameron (Croydon) and Hall (Chingford). Hectic, rugged and fierce are just three descriptive adjectives that explain the eventual state of affairs. Cameron's *Little Sheba* literally flew out of the race and met an untimely end when both lines snapped as the model was nearing the one hundred m.p.h. mark. A pile of wreckage in a car park, 150 yards away, was all that remained. Owner/mechanic Cameron lamented: "I had just turned round to chat with someone; I looked back and there it was—gone." Only model to finish the course was Chas. Taylor's entry. Even so, intrepid team though they were, trouble still came and it was a considerable time after the flag-off that Taylor crossed the finishing line.

The early evening deluge that nearly turned the event into a swimming gala washed out the "A" final but, as all three finalists came from the successful High Wycombe club, Cambridge organisers decided to hand over the three prizes and let them fight it out. The high aspect wing, Oliver powered entries put up consistently good performances; and that in spite of *Fourth Dimension* wrapping itself around one of the lap counting boards during practice.

Rain also took a hand in deciding Combat honours and a spin of the coin gave popular country member, Johnny Beer, first prize. The ½A class attracted less attention than usual. The nattiest midget racer seen was a scale *Tempest IV*, powered by a new McCoy diesel, by Kit Milford, of St. Alban's club.

Current craze amongst the London boys appears to be Dan Dare type repeater water-pistols for annoying fellow competitors. Britain's "best-dressed modeller," West Essex's "Stoo" Stewart, aroused the wrath of an opposite mechanic, during a class "B" heat when the mechanic received an earful from "Stoo's" pistol. "What do you think you are doing," demanded the annoyed assistant, "trying to sabotage me?"

Full marks must go to Pye Radio for complete co-operation. They supplied nearly all materials—and the ground—free of charge. Cheers, too to the Cambridge chaps who really "got stuck in"—at times literally—and ensured that things went with a swing.

P.J.H.

1. Paul Firman, of Cambridge club, holds aloft the starting flag for a semi-final. On the left is lap counter D. Crankshaw.

2. Cambridge club chairman, John King, assists Mrs. Betty Moulton to tie streamers on the tail of her husband Ron's "Combat" entry. Model is an E.D. 3.46 "Hunter" powered "Stunt King" complete with flap.

3. "Change partners please," as class "B" pilots battle it out during one of the heats.

4. R. J. "Tutty" Tuthill, of Enfield Club, makes furious last minute adjustments to his E.D. 2.46 powered "Enfield Missile" before an "A" heat.

5. A scene which is all too frequent on flying fields this damp year. Photo of an Elfin 2.49 "Mini-buster" sheltering—not sweltering!—under an umbrella typifies the 1954 season contest scene.

6. "Taurus" successful High Wycombe "A" finalist rests between heats. Power is an Oliver change 3 "Tiger."

RESULTS

½A

1.	Ford	Bushey Park
2.	Crawford	Nottingham Foresters

A.

Finalists: Smith, Edmonds, Lee. Rain stopped play! All from High Wycombe.

Combat

1.	Beer	Country member
2.	Muscutt	West Essex

Rain again stopped play!

B.

1.	Taylor	West Essex
2.	Muscutt	West Essex
3.	Hall	Chingford

Topical Twists

View-point

Now and again the great public unbends from its lofty disdain to show some condescending sign of favour towards us wretched model fliers. At once there is great jubilation and exceeding joy in our midst. Even the most wildly distorted Press reference, rendered in the familiar "toy aeroplane" brand of journalism, is enough to send us all into a mad frenzy of self-congratulation, whilst the ecstasy that follows the tersest broadcast plug knows no bounds. Indeed, it has been known for modellers, who for long years have kept the dark secret of their abnormality from the neighbours, to walk abroad with their models shamelessly exposed to the derision of all and sundry.

What abandonment of joy is likely to follow the fabulous gesture of a television feature is too frightening to contemplate. Already there is the most optimistic speculation: Has "What's My Line" a possible rival in "Mind My Lines"? Will the testiness of the keyed up R/C type eclipse even the great Gilbert Harding in the sphere of professional grumpiness?; and will the plunging neckline give way to the plunging thrustline?

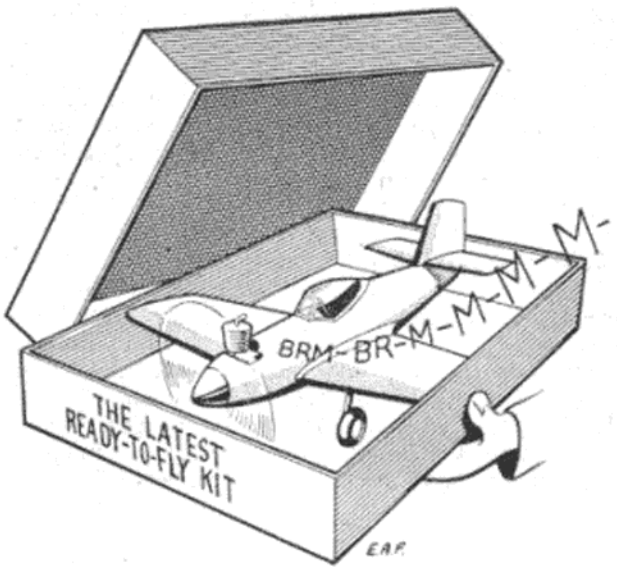
Possibly, at first, our hectic style of model entertainment will prove much too wildly exciting for a public accustomed only to the more gentle preoccupations of parlour games, Test cricket and ballet for beginners. The shock of seeing Aunt Fanny being chased round the front parlour by a snarling combat job might well give Granny an acute attack of the vapours.

