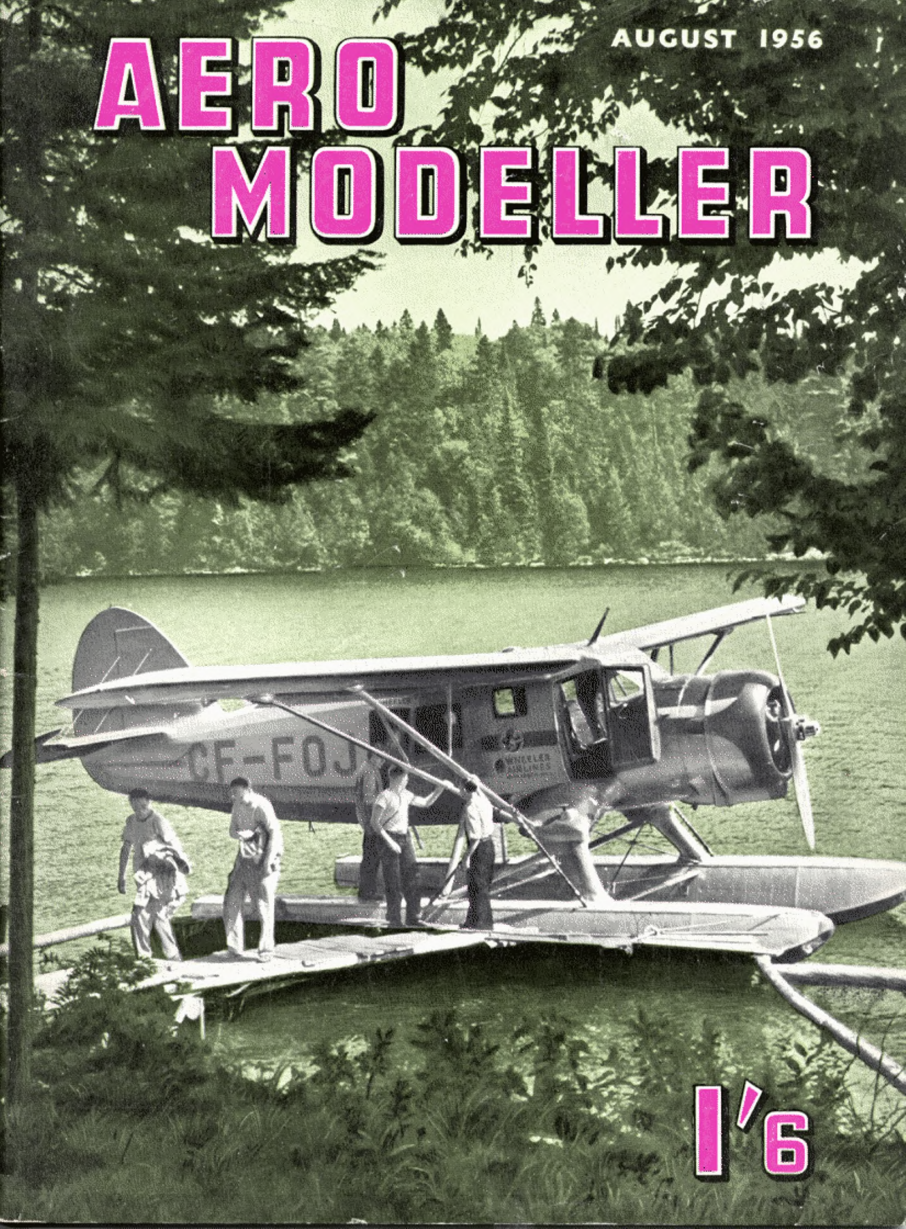
AUGUST 1956

AERO MODELLER



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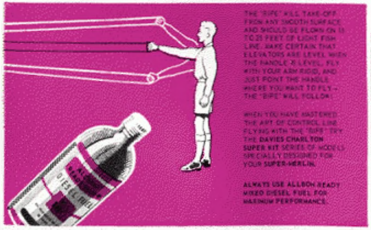

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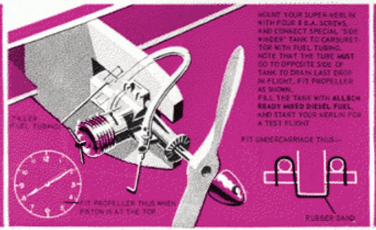

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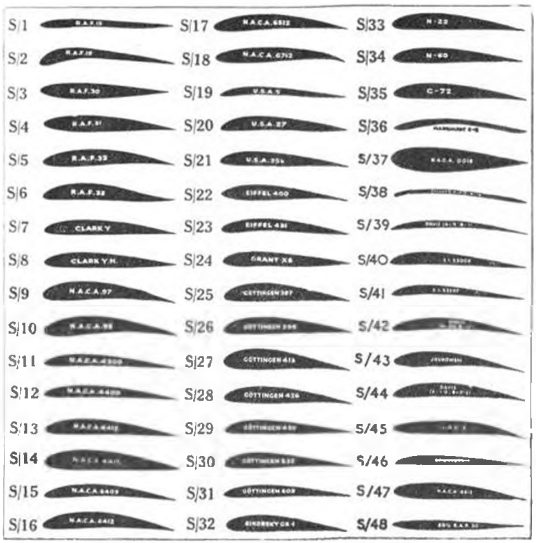

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Flying ...and a career

AERO MODELLER

"Covers the world of Aeromodelling"

VOLUME XXI
NUMBER 247
AUGUST 1956

Managing Editor - - - C. S. RUSHBROOKE
Editor - - - - - - H. G. HUNDLEBY
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Special features

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Regular features

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F.A.I. DECISIONS

EXTRACTS FROM A REPORT relative to the General Conference of the F.A.I., held in Vienna from May 16th to 21st, are of vital importance to aeromodellers the world over, particularly in view of the considerable expression of opinion that followed the last meeting of the Models Commission.

Decisions taken at that meeting "had raised objections from several countries; these objections were reported to the Conference which decided to refer the subjects in dispute back to the Model Committee for reconsideration; *the Model Committee was asked to submit any new decisions on these matters to a postal ballot of all the Clubs before they were finally adopted*". (The italics are ours.—ED.)

In case readers think that they will receive a ballot form, it should be made clear here that reference will, of course, be made to the national Aero Clubs (in the case of Great Britain the S.M.A.E.). In this way, those nations who are unable to be represented at a particular meeting will be able to register their vote.

"A proposal to hold all the Aero Model Championships at the same time and in the same place is a very important matter which the Committee will be asked to consider at its next meeting. The Aero Model Clubs in countries far distant from the place where the Championships are to take place will be able to attend only if all the Championships are held as proposed. *There are objections to the proposal, but the Committee will have to find an answer which will satisfy the majority.*"

The sting is in that last sentence! When we proposed a Model Olympics some years ago, we were promptly informed of many difficulties that would prevent such a logical development—most of which we appreciated, but remain convinced that such handicaps as time and accommodation are not insurmountable.

If our original suggestion of a planned rota of Championships was adopted, the onus of organisation would only fall on any nation at widely separated intervals; those travelling to other countries to participate are not going to quibble at a six or seven day comprehensive meeting in preference to a three-four day single contest event; and we are convinced that sufficient staff can be found able to devote the necessary time to run the longer meeting.

Accommodation seems to be the greatest difficulty. Here a degree of alleviation could be produced by a further scaling down of the size of International teams, which would further assist the financial situation, but there is no doubt that with many nations competing our ideas of accommodation will require revision. Service assistance would seem to be the answer, and could surely be secured for a full-scale Model Olympics where the requirements of organisation would only fall on any one nation at long intervals.

That some move in this direction is contemplated by the Federation is evident by the appointment of a permanent F.A.I. Committee to further the project of a "Gathering of Aviation Sport every four years, to be organised in a different country on each occasion and be for private and sporting aviation, for example for Powered aircraft, Gliders, Aero Models, Balloons and Parachuting, *what the Olympic Games are for other forms of sport*".

On the cover . . .

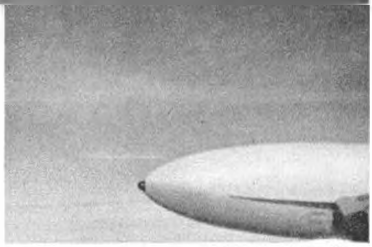
With the holiday season upon us we thought this a fitting cover picture. It shows holidaymakers leaving a Wheeler Airlines Nordyn Norseman at Gray Rocks Inn, St Jovite, Quebec. Aeromodelling fishermen will appreciate the setting! (*Photo: National Film Board of Canada*

HEARD AT THE HANGAR DOORS

Valiant Vapour Trails

THIS OUTSTANDING shot of a Valiant was taken from a Sea Venom during a photographic sortie from Boscombe Down.

Several squadrons of Valiants are now in service with the R.A.F. Long Range Bomber Force including 138 Squadron which was the first of the "V" Bomber squadrons to go into service. Others include 207 Squadron, 214 Squadron and the Photographic Reconnaissance Squadron 543. The De Havilland Super Sprite rocket for assisted takeoff is now in regular service with Valiant aircraft, particularly where excess loads are being carried.



Official Air Ministry Photo

Golden Wings Contest

Junior modellers under 16 years of age at December 31st, 1946, who have not yet joined the "AEROMODELLER" Golden Wings Club with the intention of participating in this year's Golden Wings Contest should hasten to do so immediately. Closing date for the eliminating round is August 10th, 1956, and the finals will be held at R.A.F. Halton the week-end September 8th and 9th. Besides a most enjoyable week-end finalists will reap the benefit of a magnificent prize list which includes a B.S.A. "Golden Wings" bicycle.

To join the club and enter the contest all that is necessary is to send 2s. 6d. for the "Golden Wings" glider plan which will include club badge, transfers, and entry form.

American Team Members

We learn that the teams selected to represent the United States in the 1956 World Championships are as follows:

WAKEFIELD	POWER	GLIDER
Cliff Montplaisir	Bill Hartill	Bill Hartill
Jerry Kolb	Lawrence Conover	Bob Moulton
Joe Bilgri	Dick Sladek	Joe Bilgri
Herby Kothe	W. F. Huffman	Carl Hermes

Bilgri and Hartill thus score double honours, and many of the names will be recalled as regularly featuring in specialist contests. Cliff Montplaisir has been here before, as has also Carl Hermes, and we hope that negotiations succeed in finding a sponsor for the teams in order that they may participate in person. Our newshawk is not optimistic on this score at present.

Designers Please Note !

Processing at the Flying Wing Contest, fully reported on page 408, brought to light an interesting controversy appertaining particularly to the tailless category of model. This referred to the use of "park bench" ailerons on a flying wing, the interpretation being that these aids contravened the F.A.I. Code, which states (*see* Definition 1.1.3 Flying Wing): "The flying wing is an aircraft which has no horizontal or oblique stabilising surfaces separate from the mainplane."

With the "separately supported" stabiliser ruled out, Andersson of Sweden and Graham Gates had to remove their high-mounted stabs. and fasten them to the trailing edge of the wing. This undoubtedly affected Gates' machine, for it was not until he had fitted small supplementary tabs during the fourth round that his model settled into its known performance.

Another point of discussion is whether a model can be picked out of the air before 20 seconds has been reached, thus claiming an "attempt" and a further flight. This occurred when Waldhouser (Saar) had a poor launch on his fifth flight, and assistants moved to stop the model before the 20 seconds were up. Officials prevented this happening, and the competitor had to be satisfied with only 24 seconds added to his score in the final round.

Arguments are that the rules allow a glider to be brought back to earth still attached to the line, *i.e.*, the model can be controlled down to a "no

flight", and therefore it should be permissible to stop a model that is obviously going to clock a low score. This is one we leave to the F.A.I. to sort out, for it is a tricky point that should be cleared up without delay.

Radio Controlled Gliders

Latest international model record to be ratified by the F.A.I. is that for Radio Controlled Gliders, flier again being Frank Bethwaite of New Zealand. On April 2nd, 1956, flying from Long Bay, Auckland the truly astounding time of 7 hours 37 minutes was recorded, and our sincere appreciation of Bethwaite's effort is coupled with a sense of wonder at the powers of concentration required for a performance of this nature.

The annual Slope Soaring Meeting at Clwyd saw another very fine flight in this category, when Don Bailey of the Burton-on-Trent club made a flight of 14 minutes 15 seconds, which will form the first application for a British record in this class. The feat is all the more meritorious when it is realised that the Clwyd meet was only the second occasion on which these fellows from Burton have been able to tackle slope soaring. We understand that "Lord Gosling of Clwyd" has put his mountain lair at their disposal for future attempts, and we foresee the world figure taking a beating in the not too distant future.

The Hill Receiver

Following publication of the Hill 2-valve receiver in our June issue we have had enthusiastic reports of the reliability of the equipment from radio control operators up and down the country. Inevitably we have also had plaintive letters from the odd few builders who have been unable to get their sets working correctly. Mr. Hill the designer is giving the best possible advice that can be given by post, providing the enquirer encloses a stamped addressed envelope. Messrs. Dockerty, who advertise sets of components for the receiver, also offer to investigate any trouble that may be experienced by modellers without expert radio knowledge and the necessary test equipment. There are, however, provisos to this offer as follows: A reasonable job must have been made of the construction. The valves and relay must be in good order. Sufficient postage and packing is enclosed for the return of the receiver. *This offer is only available to people who purchased their components from Messrs. Dockerty.*

Mercurian Might !

Best fly-away story we have yet heard, which unfortunately does not qualify for the subscription prize offered in last month's Editorial as the model was lost, comes from reader J. Margree of Clacton. After a bout of flying his version of Ray Malmstrom's "Mercurian Mite" in its normal control line form he decided to free flight same. Quite a ridiculous thought when one considers the diminutive proportions of this 7-inch span flying saucer which in this instance was powered with a Dart.

Anyway, from a hand launch the model went into a 45 degrees corkscrew climb and has not been seen to this day. The flight was witnessed by five senior club members, who no doubt are still recovering from shock, and certainly is a warning to "Mercurian Mite" owners to fit D.T.s if they intend letting go of the handle!

Supply and Demand

Although perfectly true, we can start this story thus: Once upon a time there was a modeller not unknown in control line circles to whom nitro methane was then just a name which he had read in an American magazine. Accordingly he went along to a certain chemical suppliers in London and calmly asked for two gallons. They, also seemingly ignorant of its worth, supplied him and charged something like ten shillings.

Both parties, it appeared, benefitted. The control line flyer's name became Nationally, and indeed, Internationally known. The suppliers did not know this, but they did know that they had sold their complete stock of nitro at the time for a mere fraction of what it had cost them. From that time on nitro methane has cost about a pound a pint.

The sequel happened fairly recently. The same modeller went back to the same people with a repeat order. The man behind the counter was rather taken aback at the value of the order and thought it best to mention the price—about fifteen pounds.

"Why, it didn't cost anything like that the last time I bought some from you!" the indignant modeller exclaimed.

"Oh!" said the man behind the counter. "So it's you! We've been waiting for you to come back. You owe us . . ." But by this time he was talking to an empty shop. Which also explains why the modeller must remain anonymous.

Scots awa'

Will Meecham sends news of the 1956 PAA Scottish Festival of Model Aviation which will take place at Royal Naval Air Station, Abbotsinch, Paisley, near Glasgow, on the 25th and 26th August, 1956.

STOP PRESS

Latest news on World Power Championships entries is that Russia will be sending a team, also Czechoslovakia. Entries to date include Finland, Germany, Italy, Canada, Russia, Australia, Czechoslovakia, Eire and Great Britain.

The Contest will be held on August 6th, which is, of course, August Bank Holiday Monday.

British Team Trials 1956

R.A.F. SPITALGATE
JUNE 9/10th

A/2 Glider

Twenty-miles-per-hour winds under overcast, with an occasional flash of sunlight and slight rain soon sorted out those who could tow without breaking their wings. It was a case of making 1:30 or collecting a thermal for a maximum in the early stages and there were ten people with six minutes on the scoreboard after the end of the thermal-prone second round. Misfortune struck Geoff Lefever's finely-trimmed *Altair* as it caught a turbulator pin on another's towline and spun to earth, and many a launch became a snap loop or winch throwing gamble in the high wind. Norman Marcus held on till the nylon line broke!

At tea break, with three rounds gone, all honour went to Reg and Fred Boxall, the indistinguishable twins from Brighton who shared nine minutes each with Ron Gould of Southend. There were many others well in the running, and the fourth round served to eclipse Reg Boxall, bringing G. Roberts out to top place. It also saw the demise of Burwood from Blackheath who had been in fifth place.

The order was then Roberts, Winder, F. Boxall and Gould; but the final team was still much in doubt until the closing minutes of the fifth and last round. Conditions had changed to a mixture of thermal and downdraught, and it was more than cruel to young Winder of De H. Hatfield, who ran his legs off all over the field to get out of a downdraught area and still came down from full height at 1:17. Gould was similarly unfortunate, and these two vacancies in the top quartette let Neville Willis of Anglia (Chelmsford) and Country Member Bob Amor (Ilford) through to the team as they each collected fifth round lift. Roberts and Boxall had held on to their positions with good flights to prove themselves best all-weather men on the field.

One of the attractions of the A/2 class is that it affords a fighting chance for the many hopeful types to get near a team place. We always have a good swap around of team names in the glider category, this year being no exception; but it is interesting to note that one of Geoff Lefever's *Altair* designs gained a place for Bob Amor, being the second year that one of these all-weather high aspect ratio models has joined the team.

Wakefield

The second day was even worse for its weather, and the Wake's took a pounding even in most expert hands. Low cloud and a fast drift into mist handicapped those who flew early, but several managed to get a maximum within the timekeeper's eyesight during the first round. Hugh O'Donnell came in on full power to write off a fuselage in the early stages, and after another round with the reserve he tree'd and lost a pair of wing tips. Not daunted, he made up a combination of '54 and '55 models that had never flown as such before—and still went on to fly better than most. Bob Copland had a model lost, and another beautiful streamliner with its nose stove in; but he found cardboard, Sellotape and balsa to make a Trojan job of rebuilding that almost saved his place—at one time fourth—though he finally slipped to eighth. Perhaps the hardest blow of all fell on R. Baldwyn with one of the few apparently new models on the field, and who was all set for the team when a blade stuck on his fifth flight and the model spun in. Recompense came to Geoff Lefever for his glider misfortune (though he did not escape ill-luck in Wakefield—by losing his best model before breakfast, into mist, and went into a rainstorm for his fifth) and this year he heads the rubber list to join the growing band of those who have been in more than one team.

It is, of course, a triumph for the O'Donnell brothers that once more they should both be in the British team, and also a fine achievement for H. Revell of Northampton (Ted Evans was there helping him retrieve), who has at last gained a place after trying so hard over the years.

Power

We mentioned in the Nationals report that the standard of power flying is extremely high this season, and some evidence of this (and the weather) is that the first flight of the day was O.O.S. at only 18 sec., including a 14 sec. engine run. It was George French's Oliver Tiger model which gained this doubtful honour, and he had plenty of time to retrieve and return before a delayed re-start was made as the cloud lifted. Northern hopes of Eckersley and Collinson were dashed when they did not return in time for their second round, and Gaster, too, was worried as it took some time to locate his famous Gastove. Recovery did in fact become the criterion of the first rounds, and a number of models were abandoned in favour of reserves.

Mike Green of Croydon was stymied by landing in an "impossible" tree, Peter Buskell looped in and had to use his reserve with his own-design home-constructed diesel, Silvio Lanfranchi mixed his *Creep* and *Swiss Miss* to save waiting for retrieving, and countless others spent their day gathering pounds of mud from heel to waist as they searched the downwind area. Such were the conditions, yet through it all came George Upson, flying his one and only power model, four seasons old and providing the perfect 15 minute total. Ron Draper of Coventry got over a low start in the poor visibility of the first round and came a creditable second with his neat red model, and Dave Posner once more displayed fastest rate of climb.

