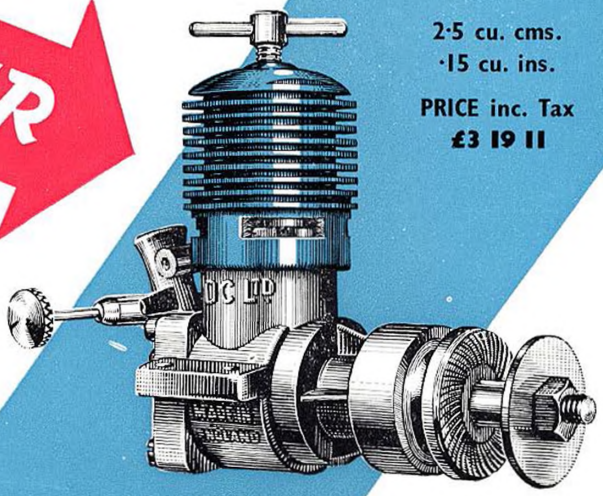
AUGUST 1957

AERO MODELLER

Superb D.H. Dragon Rapide details
European C/L Champs - Nats report

1/6

RAPIER



2·5 cu. cms.
·15 cu. ins.

PRICE inc. Tax
£3 19 11

For the Expert . . .

the very latest in high performance design, with twin ball races for friction free running and domed piston with 360 degree porting for maximum gas flow efficiency. Down-draught carburettor and rear rotary valve induction also contribute to its breathtaking performance. Refinements such as the positive lock needle valve and provision for a two-speed fitting or choke assembly make it ideal for radio control purposes as well as for 2·5 c.c. International class contest flying.

Engineered to last a Modelling Lifetime!

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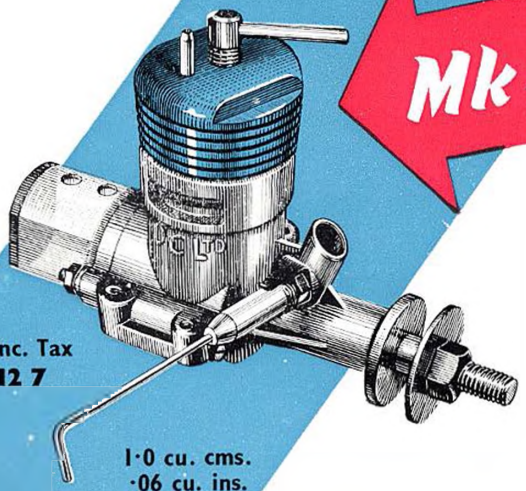

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1·0 cu. cms.
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a new and improved version of this famous engine with all the original virtues of easy starting, flexibility and long life maintained; plus sparkling increased performance. Angled, positive action needle valve keeps your fingers out of the prop and a limit stop ensures that the compression adjustment can be found without difficulty. Like the "Rapier" it is now available at your local model shop.

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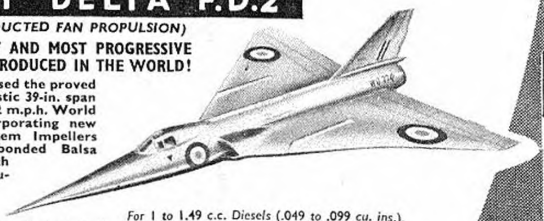

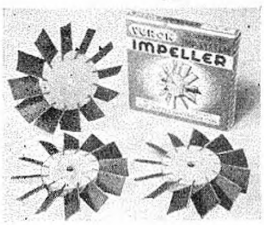

For 1 to 1.49 c.c. Diesels (.049 to .099 cu. ins.). Kit includes: 1st Grade die-cut formers and ribs; Turned cone and nose fairings; Plastic cockpit cover; Authentic transfers; Hand graded strip; Selected sheet balsa, etc. **KIT PRICE 49/6** *(Tax Paid)*

(Illustrated left)

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Span 52 in., powered 1 to 1.49 c.c. motors for Sport Free Flight, 1 c.c. "PAA-load" or for Simple Single-Channel Radio Control for rudder operation only.

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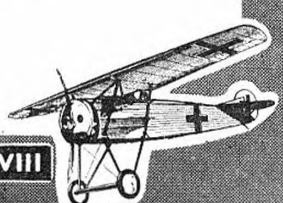

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THE BALSA STORY

Part 4 of a series of twelve

This is one of a series of twelve articles written by John Paterson, Managing Director of Solarbo, Ltd. giving facts about balsa and its applications.

TYPES OF GLUES AND THEIR PROPERTIES

I THINK a short history of glues might be interesting and help you to understand this sandwich construction.

It was only recently that anything other than animal or vegetable glue was known. You know the sort of thing—a double pot with a revolting smelling concoction, made from fish or certain animal residues, or natural vegetable gum.

The method of application is to put it on hot, when it is liquid, and as it cools it gells and sticks the two pieces together. These glues have two main drawbacks—first, with any degree of heat they soften and second, they are not waterproof.

The next stage was CASEIN glue made from dried milk curds ground to a fine powder and mixed with other chemicals. This powder being mixed with water forms a sticky paste which when dry gives a much harder glue line very much more resistant to water. Casein glue normally takes some hours to harden but can be accelerated by heat to a limited extent. That is, you can shorten the time down to say two hours.

We used Casein glue in the manufacture of all lifebuoys and floats for the Admiralty during the war. The floats afterwards were painted and there was never any failure of the glue line due to weather conditions, including the 77,000 lifebuoys.

Modern glues are really another branch of plastics and are known as synthetic resins. The action of this group of glues is very different. You have two chemicals—one, the resin and two, the hardener—which when put together have a chemical reaction forming a substance of complex chemical form which adheres to both faces. These glues have a very wide range of properties depending on the resins used.

The first of these synthetic resins were the ureas. They were followed by the Phenols, and now you have a vast range of which I would mention the Polyesters, Resorcinals and the Epoxides.

I think the most interesting feature of some of the new resin glues is that they will stick together non-porous smooth surfaces such as metal. In the older glues the function of sticking together involved both suction and/or minute keying to rough surfaces.

All these synthetic resins are virtually waterproof, the ureas being least so, but the Phenols and the other glues I have mentioned all will stand a boiling water test for at least 6 hours. Phenols used in making exterior quality plywood have to stand a 72 hours test.

Glues are said to be gap filling or otherwise. The maximum gap that a resin glue will fill is in the order of ·050 of an inch. The maximum gap that some people seem to think that other glues will fill is, perhaps, $\frac{1}{8}$ of an inch, but that will never give a good glue joint. The closer the contact between any pieces to be glued the better will the glue joint be. The skilled joiner knows this and takes elaborate care to "shoot" the edges of the joint he is making.

In general, synthetic resin glues need particularly close contact between the pieces to be glued together and this requires pressure often in the order of 150 lb. to the square inch. The harder the wood to be glued the higher the pressure required and with metal to wood or metal to metal joints, high pressures are always required.

Balsa being a soft wood and porous does not need high pressure to make a really strong joint. You modellers know how easy it is to use balsa cement, which incidentally is a cellulose product. This needs no heat or added chemicals to set, very little pressure to close a joint and sets hard in a matter of minutes. Balsa cement is also gap filling to a certain extent, but the same principles apply—the better the "fit" of the pieces the stronger the glued-up joint. The table lists the various types of glues which can be used for sticking balsa to other materials.

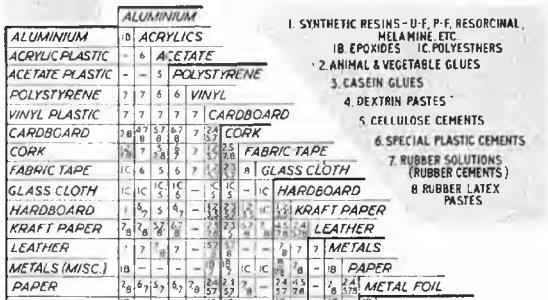
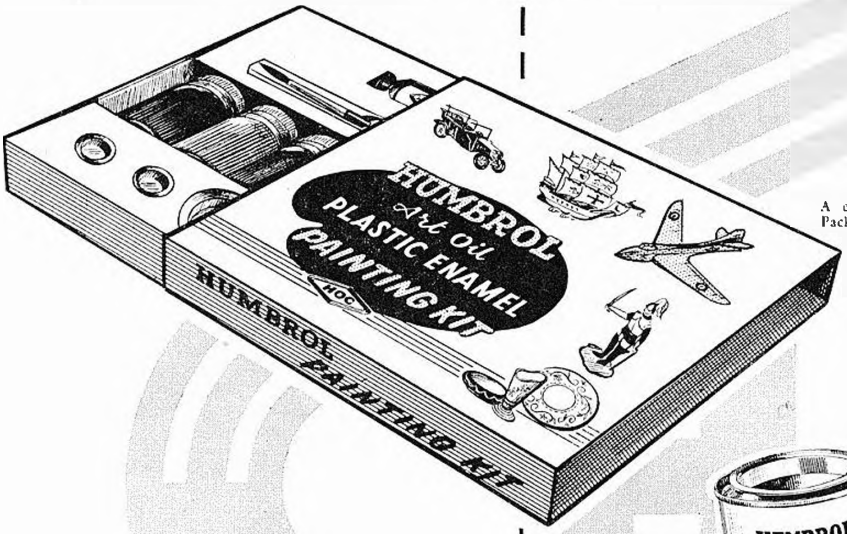


Chart above indicates which type of glues are best or most commonly used for joining different surfaces. Glue types are listed in the shaded panel, with reference numbers.

Get the HOC habit!



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ART OIL ENAMEL
A superior quality oil enamel which dries in 2-4 hours.

BRITFIX DOPES
Clean and bright, smooth and easy to work with. Quick-drying.

THE MOST COMPLETE RANGE

HOC THE HUMBER OIL

Their thoughts in the sky, their feet on the ground, air-crew blend courage with careful skill.

Per ardua...ad astra. *It is not easy to fly with the R.A.F., to lead others, to shoulder great responsibilities while still young. But in the lasting satisfaction of this immensely worthwhile career...*

great effort finds great reward

A YOUNG MAN'S DREAM may dwell on flying — on the exhilarating challenge in the airy spaces of sky. His common sense tends to call him back to earth—to consider the future and the building of a career.

Feet on the ground

In the Royal Air Force today you can satisfy both these demands — and the new appointment of Air Electronics Officers means more can now fly. These highly skilled men are trained to be responsible for all the electronic devices in the new V-bombers. But aircrew are much more than flyers. They are often seconded for other important work in Britain and abroad. Training others, international liaison, aircraft development — these are but some of the jobs that may come your way. And responsibility grows fast. You can be a Group Captain while in your early forties, responsible for perhaps fifteen hundred men and several squadrons of modern aircraft. Beyond that? There is no limit. Quality counts in the R.A.F. and there will always be room at the top for good men.

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Travel, adventure, opportunity, achievement . . . here is a unique chance to blend them all in the satisfaction of a great career. Are you qualified to grasp it?

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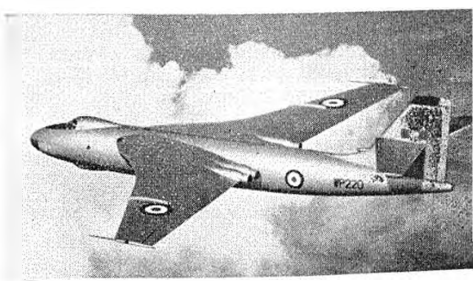
RESPONSIBILITY. To fly with the R.A.F. is to work with the most dependable men in the world, confident and well qualified for each of the many calls on their skill and initiative.

AND RELAXATION. Work over, pleasure begins. Gliding, yachting, winter sports — these and many other privileged pastimes link up with a social life that is full and varied.

The Royal Air Force
Flying . . . and a career



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The latest edition of our famous Plans Catalogue appears in new guise with all the latest additions to our plans range duly illustrated and described, a number of older designs deleted where they failed to meet the exacting standard we guarantee, and, in response to a very wide demand, a series of practical articles added which makes the catalogue more than an illustrated price list but a real **HANDBOOK!**

Articles by experts cover the most usual sources of difficulty that a weekly post of hundreds of letters prove to have been the main stumbling blocks of our less skilled customers. These deal with such subjects as : BUILDING FROM PLANS : SCALING PLANS UP OR DOWN : THE USE OF DETHERMALISERS : DOPING : CONVERTING MODELS TO RADIO CONTROL : HULL CONSTRUCTION IN ITS VARIOUS FORMS : SOLDERING : RADIO CONTROL FOR BOATS : RADIO CONTROL FOR AIRCRAFT : F.A.I. REQUIREMENTS : TOWLINE TECHNIQUE : HANDLING RUBBER : DATA ON THE WORLD'S MODEL I.C. ENGINES : COVERING : and a host of other useful items of information.

Plans are fully illustrated with photo blocks of actual models, each one is dimensioned and priced, and suitable engines, where applicable, indicated. Group headings include the following main divisions : FLYING SCALE AIRCRAFT in every category : FREE FLIGHT POWER : CONTEST POWER : A2 & OPEN CLASS GLIDERS : RUBBER MODELS : WATERPLANES : INDOOR MODELS : JETEX DESIGNS : RADIO CONTROL : CONTROL LINE SPORT, SPEED, STUNT, TEAM RACING : SOLID SCALE PLANS : RACING YACHTS : SAILING CRAFT : POWER BOATS : AIRSCREW DRIVEN HYDROPLANES : STEAM ENGINES : CARS including PROTOTYPE PLANS : RAILWAYS : WORKSHOP ACCESSORIES.

140 PAGES

THE EVENT of the year is publication of the new and enlarged 140-page PLANS HANDBOOK. This handy square-backed book should be your constant source of inspiration for the next model, and for guidance in completing work in hand. Our original catalogue sold well over 175,000 copies throughout the world, completely wearing out its set of illustrations! Once again we have followed the precedent established in the last edition of inviting the co-operation of the model trade, so that readers have in one volume both details of the plans they may think of building, and appropriate model suppliers for materials, motors, etc., they may also be lacking. It adds even more comfort to armchair modelmaking. First print is due by July 1st—all orders waiting attention will be despatched from the first supplies received, when we shall be delighted to give our famous "by return" service to all other orders. You should be able to obtain locally from your own model shop, but if in difficulty fill in coupon below.

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AERO MODELLER

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AUGUST 1957

Managing Editor - - C. S. RUSHBROOKE
Editor - - - - - H. G. HUNDLEBY
Assistant Editor - - - R. G. MOULTON

★

Special features

★

Regular features

★

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An Honoured Aeromodeller

FOR MORE YEARS than we like to record, aeromodelling in Great Britain has been something of an "orphan" in aviation circles, and rarely did we witness the recognition afforded to other sporting activities. Despite singular achievements in the international field, such highlights were barely noticed outside the knowledgeable circle of modelling enthusiasts, a disregard that has irked us considerably from time to time.

Recent months has seen a dramatic change in the situation. World Model Championship participants have been guests of the Royal Aero Club at functions staged in recognition of their feats, and more recently Ray Gibbs was awarded the coveted Bronze Medal of the Club as official cognizance of his contribution to British aeromodelling, particularly in the world of speed.

The culminating point has, however, been reached by the creation of S.M.A.E. Chairman, Mr. A. F. Houlberg, as a Member of the British Empire, an honour he richly deserves in recognition of his sterling work in the field of British and International aeromodelling.

"A.F.H." started modelling way back in 1909, and was the holder of many British aeromodelling records, also the winner of innumerable contests. We well remember his meticulous attention to detail in both workmanship and design problems, but more important in recent years has been his unruffled approach to administrative requirements which has proved of immense benefit to aeromodelling both here and abroad.

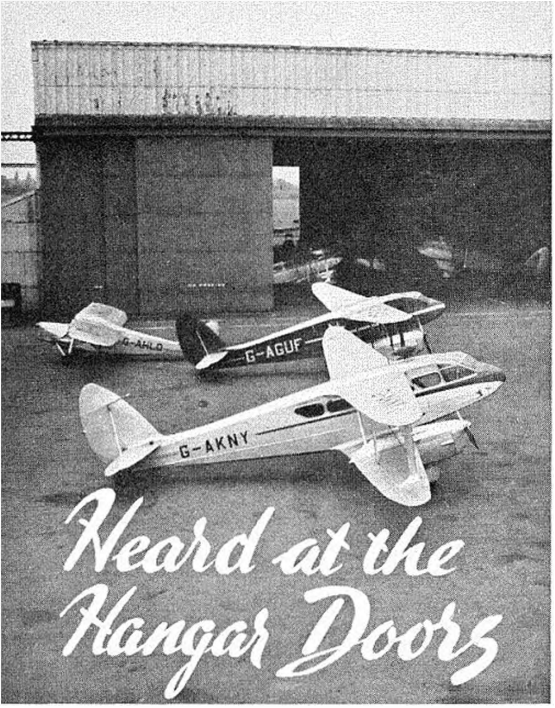
Chairman of the S.M.A.E. since 1921, with the exception of a two-year break when he first moved to Oxford, and President of the Models Commission of the Federation Aeronautique Internationale for the past ten years, Mr. Houlberg is noted for his impartiality and a degree of integrity that ideally equips him for his high position in the world of aeromodelling.

Mr. Houlberg prefers to regard his high award as recognition of the aeromodelling movement itself, but we well know that it has been his steady hand at the helm during many difficult years that has brought the S.M.A.E. to the prominence that it enjoys, and aeromodellers all over the world know and respect him for his personal qualities above all else.

In a world that has become prone to abbreviations we are indeed happy to record "A.F.H."—M.B.E.

On the cover . . .

THE ELEGANT LINES of the D.H.89a Rapide are clearly portrayed in this photo by B.E.A.'s Chief Photographer of 'FEZ which was used for runs between Land's End and the Isles of Scilly. FEZ has now been sold overseas and is currently flying in Laos as F-LAAL, but the B.E.A. "Islander" service continues with hourly frequencies out of St. Just Airport in Cornwall. A description of the D.H.89a and fully detailed drawing by George Cox will be found on pages 420 to 424 of this issue.