The real benefit of televiewing, of course, will be enjoyed by the average club member. On those rare occasions when he can summon up sufficient energy to watch some model flying, he will no longer suffer the bind of that tiresome journey to the flying field. This, in turn, will bring a measure of relief to those harassed few survivors of the pre-television era who are much too busy building models ever to watch television, and always too broke ever to afford one.

● ● ●

Draught-proof

When you consider the endless gales of wind we experience in these turbulent isles, it seems incredible that anyone would seek to reproduce the model mangling stuff artificially. But every so often some breezy types rig up a draughty tube in order to shake us flying field types out of the complacent idea that there isn't an iota to choose between one airfoil section and another. The result is usually a mass of frilly formulae and galloping graphs, which, when analysed, reveal a slight bias in favour of the Juboslovovitch xy (5-0) over the archaic R.A.F. 32; supposing, of course, that our models were full size aircraft.



Even so, you can't help feeling a pang of sympathy for the well-meaning backroom boys. While they were engrossed in ruffling the backs of woolly coated airfoils with horizontal downdraughts, and snagging their long hair in the slide rule cursors, the only significant advance in model aerodynamics was achieved by some obscure foreign gentleman, who earned undying fame by accidently building in the most glorious wing warp in modelling history.

In my own modest way I have been working on the same line of research for years, but without quite the same degree of success. Notable botch-ups, such as square nose-radius airfoils, reflexed tailplanes, multi-warp wings, cranked fuselages and S fins, have all yielded much the same rate of disintegration when tested in that open air wind tunnel, which we call the British Isles.

● ● ●

Too much licence

For several years past hordes of unlicensed, click-clacking radio modellers have violated the ether in an abandoned orgy of untriplicated freedom, and masses of off-tune radio pulses have been discharged into outer space with not so much as a carbon copy to record their bleeping journeys.

This singular excess of liberty in an age of rigid, bureaucratic control must be regarded in the light of a minor miracle, and can only be attributed to apathy of the most criminal nature in one of the citadels of petty officialdom. But now, appalled by the enormity of this incredible oversight, the authorities are frantically assembling the regiments of staff, compiling and printing the skyscraper piles of ambiguous, triplicated forms, and preparing the cavernous vaults for the reception of the essential records.

Fortunately, the average modeller can regard all this belated activity with detached amusement, for the novelty of radio control has virtually worn off. The crash-happy amateur has long since departed the wreck-bestrewn radio field, and there now remains but a handful of electronic experts, busily scheming out multi-channel systems of such complexity to make a model do everything but fly.

Still, it does seem rather hard on these few survivors of the Great Radio Era, to bear the full brunt of this official reaction. After all, they don't fly their lugubrious, radio missiles just for the fun of the thing: they merely act in the capacity of public demonstrators for their respective radio firms. So, perhaps, in future we can feel less grudging about all those contest prizes which a grateful model society concedes to them as a token reward for their valued exhibitions.

● ● ●

Newest craze is to fit models with compasses in order to steer them into wind. Now, this seems a quite splendid idea, since my models always seem to lack any sense of compass direction. Immediately after being launched into a strong east wind you will invariably hear the comment: "Well, that's another one gone west."

Pylonius

ANTI-WARP STRUCTURES

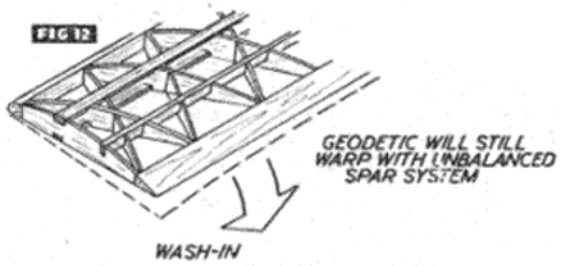
(*Continued from page* 398)

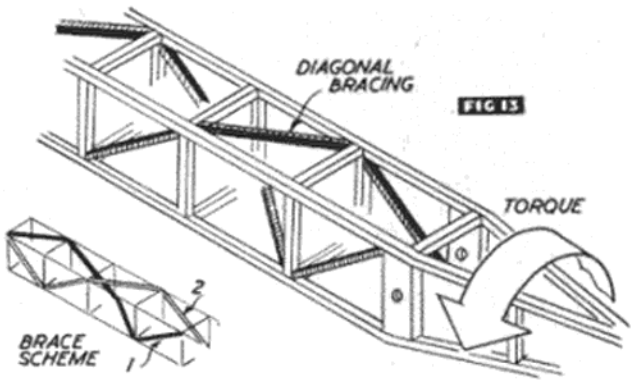
out its life. It does not have to be pinned down after doping. Consequently any warps *required*, such as wash-out, must be built in when assembling the wing (by packing up the trailing edge towards the tip).

It is practically impossible to effect a permanent cure should a " droop warp " appear, such as caused by introducing a spar to support the trailing edge as in Fig. 12. Since this will result in wash-out (which is seldom tolerable on wings or tail-planes) the best solution in such a case would be to strip the wing and remove the spar entirely (or " balance " with an extra bottom spar), then re-cover. The very nature of angled ribs gives rigid trailing edge support and such spars are seldom necessary. There is no reason, however, why normal multi-spar arrangement and geodetic rib spacing should not be combined for a light, extremely rigid structure. If this is used on fins then it should be remembered that with a symmetrical aerofoil section an equal number of spars should be used symmetrically on each side of the section. Whilst it may be difficult to arrive at an exact spar balance with a cambered section, with a symmetrical aerofoil the problem is one of simple geometry.