Wakefield Team: Geoff Lefever with his sheet fuselage reserve, used to make his flights at Spitalgate. Centre: Hugh O'Donnell with mixed model combination, and at right: H. Revell with his fast climbing blue and orange slabsider. Below right: John O'D. confers with Power Team member Dave Posner, holding his Oliver Tiger/Dream Weaver Mk. 11

RESULTS

A/2 GLIDER—"AEROMODELLER" TROPHY (84 Qualified—59 Flew)

1.	G. Roberts	Five Towns	3:00	3:44	3:00	2:55	2:54	14:33
2.	F. Boxall	Brighton	3:00	3:00	3:00	1:59	2:17	13:16
3.	N. Wells	Anglia	3:00	3:00	1:23	2:14	2:52	12:28
4.	R. Amor	C/Member	1:29	3:00	2:28	2:23	3:00	12:20
5.	W. Winder	De H. (Hat.)	2:42	3:00	2:17	3:00	1:17	12:16
6.	R. Burwood	Blackheath	3:00	3:00	2:43	0:58	2:29	12:10
7.	P. Guest	Barnsley	2:02	2:44	2:27	1:42	3:00	11:53
8.	R. Gould	Southend	3:00	3:00	3:00	1:10	1:32	11:42

WAKEFIELD—"PREMIER" SHIELD (44 Qualified—29 Flew)

1.	G. Leeves	C/Member	2:58	3:00	3:00	2:26	3:00	14:24
2.	J. O'Donnell	Whitefield	2:56	2:19	3:00	2:48	3:00	14:03
3.	H. O'Donnell	Whitefield	3:00	3:00	2:51	3:00	2:12	13:49
4.	H. Revell	Northampton	2:49	1:38	3:00	3:00	3:00	13:27
5.	R. Baldwin	Wigan	3:00	2:21	3:00	2:31	1:55	12:47
6.	M. Budding	York	1:36	3:00	1:30	3:00	3:00	12:26
7.	G. Cartwright	Hull	1:47	2:45	2:37	2:15	2:46	12:10
8.	R. Copland	Northern Hts.	1:57	3:00	3:00	2:31	1:37	12:05

POWER—"AEROMODELLER" CUP (57 Qualified—38 Flew)

1.	G. Upson	Northwick Pk.	3:00	3:00	3:00	3:00	3:00	15:00
2.	R. Draper	Coventry	1:57	2:48	3:00	3:00	3:00	13:45
3.	M. Gaster	C/Member	2:46	1:35	2:17	3:00	2:45	12:33
4.	S. Lanfranchi	Bradford	2:59	2:25	1:59	3:00	2:07	12:30
5.	D. Posner	N.W. Middx.	1:41	3:00	1:17	3:00	3:00	11:58
6.	P. Bushell	Surbiton	3:00	3:00	1:07	1:42	3:00	11:49
7.	R. Greygoose	Anglia	2:13	2:52	2:03	1:57	2:40	11:45

For the spectators at Cranfield, this British power team promises some excitement as it represents four different approaches to use of a pylon model, with a cocktail of engines (Elfin, E.D., Super Tigre and Oliver) to provide a most interesting comparison with visiting teams. They should do very well, and we wish each and every one of our twelve 1956 representatives Good Luck in the Championships—they deserve it after the Trials!

Right: Five max's gave George Upson a handsome lead in Power with his veteran black and yellow Elfin 2.49 design. At far right: Mike Gaster appears pensive after releasing Gastove for his last flight of the day

Left, Glider Team: G. J. Roberts with his low aspect ratio (8 x 36 in. centre section) model which was so reliable in the poor weather. Fred Boxall has a 77 in. wing (weighs 8 oz.) with Isaacson 53009 section and complex structure. Neville Wells also favours high aspect ratio with 74 in. span, and has a glass fibre fuselage now. At extreme right: Bob Amor and his Altair, designed by his pal Lefever and available through A.P.S.

Ron Draper of Coventry and his long moment open Super Tigre model, was 6th last year

Sleek lines of the model are well accentuated in family picture above.

Build the 1956 GOLD TROPHY Winner!

"334G"

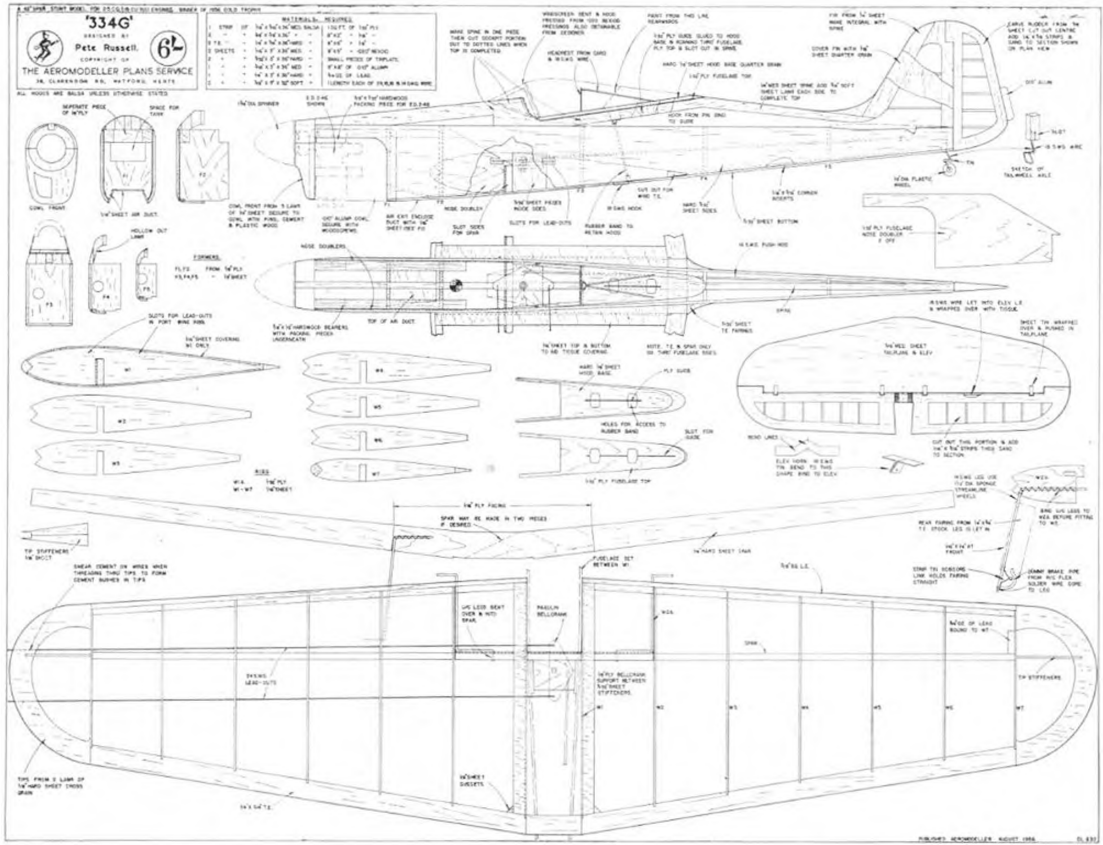
By Pete Russell

THIS GOLD TROPHY winner must hold the record for long development, being the same size and shape as the first in the line, "280", built in 1946! Apart from 1950-1, when Pete Russell used the Mercury "Monitor" and a couple of years with an upright-engined version of "334", all his models have looked like this. The design aims at long life, good appearance, ability to fly anywhere, manoeuvrability. At first the latter quality was the one that suffered, but careful development, especially on wing section, areas, tail areas and control gearing, has led to a model with adequate manoeuvrability for top contests, above average looks, and one that will last indefinitely. Less anyone should criticise the fitting of a Chipmunk type u/c to a World War II type of design, it was considered that this looked less incongruous than a fighter doing aerobatics with its undercart down. For non-contest flying, or if your choice of ground is limited, leave off the undercart, then you can fly anywhere.

Start by bolting the engine to the bearers with the spacers in position. These latter ensure an accurate tank line up with the E.D. 246. Then fit the ply front formers and the side doublers. Make a good job of this. Box in the tank compartment, then add the $\frac{1}{16}$-in. sheet sides, and the top spine. Build the wing and when complete except for controls, add to the part built fuselage using templates to ensure accurate line up. Then fit the tailplane and elevator unit, and fit control system. Next add several rectangular formers to support the fuselage sides, and act as guides for the push rod. Being 16 s.w.g. it will bend if not well supported. Now complete the fuselage top by adding shaped laminations. When shaped externally it is cut off and hollowed out before final fitting. Fit the fuselage bottom, not forgetting to fit the hook to take the hood retaining rubber band. This holds the hood firmly down, but small registers are incorporated in the fuselage top to hold the hood in the extreme open or closed positions. A small sealing strip of celluloid is fitted around the inside of the windscreen to prevent oils seeping in. The cowling front is first stuck to the fuselage so that the aluminium cowling can be wrapped round. The two parts are held together by cement and short pins, with a fillet of mixed plastic wood and cement inside. Make this good and solid if you are not fitting an undercart. When this is complete, part off the cowl from the fuselage top. These short notes should cover the only out-of-the-rut points of this otherwise orthodox model.

The model should be covered all over with lightweight Modelspan after careful sanding. The finish consists of two coats of clear dope all over, followed by three coats of sanding sealer on the good parts. When the finish is right, a final single coat of silver is sprayed on. This consists of a mixture of white and silver to avoid the characteristic flakey nature of silver dope.

If you have flown aerobatic models before, you will have no difficulty with "334". It is just longitudinally stable but fairly sensitive. If accurately built, line tension on 60 ft. x .010 in. stainless steel cable line will be good, as the speed is 65 m.p.h. Note that no offsets are used. In practice "334" can be flown in any wind in which you can stand up, as was demonstrated at the Huddersfield Club's 1955 spring rally when the earlier "334E" won the stunt event, with the complete pattern, in a wind gusting up to 30 knots.



FULL SIZE COPIES OF THIS 1/5th SCALE DRAWING CAN BE OBTAINED FROM THE AEROMODELLER PLANS SERVICE BY QUOTING NUMBER CL/632 PRICE 6/- POST FREE

SCENE: Terlet, near Arnhem, Holland. Gliding centre of the Royal Netherlands Aero Club. A rolling sweep of heathland and scrub bushes, in startling contrast to the accepted Dutch picture of flat fields, dykes and windmills.
OCCASION: Fifth International contest for Flying Wing Model Aircraft.
ACTORS: Thirty devotees of the pterodactyl culled from six nations.
PROPS: A multitudinous assortment of "V" and boomerang shaped models with one common feature . . . no tailplanes.
CHORUS: Aero Club officials; timekeepers; assorted team managers; radio and television reporters; guests, etc.

TAILLESS TRIUM(PH)VIRATE

By RUSHY

WAY BACK at the 1955 Southern Cross Aero Club dinner I was informed that a party of the boys contemplated a cycling holiday in Holland during 1956, and proposed to take in the Flying Wing contest at Terlet to add a bit of spice to their trip. In view of the specialisation with the tailless category of model by this club, it was evident that they had every chance of putting up a creditable show, and this view was supported by the S.M.A.E., who approved their private venture by giving official sanction to their entry.

That this confidence was not misplaced is clearly demonstrated in the results achieved on the 9/10th June, when Ray Delves, flying proxy for F. C. Smith (recognised British expert in this field) came from fairly well down the list to reach maximum scores in the 4th and 5th rounds, and gave Great Britain her first win in this International contest.

In addition, Grahame Gates (4th) and Keith Donald (5th) supplied sufficient points to give us top placing in the team classification, thus completing a double victory. As Herr Meier, German representative, said at the victory dinner, we had "beaten the Continentals in a class they had come to regard as exclusively their own".

With competitors housed in a long loft over the glider repair shops, first job was to process the oddly-shaped aircraft, a task that was almost completed during the night of Friday the 8th. The task of the processors was no easy one, with so many varying degrees of sweep-back, weirdly-shaped surfaces, and, in the case of the British models, airframes of startling dimensions! However, Penje and Co. manfully coped with the situation and very few models were left to pass through their hands on the following morning.

With Rounds 1 and 2 scheduled for the afternoon, and the remaining three the following morning, time was whiled away by watching the full-size gliding activities until lunchtime, then away to the starting point for the commencement of the contest.

Take-off was from a low ridge, and a fair breeze took models across a valley to another ridge some distance downwind. This made things tricky, for very few models gained sufficient height to get above the very definite turbulence existing in the valley, and many seemingly well-set flights came to an abrupt end when bucked by the valley currents.

Germany took an early lead when G. Weber (a dentist from Hamburg) made best flight of the 1st round with 2:50, closely followed by Cornellison of Holland with 2:46; but even at this stage the British contingent was making their effort felt with Donald placing 3rd (2:07) and Wilkins' model proxy-flown into 4th place with 1:48. At the end of this round Germany lead the team event with 338 points, Holland next with 320, and Great Britain a few points behind with 316.

Occasional spatterings of rain marred Round 2, but in spite of this Gerken (Germany) clocked in the first maximum of the contest to displace the Dutchman from second place, though Donald still hung on to his 3rd position. Gates nearly came a cropper when his huge model ripped the braided nylon line from his winch before he was ready to release, but claimed his 96 seconds as an "official" to hang on to 8th placing. With Donald dropping half a minute from his first round effort, Weber increased his lead considerably and at this stage of the contest was in an unassailable position with 5:03, followed by Gerken 4:14, Donald 3:42, and Cornelisson 3:17.

Shocks came next morning for the airfield was obliterated from view by a complete clampdown of heavy mist. Team managers met every hour until it was finally agreed to start as soon after 11 a.m. as possible for round 3, and to complete the final rounds during the afternoon, scrubbing the sightseeing tour organised for that period.

With take-off shifted to a small plateau, and with almost imperceptible drift, the contest resumed under reasonable conditions with the assurance that flyaways would be virtually non-existent. In fact, many models landed back on the take-off area, and little real chasing was required from anyone.

Andersson of Sweden made a good flight of 2 minutes with his beautifully-constructed model; Waldhauser (Saar) made up for his poor start with a good flight of 1:58; whilst the best that Holland could do was Fiks' 1:31; Switzerland 1:16; and Donald's flight of 1:40 was the best British time. Germany again pulled one out of the bag when H. Kron (1954 winner) made best time with 2:19, thus giving them first three placings and

Top: The British entry startled the opposition by the size of their models. Below left: Processing was carried on well into the night, and gave the officials plenty of headaches. Centre: Frau Weber launches for her husband, who looked a certain winner until quite late in the contest. Right: The British party with the winning model, proxy flown by Ray Delves

Left to right: Herr Schubert, winner of the rubber class, is assisted by Hans Meier of the German Aero Club. Waldhauser of the Saar assists in launching. But for two nil scores, this chap would have finished well at the top. The brothers Graf of Switzerland with their interesting flying planks. Olsson of Sweden had probably the best built model in the contest, well up to the well known Wakefield standard of his compatriots

a substantial lead in the team event with 1,009 points, followed by Great Britain with 873, and Holland 735.

The resumption after lunch saw conditions worsening steadily, and the mist gradually thickened with the addition of a soaking drizzle which made things far from pleasant for all. Strangely enough, with the exception of the German team, most competitors improved on their times during the poorer conditions, and first W. Graf (Switzerland) and then Smith (Great Britain) scored maximums to boost their positions to 7th and 5th placings respectively.

Weber, who had been dogged by poor flights since his encouraging start, lost the lead to Gerken, and Donald went into second place. Other good flights by Olsson (Sweden), Waldhauser and Harig (Saar) made a general switch in positions, and we had cut back the German team lead of 136 points to 86.

All then depended on the final round, and here truly was a contest crackling with excitement. Weber got away to a fine start with 2:00, E. Graf (Switzerland) made his personal best of 2:24, to be followed shortly by his brother who chalked up another maximum, bringing his total score to 9:04. A stout effort this from two lads who had travelled on a small motor cycle all the way from the Alps, loaded with four models.

However, Weber had overhauled his compatriot Gerken, but was 18 seconds behind the Swiss, and all eyes were now on Donald. No, he could only score 1:42; and it was left to his team mate Gates to pull off another maximum, his huge model gently soaring away and touching down only a couple of seconds after the limit had been reached. The position now was Graf, Weber, Gates, Donald, and Delves put Smith's model into the air for its last fling. Away soared the "Pheon" to another limit score, and a hasty check up showed that the proxy-flown model was a scant six seconds ahead of the Swiss lad, and Great Britain had 112 points more than her closest rival to score a resounding victory in her first attempt at this specialist class of contest.

Concurrent with the glider event, classes for both rubber and power driven categories were held, but unfortunately full support only came from the German contingent. A. Scheffer of Holland made an entry in the power class, but never succeeded in getting going properly, and the field in both sections became a "local" Derby between the large party from over the border.

The rubber-driven jobs were of a fairly orthodox type for this class of model, and tribute must be made to the sterling effort of Herr Seidel of Heidelberg, who completely rebuilt the fuselage of his best machine during the night prior to the contest, following a test prang.

Zwilling produced a most controversial power model, and it seems that some top direction is required to distinguish the full definition of a "tailless" model.

Full credit was given by Herr Kolfe (President of the Dutch Aero Club) at the farewell dinner, and thus ended a very pleasant, unpretentious, and successful event that was a model for friendly organisation, sustained excitement, and the real get-together spirit. I duly staggered back to England carrying the "loot", leaving the Three Musketeers to continue their pedalling around Holland for a further week!

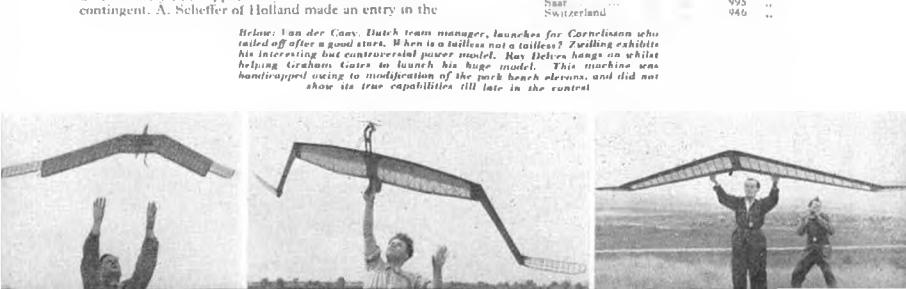
Results

1. F. C. Smith	(Gt. Britain)	0:57	1:10	0:34	3:00	3:00	9:10
2. W. Graf	(Switzerland)	1:14	0:47	1:03	3:00	3:00	9:04
3. G. Weber	(Germany)	2:50	2:13	1:04	0:59	2:00	8:46
4. G. Gates	(Gt. Britain)	1:21	1:36	1:31	1:11	3:00	8:39
5. R. Donald	(Gt. Britain)	2:07	1:15	1:30	1:26	1:42	8:30
6. H. Gerken	(Germany)	1:14	3:00	1:21	1:30	1:23	8:28
7. L. Olsson	(Sweden)	—	2:08	1:23	2:24	1:19	7:18
8. H. Kron	(Germany)	1:27	1:41	2:19	1:12	0:34	7:13
9. P. Wilkins	(Gt. Britain)	1:48	1:19	1:36	1:23	1:07	7:13
10. W. Schonborn	(Saar)	1:22	1:38	1:13	1:31	1:10	6:54
11. J. Osborne	(Holland)	1:38	1:16	1:27	1:27	1:01	6:49
12. E. Graf	(Switzerland)	0:52	0:45	1:16	1:25	2:24	6:42
13. G. Elks	(Holland)	0:29	1:25	1:31	1:31	1:41	6:37
14. K. Andersson	(Sweden)	0:25	1:37	2:01	1:17	1:45	6:24
15. P. Schroder	(Germany)	1:21	1:12	0:23	1:05	1:56	5:57
16. G. ten Haven	(Holland)	0:44	1:06	0:42	1:29	1:48	5:56
17. G. Cornellisson	(Holland)	2:46	0:31	1:12	0:45	0:25	5:39
18. H. Waldhauser	(Saar)	—	—	—	1:58	2:44	0:24	5:06
19. E. Struik	(Holland)	0:56	1:04	0:49	0:52	1:21	5:02
20. R. Way	(Gt. Britain)	0:32	1:10	1:01	0:59	0:57	4:39
21. W. Harig	(Saar)	1:04	0:23	0:36	1:47	0:45	4:35
22. U. Mattsson	(Sweden)	0:27	0:34	1:21	0:43	0:50	4:15

Team

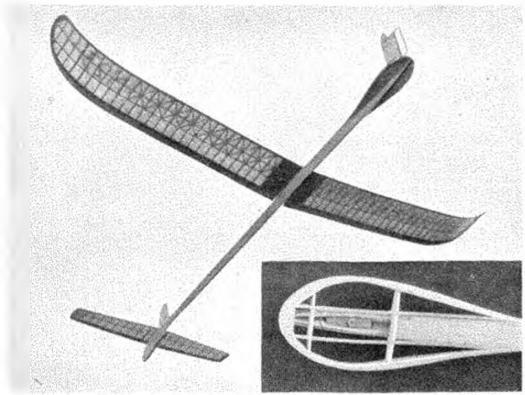
Great Britain	1,579 points
Germany	1,467 "
Holland	1,162 "
Sweden	1,077 "
Saar	995 "
Switzerland	946 "

Below: Van der Cany, Dutch team manager, launches for Cornelissen who tailed off after a good start. When is a tailless not a tailless? Zwilling exhibits his interesting but controversial power model. Ron Delves hangs on whilst helping Graham Gates to launch his huge model. This machine was handicapped owing to modification of the park bench plevons, and did not show its true capabilities till late in the contest



More on Magnets

BY HANS GREMMER



The author's "Standvogel" (stationary bird), a development of "Windbird" is shown on left. To improve lateral stability elliptical dihedral is used, note the long nose which provides ample rudder moment. Inset, is an inverted view of nose.

