

JULY 1959

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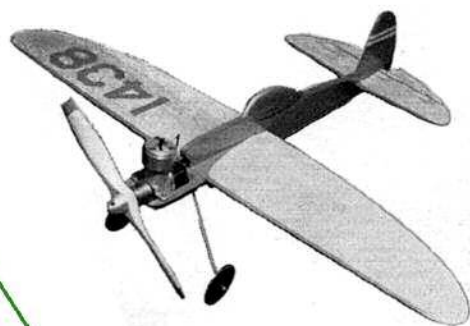
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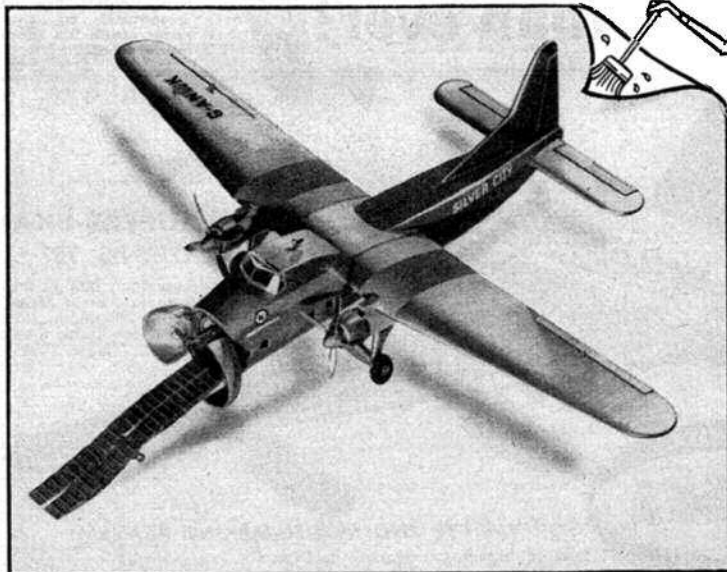
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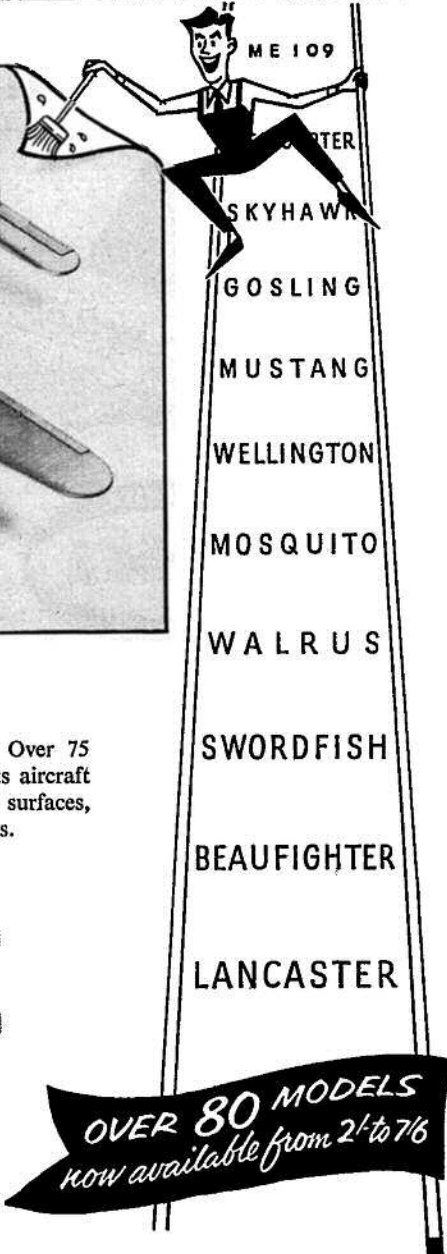
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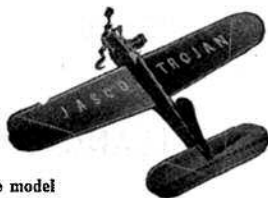
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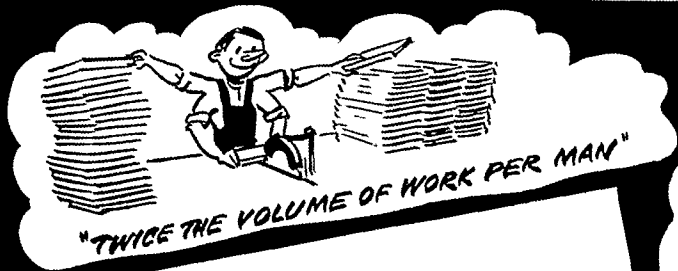
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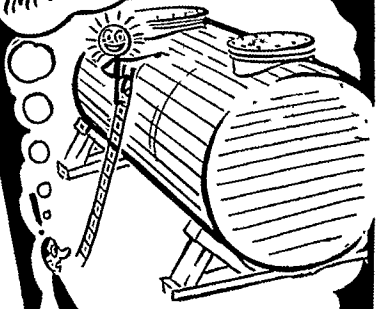
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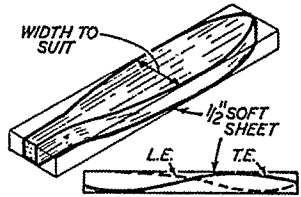
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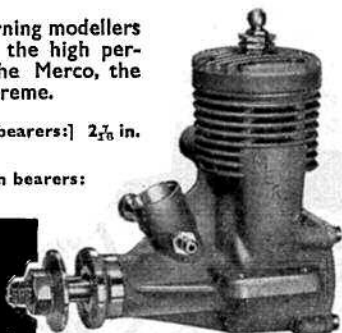
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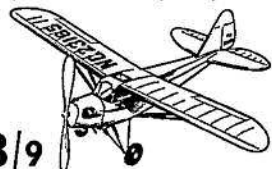


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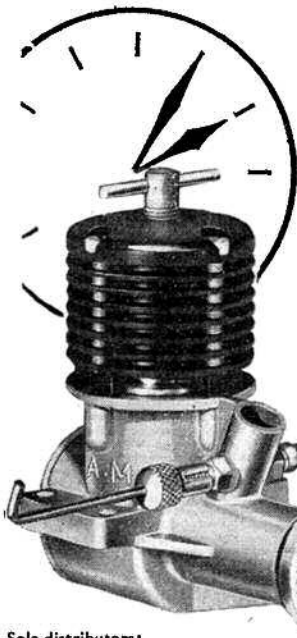
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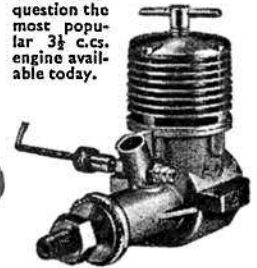
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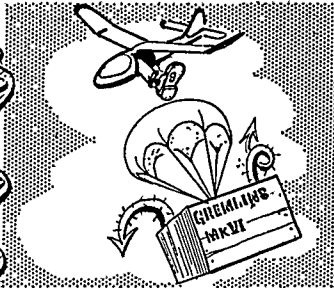
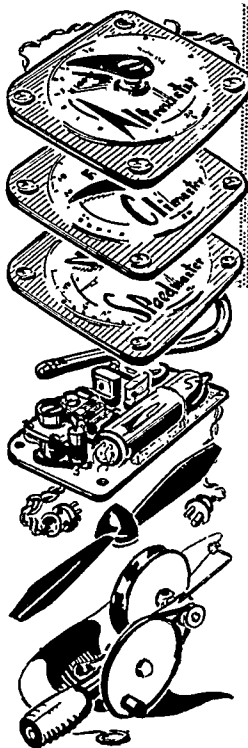
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JULY 1959

No. 217

VOLUME 18

EXECUTIVE EDITOR: C. E. WALLER

IN THIS ISSUE

- Here and There 193
- Engine Tests: Cox
Olympic 195
- The 1959 Nationals 197
- A novel C/L handle 203
- Topical Twists 204
- Over the Counter 205
- And so to Radio 206
- Plane of the Month 209
- Latest Engine News 210
- Avro Athena 212
- Club News 214

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Here and There

HIGHLIGHTS of the average contest modellers' year—the Nationals —is once again all over bar the shouting; all that now remains is to report and assess.

Firstly our report, which we have subtitled "Bright but breezy," an obvious choice, epitomised by the photo below showing E. A. Coates' Blackburn Ripon caught by the wind. A few seconds after our shutter had clicked it was dashed to the ground—a fate unfortunately shared by many of its companions in the F/F scale event. Full coverage of the Nats appears elsewhere in this issue, but this is an appropriate place to mention the cover. This was taken at the Nats and shows Arthur Evans of Mill Hill, assisted by his wife, preparing his Sikorsky S.39B amphibian for its qualifying flight in the Super Scale Trophy. The outcome is shown—also pictorially—on page 201. That is the story of the cover picture—the story behind it is simple. Many readers have asked "Why no model picture on the cover of MODEL AIRCRAFT"? Last month we promised one, and this month, to tie in with our Nats report, we made good our promise.

In assessing the Nationals there are many things to be borne in mind not least of which is its size. The entry this year was the highest yet, 1,320 against 1,140 last year



and 685 at the first meeting 12 years ago. These figures speak for themselves as regards popularity with modellers, and there can be no doubt as to its appeal with the general public; attendance on the first day was the best we have seen at any meeting for a long time. But, and it is a big but, if the Nationals is, as has been stated, the showcase of aeromodellers in this country, then the goods are poorly displayed, and poorly displayed goods—even of the highest quality—are difficult to sell.

This year was an improvement inasmuch as there were boards naming the contests, but to the uninitiated these were of little help, even if used in conjunction with the programme. The public are attracted to model meetings and are more than welcome, but unless we can enlighten them as to what is going on, then their continued attendance—and thereby their support—cannot be guaranteed.

From the competitors' viewpoint the fact that a large part of the aerodrome was out of bounds might have caused great inconvenience. As it happened, the strong wind was blowing most of the models parallel with the banned territory and, in many cases, right out of the "drome"! There is little to be gained in obtaining one of the largest 'dromes in the country if half of it is unusable.

Two other criticisms that have become more justified each year, are the lack of annual continuity in the running of separate contests, and the increasing awareness that there are too many events. To take the latter

The dispute in the printing trade which has aroused nation wide attention has, of course, affected MODEL AIRCRAFT. So if any of your favourite features are missing or your copy arrives late this month, then we can only ask you to accept our apologies, and assure you that we are doing our best, under the present difficult circumstances.

point first, several well-known modellers have suggested splitting the Nats in two—F/F and C/L. This, in our opinion, is hardly feasible. Few clubs are entirely F/F or C/L—most rely on support from all members, particularly at large meetings. However, there are definite grounds for "pruning" the number of contests, thus ensuring a more streamlined organisation.

The question of continuity is more difficult, but very urgent. Certain contests this year were run by people who had supervised the same events in preceding years, and these contests were notable for the efficient way in which they proceeded. It was obvious that competitors and officials alike knew the procedure, and that lessons learnt at previous Nats had been put into effect. We are not criticising the "first timers," who did a splendid job, but surely the S.M.A.E. Council, with its comparatively stable make-up, can arrange for at least one person, with previous experience of a particular event, to be on hand to ensure a continuity of conduct and flying standards. (This is particular applicable to team racing and similar events, where we have seen conduct that would have led to disqualification one year, ignored the next.)

To close on a less critical note—a well-deserved vote of thanks to everyone—S.M.A.E., Area and Club officials, and the many individuals, who gave their time before, during and after the meeting to make it a success. Last, but not least, thanks are due to the C.O. of Scampton for making this aerodrome available.

Strong-arm tactics

Team racing in this country is noted for the fair play and sportsmanship that exists among competitors, particularly as regards "whipping" of models. There have been, and still are, notable exceptions but they are few in number and regarded with contempt by the majority of flyers.

On the Continent, however, the opposite prevails; there is no rule banning whipping, and a strong right arm is often the deciding factor between winning and losing. It is

obviously for this reason that in the S.M.A.E. Competition Rule Book amendments, it states expressly (when referring to International Class Team Racing) "Whipping is permitted in this class."

Our views on the matter are unequivocal—if the F.A.I. cannot stop whipping in team racing then this event should not have World Championship status. The present position proves no more than would a F/F power event with an unrestricted motor run.

It's a bit much

In fact it's more than that—it's the giddy limit when we have to learn of F.A.I. rule changes from an American magazine. We refer, of course, to the rules concerning the throwing of winches and inter-changing of motors.

Neither of these was mentioned in the official minutes nor, apparently, considered sufficiently important to be included in our delegate's report. Yet they were reported in full in *Model Aviation*—the news bulletin of the A.M.A.—whose editor, Carl Wheelley, was at the meeting.

At first his report was stated to be inaccurate, but a subsequent check showed that the two items mentioned were, in fact, correct. The third change he mentioned—the banning of steel towlines—is stated to be an error, but in view of the way the other points have been mishandled, we wonder!

It is indeed fortunate that copies of *Model Aviation* are sent to a few people in this country, as otherwise our glider team would probably have "thrown away" any chance they had of winning this year's event!

New appointments

THIS issue marks the end of a four and half years' association with MODEL AIRCRAFT by our Editor, Roy Wesson, who is leaving, on his own initiative, to take up an editorial position in the motor industry.

There have been many changes in M.A. during the time of Roy's editorship, the most striking of which has been the introduction of a new cover design, together with, as a leaving contribution, a model photo on the cover this month.

The new Editor will be Norman Butcher, who needs no introduction to our readers as he has been Assistant Editor for three and a half years, and is well known throughout the model aircraft movement.



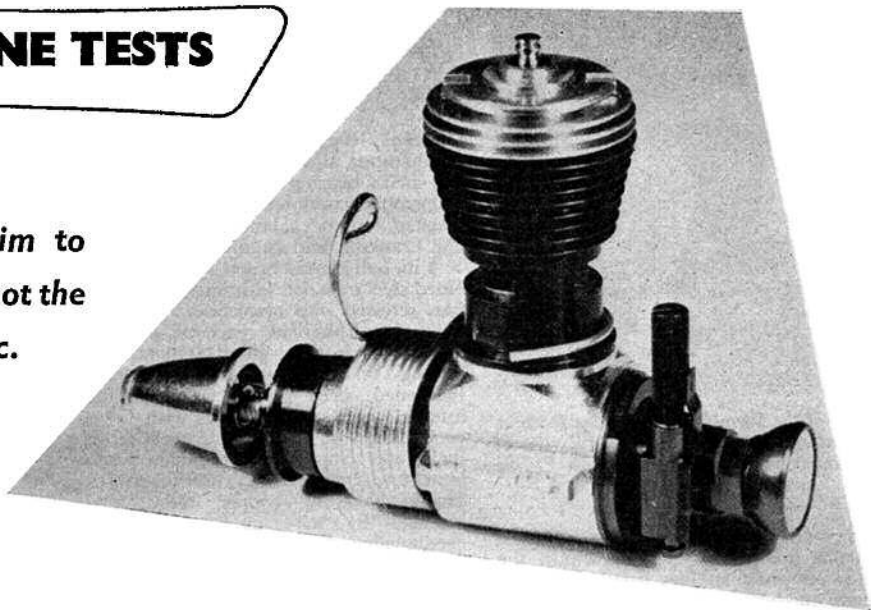
To sell fifty million—yes 50,000,000—kits in the space of some eight years is quite something, yet that is what Airfix have done. To mark the occasion they held a cocktail party at which a model of the "Lancaster," built from one of their kits, was presented to Lord Tedder, together with a cheque for £100 in aid of the Malcolm Clubs' appeal.

The photo shows Lord and Lady Tedder with Mr. A. G. Elliott (left), Chairman of Airfix Products Ltd.



ENGINE TESTS

“ . . . justifies its claim to be one of the most, if not the most, powerful 2.5 c.c. engines available in the world today ”



The Cox Olympic 15

THIS is the 125th MODEL AIRCRAFT Engine Test report and, with this not inconsiderable background of experience, we have no hesitation in placing the Cox Olympic 15 on our short list of the most impressive engines yet tested.

The reasons for the high rating of this new American engine are many. Firstly, there can be no doubt that the Olympic justifies its claim to be one of the most, if not the most, powerful 2.5 c.c. engines available in the world today. Secondly, this performance is matched by starting and handling characteristics of the highest order. Thirdly, the quality of its construction is to a standard seldom equalled in quantity-produced miniature i.c. motors.