Only rubber model fuselages are considered as additional components likely to benefit from the use of warp-resisting structures. Warren-girder is very effective for normal slabsided fuselages, particularly if square or nearly square in section. It is generally preferred to geodetic in this case, due largely to the relative complexity of the latter and the appreciably greater amount of material required.

An effective compromise for rubber model fuselage construction is diagonal bracing running from end to end of the fuselage in two " sets," starting from the rear rubber anchorage point (Fig. 13). This has the effect of providing a series of compression struts to resist twisting under the action of the torque of a fully wound motor and need add only a fractional amount of weight. Considering a normal " box " fuselage, the orthodox " square " spacers can be half the section of the longerons (same width, but half thickness), and the diagonal braces of similar size. Weight is then about the same as a conventional box fuselage built with spacers the same section as the longerons.





PENNY ROCKET

(*Continued from page* 402)

cowl while in position, then remove. Finally sand smooth all over, then tissue cover pod, pylon, wing platform, sub fin, tail base and cowling. Dope liberally inside the " engine room " and cowling. The original used an 8 × 6 Frog plastic prop (squared tip variety) and a standard 1½ in. dia. spinner.

Wings

Cut out two lower tip spars as shown from ¼ in. × ⅛ in. then pin the lower spars and trailing edges to plan, place pins on either side of the wood. Cement ribs in place, draw the lower spars up into the notches in the ribs. Tilt the ribs indicated using the angle template shown cut from thick card. Apply cement to the front slots in the ribs and press the ¼ in. × ⅛ in. leading edges in place. Add the wing tip pieces and after checking the tilt in the specified ribs add the top spars and scrap gusset pieces. The 1/32 in. sheet covering may be attached while the wing is still pinned down. Remove the wing panels from the plan and sand smooth all over, taper the trailing edge down to a fine edge and round off all sharp corners. Cement a tip panel to a centre section panel and leave to set with the tip propped up to 3 in. Cement the two halves together and support to 1½ in. on each side where indicated on plan ; the dihedral at the extreme tips should now be approximately 5½ in. Enlarge the slots in the ribs behind the top spar at each dihedral break and cement the 1/16 in. three ply dihedral braces in position.

Tailplane and Fin

Pin the trailing edge and leading edge strips over the plan, cement the tip pieces in place, add all ribs and gussets. Cement the top spar into notches. Cover the leading edge portion and the centre section with 1/32 in. sheet balsa as shown. Cut the fin from two butt joined pieces of 3 in. wide 3/32 in. sheet and after sanding smooth cement in place squarely on top of the tailplane centre section.

Club News

AND NEWS FROM THE S.M.A.E.

WEST OF SCOTLAND AREA

Well, another U.K. Challenge match has come and gone, and the cup still remains in England. What are we going to do about it? What went wrong this time? I think it can all be put down to lack of contest experience and carelessness.

For instance, there were the people who didn't (or couldn't) fit a d/t; those whose d/t's caused violent stalls; others who needed to practise the art of glider towing, and those who had to do their trimming on the field when it was stated clearly months before that everyone had to have two fully trimmed models. There were the bods whose timers either did 10 sec. or 16 sec., but never 15 sec. There were also those who could do this without a timer and even manage about 20 odd sec.

There was the rubber man who turned up with Wakefield weight rubber when unrestricted is allowed, and all these clever people cannot be told that they are wrong. The same thing happens time and time again —no wonder we are losing our comp. sec. Let us cut out any bad luck stories and realise that it is practice that we need and more finesse.

There is one thing about the U.K. which caused some concern and I hope our area will complain officially about the matter. As published in "Model Flying," the names of those in the teams had to be sent in at least one week in advance, our list at Darlington was complete, but there were many gaps in the English team which were filled in as the day and times progressed.

On August 15th, the area held its C/L gala at Heathfield on the very day that our pet monsoon decided to move in over this area. Things were held up due to the rain and flying couldn't commence until 3 o'clock. S.A.S.M.A.C. won the class "A" team race by 15 laps and two good fit men, Messrs. D. Norwood and W. Miller, Barnstormers, came second.

E. Perry of Barnstormers won the stunt by about 100 pts. and his racer flown by tall boy MacFarlane and crewed by himself and Jos. Taylor won the class "B."

Perhaps the most thrilling spectacle of the day was the combat which was won by Ralph (I'm blowed if I can remember the surname) of Maybole. He was pranged in one of the heats and went into the final with an aircraft literally remade with bits of scrap balsa, brown paper, envelopes and Sellotape.

NORTH WESTERN AREA

It was a clean sweep at the Northern Gala for the Northwesterners, all the major free-flight events being taken back Manchester way.

On the Sunday Hughy O'Donnell, fresh from his Woodford clean-up, flew the same seven-foot span, lightweight glider into first place in the C.M.A. Cup. Backing up Hughy in the English team were B. T. Faulkner and J. O'Donnell who collected a useful aggregate for England. John's model went about 2 miles on the first flight, since he was using a long D/T in order to fish for a thermal. Tom Smith rolled up in time to make three very nice flights with his *Oliver Twist*—the engine is now beginning to peak its h.p. since it is almost run in. A dead air ratio of 3.54 off 13 (work it out) at least can be claimed.

John O'Donnell defied the worst that the elements could do, and he scored a triple maximum, to the amazement of all. Upon launching his open Wakefield on the second flight, he caught the prop with his hand, and the $\frac{1}{4}$ by $\frac{1}{8}$ in. longerons exploded. The other flights were made with a new rule Wakefield. Class "A" payload was won by Brian Faulkner whose model was locked up in O'Donnell's van until 6.30 p.m. and some fast work gave three comp. flights before the 7.0 p.m. deadline. The model is a 2.49 design originally for the *Oliver Tiger*, weighing only 12 oz. with Elfin 2.49 and E.D. clockwork. A total area of 650 gave a very Bowdenish climb, but super glide.