THE FASCINATION OF slope soaring has yet to be appreciated by the majority of the aeromodelling fraternity, and those who have yet to enjoy the experience of seeing a hand-launched model hovering into wind, are indeed missing something.

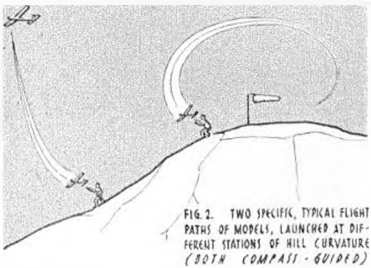


FIG. 2. TWO SPECIFIC, TYPICAL FLIGHT PATHS OF MODELS, LAUNCHED AT DIFFERENT STATIONS OF HILL CURVATURE (BOTH COMPASS-GUIDED)

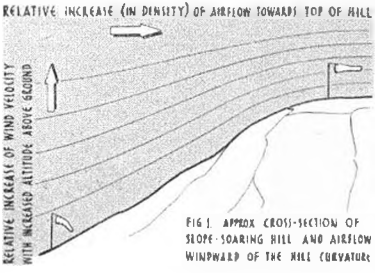


FIG 1. APPROX CROSS-SECTION OF SLOPE-SOARING HILL AND AIRFLOW WINDWARD OF THE HILL CURVATURE

Many are mistaken in believing that slope soaring is limited to those sites where there is a steep ridge—(or even a mountain side!) and do not venture into this phase of model flying because they consider their local slopes unsuitable. Now, thanks to the introduction of magnet or vane steering, by Herr Gremmer of Germany ("AERO-MODELLER", April, 1955) we can now use *any* sloping gradient providing there is a steady air current over the face of the hillside.

For example, Herr Gremmer's own local flying field provides him with a gentle slope of only 120ft. rise above the level of the surrounding ground and yet his best flight to date is no less than 16 minutes 34 seconds, and if you consider this to be a lucky slope, you should consider that during last season, his *average* flight on this field during a whole succession of flight tests, was no less than 7 minutes 11 seconds.

One could not, of course, make flights of such long durations without thermal assistance, and the Gremmer technique is as follows:—

First, one should endeavour to fly on a slope where the air flow of the oncoming wind closely approximates the flying speed of the model. The wind speed actually increases with the slope height (*Fig.* 1) and by supporting the model and walking at a moderate pace into wind, down the slope the launch is soon achieved when the glider literally rises from one's hand. After release, the model will fly with a very slow forward speed, and the upward current creates a climb, bringing the model into the faster airflow, and, according to Herr Gremmer's experience, the flights improve as altitude is gained.

Two particular experiences can be singled out of the Gremmer flight-log. One, where the glider was launched at the top of a hill in a high wind

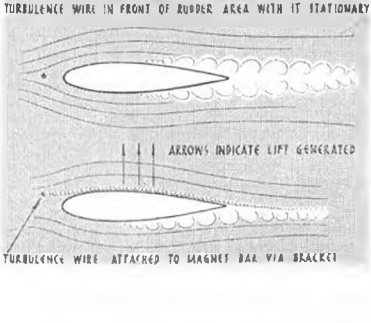
speed, and when a very low flying time of 30 seconds was retained as the model retired rapidly to earth. The second flight was made with a lower launch point approximately 50 ft. down the slope and with the model released at walking pace (*Fig.* 2). This flight was of 11 minutes duration, yet made only a few minutes after the earlier one! Exactly the same experience occurred at another flying site in Germany, where a modeller had the use of 180 ft. slope and, although satisfied with 4-minute flights from the hillcrest, he tried a release some way down the hillside and immediately found the model soaring away for 20 minutes.

Some idea of the measure of improvement over the years, is given by *Fig.* 3, which illustrates how, using a lower sinking speed and the improved, launching technique, Herr Gremmer's models now rise up to 300 ft. above the height of the actual slope.

Theoretically, the ideal type of slope is rather like the famous Dunstable "Bowl" where the ridges form a curve rather after the manner of a horse-shoe and one simply cannot help but find a position with the wind facing direct onto the hillside and generating a standing wave of up-current. *Fig.* 4 illustrates the air-flow over a steep ridge and the manner in which a slope-side launch as described above, can provide long durations. The wind force diagram on the face of the hill shows how Vh (Velocity horizontal) is at a minimum. In fact, if the slope happens to be vertical, in theory, the forward velocity would be zero! As the model is released and it ascends on the upcurrent, it can penetrate the wind to a degree then as the Vh increases, the model is forced to recede. In due course, a flight pattern not unlike a vertical "Big-Dipper" takes place, and final descent is usually terminated when the model becomes involved with the leeward vortices.

The article in the April, 1955, issue detailed the manner in which Herr Gremmer utilises his magnet steering to best advantage, by circling or "figure-eight" flights. The magnet operates a forward rudder on an A/2 size model that was both simple and inexpensive to construct. On the

FIG 5 PRINCIPLE OF VANE-STEERING BY MEANS OF COMPASS DIRECTED TURBULENCE WIRE IN FRONT OF RUDDER AREA WITH IT STATIONARY



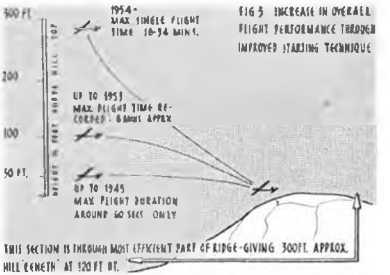


FIG 3 INCREASE IN OVERALL FLIGHT PERFORMANCE THROUGH IMPROVED STARTING TECHNIQUE

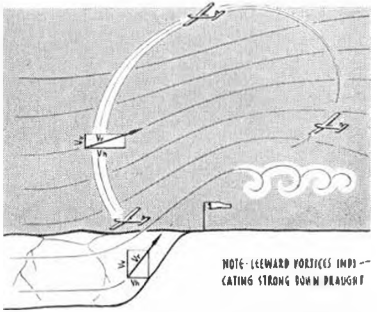


FIG 4 APPROX AIR FLOW DIAGRAM (SECTIONAL) WITH STEEP-HILL SOARING

basis of expenditure per minute duration, there is no doubt that magnet or Vane steering on a glider is way ahead of any other form of aero-modelling for economy!

As ever, progress in experience and design has led to new developments, latest of which is shown in *Fig.* 5. This is a simplified form of steering control in which the fin remains stationary on either nose or tail of the glider, and the turbulence wire is swung by the compass bar. Thus the inter-linkage and complicated bearings required by the established rudder system are eliminated, although it should in all fairness, be stated that the new method has yet to be tried under all conditions.

The principle is that the wire should swing from side-to-side and according to its position in front of the stationary fin or "rudder", it generates the turbulent flow on the control surface and in consequence a lifting force should serve to bring the plane back on its course. Such a steering device would embody the additional benefit of a very small magnet bar that could be housed inside the glider nose or tailplane, without the distortion of a "Cobra" nose effect on the earlier "Windbird" design, described last April. (*continued overleaf*)

Magnet Bars

Repeated requests, both in England and Germany following the publication of Herr Gremmer's earlier feature, have shown considerable interest in magnet steering and as has been announced in "AEROMODELLER", a special supply of Alcomax bars has been made available in this country through Woodside Model Aircraft Supplies, 72 Shirley Road, Croydon, Surrey. The requirement is that for a very special metal alloy containing Aluminium Nickel and Cobalt components, the first syllable of each going to form the trade name "Alnico". *Fig.* 6. This alloy when in full power, will "lift" about forty times its own weight! Even when aged, such a bar will still lift twenty-five times as much as its own weight.

"Alnico 400" is the particular recommendation for Herr Gremmer's own prototype models, and just for comparison, we sent along a sample Alcomax bar as supplied by Messrs. Woodside Models for his examination and report. After tests in his latest model, it was found that the size and quality of the Alcomax bar is equal to the best that Hans can obtain in Germany, the magnetic power being exactly equal to that of the German product.

Balancing

There is no great point of balancing of magnet bars, as due to the magnetic "inclination" of any magnet bar suspended in mid-air, there will be a tendency to dip one end in the west-east plane. This will mean a very small deviation of the compass when the model banks, but this deviation is easily compensated, as the flight path is an undulation (zig-zag) about the main course, and as the model is swinging from side-to-side, so advantage and disadvantage balance each other.

Herr Gremmer has seen and heard of a great number of "magnetic" flyers, who have almost been driven to distraction in trying to maintain balance on their magnet bars and hastens to assure them, and all other experimenters, that there is no need to be anxious on this point. The question of balance tends to be over emphasised and what matters most is that there should be completely free movement in any mechanism, whether using the rudder control or turbulence wire.

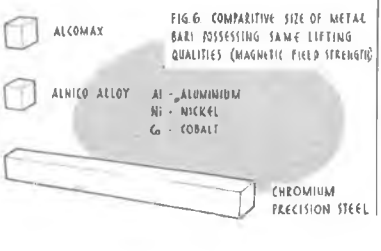


FIG.6 COMPARITIVE SIZE OF METAL BARS POSSESSING SAME LIFTING QUALITIES (MAGNETIC FIELD STRENGTH)

RAF GEN

Badges and Brevets

By Bruce Fergusson

THE ORIGINAL COLLAR BADGE of the Royal Air Force Medical Branch closely resembled that worn by members of the Royal Army Medical Corps, except that the CRUX ANSATA—the symbol of life in Ancient Egypt—was used with the addition of the serpent from the Rod of Aesculapius. On a scroll below was the motto *"Nec Aspera Terrent"* ("Nor do hardships cause us fear").

In 1920, however, the badge was changed to the winged Caduceus of Mercury, with crown above. This collar badge is gilt for medical and nursing officers and brass for non-commissioned officers.

From 1921-1929 those in the Works and Building Branch of the Service—always known as Works and Bricks—had their own special cap and collar badges. This badge consisted of a mason's square in the angle of which were the letters "W & B", and surmounted by the crown. This is, indeed, a rare collector's piece as there are very few now in existence.

For a few months in 1918-19 officers wore a gilt metal cap badge instead of the more familiar embroidered one. This was due to the difficulty in obtaining gold embroidery. The badge was similar to the type worn today by warrant officers, but eventually the officers reverted to their embroidered badges and the warrant officers brass.

There are two distinct badges for chaplains. This is a little known fact. The most familiar one consists of a black winged Maltese Cross with the letters "R A F" superimposed in the centre. The whole is surmounted by an embroidered crown. An enlarged replica of the badge is to be found embroidered on the bottom of the black silk scarf worn by all chaplains (except Roman Catholic) when robed.

The badges of the Jewish chaplains are exactly the same style as Christian chaplains except that the winged Maltese Cross is exchanged for a winged Star of David.

One of the most cherished badges in the Royal Air Force is the Pilot's Brevet. It was designed in the first instance for wear by pilots of the Royal Flying Corps about the year 1912. The designers of the brevet, or "Wings", were Sir David Henderson and Sir Frederick Sykes, both of them brigadier-generals who later became lieutenant-generals. With the formation of the Royal Air Force the letters "R A F" were substituted for "R F C" and the brevet continued to be worn. Until the last war the only other flying badge was the single wing of the Observer, which, like the pilot's brevet, was worn on the left breast of the uniform jacket and above ribbons. The Air Gunner in the days before the war wore a "winged bullet" on the right arm. Today there are many types of single flying brevets.

AEROMODELLING STEP BY STEP

SOLDERING is frequently badly executed by aero-modellers—a combination of faulty materials and faulty technique. The soldering jobs required are usually sharply divided—soldering to or joining piano wire; and the soldering of electrical wiring or connections. Remember the tasks *are* different:—

For soldering steel wire (e.g. undercarriage and propeller assemblies), use an "active" type flux (e.g. Baker's Soldering Fluid), a gas heated iron for preference (since this can be used hotter than an electric iron) and 60/40 strip solder. (The figures here refer to the proportions of tin and lead respectively)

For soldering metal sheet (e.g. brass or tinplate for control line tanks, etc.) use a "passive" flux (e.g. a paste flux) and 40/60 solder.

For all electrical wiring use 60/40 or 50/50 resin-cored solder and an electric iron. No additional flux required and *never* use an "active" flux.

Plumbers' solder is virtually useless for model work (except for casting "lead" weights for ballast). Solder tape of the type which can be melted with a match can be used for emergency field repairs. "Cold" solders, which dry and set like cement, are not suitable for any of the work mentioned above.

Your soldering gear should include both a plain and electric iron, plain and cored solders, suitable fluxes and means for cleaning, e.g., a fine flat file (warding file) and emery paper (or fine sandpaper) **1**.

To make satisfactory joints with steel wire:

(i) Clean the surfaces to be joined *thoroughly* by scrubbing with emery or sandpaper and then do not handle or fingerprint—**2**.

(ii) Paint an acid-type flux over the areas to be jointed (a short length of fuze string makes an excellent "brush" **3**).

(iii) Then tin both parts lightly, using a really hot clean iron (a plain iron heated in a fire is "dirty", so wipe on a rag before use).

(iv) Bind the two parts tightly together with a spaced binding of 2 amp fuse wire.

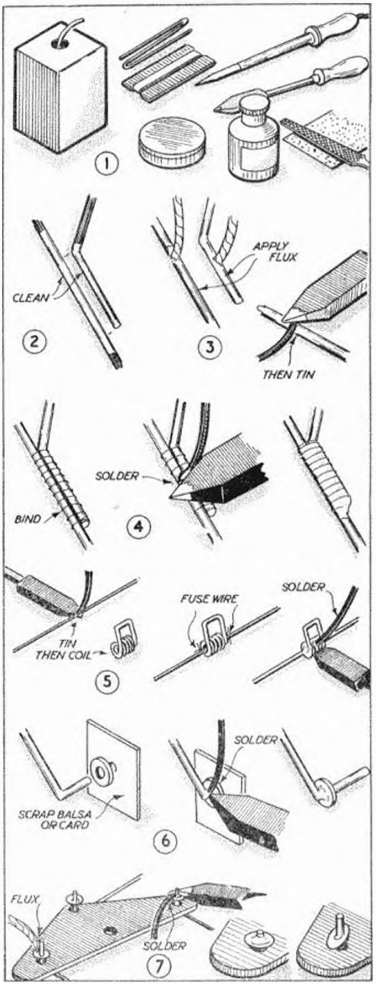
(v) Apply a hot iron to the joint area (iron almost, but not quite, dull red heat). Let the joint area heat up, then press solder in place and let it run over the whole joint—**4**.

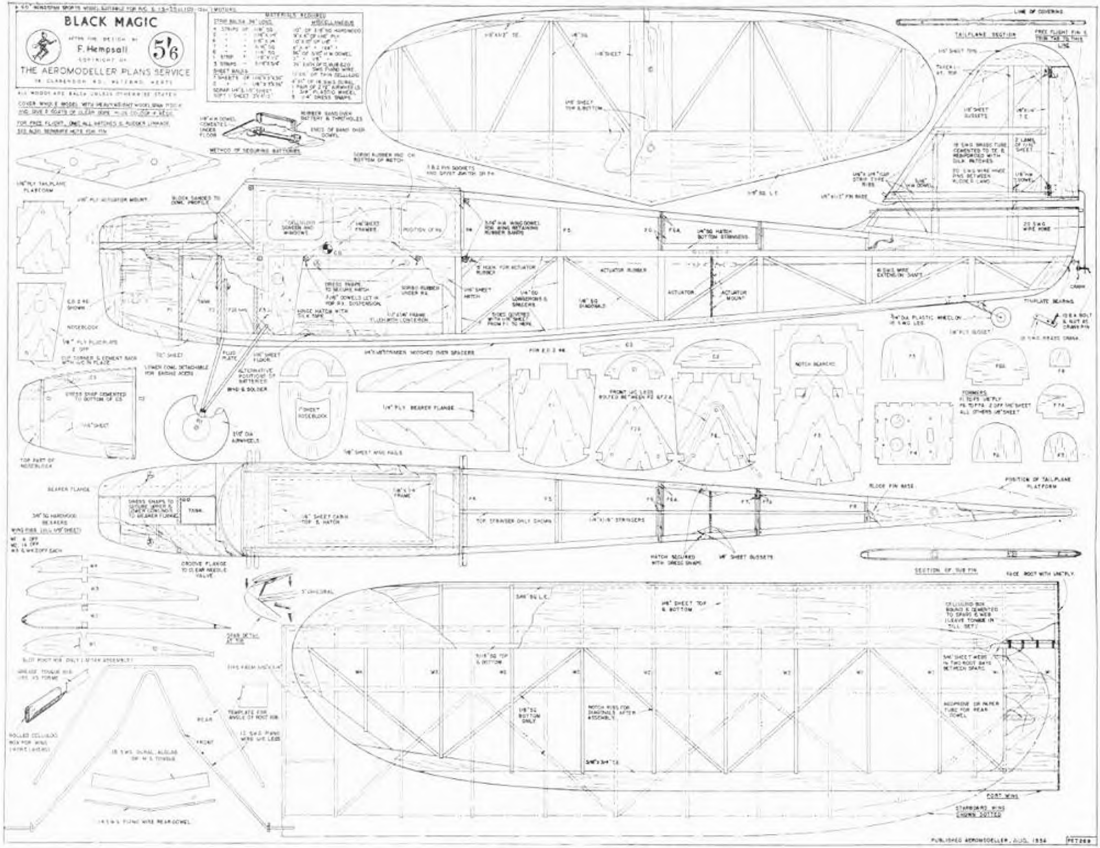
The technique is similar when soldering clutch coils to a propeller shaft **5**. Clean and tin the wire lightly before bending the coil. Clean and tin the shaft. Slip the coil in position, using an iron to melt the tinning, if necessary. Make a turn or two of fuze wire around each end of the coil, then finish solder with a very hot iron, letting the solder flow over the joint.

For those tricky little jobs like soldering washers onto stub axles—**6**—use a piece of scrap balsa or card to hold the washer true and square on the wire, after cleaning both parts thoroughly. After fluxing, apply the iron to heat up the joint and the solder to the joint, not the iron, and allow to flow out over the joint area.

Due to the surface tension of the molten solder, cup washers nearly always tend to "set" at an angle—**7**. Provided the joint is otherwise sound, just remelt the solder with the tip of the iron, hold the washer true with a piece of scrap balsa and blow on the joint to solidify the solder more rapidly.

All joints made with acid fluxes *should* be neutralised afterwards. Washing in water is sufficient, or better still in water with a little soda added. But you need not normally bother with undercarriage joints. Alternatively you could, in the type of job shown in **7** use a non-corrosive flux.





FULL SIZE COPIES OF THIS 1/5th SCALE DRAWING CAN BE OBTAINED FROM THE AEROMODELLER PLANS SERVICE BY QUOTING NUMBER PET 260 PRICE 5/6 POST FREE

The New BLACK MAGIC

Fred Hempsall's 9 year old 60-inch span Sport Model re-designed and re-issued in A.P.S. for radio flying

As built by R. GARMAN

BLACK MAGIC was first published in the September, 1947, "AEROMODELLER" and has been a firm favourite of thousands of sport fliers ever since. Good looks, clean lines and snappy reliable performance have accounted for its success.