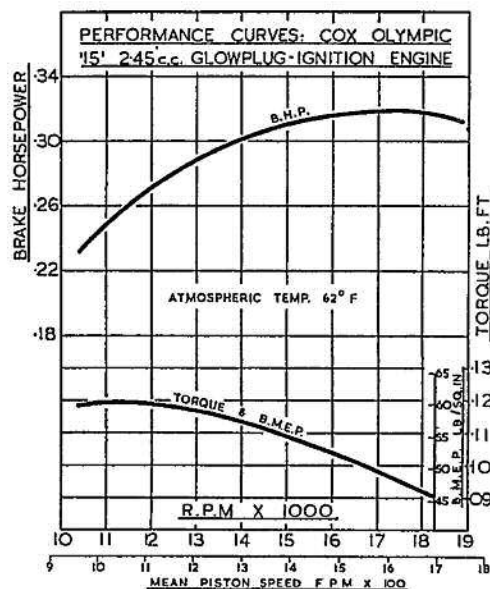
In general, the Olympic follows the same basic design and construction as the smaller Cox motors, with the additional refinement of a ball-bearing mounted crankshaft and with beam mounting lugs instead of the radial mount that has hitherto characterised this manufacturer's products. All the typical Cox features, such as reed induction, one-piece opposed-port reverse-flow scavenged cylinder and

This has been made possible by working to extremely close tolerance limits in grinding operations, cylinder boring and honing, etc., and, to this end, all such operations are done in a temperature controlled room.

One of the features that must contribute to the performance and handling characteristics of the Cox 15 is the special multi-jet carburettor. This feature, which was first introduced several years ago as a modification for the Space-Bug and as a standard item on the Thermal-Hopper, dispenses with the normal spray-bar type needle-valve or needle controlled jet orifice. Instead, there are three small jet holes, spaced at 120 degree intervals, through the choke tube, which is of an efficient venturi shape, providing a smooth, finely atomised supply of mixture to the reed-valve. These jet holes are connected by a channel machined around the outside of the choke tube. Over this section is the carburettor body, comprising a collar and the needle-valve which meters the amount of fuel reaching the channel.

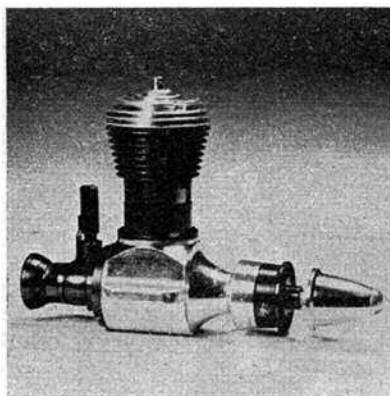
The Olympic cylinder is machined in one piece, with integral fins. It has two large exhaust ports giving an exhaust period of 140 deg. of crank rotation (plus a sub-piston supplementary air induction period of approximately 60 deg.) and two internal transfer flutes. With these latter, incidentally, there is a considerable timing overlap, the transfer opening only 6 or 8 deg. after the opening of the exhaust port. The cylinder head is of the usual Cox hemispherical form, with built-in glow filament to give the smoothest possible head contour.

A feature that may cause some



Unorthodoxy has always been a characteristic of Cox engines—not only in design, but in construction, too. No castings are used in the Olympic and the crankcase is machined from extruded bar stock. The piston is hardened on the wearing surface only, the interior being protected by a plating of copper so that the socket for the ball ended connecting-rod remains soft enough for swaging. This latter operation, incidentally, is carried out entirely automatically, on a special hopper-fed machine, built for the purpose by the Cox company.

As has been pointed out in previous articles, Cox engines are remarkable for the fact that the need for running-in, in the ordinary sense, is virtually eliminated.



Many of the Olympic's unorthodox features are internal, and an "exploded" view of the components appears in Latest Engine News.

surprise is the starter spring. Spring starters are now widely known in the U.S. on small engines fitted to ready-made models, and the average experienced modeller undoubtedly thinks of this as "something for the kids," and as having no particular merit for "expert" use. In actual fact, the Olympic's starter is no mere gimmick. As our performance notes disclose, it has strictly practical value as applied to this particular engine.

Specification

Type: Single-cylinder, air-cooled, reverse-flow scavenged, two-stroke cycle, glow-plug ignition. Reed-valve induction plus sub-piston supplementary air induction. Flat top piston with hemispherical combustion chamber.

Bore: 0.585 in. Stroke: 0.556 in.

Swept Volume: 0.1495 cu. in. (2.449 c.c.).

Stroke/Bore Ratio: 0.9504 : 1.

Weight: 4.15 oz. including starter spring.

General Structural Data

Machined aluminium alloy crankcase and main bearing housing. Hardened and ground crankshaft with machined-in crescent counterbalance and 5/32 in. dia. crankpin and running in two 1/4 in. x 3/8 in. ball journal bearings. One-piece blue steel cylinder with integral cooling fins, screwed into crankcase. Screw-in alloy hemispherical pattern cylinder head, with integral glow filament, and seating on confined copper gasket. Hardened steel piston assembled as integral ball-jointed unit with steel connecting-rod. Screw-in carburettor body unit comprising crankcase back-plate, reed-valve housing and choke-tube. Single 0.004 in. copper alloy reed retained by wire circlip. Separate needle-valve body, metering fuel to three carburettor jets, can be rotated to any convenient angle. Wire gauze intake filter. Beam mounting lugs. Eight-coil starter spring of 0.056 in. spring steel wire.

Test Engine Data

Running time prior to test: 30 min.

Fuel used: Record Super-Nitrex (50/50 mixture of Super-Nitrex and Methanex used for first 15 minutes' running).

Performance

The maker's leaflet suggests that, no matter how expert the user might be, he follows, to the letter, the starting instructions laid down. This includes the use of the starter spring, and, after trying the engine both with and without

the spring, we wholeheartedly agree. This is not because the Olympic is hard to start by normal finger flicking, but because, with the spring, starting becomes so simple and so certain, that there is no good reason for not using it. Like all reed-valve engines, the Olympic will run in either direction and with a tendency to sometimes start in reverse rotation with normal finger flicking, especially on small diameter, light props. Using the starter, this bother is eliminated, the spring storing sufficient torque to spin the engine over compression far more effectively than the most vigorous finger flick.

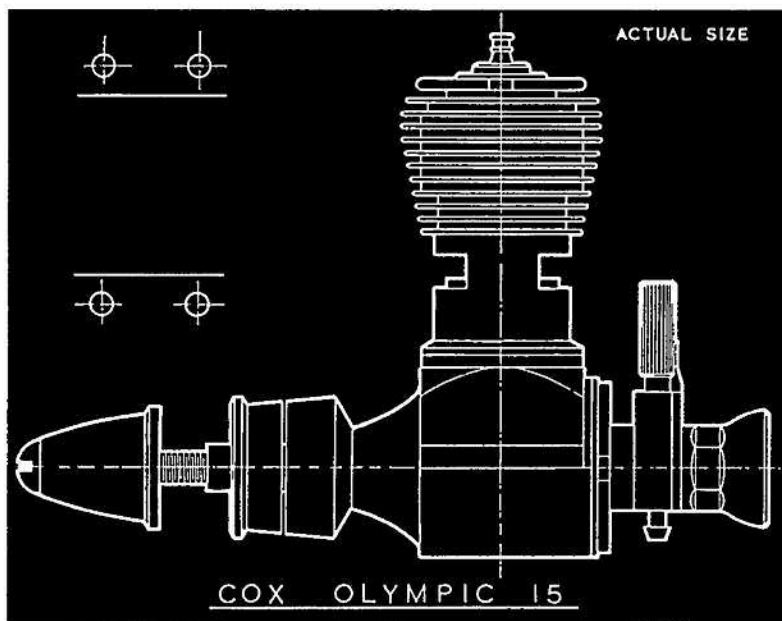
At first, it will usually take a few attempts before the precise prime required is determined, but, thereafter, the Olympic will generally start instantly on the starter spring. With the engine hot, it is not necessary to prime through the ports or even to choke the intake provided the fuel line is full. We made about 30 successive warm starts in this way, using a variety of props and, in every case, the motor went off straight away at the first attempt.

As regards performance, the most surprising thing of all is the substantially improved torque of the Olympic when compared with other 2.5 c.c. glow engines. We were prepared to find that the engine would peak at higher revolutions than any other 2.5 tested, but its torque, indicated in a maximum b.m.e.p. of 60 lb./sq. in., is up to the best diesel 2.5 standards and is better maintained at the higher revs. This gives rise to a b.h.p. of close to 0.32 at approximately 17,500 r.p.m. which appreciably exceeds the performance of any other production type International class engine yet tested.

Despite the high torque indicated at 11-12,000 r.p.m. the Cox is essentially a high speed engine and should be treated as such. On a good 8 x 4 prop for example, F/F men should find that it can offer up to 1,000 r.p.m. more in the air than the best of the opposition. For C/L team-racing it is doubtful whether it has any advantage over a well-tuned Oliver, due to higher fuel consumption, but for C/L speed, it is clearly the most promising Western-built 2.5 c.c. engine to date.

The Olympic is built to take a powerful fuel and our tests were carried out on a commercial fuel containing 30 per cent. nitromethane. For pure speed work, it is probable that even more nitro can be used to give still higher performance. Running characteristics are excellent. Provided that props are correctly balanced, vibration is at a very low level and the engine runs extremely evenly. The needle-valve is non-critical and easy to adjust and holds the setting perfectly.

The Cox Olympic 15 will shortly be available in the U.K. and although, with import duty and tax added, the price is likely to be rather higher than for most other 2.5s, we feel sure that it will find a ready sale among contest enthusiasts.



'59 Nationals



*Bright
but breezy!*

... and it certainly was at R.A.F. Scampton, in Lincolnshire, over Whitsun weekend for the 12th British Nationals. Lincolnshire is the home of large aerodromes as readers who made the pilgrimage to the '56 meeting at Hemswell—only a few miles from Scampton—will remember, and we hope that the similarity of weather conditions at both places was only a coincidence, just in case we have to go that way again! (Just remembered the trials are at Wigsley only a few miles away.)

Although the sun shone throughout both days the wind was really strong, particularly on the Monday, and really cold to boot. Fortunately, regular fliers are used to such hazards by now, and with the exception of the F/F scale event the contests were little affected by the wind.

On the Sunday morning we decided to have a quick look round, and then to cover seriously the separate events. This was a wise move, for as we arrived at the multi radio Chris Olsen was about to fly; and what a flight! He did the lot, only to 'lose' the model at the end of the flight when it spun in. It was a wonderful performance bettered only by his friend Stuart Uwins, who flew a similar design into first place later in the day.

Of such high quality was the multi flying this year that we were loath to drag ourselves away (quite a change from some previous meetings!). Next stop was at the glider which was, as usual, the most popular (numerically) event with 355 entries. All sorts, shapes and sizes of model were taking the air, from A/1's, to monsters that would reach a grade of about A/5—if there were such a thing! Top honours eventually went to our old friend Fred Boxall of Brighton (the second time he has won the Thurston Cup, the first being at Hemswell—the Lincolnshire air must suit him!), after a three man fly-off, this being the only event of the meeting to require a deciding flight.

Flick rolls at this height are not recommended—especially in the qualifying flight of a F/F Scale Contest! Acrobatic Sikorsky S.39 is that of Arthur Evans, who still managed gain fourth place, by virtue of his 85 pts. for construction and finish.

Scale judges Bob Gosling and Alex Houlberg, take a well-deserved break halfway through the scale C/L judging.



It took us a long time to find out where the PAA-load was; no one seemed to know. John O'Donnell asked us, as he wanted to fly in it, just as we were about to ask him, as we wanted to photograph it! We eventually ran the organisation to earth sited in a very sensible position well up wind, but here was a concrete example of where the organisation of signboards and markers fell down. Entries for this event were again down, lending emphasis to our opinion stated last year, that this is an event which could well be dropped from the Nats programme. However, of those who did fly the standard was high, and Arthur Collinson's winning time of 9:34 is very creditable.

This year the class "A" team race was to F.A.I. specification, but not run to F.A.I. rules—with the exception of that regarding whipping, and our views on this are stated in no uncertain terms in Here and There (page 194). Our condemnation of

whipping was repeated very forcibly by several pilots. In fact, Charlie Taylor, who surely must rank as the "elder statesman" of all currently practising team race pilots, complained of a strained muscle caused by trying to whip a model too hard! Anyway, whipping or not, Dick Edmunds once again emerged from the mêlée triumphant, which must prove something—or does it?

The sound of a healthy motor drew our attention towards the circle where the Gold Trophy competitors were fighting a generally losing battle with the wind. As we approached, a large yellow and green model took the air, being flown by a neat figure in white overalls and Australian bush hat, which gave us an obvious clue to the flyer's identity—Australian stunt expert, Brian Horrocks. He flew a very good pattern which we remarked at the time would be hard to beat—it was—he won! Congratulations, Brian, on a first-class opening performance.

By now the lure of the tea urn and buns drew us towards main control, where the N.A.A.F.I. facilities were in great demand. While there, we looked in on the scale judges who were safely ensconced in a small back room assessing the merits of the C/L scale entries. Interested onlookers crowded the windows, but they had ample opportunity to see the models later when the flying tests took place. These were carried through smoothly, although here again the organisation slipped badly in not having a means of informing the general public what was happening, particularly where a model was fitted with a third line for working equipment such as bomb doors, etc., whose operation could be easily overlooked unless one was watching for it.

The winner was once again Cesare Milani with a beautiful replica of the Nash Fokker D.7 powered with a Taplin Twin and using the built-in throttle. He was obviously handicapped by the strong wind with this comparatively lightly loaded model, but nevertheless proved its flyability. Incidentally, he qualified for the cash award of £25 offered by the motor's manufacturer to the first person to win a National contest with one.

Activity on the speed circle was more pronounced than in previous

1. A.R.C.C. member Ed Johnson prepares for his flight in the Ripmax Shield, where he tied for second place.
2. F. McNulty of Baildon launches country member I. Amor's interesting glider, which had a transparent centre section and very slim fuselage.
3. Giant Thurston Cup entry was Jim Baguley's glider, released here by fellow Hayes club members, T. Punter and B. Chapman.
4. J. King of Cadzow puts all he's got into releasing clubmate J. Stother's F.A.I. team racer.



years—which isn't saying much—but we were pleased to note that far more than usual of the entrants were at least getting their models airborne. Congratulations to Pete Drewell for winning the Class III for the second time, together with our commiserations for failing to raise the record (held by Gadget Gibbs at 159 m.p.h.), an ambition he has been trying to realise for several years.

A quick look in at the combat circle to see how the first heats were getting along and a last round up of the other events to watch the final flights brought the first day to a close.

The Monday dawned cloudy and cold, but the sun soon broke through although it remained far more chilly than the previous day. The general public, too, did not turn out in such large numbers, although this was doubtless accounted for by the fact that there were several full-size displays at other local airfields.

Following our previous day's programme we started off at the radio only to depart in disgust at the poor standard of the rudder-only flying compared with the multis. There were one or two good flights, but they were definitely in the minority.

Although many of the entrants in the Sir John Shelley were deterred from flying by the stiff wind (which was by now far stronger than it had been on Sunday), the standard of many of those who did fly was exceptionally good. There were, of course, the inevitable spectacular prangs, but most of the models were really "sorted out" and some rates of climb can only be described as fantastic. This was particularly noticeable with some glo-engined jobs, where the noise matched the performance, and drew all eyes skywards.

Compared with the power, the rubber contest for the MODEL AIRCRAFT trophy was a haven of peace but not rest! Shielding the models from the wind while winding was a great problem and this followed by a quick launch and high speed sprint down the 'drome, dispelled any ideas of rubber being the "old man's" branch of the hobby. As was not unexpected, John O'Donnell flew in his usual impeccable style to score his only Nationals win this year.

The lunch break again found us at main control where Messrs. Houlberg and Gosling were once more hard at work judging scale

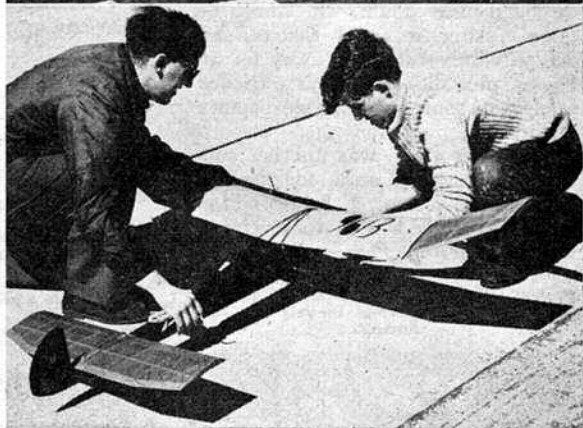
He'd come a long way but it was worth it! Australian Brian Horrocks with his Gold Trophy winning stunt model.



Best flying in the rudder-only radio for the RipMax Shield came from Eric Scholes of N. Lincs, who ended up an easy winner.

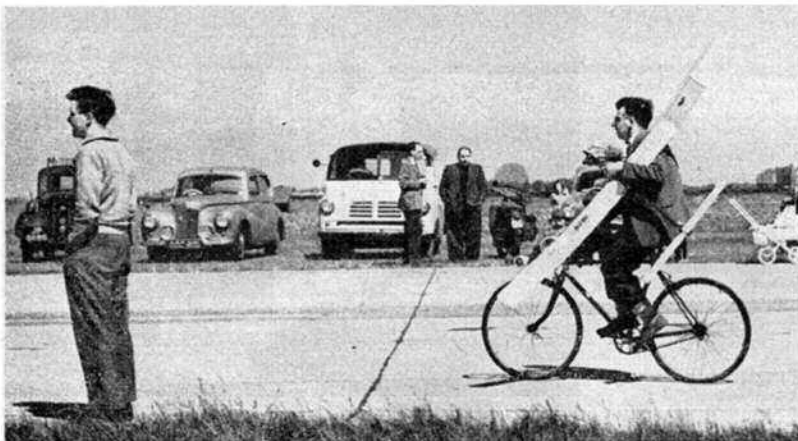


When we took this picture of J. Sayer (Tee-side) he was leading in the Short Cup but finally had to be content with second place.