CHESTER M.F.C.

As part of the Chester Autumn Sports meeting on August Monday, the Chester M.F.C. organised a Control Line Model Aircraft Rally.

The events at this meeting were Classes "A" and "B" Team Races, Combat and Stunt.

We were fortunate in obtaining a star studded entry for the meeting, and a hot sunny day. Some of the well-known modellers present included G. Eifflaender, R. Buck, and D. Bolton and team, who were fresh from their success at the Northern Gala.

There were two circles in continuous use, one for team racing and the other for combat and stunt. The grass arena had been previously mown and prepared by members of the Chester Club.

The stunt event fell once again to G. Eifflaender, who gave a most polished display. The exciting 3-up combat final was won by R. Buck and both team race events were won by D. Bolton and team. The full results are:

Stunt

1. G. Eifflaender (Macclesfield): 393 pts.
2. R. Buck (Five Towns): 366 pts.
3. D. Howarth (Meanwood): 296 pts.

(Possible 400 pts.)

Combat

1. R. Buck (Five Towns).

Class "A" Team Race

1. D. Bolton (Foresters, Nottingham).
2. T. Pumford (North Wirral).
3. J. McKechnie (Crosby).

Class "B" Team Race

1. D. Bolton (Foresters, Nottingham).
2. S. Lawton (Macclesfield).

After the competitions were over G. Eifflaender gave a stunt display with his stunt biplane and R. Buck flew his scale *Spitfire*.

ENFIELD & D.M.A.C.

A good number of modellers turned up to enjoy the Enfield Team Racing Rally, held in perfect weather on July 11th, and between them produced a total of 57 entries (Class "A"—33, Class "B"—16, Combat—8).

The general standard of flying was fairly high, and everything went off smoothly, the only complaints having so far been received being about a Class "B" finals lap-counting mess-up. I will explain this below to try and clear up the dispute, which surprisingly was *not* between the two chaps concerned, but between about a dozen quite unconnected persons, some of whom were overheard to say that they "just wanted to stir something up."

Hall of Chingford was at first thought to be the winner, with a time of 10 min. 23.8 sec. (57.7 m.p.h.). Cameron of Croydon, whose lap-counter was the subject of the dispute, was officially second, but three persons claimed that they had timed him at 8 min. 59 sec. (66.8 m.p.h.) for the 160 laps. As neither could re-run the race (no fuel, and motor trouble), Hall and Cameron decided to split the prize money equally whatever the decision, so, as we could do nothing fairer, it was declared a tie, and the money—£3 first, and £1 second (same for all classes)—was divided into two lots of £2. On top of this, it was found while examining the lap-cards four days later, that Hall's lap-counter had counted him over 180 instead of 160 laps.

The result of the Class "A" finals was: 1st, Wilks of Belfairs, 2nd, Spear of I.C.A. Tigers. Unfortunately the time for this race has been lost, but it was certainly very fast.

The result of the combat was: 1st, Steward (Stoo), West Essex, 54 pts.; 2nd, Whitbread Northern Heights, 24 pts.

Although officially only a team racing rally, at least five speed jobs turned up, and the good weather and the presence of a speed pylon and S.M.A.E. sanction, encouraged three of these to break records, the minimum increase being about 7 m.p.h. One was the first official British record to exceed 150 m.p.h. Davenport, using the superb "Carter Special 61," clocked 244.9 k.p.h. (153.1 m.p.h.); as his lines were well over length his actual speed was 246.5 k.p.h. or 154.2 m.p.h. The other records were both by Hall of Chingford using Carter/Checksfield McCoys: 49 class—131 m.p.h., and 19 class—194.95 k.p.h. (121.9 m.p.h.). Although these last two are officially abolished, a petition is being organised to get the three classes concerned back (1.5 c.c., 3.5 c.c. and 8.5 c.c.), and the record claims are to be sent in with it as support.

Assuming space is available, the rally will certainly be held annually and in future will be even better and bigger (possibly a full control line rally).

FORESTERS (Nottingham) M.F.C.

The Foresters' Team Race crews had a busy bank-holiday. Up to Darlington for the Class "A" Davies, they reached the final with one model only to have it literally knocked out of the sky; they straightened the model, reeled out fresh lines and placed third in 12 min.

The following day saw one crew at Chester where both "A" and "B" were won fairly comfortably.

At Cambridge the following Sunday, bad luck was the order of the day: one model broke its lines, as did quite a number in spite of (or because of ?) the line pull test; the control system on the second failed to function; a third was winning its heat comfortably, came in for a pit-stop and hit another crew; and the fourth got through its heat but lost its semi-final by 2 laps when the fuel-tubing came adrift. A consolation prize was a second place in $\frac{1}{2}$-A with a Cox *Space Bug* powered midget with the dope hardly dry.

The free-flight wallahs are hibernating till the crops are in; they decided that losing anything up to one model per contest flight was a trifle much.

MODEL AIRCRAFT

CONTEST CALENDAR

Sept. 26th **All Britain Rally.** Radlett Aerodrome, Herts.
International "Jetex" Contest. 1 c.c. P.A.A. load Contest.

Oct. 3rd Area.
K. & M.A.A. CUP. 1st 1955 A/2 Elim.
HALFAX TROPHY. 1st 1955 Power Elim.