Reader R. Garman, searching for a suitable radio control design for his E.D. 2·46, decided Black Magic had definite possibilities and wrote to the Editor regarding structural modifications. It was decided to strengthen the mainplane anchorage, the fuselage cabin structure and the wing tips. The fin area was increased and the original knock-off plate type engine mount replaced with an adaptable ply plate on bearers, which will accommodate varying sizes of motor. Mr. Garman still favours the old type mounting, however, and says it has saved his crankcase on several occasions, so we leave this particular design feature to the choice of the individual builder.

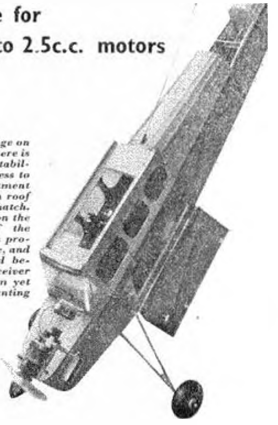
The new drawing shows installation for the normal battery sizes, *e.g.*, B122 or B123 for H.T. and U12 for L.T. etc. Mr. Garman, however, uses a set with fairly heavy current consumption and therefore employs heavier batteries. He uses a B101 Batterymax for H.T., a U2 for L.T. and a 1239 for actuator, which total 1 lb. 2½ oz. in weight. The B101 lies on the floor between the rear undercarriage wire and a ½-inch square block with ¼-inch dowel let in for rubber band anchorage stretched between undercarriage wire and the dowel. His U2 battery also lies on the floor immediately to the rear of the B101 and the escapement battery goes in the compartment between F.2 and F.3.

Those people who have flown radio models extensively will appreciate another suggestion by Mr. Garman. Instead of leaving the rear undercarriage legs as one complete length of wire he cuts it through the centre, taps the two ends 4 B A and joins them by means of a 4 B A sleeve. This enables the undercarriage to be replaced when necessary without disturbing the structure. Those people without taps and dies could easily solder a copper sleeve over the two ends, which would do the job just as usefully.

Another scheme would be to insert a hardwood block between formers F2 and F3 at the bottom of the fuselage and attach by means of bolts inserted in the block, a 14-gauge strip dural one-piece undercarriage.

This provides an easily removable unit which can be replaced when necessary and is a popular method in America particularly with radio control kit models such as the Trixter Beam and Live Wire series.

Suitable for 1.5c.c. to 2.5c.c. motors



View of fuselage on right shows there is ample "getatability", with access to radiocompartment through cabin roof and side hatch. A sorbo pad on the underside of the centre section protects the valve, and a similar pad beneath the receiver ensures a firm yet resilient mounting

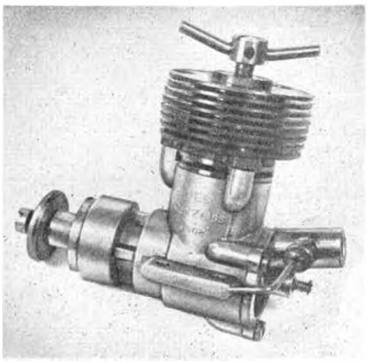
MOTOR MART

AFTER A PERIOD of sporadic activity, we now understand that the esteemed ETA 29 is now back in production and a large batch of engines is currently on its way through the Watford factory. This disc valve racing 5 c.c. engine is now in its Mark IV version and for the benefit of owners of earlier marks requiring spares, etc., the address of the company is Eta Instruments, 289 High Street, Watford.

From time to time we have mentioned the Activist engine manufactured by the world-famous Carl Zeiss Camera Company at Jena in the Soviet Zone of Germany. This engine has appeared in several versions and was actually used by countries in the Soviet bloc competing at the Soviet Internationals in Czechoslovakia last year and Hungary this year. We believe that it is now in full scale production and can be obtained at a most favourable exchange rate in Western Germany for the equivalent of about 30s. As the photo shows, it is a twin ball race motor of 2·5 c.c., weighing 4¾ ounces, with disc induction and a centrally-disposed carburettor after the manner of the Webra Mach 1. The manufacturers claim .34 horse power at 17,000 r.p.m. and one owner tells us that, although supplied rather stiff, it starts readily and performance appears to confirm the workmanship expected of this precision instrument company of Carl Zeiss.

The unique feature of the engine is one which dates back to the earlier Super Tigre diesels, in that it has a decompressor device for stopping the engine by introducing air to the crankcase. As can be seen in the photo, the disc shaft is spring-loaded, and by allowing a travelling distance between the disc and rear face of the connecting rod it is possible to push the disc and thus stop the engine. Note also the alternative position for the tommy bar in the compression screw, which is a most sensible fitting with a screw-slot for use in the case of a fully-cowled engine. Altogether a most practical production embodying many sensible features, although we do not altogether like the screw fitting for the airscrew in a tapped shaft, nor the characteristically large diameter propeller driven boss.

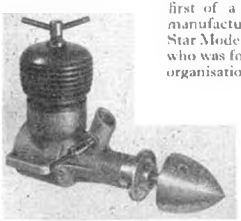
Following last month's analysis of the Frog 149, a comparative fuel consumption check has been carried out to tabulate the advantages of "vibromatic" induction over the normal shaft valve on the point of fuel consumption. As the graph shows, the new

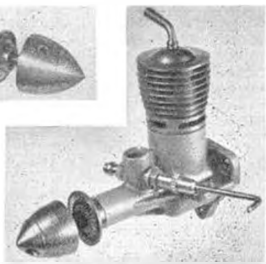


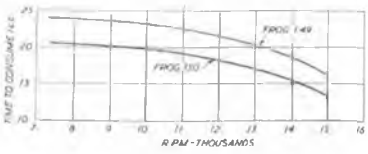
Frog 149 has a distinct lead in this respect, although using the same bore, stroke, timing, etc., of 150 motors.

Control line enthusiasts will be interested to know that H. J. Nicholls will be receiving a token import of approximately 50 glowplug engines from America in the near future. Types include the Fox 19, Fox 35, K & B 29 and K & B 29R, and prices will range from £6 to £8.

Recent visit of our Editor to Germany brought examples of new engines from both East and West Zones. The Schlosser 2.43 c.c. is from the East and like the "Activist" sells at a modest 30s. It is well made and beautifully finished and we hope to report on performance at a later date. The same can be said for the "Star .5" the first of a new range of diesels manufactured by a new company Star Models owned by Eric Spivey who was formerly with the Webra organisation.







Above: The Schlosser 2.43 c.c. diesel. Right: The "Star .5" which has beam or radial mounting and sells for approx. £2 2s. in Germany

Famous Biplane No. 4

FIAT C.R. 42

By G. A. G. Cox

Squadron insignia of white horse on black ground denotes that these machines are from the famous Buracca Squadron. This motif was also carried in reverse, i.e. black horse on white ground.

PRODUCED IN 1939 when the supremacy of the monoplane fighter had long been established, the C.R.42 was the last biplane fighter design to be flown in active service. Even more surprising than its late appearance is the fact that a total of 1,800 machines were built, the last of them in 1942. Designed by Ing. Rosatelli, the "Freccia" (Arrow) was similar to his earlier C.R.32 and in fact used the same wings with their unusual Warren bracing. An advantage of this triangulated structure was the elimination of flying and landing wires, but the drag of eighteen struts must have been a heavy price to pay.

The Freccia saw action in North Africa and over Malta, where it met its Allied counterpart the Gloster Gladiator. Although the Gladiator was a much earlier design (1935) it is interesting to compare specifications. Figures for the Gladiator are given in brackets. Engine H.P. 840 (840); maximum speed 272 m.p.h. (250); service ceiling 32,800 ft. (32,800); climb to 20,000 ft. 9 min. (9); loaded weight 5,049 lb. (4,750); armament 2 or 4 x 12·7 mm. m./guns (4 x ·303).

The C.R.42 was of all-metal construction with fabric covering on wings, movable tail surfaces and rear fuselage. It was a very robust machine, extremely manoeuvrable, but rather clumsy to land. When replaced as a fighter the C.R.42 was modified to carry two 220 lb. bombs for tactical support work. Experimental versions were also built with a retracting undercarriage and with twin floats, but neither of these achieved production status.

General note on model building

All modellers are familiar with the tedium of filling the pores, or vessels in balsa. Each coat of sanding sealer softens the deposit left in the pores by the preceding one, enabling it to penetrate farther into the wood; sometimes as many as seven coats being necessary to give a smooth surface. One way to solve the problem is to make one's own primer by mixing a teaspoonful of *dental* quality plaster of paris (the ordinary grade is too coarse) with a small jar of sanding sealer. Apply one coat and allow to harden. Rub down with 0 grade glasspaper until the filler is left only in the pores, then give one or two coats of sanding sealer in the normal way. The primer should *not* be left on the surface of the model—it may crack after a period of up to three days and ruin the dope or enamel finish. "Brummer" stopping, thinned slightly with water and applied with a knife is also a good pore filler.

The Fiat model

Illustrated stages are marked with an asterisk (*).

1.* With a very fine fretsaw cut two fuselage halves from ¼-in. balsa.

Omit the headrest, cowling, and tailwheel and carburettor intake fairings. Taking special care to keep the blade vertical, saw along the lines A and B then lightly cement these pieces back into position.

2.* When carving the fuselage exterior ignore the turtledeck line C.

After sanding, make vertical and horizontal cuts to C and finish shaping.

3.* Hollow the cockpit. The sanding sticks shown made from scrap balsa covered with glasspaper are useful for smoothing the awkward corners. Make and fit the interior details. (The seat structure can be made from split bamboo.)

4. Cut the wings from ¼- in. sheet, remembering to reduce the thickness of the lower wing slightly. Fill the grain, add threads to represent the ribs, and give dihedral.

5. Remove portion A from the fuselage, sand the upper surface of edge A to fit the wing, then reassemble.

6.* Cut slots at the L.E. of the wing root to fit waxed ⅛-in. dowel (dip the dowel in melted paraffin wax to ensure good coverage).

Add soft balsa fillets and fill in all crevices with cement.

Sand fillets to shape before removing the dowels.

7.* After making the tail surfaces from ⅛-in. sheet, fill the grain and score the hinge lines. Assemble as shown, and fillet with two or three applications of glue.

8.* Carve the headrest, cement in place and give the entire fuselage a coat of primer and sanding sealer.

9.* Carve the carburettor intake fairing on the

edge of a $\frac{1}{16}$-in. sheet. When parting off, increase the depth at D to fit in the groove E. Run the thumbnail along the upper edge to exaggerate the curvature. Pressure will then only be needed in the centre to ensure a perfect fit all along its length.

10.* Repeat the process with the tailwheel fairing, adding a half wheel when doped.

11.* Turn the cowling, scoring joint lines and drilling exhaust holes before parting. Mark the cooling gills by vee cuts.

12.* Turn the crankcase to $\frac{7}{16}$-in. dia. and cut grooves to take the oil filler and sump F and G. The upper half of each cylinder is carved from balsa dowel before parting and cementing to the $\frac{3}{8}$-in. dia. inner section.

13.* To mark-out the engine jig, draw a circle of $3\frac{1}{4}$-in. dia. and divide the diameter into seven equal parts. With compass open to the diameter, draw arcs intersecting at x. Draw a line from x through y to z. Step off distance z w round the circle. (This construction can be used for any polygon as long as the diameter is divided into the same number of parts as the polygon has sides, and y is the *second* point along the diameter.) The crankcase is fitted in a hole in the jig and raised for the addition of the rear cylinders.

14. Add the engine, cowl and air intake.

15.* Make each main u/c leg from two pieces of $\frac{1}{8}$-in. sheet. Arrangement of the grain as shown will strengthen the rear end of the spat. After adding the sleeve of thin card, pierce holes for the struts H and I. Carve recesses in the wings to take the legs and assemble with struts H in a jig similar to the one used for the "Fantome". When the glue is hard add struts I.

16.* Score the fuselage panels and pinprick the rivets. The simple gadget shown is a good substitute for a clock wheel, but do place a flat piece of metal or glass under the scrap wood to level the points before soldering.

17. Colour the entire model. If camouflaged, give an all-over coat of the lightest colour then add the others in patches.

18. To paint the Fascist insignia on the wings, use a compass with pen attachment and Indian ink for the circles, fill in with grey paint and then add the fasces. (XXVII on the fuselage badge is the date of manufacture in the Fascist calendar which started in 1922 when Mussolini came to power, hence Anno XVII = 22 + 17 = 39.)

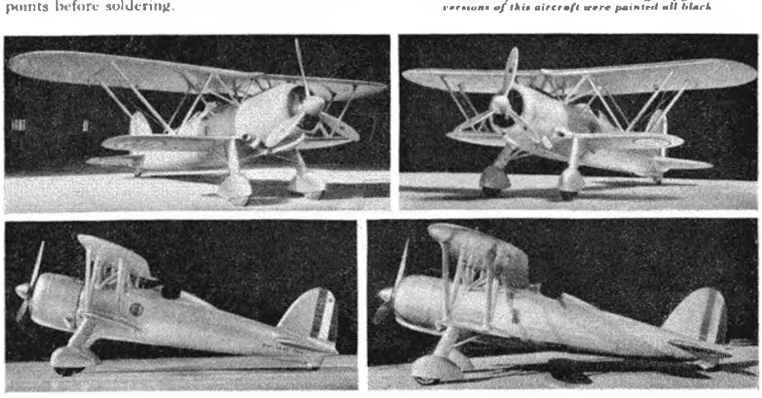
19.* Fit a windscreen cut from a moulded cover. The web joining windscreen to cockpit edge should be included if possible. Cut control horns from celluloid and glue into slots in the ailerons and rudder. Pass a thread through the wing at O and glue; twist to open the fibres, pass over the end of the horn and glue at tip of horn, then cut off the surplus. Fine brass tubing makes realistic gun barrels—fit them into notches as shown.

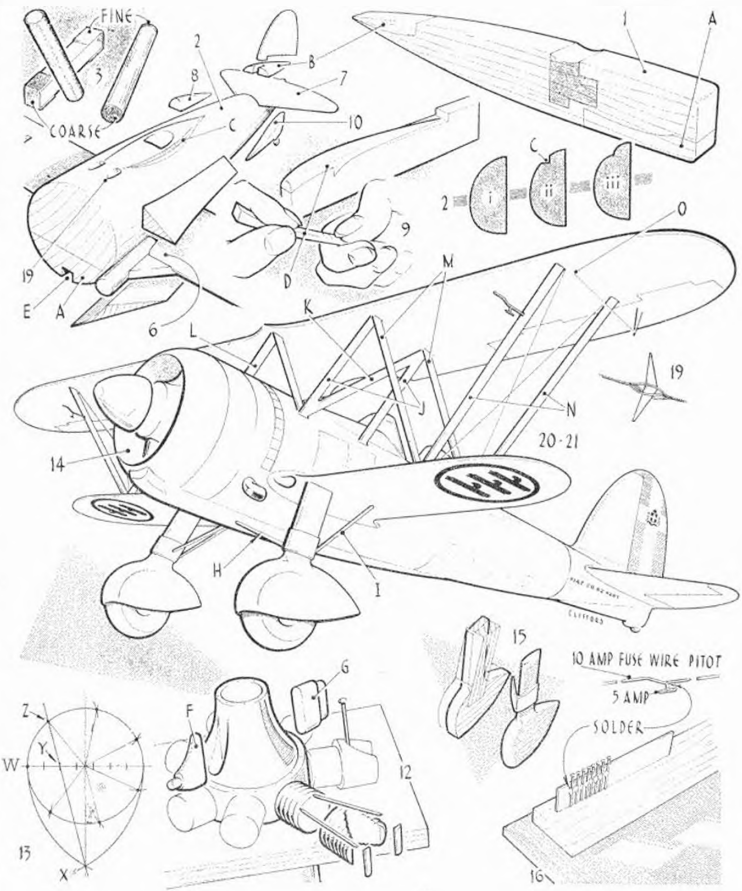
20.* Make all struts from bamboo. Glue struts J into the fuselage, add K when dry. Glue struts L to the *wing* and leave assembled until dry. Remove the wing and fillet these with glue. (If they were fixed to the fuselage at first, filleting at their upper ends would be very difficult.)

21.* Cut the struts M and N to exact length and glue M in place. Glue threads for the bracing wires into the strut holes in the upper wing, pass them through holes in the lower. Glue the tops of the cabane struts and hold the upper wing in place with an elastic band. Pop the struts N into place, but don't forget to pierce holes for the pitot tubes first. Pull the threads tight and trim off the surplus.

22.* Paint all struts and add propeller, spinner, exhausts, pitots and oil cooler outlets at the wing root T.E. (Celluloid tubing is ideal for these.)

Only the hanger windows on left hand picture denote which is the full scale aircraft, such is the high standard of George Cox's model which is finished all silver. Night fighter versions of this aircraft were painted all black




FINE
COARSE
1
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3
8
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10 AMP FUSE WIRE PITOT
5 AMP
SOLDER
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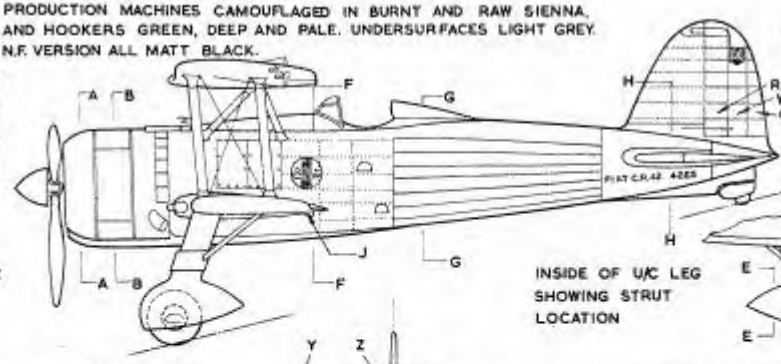
X

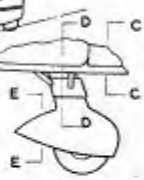
COLOURING PROTOTYPE ALL SILVER ILLUSTRATED PRODUCTION MACHINES CAMOUFLAGED IN BURNT AND RAW SIENNA, AND HOOKERS GREEN, DEEP AND PALE. UNDERSURFACES LIGHT GREY. N.F. VERSION ALL MATT BLACK.

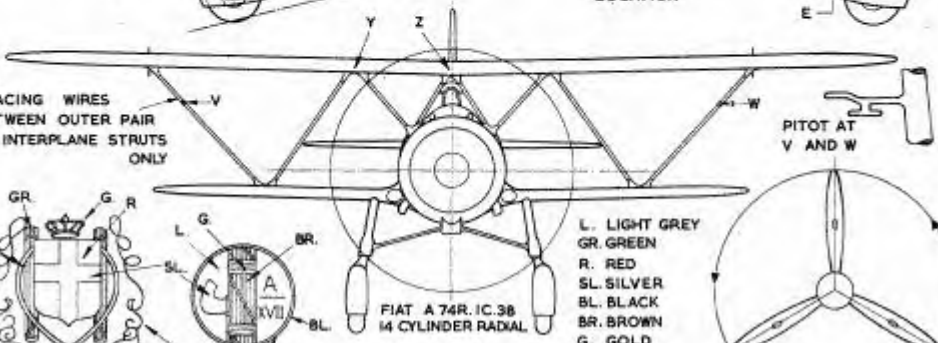
CAMOUFLAGE PATTERN

VENTURI AT X



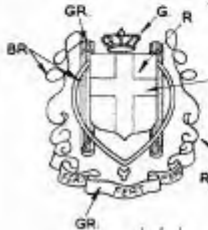
INSIDE OF U/C LEG SHOWING STRUT LOCATION





BRACING WIRES BETWEEN OUTER PAIR OF INTERPLANE STRUTS ONLY

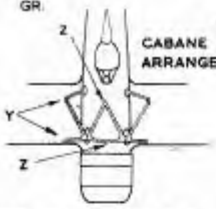
PITOT AT V AND W



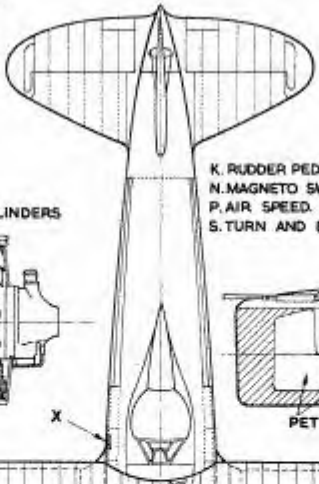
RUDDER AND FUSELAGE BADGES

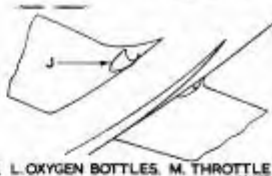
FIAT A.74R.1C.38 14 CYLINDER RADIAL

L. LIGHT GREY
GR. GREEN
R. RED
SL. SILVER
BL. BLACK
BR. BROWN
G. GOLD
W. WHITE



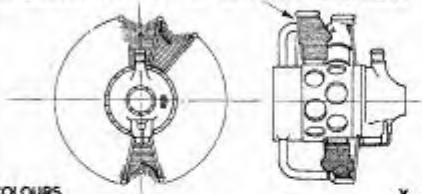
CABANE STRUT ARRANGEMENT



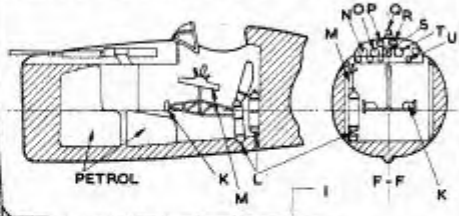


K. RUDDER PEDALS. L. OXYGEN BOTTLES. M. THROTTLE AND MIXTURE
N. MAGNETO SWITCH. O REV. COUNTER.
P. AIR SPEED. Q COMPASS. R. RATE OF CLIMB.
S. TURN AND BANK. T. ALTIMETER. U. CLOCK.