Peter Drewell of Lewisham Orbits preparing his "60" model for his class III Speed winning flight, assisted by club mates J. Watson and I. Roffey.





The O'Donnell bicycle was put to good use retrieving from way down wind. This photo, taken on the first day, shows John with his Thurston Cup entry.

models—F/F this time. The qualifying flights for these models were a photographer's delight and a competitor's heartbreak. First man away was Crawley of Mill Hill, whose Bristol *Monoplane* made a very neat circuit and landed undamaged. This doubtless raised the hopes of everyone, but they were soon dashed (literally) as model after model was blown into the ground, crowd, and even the judges. We had almost despaired of anyone else getting away by the time young Den Partridge of Croydon came out to fly. However, he soon dispelled any doubts—it could be done. After a rapid take-off his S.E.5a climbed happily away for an 80 sec. plus flight and was retrieved safely from some considerable distance downwind.

After this there was another succession of crashes until, for the last flight of the contest, J. Bridgwood of Doncaster made a very steady circuit with his Heston *Phoenix*, fitted with

Typical combat pits scene—whole models, broken models, patched models and fuel bottles.



a fuse operated retractable undercarriage, following a handlaunch after several abortive r.o.g. attempts.

The class "B" team race, after a day of much "cleaner" flying than was evident in "A," resulted in a very close final in which McNess just pipped the Walker/Tuthill team—a situation which the latter have been trying to reverse for a long time. As a spectacle we still prefer "B" to "A" racing, if only because the entries are usually experienced and

thus the standard of flying better—also, perhaps the noise has something to do with it!

On the subject of spectacles, combat had now reached its final stages. Bernard Shaw once said of Wagner's music: "It has moments of divine beauty interspersed with quarter hours of dreariness." Substitute the words "real excitement" for "divine beauty" and you have our opinion of combat as it is run at the moment. However, taking into account the weather and the large entry, it went very well indeed and the Northwood club are to be congratulated on volunteering to cope with this "hot potato" of a contest and handling it very well indeed.

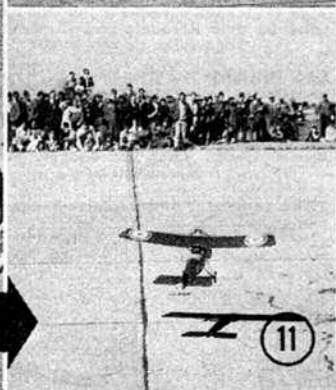
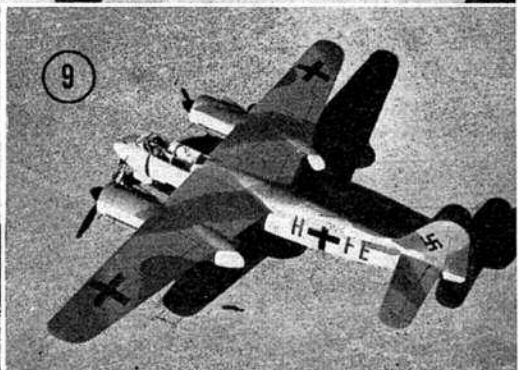
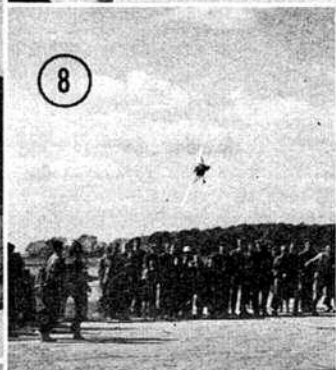
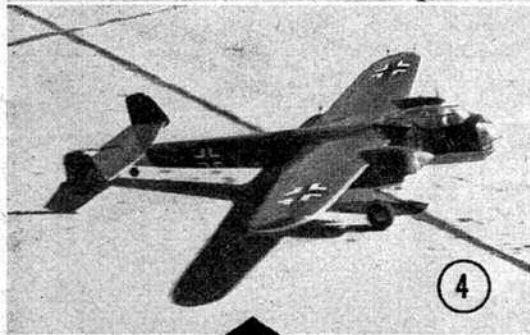
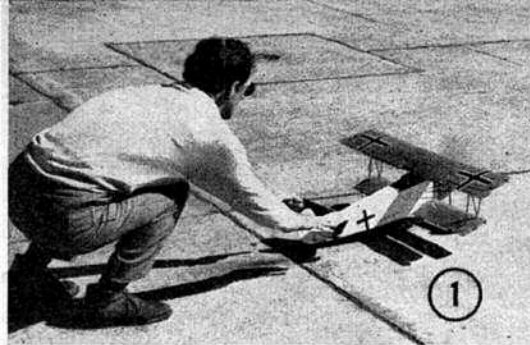
If anyone would have taken a bet with us on the results of the F.A.I. speed we would have been nicely in the money thank you, but they wouldn't and we have only the satisfaction of being able to say "We told you so." Even so, the results were far closer than we anticipated and we wish the boys luck at the Criterium d'Europe.

And so the Nationals ended. Tired, windswept and cold, we joined the happy throng (happy except for one unfortunate who shall be nameless—he wrote off the sump of his car on

Continued on page 202

SCALE SYNOPSIS CAPTIONS TO FACING PAGE

1. Cesare Milani's Fokker D.7 took off realistically but was buffeted considerably by the strong wind.
2. First F/F scale model to take the air was C. Crawley's Bristol *Monoplane* which was very stable.
3. By coincidence the last flight of the contest was among the only three successful ones, and here J. Bridgwood's Heston *Phoenix* gets away nicely from a hand launch.
4. The Do.215 is an ideal "twin" prototype and this replica by R. F. Moss of Eastbourne performed very well.
5. Longest flight of the day in F/F scale was made by the winner Den Partridge of Croydon who made a perfect take off with his Frog 80 powered S.E.5a.
6. Assisting Partridge to start up for his winning flight is clubmate P. Scarbrow—note "windsock."
7. R. F. Moss prepares to "take off" for the centre of the circle having quickly started the motors of his Do.215.
8. One more for the crowd—B. Newman's (Blackheath & Halesowen) D.H. Beaver caused some rapid evasive action.
9. C. P. G. Wheldon's T.A. 154 Va *Moskito*—a German nightfighter—was one of the prettiest twins we have seen—it performed really well, too.
10. J. Simmence entered this beautiful Sopwith *Swallow* in the F/F. After the perfect take-off shown in photo.
11. it unfortunately crashed into the crowd.
12. George Fletcher is assisted by Ron Aaron, to get the most from his Frog 3.49 powered *Tempest* which flew well. Aaron's also entered a replica of this machine fitted with a working undercarriage—the story of why he didn't fly it will be told in a later issue.
13. Tony Clements' R.E.8 appears to be off for a good flight but as with so many others the wind was too much for it.
14. Ambitious entry shown here is S. B. Perry's S.6B, it took-off successfully from the dolly and we admire Mr. Perry's courage in landing it on concrete!
15. Lots of power but unable to use it. George Miles of Blackheath & Halesowen showed a really catholic taste in motors for his *Viscount*—two A.M. 15s, and one each E.D. 2.46 and Frog 2.49—but he was unable to get them all going at the same time.





a concrete block that had been hidden before by the entry ticket seller's table!) leaving the gate and splitting up to go their various ways. This is really the moment when it sinks in that it is all over and a year must pass before the next Nationals modelling weekend.

Talking Points

It was interesting to note an increasing interest in multis among scale C/L enthusiasts but we hope that by next year some of them will have got their starting procedures better organised.

* * *

Quick change artist award must

1. We're off. Gadget Gibbs sprints for the pylon to make his winning flight in F.A.I. Speed.

2. Brian Greenaway and Dave Balch of Hayes with scaled up Peacemakers powered with Prototype Rivers 3.49s, pose with motor manufacturer A. E. Rivers.

3. Making a welcome return to the speed circle, Mike Billington of Brixton placed third in Class III.

4. Interesting Combat design by C. N. Campbell of R.A.F. Marham featured all booms and motor change in their class "B" team racer. See text for details.

5. Ray Tuthill and Don Walker make the quickest ever motor change in their class "B" team racer. See text for details.

go to Ray Tuthill and Don Walker of Enfield. Their motor seized during a run-up at the start of a "B" team race heat—it was out and another substituted within, at a guess, two minutes. They went on to win the heat and place second in the final.

* * *

Photographers can be useful—afterwards. Ron Ward's PAA-load

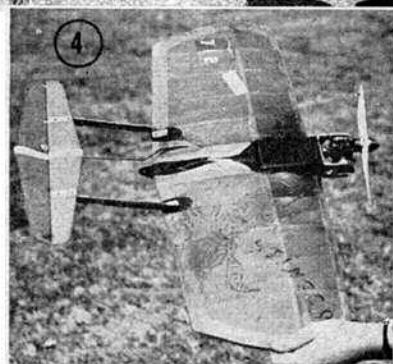
CAPTIONS LEFT TO RIGHT

John O'Donnell's model is shielded from the wind by Eric Barnacle and D. Greaves as John piles on the turns.

Dick Edmunds has won the "A" team race so often we've lost count! Here he prepares a model in one of the heats.

Chris Olsen, with transmitter, is flanked by Stuart Uwins (left) and Judges "Rushy" and Henry J.

Silvio tells us "no photographs please the engine bearers are loose." Competitors Ken Glynn does not seem unduly worried!



model crashed—a study of a photograph taken while it was taking off showed the tail scraping the ground and being pushed out of alignment.

* * *

About halfway through the rudder-only radio we saw a model really "doing the book." Couldn't believe



KEILKRAFT sanded balsa

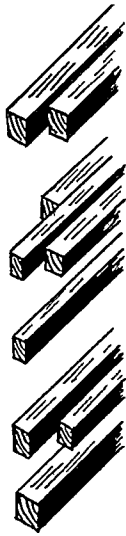
— costs no more than ordinary balsa!

CHECK THIS LIST

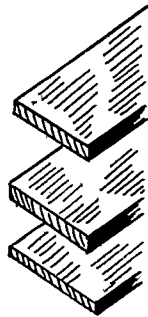
SHEET (3 ft. lengths)

BLOCK (3 ft. lengths)

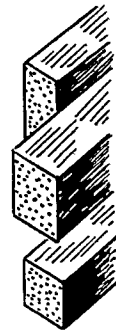
STRIPWOOD (3 ft. lengths)



1/16" x 1/16" ...	1 1/2 d.
x 3/32" ...	1 1/2 d.
x 1/8" ...	1 1/2 d.
x 3/16" ...	1 1/2 d.
x 1/4" ...	2 d.
x 3/8" ...	2 1/2 d.
x 1/2" ...	3 d.
3/32" x 3/32" ...	1 1/2 d.
x 1/8" ...	1 1/2 d.
x 3/16" ...	2 d.
x 1/4" ...	2 1/2 d.
x 3/8" ...	2 1/2 d.
x 1/2" ...	3 d.
1/8" x 1/8" ...	2 d.
x 3/16" ...	2 1/2 d.
x 1/4" ...	2 1/2 d.
x 3/8" ...	3 d.
x 1/2" ...	3 1/2 d.
3/16" x 3/16" ...	2 1/2 d.
x 1/4" ...	3 d.
x 3/8" ...	3 d.
x 1/2" ...	3 1/2 d.
1/4" x 1/4" ...	3 d.
x 3/8" ...	3 1/2 d.
x 1/2" ...	4 d.
3/8" x 3/8" ...	5 d.
x 1/2" ...	6 d.
1/2" x 1/2" ...	7 1/2 d.
x 1" ...	11 d.
3/4" x 3/4" ...	13 d.



1/32" x 2" ...	8 1/2 d.
x 3" ...	11 d.
x 4" ...	14 d.
1/16" x 2" ...	8 1/2 d.
x 3" ...	11 d.
x 4" ...	14 d.
3/32" x 2" ...	9 d.
x 3" ...	12 d.
x 4" ...	16 d.
1/8" x 2" ...	10 d.
x 3" ...	13 d.
x 4" ...	17 d.
3/16" x 2" ...	11 d.
x 3" ...	15 d.
x 4" ...	20 d.
1/4" x 2" ...	12 d.
x 3" ...	16 d.
x 4" ...	21 d.
3/8" x 2" ...	14 d.
x 3" ...	18 d.
x 4" ...	24 d.
1/2" x 2" ...	16 d.
x 3" ...	21 d.
x 4" ...	28 d.



1" x 1" ...	21 d.
x 1 1/2" ...	33 d.
x 2" ...	39 d.
x 2 1/2" ...	46 d.
x 3" ...	59 d.
1 1/2" x 1 1/2" ...	41 d.
x 2" ...	49 d.
x 2 1/2" ...	56 d.
x 3" ...	73 d.
2" x 2" ...	59 d.
x 2 1/2" ...	73 d.
x 3" ...	89 d.
3" x 3" ...	126 d.
x 4" ...	161 d.



SHAPED MOULDING (Leading Edge)



1/4" x 1/4" ...	4 1/2 d.
3/8" x 3/8" ...	7 1/2 d.
1/2" x 1/2" ...	8 d.

SHAPED MOULDING (Trailing Edge)



1/8" x 3/8" ...	4 d.
x 1/2" ...	4 1/2 d.
3/16" x 1/2" ...	5 d.
x 3/4" ...	6 d.
1/4" x 3/4" ...	7 1/2 d.
x 1" ...	9 d.

SHEET Balsa HOBBY PACK 1/-
BLOCK Balsa HOBBY PACK 2/-

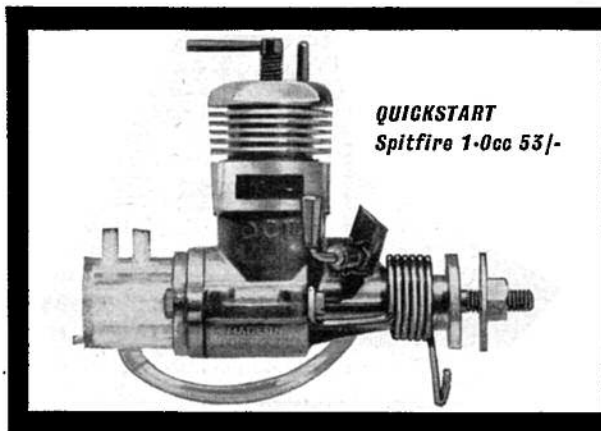
INSIST ON KEILKRAFT
THE ONLY SANDED Balsa



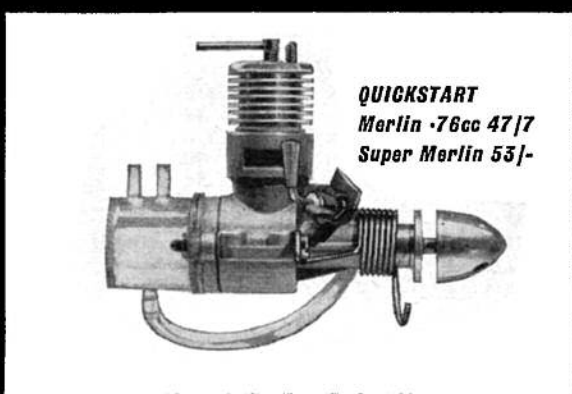
the easy way to start a diesel

QUICKSTART

New and exclusive to these Davies-Charlton engines



QUICKSTART
Spitfire 1.0cc 53/-



QUICKSTART
Merlin 76cc 47/7
Super Merlin 53/-

With four other 'easy starting' extras

- ★ new style fuel tank — non-spilling; positive feed
- ★ redesigned jet assembly for non-critical adjustment
- ★ new limit pin prevents over compression
- ★ new style crankcase

QUICKSTART really lives up to its name

This outstanding diesel development enables even the beginner to start his Davies-Charlton engine with only a turn of the propeller.

No more hours of finger-weary flicking!

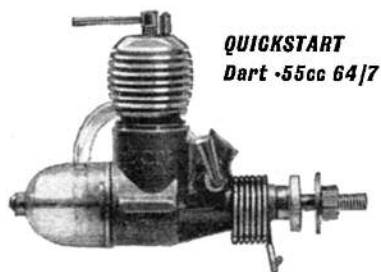
It's a simple device! . . . a uniquely effective device!

Quickstart is a tempered steel spring which fits over the propeller shaft and engages with the blade.