„ 17/19th **INTERNATIONAL GLIDER, POWER & TEAM RACE, CONTESTS.** Spain.

S.M.A.E. CONTESTS IN CAPITALS

SOUTHERN CROSS AERO CLUB

Although the Southern Cross Aero Club has enjoyed a fairly successful season on the contest field, its membership has slowly decreased during the year, and so the Club has decided to introduce itself to the public in a big way in an effort to gain new members. The Club, which serves the towns of Hove, Portslade, Southwick and Shoreham, is to commence its winter programme with a film show to which all prospective members are invited. This will be followed by a series of instructional film shows and practical building sessions. Out of door activities will include the flying of most of the Club's contests which have been blown off or washed out during this summer. All those interested are invited to write to, or to call upon, the Club's Honorary Secretary: GRAHAME K. GATES, at 45, Boundary Road, Hove, 3, Sussex, for full details.

CROYDON & D.M.A.C.

The four club members who went to the Northern Gala found themselves quite at home as the meeting had all the appearance of a London Area competition day. Perhaps this was because even the Northerners had to travel North ! No prizes for the boys, although John Blount is trying for his forestry badge next time.

At Cambridge the team race crew came unstuck (literally) having reached the final as usual, with 1st class pit work by Cameron and Martin backing up Norman Butcher's usual competent handling of *Lil' Sheba*. Both lines broke leaving slight up elevator on the model which disappeared from the flying ground, at an estimated 150 m.p.h. The pieces were scraped up from an adjoining car park over 100 yd. away. The "hot" Eta was undamaged, but a new model is now needed before further flying can be undertaken.

CHEADLE CLUB

Brian Faulkner is currently leading a "contest crusade" in the Cheadle & D.M.A.S., with a PAA load win at Croft, and a ½-A power win at Burtonwood; at the latter, he used a throw-together job with a lightweight rubber wing which has just finished a tour of duty on a Jetex job !

Burtonwood backers included club "veteran" Pete Foulkes (Northwest Area Chairman) who won glider, and a newly awakened team race crew, who also won . . . glow plug, good range, 6 sec. pit stops . . . what's happened ? Nice work, pilot Jolly, and team Metcalfe and Francis—keep it up.

Faulkner contributed a 9 min. score in the C.M.A. at Darlington, which, added to the J. & H. O'Donnell score, gave England a very clear win in the glider section of the U.K. Challenge match.

New members G. Cowdrey, flying a club 2.8 oz. rubber design, and J. Venn, flying a monster "55" own design rubber job, showed a considerable number of "experts"(?)—including the one or two of Croydon who dared to unpack their models—how to return high scores in very high winds. Incidentally, of the seven or eight tents at Croft, five were from Cheadle . . . biggest laugh was Ian Harrison, who after pranging a *Tiger* fast climber, and a *Tiger Cub* PAA loader trimming, pulled out a reserve "conventional pylon" design, more than somewhat identical with the fabulous Marcus *Eureka*. A week or so previously, he had left it with the venerable Faulkner, who covered it with a large "Croydon" transfer, and an "if found, please notify N. G. Marcus, etc." label clearly displayed.

Ian was clearly relieved when this model got pranged. His plea . . . "This isn't a *Eureka*—it's MY REEKER. . . ."

BRADFORD M.A.C.

Principal topic of conversation just lately has been, of course, our President's notable achievement in placing second at the World Power Championships in America. Flying with great consistency and logging almost four maximums, Silvio finished only 13 sec. behind the winner, and his account of the event at the club meeting following it, when Vic Duberry and his wife, of Leeds M.F.C., were guests, kept those present rolling in the aisles for an hour.

Resorting, in desperation, to evening contest flying, the club held its 4th general competition on July 11th. Those rare conditions, even rarer at Baildon—"still air"—were encountered, and as a result C. P. Miller's Wakefield had an advantage over the heavier power models, placing first with 6 : 06. J. A. B. Pannett's *San-de-Hogan* came second with 5 : 37; Ron Calvert would probably have bettered this time with his Collinson-design F.A.I. model (Elfin 2.49), but on his last flight the timer jammed and the machine disappeared at a great height !

We remember the Northern Gala at Croft with mixed feelings. Silvio, after being top English U.K. Challenge Match man in power, won the open power event on Monday at the expense of losing his model; whilst J. A. B. Pannett's *Hogan* was also lost after a maximum on its first flight in the Frog Senior !

READING & DISTRICT M.A.C.

Lack of a report lately is due to the P.R.O. trying to keep up with the prang rate caused by C/L combat practice for displays. The club has given five demonstrations so far this year, with a window display in the model shop and an article in a local magazine to support the publicity campaign. We have recently received permission to use a local playing field for C/L flying and members can now get down to some serious team racing.

The Scramble contest (now re-named The Marathon), although held on a cold, very windy day, had one entrant stripped to the waist at the end! The first three men clocked 5 : 09, 5 : 08, 5 : 07, using an A/2, a power job, and a Bee-powered *Luton Minor* respectively. Our youngest and newest junior member has just won the A/2 contest, and although lucky with his thermals it was a good show for a first attempt at contest flying.

There has been more attention to sport and scale models this year and one member has been dabbling successfully with a Dart-powered helicopter. Modellers in the Reading area are cordially invited to travel on the Club coach to the All-Britain Rally at Radlett on September 26th, or to attend any other meeting. Enquire at Sleep's Model Shop, 22, King's Road, Reading.

REGENT'S PARK M.F.C.

Although again homeless—temporarily, we hope—the club has been active, and even sought new fields to conquer.