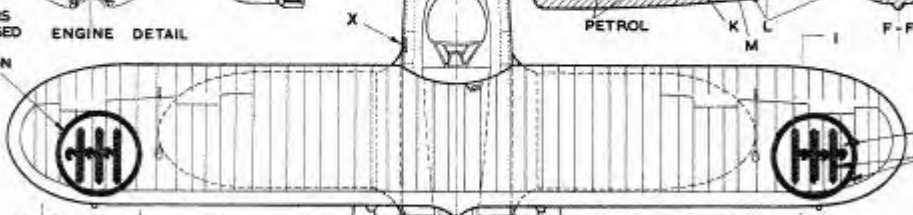
PUSHRODS AT REAR OF BACK ROW CYLINDERS

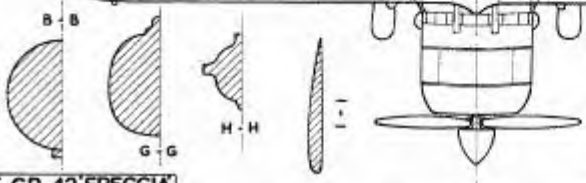


ENGINE DETAIL



COLOURS REVERSED ON N.F. VERSION



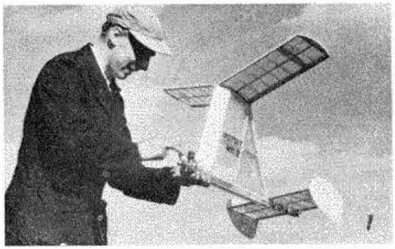


RIB SPACING LOWER WING

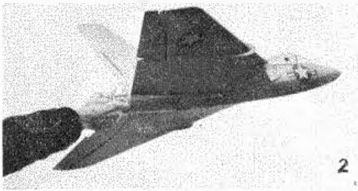
FIAT C.R. 42 FRECCIA

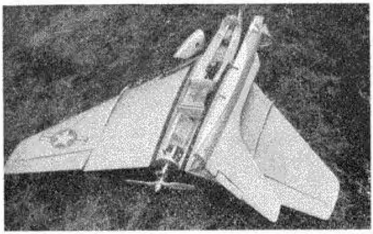
DRAWN BY G.A.G. COX

FT.



Model News





ONE OF THE thumb-nail sketches sent by cartoonist Russ, following his visit to the Nationals at Hemswell, was the little sketch at top left concerning a weird, fast climbing model with a brief but happy life. By good fortune the builder sent along photo No. **1** and it so happens that it is the work of another cartoonist, E. Clutton! (A case of dog eats dog?) It would be hard to classify Wotsit Mk. II for F.A.I. purposes, and we might describe it as a tandem wing pylon model, but the actual facts and figures are as follows: Span 32 in., weight 10 ozs., power an Arden .099 and tail area no less than 65% of the wing area.

Following publication of Ron Smith's unusual radio controlled Delta models in May, *World News* F. W. Biesterfeld of Hameln, Germany, has sent along photos of his own semi-scale experiments in this field, which are seen at left in photo No. **2** and below. This model which has a Skyray influence is 36 in. span and weights 20 ozs. complete with an "AEROMODELLER" receiver, plus transistor stage. Total wing area is 500 square inches, yet the power unit is only a Taifun Hobby of 1 c.c., mounted pusher fashion at the rear. Flying can be said to be on the safe side, although very fast, and turns can be held a long time without fear of the model spiralling downwards, nor does a stall occur when the turn is finished.

Refreshing change in Class A Team Racer line is seen in photo **3**, where Derek Allen displays his interesting and fast model which placed 2nd at the recent Dartford Control-line Rally. Derek comes from the Boreham Wood Club, and favours sweep forward for a change in appearance as well as structural advantage in leaving the nose portion of the fuselage free for tank and engine access. Power unit is inevitably an Oliver Tiger.

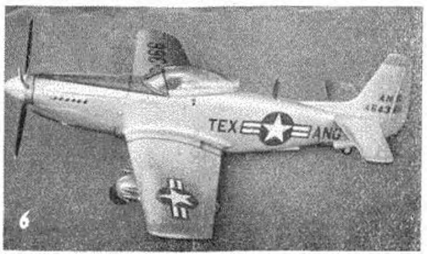
Last month we published what we term "rare bird" in the form of a twin engine free flight model and our "Model of the Month" this time is one of the same breed. Built by D. McIntyre of Troon, Ayrshire, not so far from the Scottish Aviation Ltd. factory, it is a scale Prestwick Twin Pioneer, one-twelfth full size and fitted with a pair of Elfin 2.49 diesels. These are off-set to compensate for unequal power output, but the model has advantages in this respect in that it is fitted with radio control on the centre fin, the receiver being an E.C.C. 951B. Although flight tests have yet to

take place, it is said to glide most satisfactorily, although a trifle fast, seeing that the all up weight is 4¼ pounds.

Aye, Aye, whose been taken in charge? Photo **1** is doubly interesting in that is shows P.C. Langridge of the Devon Constabulary, who is a very keen aeromodeller and has been responsible for starting aeromodelling clubs at Ilfracombe and lately at Plymstock, near Plymouth. The model he is holding belongs to Mr. Jim Tapp of Plymstock and is a controliner weighing 3½ lbs. for two E.D. Racers. Span is 55 in. and the entire surface of the wings and fuselage is covered in metalised wallpaper. The undersides are doped with a very high gloss, wing tip tanks and other markings are in red.

Following recent comments in this feature on how to take a photo of your model, Photo No. **5** is particularly interesting in view of the use of the background. Had Mr. H. B. Smith of Trim, Eire, lowered his camera just a few inches and brought the horizon below the wing tip level of his A.P.S. Focke Wulf Stosser, he would have conveyed a greater degree of realism. However, the final effect is not at all bad, and we can see that Mr. Smith has followed the Civilian/Military markings as indicated on the plan.

One might term the beautiful model of the North American Mustang shown in Photo No. **6** as being professionally made, for it was constructed to order by P. Donavour-Hickie and is at the moment used for display purposes by the American Jetco (formerly Jasco) Company, who are manufacturing a kit in the U.S.A. for this particular model. The original design won the 1954 and and five All-American National Scale Competition and is complete with full interior detail, which will be reproduced in the kit model.

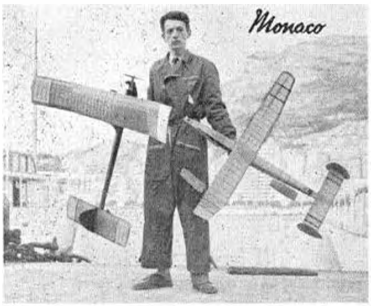


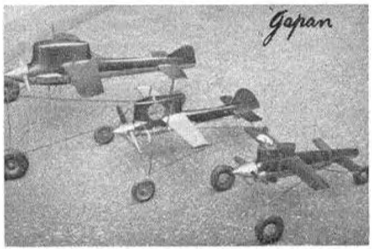
World News

Gay Monagesque scene, with Prince Rumier's Palace on the hill in the background as competitors at the International Hydromodel Contest of May 5/6th assemble to fly. Note the placid harbour and glorious weather.

Henri Navarro with his models, was second in rubber, and 6th in power. Uses the two forward float, one rear float layout, unlike the majority who prefer a large single forward float. After the contest, Henri made a controline aerobatic display from a boat.

Japanese speedsters by Akiau Fujimura hold three National records. They are: McCoy 60, 133 m.p.h., McCoy 29, 128 m.p.h. and K. & B. 15, 89 m.p.h.





FIRST OF the European International events this season was the Fourth Hydromodel Contest, organised by the Aero Club de **Monaco** where competitors are given the opportunity to share the famous harbour with the yachts of Millionaires and Princes. The contest is for rubber and power models and was attended on May 6th by representatives from France, Italy, Switzerland, Yugoslavia and the hosts, Monaco.

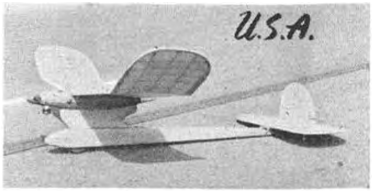
It would be superfluous to relate more than to say that weather conditions were perfect, and hospitality unlimited, and it does seem a great pity that more nations do not attend to enjoy what must be one of the most socially delightful meetings in the International calendar.

Launching took place in the open sea at the entry to the harbour, and results were as follows:

RUBBER			POWER		
1. P. Bluhm	France	511 sec.	1. Cedomir	Yugo.	494 sec.
2. H. Navarro	Monaco	477 ,,	2. Molinari	Monaco	424 ,,
3. J. Mavro	Monaco	435 ,,	3. Montaperto	France	408 ,,
4. R. Molinari	Monaco	292 ,,	4. Giudici	France	378 ,,
5. B. Dugoni	Italy	229 ,,	5. Ihge	France	315 ,,
6. R. Aubertin	Monaco	68 ,,	6. Vinko	Yugo	296 ,,

Best flight in rubber was 2:34 by Bluhm, and in power 2:35 by Cedomir, while the precision event was won by Zaug of Switzerland. After the contest numerous cups were distributed at the Hotel Bristol and those who had time to spare stopped to watch the "round the houses" Grand Prix de Monaco car racing on the following Sunday.

Sponsorship of International events by the American Chrysler-Plymouth Automobile organisation has been common news in the New World and South Africa; but it will probably come as a surprise to many that the latest event arranged by this



Left: At the Finnish Chrysler-Plymouth meeting, S. Pimenoff, the power winner and B. Storgards in National Service uniform, with their FAI Class team racer. Above, high thrustline contest model for A, and B, 29 by Jack Linn in California, much after the Frog Powercan layout.

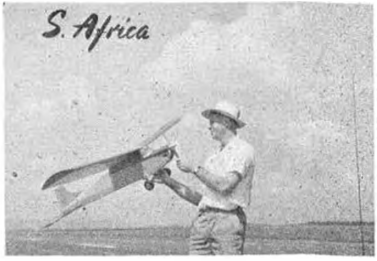
business group was over the Whitsun holiday in **Finland**. All classes, from team racers to chuck gliders were catered for, and performances high with many out of sight flights in the strong wind. S. Pimenoff made a triple maximum victory in 2·5 c.c. power, and should be worth watching if he attends the World Championship at Cranfield, and among the many results perhaps the new Finnish speed record of 167 k.p.h. with a Super Tigre by J. Jaaskelainen is most creditable.

More news from **South Africa** gives additional data on the Nationals which we reported in June issue. Total entry was 345 models, and among engines used the most popular ¼A is the Thimbledrome (Thermal Hopper) usually in a *Zeek* or *Spacer* design. Unique achievement by Brian Neuman of the Cape was to win Classes A and B (2·5 and 5 c.c.) with Super Tigres, he also used the big S Tigre for 10 c.c., but was beaten by Connacher's McCoy 60 at first place, and Jim Hedges with another Mac 60, second. Voted the best Nats. ever in the Union, the event wound up with a dance, during which one bod effectively dat'd himself blotto on the floor. Next year the boys travel to windy Port Elizabeth.

Keen eyes who spotted the illustration of an R6-B radio design in the "AEROMODELLER" Plans Service advt., page 344 last issue, will have perceived that it bore South African registration lettering. It is in fact an enlarged version of this now famous New Zealand design which Pat Wheeler has made using a German BWM 2.5 c.c. diesel.

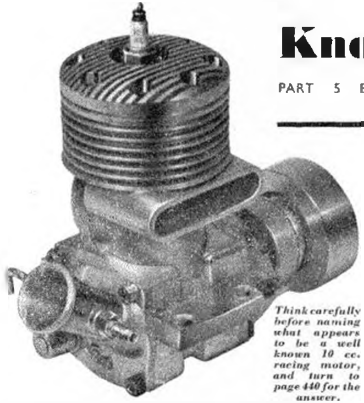
Advance news of the important Soviet International held in **Hungary** tells us that the Hungarians won the team event once more, although in terms of first places they came off second best to Czechoslovakia. The Czechs won all free-flight classes and were second in speed and stunt; but on a points basis their place in stunt was just that much behind the Hungarian winner to lose the team victory by a slender 0.14 per cent. of points awarded. More details of this meeting will be given next month, but immediate points of interest are that for the first time a team was sent by the **Chinese** People's Republic, and that Sladky's speed flights were 111, 112 and 113 m.p.h., the latter tying with R. Beck's (Hungary) winning speed, made with a Super Tigre. This indicates that the Czech strength at the World Championships in Italy might not be as strong as anticipated, these results being considerably behind the 125 m.p.h. figures of Gibbs and Battlo in Brussels.

Below: Henry Heydenrych won the S. African Nationals in Class B free flight with his A, and B, powered Spacer. At right, is Cliff Cattersell who was third in radio control with a Line-wire Cruiser.



Know your Engine

PART 5 EXPLAINS THE PRINCIPLES OF CARBURETTION



Think carefully before naming what appears to be a well known 10 cc. racing motor, and turn to page 440 for the answer.

IT IS A FACT that liquid fuels in liquid form are reluctant to burn. To render them combustible, they have to be in finely divided or vaporised form, mixed with air. Ordinary paraffin provides a good example of this. It does not vaporise at room temperatures and so a match plunged into a tin of paraffin would merely be doused, almost as if you had plunged it into water. Yet gently heated so that the surface of the liquid was covered with a film of vaporised paraffin and a match brought near it would readily set it alight. (You get a similar effect with a wick used with a paraffin lamp, the wick promoting evaporation and thus vaporisation of the paraffin.)

Thus for fuels to ignite properly inside an internal combustion engine they must be fed to the cylinder in vaporised form. Also for them to ignite properly and efficiently, the vaporised fuel must be mixed with the correct proportion of air. This principle is utilised in almost all model engines, irrespective of the type of ignition or method of firing the fuel. In some larger engines, and with nearly all "full size" diesel engines, air and fuel are introduced separately into the cylinder, the latter being injected into the top of the cylinder in the form of a fine spray as the piston approaches the top of its stroke. In the sense that it inducts a fuel-air mixture the model diesel is, therefore, not a true "diesel" in the accepted sense (a true "diesel" employing "solid" fuel injection) and more correctly, a compression-ignition engine. In model engine sizes, and particularly because light volatile fuels are used, supplying a fuel-air mixture to the cylinder is by far the simplest solution and gives quite satisfactory results.

The part of an engine concerned with metering and atomising the fuel and mixing it with air is generally termed a carburettor. Again, in model sizes, the type of carburettor used is about the most elementary form that it can take—again, because of simplicity and the fact that it will do the job satisfactorily. Whereas the carburettors on larger engines have to incorporate throttle controls model engines are, largely, one speed engines with any particular load.

Because of its simplicity the model engine carburettor is seldom termed as such, although it performs the basic function of "carburettion"—i.e., metering and mixing the fuel and air supplies to the engine. Nearly all forms are basically similar and consist of a metering jet inset in a tube, the latter called either the choke tube or induction tube. The metering jet is either of fixed size (comparatively rare) or with variable size of orifice brought about by means of an adjustable needle which can be advanced into or withdrawn from the orifice and so vary its effective opening or area.

The needle valve and jet assembly is usually of one of two forms. The jet opening can be located in one side of the intake tube with the needle valve entering it; or the jet tube can be extended across the width of the intake tube with a hole (or holes) at its centre, the effective jet orifice area being varied by Adjustment of a needle valve running inside the tube—*Fig.* 1. A majority of modern engines employ the latter type, the extended jet tube being known as the spray bar. It is far less critical and rather more efficient (for most purposes) than the jet in the side of the tube. It is also less sensitive to changes in fuel level due to better capillary attraction between needle and spray bar. *Fig.* 2.

Whichever design is employed the principle involved is that of creating a reduction in pressure within the intake tube at the region of the jet, thus producing a suction effect to lift the fuel out from the jet in the form of a spray. The simplest way to ensure a suction effect in a straight tube is to give it a venturi shape, as in *Fig.* 3, incoming air being speeded up in passing through the convergent section, reaching a maximum velocity (and thus having minimum pressure or maximum suction) at the narrowest section or throat. The jet

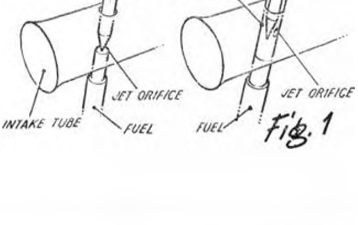
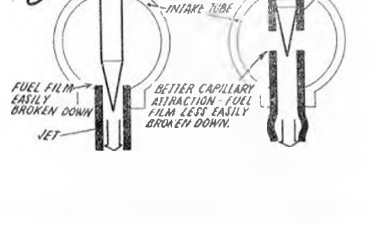


Fig. 1



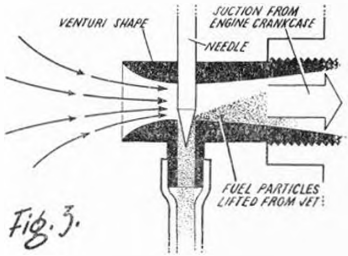


Fig. 3.

orifice is thus placed at this point. Air passage through the tube into the engine is, of course, produced by the reduction in pressure within the crankcase of the engine during the induction period of the timing cycle, and with the induction port open.

This type of carburettor has a number of limitations. The airflow immediately adjacent to the walls of the tube will be slowed down by friction, hence the actual suction effect will be less on the walls than at the centre of the tube *Fig.* 4. Thus the fuel will be less ready to emerge in the form of a fine spray and also the size of the orifice will tend to be very critical. In other words, even with a finely tapered needle valve the setting for correct fuel proportions will tend to be extremely critical, a fraction of a turn making all the difference between a mixture which is too weak or too lean.

This inherent disadvantage can be minimised by using a good venturi shape in the first place, which ensures that there is a reasonable amount of suction at the walls and a high finish on the walls to minimise gas friction. Also it becomes less important where relatively large quantities of fuel are involved, with proportionate large air volumes and high velocities. This type of carburettor is still widely used on the larger racing engines, where the intake diameter may be quite big in order to pass the necessary air and the fuel flow rate is also proportionately high. Engines of this type, too, usually have rotary disc induction, which itself induces swirl and "chops" any solid fuel particles into more finely divided form. All two-strokes inherently tend to have good atomisation characteristics, due to the heat of the combustion chamber, swirl induced by crankshaft rotation, etc. And because of the large quantity of fuel passing the sensitive nature of the needle valve control it not so apparent. With such carburettors, however, it is quite common for low speed suction to be poor so that prolonged or (apparently,) excessive choking may be necessary to get the engine started and initiate the proper flow conditions through the venturi.