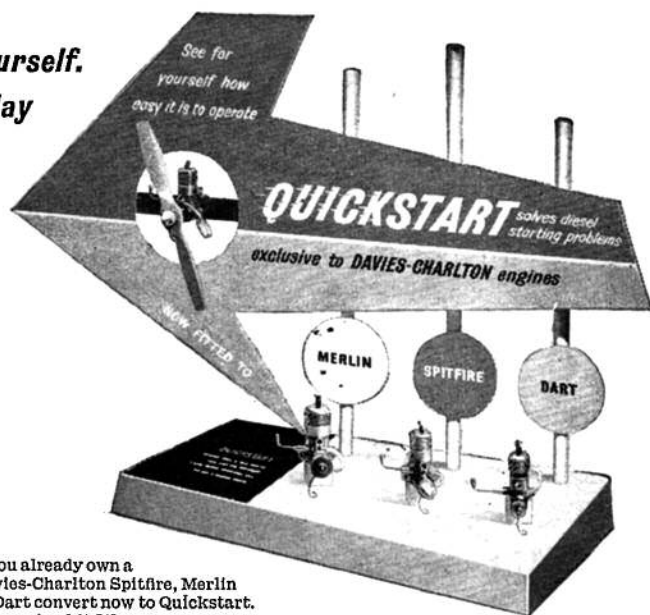
A turn of the propeller and, on release, the engine will turn over at least three times against compression.

When the engine starts the spring recoils free from the blade.

**Try Quickstart for yourself.
Look for this display
in your local Model Shop**



QUICKSTART
Dart -55cc 64/7



If you already own a Davies-Charlton Spitfire, Merlin or Dart convert now to Quickstart. Conversion kit 2/6.

DAVIES-CHARLTON LIMITED

HILLS MEADOW DOUGLAS ISLE OF MAN



MODEL DIVISION

PARAGUAY · ARGENTINE · PORTUGAL · YUGOSLAVIA · SOUTH AFRICA · SWITZERLAND · BELGIUM · MALTA · FINLAND · NEW ZEALAND · ITALY · AUSTRALIA · INDIA · THE CONTINENT · HOLLAND

SUPPLIES THE WORLD!

Equado

BALSAWOOD

More and more satisfied clients the world over receive their regular shipments of Equado—such is the popularity of this fine balsawood used by modellers everywhere. Equado balsawood is supplied in metric and English sizes.

TRADE PRICE LISTS ON APPLICATION TO SOLE MANUFACTURERS AND SHIPPERS.

E. LAW & SON (TIMBER) LTD. 272-274 HIGH STREET · SUTTON · SURREY · VIGilant 8291-2



USE HMG FUEL PROOFER

Users of HMG Fuel Proofer agree it is the best obtainable. Due to the extremely high gloss which it imparts, HMG Fuel Proofer is extensively used as a finishing coat. The high gloss reduces drag, thereby increasing flying speed. No hardener or other addition required.

Suppliers to the Trade. Obtainable from all Leading Model Shops

RETAIL PRICE per 2 oz. jar, 2/-.

B. Relf & Co. 129 Eastbank Street, Southport, Lancs.

CEMENTS AND DOPES
 HMG Heat and Water Proof Adhesive per tube 1/3
 HMG All Purpose Clear Adhesive . . . per tube 1/9
 HMG Polystyrene Cement . . . per tube 6d.
 Pukka Balsa Cement Three sizes, tubes 7d., 1/- & 1/6
 Finishing dopes, clear and coloured—Supplied in standard sizes and popular colours.

READ POPULAR FLYING

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

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SPLIT-ACTION Stop Watches

These fine precision watches are ideal for individual and successive timing. Either hand can be stopped independently. Split action obtained by side button. Reads to 1/5 sec. and records on separate dial to 30 min. Fully tested and guaranteed for 12 months. Others from 52/6.



UNITED TECHNICAL SUPPLIES

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Opp. Edgware Road Stn.

£5.5.0

Tel: PAD 1133.
5 min. Marble Arch

our eyes until we found out it was Stuart Uwins giving a demonstration of his multi winner during the break.

Several combat ships were fitted with prototype Rivers 3.49s under the

careful eye of designer A.E.R. himself —they really went, too.

Ask the campers who kept them amused with a flame throwing act

—one mouthful of diesel fuel plus one match = 10 very impressive feet of flame—until it backfired! Would make a wonderful act for the S.M.A.E. dinner though.

RESULTS

THURSTON CUP 355 entries

1. F. H. Boxall ...	Brighton ...	9 : 00 + 1 : 58
2. G. Tidewell ...	Baldon ...	9 : 00 + 0 : 55
3. L. Foster ...	Sheffield ...	9 : 00 + 0 : 14
4. P. T. Waters ...	Port Talbot ...	9 : 00

SHORT CUP 19 entries

1. A. Collinson ...	Baldon ...	9 : 34
2. J. A. Sayers ...	Tee-side ...	7 : 34
3. J. O'Donnell ...	Whitefield ...	7 : 00

GOLD TROPHY 41 entries

1. B. Horrocks ...	Wolves ...	444 pts.
2. R. E. Brown ...	Lee Bees ...	441.5 "
3. D. J. Day ...	Birmingham ...	384 "

KNOKKE NO. 2 TROPHY 21 entries

1. Capt. C. Milani ...	Wayfarers (Fok. D.7) ...	137½ pts.
2. C. P. G. Wheldon ...	Blackheath & Halesowen (TA 154 Va) ...	110½ "
3. R. F. Moss ...	Eastbourne (Do 215) ...	31½ "

S.M.A.E. TROPHY 43 entries

1. S. E. Uwins ...	C.M. ...	174 pts.
2. C. H. Olsen ...	C.M. ...	145 "
3. F. Van de Bergh ...	Bromley ...	119.5 "

DAVIES "A" TROPHY 98 entries

1. R. Edmunds ...	High Wycombe ...	6 : 02.3
2. D. Tyler ...	Feltham ...	6 : 16.2
3. F. Baxter ...	Wharfedale ...	6 : 27.4

SIR JOHN SHELLEY CUP 266 entries

1. G. R. French ...	Laindon ...	12 : 00
2. B. Talbot ...	Wigan ...	11 : 31
3. K. G. Smith ...	Croydon ...	11 : 03

TOTAL ENTRIES: 1,320 from 782 individuals in 168 clubs.

MODEL AIRCRAFT TROPHY 169 entries

1. J. O'Donnell ...	Whitefield ...	12 : 00
2. C. D. Miller ...	Baldon ...	11 : 50
3. F. Barnacle ...	Kennington ...	11 : 26

SUPER SCALE TROPHY 22 entries

1. D. Partridge ...	(S.E.5a) ...	126 pts.
2. J. Bridgewood ...	Doncaster (Heston Phoenix) ...	110 "
3. J. G. H. Simmence ...	Northwood (Sopwith Swallow) ...	107 "
4. A. Evans ...	Mill Hill (Sikorsky 5.39B) ...	102½ "

RIPMAX SHIELD 50 entries

1. E. Scholes ...	N. Lincs. ...	44 : 5
2. D. Grocott ...	A.R.C.C. ...	24 : 0
3. E. Johnson ...	A.R.C.C. ...	24 : 0

DAVIES "B" TROPHY 55 entries

1. J. McNess ...	W.E. ...	8 : 23.8
2. D. Waller ...	Enfield ...	8 : 35.5
3. K. Lay ...	Wharfedale ...	8 : 39

SPEED CLASS 1 25 entries

1. R. Gibbs ...	Hornchurch ...	115 : 03
2. J. Hall ...	Belfairs ...	111 : 09
3. R. Irvine ...	Glasgow ...	99 : 87
4. B. Jackson ...	Worksop ...	85 : 04

SPEED CLASS 2 19 entries

1. J. Watson ...	Lewisham ...	131 : 06
2. I. Roffey ...	" ...	124 : 03

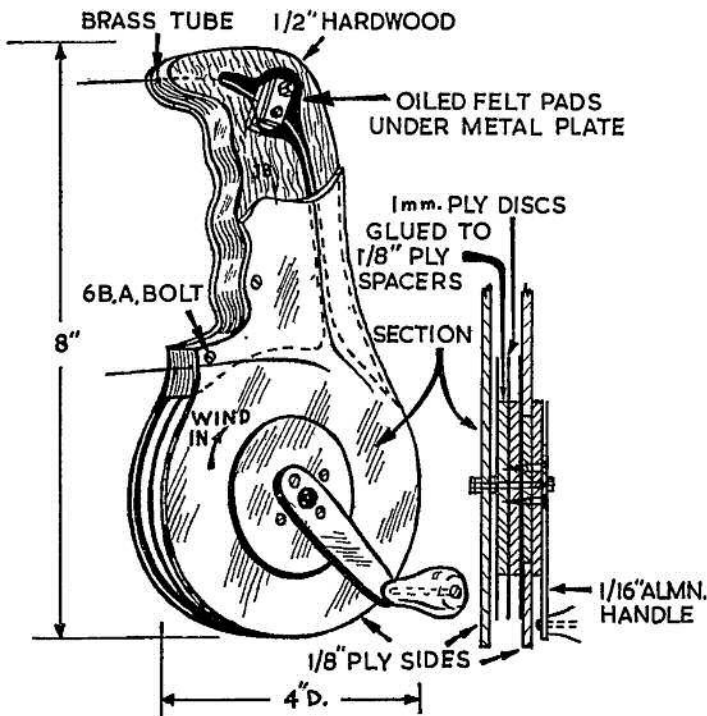
SPEED CLASS 3 8 entries

1. P. Drewell ...	Lewisham ...	151 : 20
2. D. Howell ...	Watson ...	142 : 05
3. M. Billington ...	Brixton ...	133 : 01

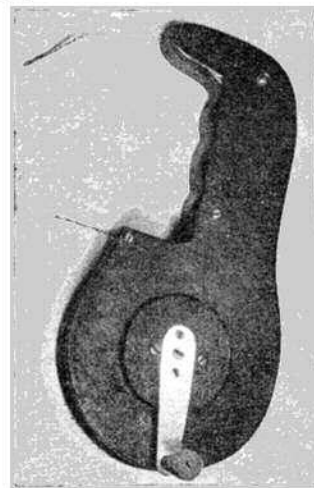
COMBAT 128 entries

1. R. Stevens ...	Northwood ...	
2. M. Kendrick ...	W. Brom. ...	

Build your own "self contained" CONTROL LINE HANDLE



IN response to requests from local club members, P. D. Allen of Dymchurch, designed this easy to make "U-Reely" type handle. It is unique as it contains the lines below the grip, which obviates the main criticism with handles of this type—"nose" heaviness. The construction is self-explanatory and can be easily followed from the drawing and photograph which incidentally shows the original handle—made by C. G. Everest.



Topical Twists

by PYLONIUS

All Square

Our ancient institutions are coming in for quite a lot of youthful criticism of late, and it's only fitting that I should come in for my share. Here is the sort of letter I am expecting to receive in the near future:

The Secretary,
En Bee Gee Model Club,
Grizzlington,
Beds.

Dear Twister,

A gang of us club blokes had a bit of a get together at the local skiffle centre to have a gripe about this model plane lark. One of the blokes brought along a model mag what had been delivered to his house by mistake, and we all had a duffy at it. Now, we blokes don't go in for this reading lark much, but one of the gang—a bit of a square, what has read Shakespeare and that—reckons the nana what writes a lot of guff in the model mags is too ignorant to spell Pylonus. This made us think quite a bit. If the blokes what write in the model mags can't even spell proper it's a dead loss buying the things.

Anyway, we put the whole thing to the vote, democratic like, and it was carried anonymously that Washing Board Willy ought to flog the model engine what he'd swapped his guitar for, and flog his washing board, come to that, as he couldn't play the thing with a wonky finger, anyway. And we also decided to flog our plastic kit, as it wasn't much good if we had to rely on blokes what couldn't spell to tell us how to stick it together.

Yours truly,
The Secretary,
En Bee Gee Model Club.

Getting Ahead

The usual telly approach to modelling is the kiddy get together, there's a clever boy, type of programme. The little cement caked horrors are lined up, resplendent in best school blazers and water-slicked quiffs, asked a few kiddy questions, as if to suggest that modelling makes a nice change from tiddler catching, given an encouraging pat on the head by the avuncular interviewer, and then, no doubt, whisked away to the studio canteen for some well deserved tuck.

Surprise then, to see a fully grown modeller unblushingly declare himself as such on an adult programme. Admirer though I am of such feats of heroism, I hardly had the stomach to witness the ordeal by interview and would have switched off had not someone mentioned 5,000 quid.

However, the interview wasn't the "fancy a grown man playing with toy planes" that I had fearfully anticipated; it turned out to be a mild sort of quiz on industrial relations and what he'd do if he had 5,000 quid.



He answered the latter question by saying that he'd go on building model planes on an even bigger scale. This went down quite well, as most of us would be off to Honolulu or somewhere on the next plane.

Being an adult programme I didn't quite grasp what it was all about, but the general idea seemed to be to give the 5,000 quid to the claimant with the most eccentric pastime. Of course, it hurt me to see modelling bracketed with such odd interests as making donkey bonnets out of plastic straw and building fibre glass cesspools, but, if it's all good publicity for the movement, we can't be too choosy.

Friends are now urging me to go in for the contest myself. They say its about time I got a head.

Ergsome Details

The inventiveness of club founders in dreaming up out-of-the-rut titles for their fledgling broods never fails to astound me. Having long since exhausted all the comic stuff and witty alliteration, they are now exploring the poetic pages of Physics Encyclopaedias for new and captivating titles. Already they have enriched our modelling vocabulary with the euphonic term, Erg, and, who knows what other inspiring names might not spring from this lyrical source?

For information of the less literary among you I might point out that Erg is not some dim spelling variant of Urge (the g is pronounced hard, as in prang), but means the energy used in lifting one whatsit through one thingumabob, which, for some reason which escapes my non-technical mind, has something to do with model flying.

Other similar terms should not be difficult to ferret out, and I have compiled the following selection, which should make any club founder flounder:

- Mug: The energy used in lifting x fluid ounces through the gravitational pull of a 30 degree elbow. Alternatively, it can refer to the biped unit appearing at the chronological rate of one per minute.
- Ság: The declivity factor which occurs when a viscous fluid is ejected from a metal vibrator on to a porous surface.
- Gor: The antithetical unit of rog, used to measure the surface adhesion of electronically controlled flying machines.
- Bog: The rate per sink per foot per foot (see also Chobham Common).

Modelling Ranks

I am asked to state that the Brian Horroc', referred to in the West Bromvich report, is not a retired general flying a hotted up Black Rod, but a civilian type Australian living in perfidious Albion.

I admit I was a bit puzzled at first over the idea of a general flying model planes. As a general rule, generals are too busy writing to engage in that sort of boyish fun, but it does raise the whole question of what ranks are allowed to fly model planes.

As far as I know, retired admirals aren't on the list, not even for half payload models, but protocol does allow them an occasional duffy on the round pond. Colonels on the other hand, can indulge to their heart's content, but they don't abound quite as much in the model world as they did a few years ago. Whether this is due to the fact that fewer modellers take up colonelling, or vice versa, we don't know. To some extent the deficiency is made up by a modest sprinkling of squadron leaders, but above this rank the R.A.F. seems to clamp down quite firmly, and the most that the modelling wing-commander can hope for is the spectacle of a rally on his airfield.

My own rank on the field is quite a lowly one—that of a private flyer.



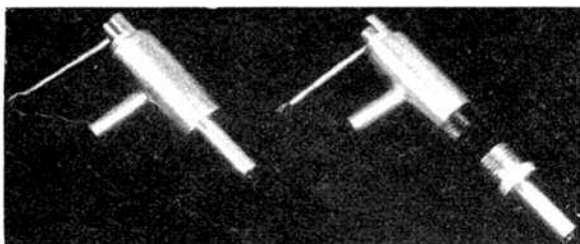
Sketches by _____ ALI

Over the Counter

Retailers will be interested in the display stand which is now supplied free by **LePage's Ltd.** This looks most attractive on a counter, and holds a good selection of their products. A useful table incorporated in this firm's advertising leaflets shows at a glance which of their adhesives is suitable for any specific purpose. It is called, appropriately enough, a "Glue it Yourself" chart.

An attractive 51 in. span towline glider named *Caprice* is the latest addition to the **Keilkraft** range of kits. Costing 15s. 9d., the contents are well up to the expected quality, while the standard of die cutting of both the ply and balsa parts is exceptionally good. If we can break away from the control-liners for a while we hope to get this model built up and flown for a full Kit Review.

A new engine cut-out from **Davies-Charlton** makes a useful accessory for F/F power models. Known as the *Snapshtut*, this cut-out valve can be taken



apart for cleaning or spring replacement (see photograph) and is well finished in brass. Price is 6s. 4d.

A new book announced by **Harleyford Publications** is entitled "Air Aces of the 1914-1918 War." The team of writers who have covered the pilots of the eight countries dealt with include such well-known names as J. M. Bruce, H. J. Nowarra and D. A. S. McKay, so we look forward to receiving a copy of this book, a review of which will be published as soon as it is available.

Incidentally, that best seller from the same publisher—"Aircraft Camouflage and Markings 1907-1954"—is now in its third reprint which means that over 9,000 copies have been sold.

A glue that has been on sale for many years and is still hard to beat for joining hardwood parts, such as engine bearers etc., is **Durofix**. We used some recently for a hardwood/balsa joint and have to report that it is still as good as we remembered—which means well up to latest standards.