Heard at the Hangar Doors

The Rapide

The thoroughly De Havilland photo used in our heading this month was taken on a recent visit to Croydon Airport, the future of which hangs in the balance. Of all the aerodromes in the London area, Croydon is the only one which retains the truly glamorous atmosphere of aviation. Here the prying eye can find Geminis, Ansons, Rapides, in fact all sorts of aircraft in various states of repair and maintenance, foreign visitors and novel types such as the recent Italian visitors, the Bell 47 Helicopter and Piaggio amphibian.

Rapides are predominant. In this photo it is possible to see four, while another three rest inside the depths of the hangar. In the foreground is 'KNY, a plane which has landed in ploughed fields, on racecourses, on disused landing fields, during its twenty-four hour period of duty serving British press and news services.

George Cox certainly selected a work-horse in picking G-AKNY for his tenth Famous Biplane which is featured in this issue. Incidentally, this tenth feature marks the beginning of a departure in style for, from now on, George will try to include more of the aircraft history now that he has covered most of the salient points of solid model construction in various forms during his previous articles.

A disappointing Nats

R.A.F. Waterbeach once again saw the British Nationals at Whitsun, and the return to this favoured ground was obviously welcomed by the aeromodelling fraternity, if contest entry is any criterion. Most events attracted greater numbers than ever before, and it is obvious that we are getting to the stage where certain contests must have a limit put upon the entry in order to give (*a*) time to cope and (*b*) a fair chance to each and every competitor.

In the normal free-flight contest size of entry that can be handled is limited only by the organisation and number of timekeepers available . . . but what a qualification that is! Everyone wants to fly, and expects any but themselves to do the necessary work to give them that chance, and we end up with a handful of hard-pushed officials, oftimes abused by those they are trying to help, voicing the view "Never again ! !" Such attitude generally follows a brush with one or more well-known modellers who think their past successes give them priority over the general run of competitors. This type expects to be able to jump the queue at will, and loud is the moan if told to take their turn.

Much as we deprecate this dog-in-the-manger practice, even less excusable is the situation where an official is put in charge of an event without the necessary equipment and/or a knowledge of the rules appertaining to that contest. In such cases our sympathies are entirely with the competitors, whether they be reasonable or the "big 'ead" type.

Radio flying demands a limit on the entry, for the very nature of the event prevents more than one machine being operated at the same time, and notice must in future be taken of the flying hours available and the number which can be accommodated in that period. Had the full entry for the "AEROMODELLER" Radio Control Trophy wished to fly, even without the loss of a single minute (impossible in practice) the last man would have been flying four hours after the closure time!

The impossibly large entry accepted for the newly-introduced Combat event resulted in chaos, with nobody detailed ahead to prepare, plan or otherwise deal with this complicated and time-taking event. Full marks to Croydon and Wanstead who stepped in at the last minute rather than see the event abandoned; and to the Huddersfield lad who handed his prize money (gained by drawing from a hat!) back to the Society for the International Contest Fund.

Weather played a very big part this year, and was a face-saver in some respects. Frequent heavy showers of rain dampened the ardour (and equipment) of a number of competitors, and failure to take their flights eased an already hard-pressed organisation. Luck certainly failed the S.M.A.E. on this occasion, for the week-ends either side of the Whitsun holiday were perfect.

The thanks of all aeromodellers go to Group Captain Dutton, Station Commander at Waterbeach, for the co-operation received at this popular venue, and we are happy to record the Commander's comment that "the attending multitudes left me a very tidy airfield, which was most kind of them. We enjoyed having you, but fully expected a big mess to clean up". What a delightful change from the usual charge of litter-louts!

Tailless Contest—Off/On

The S.M.A.E. has notified interested national Aero Clubs that they are unable to organise the yearly Flying Wing Contest, won in 1956 by Great Britain.

In order that this interesting type of contest shall not be allowed to lapse, the Royal Netherlands Aero Club has proposed to the S.M.A.E. to take over the option and organise the event at Terlet in September of this year, under similar conditions as in 1956.

We applaud this prompt action by our Dutch friends, confident that they will stage a contest every bit as good as last year, when a free-lance team from the Southern Cross Club took top honours. At the same time we urgently request that the S.M.A.E. makes a definite statement of policy of its attitude to non-Championship international events, thus saving future embarrassment both at home and abroad.

I.R.C.M.S.

Full details of the I.R.C.M.S. International Contest to be held over August Bank Holiday are now available from the Competition Secretary H. Croucher, 27 St. John's Road, Sparkhill, Birmingham 11. The model aircraft section will take place on Sunday August 4th, at Wellesbourne Aerodrome, Wellsbourne Mountford, near Stratford-on-Avon and prizes are to be for multi- and single-channel with bonus points claiming up to a maximum of 25 per cent. for single-channel entrants. Pre-entry is advisable.

Light-fingered Gentry

A. L. Brookes had a Frog 50 Mk. II Serial 9076 stolen from the Competitors' Enclosure at the *Stockport Express* Rally and anyone observing this particular engine up for sale, is requested to contact us immediately.

Missing Answer

Much to the consternation of many readers—and ourselves—page 361 of the last issue did not contain the promised answer to our query on the identification of the four-cylinder diesel used in our "Know Your Engine" heading.

To satisfy many of those who have bothered to telephone and write to us, we can assure readers that the motor does in fact exist and the builder is none other than Col. H. J. Taplin of Birchington-on-Sea. Col. Taplin offers the following information on this fascinating in-line product.

"The total capacity of this four-cylinder engine is 10 c.c., *i.e.*, 2½ c.c. per cylinder. With a 14 by 6 prop. it winds up at about 6,000 and with a 12-in. prop. somewhere about 9,000. I have never actually taken a brake horse power test, but I would estimate this to be just under 1 h.p. and the total overall weight about 9 ounces. The order of firing is 1, 3, 2, 4 and being a two-stroke it is interesting to note that at 8,000 r.p.m. one gets 32,000 explosions per minute and something over 500 per second; and the note, of course, is rather a high-pitched whine which is not unpleasant, but when you stop the engine you find your ears are singing.

"Possibly the most interesting feature about this engine is the crankshaft itself which is made up in four pieces. As to its ultimate use, broadly I would say that it is useless except as an academic experiment, although being completely vibrationless it might well be fitted to a radio-controlled aircraft with satisfactory results."

Lost Models . . . (1)

Sergeant Widdick of the Balloon Unit, R.A.F. Cardington, is the very lucky owner of an A.P.S. *Quickie*. Launched during the first round of the Thurston Trophy at the Nationals it was last seen at 2,000 ft. starting to climb into the cloud with no D/T of course! Nor did the model carry a name and address, but it happened to land 35 miles away at R.A.F. Station Marham and the amateur detectives stationed there worked out the single RAFCARD insignia and lost no time in tracing Sgt. Widdick at his Bedfordshire Station.

Lost Models . . . (2)

We hold one lost model at the A/M Offices, a Mills ·75 pylon design found near Woburn Abbey and have information on another with a Mills 2·4 which was located near to Waterbeach. When we have sifted out the queue of enquiries and selected those who give the correct additional identification markings, we would be only too pleased to return the models to the rightful owners.

Bruno Bachli

The tragic loss of Swissair DC.3 during single engine stall trials on June 18th robbed Switzerland and the world of aeromodelling of an outstanding enthusiast. One of the Swissair engineers aboard the aircraft, Bruno Bachli was already an accomplished pilot; he needed only instrument rating to complete his air training for commercial airline flights; had passed a course of mountain flying including 75 glacier landings; was a leading aerobatic pilot in the Bucker Jungmeister, being one of the few pilots in the world with an outside loop in his repertoire; and, such was his enthusiasm for the air, he occupied his week-ends piloting De.H. 89a trippers from Kloten around the Alps.

Though full-size activity occupied most of his time in recent months, his first love was always for modelling. He represented his country in Great Britain, Finland and Sweden for the Wakefield contest, placing 8th in 1950 at Jami-Jarvi and was a leading exponent of the highly-developed stick fuselage A/2. With an understanding of aerodynamics gained through years of aeronautical study, Bruno Bachli was an exceptional modeller who will be sorely missed in his country for there was undoubtedly a great future ahead of his 26 years. Last year we had the pleasure of flying with him in HB-CPD, the same Cessna 172 which we featured as a free-flight scale design last month, and his piloting skill impressed us considerably. We know that all readers will join us in extending sincere condolences to his parents, brothers and sister.

1957 Nationals

ANOTHER NATS has come and gone. Poor weather spoiled what could have been a best-ever meeting, and of the 130 clubs that provided 1,500 individual competitors there could not have been many that did not return home disappointed.

Once more it was a case of so many placing reliance for smooth administration on too few. Of the twelve events, one was directed by an E. Midland club, four by London area clubs, four by S. Midland area and three by individual officials of the Council. What a poor—even degrading response to the S.M.A.E.'s appeal for assistance when this meeting was planned!

Having cleared our chest on this point (we could ramble on forever with a list of justifiable grumbles)—was it bad Nationals? Of course *NOT*. The large entry and huge tenting area could not fail to make it one long weekend of concentrated model-bods delight. Motors were yowling at all hours. (The Scots boys drove down to arrive at 2.30 a.m., and couldn't sleep for the racket of running motors) and the aroma of weird and wonderful fries over perilous cooking devices, could only lead one to suppose that all were enjoying themselves in spite of damp canvas and hailstones as big as cobnuts which fell on Saturday afternoon.

Thurston Cup (*Open Glider*)

A brisk wind and the largest ever entry of approx. 380 models for this popular event (run by the S. Midland Area) were decisive factors for reducing the maximum flight time from 4 to 3 mins. Earlier fliers were soon finding plenty of lift, and up to 10.30 a.m. approximately 50 per cent. of the flights were maximums—then came the rain. First a light drizzle followed by a natural reticence to fly and scampering to shelter by the many competitors queueing around Control. However, as soon as one glider shot upwards like a pylon model into the rising air which arrived with the rain, a few more intrepids ventured forth and found that although the fuses were hard to light, one could still collect a 3 min. time in spite of the very wet atmosphere.

Flying throughout the day was not such a matter of skill on the towline but of luck in connecting with the lift coming off the perimeter track. Some appalling launches were swiftly converted into rates of climb which must have approached 20 ft. per second, and as the weather cleared during mid-day it became evident that there would be a fly-off. Though many large gliders were to be seen, A/2's formed 90 per cent. of the entry. Early in the afternoon two "trebles" were announced, one for last year's A/2 Team-member Neville Willis of Anglia, and another for Peter Giggle, the popular Southampton flier. There were also a number of near misses which indicated the integrity of the timekeepers. (Many would-be fiddlers were frustrated during the course of the contest by a system intended to prohibit competitors from contacting their recording cards.)

Eventually, after a very hard, wearing day of alternate sunshine and downpour, hopes and disappointment (many excellent chances were lost by the downdraughts). Giggle and Willis were called up for the fly-off at 6 o'clock. Out of nearly 1,000 recorded flights, they alone had topped the field, and both models were sent up on the line with lengthy fuses to decide the winner.

Biggest cheer at the Prizegiving was for Junior D. Greave of Leamington, 3rd in the Model Aircraft Trophy. Mrs. Dutton is congratulating him on his fine effort, and at right, Group Captain Dutton, C.O. of Waterbeach and himself a model enthusiast, apologizes for the weather and welcomes our return next season

Willis was down in 40 secs., Giggle in 1 : 33, and this should be an illustration of the conditions of the day to those who were not present. Willis was unfortunate in launching the model against its normal turn, but even so, both times were but a fraction of what might have been expected from two top-line models.

Short Cup (*PAA-Load 2·5 International Class*)

The usual perennial entry—a few new models and the *same* luck element pervaded this event, won by K. Glynn, now of the Surbiton Club. He was most consistent with times of 1 : 45, 2 : 17 and 2 : 10, as distinct from D. Posner's 4th place time which included a 3 : 56 flight and two of less than a minute. Of 22 entries, 14 flew in this weight-lifting contest which deserves better support, for it offers more than a sporting chance to Mr. "Average-man", unlike pure F/F power duration.

Davies Trophy (*Class A 2·5 c.c.*)

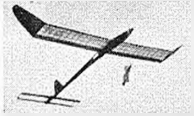
An all-time record of 114 entries were swiftly organised by the Enfield Club into simultaneous heats with two circles operative. The pace, like some tempers, was fast and furious, and a stopwatch check on some of the models revealed that not only are the best in Class A faster than some of the Class B entry, but would also do well in pure speed as well.

Models were processed *after* they had won their heats on the Elimination system and of the eight disqualifications, five were eliminated with over-size tanks, two by the aspect ratio ruling and one for its very non-scale appearance.

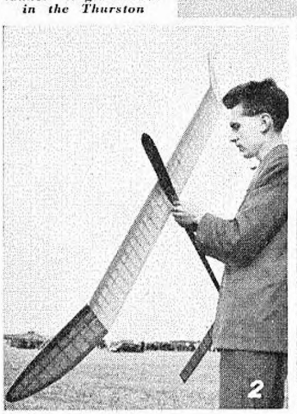
Dick Edmonds of High Wycombe was known to have a fast model, having completed five miles in 3 : 56 at Dartford. In heat 21 he excelled himself by covering the same distance in 3 : 54 (77 m.p.h. including pit stops!). A close competitor was obviously M. Bassett (East London) at 4 : 08, whilst taking the other extreme, heat 30 (longest of the day) was finally concluded after almost 8 mins. of delayed and slow flying, only to find that the winner used an over-size tank!

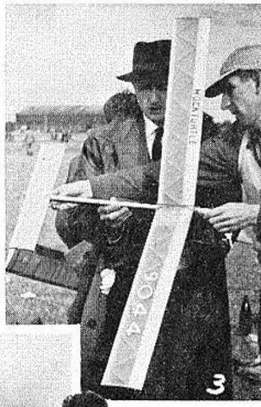
The pyramid system of knock-out Elimination matched up several of the fastest models prior to the eventual finals. Howard of Foresters, last year's winner, came up in spirited rivalry to lose against Edmonds for example, and not until the succession of semi-finals had been concluded, did one realise that the eventual final would be one for considerable speculation. G. Allen of Enfield, Edmonds and Bassett were matched for the 10 miles. Full of excitement, especially when pilot Gibbs landed Bassett's model on top of Edmond's racer causing a slight delay, the race was one of the fastest ever in the Class "A" field, finishing in 8 : 12·5 (73 m.p.h. overall).

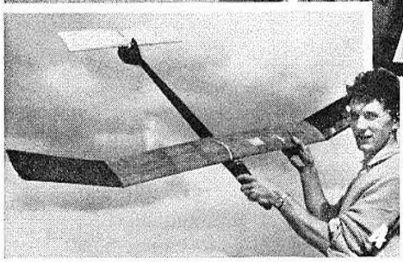
It was a personal triumph for Dick Edmonds, as he has now won this Trophy for five years out of the six



M. Radford of D.H. (Hatfield) shows how to launch single-handed in the Thurston

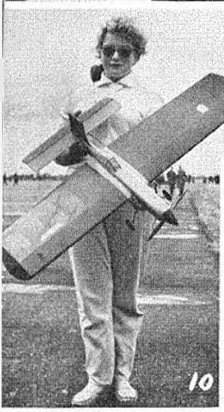


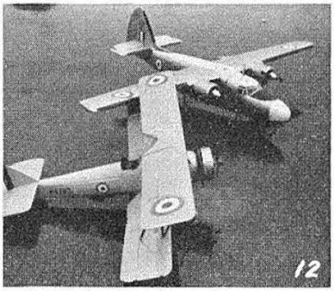




Heading opposite illustrates the extreme contrasts in flying weather over the Nats. period. Ye Editor shelters beneath a brolly, awaiting Alex McDonald's efforts to dry out the Tx, whilst Class A tjr proceeds over scorched tarmac earlier in the week-end. At right, pic. 2 is of Nov. Willis, finalist in A/2 along with Pete Giggle in 4, but their fly-off times were disappointingly low. 3 is Bill Park, all the way from Germany with a smart A/1 called Mock Turtle. 5. Class A finalists, Mike Bassett and Ray Gibbs had a tussle with the old maestro Dick Edmonds in 6. During the race, one of fastest ever, Bassett's model landed on top of Edmond's but the rugged Wycombe racer could take punishment! 7 is Britain's first Monoline speedster, flown by Maurice Meadham of Watford. Did 137 in contest, has been much faster in practice. McCoy 60 and bladder tank

J. Fergusson's pleasant and enterprising surprise (8) in scale was a Percival E.P.9, unfortunately suffering in the downpour. Similar troubles beset Arthur Evans of Bromley with his D.H.6 in pic. 9





Gold Trophy 3rd place went to T. Jolly's Fox 35 model held by Miss Roberts in 10. Second was D. Chislett with smart trike semi-scale for Frog 500 in 11

it has been running and to come through such a large entry (in which we witnessed several shocking examples of poor sportsmanship) reflects considerably on his ability.

Gold Trophy (*Controline Stunt*)

Now that Pete Russell of Worksop (or should we say London Gliding Club?) has carried off the Gold Trophy for three consecutive years, one can offer him the honourable title of "Britain's King of the Stunt Handle". Pete's smooth and effortless manoeuvres gained top place yet once more with a 30 pt. margin over his nearest competitor, D. Chislett of Dagenham, from a field of 39 entries. One could never claim that the general standard of flying in the Gold this year was exceptional. In fact the "excellent" rating on the new type score cards, ably completed by Judge Eddie Cosh, was only given for the elementary manoeuvres of take-off and landings! By scoring a consistent "good" for almost all of his flying, Pete Russell deserved to win with his beautifully constructed silver and green A.P.S. "334G".

Perhaps this new streamlined system of marking points will help to improve the standard of flying in general. Fast flying 2·5 c.c. diesel-powered models do not give the Judge a great deal of scope to follow the pattern of the manoeuvres and perhaps it is significant that the closely pointed 2nd to 4th places went to Frog 500, Fox 35 and Veco 19 powered models. Dave Platt's entry with the Veco was one of the nicest finished models at the entire Nationals.

One must agree that the conditions were poor. Mac Grimmett's Oliver Tiger model was literally blown from one side of the circle to the other during a vertical eight and wind gusts up to 25 knots were not exactly conducive to good flying especially when loaded with stinging rain across a puddle covered tarmac during the last flights.