Choking, of course, consists merely of blocking off the free end of the intake tube so that the whole of the crankcase suction is applied through the fuel system, thus providing an extremely powerful suction lift to draw raw fuel up into the intake tube *Fig.* 5. It necessarily results in an over-rich mixture because of the absence of air. Partial choking implies leaving the intake tube partly open so that a very rich mixture is produced (i.e., limited air induction) *Fig.* 6. and may be used to promote firing and initial running after full choking. Partial choking will not, normally, draw in raw fuel unless the fuel level in the tank is at the same horizontal height as the jet.

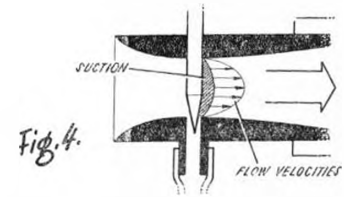


Fig. 4.

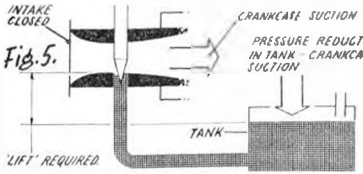


Fig. 5.

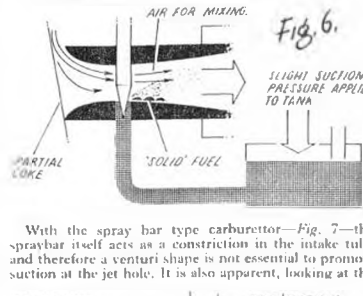


Fig. 6.

With the spray bar type carburettor—*Fig.* 7—the spraybar itself acts as a constriction in the intake tube and therefore a venturi shape is not essential to promote suction at the jet hole. It is also apparent, looking at the

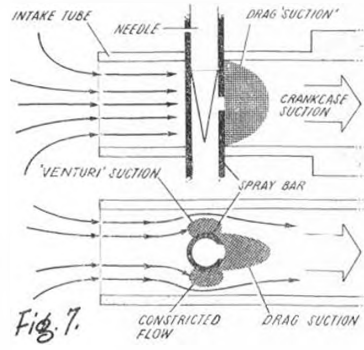
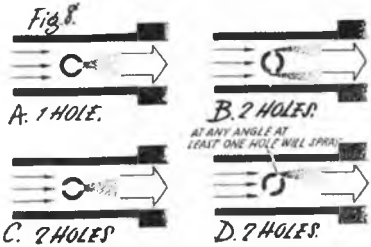
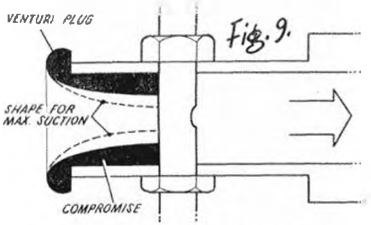
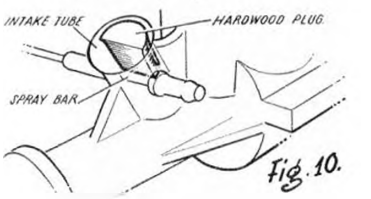
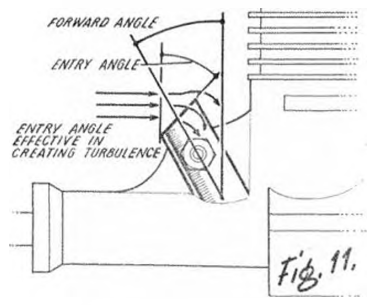


Fig. 7.









assembly from the top, that there are three regions of suction—one at each side produced by "venturi" effect, and one behind the spray bar due to its drag effect. Also these effects will be maximum in the centre of the tube.

If the spraybar has a single jet hole, then the best effect is produced if this is faced downstream—*Fig.* 8 (a). On some designs with this type of spraybar, the engine will only run consistently with the jet hole so located. On others consistent running can be obtained with the hole at one side, but where this is so a slightly coarser needle valve setting is usually required to supply the same mixture.

If the spraybar has two diametrically-opposed holes, then it will usually perform satisfactorily in *any* position. In other words, you do not have to worry about how you reassemble the spray bar, if removed, but again the most economical position (i.e., as reflected by the leanest needle valve setting) will be specific—with the holes in the position shown in *Fig.* 8 (b).

Locating the spraybar with one hole facing forward and the other back *Fig.* 8 (c), will mean that only one hole is effectively spraying, but this action will be assisted by a positive pressure build-up through the other hole. In any other position *Fig.* 8 (d), either one or both holes may spray, but in all cases adequate carburettion is produced.

The actual bore of the intake tube must be proportioned so that it is large enough to pass enough air to produce the required volume of mixture at the highest design speed of the engine. In simple terms, the faster the engine is to run the larger the intake tube required. Coupled with the increased gas velocities resulting from high speed operation, adequate suction will be maintained.

At lower speeds, however, the large bore intake will prove an embarrassment. Increasing the bore means a marked reduction in suction effect with lower gas velocities so that even if the engine can be started initially by choking, suction in the intake during the period when it is running on its own and building up speed, may be unsatisfactory and so the engine does not get the proper mixture to sustain running. This is the reason why some high speed engines are hard to start and often difficult, or even impossible, to run at low or moderate speeds (although other design factors also enter into the question of low speed running, of course). The solution may be a definite venturi shape for the intake or, more usually, interchangeable venturii which can be inserted into the throat of the intake tube—*Fig.* 9. A whole range of such venturii may be used, the one with the smallest opening making for good starting and low speed running (but starving the engine and thus limiting its high speed performance), and so on up to no insert for maximum performance. Plugging the intake with a piece of balsa or hardwood, was at one time a common method of "taming" high speed flow motors for moderate speed performance—*Fig.* 10.

An apparent solution to getting more air through the intake tube is to have the intake facing forwards into the airstream and thus utilise ram effect at speed. This, however, is highly unsatisfactory in practice and normally so upsets the mixture setting as speed builds up that the engine just stops. In point of fact, it seems to make very little difference which way the intake tube faces, as long as it does not point straight ahead. It is also interesting that it can "breath" in quite confined spaces, such as close up to a bulkhead, provided a ready flow of air can reach the region of its open end.

The practice of raking forward the intake tube and/or

Continued on page 436

Trade Notes

THAT FINE QUALITY lightweight silk we were mentioning a few months ago is now available in brilliant orange tint at 9s. 6d. per yard through all agents for **Mercury** models. The colour is most attractive and bright enough to give a maximum visibility range for any model, at the same time providing a most attractive translucent effect which will enhance those models with intricate framework. Another new item for Mercury is an ultra-light-weight cut-out, retailing at 4s. 11d. which weighs not a dram more than is necessary for an effective and immediate shut-off valve.

Many scale or semi-scale models have been spoiled for the sake of interior detail and most modellers appear to shy at the thought of having to reproduce an instrument panel. The problem is now solved by a neat little embossed card on which two instrument panels are given, measuring 1¼ in. and 2¼ in. wide to suit most models. Unfortunately those who have had contact with full size aircraft will probably find the panel far from accurate, but for 6d. per card (manufactured by Messrs. Glassford's of Glasgow and distributed by most wholesalers including **P. Smith** of Croydon) no one could complain.

Incidentally, few people seem to realise that although **Bondaglass** kits are no longer distributed as such, one can now obtain considerably more Bondaglass fibre material and resin for the same expenditure, and these items are now sold separately from most enterprising Model Shops free of purchase tax.

Also distributed by P. Smith is the **Scamp**, a smart little ready-to-fly rubber power model complete with plastic propeller and nose pieces and ready cemented dihedral. We managed to get quite a few seconds' duration out of the one tested (as illustrated) and for 3s. plus 7½d. tax it makes a nice present for the young beginner to get him in the groove for bigger stuff later on!

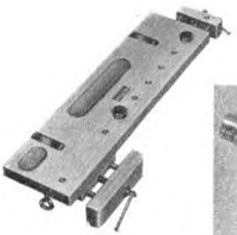
Jasco Spotter, shown above has pleasing semi-scale lines. A.30 Relay on right, has single point mounting and silvered contacts.

Latest kit from the **Jasco** stable is a neat little 18-inch span rubber model designed by John Chinn which is attractively boxed complete with printed balsa sheet, plastic wheels and propeller. The semi-scale appearance and the name **"Spotter"** presumably indicate A.O.P. origination. Designed as a beginner's model the kit is complete apart from the rubber motor and retails at 5s. 11d. We shall be commenting on the flight performance in a later issue when our review kit is made up.

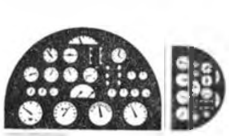
Home constructors of Radio Control equipment will welcome the new **A-30 Relay** produced to retail at 18s. 6d. by **Messrs. Ripmax Marine Accessories.** Coil resistance is 5,000 ohms and the weight approximately three-quarters of an ounce. We were very impressed with the high standard of workmanship and found adjustment much easier than most relays we have tackled. The armature appeared slightly on the heavy side, but this does not appear to affect sensitivity. We were able to adjust our example, as far as current change was concerned, as low as ·2 of a milliamp, which speaks for itself. In view of the long armature we recommend that the relay is mounted with the armature vertical, *i.e.*, with the points at the top.

Messrs. Davies Charlton have recently reduced the price of a number of their engines including the **Sabre**, which now sells at 54s. Our printers, however, reduced the price even more in the July issue by transposing the five and the four. Our apologies to Messrs. D/C. Ltd., and also those readers whose hopes were raised at an exceptional bargain.

We hear from **Messrs. Bradshaw Model Products Ltd.**, that a British Company known as Revell (Great Britain) Ltd., has been formed to manufacture these fantastically detailed kits in the not too distant future. Messrs. Bradshaw will be handling distribution in both the Hobby and Toy trades.



New Multicraft Table Top Workbench is a boon to the modeller without a workshop. Made from top grade beech, it clamps to domestic table top, has two vices incorporated. Costs 37s. 6d. Below, is the Mercury cut-out



A DEURNE GOOD SHOW

FOURTH INTERNATIONAL RADIO CONTROL CONTEST AT DEURNE AIRPORT, ANTWERP ATTRACTS SIX NATION ENTRY

Jean-Pierre Gobeaux and Dr. Gobeaux Pere inspect the re-designed model that they flew to yet another international victory at Deurne. Any likeness that now remains to the old "Queen" is purely coincidental!

RESULTS

KING OF THE BELGIANS CUP (MULTI-CHANNEL)

1 Gobeaux	Belgium	1,703
2 Stegmaier	Germany	1,098
3 Hemsley	Great Britain	778
4 De Hertogh	Belgium	575
5 Lichius	Germany	532

MINISTRY OF COMMUNICATIONS PRIZE (SINGLE CHANNEL)

1 Bickel	Switzerland	587
2 Satz	Switzerland	429
3 Brunenkant	Germany	381
4 Fisher	Great Britain	337
5 Dzeich	Germany	326
6 *Brinkman	Holland	316
12 Parkinson	Great Britain	179

* Special "Most Deserving" award

MINISTRY OF HEALTH PRIZE (GLIDERS)

1 Klauser	Switzerland	369
2 Huber	Switzerland	281
3 Schmid	Switzerland	229
4 Mabille	Belgium	185
5 Muschner	Germany	183
6 Meyer	Germany	182
7 Boys	Great Britain	141

FOURTH ANNUAL CONTEST for the King of the Belgians International Radio Control Trophy resulted in the famous Gobeaux team notching yet another convincing victory with a lead of some 600 points over second man—again German Kurt Stegmaier. Our own Ted Hemsley came up into third place—one up on 1955. In the single channel class Bickel of Switzerland was a runaway winner with 587 out of a possible 630 points, flying an attractive delta developed from experiments with a Laurie Ellis *Vultan*. Fellow Swiss Setz was second with German kit model *Funk Boy*. Glider section with nine entries showed increase on last year with Swiss again in front, occupying three top places.

Belgian *pate* put paid to any chances our team might have had, plus delays *en route* which reduced pre-contest checks to almost nil. With Hemsley third in Multi, Fisher fourth in Single Channel (out of 18), Parkinson twelfth and Howard Boys seventh in Glider, we did well to record flights in each category, and what is more *two* flights by each of the above. Had results been based on *total* of two flights and not *better* of two we should have moved up well.

Little that was new technically appeared at this meeting, which numbered 34 entries and included France, Belgium, Holland, Switzerland, Sweden, Germany and Great Britain, with observers from Czechoslovakia. Dr. Gobeaux has produced a new model that has moved away from the out-dated Radio Queen, though still faithful to his E.D. reed basic receiver, Micron 60 engine and robust slabsider construction. Stegmaier, too, has re-built though with little change from his successful—but to our minds grossly overweight—round fuselage high shoulder-wing, still equipped with his air-pump control system.

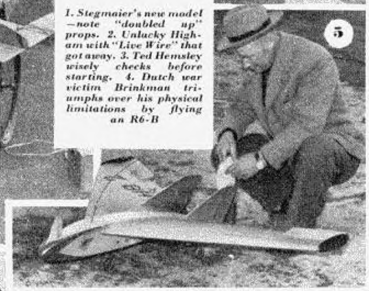
Most promising innovation was Dutchman Veenhoven's simplification of this air-pump system which he had installed in a model of only moderate size powered with one of his own manufacture Typhoon 2.5 c.c. engines. Alas, he never became airborne so that the quality of his equipment remains unknown!

Once again we must record that the contest was won in the air—not on the ground. Had models been drawn out of a hat top men would probably have been the same as they were all real *pilots*. Contestants have appreciated by now that entry with unreliable radio gear is futile so that in very few cases were flights terminated by loss of control. Superb pilotage by Jean-Pierre Gobeaux, particularly his loops and inverted flying gained him the day. Stegmaier was off form, and flew well below his best with an untidy landing, only good inverted flying redeemed the flight from mediocrity. Ted Hemsley could have snatched second place but for contest nerves resulting in misplaced fin that cut down right turn.

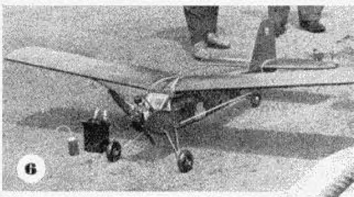
Bickel, whose fine glider flying was remarkable in 1955 at Essen, proved just as good with a powered delta—his total of 587 out of a possible 630 speaks for itself. At times in his first flight one tended to look for lines, for the model carried out tight turns like a controliner. Take off and landing—again his fish-tailing brought him in beautifully—were delightful, and generally his polished efforts left other flights in the shade.

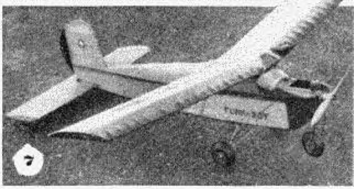
Glider section was a Swiss walkover, thanks again to Arnold Degen who put them up there with his incomparable control over a 200 metre line. We studied his technique which is really very simple—just a hand held pulley, plus helper who holds the winch and stands nearer the model. On release winch-holder runs towards launcher, pulley holder walks quietly away, and controls launch by directions to winch-holder limited to "come, go, stop". Meanwhile pilot controls rudder even before line is released. Howard Boys puffed like Pirie to achieve even moderate launches of his "*Ann Twerp*" using a straightforward technique. Germans had a form of pulley launch but it was more complicated than Degen's.

Bad weather marred the meeting, but did not dampen any spirits. City of Antwerp and the Royal Antwerp Aero Club made contestants very welcome, with light aircraft flying meeting to follow the contest, a contest dinner, dance orchestra and excellent catering.



1. Stegmaier's new model —note "doubled up" props. 2. Unlucky Higham with "Live Wire" that got away. 3. Ted Hemsley wisely checks before starting. 4. Dutch war victim Brinkman triumphs over his physical limitations by flying an R6-B

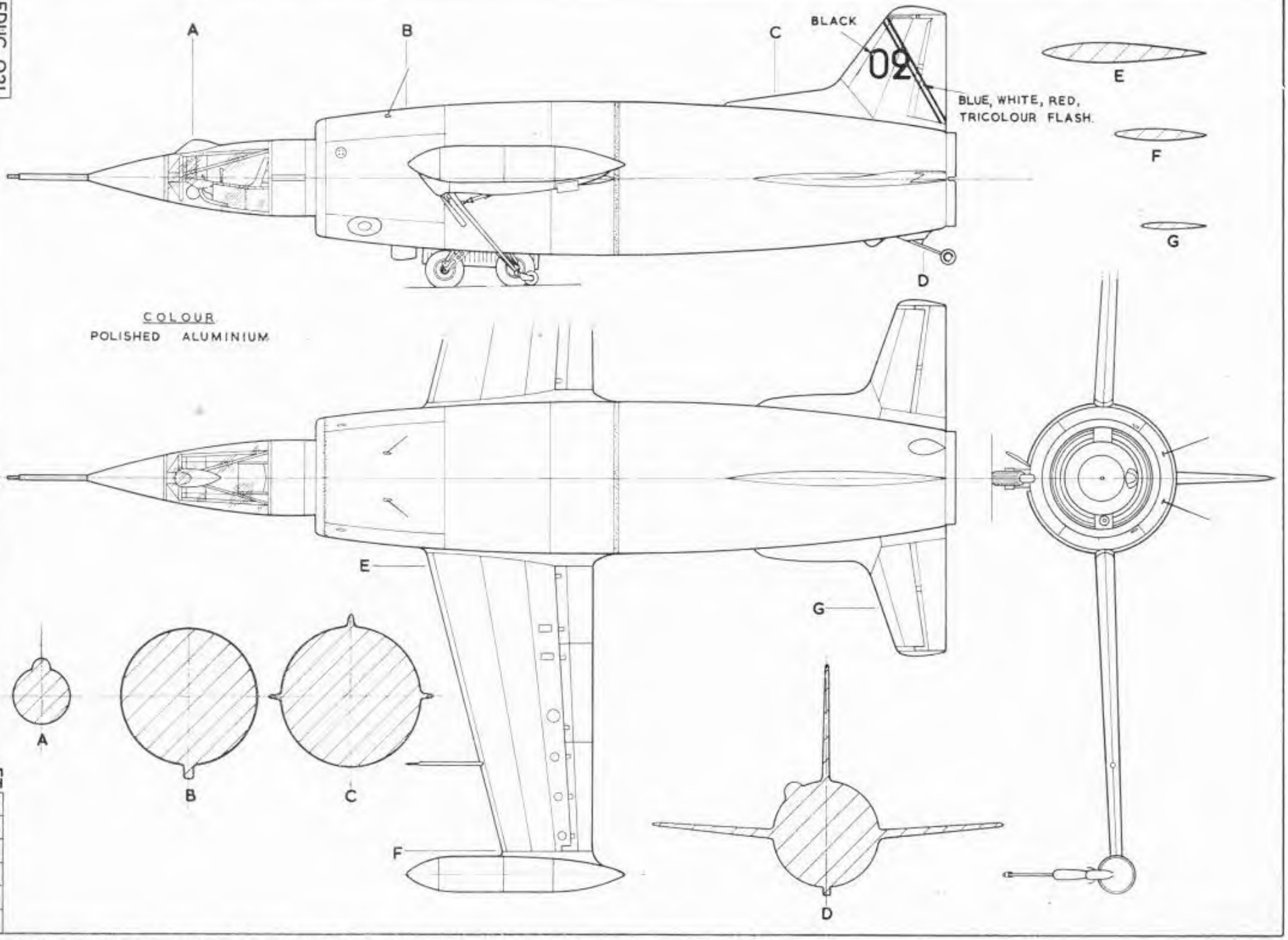




5. Swiss Bickel wins again with this forward rudder delta. 6. De Hertogh, Belgium, did well with an old friend. 7. "Funk Boy" German mug design well flown by Swiss Setz. 8. Breeze holds Fisher's shapely single channel entry

9. Dzeich, Germany, with three-year-old Mills-powered job. 10. Setz with Klauser's winning glider. 11. Huber, Switzerland, with his second place glider. 12. Unlucky Lichius before "prang of the day" with his Cessna. 13 Parkinson with Howard Boys' "Ann Twerp"

LEDUC 021


A
B
C
BLACK
09
BLUE, WHITE, RED,
TRICOLOUR FLASH.
E
F
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COLOUR
POLISHED ALUMINIUM
E
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A
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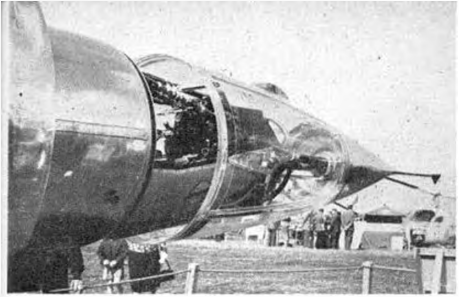


AEROPLANES IN OUTLINE

Number 47

Leduc 021

Described by R. J. Silvester

IT IS DIFFICULT to ascertain exactly when M. Leduc first started work on ram jet engines and dates varying from 1929 to 1933 have been quoted in various technical journals. However, after many years of experimental work using large scale free drop models, the construction was started on an actual machine, the "01", and it is interesting to note that the aerodynamic configuration of this aircraft was not particularly advanced and supersonic speeds were not catered for. M. Leduc felt that the engine problems were sufficient without the addition of those of the airframe aerodynamics.