There has been such an influx of plastic kits into the office in the last few weeks that we cannot hope to review

them all, but the following list is included to keep you up to date on new releases.

From **Revell's** the long awaited *Liberator* bomber—with a choice of transfers of either British or American markings—the Russian *Bison* four-jet bomber, and the Bell *Airacobra* fighter. With the new budget prices the first two cost 8s. 6d. and the *Airacobra* 7s. 6d., a saving of 5d. on each. To the 2s. **Airfix** series has now been added the *Armstrong Whitworth Sea Hawk*, while, ideal for anyone just starting in plastics, or as a present, are two sets selling at 19s. each and consisting of six fighters or the *Lancaster*, *Wellington* and *Spitfire*. Both sets include paints, cement and a brush. **Sebel Products Ltd.**, manufacturers of the **Jetex** products, have added a rather attractive *Britannia* to their series.

Final word with plastics this month rests with **Frogs**, who sent no less than seven kits. Although not strictly model aircraft—the range includes tanks, anti-aircraft guns, missiles, etc.—there is obviously some affinity, and the kits are so magnificent that they can be unreservedly recommended to anyone who wants to make an "out of the rut" model.

We have been experimenting with the fuel-proof qualities of the new **Humbrol** plastic enamel. In addition

to excellent covering and brushing qualities, one hour drying, and a weight 30 per cent. less than colour dope, it is also claimed to be 100 per cent. proof against all fuels. To substantiate this claim a full period of several weeks' flying use on a model would be necessary, but out tests, made on a base of heavyweight **Modelspan** given three coats of **Britfix** clear dope, and one of the enamel, were pretty drastic. After a 24 hour soak in fuel the colour had not softened at all, and could not be moved even with a brisk rub. We have been asked to emphasise that only the glossy finish is fuelproof, but **Humbrol's** are working on the matt and metallic colours, and expect to achieve the same resistant qualities.

The fuels used for the test comprised a standard diesel mix containing castor oil, a normal methanol/castor glo-fuel, and a hot 55 per cent. nitro methane/5 per cent. nitro benzine glo-fuel.

First home produced motor with a "self starter" to reach the market is the **Davies Charlton** Quickstart *Merlin* 0.76 c.c. diesel. Basically the same as the *Super Merlin*, but of course equipped with the starter, it will cost £2 4s. 7d. and will be followed by **Quickstart**

versions of the *Bambi* (£3 17s. 5d.) and *Dart* (£3 4s. 7d.). Present owners of this range of engines have not been forgotten as they will be able to purchase a **Quickstart** conversion set for their engines from their model shop—price 2s. 6d.

The long awaited *Tornado* 5 c.c. twin will be out shortly. We have seen one and it is most impressive. Further details and write up of this, and the **Quickstart** motors, will be published later.

With the increasing number of glow-plug motors on the market there is a definite need for a good accumulator, and such a one is available from **Sheen Models**. As a practical test an **Ohlsson** Gold Seal plug (consumption 1½ amps) was coupled to one, and it gave 5½ hours continuous burning—quite a test for the plug as well! The accumulators are rated at 2 volts, 10 amp hours, have 13 plates, measure 4½ × 1½ × 4½ in., are unspillable and weigh 1 lb. 13 oz. They cost 9s. 11d. dry uncharged, and in this state can be sent by post, filled and charged, but available over the counter only, they cost 11s. 6d. or complete with dropping leads to 1.8 volts, including spade ends and crocodile clips, 14s. 6d.

The name of **Dennis Elmes** must be known to all modellers if only for the **Elmic Timers** produced by the **Scorpion Precision Co.**, in which he is a partner with **Les Graines**. Branching out in a new firm having no connection with the above, **Dennis** has now started **Mail Order Models**, of **Bryant Avenue**, **Gallows Corner, Romford, Essex**. As the name implies they are specialists in mail order and, in fact, there is no over the counter sales service at all. So if you live in the country, with no model shop handy, you can get expert attention from the only 100 per cent. mail order firm in this country.

E.D. Price Corrections

Please note that certain prices shown against the illustrations in the **Electronic Developments (Surrey) Ltd.** advertisement in our June issue were incorrect. The prices of the engines should have been as follows:

- E.D. 1.46 c.c. "Hornet":—
Air-cooled £2 6s. od. plus 8/4 P. tax.
Water-cooled £3 2s. od. plus 11/2 P. tax.
 - E.D. 1.49 c.c. "Fury":—
Air-cooled £3 3s. 9d. plus 11/6 P. tax.
Water-cooled £4 0s. od. plus 14/5 P. tax.
 - E.D. 2 c.c. "Comp Special":—
Air-cooled £2 12s. od. plus 9/5 P. tax.
Water-cooled £3 10s. od. plus 12/7 P. tax.
 - E.D. 2.46 c.c. "Racer":—
Air-cooled £3 5s. od. plus 11/9 P. tax.
Water-cooled £4 0s. od. plus 14/5 P. tax.
 - E.D. 3.46 c.c. "Hunter":—
Air-cooled £3 6s. od. plus 11/11 P. tax.
Water-cooled £4 8s. od. plus 15/10 P. tax.
- The prices of the "Baby" E.D. 0.46 c.c. and "Bee" 1 c.c. engines were correctly given.



PART VII
and
conclusion
of the
series written
specially
for the
tyro by
HARRY
STILLINGS

IN this, the last article in the present series, I describe a simple and reliable system for elevator/rudder control on single channel, also an all-position tank for advanced stunts. Before dealing with these, however, it might be a good idea to have a brief summing-up of progress so far. If you have been following the series in practical form, i.e. actually keeping in step with the various parts, you should by now have logged a fair number of hours' flying time. Let me assure you that if the overall results have been *reasonably* successful and consistent then you have done very well; in the normal course of events (especially in the early days of R/C) most of us have to endure our fair share of mishaps and even disasters. The radio link is tenuous and fragile, and with the best care in the world there will always be the occasional breakdown in control. Don't let this dishearten you or make you feel you're a failure; as long as you learn from these errors then no lasting harm is done. The essential thing is to emulate Bruce's spider and try, try again.

Probably the most dangerous period is that immediately following your first few successful flying sessions. There is a distinct tendency (if all has gone well) to be lulled into a false sense of security. In the mistaken belief that you have completely solved all the problems you tend to become a little less careful, and devote less time to testing and checking. For a time you get away with it, but the reckoning is bound to come sooner or later, and when it does it might easily be disastrous, resulting either in complete loss through failure of response during

flight, or a stuck-on rudder causing a shattering spiral-dive with perhaps irreparable damage to the model and/or radio.

Being merely human I don't always practise what I preach, but I have learned that the only sure way to consistent and reliable R/C flying is to maintain, at all times, the high level of care and attention to detail which we exercise in the initial stages, when we wouldn't dream of flying before carrying out the recognised checks to make sure all is in order. Familiarity breeds contempt, and this is especially true of R/C. Having enjoyed a succession of trouble-free flights one is apt to *assume* that the receiver is on tune, or there are enough turns on the actuator motor, or the sensitivity control has the essential safety-margin, and so on, instead of patiently and deliberately going through the proper drill to *make sure*. Only one such careless assumption needs to go wrong to result in serious trouble, so take a tip from one who has paid for his folly more than once—DON'T take a chance, take a check!

I know that this takes up precious flying time, but believe me it's far better to enjoy three fully-controlled and completely satisfying flights in an afternoon than to skip the care and have five flights, the last of which ends with a lost model or a pile of wreckage. Resist the good-natured clamourings of friends to "Get it flying, chum" and don't let them deter you from carrying out the recommended pre-flight checks.

On the other hand there is no need to take caution to extreme, even absurd, lengths, so that you only manage one

flight in three or four sessions, wasting time in needless fiddling and probing so that there is no time left for flying; after all, this is the main purpose of the exercise, and only sensible and reasonable care and forethought are necessary. The crux of the matter is that the pre-flight drill is a means to an end, not an end in itself.

After a few months of generally consistent rudder-only flying you will probably feel the urge to extend the scope of your activities to include elevator control, so that you can execute true straight loops, etc. You must appreciate at the outset that this inevitably involves complications of the equipment however simple the system may be in itself, and adds to the amount of gear which has to be checked and maintained in operational trim. If you are prepared to accept these liabilities I can recommend the following system, for multi-control on single-channel, which I have used successfully for some considerable time.

"Interval" Elevator Control

The basis of the system is that, for most of the time during any flight, the main need is for directional (rudder) control, elevators being required only at intervals for stunts, etc. My method uses two successive rudder-neutrals for down- and up-elevator at intervals of eight rudder movements, the sequence being:—

Neutral, Left, Neutral, Right (one complete revolution of the rudder actuator), N, L, N, R (second complete revolution), N, L, N, R (third complete revolution), then Neutral-Rudder/Down-

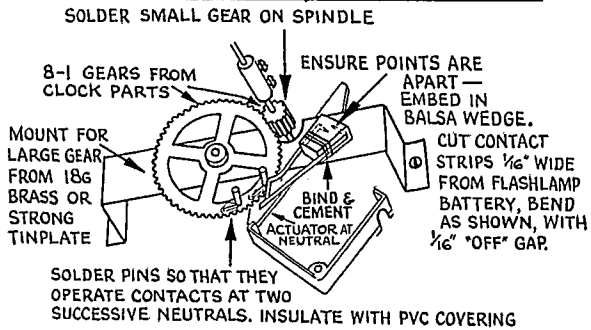
Elevator; Left Rudder; Neutral-Rudder/Up-Elevator; Right Rudder. Thus we have eight rudder positions for each two elevator positions; if the latter are not required when they "come around" they are merely blipped through, and the model again reverts to rudder-only for the next six signals. It may be thought that trying to remember the sequence makes for dicey control, but in actual practice one needs only to keep a rough mental count, as, if a miscalculation is made, ample warning is given by the nose going down, and two quick blips correct the situation almost instantaneously—in fact the average spectator is not even aware that anything untoward is happening. The only time that special care is needed is when the model is very close to the ground, when it is obviously important to know exactly when down-elevator is due to come in. Generally speaking, this situation only arises when the model is being brought in to land. In this case, to be on the safe side, I mentally count off the sequence very carefully towards the end of the approach glide so that I know exactly when to blip through the elevator positions. As a further aid to the mental check, I ensure that down-elevator always follows right rudder—if, after winding up, this is not so, all that is necessary is to trip one position on the elevator actuator by hand.

The main attractions of this system are that:—

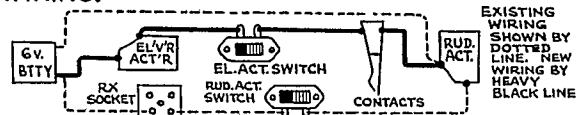
- (1) It is extremely simple and adds very little weight; no transmitter control-box is needed.

- (2) It is almost fool-proof and calls for little extra checking and maintenance.
- (3) It is positive and reliable.
- (4) No extra motive power or batteries are required, both actuators using the existing battery and rubber motor, the elevator actuator taking the place of the front hook.
- (5) By putting a switch in circuit, as shown, it can be immobilised at any time so making the model "rudder-only"—this is especially useful for trimming flights, or for contests

GEARING & WIRING for 'INTERVAL' SYSTEM.



WIRING.



INSTALLATION NOTES

- (1) Ensure sufficient play in all bearings, guides, loop, etc., to prevent any possibility of binding.
- (2) Make elevator horn and slotted brass arm about 1 in. in length; off-set of crank about 1/2 in. or a trifle more.
- (3) Install so that push-rod is at rear end of slot with elevator-actuator and elevator at neutral.
- (4) Solder pins on large gear wheel so that they operate contacts on two successive rudder-actuator neutrals. Note that pins MUST be insulated with PVC covering stripped from lightweight insulated flex to prevent shorting through rudder-actuator.

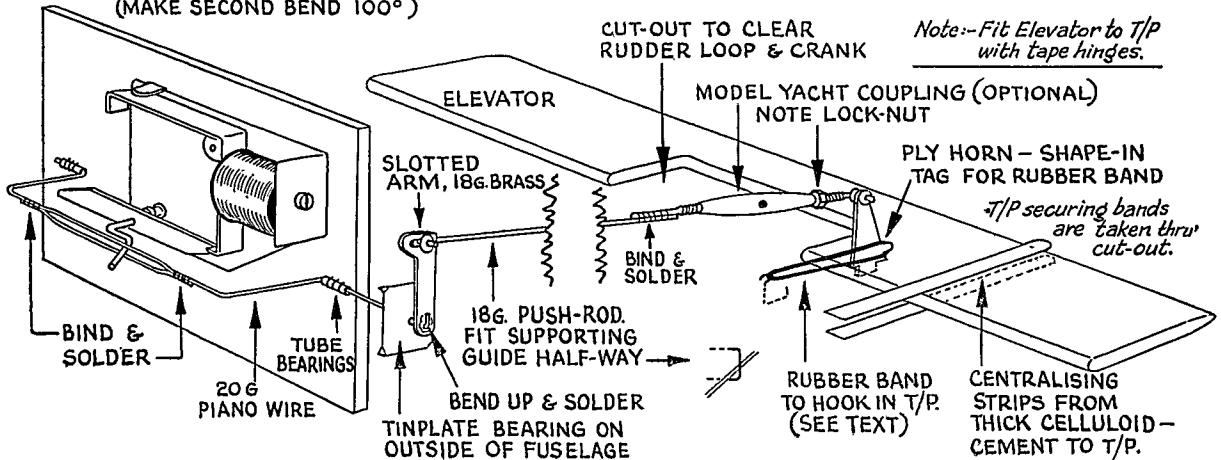
based solely on a set course, when elevator control is not needed.

You will note that there is a slot in the brass arm to give less down-elevator than "up," so that the dive builds up fairly gradually, whereas full up-elevator is used to take the model quickly and safely over the top. This gives a tight loop which can be allowed to repeat itself several times if desired, followed by a half-roll off the top merely by giving a signal (neutralising the elevator and moving the rudder), releasing the button as soon as the model is right-way-up. Outside loops (bunts) are possible also, but in this case dihedral must be small and a symmetrical wing-section is preferable, otherwise the aircraft will more than likely roll out of the bunt before it can be completed.

Inverted flight is also possible (with the above-mentioned design features)

'INTERVAL' ELEVATOR SYSTEM for SINGLE CHANNEL

MOUNT ACTUATOR SIDWAYS - BEND SPINDLE INTO CRANK, PARALLEL TO CROSS-ARM.
(MAKE SECOND BEND 100°)



but involves carefully counting off the sequence so that the last normal left-and-right rudder positions are used to put the model into a half-roll, releasing the button (and thus bringing in down-elevator) when it is upside-down. Unless the model is specifically designed for the purpose, however, it is virtually certain to roll out before it has travelled far.

As stated above, no additional rubber motor or battery is required, both actuators using the existing ones, but there will obviously be a *little* extra drain on the battery, which now has to serve two escapements, although the elevator actuator is only brought into operation infrequently. Very slightly more frequent replacement of this battery may therefore be required, but this is a small price to pay for the benefit of a second control. The contact points operated by the pins on the large gear wheel **MUST** be completely insulated from the rudder actuator, otherwise shorting will occur. This is best achieved as shown in the diagram, using a small wedge of hard balsa as a mounting block, and attaching this to the gear-wheel bracket with a good plastic cement.

As with the original rudder actuator assembly, the elevator system must be installed with care and precision so that there is no possibility of binding or sticking. An alternative method of differentiating between the amount of down and up-elevator is to drill a hole in the elevator-actuator arm instead of making a slot, so that the amount of movement is the same for both down and up-elevator. The elevator itself is then "split" so that only the smaller area moves downward, but the whole area moves upward. There is little to choose between the two methods, each

having its own advantages; probably the slotted-arm is simplest and less complicated.

The ratio of elevator-to-tailplane area must be the subject of a certain amount of experimentation, but I think you will find that 15 per cent. will be sufficient with most models, with an up-elevator movement of about 25 deg. and down-elevator 12 deg. to 15 deg.; this formula allows for the cut-out required to clear the crank and rudder-loop, so that the actual elevator area is somewhat less than 15 per cent. If this proves insufficient for adequate response, increase the size of the elevator—do NOT increase the degree of movement. You will find the addition of a model-yacht type of coupling in the push-rod a useful accessory for accurate adjustment of the elevator neutral position, but it is not essential, provided the installation is accurate. The small tensioning band above the elevator should be adjusted to counteract gravity pull so that it remains at neutral even when the centralising strips are pulled apart. This not only prevents the elevator from tending to droop in neutral, but assists the actuator by equalising the load in both up and down positions. The band should be renewed and tension checked at intervals.