Most of us see modelling as the ideal hobby—I need hardly list reasons ! Recently, one of our members who is connected with social welfare work pointed out that it could also be an excellent occupational therapy. This led to our staging, at the Phoenix Club at Bayswater, an exhibition, talk and demonstration of R.T.P. flying, with some emphasis on this aspect. This was so well received that we have made contact with, and had invitations from, several other groups with similar interests.

With a view to future exhibitions experiments are under way with electrically powered R.T.P. models.

Recently an E.D. Bee-powered Veron *Cardinal* made a flight verified as 61 minutes, from Tattenham Corner to Banstead. The gentleman who not only retrieved it, but noted the exact time of landing, and telephoned us, renewed our faith in human nature !

SOUTHAMPTON M.A.C.

At the Southern Area Rally, held at Larkhill, Club junior Norman Worley collared the Jetex comp., bringing home as his prize not only a *Swift* kit, but a Jetex 100 motor and augmenter tube as well. Congrats to one of the very few of our juniors who seem to build model aeroplanes these days.

The Area eliminators for the Davies Trophy were held at Christchurch on July 18th, our opponents being West Hants, Salisbury and Amesbury. Since no one can face the journey to Darlington anyway, the flying was run off on the points system as an inter-club meet. Southampton, turning up with scratch teams—and models—acquitted themselves well by coming second in both the "A" and "B" events. Arthur Sanger's "A" job (E.D. 2.46) and Ron Gillies' ancient "B" effort with Frog 500 were mainly responsible for this happy state of affairs.

One of our T.R. converts, after pranging three brand-new mods. in unavoidable and almost unheard-of circumstances, is understood to be throwing in the towel. Come, come, faint heart ne'er won fair pot !

WAKEFIELD AND INTERNATIONAL CONTEST FUND

Donations received to date	£	s.	d.
B. Pryer		2	0
South Eastern Area		3	5
W. Rockell		10	0
Wolves M.A.C.		7	6
R.A.F. Upwood		12	0
Leigh M.A.C.		7	6
Northampton M.A.C.	1	10	0
B. Dack		3	0
R. Ferguson (Canada)	4	0	0
P. G. F. Chinn	2	2	0
Seletar M.A.C. (Singapore)	10	10	0
Dulwich College M.A.S.		10	0
N. E. Bugden		10	6
J. Green		2	0
Lincoln & Dist. M.A.S.	2	2	0
Merseyside M.A.S.	4	13	2
R. S. Higham (Country Member)		10	0
Bournemouth M.A.S.		5	0
Edinburgh M.F.C.	1	0	0
Oxford M.F.C.	2	2	0
Mid Sussex M.A.C.	7	9	5
Bradford M.A.C.	5	5	0
S. Lanfranchi	5	5	0
Wakefield Team Member (Anon)		17	0
J. A. B. Pannett		4	0
S. Eckersley		5	0
J. Oxley		5	0
12th Hastings Scout Group		10	0
Northern Area		11	6
R.A.F. Leconfield M.A.C.		10	0
Bill Fletcher (U.S.A.)—10 dollars	3	10	0
J. A. Chant		10	0
Portsmouth & Dist. M.A.C.	1	1	0
F. J. Franklin		6	0
Total	£58	11	0
Total to Date	£326	0	0

WALLASEY M.A.C.

Our open day was held in a gale, after consultations with prospective fliers as to its cancellation, it being decided to have a 1 : 30 max. After much retrieving trouble and close times the top ones were:—

Glider

1. J. O'Donnell (Whitefield): 1 : 16 + 1 : 04 + 1 : 17 = 3 : 37.
2. Chestnut (Wavertree): 3 : 14.
3. S. Hinds (Wallasey): 2 : 48.
4. J. Hannay (Wallasey): 2 : 40.

Rubber

1. J. O'Donnell (Whitefield): 1 : 30 + 1 : 30 + 1 : 30 = 4 : 30.
2. J. Hannay (Wallasey).

Power

1. J. Done (Wallasey): 1 : 10 + 1 : 30 + — = 2 : 40.
1. G. M. Hutton (Wallasey).

On the same day the club flying scale contest was held, regrettably with no flying; the winning model being a D.H.4 by S. Hinds.

WEST HANTS A.A.

Some good racing was seen at the Davies Trophy Eliminators, the organisation of this event being undertaken by West Hants, and held at the S.R.D.E. ground, Christchurch, on July 18th. Salisbury were the winners of the Class "A," and Amesbury the Class "B," with Southampton the runners up in each case. A very good race between Amesbury and Southampton in a Class "A" heat finished with only 10 laps between all four machines, Amesbury managing to beat Southampton to the post by the narrow margin of 2 laps.

Another good day's team racing is anticipated for August 22nd when S.R.D.E. will again be the venue for the S.R.D.E. Trophy at present held by the West Hants A.A. This is an inter-club contest open to all clubs in the Southern Area, the Trophy going to the club gaining the most points in the day's racing, and individual cash prizes for the 1st, 2nd and 3rd placings in each of the Class "A" and "B" events.

SOUTHPORT MODEL & ENGINEERING CLUB

This club is holding its Annual Exhibition at the Chapel Street Congregational Hall, Southport, from September 25th to October 2nd next. Open: Monday, Tuesday, Wednesday, Thursday, from 2.0 till 10.0 p.m.; Friday and Saturday, from 10.0 a.m. till 10.0 p.m. (closed Sunday). A good variety of model aircraft, boats (radio-controlled and otherwise), railway engines, etc., will be on show, also working Grand Prix race track (which we displayed at the Manchester Exhibition), "OO" layout and R.T.P. flying with 0.5 engine powered models. It is well worth seeing for the static exhibits alone.