With the French capitulation in 1940 the aircraft was dismantled and hidden to prevent it falling into the hands of the enemy, M. Leduc himself being pressed into service by the Germans.

Work on the aeroplane recommenced after the Allied victory in Europe and by December, 1945, it was completed, though flight testing did not start until November, 1946, due to delays in the construction of the "Languedoc" carrier aircraft and the production of suitable parachutes.

For launching, the "Leduc" is mounted at its centre of gravity point on a pylon above the "Languedoc", the tail being steadied by a jury strut. The engine is started at a suitable altitude and the tail strut is lowered, permitting the machine to be ready to release "01" made some forty composite flights before being released, and when the engine was first started in the air, the spectacle was so frightening with flames licking in all directions that the motor was switched off and inspected for correct functioning. The first landing from a release was heavy enough to result in two burst tyres. In the meantime a second "01" had been built and numerous tests were carried out with both machines until they were finally "written off", one by failing to make the airfield after a fuel valve had failed and the other by touching the carrier aircraft when being released which resulted in jammed ailerons. Both pilots survived due to the control compartment breaking away on contact with the ground.

By February, 1951, a third machine had been completed, and this, the "016", was fitted with two Turbomeca Marbores at the wing tips for cruising and landing, but these proved too much for the pilot to handle; in fact no less than three serious landing accidents occurred when these were in use. This machine was retired to the Musee de l'Air in January, 1954. Two "021"s, the subject of our G.A., were built, one being completed in March, 1943, and the other in February, 1954. Between them these machines notched up over one hundred and sixty test flights by spring of 1955.

The pilot is accommodated in a semi-reclining posture in the conical-shaped jettisonable cockpit, the transparent portion of which slides forward on a splined shaft supported, together with the instrument panels and pilot's control platform, etc., by a tubular framework. Behind this section is mounted the radio, oxygen bottles and the parachute for the cabin.

Within the fuselage proper the engine consists of six concentric stainless steel skins, each one being of a slightly larger diameter than its predecessor. These skins are joined at their ends by perforated steel "burner crowns," the completed assembly forming a stepped conical shape, a Turbomeca Artouste Turbine being mounted at the small end which is positioned immediately behind the cockpit section. The outer skin is supported on circular frames and an air space is provided between these and the burners for cooling purposes.

The tandem undercarriage retracts upwards into a compartment built between the cockpit section and the outer skin and is covered with a louvred door when stowed. Stabilising wheels are fitted at the wing tips and these retract backwards into streamlined fairings.

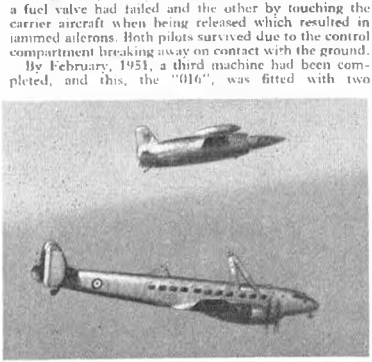
Dimensions.—Span 38 ft. 1¼ in. (11.6 m.); length 41 ft. (12.5 m.); height 9 ft. 3 in. (2.75 m.); wing area 237 sq. ft. (22.2 m.), aspect ratio 5.5; leading edge sweep 14.0; dihedral 3.0; incidence 0.0; chord on centreline 8 ft. 8 in. (2.64 m.), at wingtip 3 ft. 11 in. (1.19 m.); thickness ratio, root 10%, tip 8%; ailerons, span 5 ft. 10in. (1.87 m.), chord 25% tailplane span 17 ft. 1 in. (5.2 m.); incidence 0.0.

Weights and loadings.—Empty weight 8,380 lb. (3,800 kg.); gross weight 13,260 lb. (6,000 kg.); wing loading, take-off, 56 lb./sq. ft. (273.4 kg./m.²), 35.4 lb. sq. ft. (171.9 kg./m.²)

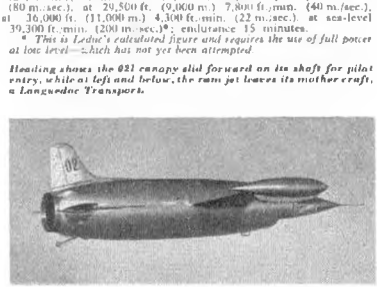
Power.—Sea level thrust 14,300 lb. (6,500 kg.) at 620 m.p.h. (1,000 km p.h.).

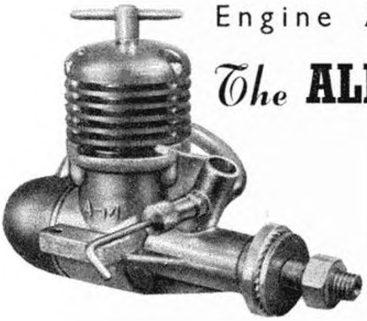
Performance.—Max. speed Mach 0.87; ceiling 65,500 ft. (20,000 m.); climb: at 16,400 ft. (5,000 m.) 15,700 ft./min. (80 m./sec.), at 29,500 ft. (9,000 m.) 7,800 ft./min. (40 m./sec.), at 36,000 ft. (11,000 m.) 4,300 ft./min. (22 m./sec.), at sea-level 39,300 ft./min. (200 m./sec.)*; endurance 15 minutes.

* *This is Leduc's calculated figure and requires the use of full power at low level—which has not yet been attempted.*



Heading shows the 021 canopy slid forward on its shaft for pilot entry, while at left and below, the ram jet leaves its mother craft, a Languedoc Transport.





Engine Analysis Number 24

The ALLEN MERCURY "10"

Reviewed by R. H. WARRING

ALTHOUGH THE DESIGN and manufacturing standards of present-day engines are extremely high, few engines escape criticism on some point or other. Every so often a particular engine comes along which, as far as can be assessed on the several hours test-running given it, just cannot be faulted on any score. It is in this latter class we unhesitatingly place the new Allen Mercury "10". Not only was it a delight to handle, and perfectly consistent in performance, but its power output approximates closely to the best of the 1·5s. In fact, at the upper end of the speed range it is beating most 1·5s and not a few engines of more than twice the capacity.

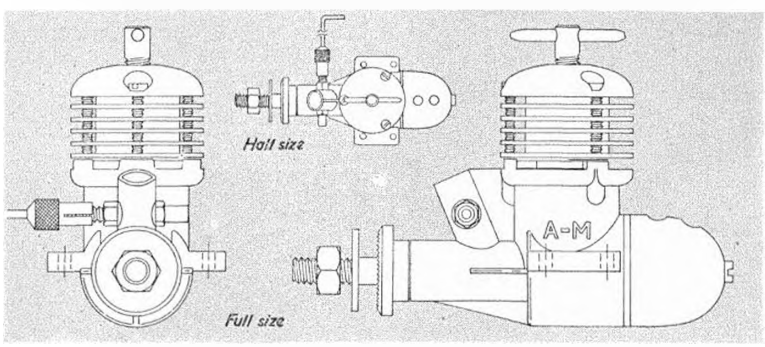
Physically the "10" is a bit big for a 1 c.c. engine, but its displacement checks out at exactly that figure. It is built rugged and tough and therein probably lies the secret of its outstanding performance. In other words it is a rigid engine which is less likely than most to suffer from cylinder distortion and resulting internal losses.

This is apparent on taking the engine to pieces. The cylinder is a really massive affair, ·190 in. thick at the bottom end and ·134 in. thick at the top, but still weighing only a shade over half an ounce. The crankshaft is ¼ in. nominal diameter, with a crank pin diameter of ⅜ in.—sizes in excess of those normally employed on an engine of 50 per cent. greater capacity.

The resulting stiffness would certainly appear to pay dividends. Good workmanship also plays its part. The piston is a very nice fit in the slightly tapered bore (relieved slightly at the lower end) without the slightest signs of tight spots. Both the main bearing and the shaft are honed and individually matched for fit, the crankcase alloy (LAC 112A) being of a recommended type for plain bearings with steel shafts. Both the piston and cylinder are of Meehanite, which in itself is more free from heat distortion and internal stresses than plain steels. Essentially, in fact, the A-M "10" has all the hallmarks of a sound design coupled with good material specification and each is, to a large extent, a handmade engine.

In order to accommodate the rather higher than average labour time and still keep the cost down, machining on the crankcase itself is reduced to a minimum. It is not, for instance, machined either where the cylinder fits, or faced off to take the back cover. In both cases gas-tight seals are obtained with the use of gaskets.

The contra-piston is of generous size, lapped individually to each cylinder and is just right as

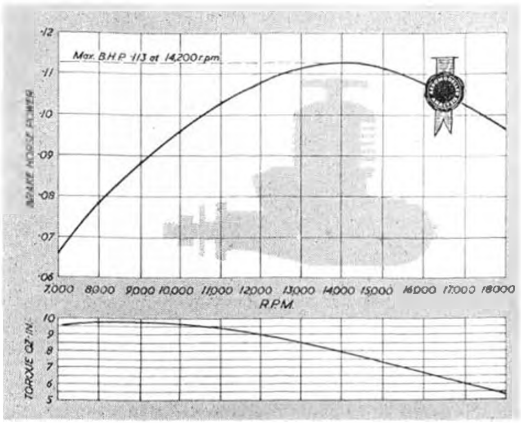


SPECIFICATION

Bore: .426 in.
Stroke: .430 in.
Bore/Stroke ratio: 99.
Displacement: 1.00 c.c. (.0614 cu. in.).
Bare weight: 3 ounces (including tank).
Max. B.H.P.: 1.13 at 14,200 r.p.m.
Max. torque: 9.8 ounce/inches at 9,000 r.p.m.
Power/Weight ratio: .038 B.H.P. per ounce.
Power rating: 1.13 B.H.P. per c.c.

Material Specification

Cylinder: Meehanite.
Piston: Meehanite.
Contra-piston: Meehanite.
Connecting rod: Turned from forged dural bar.
Crankcase: Pressure die casting in L.AC. 112A light alloy.
Main bearing: Plain.
Crankshaft: S.14 case-hardened steel.
Cylinder jacket: Dural, anodised green.
Tank: Dural, anodised green.
Spraybar assembly: Dural.
Propeller nut: 1 B.A.
Manufacturers: Allen Engineering, Edmonton, London, N.9.
Retail price: 58s. 6d. inc. P.T.



regards stiffness for adjustment and the retention of any compression setting. The cylinder jacket is of dural, itself quite robust in section and weighing almost as much as the cylinder. It is a good smooth fit over the cylinder, the cylinder and jacket assembly being fixed to the crankcase with three 7 B.A. screws extending down from the head. There is little or no possibility of distortion on tightening these right up although really ham-handed action could possibly strip the threads in the crankcase.

Handling characteristics are generally excellent. Starting was extremely good with any size of propeller. The best technique appeared to be to slacken the compression right off, finger choke and flick. This could be carried on without the usual vicious "snap" right up to the very smallest sizes of propellers. Quite a bit of running, for example, was done on a 6 x 4 Frog nylon propeller and a similar prop. trimmed to about 5 inches diameter —the latter corresponding to a running speed of over 18,000 r.p.m. It was as easy to start with this prop. as any of the larger sizes and running was still as steady and consistent.

Lower down the r.p.m. scale at about 7,500 r.p.m. there was an apparent deterioration in performance, presumably because here the engine had reached the limits of its induction system. In other words, the gas flow was a little hesitant in finding its way correctly to the top of the cylinder. Also below about 9,000 r.p.m. there was a definite falling off in performance on warming up, presumably because the engine was heating up more rapidly than at higher speeds due to less efficient cooling from the slipstream. Power loss on warming up was more or less negligible at normal and high speeds, although the cylinder does get very hot—as the fingers appreciate if they slip off the tommy bar when making a compression adjustment.

To start without turning back the compression, priming through the exhaust is the best technique; in fact, the only sure technique of not getting the mixture too rich. We would, however, personally recommend always starting with the compression slackened off, with a generous exhaust prime or a one-turn finger choke (after the fuel line is quite full) as this is a very comfortable method with a fast revving propeller. Both controls are non-critical, but not so insensitive that it is difficult to adjust to the optimum settings. Suction lift is not particularly high, but one is apt to forget in handling it that the "10" is only a 1 c.c. engine. The best tank position is on a level with the bottom of the spray bar.

Some preliminary tests run at the "AERO-MODELLER" offices intimated that the fuel consumption appeared to be extremely low. Our own figures did not confirm this, typical averages being:

operating r.p.m.	*time to consume 1 c.c. of fuel (seconds)*
10,000 ...	11·4
12,000 ...	8·0
15,000 ...	6·8

These figures are, in fact, appreciably higher than

PROPELLER— R.P.M. FIGURES	Propeller dia. x pitch	r.p.m.
	8 x 5 (Stant)	8,800
	8 x 4 (Stant)	10,000
	7 x 6 (Stant)	10,300
	7 x 4 (Stant)	11,800
	6 x 6 (Stant)	11,700
Fuel used:	6 x 4 (Stant)	13,900
Mercury R.D.	6 x 3 (Trucut)	14,600
	6 x 4 (Frog nylon)	17,000

ENGINE ANALYSIS—Continued

some 1·5 c.c. motors, but it should be borne in mind that at the higher speeds the power output is probably equivalent.

Porting of the engine is quite conventional.

Induction timing appears orthodox. The exhausts open early, but are fairly shallow, although of generous width. The transfer period is relatively short yet quite obviously well matched to high speed running requirements. The engine on test peaked at 14,000 r.p.m., but the whole power curve was noticeably flat, thus giving a wide range of useful operating speeds with a high power output.

Our personal choice would be to use as high a diameter as possible for a free flight propeller—a 9 x 2 or 2½ or an 8 x 2½ or 3 possibly being an ideal range of sizes, although not yet made commercially. A 7 x 4 would appear about the best of the commercial (wooden prop.) sizes, giving around 11,750 r.p.m. static, so this could usefully be reworked by thinning and smoothing the blades to put the static r.p.m. figure up to about 12,500. For control line work a 6 x 5 would appear a good proposition. A rather interesting point is that power output is maintained at a good level well past the peak speed so that in a ducted fan installation it would be possible to run the fan at speeds up to 18,000 r.p.m. if required and still be getting more power per c.c. than the majority of engines operating at their peak r.p.m.

Prior to test running, the particular engine had some 80 minutes running-in time on various fuels. It did not appear to be particularly worried about what type of fuel was used, but for all the measured runs Mercury R-D was used as giving a slightly superior performance to No. 8 (only a matter of about two to three hundred r.p.m.). No evidence of a high speed "miss" developed up to the highest speeds tested and we are pretty confident that the engine could go a lot faster and continue to run just as happily—well into the twenty thousands on a flywheel, for example. In fact it is almost unbelievable that it is only a 1 c.c. engine.

Summarising in one sentence—an engine we can thoroughly recommend to anyone. It is a docile enough engine to suit a beginner. It is powerful enough to outclass many larger engines on the contest field. And it is so rugged and so well built that it should last indefinitely. We ourselves were most thoroughly impressed by it in every way. If ever Mercury think of advertising it as giving "1·5 c.c. power for only 1 c.c." we would endorse that statement, even if it is perhaps up to 1·5 c.c. weight. But for once we are prepared to forget any mention of "excess" weight, when this appears to have been put to very good use.

One thing we would suggest, however. If you want to continue to get top performance out of your A-M "10", then don't take it apart. Once bedded down with the cylinder clamped in a certain position you could find that you have lost a lot of revs if you take it down and reassemble with the cylinder in a different position, as could well happen.

What's the Answer

Tired Motor?

We've had a violent argument going on in our club for weeks about rubber motors. Most everyone agrees that when the motor is wound right up the sooner the model is launched the better, otherwise the motor may break, or if nothing else gets tired and loses a lot of power. Our theorist, however, maintains that nothing will happen—the rubber has stood the number of turns put on, and will continue to hold those turns without breaking. Also it cannot lose energy as it is not doing any work. What's the answer?

What would YOU do in a case like this! Think a moment, then twist this page for the solution to the problem printed below.

ANSWER. A motor does get tired if held for any time in a fully wound condition—generally tending to give a lower torque output but a slightly longer motor run. So getting the model away as soon as you can is good practice. But this worry about loss of power is a bit overdone. It never affected the return [illegible] jobs to any marked extent, and there one motor had to wait in a fully wound condition whilst the second one was wound up.

Frankly, too, we think it very unlikely that a fully wound motor would ever break on its own accord. Despite claims to having seen this happen, the answer in such cases is always that some structural part has collapsed under the strain—a shaft straightened out or a rear anchorage pulled loose. In this respect we deplore the use of sheet celluloid as an "anchor" material as this will tend to tear and fail by "creep" under load.

Structural Collapse!!

KNOW YOUR ENGINE—Continued.

cutting off the top of an angle to face forwards on shaft-induction engines—*Fig.* 11—is probably more a concession to appearance than performance, but in this case there is no *direct* airflow into the bore of the tube and the adverse ram effects just mentioned are not present. There appears to be little possible gain in experimenting with rake angles, as such.

The high speed performance of some engines can, however, be improved by increasing the bore of the intake tube and giving the entry a bellmouth shape. It may well be that production demands a rather generous safety margin on wall thickness in the first place and perhaps adherence to an original crankcase design for which the moulds have not been fully utilised.

The manufacturer of standard commercial engines has nearly always, of necessity, to produce a compromise design. To satisfy a majority of his customers, starting characteristics must be good (which means good low speed suction and therefore a fairly small bore intake); the needle valve control needs to be relatively non-sensitive, but still positive enough for accurate setting at around peak r.p.m.

As such the spray bar type with two jet holes has become almost a standard and as an example of how relatively non-critical such a carburettor control is, the same spray bar unit will often perform satisfactorily in a range of engine sizes from, say .5 c.c. up to 2.5 c.c. even if in the former case it appears to be almost blocking the intake tube.

Above, from left to right, Glen Howard with beautifully built team racer powered by Veco 29. T/Sgt. Curtis Hunter with Hogan ¼ A Wasp powered free flight entry. The "Vers Demons" from Dreux in France, with Jo Petit in centre with his T.28 that won the C/L Scale event. Right, M/Sgt. Charlie Muhr from Hahn with Kiwi B Free Flight model that had a Torp 15 up front. Far right, Captain J. Solko from Landsberg Air Base with the latest Veco "Thun-derbird" control-line kit-designed by the famous Bob Palmer. Capt. Solko's superbly finished model won first place in the C/L concours event. Immediate right, outstanding in free flight events was 2nd/Lieut. William Park, originally a Scot and now in the U.S. Air Force, who is shown launching his ¼A power job flown with a German RAF 1.62 c.c. diesel, and appropriately known as the "Waffle".

USAFE MEET

AMERICAN MODELLERS stationed throughout Europe gathered together at Wiesbaden Air Base Germany, on the first three days in June for the annual USAFE (United States Air Forces Europe) Model Championships. The three-day programme included some twenty-two contests ranging from chuck glider through to radio control. The contingent from this country flew from Bovingdon Airport and included four British judges for the meeting: Henry Nicholls, Col. "Bob" Yates, Eddie Cosh and the Editor, who were performing this pleasant task for the sixth year running.

Top scoring men were due to go to the States to compete in the American Air Force World Wide Meet, so, as was expected, competition was keen with excellent flying both in the free flight and control line events. Outstanding modeller was S/Sgt. Glen C. Howard of Rhein Maine who took no less than seven first places, two second places and a single third place. Considering he has only been modelling for two years or more, and that all of his models are "own design", we can safely say that he is one of the most outstanding modellers we have ever met. It was significant that this year for the first time the event was A.M.A. sanctioned with an A.M.A. Contest Director in the shape of C.W.O. "Hank" Brewer. We understand that official A.M.A. USAFE model records will be established as a result of this most successful three day meeting.