Davies Trophy (*Class B 5 c.c.*)

For months the London area had been buzzing with prospects of a fast final on the contest at the Nats, and those who braved a drenching to watch were not disappointed. The Walker/Tuthill team from Enfield had a neat white racer equipped with hybrid Eta, Sid McGoun was flying a very smart green and orange number with Carter McCoy, and the Steward/Taylor team had their old reliable reworked McCoy (which had been in the finals of the same trophy so many times before) in a new low-winger while the dark horses, McFarlane and Co. from Glasgow Barnstormers, were using a superbly fast Barclay-McCoy/Eta. Four new models, four top-class re-worked engines and the best pit crews from a 70 entry (the event was run by the Foresters club) were set for an "over 100" final. The result order was as above; but there were only three laps covering first to last, and one should agree that the Enfield lads were lucky. Fastest model, approaching 110 m.p.h. at times, was the Scots high aspect ratio design, but one of the pit crew inadvertently re-filled his squeeze bottle with paraffin in the middle of the race, and it took some time to detect why the engine wouldn't start. Added to that was the fact that one of their pit crew men saw fit to enter the circuit to part the wet lines and in

Scale winners from the R.A.F. Pic. 12 shows the f/f Tutor and c/l Pembroke that set a high standard in the Super Scale event. F/O Norman and Cpl. Godfrey upheld the traditions of the Service with two of the nicest models in the entire Nats. 13. Dutch Typhoon 2.5 powered this P.A.A entry by W. Daniels of Walsall. 14. Unique Class B racer from keen Wharfedale club by J. Horton for Frog 500. 15. Dave Platt of Wanstead with his elegant Veco 19 stunter plus sword embellishment across wings

so doing hampered both McGoun and Steward (who forcibly removed said offender in appropriate manner). Meantime the Enfield "White XI" had come through unscathed to finish in 7 : 59. Considering the rain and the delays, it was a fast final and the lappage of some of the new models using chicken-hopper two-cell tanks was a refreshing indication of new thought in team racer design.

Speed

Conditions were far from good for the speed men, and the low entry and times for 2·5 c.c. were hardly impressive enough to justify a team for the Championships. One welcome introduction came with M. Mendham's (Watford) first demonstration of Monoline speed in this country and although 137 m.p.h. with his McCoy 60 is lower than that obtained in practice, it was good enough to gain him Monoline's "first 1st" and to show how easy it is to fly speed with this form of control.

Combat (2·5 *c.c.*)

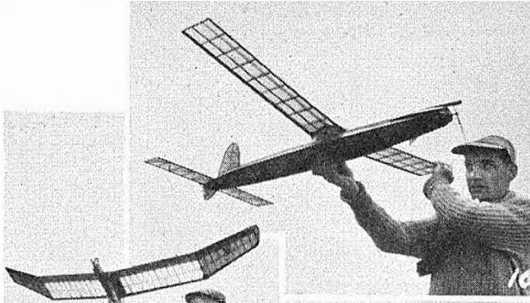
What can one say of a contest that had to be concluded by a draw out of a hat? 86 entered and many of those at least had the opportunity of flying one heat but the pyramid system of elimination was hopeless with only two circuits operating, and this was a great pity. This was the orphan child of the Nats, and one which deserved better administrative attention. In the end, two participating clubs, Croydon and Wanstead, helped to save the situation; but the rain, and sands of time made it a hopeless case. However, we can always reflect on the fact that this was the first S.M.A.E. combat event and hope that next time one of the less co-operative Areas will volunteer or be obliged to do something about it. All credit to the lucky draw winner, H. Farrar of Huddersfield, who refused his "first" prize and returned the cash as a donation to the International Team Fund.

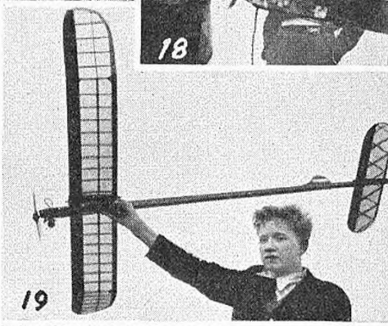
Scale

Coupled with the Gold Trophy, the Scale event shared the honours for having the best finished models at the Nats. Sixteen entered and never was a winner more difficult to find than among the top three. All were beautifully constructed, and flew well despite the constant rain, but it was F.O Norman's *Avro Tutor* that edged forward by 3 points to collect a first place. Accurate to the last detail and looking exactly like the real thing in the air, the yellow trainer was a glutton for flying and ended the day by towing a tricolour banner around the field. Being control line, Cpl. Godfrey's *Pembroke* (two Frog 500's) gained a take-off and landing advantage over the Ameo BB 3·5 free flight *Polish PZL Mewa* by T. Datkiewies. However, only a slim point separated these two, and if conditions had been better, the order might well have been changed. Showroom finish on the first three contrasted with the rest of the entry which included several enterprising efforts, notably J. Fergusson's *Percival E.P.9* at fourth place, A. W. Evan's *D.H.6*, and M. Garwood's ducted fan free-flight *Le Duc* 02.

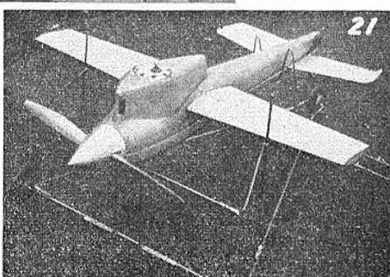
Sir John Shelley (*Power Duration*)

Monday dawned with constant drizzle, and not until the scheduled starting time of 8.30 did Pluvius decide to leave the modellers alone. Wind had veered 180° in 24 hours, and conditions in the rapidly drying air were ideal for the high fliers. And what high fliers they were! Each year we are impressed by the standard of Power model climb and this time we were not disappointed. Familiar names, Jays, Posner, Gaster, Lanfranchi,



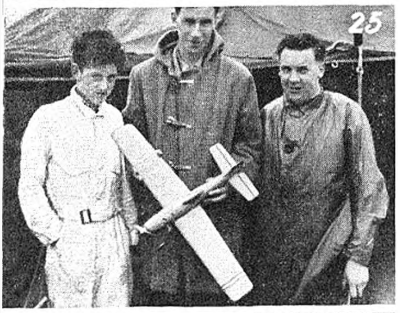


16. Large rubber jobs did best in the "M.A.", N. Taylor came from Belfast to fly. 17. Long nose trend from Bradford seen in A. Collinson's latest for Torp 15 also for Silvio Lanfranchi in pic.18. Opposite extreme in 19 is P. Ward's approach for Oliver Tiger from Darlington

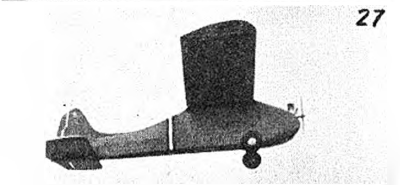


Sgt. Elliott, R.A.F., piles on turns for a max in 20, as Norm. Couling holds on. In 21, a Cheeksfield Dooling 61 hides within the all-metal airframe of Cox's entry in speed

Wings were much in evidence for combat. Wanstead's Jewby flew this A.M.35 slab in 22. Dave Morgan of Wigan was 2nd in 5 c.c., unplaced in 2.5 with E.D.246 model in 24



Enfield's Class B winner, No. XI, has a hybrid ETA flies up to 109 m.p.h. over good range with 2-cell tank. Tuthill is starting in 23. Fastest Class B racer came from Scotland, in 25, McFarlane is holding model, Barclay McCoy - Eta - powered. 26 is Hopkins of Bristol, the Gold Trophy's most consistent trier over the years, and once more out of luck. 27, most potent among the r/c entry was Eric Cable's McCoy 35 model that has flown inverted but suffered from gremlins and wet weather in the contest



Collinson, and Eckersly were well in the running from the very start and it was only a matter of time (we thought) that the loosely knit organisation would reveal one of these as the winner with a treble max. But Pluvius came again, and with the afternoon rain, the results took on a different order.

Mike Green of Croydon was to be the only treble maximum flier, and only three seconds short came John O'Donnell with Silvio Lanfranchi at third. The drenching obviously had its effect, and we imagine that it was also responsible for the low proportion of the entry that came up to fly.

New trends in design were hard to locate but one obvious leaning among the recently-built models is the use of long tail moments and 33 per cent. or less tail area. The fast flat spiral too seems to be coming into vogue with the longer noses, notably on the designs from Bradford.

Model Aircraft Cup (*Rubber Duration*)

After the helter-skelter of glider organisation the previous day, the comparative calm of the rubber control area was more than relaxing. Wind drift across the width of the 'drome to the hangars was one major problem for the four-minute fliers, and the fire brigade will have cause to remember aeromodelling after numerous recoveries from the buildings. Final victory went to Ray Monks with a well-deserved treble max., but loudest cheers at the subsequent prize-giving were for diminutive young D. Greave of Leamington, who was only 18 seconds short of a perfect total, placing fourth.

S.M.A.E. Radio Control Trophy

Held on the Sunday under variable weather conditions, this contest attracted 45 entries, the number recording scores comprising 10 multis and 19 single channels. The winner, J. Nixon of Grimsby, came from the latter group, and was flying the same high-wing model used the previous year, looking even more oil stained and well used than when we last saw it. A single hard-valve receiver with home-made Bonner type compound escapements was used to give rudder and engine control, the E.D. 3·46 proving yet again its stalwart qualities for R/C work. Take-off was good, also his turns, but the figure eight was poor as were most others performed during the contest. Three good spins did, however, tot up sufficient points for Nixon to gain a clear lead over his nearest rival R. Donahue of Kersal flying multi.

Donahue's model was a refreshing departure from variations of the "Radio Queen" set-up that multi fliers are at last realising is completely unsuitable for aerobatic work. Powered by an Enya 29, it was functional yet of pleasing lines, with twin truck-type landing gear *a la* Claude McCullough. Bonner influence in the shape of a squeeze bottle plastic tank and a Bramco throttle, with home-made 6-reed equipment and Mighty Midget servos completed a very practical layout. The truck gear gave an excellent straight take-off and Donahue progressed through the schedule as far as a single loop before the Enya went temperamental. George Redlich, who placed third, had his rudder come loose after three rather flat spins and was lucky to get down intact.

In general, radio troubles were at a minimum and the standard of flying appears to be on the upgrade. Most models performed successful R.O.G.'s, but few spot landings were recorded and it was painfully evident that a large proportion of the contestants had not familiarised themselves with the relatively simple rules.

"AEROMODELLER" Radio Control Trophy

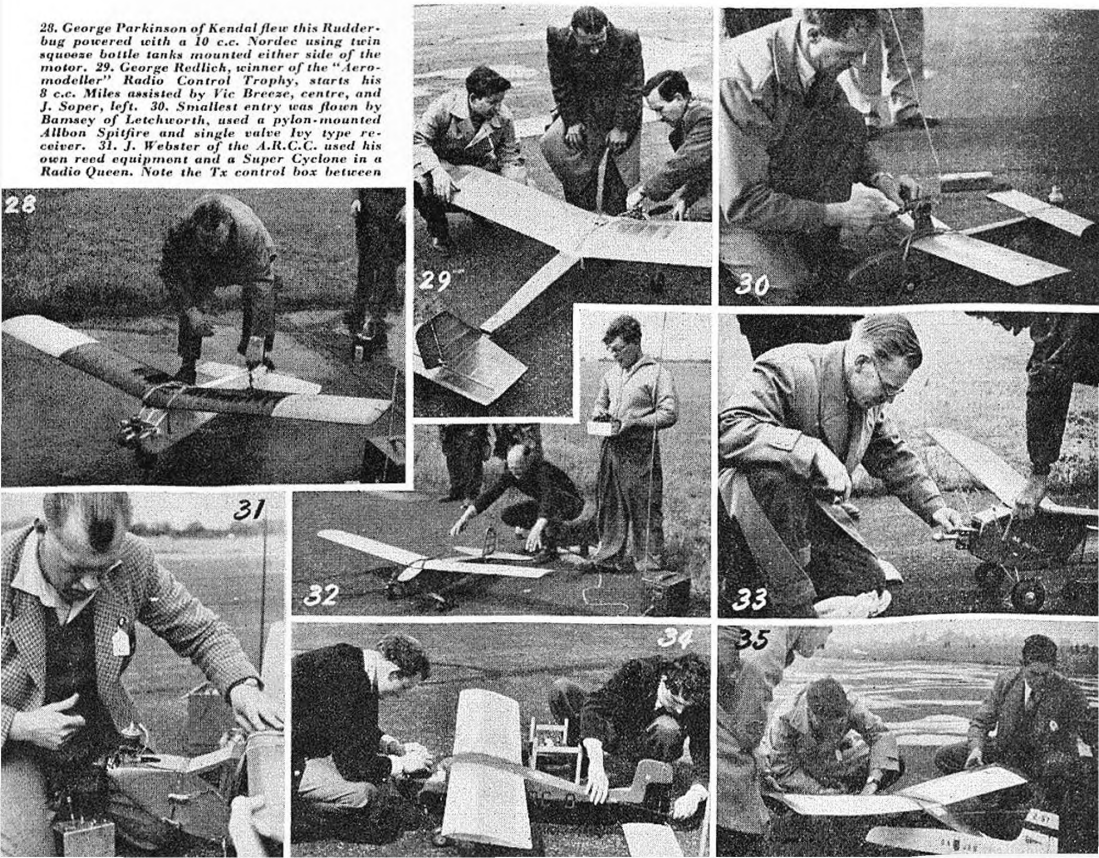
This two-part contest held on the Monday included course flying in the first section, followed by an aerobatic pattern as per S.M.A.E. Trophy in the second, with the advantage of two attempts at a spot landing. The new F.A.I. "H" landing system was utilised for this and the previous day's contest, but was unsuccessful. Entries were the largest yet recorded, totalling 48 of which only seven multis and seven single channel recorded scores. The weather was mainly responsible, for after showers in the morning, it poured down in buckets from 2 p.m. to 4.30 p.m., playing havoc with reed equipment and deterring a large proportion of the entry.

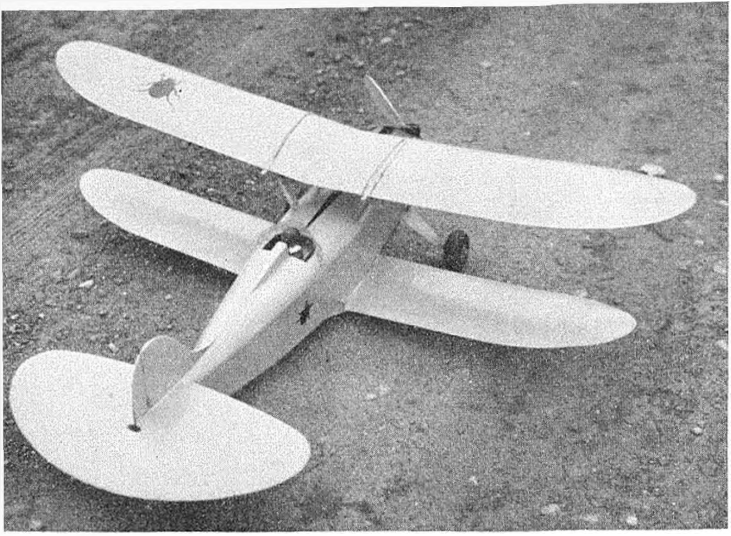
Howard Boys, who subsequently placed third, was first away, waggling his rudder steadily round the pylons, and proceeding after a spot landing to the aerobatic section, where his motor failed after two spins had been completed. Winner was George Honnest-Redlich, flying another battered veteran that he ruefully admits is overdue for retirement. With a Miles 8 c.c. up front and using 6-reed equipment, giving rudder, elevator and engine control, it nevertheless flew happily through the schedule as far as the completion of three good loops, when the radio failed to respond. Travelling in wide circles, the model flew well out of the 'drome until the motor cut, whereupon the old stager glided back dead up wind like a well bred homing pigeon, to land in front of the hangars!

A very stout effort for the single channel brigade was made by second-place man, F. Knowles of Croydon. Flying a *Waveguide* with Forster 29 fed by a squeeze bottle, he was away to a good take-off and had plenty of spare power to romp around the pylons in the first section. After a landing well short of the "H" he soon refuelled and climbed rapidly during the left and right turns of the aerobatic section. His height was such that by the time he reached his figure eight his engine cut, whereupon he completed the latter manoeuvre on the glide, following with a good crosswind spot landing within the "H". RESULTS ON PAGE 441.

his knees. 32. Askew of Cheadle releases for club-mate Donahae. Home-made reed receiver was used with E.D. reed transmitter and a dicky motor spoiled what would have been a winning performance. 33. J. Nixon of Grimsby with his well known "4b Initio" makes last minute adjustments to E.D. 3.46 Hunter. 34. F. Knowles and R. Rice of Croydon with the former's "Waveguide" that placed second in the "Aeromodeller" Trophy. 35. Another "Waveguide", this one flown by J. Soper of the A.R.C.C., and fitted with a 5 c.c. Miles diesel using a Truflex prop plus a small flywheel

28. George Parkinson of Kendal flew this Rudderbug powered with a 10 c.c. Nordec using twin squeeze bottle tanks mounted either side of the motor. 29. George Redlich, winner of the "Aeromodeller" Radio Control Trophy, starts his 8 c.c. Miles assisted by Vic Breeze, centre, and J. Soper, left. 30. Smallest entry was flown by Bamsey of Letchworth, used a pylon-mounted Allbon Spitfire and single valve Ivy type receiver. 31. J. Webster of the A.R.C.C. used his own reed equipment and a Super Cyclone in a Radio Queen. Note the Tx control box between





August, 1957

A super-stable 4-ft. span biplane for radio control with rudder only, or pure sport free-flight

JUNE BUG

by Norman W. Davis

Eminent American Entomologist, hence the name for this snappy design, Mr. Davis is 51 years old, lives at Dansville, N.Y., and has an appreciation for models to be flown for fun rather than for contests.

JUNE BUG I WAS designed as a result of a dispute with a fellow modeller over the possibilities of powered biplanes. It was powered by an original Garami "Atom" (1·6 c.c.) and had 32 in. span giving 235 sq. in. wing area. Certainly it flew, but was rather difficult to handle—too much fin area and not enough dihedral. June Bug II corrected this error and was entirely satisfactory. Powered by a Super Atom, mounted inverted, it could be adjusted to do very nice loops by loosening the screw on the spark advance slightly.