Our aircraft competition members attended Woodford and other local and S.M.A.E. rallies this year, but up to date have had little success—only lost models.

HENLEY MODEL CLUB

Latest club successes have included Dave Painter's 2nd in the Hamley, flying his Oliver Tiger powered, shoulder wing job, a similar model being flown by J. G. Waldron into 5th place.

Waldron's 6 ft. *Icarus* also won the glider event at Northern Heights Gala, while Painter was 2nd in the Thurston with his version.

Two new club records of 23 min. 41 sec. and 23 min. 32 sec. were set up recently by Tony Cooke with his A/2 and once again the inevitable *Icarus*.

Waldron retained the Club glider cup for this year, and was also club champion, Dave Painter winning the power event and regaining the control-line cup. Junior P. Larcey won the rubber event, flying his modified *Gee-Bee*, last year's winner Tony Cooke shedding a blade from his Wakefield after launching, with disastrous results.

Roy Cooke obtained his "A" certificate recently, bringing the club total to 8 "A", 4 "B" and 1 "C." Latest models flying include a 555 sq. in. F.A.I. job with an Oliver Tiger and a 350 sq. in. Tiger Cub F.A.I. job, both by Tony Cooke. J. G. Waldron has also been experimenting with a very thin winged 350 sq. in. Elfin 2.49 model, all of these being to the standard shoulder-wing club layout.

MEANWOOD INDEPENDENTS

From a rather hectic fortnight's flying our C/L happy boys have collected three firsts, three seconds and two thirds at the rallies Sheffield, Chester and the Northern Gala (two of the firsts, unfortunately, were both in the same event !). Of the eight places six were *Kers*(!), one a *Kombat Kapers II*, and one was one of our elliptical wing flapped stunters that we have been working on for a couple of years. The *Kombat Kapers II* was of course entered by our Derby branch, and marked their first official bit of contest flying ! The Leeds boys could be heard chuntering: "What's this ? Serious competition at last ?"

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PHIL SMITH

Phil has many fine designs to his credit, but he should receive an aeromodelling 'Oscar' for his invaluable work on ducted fans

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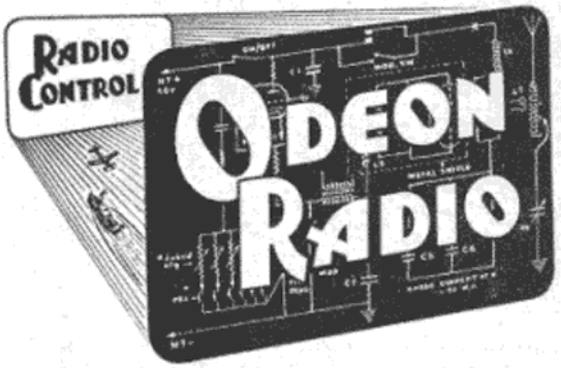

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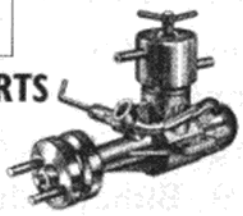

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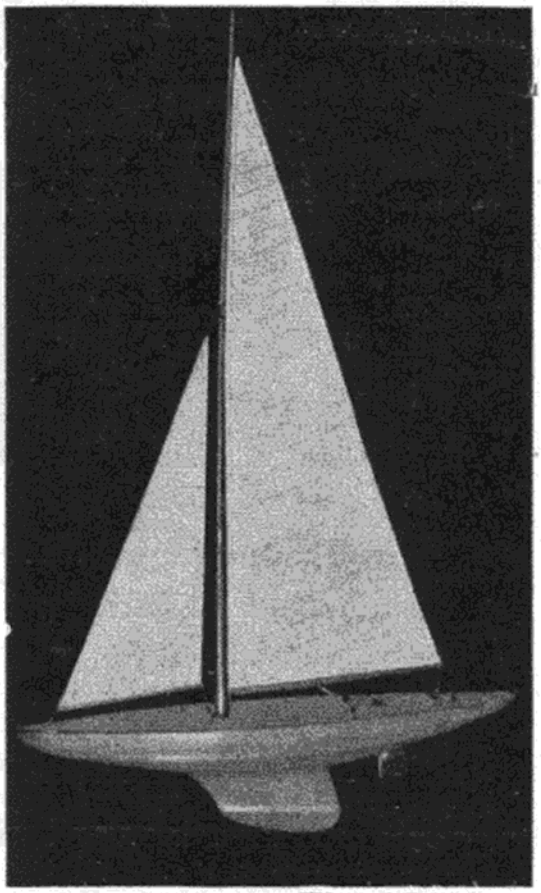

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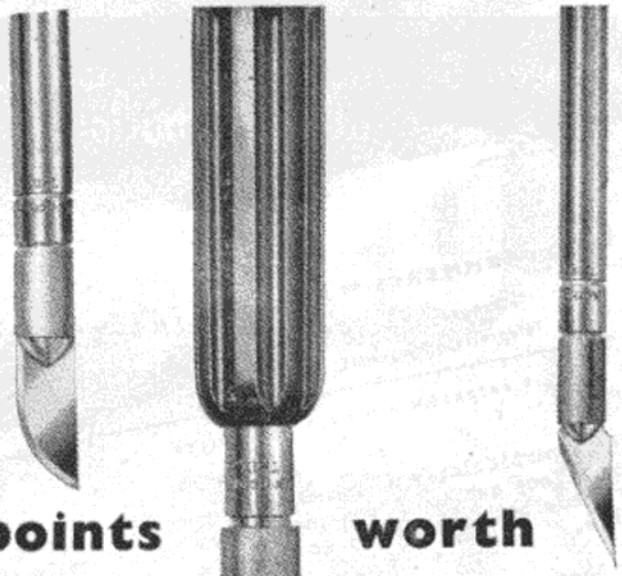