Sgt. Titcombe lifts the "fuel" of Fox 35 powered "Bearcat"

Readers Letters . . .

Another E.D. Racer tip

DEAR SIR,

I found your article on the improvement of the E.D. 2·46 of great interest as I have tried most of the points you mention and found them helpful. In addition I have streamlined the crankshaft balance weight and removed metal around the crankpin to decrease the weight and have brought the crankshaft nearer static balance. This actually produces more vibration than normal.

The greatest improvement I obtained was by packing the cylinder up about ·060 in. with a brass washer between the cylinder and crankcase. This makes the exhaust and inlet ports remain open longer and improves the charging at high speed. I have not yet determined the optimum amount of packing, but this amount was helpful without impairing the starting which seems to be improved by the modifications.

Woking, Surrey. G. P. GILBERT.

Engine requests

DEAR SIR,

Writing as a purely practical power modeller, and not one given to taking an engine to the flying field mounted on a chunk of wood instead of a model, I would like to register some (I hope) constructive criticisms of the design of modern engines.

Firstly, regarding engines with front rotary induction. The main point here that I don't like is this angling-back of the needle valve. Manufacturers have been driven to this scheme mainly, I should think, by engine-testing journalists who, while I like their articles, tend to criticise any engine with a needle nearer than an inch away from the prop. arc. I would like to point out that this would be warranted if engines were made for bench running with a wide range of settings for testing purposes, but as they are not I think most practical men can leave a needle setting unchanged, once found, in any certain model. It is very frustrating to reject side mounting in designing a new model, as "the needle points downward and I've no u/c so it will get broken". Angling-back isn't quite so bad if the needle is on the *port* side of the engine, but I suggest that the best idea is that of the Oliver engines where the venturi is a separate screw-in part, and by fitting small washers of varying thickness one can have the needle on either side, straight or angled-back as desired. I'd willingly pay five bob extra for this idea on any new engine I bought! But if this is not practicable on some designs, please leave the spray-bar *straight*.

Point number two is concerned with mounting. Why can't *all* front-rotary engines have both beam *and* radial mounting in the style of the Webra 1.5, J.B. Atom, etc.? Some engines pretend to be beam and radial by virtue of bolts through the mounting lugs. As any practical modeller knows, this is not enough. Three points at least are needed—preferably four. Separate back door screw-in radial mounts are no good either—they unscrew with vibration and it would have been far better to have cast another three or four lugs on the crankcase in the first place.

Two further minor points.

When an engine has rear-disc induction, do the designers always make it as short as possible in the venturi to reduce the overhang? They don't. Why not?

Prop. drive-discs often have a collar for better crankshaft grip which results in the annoying process of reaming-out every new prop. you buy. The answer—make the disc thicker and so do away with the extra collar on the front.

I realise that any, or even all, of these points could be called trivial. However, given two engines of equal performance, I'd plump for the most "practical" one every time!

Wanstead M.A.C. D. PLATT.

That Hunter drawing

DEAR SIR,

With regard to your editorial request for comments upon the plan accompanying the article on the Hunter, may I be one of the first to express my gratitude for, and appreciation of, Mr. Cox's work.

As an ardent Solid fan, "never have I come across such a wealth of information set out so well on one piece of paper"—away with those photos, trade magazines and gen. books—all is there.

It just remains for the Solid's fraternity to get on with it and show what can be done.

The Air Ministry and C.O. No. 41 Squadron are to be congratulated upon their co-operation in this work and let us hope that more will follow as surely no vital or secret information has been divulged and we are satisfied.

Lincoln. PETER T. DANIELL.

This was the first of dozens of letters received on the subject of the Hunter—and we hope to present further detailed drawings of this type in the future.—ED.

Club News

INSURANCE IS FOREVER the most important associated item with our hobby and can never be over-emphasised. Some clubs take the subject for granted, others are keenly interested in seeing that all members are clued up on insurance. For example, the Leamington lads circulate a natty little leaflet which brings the point right home to all who see it, and because it is not written in the usual stilted terms of insurance brokerage, is appreciated by the members.

In the leaflet, they quote the possibilities involved in an accident, and thus qualify the Club decision that all members be 3rd Party Insured. Seniors pay their own way, and the premium for Juniors is met from club funds for the first year only, the insurance being arranged through S.M.A.E. membership.

As an example of what can happen when the unexpected occurs—particularly now that handle throwing appears to be prevalent among team race and combat people when in trouble—was the recent incident at the Dartford Control Line Rally First, during the Class B team race finals, the Enfield model landed on fire and was subsequently charred out of the race, then, with the race over, and Ken Muscutt's "Jack O'Diamonds" winner, with Sid McGoun second, the latter's model suddenly went into a wingover.

His "down" line had broken, and with thought for the Carter special engine, and some danger to Muscutt's motor of the same breed, Sid let go the handle, hoping for the chance of a soft landing. Already circulating at over 100 m.p.h., the racer speeded up like a greyhound from a trap and tore across the field in a steady climb. The handle caught on something, and the other line pulled off as the racer zoomed upwards into an incredible vertical climb. At 600 ft. it about turned and came down at a speed which more than one authentic witness has quoted as over 200 m.p.h., the Carter engine screeching out a note that made all on the field hold their breath in anticipation of the expected crash. Then it levelled off and made for Dartford Town, after a brief display of aerobatics that would not have disgraced Farnborough, and thankfully found a vacant plot to plummet in.

One can only shudder at the thought of what might have happened at the end of this full minute of "unguided missile" flight, and I trust the moral has been well and truly learned by all concerned.

London

At the c/line meeting at **DARTFORD**, the class A race was a case of vindication for Dick Edmonds and his F.A.I. class *Time Traveller* as he won the event, and for a picture of the unique model that followed in 2nd berth, see "Model News" this month.

ENFIELD are bucked again, following their second place in the Class B racing at the Nationals, and they have the thought that they might have collected first position had the con-rod not given up in Don Walker's E.T.A. 29, flying at 106 m.p.h. Engine fixed for the Dartford meeting where Don was third, and explanation for the fire in Ray Tuthill's model, is that the booster plug shorted out. Sad news is that the vandals at the Nats ripped a Webra Mach 1 from Jim Moseley's free-flighter.

Unattached modellers would be welcome at the **DAGENHAM M.A.C.** meetings held at Warren School, Whalebone Lane North, at 8 p.m. each Friday, and if they know how to make a power job tow a glider without causing a prang to bend a crankshaft, they would be especially welcomed. Main interest of late has been in rubber and P.A.Mload.

HAYES M.A.C. were of course, well to the fore in Tailless at the Nats with the first two placings, and the club Class B team race group has been rather active. Mechanic Chris Hearn, became a trifle over-enthusiastic at Dartford and tried to knock the opposition out of the sky with his head! This rather put an end to things as all attended to the casualty.

Now hear Yet Last year, the C. H. Roberts Cup for Rubber driven flying boats was not located by all who wanted to attend. This time, the full details are: The date, August 19th. Time, 10.30 until 12.30 a.m., the location, the Pond on Blackheath, South London. This is about 200 yds. south of the Shack bar near Greenwich Park. Pre-entry is required, and for the rule (include requirement for Hull to be main flotation support and minimum 150 sq. in. wing area) send to **NORTH KENT NOMADS**, C. F. Cooper, 79 Lion Road, Bexleyheath, Kent.

South Eastern

Greatest news from **SOUTHERN CROSS A.C.**, is of course, the victory in International Tailless, as reported in this issue. The lads went up to the Nats in spite of the cancellation of the coach, and by devious means, a large collection of models appeared at Hemswell. An auto-rudder jam put Fred Smith out of the running in Tailless; but all was not gloom and despair as their News sheet relates. We quote from the funny story section: "At 11.45 p.m., Saturday, a strange light was seen circling above the encampment. The bang as it hit a nearby tent confirmed suspicions that it was a glider, and the strange thing was, that the gent who came to collect was wearing a neat suit and a straw hat!"

East Anglian

A flush of new clubs is coming up in the Essex area **BRENTWOOD M.A.C.** was formed in February with Ron Landymore at the helm, and interest ranges from indoor to radio control flying. Regular meetings take place in the Congregational Church Hall, South Street on the 2nd and 4th Thursdays of each month at 8 p.m. **WITHAM and District M.A.C.**, near Colchester, are active in indoor and out-door work. Recent highlight was the vertical disappearance of a *KK Junior* 60 and a 14-minute flight that went four miles.

The **CAMBRIDGE CLUB** have sent details of their Combat Rules to be run at their C/Line Rally on August 12, 1956. They are as follows:—

1. *Maximum motor capacity to be 3.5 c.c.*
2. *Line length to be 52 feet 6 ins.*
3. *Five minutes allowed per "joust" starting from when the whistle is blown after the models are airborne.*
4. *Models must rise from the ground.*
5. *One assistant only allowed for restarting.*
6. *Streamers to be 15 ft. long attached by 3 ft. of thread.*
7. *Five extra points awarded for starting within one minute.*
8. *One point to be awarded for every foot or portion thereof cut from opponent's streamer (at end of flight).*
9. *One point to be deducted for every ten seconds spent on the ground when refuelling, prop changing, etc.*
10. *All models to undergo 15lb pull test.*
11. *No flying below 6 ft. for more than two consecutive laps in any one "joust" period.*

Typical Sunday session by the Salisbury Club showing a variety of models from team racers to big free flight power. Can your Club put up a show like this each Sunday?

12. *Streamers to be affixed to centre of tail.*
13. *Two fliers per "joust"—names drawn from hat.*
14. *Entry fee 2/6 non returnable. Contest Marshall's word is final.*

Team Racing "A" and "B" are also being run to S.M.A.E. rules, and further details of the Rally can be obtained from Mr. Clive King, Red Roofs Garage, Ely Road, Waterbeach, Cambridge.

Midland

Although the **BURTON-ON-TRENT M.A.C.** did not return from the Nats. with any hardware, they did at least have the claim that Davina Bailey was the youngest modelling enthusiast there (aged 16 months)!

WEST BROMWICH M.A.C. are powerful Combat fliers, and I feel sorry for anyone who gets drawn against Mac Grimmett in a tourney. He was an honourable 2nd at the Wycombe Rally this year. Ist at last year's Heanor, All-Britain and South Midland do's, so watch out. Sad news is that a horror, who obviously knew what he was doing, took an Elfin 1.8 Blue Combat job, complete with lines, three 8 x 6 in. props and a can of oil from the West Bromwich Park at Dartford. Model has silk covered wings and information on this despicable theft would be appreciated.

CHESTERFIELD SKYLINERS took a coach to the Nats. and learned a lot about Class A team racing, in which they were entered, including how to use stronger lines! They hope for another Nats. up North, and I fancy they have a large number of modellers to support their view. As the club flying field has now become a building site on one boundary, there is a search for a new and more satisfactory flying field.

Chesterton was the scene for a Whitsun Monday all-day meeting by **LEAMINGTON M.C.** and an abundance of thermals gave the free-flighters plenty of exercise. Club has to use a roped off area to keep the numerous spectators away from their parked models, and I hope that they'll be able to recruit some new members among those who flock on Mersey Street each Tuesday evening (there are 48 of them thus far) in the clubroom, and Juniors have special instruction on the provided building boards. To encourage Juniors to enter the *Golden Wing* contest and the new Chuck Glider event, first three places to have membership of the Golden Wings Club as prizes. Incidentally, the lads have R.A.F. Melksham-Mountford as their "local" flying field.

North Western

A letter from the Commanding Officer of R.A.F., Tern Hill, has been given due prominence in the Area News Sheet and I hope all Riley have digested its contents and realise how lucky they are to have come off so lightly. If you hav'nt seen it, pester your secretary to show you the copy he *should* have shown to all fliers in the club.

An exhibition at **COLNE** by the local Club was centred around an *APS Mosquito* with two ED Racer diesels and we learn that Bill Riley took 14 months to make the job, including application of 18 coats of dope! Interior detail is complete down to the Navigator's pencil and dividers, and the Flying Officer Kite's Moustache. Another Classic is the new **LEIGH M.A.C.** where they are on the hunt the flying field game and just getting going again after difficulties. Favourite model is still the *Ambassador*, and a number of team racers and combat designs are active.

Tom Smith's wm in the Sir John Shelley has bucked the **ENGLISH ELECTRIC M.A.C.**, who are pleased to help him with an efficient recovery service. Members are preparing for an exhibition to be held during the firm's sports day. A brief control line display is scheduled and as this date is only a week after the Stockport Express meeting at Woodford, they hope they'll have some models left!

If any single person deserved a place in the organisation at the World Championships, Cranfield, it should be the man from **WIGAN** (and his direct assistants) who coped with the unco-operative spectators (perhaps I should say "passive"—for they seemed to want to do little to help) at the Thurston Glider Cup in the Nats. A club contingent went along to the Clwyd Slope meeting, and a couple of R/C models are said to be on their way: but sad news—they've lost their flying field and are once more on the hunt.

Wales

The forthcoming Model Engineer Exhibition, September 9-15th in Sophia Gardens Pavilion, Cardiff, will call for 300 models and to keep the Welsh flag flying, clubs should send for details to K. Horlock, 33 Conway Road, Canton, Cardiff.

The Welsh Rally will be held on Fairwood Common, Swansea, on July 22nd, starting at 10.30 a.m. for team racing in A and B classes, stunt and all free-flight.

CARDIFF M.A.C. report that due to the fact that no less than five displays fill their appointment book, they have had (reluctantly ? ?) to raise the charge to £2 2s. 0d from one Guinea. The crowds at these displays really enjoy the balloon bursting act and a new trick of picking up windsocks.

North Eastern

More models than modellers—that's the kind of report I like to hear and it comes from **SUNDERLAND AND D.M.A.C.**, who are increasingly active and meet on the first Friday of each month at R.A.F. Usworth. Mr. Summers has an all-sheet sports model for .5 c.c. that claims a vertical climb and hanging glide. This new vogue for all-sheet will be putting the Tissue people out of business to judge by the numbers of *Vampires* I see on my travels.

Scotland

Following their fine second place in the Davies Class A team race at the Nationals, **PRESTWICK M.A.C.** are well on the step, and can list a few other successes North of the Border, too. At the Kelvin Hall Indoor Champs., they gained second and third out of a list of fifty, and in free-flight outdoors, B. Harris has collected the Montgomery Cup and the club now has the Scottish Championship Caley Shield for the third year running. **ARBROATH M.A.C.** had perfect weather for their first event of the season, at H.M.S. Condor on May 27th, it was a 2 hr. glider scramble won by R. Stewart with a total of 1,192 seconds in no less than 20 flights (phew!) Club has taken A/1 seriously and is making a bid to get others interested.

Work on the Club hut at **MONTROSE M.A.C.** has kept the members busy with ceiling fitting, wiring, etc., but they are back in production again and "tis said, that the smell of fresh paint mingles well with that of old leather as Sporrans open wide to pay the ex's. They have a garden too—beans, potatoes, flowers and that sort of thing—I bet they are lone in that respect. On June 10th the club gals was an *APS Corsair* victory for Roy Yule of **BUCKSBURN**, who made double mat's followed by another Corsair which soared away after remaining m aight for nine minutes (no d/t!). An A.P.S. *Khamsen* made a seven-minute flight and to qualify for the S.M.A.E. "A" Certificate, W. Petrie did exactly the same time on one flight with his o/d *Lynx*. R. Yule also qualified for the "A" Cert. with an A.P.S. *Eliminator*.

The **INVERSNICKY** contingent had a slope soaring session on the dunes after the contest, and the guests at this closed-to-competitors rally, went home to Aberdeen Arbroath and Bucksburn happy and sun burned.

Activity in the far far North at **WICK**, has also steadily increased and with associates in the Kirkwall and Thurso areas, the club has had some fine team racing over 75 laps with class A models. A. S. Matheson won the last one with his o/d F.D. 2.46 model. Recruiting is going ahead well at present for the Golden Wings Comp. (perhaps they've caught on that the organisers—that's us—pay fares for the finalists!).

Pen Pals

For members of the Capitol Aeroneers, 3405 Larry Lane, Austin, Texas, T. L. Tyree, 1449 Sunrise Avenue, Modesto, California and L. C. Williamson, U.S. Naval Home, 24th and Gray's Ferry Avenue, Philadelphia 46, Penna. All want British correspondents.

THE CLUBMAN.

Know your Engine

No! It was not a Dooling 61, but the first production model of the Swiss Amra racing engine, available in Switzerland at about £15.

For your Diary

Events inviting your entry

July 15th
Enfield C/L Rally—Enfield playing fields—all classes.
Croydon Gala—Chobham Common—*f/f*.

July 29th
Epsom Slope Soaring Rally—Box Hill, Surrey.

August 5th
I.R.C.M.S. R/C—R.A.F. Wellesbourne Mr. Stratford-on-Avon.

August 12th
Cambridge C/L Rally—Pye Sports Field—T/R, Combat.

August 19th
The C. H. Robert's Cup—Rubber Driven Flying Boats—Pond on Blackheath, London, S.E.3.

August 26th
S. Midland Area Rally—Cranfield *f/f*, T/R, R/C, Combat.

August 25th 26th
PAA Scottish Festival—R.N.A.S. Abbotsinch—*f/f*, PAA, T/R

August 26th
Devon Rally—Woodbury Common, Exeter—*f/f*, C/L.

September 2nd
Northern Area Rally—venue to be announced

September 16th
All-Britain Rally—Radlett.

S.M.A.E. Contests

THE NORTHERN GALA

Date and Venue *still* not announced.

C.M.A. Cup—U/R Glider.
Frog Senior Cup—U/R Power.
Flight Cup—U/R Rubber.
Ripmax Trophy—Radio Control.
Pan American Trophy—American Class PAA-Load (.049-1 c.c.).
Team Racing—"A" and "B".
Team Racing—"A" and "B".
Speed—All Contest Classes.
Combat—Possible new event.

International Events

August 4th/6th
WORLD POWER CHAMPIONSHIP—Cranfield Beds.

August 17th/19th
WAKEFIELD CUP—Hogenas, Sweden.

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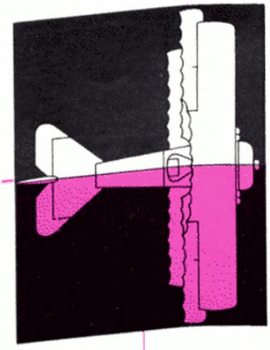

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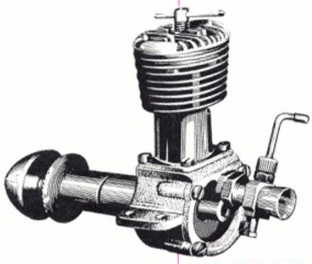

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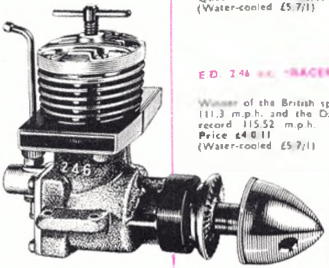

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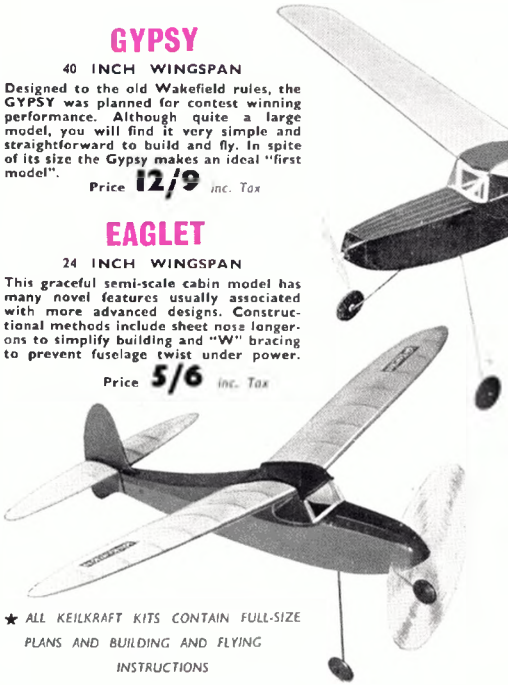

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