It would climb to about 40 ft. and as power increased, due to automatically advancing timing, it would start looping and continue until the engine timer shut off.

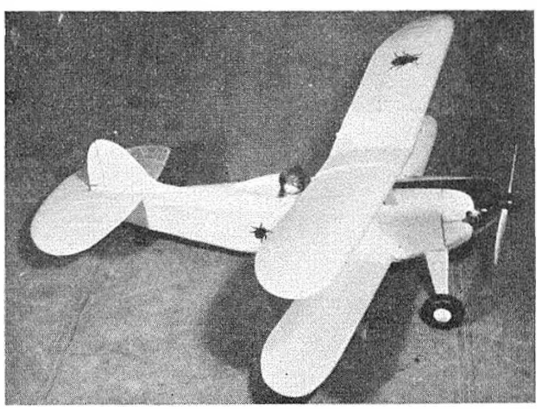
June Bug III was very similar to J.B.II, with same span and area, Super Atom powered, but featured a float gauge in the fuel tank, shorter landing gear, and the present system of mounting the lower wing. Mark IV was the first diesel powered "Bug", and this was a delightful free flight model. Powered by a converted Arden, then an Amco ·87 c.c., then a Mills ·75 c.c., it was a favourite until summer of 1956, when it flew away. It was returned this spring, but there was little left of it except the Mills ·75, which started with a few flips and ran as well as ever!

June Bug V was the first 4-ft. span model for an Elfin diesel. Mark VI, the latest model, has a David Anderson Viking 2·5 c.c. (minimum recommended capacity) and is a veteran flier. It needs 8 degrees right thrust with a 10-in. x 4-in. prop for straight flight, to counteract the usual biplane torque effect, and will fly as though on rails.

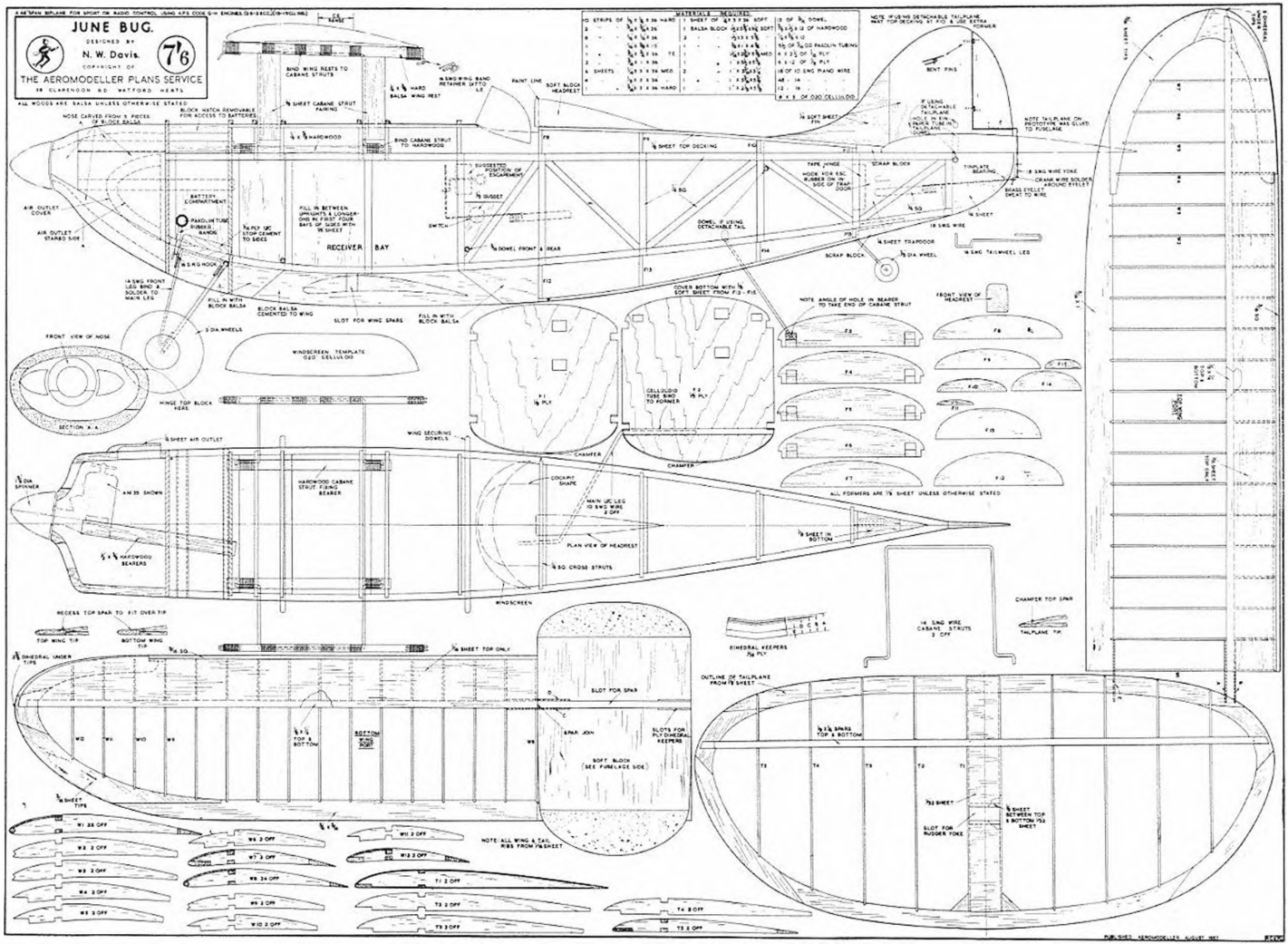
The fixed tail is a personal preference: being rigid and extending out behind the fuselage, it offers a good deal of protection to the rudder mechanism when the model is being carried or flown. Details are given for alternative detachment.

The fixed tail also lends itself to elevator installation, although the "Bug" is primarily for the rudder-only fans. Being rugged in the extreme, simple to make and pleasing to look at both on the ground and in the air, June Bug is a Biplane with personality and one which many modellers will enjoy for simple sport flying or R/C contest work.

It is not intended for the beginner, but any builder with experience of a power model will find all the necessary building detail on the full size A.P.S. drawing.



Stable as the Royal Scot is on railway lines, June Bug is a compact design for easy transport and takes any motor from 2.5 to 3.5 c.c.



FULL SIZE COPIES OF THIS 1/5th SCALE REPRODUCTION ARE AVAILABLE PRICE 7/6 POST FREE FROM AEROMODELLER PLANS SERVICE. QUOTE PLAN No. RC 670 WHEN ORDERING.

At left: Henry Stouffs, man of the meeting, winner of stunt with Veco Thunderbird at rear. TJR with his "Pfffft" and 7th in speed. At right: L. Hungarian Vitkovits placed 5th in speed with rear disc Super Tigre, close-up in picture 2. Fewer of Switzerland did not have much success with pressure feed on his Tigre in 3 and 4. Model has solid "Anti-Corrodal" metal wing. Czech speed team (5) Husicka, Smejkal and Sladky with his jet projectile, latter's winning model is caged in dolly, pic. 7. From Holland, nearest racer was by Dick Olthuysen for Webra Mach I, whilst longest range honours went to the Spaniards, Batlle's in 8. Compatriot Garcia in 9 displays the Spanish "Taxi" stunt design. Fastest racer was Bassett's in 10 while British influence was evident in Swedish Soderberg's Oliver Bomb (11). Two impressive stunt men were Breukink (Holland) in 12 and Egervary (Hungary) in 13

were conspicuous by their absence. So we saw nothing that could be claimed as new. However, we were not to be disappointed, for speeds were high and the quality of flying in all classes better than ever before.

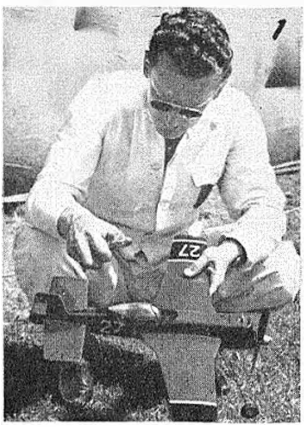
To a large extent, participating teams pay their own way to the Criterium and the added keenness to gain value for one's outlay normally pervades the fine arena. Regrettably this spirit was sadly lacking among the Nottingham contingent in the British team, who chose to miss the first TJR heat and Combat round by arriving two hours late. Britain had been drawn number one in the sequence of team appearance and it was Dave Platt who had to open the meeting with his beautifully finished Veco 19 stunter, fourth in the Gold Trophy only

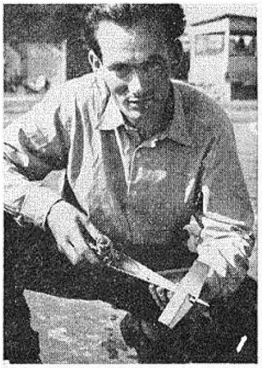
VIIIth Criterium of Europe

ETTERBEEK, BRUSSELS
JUNE 15/16

ELEVEN COUNTRIES participated in this most popular of all European C/L events run by the F.P.A.B. at the Etterbeek controline circuits under the able direction of Albert Roussel. This year's meeting was to have a special significance, for with the coming World Speed Championships only two months distant, one could expect to pre-view new motors and models. Such was not to be, for although the Criterium was well supported, the much vaunted Italian speedsters with new twin-cylinder Barbini's and pressure-fed Super Tigre's a few days before and quite the best finished model in entire Brussels city. Dave did his best, but high loops and eights lost valuable points and an ultimate twelfth position realistically demonstrated the need for more home contests to elevate our British standards. Dave had to show the way through the newly-introduced reverse wing-over, and the rest of the entry flew with a motley assortment of power-plants in endeavour to follow his lead. Stouffs with a Fox 35 *Thunderbird* and Breukink (Holland) with A.M.35 in scaled-down A.P.S.

Last year's TJR winner Pete Smelt (E.D. 216) was not fast enough this season. In 2, Gombocz of Hungary (Schlosser 2.5) shows a neat snap vent cover to stop spillage from the spare pipe, and in 3 Papegnies of Belgium had a smart all-white racer.

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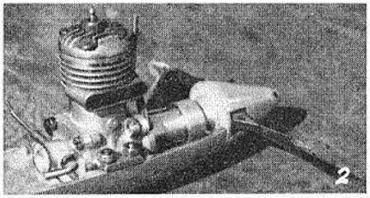
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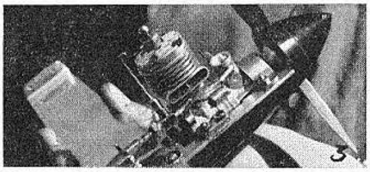
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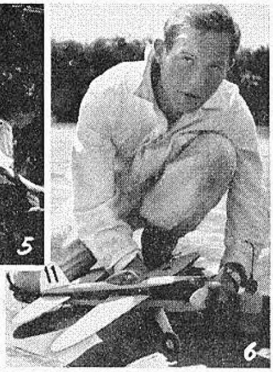
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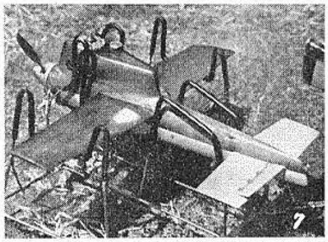
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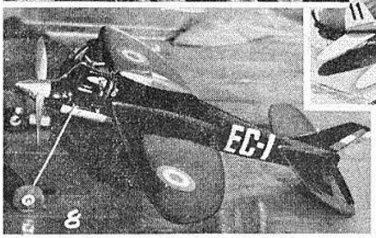

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9


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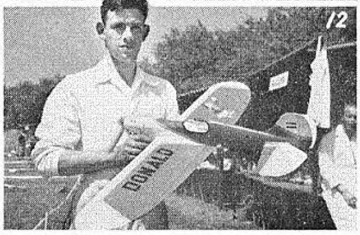
11



12

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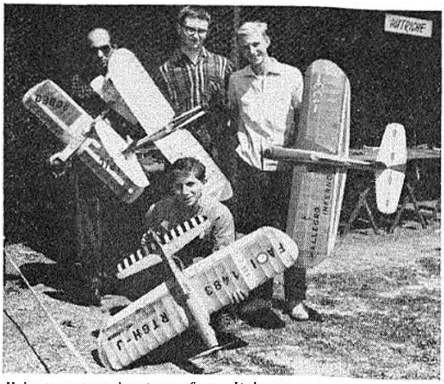


Private enterprise team from Italy was strongest in stunt, using Fox engines and reduced size Palmer "Smoothie" type designs

Thunderbolt, were impeccable through this manoeuvre, which really sorts the men from the boys. Batllo had a terrific "splat" when his up line broke in a snatch turn, his fellow countrymen Pedemonte and the jovial Garcia (using the Miles 5 c.c. to very good effect) had inverted prangs through taking stunts too close in the strong wind, and altogether five models hit the tarmac when their pilots tried too hard to gain points. Egervary from Budapest used a McCoy 36 with balloon tank and had a smoothness of flight pattern that we rarely see in G.B., while for motor runs, the O.S. Max 35 used by Diemer of Germany evoked considerable admiration. In each particular stunt, individual performances shone brighter than the rest. Rieger with his fast pattern after the famous Hewitt Bros. style, completed every loop and eight a bare metre from the ground. Garcia took off and landed on a trike u/c so softly that one could not detect the contact point, Deimer executed F.A.I. horizontal eights as tight as they should be, and the Italian, F. Contini, threw in some Palmer style square outside loops to make up for forgetting the reverse wing-over. But above all shone Stouffs, so smooth, precise and clean in all but the overhead eights.

In team race, our unfortunate start was overshadowed by an incident that will forever be a lesson to two very regretful fliers. Bassett and Gibbs knew they had to beat 5 : 12 on the clock if they were to gain a place in the results. This time (over 30 seconds faster than last year's record) had been set for 10 kilometres by Stouffs at the top of the T/R list and the lilac racer from E. London was the only one on the field that could approach the figure. Most of the 26 entry was Oliver Tiger powered, but few outside of Sweden, Belgium and Spain had the 92 m.p.h. airspeed to match the British Racers. In the decisive heat, Bassett's Oliver stopped after the third hectic tankful and a voice yelled: "you're finished". The two others dawdled on, the time was barely five minutes and during the moment of elation, an ominous glance from the timekeeper/recorder showed that all was not well. It was the 96th lap—four more to go—and Gibbs had left the centre before the race was finished! Thus we were back where we started once more!

After some discourse, it was decided that the three fastest racers should take part in the final, and British hopes were pinned on the second day's session, when Howard and Bassett should be able to pull off faster heats. There were nine racers in the running, all faster than last year's winner, and no less than four of them were Spanish—using ex-Forester's engines and getting a fantastic 60-64 laps on only 10 c.c. of special brew. Like most others, they were adding a "dash" of nitro-benzine to the mixture; but the rest of the fuel was a desirable secret. Came the second day, and tremendous victory. Bassett turned the needle down, and his Oliver cut as it crossed the 100 lap line at 5 : 03 after only two stops. We doubt if 10 kilometres could ever be covered at a faster speed in F.A.I. racing. But the time was not for the leader board. Under F.A.I. Rules, each racer *must qualify* through *two* heats to take part in a final and the earlier debacle was enough to eliminate all British hopes. It was a bitter pill, admirably consumed by our most efficient and charming team manager, Miss Morgan, to whom all credit for pushing us hard into the third Criterium placing.

The Belgo-Spanish final was now a matter for speculation. Stouffs had won stunt, was seventh in Speed and his countrymen looked to him for Victory. A bundle of nerves, poor Henry could hardly locate the squeeze bottle on the vent for the warm-up—when a snap check on tanks was made to see that all was fair. This demoralising move by the organisation, and its effect, though not indicative of any breach of the rules,

Congratulations were due . . . at left to Miss B. Morgan who so capably handled our British team throughout all the trials and tribulations of the contest. Col. Borgniet presents his compliments which were heartily echoed by the participants. At right, Czechoslovakian modelling expert and a leader of the State research Institute offers his congrats to Henry Stouffs, true Champion of the meeting

was clearly evident on the faces of the four Spanish and two Belgian participants. With all found to be satisfactory, at 10 c.c., the race was soon on, and the long range of Gorgocena's jet black model put him nine laps ahead at Stouffs' first stop. Fernandez was unlucky (all the Spaniards had atrocious luck throughout the meeting) and set off under-compressed—which on 60-lap range is a fatal error. Then Gorgocena was down —right into Batllo's hands, and more bad luck, for the prop was broken! Stouffs made it level pegging, then gained another nine laps during the prop-change, and came down again. Now it was up to Gorgocena to gain advantage; but Stouffs made a quick pit stop and his pilot Janssens used all his experience to bring *"Phfft"* into a close first place, only one second ahead.

Speed was a repeat of Florence with lower speeds, and a reshuffle of positions. Smejkal was not well, suffering from the close heat and heart trouble, but nevertheless put up a fine show in holding third place to compatriot Sladky and our "Gadget" Gibbs. The Czechs had the same S.K. engines now adopted by the M.V.V.S. Institute as standard with rear disc, but it is notable that a portside exhaust and crankcase bottom induction are used on Sladky's own motor, clearly the fastest of all 2.5's. His props are marked for static r.p.m. and average 17,300 for a 5¾ in. x 8 in. p. with broad square-tipped blades.

Super Tigre variations ranged from the Swiss Hans Fawer's pressure feed to Hungarian Vitkotitz's rear disc, all sounding crisp and fast in contrast to the deceptive ground running note of the Cater Nipper. Beset by bladders which burst inside fuselages, short runs and slow starts, Gibbs was clearly second to Sladky; but one wondered what might have happened had Batllo not broken both his special engines and been obliged to rely on a standard Tigre.

RESULTS

Speed 2.5 c.c. (13 entrants) Best flt. of 3

1.	Sladky	Czech.	M.V.V.S. 2·5 modified	120·8 m.p.h.
2.	Gibbs	G.B.	Carter Nipper	125·5 m.p.h.
3.	Smejkal	Czech.	M.V.V.S. 2·5 modified	120·5 m.p.h.
4.	Battlo	Spain	Super Tigre G.20J.	115·5 m.p.h.
5.	Vitkovits	Hungary	Super Tigre modified	111·8 m.p.h.
6.	Rautek	Austria	Super Tigre G.20	107·5 m.p.h.