When using the elevator for a straight loop, manoeuvre the model so that it is dead into wind with down-elevator due on the *next* neutral; then blip through the unwanted rudder position, which will bring down-elevator into operation. Allow the model sufficient time to develop speed on the dive, and blip again when it reaches an angle of about 50 deg. This gives up-elevator, and the model will zoom up and over in a perfect loop. To prevent soaring at the end of the

loop hold down the button, which returns the elevator to neutral and moves the rudder over. This puts the model into a climbing banked turn and if the button is released when it is level fore-and-aft it should quickly straighten out into normal flight. Alternatively, the elevator can be allowed to remain in the "up" position, when the model (if elevator area and movement are right) will continue to loop; it can then be brought out by holding down the button at the top of the final loop which will give a "half-roll off the top." Release as soon as it is right-way-up, and it will again carry on in normal flight. If you want to try a bunt it is essential that you first gain plenty of height, as with the reduced "down" movement the model will take some time (and use up considerable height) before it goes over on to its back. At the end (i.e. the top) of the bunt, blip twice to shed the unwanted up-elevator position.

When I first used this system I allowed an all-neutral position between down and up-elevator, thus:— Rudder-Neutral/Down-Elevator; Left Rudder; Rudder-Neutral/Elevator-Neutral; Right Rudder; Rudder-Neutral/Up-Elevator. I found, however, that this was not only slightly confusing but quite unnecessary, the model itself happily smoothing out the transition from dive to climb. The elimination of the middle all-neutral also saves unnecessary wastage of rudder positions.

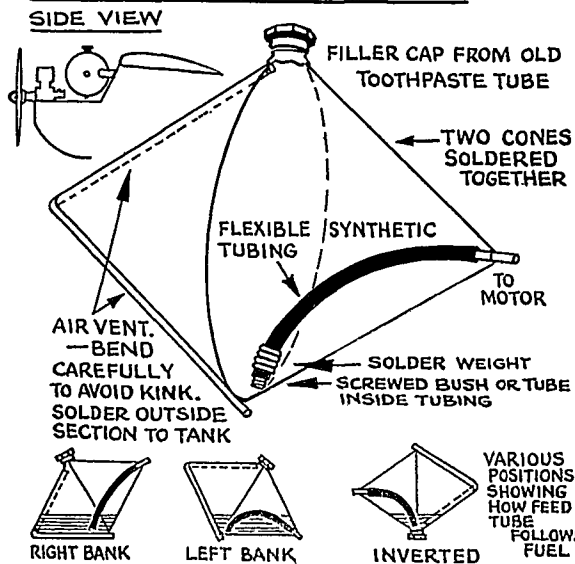
All position fuel tank

If you decide to go in for multi-control, using either this method or any other, it is obvious that you will need a fuel tank which can be relied upon to function properly in any attitude, and here I illustrate my own solution to this problem. The drawing is completely self-explanatory, the only points needing emphasis being:—

- (1) The weighted tubing **MUST** be completely flexible and, of course, kink-proof and fuel-proof. I use the synthetic black tubing used with "Snap-squeeze" timers in power duration models.
- (2) Push a small length of metal tubing into the end of the fuel-tube, so that it is not squeezed when the solder-wire weight is wrapped around it. Even better is a screwed bush which prevents the weight falling off.
- (3) Before soldering the two cones together, make sure the tubing closely follows the circumference in every position, and that it cannot foul on the filler cap opening or air-vent tube.

So we come to the end of this radio-control series. I hope that it has encouraged some of you to embark on this enthralling and very rewarding branch of the hobby, and that it has proved of real practical assistance. If you have enjoyed following it half as much as I have enjoyed writing it, then a good time has been had by all!

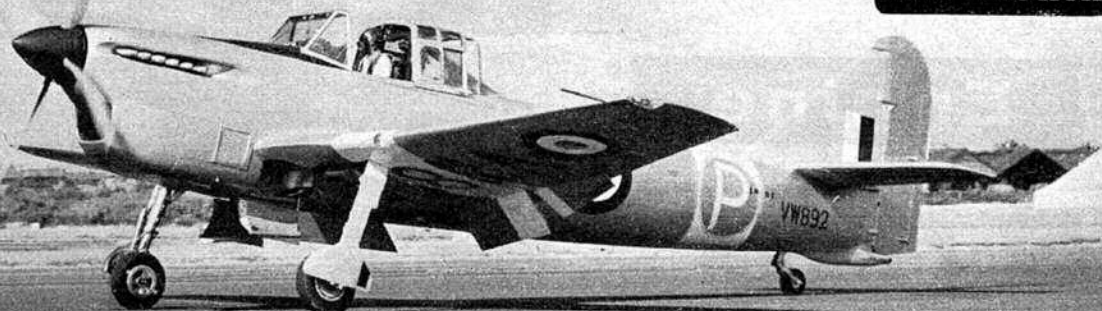
ALL-POSITION FUEL TANK.



avro's ATHENA

AVIATION
NEWSPAGE

Plane of
the month



THE *Athena* and its Boulton Paul competitor, the *Balliol*, were both designed originally to meet Air Ministry Specification T7/45, which called for a three-seat all-purpose advanced trainer with either an Armstrong Siddeley Mamba or Rolls-Royce Dart turboprop. In one respect, therefore, they were ahead of their time, for no aircraft had then flown anywhere in the world on the power of a single turboprop. Yet in another way they were already out-of-date, for by 1947 the R.A.F. realised it was a complete waste of time to carry a second pupil as a passenger in a training aircraft and lost all interest in three-seat layouts.

Consequently, by the time the Mamba-powered prototype *Athena* T.Mk.1 (VM125) flew for the first time on June 12th, 1948, it was already pretty much of a dead duck. A redesigned version known as the T.Mk.2, with only two seats and a 1,245 h.p. Rolls-Royce Merlin 35 piston-engine, was following hard on its heels to meet a new Specification, T14/47, and there was little doubt that this would appeal more to the practically-minded Air Ministry.

There is no greater asset than a well-proven engine, especially in a training aircraft, and when the prototype T.Mk.2 (VW890) flew on August 1st, only seven weeks after the Mk. 1, it showed also that the higher power of its Merlin offset the smaller frontal area and lighter weight of the Mamba, giving a generally comparable performance.

Avro pressed on with the turboprop prototypes and flew both a second T.Mk.1 (VM132) and a Dart-powered *Athena* T.Mk.1A (VM129) in 1949. But by then the T.Mk.2

had been ordered and three more prototypes of this version (VW891/2/3) were followed in August of that year by the first of a pre-production batch of 17 aircraft (VR566-582). This marked the limit of *Athena* production, because the *Balliol* was adopted as the R.A.F.'s new advanced trainer, but the pre-production machines put in good service as gunnery trainers.

Structurally, there was nothing unusual about the *Athena*, which was a perfectly conventional all-metal low-wing monoplane of simple, robust design. The wing was a two-spar structure with pressed ribs. The fuselage was built in two halves with the joints on the vertical centre-line, and was pure monocoque except at the cockpit opening, where bending loads were taken by two longerons and the floor members. Armament

comprised one machine-gun and underwing rockets.

The first Mk.2 prototype was modified from a Mk.1 airframe, with a three-seat cockpit and the original low fin and rudder. Main difference, apart from the engine installation, was that the wing was moved forward 27 in. to keep the c.g. in the right place. However, subsequent prototypes and the pre-production series had a much taller fin, with a small dorsal fin, and a parallel-chord rudder. All had a distinctive glider-towing fixture projecting rearward from the fuselage under the rudder.

Mk.1 data: Span 40 ft. Length 36 ft. 6 in. Height 11 ft. 11 in. Loaded weight 7,438 lb. Max. speed 287 m.p.h. Initial rate-of-climb 2,630 ft./min. Ceiling 34,800 ft. Endurance 2½ hr. at 253 m.p.h.

How's this for realism? W. I. Barrett's model *Athena* closely follows the full-size job—even to a "buried" motor. (Plans on page 213.)



Latest

Engine

News

From
PETER CHINN



The Cox Sportsman-15, the "sport" version of the Olympic. A plain bearing crankshaft and a smaller bore carburettor are the main differences.

OUR April issue carried the first announcement of the eagerly awaited Cox Olympic 15 contest glow engine and the first production engines began leaving the factory during mid-April, ours reaching us by airmail just a week later. Ever since the existence of a 2.5 c.c. Cox design was first mentioned in M.A., quite some time ago, we have been having enquiries from readers asking when this engine would be available. Early last year we were able to quote Leroy Cox, president of the L. M. Cox Manufacturing Co. Inc., of Santa Ana, California, as saying that the

prototypes had outperformed every similar sized engine, diesel and glow, against which they had been tested. Well-informed modellers, knowing the fantastic performance of the 0.8 c.c. Cox Thermal Hopper and 0.33 c.c. Pee-Wee, were agog: could Cox really do what other manufacturers had been trying, unsuccessfully, to do for years? Could he produce a glow 2.5 which would be a serious contender for F.A.I. speed and yet, at the same time, would equal the performance of the Oliver for F/F?

It would have been an anticlimax, indeed, if after all this, the Olympic had turned out to be anything less than exceptional.

Elsewhere in this issue will be found a full report on the performance of the Olympic, and it will be seen from the figures quoted therein, that this new engine fully lives up to the claims made for it.

* * *

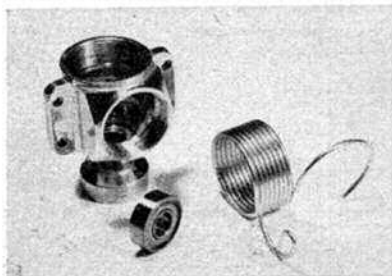
Although the outstanding performance of the original Cox design—as first seen in the 0.8 c.c. Space-Bug 049 model—has been widely appreciated, many people have entertained doubts as to whether it would prove equally

effective in a 2.5 c.c. class engine. Attempts to apply reed-valve induction to other and larger engines have, for example, often proved disappointing in regard to power, while for top performance, all the most successful 2.5 c.c. glowplug engines (with the exception of the Italian Barbini B.40TN) have used loop-scavenging, rather than reverse-flow ported cylinders. The performance of the Olympic must, however, now dispel any reluctance on the part of designers to accept the efficiency of the Cox type layout for F.A.I. 2.5 c.c. class engines.

Last month we were talking about the problem of accommodating a large and strong enough shaft in a modern 2.5 c.c. contest diesel without discarding ball-bearings or shaft-valve induction. In contrast to the $\frac{3}{8}$ in. plus shaft diameters now desirable with such engines, the Olympic gets by with a shaft diameter of a mere $\frac{1}{4}$ in., made possible, of course, by the use of rear induction (thus permitting a solid journal without the weakening effect of a valve port) and by virtue of the less severe torsional stressing of a glowplug engine shaft as compared with a diesel. The Olympic shaft, in fact, weighs only $\frac{3}{8}$ oz., and less than 0.7 oz. complete with its two German-made ball-bearings.

The use of ball-bearings in a mass produced American engine is, today, unusual. During the early post-war years, many of the better class U.S. motors were ball-bearing equipped, but as engine sizes got smaller and the demand for "popular-priced" engines expanded, ball-bearings were dropped as being too costly.

The Olympic uses ball-bearings because it is, first and foremost, a competition engine, and contest flyers do not begrudge paying a little extra for



Parts of the outstanding new Cox Olympic F.A.I. contest engine, which is the subject of this month's Engine Test on page 195. Among the Olympic's many features are a twin b.b. shaft, hemispherical combustion chamber with integral glowplug, characteristic Cox type triple jet carburettor with reed valve intake and an optional starter spring.

a top specification. But few big manufacturers can afford to build engines solely for contest flyers and it is not surprising, therefore, to find that, as a companion model to the Olympic, the makers are offering a cheaper version, without ball-bearings and known as the Sportsman 15. This is priced at \$7.98 in the U.S.A. as compared with \$12.98 for the Olympic.

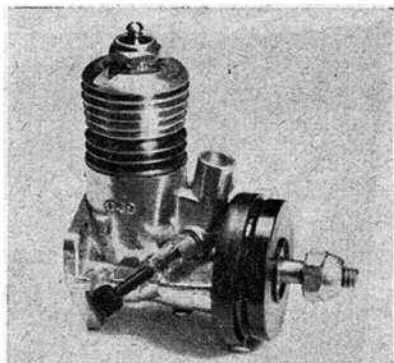
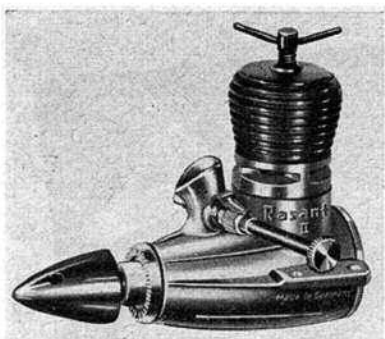
In addition to the use of a plain bearing, the Sportsman differs from the Olympic in a number of other details. Externally, the Olympic is readily distinguished by a red anodised back-plate and carburettor assembly, a blue prop driver and a spinner instead of a plain washer, but this is only half the story. The Sportsman is intended to suit stunt and non-contest applications where steady fuel suction is more important than all-out high-speed performance. To this end, the two engines use widely different carburettor choke diameters, the Olympic being appropriately 80 per cent. larger, or more than three times the area of that of the Sportsman.

Another difference concerns the crankshafts. By reason of the fact that it has to be carried in a plain bearing, the Sportsman's shaft diameter is increased to $\frac{1}{8}$ in. at the journals. Like the shafts of the smaller Cox models it is relieved at the centre to provide journals fore and aft. There is a shallow oil channel in the crankcase bearing to ensure adequate lubrication reaching the front journal.

It almost goes without saying that the construction and finish of these new Cox engines is first-class.

* * *

With so much international attention focussed on 2.5 c.c. engines, it is obvious that the Cox Olympic will be claiming the interest of modellers in a number of countries and it is a safe bet that, in some of the East European countries where the Olympic will not be readily available, such as Czechoslovakia, Hungary and Poland, modellers will be wondering about it, just as we wondered about the impressive Czechoslovak



Left: Resembling the recently introduced new-type Taifun Hobby (see May issue) is the Graupner Taifun Rasant-II 2.47 c.c. from Germany. Although similar in appearance to the ball-bearing Taifun Blizzard, the Rasant-II retains the plain bearing shaft of the previous Rasant model. Right: Latest American Wen-Mac 0.49 is the Mk. III with "Rotomatic" starter unit. Clutch-equipped clock-spring type starter engages automatically as prop is turned backwards, and disengages after spinning the engine over several compressions.

MVVS 2.5 diesel announced last year.

Readers will remember that some of the curiosity about the MVVS was satisfied when M.A. published an exclusive test report (afterwards translated and reprinted, incidentally, by the Czech model magazine *Letecky Modelar*) on the MVVS 25-D. The 25-D was the successor to the MVVS type 2.5/1958 diesel, of which about a hundred were built last year—mostly for official Czech team use. The earlier model being a ball-bearing engine (whereas the 25-D has plain bearings) our earlier report left one question unresolved: was the 2.5/1958 more powerful than the 25-D.

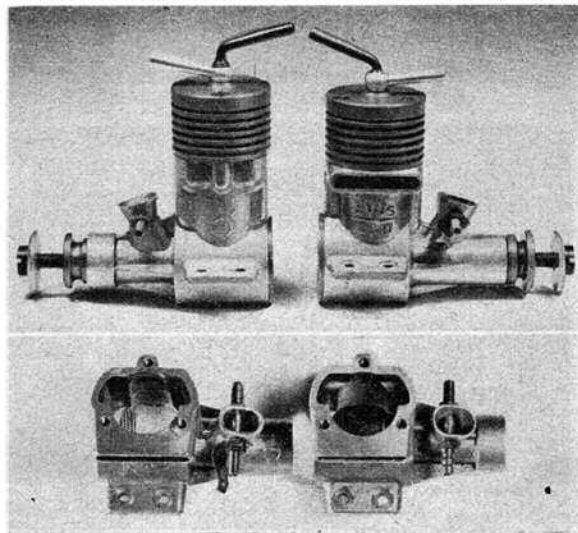
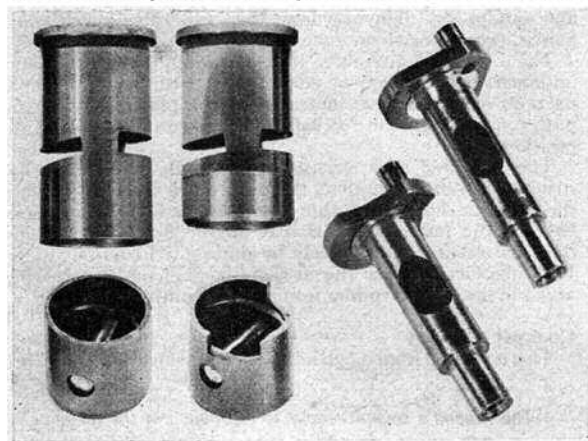
Recently we have been able to shed a little more light on the subject, having been fortunate enough to obtain a new and unused 2.5/1958 ball-bearing motor to compare alongside our 25-D. If this new acquisition is a reasonably representative example of the type, then it does appear, from our findings, that

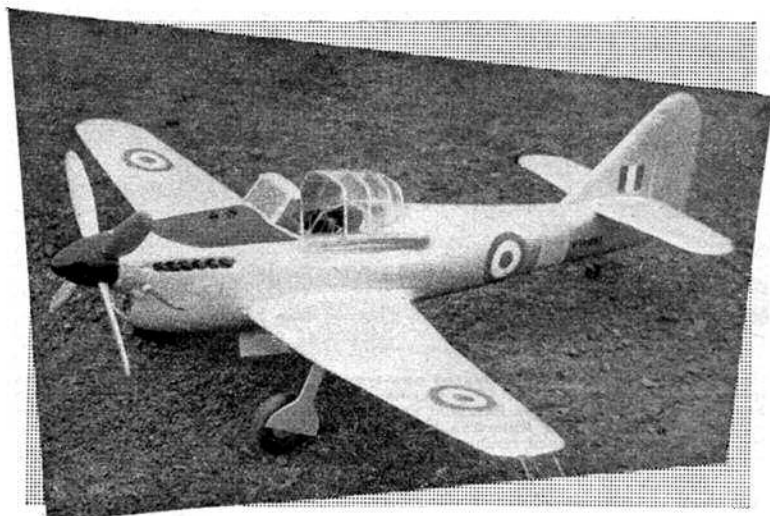
the 2.5/1958 is *not* more powerful than the plain bearing 25-D and that neither engine is quite up to a fairly good Oliver.