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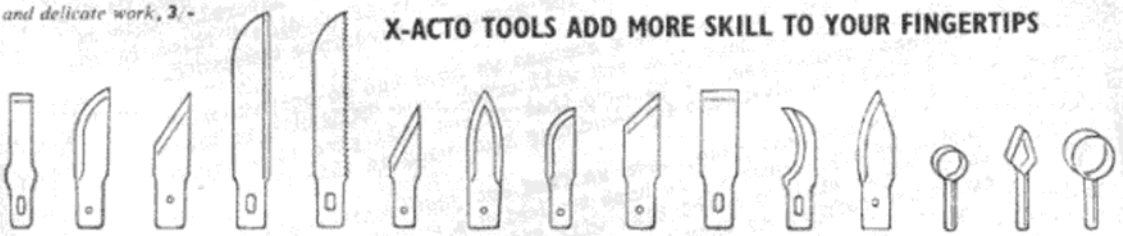

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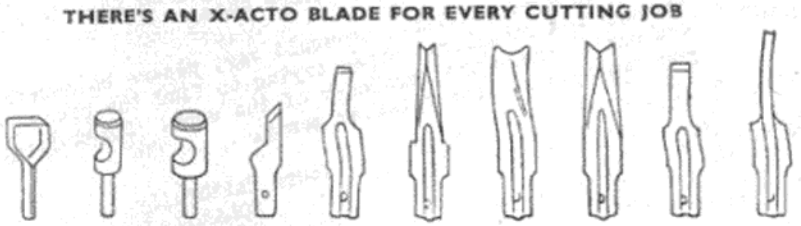

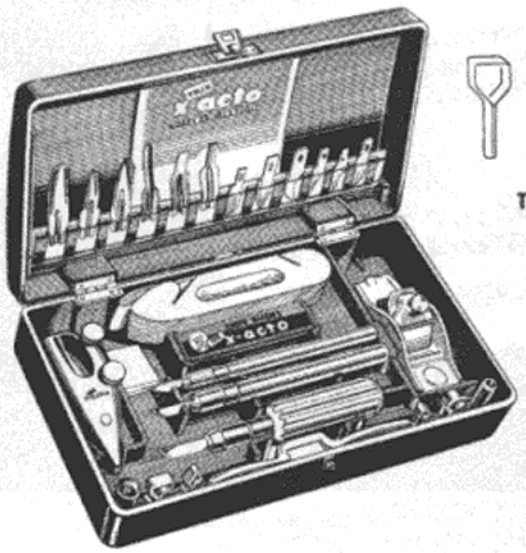

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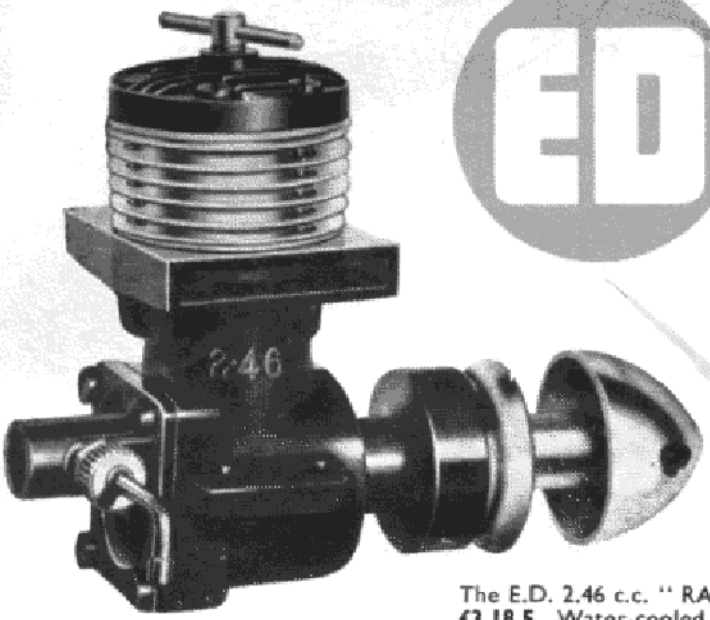

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KEILKRAFT SEDAN

18" WINGSPAN

Remember these "EeZeBILT" facts—The Sedan is designed to fly several hundred feet. It can be assembled in an hour on your first try, and has actually been put together in 20 minutes! There is no cutting, no tissue covering, no painting to do—you just assemble—then fly it. All parts are die-cut and pre-decorated, so that a snappily finished model grows into shape before your eyes, even if you have never built a model in your life.

- All balsa model with all parts pre-cut and pre-decorated.
- Undercarriage ready shaped and wheels fitted.
- Propeller, shaft, and nose-block assembly complete and ready to fit.
- Complete with rubber motor.

3/6 INCLUDING TAX

SEE ONE AT YOUR DEALERS TODAY!

KEILKRAFT
THE GREATEST NAME IN MODEL KITS

Made by: E. KEIL & CO. LTD., WICKFORD, ESSEX

WHOLESALE ONLY—Please contact nearest model shop or order from a mail order house

Sole distributors in U.K. for
ALLBON & D.C. ENGINES
E.C.C. R/C EQUIPMENT
ELMIC Timers & D/Ts.
ELFIN ENGINES

Also distributors for
E.D. ENGINES & R/C EQUIPMENT
BRITIFIX Cement, Dopes
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