Stunt (17 entrants) Total of Best 2 flts. of 3

1.	Stouffs	Belgium	Fox 35	1763
2.	Rieger	Germany	E.D.246	1617
3.	Breukink	Holland	A.M.35	1600
4.	Diemer	Germany	O.S.35	1536
5.	Egervary	Hungary	McCoy 36	1515
6.	Garcia	Spain	Miles 5 c.c.	1447

Jet (3 entrants)

1.	Gorgocena	Spain	Dynajet	141 m.p.h
2.	Sladky	Czech.	Letmo	130 m.p.h.

Team Race (26 entrants) Best 3 in final. 10 Kilometres

1.	Stouffs	Belgium	Oliver Tiger	5:50
2.	Gorgocena	Spain	Oliver Tiger	5:51

Heat Times

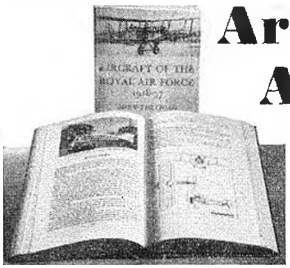
1.	Bassett	G.B.	Oliver Tiger	5 : 03
2.	Stouffs	Belgium	Oliver Tiger	5 : 12
3.	Gorgocena	Spain	Oliver Tiger	5 : 16
4.	Fernandez	Spain	Oliver Tiger	5 : 26
5.	Contini	Italy	Barbini TR	5 : 33
6.	Howard	G.B.	Oliver Tiger	5 : 39
	Pedemonte	Spain	Oliver Tiger	5 : 39
8.	Battlo	Spain	Oliver Tiger	5 : 40

CRITERIUM POSITIONS

1.	Belgium ...	7 points	5.	Austria ...	15 points
2.	Spain ...	8 ,,	6.	Germany ...	16 ,,
3.	Great Britain	11 ,,	7.	Sweden ...	17 ,,
	Hungary ...	11 ,,			

Also: Holland, Switzerland, Italy, Czechoslovakia

Armchair Aeronautics



AIRCRAFT OF THE ROYAL AIR FORCE 1918-57, by OWEN THETFORD. (Putnam and Co. Ltd.) 50s. 528 pages. *Illustrated.*

It is the bounden duty of the reviewer on opening this book to wait until the first flush of excitement has subsided and superlatives no longer dominate his vocabulary, before putting pen to paper, so that his report may be as objective as possible. Such is the initial reaction to this work. It is unique in that it is the first complete historical survey of R.A.F. equipment to be written, and only an author with Mr. Thetford's intimate and extensive knowledge of the subject could have done justice to it.

No fewer than 187 aircraft from the Bristol F2B to the English Electric P1 are included in the main body of the work, and of each there is a photograph, a three-view drawing, a technical specification, and a wealth of information on the origin and variants of the machine, its service history and squadron allocations. The more important types are dealt with unstintingly (sixteen pages on the Spitfire alone), while even the non-production record-breaking types such as the Fairey Long-Range Monoplane and the Supermarine seaplanes enjoy full coverage. In addition, photographs and descriptions of a further 96 aeroplanes of less significance are contained in an appendix, while a second appendix lists those civil aircraft impressed for duty during the Second World War.

The standard of the rather small drawings is generally high, and it is only after prolonged examination that one or two minor errors such as the side view of the Hunter fuselage and the cockpit and sweepback of the Overstrand may be detected. Some readers will find the omission of titles to the drawings an irritation, especially where the variant drawn differs from the one shown in the photograph, but these are small enough faults in an otherwise excellent book. The photographs are well-chosen; some of them, such as the one showing a Snipe in post-war colours and markings, are published for the first time, and typical of the author's attention to detail is the inclusion in the caption where possible of the serial number of the machine and the unit to which it belonged.

The book is sensibly laid out with the manufacturers in alphabetical order and their products arranged chronologically; this, with an efficient index, makes reference a simple matter. It is unfortunate that photographs, at least, of the many experimental aircraft delivered to the R.A.F. could not have been included, but the author has wisely chosen to confine the scope of his book rather than reduce the subject matter on individual aircraft. As it is, the book is remarkably inexpensive at 50s. and owners of this volume will eagerly await Mr. Thetford's companion work on Naval Aircraft.

The author has executed this monumental task with a skill and thoroughness which will bring him everlasting credit, and in so doing has produced a book which is an outstanding contribution to aeronautical history and which will undoubtedly become a standard work of reference. G. A. G. C.

"I don't think much of your sharp edges for combat".

D.H.89a Dragon Rapide

FAMOUS BIPLANES No. 10

By G. A. G. COX

IF LONGEVITY BE a measure of an aeroplane's greatness, then the Dragon Rapide must share with the Douglas DC-3 the honour of being one of the world's major passenger aircraft. For 23 years the Dragon Rapide has graced our skies with its beautiful wings, and it is likely to do so for at least another ten.

It was in 1934 that the first D.H.89 was produced as a successor to the D.H.84 Dragon; the new machine was a much cleaner design, and incorporated the tapered wing form of the four-engined D.H.86. Shortly afterwards the Dragon Six, as it was called, was fitted with trailing-edge flaps to reduce the landing speed, and became the D.H.89A Dragon Rapide. The first machine went to Switzerland as C.H.-287, was re-registered as HB-ARA and is still flying as HB-APA.

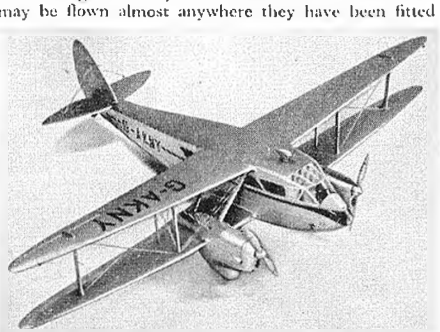
The next five were delivered to Hillman Airways and Railway Air Services, with registrations G-ACPM-R. The Spanish government ordered a batch fitted with bomb rack under the fuselage and forward and rearward firing guns for colonial operations in Morocco. These were formerly G-ADYK, L, M and G-ADYL is currently flying from Fairoaks.

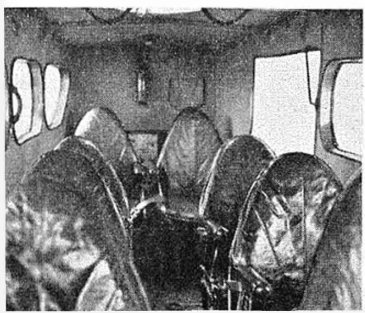
A similar machine, K4772, was built to A.M. Specification 18/35 for a coastal reconnaissance aircraft. This had a gun ring in the roof just aft of the door and a forward firing gun on the right of the pilot's seat. The chief external difference, however, was an extension to the fin which obliterated the characteristic De Havilland tail shape. The trials resulted in a contract for Ansons, and the De Havilland project was abandoned. The machine had obvious value as a communication aircraft, however, and a small number was produced to fulfil these duties, the first of which was K5070. In 1938 more machines were ordered, not only for communications but also as wireless trainers, and these, shortly after the outbreak of war, were named Dominie Marks II and I respectively. 475 Dominies were built, 200 of them at Hatfield and the remainder by Brush Coachworks at Loughborough from 1943 onwards, and these, with the civilian Rapides impressed for duty during the war were converted for civil use when the war ended. When production ended in 1946, an official total of 697 D.H.89A's had been built, but Mr. D. K. Fox, who has made a detailed study of the Rapide, has details of 739-393 D.H. machines and 346 Brush-built.

It may seem strange that an aircraft designed 23 years ago should still be a good financial proposition to the airline operator. One would think that the advance made in aeronautical science since 1934 would have made so old a machine an anachronism and a liability, yet for some work there is no available replacement for the Dragon Rapide.

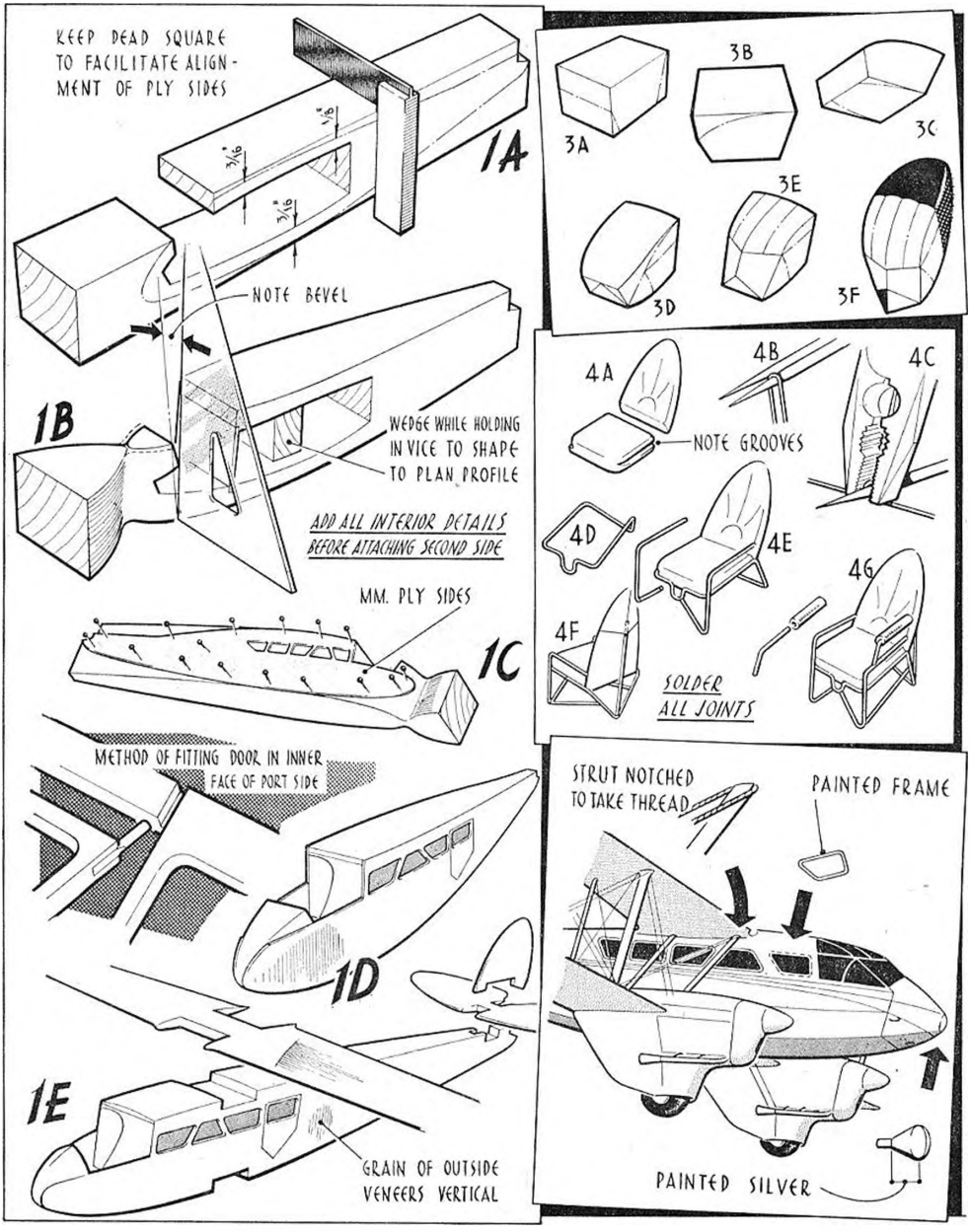
The machine illustrated in the drawing was built in 1943 and started life as a Dominie Mark I, serial R5933. It was converted for civil use in 1948, and after three changes of ownership was acquired by Air Couriers Ltd., in August, 1953, for air charter work.

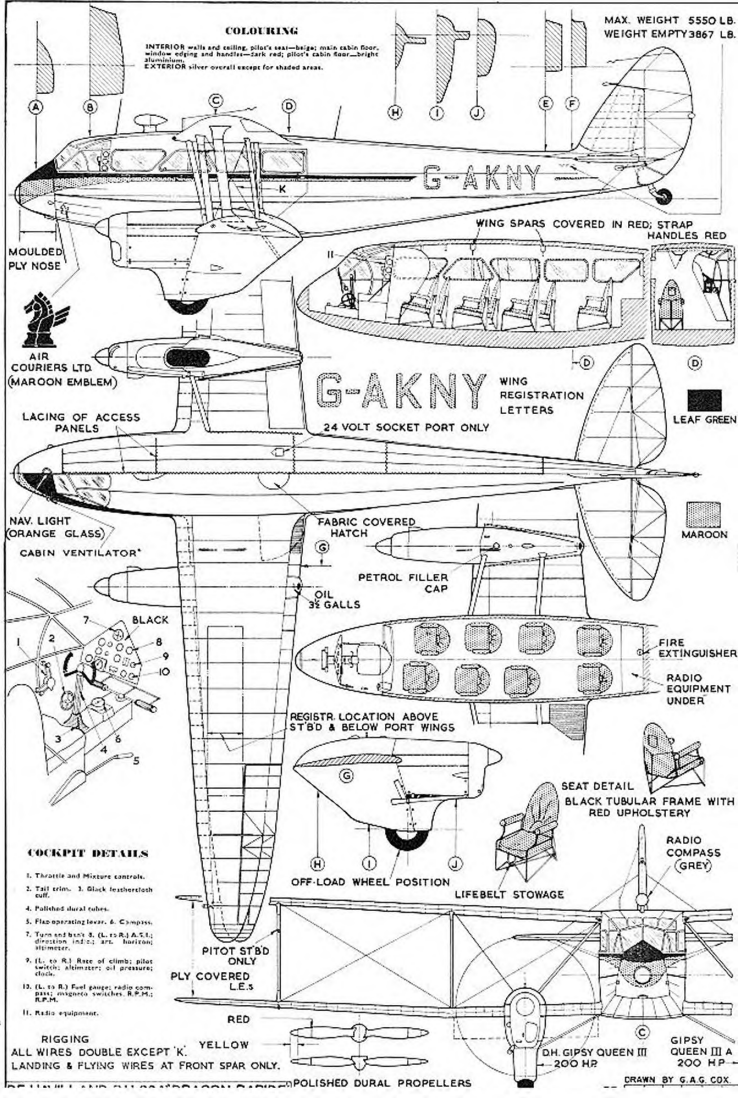
Both—KNY and her sister aircraft—LBI are used by the B.B.C., I.T.A. and the London newspapers for aerial photography and most of the aerial pictures we see published, such as those of the Harrow rail disaster and the wreck of the "Flying Enterprise" were taken through the starboard cockpit window of one of these machines. The use of Rapides in airport control zones is normally restricted because of the absence of special radio navigation aids, but so that these two machines may be flown almost anywhere they have been fitted

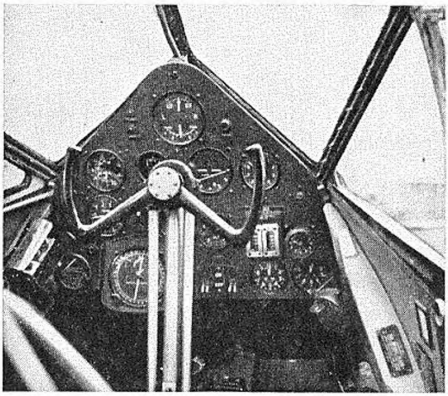




Heading photo taken by B.E.A.'s Chief Photographer shows 'FEZ which used to ply on the run from St. Just to St. Mary's in the Isles of Scilly. Note B.E.A. lettering and Royal Mail insignia. At left, seat detail on 'KNY as modelled by George Cox whose original model is seen above. Realistic finish and fine internal equipment won first prize for it in Concours d'Elegance at the Northern Heights Gala


KEEP DEAD SQUARE TO FACILITATE ALIGNMENT OF PLY SIDES
1A
3/16"
1/16"
3/16"
NOTE BEVEL
1B
WEDGE WHILE HOLDING IN VICE TO SHAPE TO PLAN PROFILE
ADD ALL INTERIOR DETAILS BEFORE ATTACHING SECOND SIDE
MM. PLY SIDES
1C
METHOD OF FITTING DOOR IN INNER FACE OF PORT SIDE
1D
1E
GRAIN OF OUTSIDE VENEERS VERTICAL
3A
3B
3C
3D
3E
3F
4A
4B
4C
NOTE GROOVES
4D
4E
4F
4G
SOLDER ALL JOINTS
STRUT NOTCHED TO TAKE THREAD
PAINTED FRAME
PAINTED SILVER


COLOURING
INTERIOR walls and ceiling, pilot's seat—beige; main cabin floor, window edging and handles—dark red; pilot's cabin floor—bright aluminium.
EXTERIOR silver overall except for shaded areas.
MAX. WEIGHT 5550 LB.
WEIGHT EMPTY 3867 LB.
G-AKNY
MOULDED PLY NOSE
WING SPARS COVERED IN RED; STRAP HANDLES RED
AIR COURIERS LTD (MAROON EMBLEM)
G-AKNY
WING REGISTRATION LETTERS
LEAF GREEN
LACING OF ACCESS PANELS
24 VOLT SOCKET PORT ONLY
NAV. LIGHT (ORANGE GLASS)
CABIN VENTILATOR
FABRIC COVERED HATCH
MAROON
PETROL FILLER CAP
OIL 3½ GALLS
BLACK
FIRE EXTINGUISHER
RADIO EQUIPMENT UNDER
REGISTR. LOCATION ABOVE ST'BD & BELOW PORT WINGS
SEAT DETAIL
BLACK TUBULAR FRAME WITH RED UPHOLSTERY
RADIO COMPASS (GREY)
COCKPIT DETAILS
1. Throttle and Mixture controls.
2. Tail trim. 3. Black leatherette cuff.
4. Polished dural tubes.
5. Flap operating lever. 6. Compass.
7. Turn and bank 8. (L. to R.) A.S.I.; direction indicator; art. horizon; altimeter.
9. (L. to R.) Rate of climb; pilot switch; altimeter; oil pressure; clock.
10. (L. to R.) Fuel gauge; radio compass; magneto switches. R.P.M.; R.P.M.
11. Radio equipment.
OFF-LOAD WHEEL POSITION
LIFEBELT STOWAGE
PITOT ST'BD ONLY
PLY COVERED L.E.s
RED
RIGGING
ALL WIRES DOUBLE EXCEPT 'K'.
LANDING & FLYING WIRES AT FRONT SPAR ONLY.
YELLOW
POLISHED DURAL PROPELLERS
D.H. GIPSY QUEEN III 200 H.P.
GIPSY QUEEN III A 200 H.P.
DRAWN BY G.A.G. COX



with Bendix SCR 269 Automatic Radio Compass, Murphy and Ekco V.H.F. sets, and three other special items of radio equipment. This extra equipment demands a higher electrical output than could be supplied by the usual wind-driven generator, so the port Gipsy Queen III engine has been modified to drive a 1000 watt, 24-volt generator, bringing it to IIIA standard. The only external difference between the two engines is a small cooling air scoop for the generator near the port exhaust pipe. The first Rapide to be so equipped was G-AIDL, owned by Fox's Glacier Mints Co., and others include G-AJHP, owned by Sir Raymond Quilter.