Bearings apart, the 2.5/1958 and 25-D have a number of other differences which are shown in our photographs. The engines have the same bore and stroke, but it will be noted that the 25-D is a little lower in overall height. This was achieved by shortening the connecting-rod and lowering the cylinder assembly to suit, with the crankcase, redesigned accordingly. The transfer passages in the crankcase were also made wider, the cylinder liner shortened below the ports and the piston skirt cut away—similar to the Enya 15-D—all to aid the flow of the charge from crankcase to cylinder. The crankshaft intake port was made slightly narrower. Incidentally, in our particular engine, the outer, 7 mm. ball race, is of Swiss manufacture, while the inner 10 mm. bearing is a German SKF.

The two versions of the current 1958 type Czech MVVS diesel, the most successful 2.5 c.c. diesel yet to appear in Eastern Europe. Shown (left) is the b.b. Type 2.5/1958 built for the use of Czech teams, compared with its plain bearing successor, the Type 25-D. Below are seen the crankcases of the two engines: the 25-D type with its enlarged transfer passages on the left.

Cylinder liners, pistons and crankshafts of the MVVS 2.5/1958 and 25-D diesels compared. The 25-D parts are on the right of each pair.





**A scale
control-liner for
1-1.5 c.c. engines
and featuring
"hollow-log"
construction**

W. I. Barrett's

DESIGNED to the same specification as the *Balliol*, the Avro *Athena* was a single-engined low-wing monoplane for use as a two-seat advanced trainer. Two versions were built, the first of which, the Mk. 1, was fitted with either an Armstrong Siddeley Mamba or a Rolls-Royce Dart turbo-prop-engine. The Mk. 2 followed being fitted with a de-rated Rolls-Royce Merlin 35 (1,280 h.p.) giving a top speed of 258 knots. The Mk. 2, with its deep radiator, provides an ideal subject for a scale C/L model, enabling the engine to be completely buried.

On examining the contours of the fuselage, it was decided that the model should have a hollow log body. Friends who saw the fuselage just after carving expressed surprise at what they called "all that trouble," but the carving took less than an hour, and was much simpler than drawing out formers and then planking.

Fuselage

The first job is to acquire a piece of reasonably soft balsa, 16 in. long by 3 in. square. This is sawn down the vertical centre-line and then the two halves lightly cemented together again. After tracing on the side elevation this is cut out, the same procedure being followed for the plan view. Now cut out templates to the sections shown on the plan, and it is

AVRO

ATHENA

then a straightforward job to carve the block to the correct outline section.

The fuselage is now split down the previously cemented joint, and hollowed out until there is an overall wall thickness of approximately $\frac{1}{4}$ in. There will, of course, be openings at the cockpit, tailplane and radiator positions.

After drilling the engine bearers to suit the engine being used, cement these to the engine bulkhead, and bolt the engine to this assembly. The unit may now be cemented into one of the fuselage halves, after which may be added the fuel tank and fuel tubing. Mark and drill a hole for the fuel needle and fit the tailwheel, the halves can then be finally cemented together.

The plywood nose former can now be added, then saw out the wing slot as indicated on the plan, saving the lower portion for fitting after the wing has been cemented in place.

Wing

Cut this to planform from $\frac{1}{4}$ in. medium sheet balsa—one piece 36 in. long by 3 in. wide is sufficient if the trailing edge is butt-jointed in position.

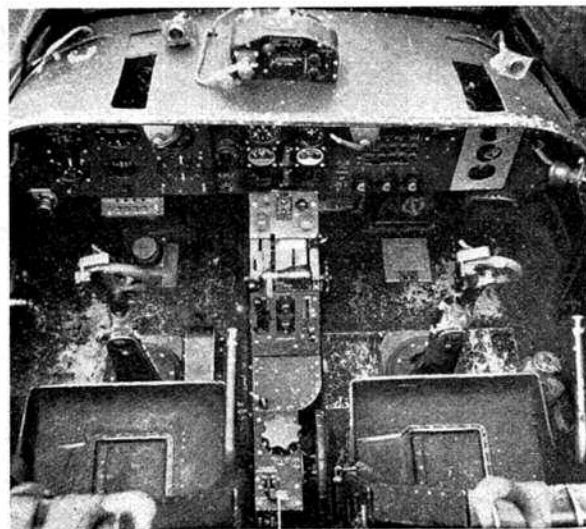
Carve roughly to aerofoil section, finishing off with a file and sandpaper. Having done this, saw off the outboard panels, cementing them back at the correct dihedral.

The bellcrank assembly, lead-out wires, tip weight and undercarriage unit may be added, after cutting away suitable portions of the wing as indicated on the plan. Thread the push-rod through the fuselage, and cement the wings into position.

The tailplane and elevator is a simple two-lamination structure. When complete, the push rod is inserted through the elevator horn, and the retaining washer soldered on. Cement the tailplane to its seat on the fuselage, checking that the elevator moves freely by pulling the lead-out wires. If satisfactory, replace the fuselage fairings under the wing and add the fin and rudder unit and the ventral tail fairing.

Cockpit Canopy

This is formed from 0.030 in. cellastoid, which is easy to work



The Athena's cockpit—easy to reproduce in the model.

with. The sliding portion can be moulded over a simple former, while the rear portion is heated and bent to shape. Take care to avoid overheating the material, otherwise striations will occur. (I know, I had to polish them out!) The wind-screen is built up around the $\frac{1}{8}$ in. ply former. Cabin structure is represented by doping in place strips of paper. Details of the sliding canopy are shown on the plan. If desired, the cockpit detail may now be added.

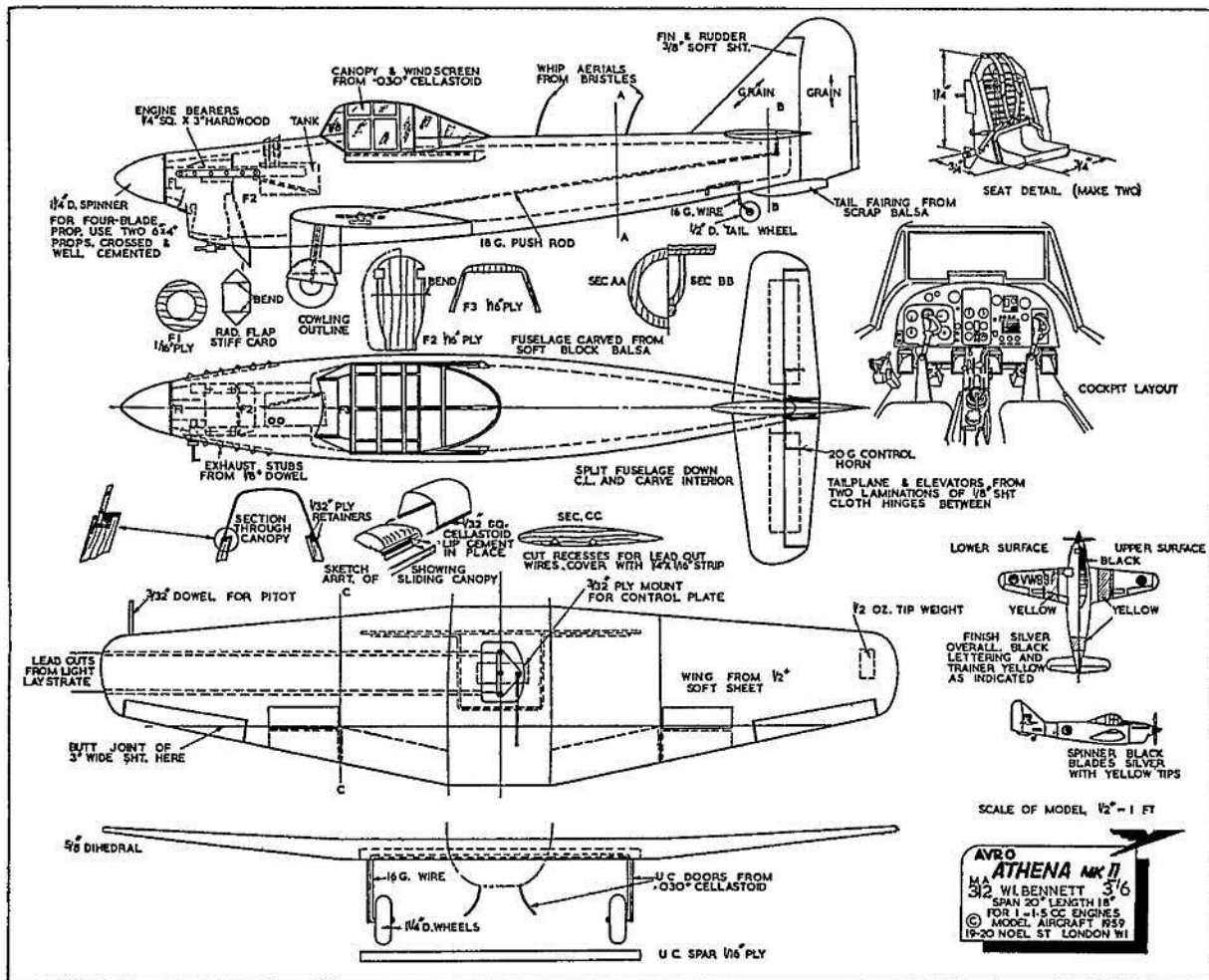
The model is completed by adding the undercarriage doors, and cementing the exhaust stubs into the troughs in the cowling. Cover the entire model with tissue, and dope until a good finish is obtained. Colour dope as indicated.

Flying

Before flying, check that the model balances on the front lead-out wire. If possible, fly off a smooth surface. The original model weighed 10½ oz., and at this weight flew very well, with straightforward take-off and landing characteristics.



Real thing or model? Careful choice of background—as in this picture—shows just how a model should be photographed.



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Club News

PORT TALBOT M.A.C.

Port Talbot's competition policy seems to be paying at area contests, as we cleaned up the glider, power and combat at a recent meeting. Now rubber is getting our attention.

Pete Waters, using an Oliver Tigered *Eureka*, really climbed to the top in power, and using the club design A/2 topped glider. Viv Lethaby used an Oliver Tigered *Toreador* to win combat after a terrific semi-final with clubmate Allan Tassell's B.B. Amco'd *Duellist*.

SOUTH WALES AREA

At the South Wales A.G.M. steps for its reorganisation were taken. Frank Holland retired from the chair. He has been the only inspiration in past years, and spent a great deal of money on the area. His successor is Peter J. Waters and Viv Davies continues as the trusty secretary.

It was decided to hold an area contest at Clyn Common the next day. On the morning, brisk thermals snatched up an A/2 with a faulty d/t, but where were the timekeepers? Peter Waters sent up his *Eureka* and *eureka!* it certainly climbed, d/t'ing at 250 ft. for 3 min. maximums to win the open power. He also won the open glider with a club design and organised the combat.

Vivian Lethaby, with a *Toreador*, fought through combat after losing half a streamer and colliding with a silk-covered *Duellist*. A good second in combat was Paul Wood, and Frank Holland with an old model won the open rubber. Considering the area's position, attendance was good and everybody enjoyed himself.

BRIERLEY HILL AERONAUTS

The club's heavy-weight flyers, Messrs. Wilkinson and Webb, have finally got the F.A.I. power duration "bug" out of their system—the hard way. At the area elims, at R.A.F. Wellesbourne, club treasurer Mick Wilkinson crashed both his models, and secretary Cliff Webb wrote off his modified *Dream Weaver*—the latter has been flying with increasing consistency for several months. They were in good company; British team man, John Bickerstaffe, wrote off his Enya 15D model, and area sec., Dennis Illsley, joined him with the remains of his P.A.W. model.

Chairman, Max Whitehouse, is still producing timers from car clocks and "kitchen timers", and his very modified *Racer* (which looks very Oliverish with its new overcoat) still defies destruction in a *Eureka*. Club combat champ to date is Jan Chodyrew—a field of battered models testified to his aggressive tactics, but all caused by opponents who took too violent evasive action. The club is very grateful to West Bromwich member, Mac Grimmelt, for the regular bus service to rallies he runs for this and many other Midland clubs, often without a word of thanks.

COSMO A.M.C.

The club held its annual prizegiving recently, approximately 100 guests and members attending and enjoying the display of models. E. Cosh was our guest of honour for the second year and presented the prizes to our club champion, S. Robinson, who did so well in the R.A.F.-M.A.A. championships. The other cup winners were R. Morley and C. Gardiner. The junior championship trophy was not awarded this year as the standard set by the juniors was not too good; however, we did present certificates of merit to P. Greenhalgh, C. Bailey, E. Jackett and T. A. Wellbelove. We hope that the unrepresented cup will spur the youngsters on to better efforts during the coming season.

WESTON CONTROLINERS

We held a "1A" combat competition recently, Lance Bell of Bristol being the winner. The club would like to see this class of combat at some of the larger rallies as it was very successful.

The younger members who find class "A" combat rather expensive found that "1A" suited them admirably and were able to join in the fun.

D. W. Evans has bought a 13 in. German pulse jet, around which he is building a speed

job. The jet weighs only 6 oz. for its 1.1 h.p.—should be interesting!

DULWICH M.F.C.

The club recently held its first film show, the two films shown being "Model Flight" and the "Story of the Mosquito." This show acted as a stimulus to our membership and it marks the beginning of our expansion programme.

We have started construction of a F/F S6B. All members will be helping in its construction including the juniors, the club being divided into teams consisting of seniors and juniors—each group dealing with a particular component.

We fly regularly at Epsom, and prospective new members should get in touch with the secretary, J. C. Barnes, 4, Copleston Road, Peckham, S.E.15, for details of membership.

SHIREBROOK M.A.C.

The Shimacs successfully ran a bus to the Woodford rally, and, believe it or not, the club actually made a small profit. A good day was had by all until Albert Duncan reported the fact that someone had whipped the new Frog 2.49 Modified and Elmic universal timer from his model before he could recover it.

THE MIDLANDERS

B. Colley and T. West attended the Midland Area "do" at Wellesbourne, but removed the cylinder head plus half the crankcase off a brand new tuned Oliver during a test flight, therefore, eliminating their chances in F.A.I. T/R. However, K. Newcombe put up some good flights with his *Topscore*, the d/t being necessary each flight as down wind drift was considerable.

WHARFEDALE & D.A.

A small contingent made their way out of Leeds at 5 a.m. to visit the High Wycombe C/L rally, but the result of the long trek was not disappointing as L. Davy took 3rd place in both F.A.I. and class "B," with R. Edwards taking 4th place in class "B." We would like to thank "Dick" and his men for a very enjoyable competition.

As we will be running the T/R event at the Northern Gala again, we thought that it would be possible to include a "1A" class as well as "A" (to F.A.I. rules, of course) and "B" T/R. This has now to be put to the Northern Area of the S.M.A.E., but there is, as far as we can see, no reason to reject the offer; so if those of you who are interested in "1A" would keep an eye on this column, we will inform you as to the outcome of this proposal.

A point which was welcomed by the C/L fanatics was a proposal that a comprehensive "guide to team-racing" in book form should be compiled, and that it should include all up-to-date information which would help senior and junior members alike. It was suggested that the book should include such things as speed chart, engine tuning, fuels, etc., plus a recently proven method of calculating total times for an entire race. K. Long was given the job of compiling and writing this book.

The club turned out in force at the Avro aircraft works at Woodford, Cheshire, where the *Stockport Advertiser* did a great job in organisation with the help of the North Western area clubs. Our achievements were mainly confined to the C/L circle, but B. Turner attained 2nd junior in glider.

The C/L enthusiasts made their presence felt as J. Horton and F. Baxter took 2nd and 3rd places respectively in class "A."

K. Long of Wharfedale's Eta powered Woodford winner.

The class "B" final was an achievement in itself, being composed entirely of Wharfedale teams, so many, in fact, that one model had to have a pilot and crew from our Thornaby friends who did a great job with L. Davy's model.