The D.H. 89A is almost entirely of wooden construction, the only structural metal components being the lower wing spars as far as the engines, the engine bearers and struts. The fuselage is ply-covered, as are the leading edges and ailerons, and these surfaces have a further covering of fabric on top.

The rear windows vary according to the internal arrangement, there being an extra window on the port side in some cases. Speeds, too, vary according to the equipment carried. G-AKNY has a maximum permissible speed of 160 m.p.h., and quite a high cruising speed of 130 m.p.h. made possible by the Fairey-Reed propellers specially designed for the Dragon Rapide to give a high cruising speed with a negligible sacrifice of take-off performance.

In 1934 a Dragon Rapide cost £3,750. In 1947 the price had risen to £5,500, but now, depending on condition and engine hours, one may be bought for approximately £4,000.

Building Notes

1. *Fuselage.*—The diagrams are self-explanatory. Do not try to dispense with the spare wood at the nose—the front is very fragile without this strengthening. Short lengths of bamboo fitted in the centre ply of the door make good pivots, but do wax them before glueing, otherwise the door may be fitted in the closed position. Bent wire will make a good door catch. Completely finish the fuselage before attaching the wings, even the colour striping. To attach the windows, hold lightly in position and apply acetone (6d. bottle from Boots, chemists) with a small brush. The acetone will run round the edge of the window softening the acetate sheet so that it will adhere to the fuselage. When filleting the wings, mask the fuselage with cellulose tape just above the windows and down as far as the prominent "stringer". After doping, carefully remove the tape, taking care not to remove the window with it.

2. *Nacelles.*—Make each nacelle in two halves (as described in February, 1957, issue) and carve the wheel recess and the air inlet before glueing together.

3. *Cockpit Cover.*—Follow the steps in shaping the former, checking against the model at every stage. Refer to the article in the June, 1957, issue for moulding instructions, or see the classified advertisements this issue for a ready-made cover.

4. *Seats.*—The diagrams show the construction of a simplified seat. Very little of the underframing is visible when the model is finished, so the modeller could justifiably omit this from the front four seats.

5. *Assembly.*—If a tongue is made at each end of the struts and the tongue at the upper end is very short, the struts will spring into position quite easily. The innermost struts should be a wedge fit against the upper wing fillet. If the landing light is made and coloured as shown, it has the appearance of a glass cover with a bulb inside.

Close up shots of 'KNY taken by permission of Air Couriers Ltd. reveal cockpit and nose detail of value to modellers

Radio Control Notes

Howard Boys

describes an interesting Czech reed outfit built by Jan Hajic whose model and fair helper are shown on the right

The R.C. 6 Contest Model

It is always interesting to hear details of models and equipment from abroad, especially when there is something different from the usual. We have been sent some details by Mr. Jan Hajic of Czechoslovakia, whose girl friend has translated it all into English, and very good it is, too.

The model is of functional design with a large rectangular fuselage, providing easy access to the radio unit and all the other equipment which is mounted inside. The nose is covered with 1 mm. ply. The tail unit is located with dowels, and held on with rubber bands. Tailplane and fin are symmetrical, the section being determined by bending stringers round the spars, instead of using ribs. The wings are Clark Y, in one piece, and held on with rubber bands passing right round the fuselage. The fuselage top is flat, allowing the wings to be slid fore and aft for trim. Spruce is used for the wing spars for strength, the main spar is two pieces 4 x 12 mm. one above the other, an auxiliary spar is also 4 x 12 mm., leading edge 3 x 10 mm. and trailing edge 3 x 15 mm. The wing chord is constant and the tips are solid balsa. The undercarriage uses 4 mm. diameter steel wire with telescopic legs and 4-inch diameter airwheels.

A 5 c.c. glowplug engine is mounted on a bed which is fixed to the fuselage by means of a rubber shock absorber to minimise the effect of vibration, and prolong its service life.

The radio equipment is multichannel on a frequency of 40·240 m/cs., this being modulated by 7 audio frequencies. A seven-reed unit is fitted, though only four reeds are at present in use. The seven tones are 150, 165, 182, 200, 220, 242, 266 c/s. The receiver is conventional, though it uses the modern economy valves. These are similar to the 1T4 and 1S5 valves though with only 25 m/a. heater current each. Four valves are used, but another receiver has been built using only three. The L.T. is 1·5 volts and the H.T. 45 volts, but the receiver will still work with the L.T. down to 0·9 and the H.T. 30 volts. Consumption is 100 m/a. L.T. and 1·1 m/a. H.T.

The reeds are made of 0·5 mm. thick sheet Permalloy, and have a small piece of 0·1 mm. platiniridium sheet soldered about one-third along the reed from the fixed end. The brass contact screws have wolfram tips and the contact gap is 0·05 mm. which corresponds to an amplitude of 0·4 mm. at the reed end. Coil resistance is 2,000 ohms. The reeds operate electro pneumatic valves which control the flow of compressed carbon dioxide to the actuators. The valve coil has a resistance of 2,500 ohms and has a 10 mfd. condenser in parallel. The current flow is 12 m/a. and is supplied from a second 45 volt battery. Current flow through the coil causes the armature to close one hole and open another, releasing pressure from the side of an actuator. The drum-shaped actuators have two rubber diaphragms with a lever between, so that when pressure is released from one side the lever moves over. If pressure is supplied to both sides the lever is centralised, the precise position being governed by positively stopped springs. These actuators are turned out of dural, are just over 1 inch diameter, weigh less

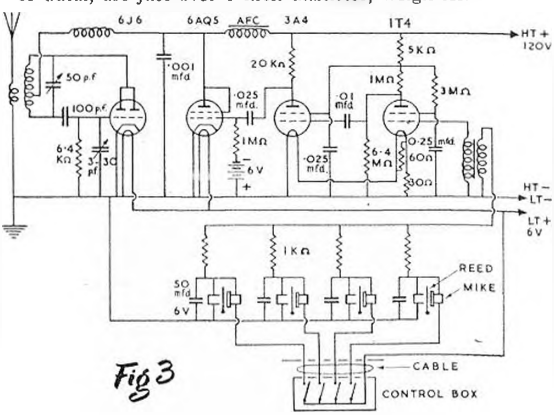
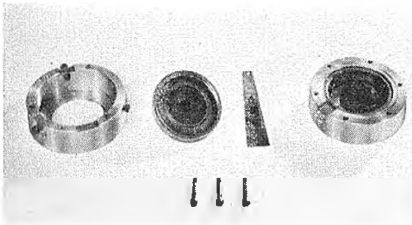
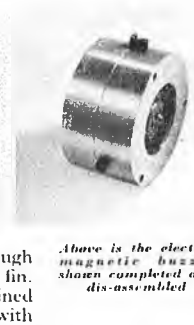


Fig 3





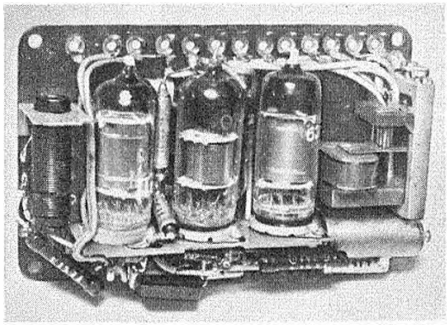
Above is the electro-magnetic buzzer shown completed and dis-assembled

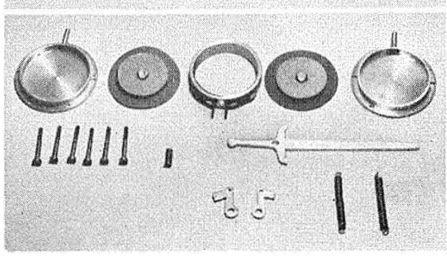
than one ounce, and are therefore small enough and light enough to be built into the tailplane or fin.

The compressed carbon dioxide is obtained from CO_2 "snow", stored in a dural tank with screwed lid. The pressure is limited to 15 pounds per square inch by a safety valve, and two ounces lasts 40 minutes at 16° C., producing 20 litres of gas. Polyethylene tube is used for the gas piping. The weight of the receiver and pneumatic system is a little less than two pounds.

The transmitter is rather interesting, using a mixture of "mains" and "battery" valves, and is shown in *Fig.* 3. Also the tones are produced in an unusual way. Electronic oscillators were considered insufficiently stable, since it was desired to maintain the frequency within an error of 1 c/s. Electro-mechanical buzzers are used, made from microphones and telephones. The diaphragm is removed from the telephone, and replaced by a reed. Both telephone and microphone are mounted in a dural case from which the reed projects. It is then tuned by spots of solder until the desired frequency is obtained. The buzzer voltage is fed through isolating resistors to the input transformer of the amplifier. This uses two battery valves which feed the 6AQ5 mains volve modulator, which anode modulates the 6J6 self oscillator, the two halves of which are connected in parallel. The heaters of all valves are supplied from a 6-volt motor cycle accumulator, and a 120-volt battery supplies the H.T. The output is 0·9 watts without modulation, and 1·2 watts modulated.

A new model, smaller and lighter, is being built, with a lighter receiver using three valves, and operating on 27·12 m/cs. Mr. Hajic is hoping to attend the contests in Moscow and Belgium this year. Surely everyone will wish him good luck with such unusual equipment.

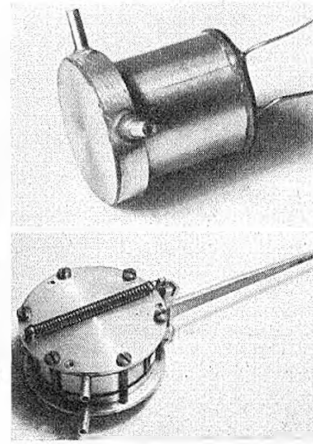




Left is Mr. Hajic's reed receiver with the 7 reed unit on the right

Bottom left shows the various parts for the pressure type diaphragm actuators which are fed carbon dioxide via electro - pneumatic valves as shown top right

An assembled actuator is illustrated bottom right, note the centralising spring and the gas inlet tubes



Crystal Frequency Meter

In May, 1955, a most useful piece of equipment was described, this being a crystal calibrated frequency meter for checking transmitters. One of

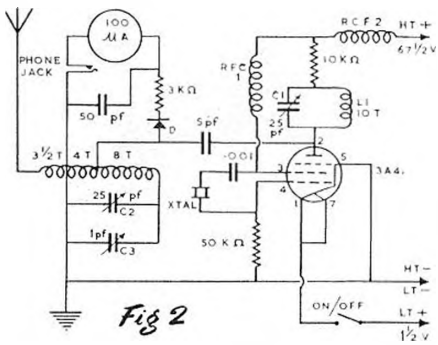


Fig 2

these which did not operate properly has been investigated and though everything was correct to the design, it was troublesome. When the battery leads were plugged in, the meter refused to respond to a transmitter. This was cured by fitting a radio frequency choke in the H.T. positive lead. The 1T4 valve did not produce a strong enough oscillation to give a reading on the meter, but fitting a 3A4 valve with a 10 k/ohm resistance in the anode lead gave results. The operation was further improved by reducing the value of the resistance in series with the meter. The final circuit is given in *Fig.* 2. The writer tried this with two of the ex-government crystals available at 10s. each and the operation was most satisfactory.

The "Galloping Ghost"

Circuit Amendment and Values

WE REGRET THAT the circuit drawing given in our last issue for the Galloping Ghost pulse box was incorrect. In the multivibrator shown the grid of each valve should be connected to the screen of the other as per circuit at right.

Values for the various components were also omitted and are as follows:

R1—15,000 ohms	Rudder Pot—1 meg. linear
R2—100,000 ohms.	Elevator Pot. 100K linear.
R3—5,000 ohms	Valves—3V4's.
R4—Same resistance as relay	Relay—4K to 10K.
C1—·35 mfd.	H/T—67½ volts.
C2—·05 mfd.	L/T—1½ volts.

It should be noted that with this type of circuit R2 should be greater than 1-R1 for the Mark/space ratio to be independent of rate and *vice versa, i.e.*, sufficient time must be allowed for C1 to recharge via R1.

Single or Multi-Channel ? —the official view explained

In view of the confusion current among a section of the R/C world when declaring their entry into competitions, we requested the Technical Secretary of the S.M.A.E. for clarification of the situation. Mr. Nicholls' reply is quoted here in full:

In reply to your letter asking for a clarification of single- and multi-channel radio control, here is the official definition:—

1. *Single-channel radio control equipment is defined as that in which there is a single channel of radio communication. This may be either a single unmodulated carrier frequency or a carrier frequency modulated by one audiofrequency.*
2. *Multi-channel equipment is that in which there are two or more channels of radio communication. These channels may consist of either different carrier frequencies or a single carrier frequency modulated by two or more audiofrequencies.*

As I see it there is no ambiguity in this definition, which is simple and clear, and was adopted by the S.M.A.E. for this very reason.

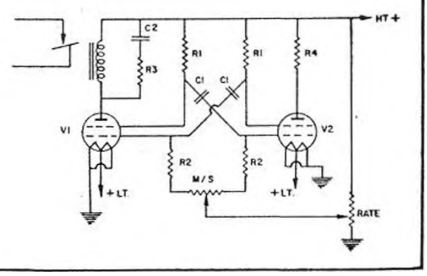
Where modellers have made a mistake is that they have confused controls with channels. If a modeller chooses to obtain two or more controls on a single-channel equipment by the use of a compound escapement, it does not alter the fact that the radio equipment is still single-channel.

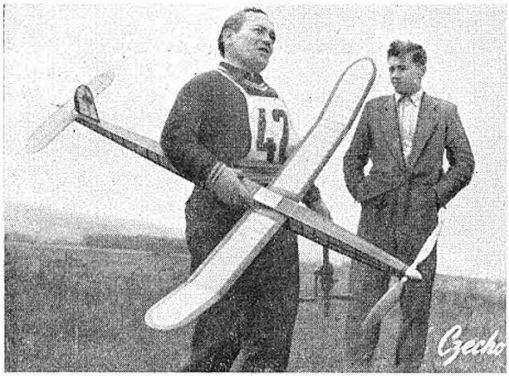
In the opposite case, should a modeller choose to use two radio channels to operate a single control, the equipment is still correctly designated multi-channel.

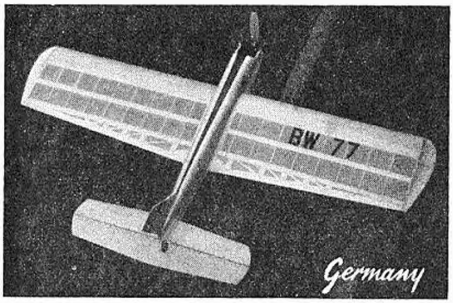
Precisely how the individual modeller makes use of the radio equipment at his disposal is, of course, a matter of personal choice which is entirely up to him.

We trust that this clear exposition settles once and for all the arguments that arise when trying to decide within which category a model should operate during a contest, and relieve the judges from making a decision on matters which are better known to the entrant!

GALLOPING GHOST AMENDED MULTI VIBRATOR CIRCUIT





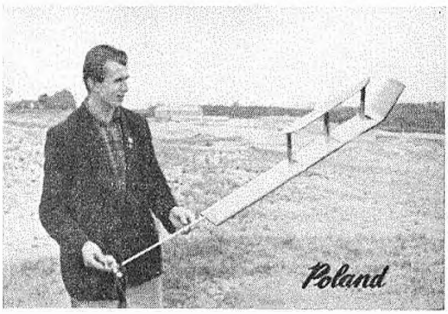


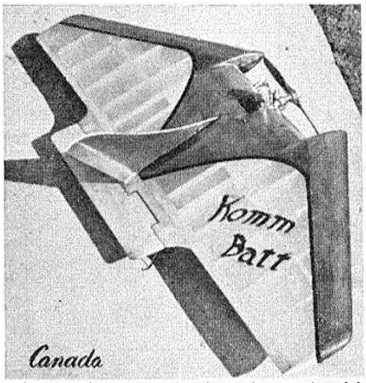
WORLD NEWS

THIRTY-FIVE competitors entered the first Wakefield contest run to the new 1958 rules in **Czechoslovakia** carrying 50 grammes of rubber. Conditions were windy, but nevertheless the winning time of 879—only one sec. short of a perfect total—by V. Mrazek of Ostrava (pic. at top left) shows that the rule change still does not limit flight times as much as was supposed. Sixth place was held with 747 secs. Obviously the prop. is going to be the key to top performance in future Wakefield events, and Mrazek's twin folder was a masterpiece.

In **Switzerland** Zurich was host city to Stuttgart and Lindau from **Germany** in a tri-city contest involving A/2 and power. Stuttgart romped home first in the English-type weather, Werner Hanma leading in power and Jurgen Hinze in A/2, both from that city. Another inter-club event took place at the same time between **Canadian, Dutch, U.S.A.** and a **British** club (Isle of Wight) with Montreal leading in A/1 and the New England

Top left, '58 rule Wakefield winner V. Mrazek was a mere second short of five max's in first Czech 50 g. contest. At right is a 1/8 scale Avia B-60 complete with crop sprayer by J. Pecenka for 2.5 c.c. From Germany is Horst Diemer's OS Max 35 Barnstormer—flown at Zurich and Brussels meetings. From Switzerland is a novel tip tank arrangement by Bruno Schafo of Zurich





Laurie Ellis, famed for deltas has produced his answer to combat for an Oliver Tiger. At right, an Me 109e by Jerry Robinson of California gets away realistically

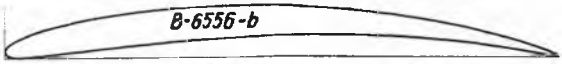
Wakefield Group in A/2. This was the postal contest mentioned earlier in these columns and in view of the interest taken by all parties in this first really successful "decentralised" International, we shall be giving full details next month.