The final placing after two models had met the ground rather hard, was: K. Long, first, with his Eta VI model, and the Rushworth/Edwards team second, flying an Eta Mk. V model.

HORNCHURCH M.A.C.

Luck was against us at the High Wycombe C/L rally, where both our team race entries blew up after a promising start.

Our F/F boys are keeping the club well represented in the national comps, and with Len Ranson winning the Lady Shelley, they have chalked up at least one first to their credit.

EAST LANCASHIRE M.A.C.

The highlight for the contest fliers during the past few weeks was undoubtedly the holding of the power and the Wakefield elims. for the N.W. Area on our club flying field.

Conditions throughout the day were really something to write home about, and the timekeepers went bogeyed timing the fly-off in the Wakefield comp., for 28 min. 27 sec. o.o.s.

One of our juniors, Uwe (say it Uree) Kenyon, flying a new model with an Enya 15D on a test flight, clocked 30 : 34 o.o.s.

Came the Woodford rally, we realised we were suffering from growing pains and needed two large coaches.

As if to prove a point, Uwe Kenyon won junior power with the aforementioned model, unfortunately losing his model in the process.

The club now has a television star in its midst in the shape of T. Klee's *Great Lakes Trainer* filmed by an ITN cameraman whilst at Woodford.

OUTLAWS (CANNOCK) M.A.C.

At the second of the area C/L championship meetings, the lads ran combat and set up what must be a record for this event by finishing in 4 1/2 hours flat, including an hour lunch break. In between times, Roy Lockley took time off to place 3rd in stunt.

A fortnight later, at Woodford, Gordon Bentley placed 4th in combat. At this meeting a P.A.W. 2.5 was stolen by some light-fingered miscreant, who also smashed the entire nose off a prospective Gold Trophy job to get it. 'Twould be appreciated if eyes could be kept skinned for a P.A.W. with an alloy prop nut and 1/4 in. cut off the end of the shaft.

BRIGHTON D.M.A.C.

Game day was perfect with biggest club turnout for years! However, little lift was to be found at Foredown. Fred Boxall did 9 : 55 in Gamage and J. West 9 : 08 in the Halifax. Weather was just the reverse for first A/2 and Wakefield elims., strong winds and visibility down to 100 yd. at times. Highest in Wakefield was again Fred Boxall with 4 : 52, with his brother, Reg Boxall, top in A/2 with 3 : 48.

In second F.A.I. power elims., J. West topped the area with 13 : 04, while Reg Boxall did 11 : 47 in Wakefield.

ENFIELD & D.M.A.C.

At the recent annual general meeting of the club, the retiring officers reported that the club was now in a sound financial position and



membership is still about 40. Unfortunately, most of these are junior members, so anyone in the area interested in competition flying of any kind would be welcome at the club meetings on Monday evenings at George Spicer School, Enfield (in Southbury Road).

We are all very pleased that Bob Moore has placed 5th in the London Area Wakefield eliminators, and so is eligible for the trials.

Our secretary (see under change of secretary for address) would very much like to hear from anyone who has any experience of compressed air motors for RTP flying, or who knows where such a motor is available. We have been developing jets powered by compressed air, but now we want something that makes a noise and looks a little more spectacular.

Also on the spectacular scale is a rumour of D.H. Mosquito being built for a pair of Ray Tuthill's class "B" motors. The designers hope to get at least 100 m.p.h. out of it. It should certainly make the spectators look up at club displays.

CROYDON D.M.A.C.

The club now meets on Epsom Downs on Friday evenings, as well as the normal Tuesday meeting.

In the A/2 eliminators, Den Partridge proxy flew John Blount's model to a higher total than he could manage himself. Very frustrating!

The club now has four I.M.A. employees as members, a nice change from the "couldn't care less" attitude of some trade people.

TOLWORTH D.M.A.C.

At the High Wycombe C/L rally, J. Turner, flying his hastily repaired Miles 3.5 powered model in combat, upheld Miles prestige after keen rivalry by beating the Rivers 3.5 team, only to be beaten himself in the fifth heat.

Members new to C/L flying are now being taught on Miles 3.5 powered Rogues, if they can tame that combination they should be able to fly anything!

SOUTHERN AREA

The Southern Area and West Hants rally will be held this year on September 27th, again at Beaulieu Aerodrome. Contests are open rubber, glider, power, "A", "A", "B", T/R (results sent to S.M.A.E. for national contests), combat and radio. Entry fees 2s. 6d. per event.

The West Hants Trophy will be awarded for radio and the S.R.D.E. Trophy for the best team in the team race.

Pre-entry is necessary for T/R and combat and should be sent to J. S. Hitchcock, "Russets," Anne Road, Wareham, Dorset, by September 20th.

EASTBOURNE M.F.C.

We have nearly 40 members now, and they are still rolling in (mostly juniors). All branches of flying are catered for, and our C/L area is at Princes Park, by licence from the local authority.

WIGAN M.A.C.

Top honours this season have so far gone to Brian Picken, whose performance with his o/d rubber job has been really first class. Five max's, followed by a 28 min. fly-off time, was his tally in the Weston Cup, flown at Colne, and this was crowned by another perfect score to win the rubber event at Woodford.

C/L flying in Wigan had just about hit a new low as a club activity, owing to lack of facility. Then, E. Wilding very generously offered us the use of two circles in his own grounds, and Tony Bullough, along with Eric Tomlinson, were quick to take advantage of this, and have already organised the C/L fraternity into a much better group than ever before, so we expect to see a lot of improved combat flying as a result.

Mr. Wilding, who has promised the C/L facilities, is himself an aeromodeller, whose

interest is mainly R/C. He has at the moment a very nice single-channel *Mataador* which performs very well, and another one which he has equipped with a pulse system of the Galloping Ghost type. Add to this his *Smog Hog* with 6 reed outfit, which he has made himself, and you will realise that he is an active one.

EXMOUTH & D.M.A.C.

The first round of our six round aggregate contest proved to be the best supported contest for some time.

Alan Parker, flying in his first power contest since joining the club, had scored two max's but spoilt his third flight by leaning out his motor causing it to cut at 6 sec. giving him a flight time of only 43 sec. Alan was flying an Arden powered *Eureka*.

Top man in power was Pete Williams, whose left wing up and almighty heave launch has to be seen to be believed. He says "If I launch any other way she spins in." Peter also took first place in rubber and second in glider.

Longest flight of the day was a test flight by Den Baudet with a *Woodford Special* which put up 15 min. A d/t fuse had been fitted but had not been lit! When he finally reached the model's touch-down point 2½ miles away, he was told, "Oh, someone picked it up and returned it to your flying site."

GLASGOW M.A.C.

Some of the members travelled to Lanark for the club power and glider contests (first rounds) and a very poor show it proved to be. Only two of the lads flew, so they couldn't help but place first and second.

G. Thomson's Fox 15 powered model is proving to be very fast using a hand-carved 7½ x 3 prop. (He'd be better with a warped razor blade.)

New members are always welcome at 8 p.m. on Fridays at 595, Paisley Road West, Glasgow, S.W.1.

NORTH KENT NOMADS

At our recent concours d'elegance, which was well supported, we were privileged in having Mr. Newell and Mr. Ball along to judge. The winners were: senior—Ivor Bittle with his own design single-channel four-control aeroplane, *Canvag*. This model is unique in that its actuator is a cross between a Laurie Ellis escapement and a Howard Bonner Varicomp. Needless to say, it was home made. The first place in the junior concours went to young Petty with a well-made combat C/L model.

We have been approached by the Television Newsreel Film Unit to put on a demonstration of point-to-point flying by radio for their benefit, and this we hope to carry out towards the end of the flying season.

At a recent jumble sale one of the items included six beautiful propellers suitable for large R/C planes at 3d. each. One member, rather greedily, bought the lot, later to discover that they were all left-handed!

GEE DEE M.A.C.

A very successful rally was held at R.C.A.F. Station Langar. Despite very adverse weather conditions, 16 Midland clubs attended and a most enjoyable, if somewhat damp, time was had by all. Because of bad weather conditions, the stunt and T/R events had to be cancelled, but an excellent combat competition was run off. This was won by M. E. Bates, of the Nuneaton M.A.C., who was presented with a Fox 15.

A film show was given in the club headquarters at 19b, Heathcote Street, Nottingham, and this included films taken at the Langar rally and other items of interest, including the American Nationals.

The club is now the proud possessor of a mobile caravan which, we hope, will be seen at many forthcoming rallies.

EAST GRINSTEAD M.F.C.

A lot of members joined the club as a result of a local Hobbies Exhibition where we had a stand. There is a keen following of combat on the C/L side as well as some "A" team-race; the tin helmets are being polished, too, as one enterprising maniac is trying to purchase a pulse jet.

STEVENAGE M.F.C.

We have lost our flying field until haymaking in July, but an alternative field is being sought out at the moment, although in this district it is rather a problem owing to the high percentage of arable farming (ploughed fields to you)!

We are also changing our clubroom—meetings will be every Tuesday at the Broadhall Community Centre, Hydeau Way, Stevenage, so if any of the unattached modellers in the district are interested they will be made welcome.

Now that Pete and Mavis Giggie have joined us from Southampton, we are anticipating an improvement in our contest performance this year.

On June 27th we are putting on a demonstration of C/L flying in conjunction with the Hatfield club to an expected crowd of 5,000 at the open day of I.C.I. Ltd., Welwyn.

FORESTERS M.F.C.

At the tenth annual general meeting it was decided to formulate a leaflet for the guidance of visitors to our local flying field, which we may be in danger of losing through irresponsible people running over growing crops and, more serious still, obstructing the full size aircraft landing and taking off.

Congratulations to Dave Bainbridge on winning the Halifax Trophy.

HORSHAM & D.M.A.S.

We have a canteen in our club room, at the Needles Estate, Horsham, where coffee, cheese rolls, hot dogs, etc., can be obtained at our weekly meetings on every Friday at 7.30 p.m. Would interested modellers in the district like to come along and join us?

CHANGE OF SECRETARY

ENFIELD D.M.A.C. D. Sparrow, 8, Manleton Crescent, Enfield, Middx.
 CHINGFORD M.F.C. B. G. Spence, 12, Liverpool Road, Leyton, London, E.4.
 WEST MIDDLESEX M.F.C. M. J. Olney, 135, Millar Road, Greenford, Middx.
 HORSHAM & D.M.A.S. R. Smith, 52, Granary Way, Horsham, Sussex.

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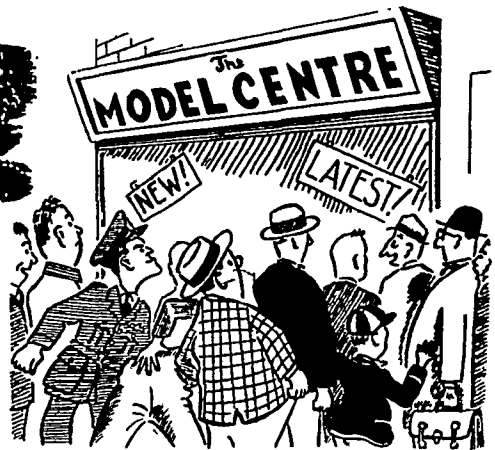
1959 STOCKPORT ADVERTISER WOODFORD RALLY

Name	Club	Power duration	Time	Fly-off
1st L. Whalley	..	Cheadle	6:00	+ 2:41
2nd J. O'Donnell	..	Whitefield	6:00	+ 2:40
3rd M. Sutherland	..	Tees-Side	4:42	
Junior:				
1st U. Kenyon	..	East Lincs	3:00	
2nd M. Haynes	..	Bolton	2:43	
Rubber duration				
1st B. Picken	..	Wigan	..	6:00
2nd K. Horry	..	Bristol & West	..	5:54
3rd E. Thorpe	..	Derby	..	5:39
Junior:				
1st B. W. Smith	..	English Electric	..	6:00
2nd J. Bronner	..	Cheadle	..	5:21
Glider duration				
1st A. Wiggins	..	Leamington	..	5:42
2nd R. Burgess	..	Doncaster	..	5:28
3rd R. Swindon	..	Tees-Side	..	5:23
Junior:				
1st H. James	..	West Brom	..	3:21
2nd B. Turner	..	Wharfedale	..	3:13
E. J. Riding Scale Trophy				
1st C. Abell	..	Doncaster	..	
2nd K. Harrop	..	Congleton	..	
Radio Control Rubber Class				
1st E. Johnson	..	Larkhill	..	
2nd R. Lever	..	Leigh	..	
Radio Control Multi Class				
1st C. Olson	..	London	..	
2nd E. Johnson	..	Larkhill	..	
Control Line Team Race "A"				
1st K. Watson	..	Thornaby Pathfinders	..	
2nd J. Horton	..	Wharfedale	..	
3rd F. Baxter	..	Wharfedale	..	
Control Line Team Race "B"				
1st K. Long	..	Wharfedale	..	
2nd R. Edwards	..	Wharfedale	..	
Control Line Combat				
1st R. Travers	..	Long Eaton	..	
2nd P. Eckersley	..	Leigh	..	
3rd S. Oldfield	..	Macclesfield	..	
Ladies' Event				
1st Mrs. E. Davey	..	Blackpool	..	3:16
2nd Mrs. M. Filtness	..	Chester	..	2:49
Senior Rally Champion—J. O'Donnell, Whitefield				
Junior Rally Champion—B. W. Smith, English Electric.				

Next Month's Events

June 21st	Northern Heights Gala, Halton.
" 21st	Clwyd slope soaring meeting.
" 28th	AREA CHAMPIONSHIPS. U/R Rubber, Glider, Power. Cent. R/C. International Class.
" 28th	Ashford Combat Rally, Victoria Park, Ashford, Kent.
July 12th	MODEL ENGINEER CUP. Team Glider. Area. FLIGHT CUP. U/R Rubber.

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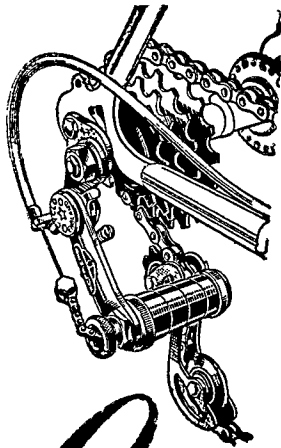
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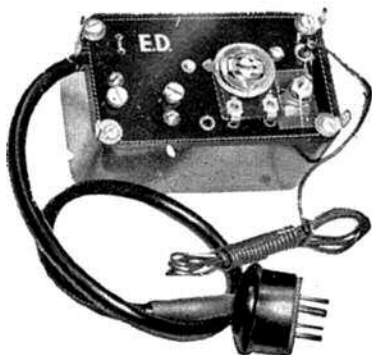
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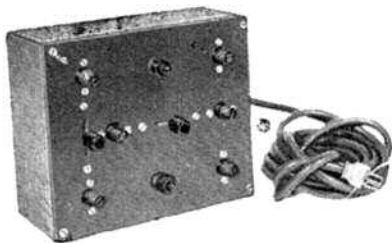
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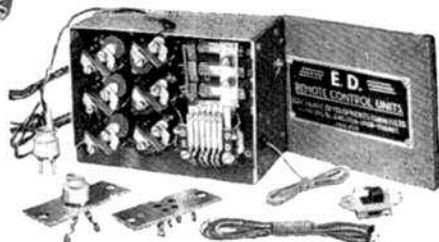


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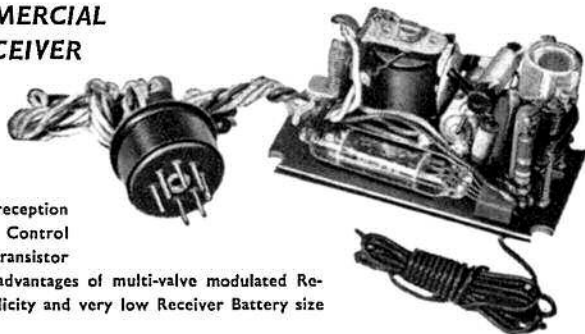


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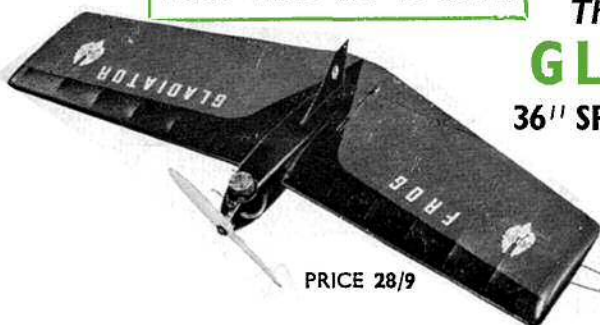


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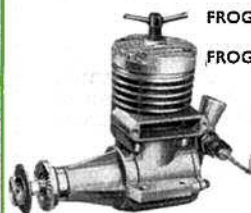


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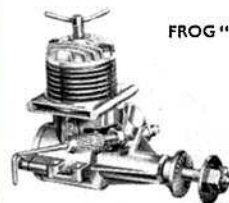
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