The **Swedish** A/2 team has been selected after a third eliminator at Ljungbyhed over Whitsun. Gunnar Kalen, a member of both the '55 and '56 teams, set a new record by being first to score a perfect 900 secs. in A/2 in topping this third meeting. He will be accompanied by Stellan Knoos, all-rounder Rolf Hagel and Gosta Nilsson who was second in the Nordic Championships last season. Some idea of Swedish flying standards can be derived from the fact that all three free-flight classes at the Ljungbyhed meeting were won with quintuple max's, and all the winners came from the Gamen club.

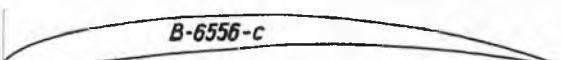
1958 F.A.I. regulations for Wakefield and Power were used for a national contest in **Hungary.** Georges Benedek won the rubber class with 778 secs. and A. Metzner made 900 secs. in power. So much for the new rules limiting the number of maximums! Trials continue for the A/2 team, and the three Roser brothers, Otto, Peter and Norbert, placed in that order, first, second and third at the June 2nd Elim.

Hungary lost a lot of her keen modellers during the political upheaval, among them Geza Vass the stunt expert, now in Austria and Kun the Alag engine designer believed to be in the U.S.A. However, this country is endeavouring to re-establish its international modelling relations, as typified by participation in the Criterium d'Europe and though hampered by lack of supplies, their keenness is exemplary considering the trying conditions.

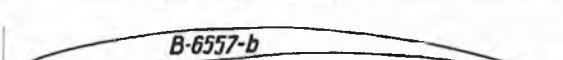
Look for a new name in radio control from the **U.S.A.** Bob Palmer, who helped Howard Bonner during their recent tour of South Africa, has built a *Smog Hog* since his return to Los Angeles and looped on his second R/C flight. By the sixth flight he was doing inverted and up to five consecutive outside loops ! ! Equipment is Orbit 5-channel with rudder, elevator and engine control.



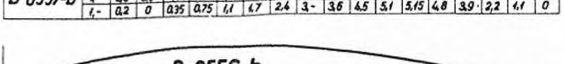
B-6556-b	0	.125	.25	.5	.75	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.5	10.0
	1.-	2.9	3.1	4.25	5.-	5.75	6.9	7.7	8.3	8.75	9.65	9.1	9.25	10.2	6.-	3.7	2.1	0.45
	1.-	0.7	0	0.25	0.4	0.7	1.2	1.75	2.25	2.8	3.3	3.75	3.95	3.8	3.-	1.75	0.87	0



B-6556-c	0	.125	.25	.5	.75	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.5	10.0
	1.-	2.5	3.4	4.6	5.4	6.6	7.25	8.-	8.55	8.95	9.4	8.3	8.75	10.2	5.8	3.55	2.-	0.4
	1.-	0.25	0	0.2	0.45	0.75	1.3	1.8	2.35	2.7	3.35	3.8	6.-	3.8	2.85	1.6	0.8	0

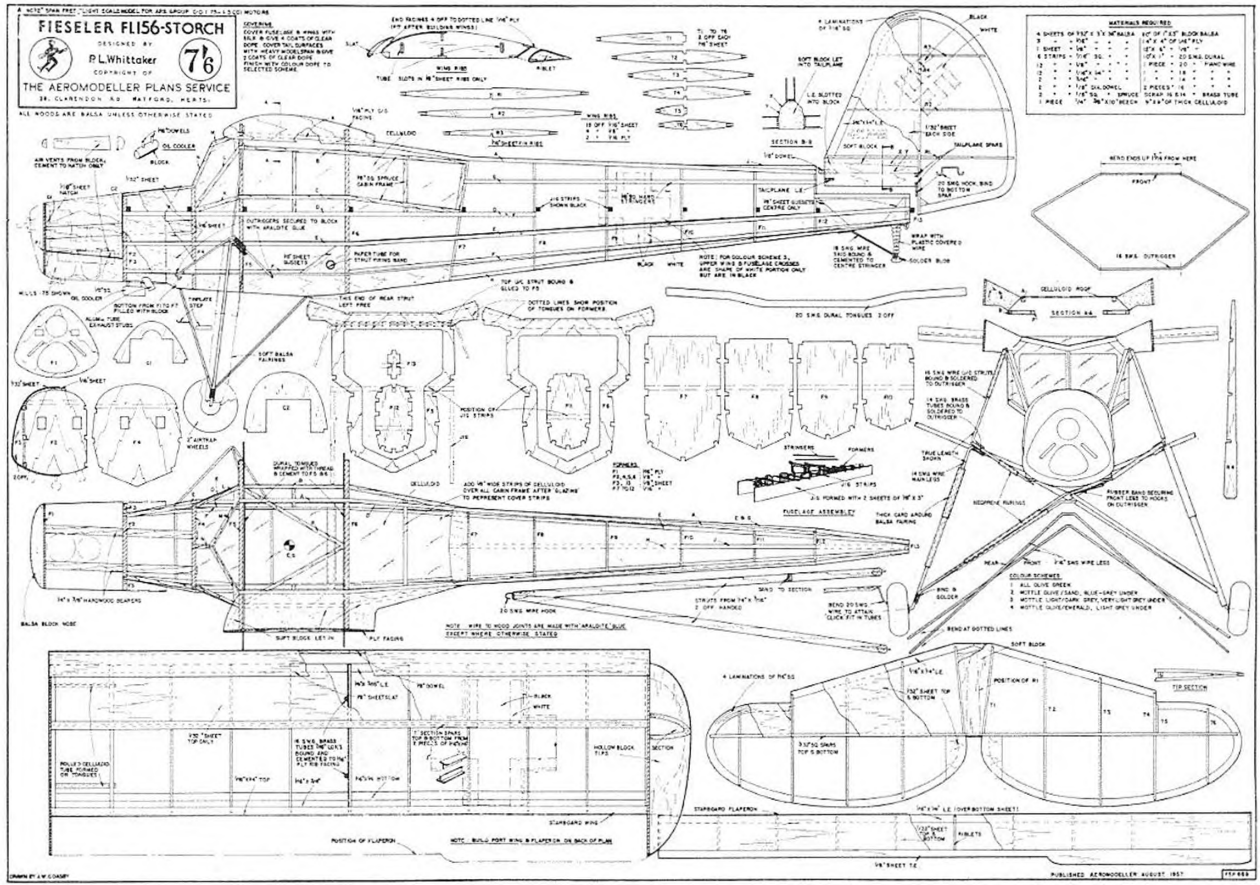


B-6557-b	0	.125	.25	.5	.75	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.5	10.0
	1.-	2.6	3.5	4.6	5.5	6.35	7.5	8.4	9.15	9.65	10.-	8.9	8.2	6.-	6.-	3.55	2.-	0.5
	1.-	0.2	0	0.35	0.75	1.1	1.7	2.4	3.-	3.6	4.5	5.1	5.15	4.8	3.9	2.2	1.1	0



B-8556-b	0	.125	.25	.5	.75	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.5	10.0
	1.1	3.-	4.-	5.3	6.3	7.-	8.25	9.15	9.75	10.2	10.5	10.2	9.35	8.2	6.4	4.-	2.5	0.6
	1.6	0.3	0.1	0	0.2	0.4	1.-	1.5	2.1	2.5	3.2	3.75	4.-	3.9	3.2	2.-	1.1	0

At left, two McCutcheon type flying machines that have flown high. Note lack of balance bar on Polish variant and opposite rotation. Zdenek Kaleb from Czechoslovakia created a 7:08 record with his. At right are Georges Benedek's latest airfoils for Wake, A/1 and A/2 classes. Each has an allowance for normal blunt edge T.E.s



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For super realism in flight build this 1/12 scale model of the famous German observation aircraft for ·75 - 1·3 c.c.

FIESELER STORCH

by P. L. Whittaker

THIS AIRCRAFT IS stark, ugly, purely functional and t possesses that peculiar charm and personality of a retired heavyweight boxer, complete with cauliflower ears and broken nose. It is a design with a fascinating history that lends itself ideally to aeromodelling, and Pete Whittaker has embodied some of his ideas incorporated in the very popular Spitfire 14 (A.P.S. Plan FSP/607). The Storch is easy to trim and fly, with characteristics close to the full size. Gliding speed is slow and weathercocking ability unusually good.

Fuselage construction involves a jig as shown on plan. Pin all formers to temporary carriers and mount on jig, spaced in line, and at correct height. Add hard balsa stringers, spruce cabin frame after cementing wing tongues to formers 4 and 5.

Formers 7, 8 and 9 may be hollowed and harder balsa can be generously used forward of the centre of gravity. When the skeleton has become self-supporting, remove from jig.

The undercarriage outriggers should now be bent into shape, bonded into position with Araldite or similar strong adhesives after "blocking in" forward fuselage belly. The top u/c strut can now be formed and "Araldited" to F4. Bind and solder the intersection of the top strut with outrigger and main leg tube on each side. *Note:* Add oil cooler and exhausts *after* covering fuselage.

Paint cabin interior matt grey, glaze windows with stiff celluloid. Form window frame from ¼-in. strip celluloid and cement into position to cover spruce frame. This secondary frame will be painted later and conceal any cement bonds.

Main oleo struts are formed in 12g wire and pivoted in the brass tube soldered on to rear tower outrigger strut as shown on plan. Thus the legs will move back and outward under landing shocks, supported by rubber bands round u/c strays.

Fin and elevator profiles are formed on a cardboard former cut to accurate shape. Assemble mainplanes (minus slats and flaperons) on the plan. Next cut 4 *full* ribs (including flaperon) in $\frac{1}{16}$-in. ply, and cement to each end. At this stage, add wing tip blocks and root fairings. Now built flaperons by cementing "riblets" direct to $\frac{1}{16} \times \frac{1}{4}$ L.E. and $\frac{1}{32}$ in. sheet lower surface, sand T.E. and cement upper $\frac{1}{32}$ sheet in position. Slats are formed wet on a broom handle and attached to $\frac{1}{8}$-in. dowel L.E. The assembly is tissue covered. Cover the entire model excluding slats and tail (tissued) with silk or nylon, well tautened with glider dope—then attach slats and flaperons. Note the reflex T.E. position of flaperon.

Cut wing struts to length for dihedral of your choice (1¼ in. at tips is sufficient with care in trimming). The struts are plugged into a paper tube across the cabin floor and drawn together by a rubber band, each plug being formed as a hook.

Authentic mottled finish can only be obtained by spray painting, but this can be executed easily with a "Celspray".

Flying

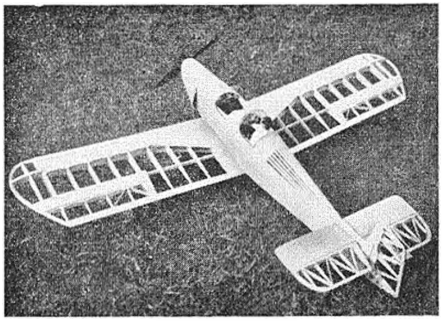
Ensure that the C.G. is on mainspar and set the tail assembly to give long flat glide. The tail assembly should now be cemented into position and a flight attempted on reduced power using an 8×4 plastic prop. Set engine offset to give very slight turn to starboard at this power.

A flight at full power should result in a short straight take off, followed by a climbing turn to port.

Rate of climb can be controlled by reducing, or increasing downthrust. By this method, a 50-inch take-off run (in still air) is followed by a typical Storch-like steep climb. Development flying on the prototype was completed using only two bolts to retain the motor. At this stage the remaining holes were drilled in the bearers and bolts screwed home.

The absorbing sight of this Fieseler clawing for altitude (using only a newspaper spread as a runway) will be ample reward for your labours.

Prototype in authentic North African campaign colours is realistically posed with dummy wheel chocks in these two photos. A Mills .75 will hoist the model off the ground in almost its own length, just like the full-size observation craft. Jig construction for the unusual fuselage cross section makes assembly a simple matter



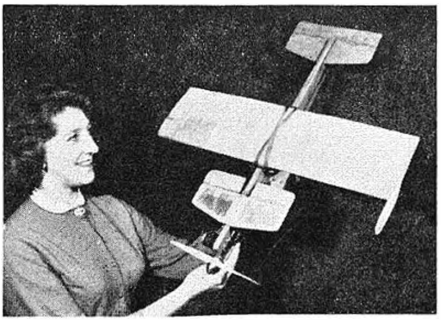
Model News

WE START this month with the attractive framework of a scale Druine Turbi by W. Lister of Kendal. Drawings were prepared from the 1/72nd original in August, 1955, issue, and the model started before we introduced the smaller single-seat Turbulent into A.P.S. The Turbi is 38-in. span, has a Mills ·75 and is fitted with a pendulum-operated rudder . . . and, by the way, the picture was taken by a Box Brownie—which just goes to show how you do not really need a super-duper f.1·8 focal plane Espresso to get good model pics. Not that we advise grass backgrounds—Mr. Lister has been lucky in this framework view.

A nicely posed Tiger Moth in the next photo was submitted by G. B. Willett of Lichfield. He likes big models and usually makes gliders of 8 ft.-9 ft. span so it is only natural that this solid is on the large side with a span of 21 in. (½ in. to 1 ft.). Photo was taken indoors with one 100 watt lamp 6 ft. from the subject and 15 sec. exposure at f.22. For the next view, also taken indoors and using faster speed to arrest possible movement (1/10th at f.5·6 with a pair of No. 1 Photofloods) we are treated to a combat hybrid by Keith Simmons of High Wycombe. The young lady is his sister. Said to fly satisfactorily, the twin tail, twin elevator model needed an A.M. 35 for respectable speed, but lack of wing area hampered its stunt performance. Note that we speak in the past tense, for it suffered an inverted landing which neatly removed the fore-plane. The picture caption reads "Designed, flown and burned by yrs. truly, who also did the photography".

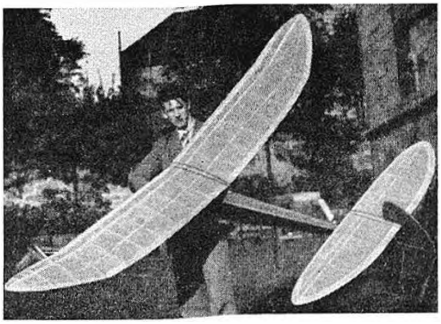
Graham Munro of Edinburgh is the man sheltering beneath the vast area of an A.P.S. *Leprechaun* in the next view. Graham is highly delighted with this huge glider, decorated with red fuselage and yellow flying surfaces. We hope he has managed to get the Scots twine-makers to provide him with some extra-strong towline for flight tests.

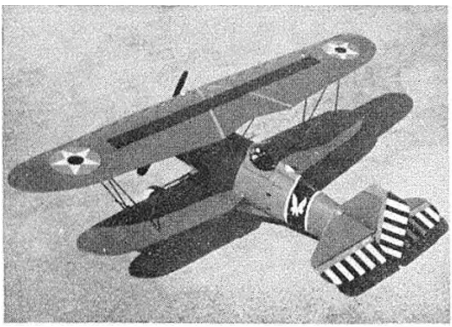
Over now to the next page and also to the Island of Malta, G.C., where aeromodeller Joe Putt made the Curtiss Hawk P.12E for control-line. It was



not made from the A.P.S. plan for a 36-in. version, but is similar in most respects to Don Deeley's original. These Hawks make a most attractive c/l stunter and we wonder why we see so few around the model meetings. With plenty of colour and scope for fancy decoration, they are a "natural" for Concours d'Elegance.

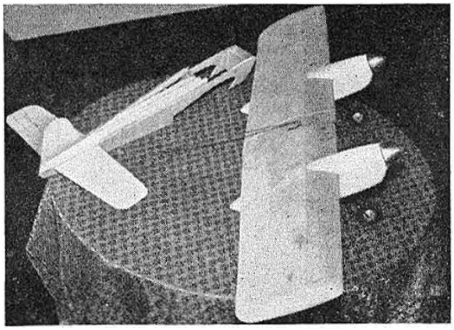
The next photo, of an unfinished model, is rather a departure from our normal run of pics. and has a special purpose. The model is known as the "Venture" and was made by C. Hollowood of Nantwich, photo taken by Clifford Kendall of the same town. In its completed form the Venture





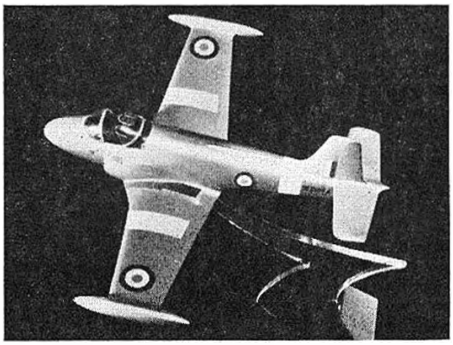
took first place in its class at the Northern Models Exhibition at Manchester and another photo sent along shows how well such a prize was deserved.

The object in showing the uncompleted model is twofold. Firstly, to display Mr. Hollowood's ingenuity in using a perfectly standard Mercury Monarch kit model wing, sheeted over and without the flaps, and secondly to show how one can devise a simple twin engined structure with attractive semi-scale nacelles built on to the wing which is then mounted under the basic fuselage. Why not try one yourself? Two A.M. 25s power this "Venture" and although speed at 56 m.p.h. is no greater than single engine performance there's never any bother with slack lines or lack of power.

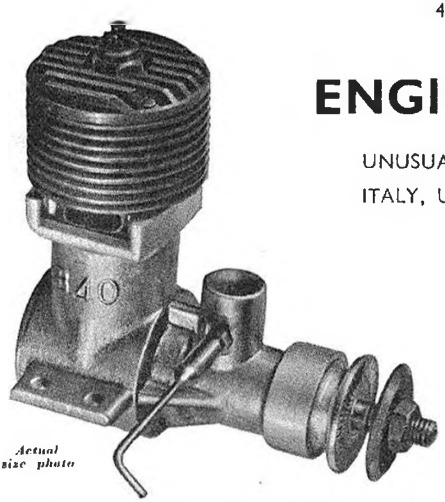


Latest variant of the Hunting-Percival Jet Provost III is seen in the solid model built by Mr. Johnson, a test pilot at Lee-on-Solent. Tip tanks and a one-piece blown Perspex windscreen are obvious modifications and we must congratulate Mr. Johnson on his fine modelling. Scale is 1/48th and the model is now used by the sales department of Hunting-Percival to show prospective customers what their Mark IIIs will look like.

For several seasons the name of the O'Donnell brothers has been so closely linked with Wakefields and A/2 contest models, it comes almost as a surprise to hear of John flying a power model. We know that he has been flying off and on with his o/d pylon design for some time, but recently (including the British Nationals) John has come to the fore in the power results sheets. He uses two models, and his number one is a Norman Marcus design, the *Eureka* seen at bottom left. Note the O'D. mods. which have worked their way into the wing and tail structure. Those diagonals are distinctly *a la* Borderline, and the 12½-ounce all-up weight shows that John is still saving the grammes. An Eifflaender 2·5 c.c. weighing a mere 3¼ ounces provides the necessary urge . . . and that's enough to take it high enough for a max each time if there is any lift to be found. Incidentally, John was flying his power job between glider flights at the A/2 trials, and we noted that for visibility the tip panels are vivid Dayglow cerise . . .can be seen across the width of an airfield.



Now a word of advice on the subject of readers' photographs. Our daily postbag brings a steady flow of pictures ranging from "my boy John's (aged 11) first 3s. 9d. scale kit model" to so-and-so's KeilKraft Junior 60 after its 1,000th flight. Now whilst we would be the last people to discourage individual enthusiasm to see one's work in print, we must ask prospective "Model News" contributors to make sure (*a*) that their subject is newsy, preferably unusual; (*b*) that the photo is at least 6 in. x 4 in. glossy black and white, or accompanied by the negative; and (*c*) that it is packed well with stiff backing. All published photos earn a reproduction fee.



Actual size photo

ENGINE ANALYSIS NUMBER 38

UNUSUAL GLOWPLUG ENGINE DESIGN FROM ITALY, USING ROLLER BEARING SHAFT & CON-ROD

BARBINI

B. 40. T.N.

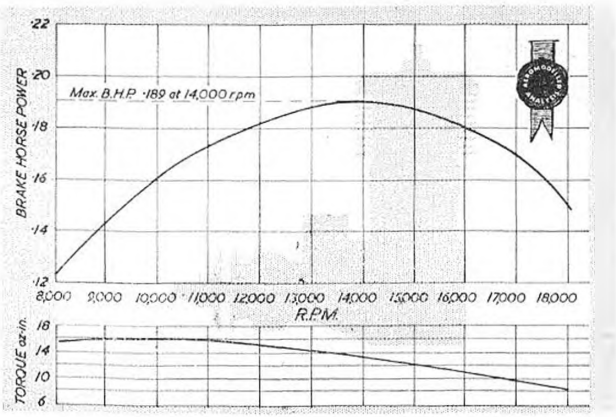
reviewed by R. H. Warring

IN MOST RESPECTS the larger B.40 is similar to the 1 c.c. Barbini diesel (May issue) scaled up. Main point of difference is the use of roller bearings for the crankshaft and the big end.

The power curve peaks appreciably earlier than one would expect for an engine of this class, the effect of piston friction being to flatten the curve out as speed increases. The B.40 has all the attributes of a high speed engine with, like its smaller brother, the highest possible attention paid to interior workmanship and again a rough exterior. The only possible criticism of it as a design is that it is a modified diesel layout (using the same crankcase as the 2.5 c.c. Barbini diesel) with diesel porting not often the best possible arrangement for glow plug running.

Main interest in the B.40 centres around the main bearing and the big end bearing. The front bearing of the crankshaft is a conventional ball bearing, located by a circlip. The rear main bearing is a caged roller assembly, consisting of twenty diminutive needle rollers mounted in a properly fabricated brass cage. These needle rollers run on the hardened shaft and a hardened outer ring pressed into the crankcase casting.

The reason for choosing a roller race here is a little obscure as the radial load is within the rating of standard ball bearings and the best of roller races normally have many times the friction of a good ball race. Certainly, also, it offers no benefits as regards oil sealing. The plain length of the bearing is generously oversize with regard to the shaft diameter (it appears to be a standard bronze inserted bearing as used on the plain bearing crankcase unit, drilled out) and there is appreciable oil leakage from the front end when the engine is running.



SPECIFICATION:

Displacement: 2·5 c.c. (·152 cu. in.)
Bore: ·574 in.
Stroke: ·590 in.
Bore/Stroke ratio: 0·95
Bare Weight: 4¼ ounces
Max. B.H.P.: 189 at 14,000 r.p.m.
Max. torque: 16 inch-ounces at 9,500 r.p.m.
Power output: ·0725 B.H.P. per c.c.
Power/Weight ratio: ·04 B.H.P. per ounce

Material specification:

Crankcase: Gravity die casting in light alloy
Cylinder: Hardened steel
Piston: Cast iron
Connecting rod: Hardened and tempered steel
Big end bearing: Cageless needle rollers
Main bearings: Ball race (front) and roller race (rear)
Crankshaft: Hardened steel
Propeller drive washer: Aluminium, mounted on split collet

Similar size needle rollers are used for the big end bearing, this assembly being cageless and retained on the crankpin by a thin steel washer and a circlip.

As in the 1 c.c. diesel, the connecting rod is machined from steel, hardened and tempered, with a hollow gudgeon pin retained in the piston by spring wire circlips; the piston is again of cast iron, but the top is castellated to give four angled deflector faces corresponding to the port positions cut in the cylinder. This is a convenient means of altering porting in individual engines.

The cylinder is similar in construction and port arrangement to the 1 c.c. diesel, but with a somewhat greater overlap on the transfer. The transfer ports appear to have been formed in two operations —first a slot cut and then re-worked upwards at an angle by an end cutter with the cylinder rotated. Taper relief at the bottom of the bore is less than normal (the liner had not been honed after grinding), leading to the stiffness previously mentioned, but piston-cylinder fit was otherwise exceptionally good, with a higher compression than is usually found on a glow motor.

The cylinder seats on to a flange on the crankcase casting, that on this particular example having a moderate finish. The cylinder jacket is of dural, sliding over the top of the cylinder and sealing by a copper and brass gasket in the head. Four hold-down screws passing through the cylinder jacket into the crankcase casting then hold the cylinder unit in place. In this instance, the holes are asymmetrical and excessive tightening of these screws was found to cause some distortion of the cylinder. However, no trouble was found with the liner rotating. So it was not necessary to assemble very tight.

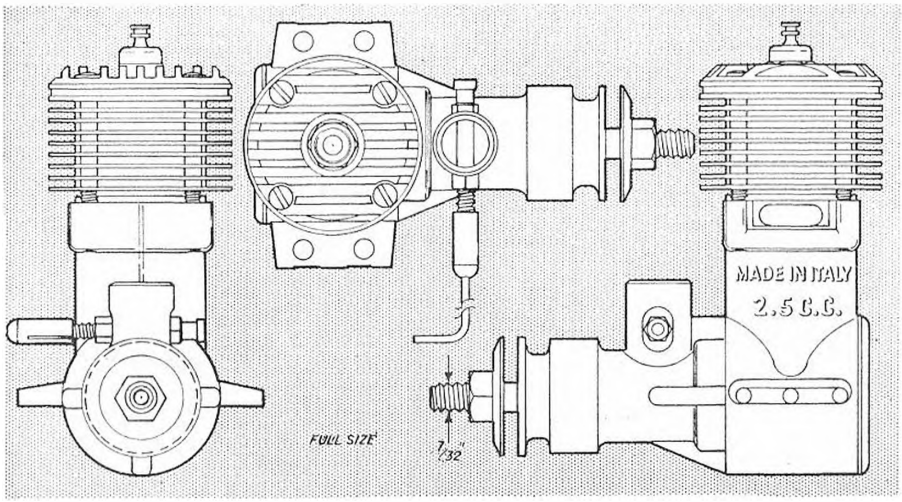
Propeller Test Data

Propeller dia. x pitch	*r.p.m.*
8 x 6 (Stant)	9,600
8 x 4 (Stant)	12,500
8 x 5 (Stant)	11,200
9 x 4 (Stant)	9,400
7 x 6 (Stant)	12,400
7 x 4 (Stant)	13,900
6 x 4 (Stant)	16,400
6 x 4 (Frog Nylon)	18,000
8 x 5 (Frog Nylon)	10,500
6 x 9 (Tiger)	12,900
8 x 3½ (Tiger)	14,000
8 x 4 (Tiger)	13,000
9 x 3 (Tiger)	11,100

Fuel used: Standard 2 : 1 methanol : Castrol M plus 20% Nitromethane.

The crankshaft is a heavy unit (1 ounce), stepping down from 8·5 mm. (·334 in.) diameter to 5 mm. (·1964 in.). The crank web is a full ¼ in. thick, relieved at the crank pin side by two cut-outs drilled through for lubrication passage. The crank pin (4 mm. (·1575 in.) dia.) is unusual in that it is pressed into the crank web after hardening, which operation appeared to have generated a couple of cracks in the top of the web in our first (oversize) test engine.

The B.40 is easy enough to start, after generous priming with the needle valve open a turn or two past the running position. The needle can then be closed down for best running, there being ample time to recover without the engine stopping if the needle is inadvertently closed too much. At the lower speeds, power markedly drops off as the engine warms up and 6,500 r.p.m. is about the lower limit of speed at which consistent running can be maintained. The ability to run consistently and smoothly increases with increasing r.p.m. Propeller tests were continued up to 18,000 r.p.m. (6 x 4 Frog nylon propeller) with hand starting readily achieved in all cases. *Continued overleaf*



ENGINE ANALYSIS. Vibration caused by an unbalanced propeller can become a problem above 15,000 r.p.m., requiring trial-and-error positioning of the prop. to achieve satisfactory results. The cylinder gets extremely hot after a short running time and the engine normally runs quite "dirty".

Various fuels are recommended by the manufacturer: a 2 : 1 methanol/castor mixture for running in, increasing to a 3 : 1 proportion for normal running. For "performance" work a 2 : 2 : 1 mixture of methanol, nitromethane and castor is specified.

The makers recommend 40 per cent. nitromethane and the 12·5 per cent. nitrobenzene for a competition fuel. No trouble was experienced with the original glow plug (a pleasant change, this, with foreign plugs), although it did have a tendency to leak unless tightened up really hard against its copper sealing washer.

Summarising, a most interesting design, beautifully engineered internally. The 2·5 c.c. Barbini is, of course, the engine which surprised nearly everyone by placing third in the 1956 World Speed Championships; and speed control line is, of course, the real test to sort out the best from the "indifferent". The engine used by Cellini had been subjected to some revision of the intake and transfer port areas and a lightening of the reciprocating parts, but otherwise was a standard model.

When originally tested, the B.40 was found to be over capacity. The manufacturers have since modified our test example and the capacity now stands at a marginal 2·5 c.c. with no change in performance. Those who own earlier Barbini B.40 engines can have capacity certified by returning their engine to the manufacturers.

What's the answer?

About running-in a new motor

We've had a lot of arguments in our club on "running-in" a new motor. Fred Johnson—he's our top power expert—believes in treating them rough, drops metal polish in the intake during the run-in period and claims his engines are fully run-in in about ten minutes. Paul Drake—he's an engineer by trade—says that is the quickest way to ruin an engine. He says the only way is long periods of steady running and considers at least five hours necessary to break-in an engine properly. What's the answer?

"When the fat sizzles he knows the engine is overheating!"

★

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

★

"Bert flogs his engines something cruel."

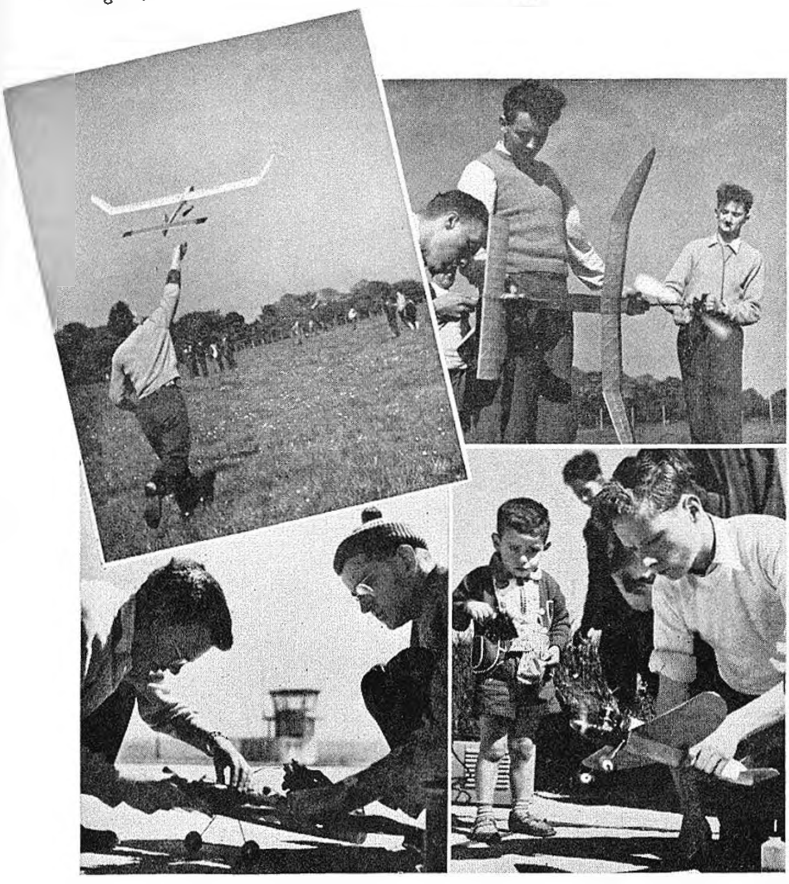
ANSWER: There are no hard and fast rules on running-in a new engine. So much depends on how the engine is made, and how tightly it is fitted. The two rubbing surfaces which have to be "bedded down" to fit are the piston and cylinder, and the main bearing. A ball race engine should have the shaft set at a proper running fit to start with, so should need less running-in time.

You *can* use metal polish to accelerate running-in a plain bearing engine if it is really stiff, *provided* you only inject polish a little at a time with the engine *running*. This makes sure the polish is all thrown out of the engine again. But never use an abrasive running-in compound if the engine is just "motored" (*e.g.*, driven by coupling to an electric motor); or on a ball bearing engine.

On plain bearing engines, when properly run-in the main bearing will be cool to the touch. All the while this bearing is hot it means that it has high spots and is generating excess friction. You cannot judge the piston-cylinder fit by the temperature, only by the fact that it obviously overheats and slows down if the fit is too tight. All the time an engine shows these symptoms, don't try to run it fast for long periods, but it is not properly run-in until it will hold a high speed *consistently*.

Patience is always rewarded with a good engine if you take matters carefully, run with a rich carburettor setting for the initial break-in and always make sure your props are in true balance.

"If there's any running-in to be done at 3 a.m.—I'm the one to do it m'lad".



Irish Model Meeting

Top Left. Nial Corewell (P.A.C.) launches Liam Murtagh's 3 - year - old glider for its third flight, when it went o.o.s. without a d/t gaining first place.

Top right. Corewell's Wakefield team in action but to no avail, as the rubber snapped, all but wrecking the fuselage. Charlie Walker is fixing up the d/t. White and Murtagh hold on.

Bottom left. Johnnie Carroll, Shankhill M.F.C. and Peter Mailleille (woolly beret) shared a depressing afternoon by failing to start either A or B entry engines

Bottom right. Bambino Romano Morelli forgets about being a cowboy as he intently listens to the tone of an E.D. 2.46 powered "A" job being run up.

REPORTED BY
G F. WOODWORTH

IN GALE FORCE WINDS and bright sunshine at Baldonnel Aerodrome, Co. Dublin, the Phoenix A.C. opened the model flying season with their annual gala, with Class A and B team races on Saturday, May 25th, and Wakefield, Glider and Power on Sunday, 26th.

Due to the high wind there was more than the usual crop of prangs in the team races, the most spectacular being D. Woods, P.A.C., whose Class B entry snapped both lines and disappeared along a runway at a colossal rate. Both plane and engine were completely wrecked, which was more than unfortunate since this team had obviously practised thoroughly and would have been difficult to beat.

Class A heats eliminated all models flown by inexperienced pilots, sick motors could not cope with the wind and models came in on the lines. The first two to finish flew extremely competently throughout leaving no doubt as to the result.

Sunday's f/f events had similar weather at the Phoenix Park, Dublin. Glider times were poor, due largely to the difficulty of freeing the models from the towlines. The launching site was 50 yards downwind from trees giving considerable turbulence. The only max. was recorded by Liam Murtagh, P.A.C., on his third flight, the model going o.o.s. after 3 mins. 50 secs. This three year old model was flown well and in perfect trim though looking the worse for wear.

The power boys had obviously not been making use of the calm conditions during the previous week for trimming as at least three models were too badly damaged on their first flight to continue into the second round. Tony Morelli came down in the farthest trees from take-off after a 2½-min. flight, making the fourth of his models this month to "sleep out".

Motor after motor exploded in the Wakefield contest, to the glee of the spectators. All models in this class were immaculately built, but with the top fliers out of action, and the remainder flying on about half turns it was an empty finale to an otherwise hectic contest.

RESULTS

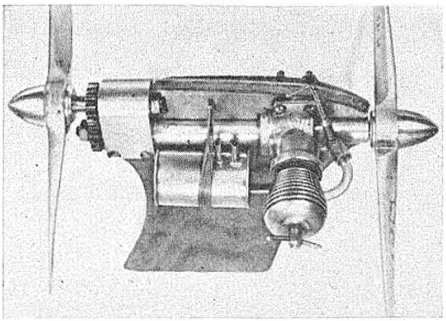
Class A Team Race
1. T. Morelli
2. D. Brown

Class B Team Race
T. Morelli

Glider
1. L. Murtagh
2. B. Coleman
3. P. Carroll

Power
1. S. Elder
2. T. Morelli
3. N. Corewell

Wakefield
1. L. Murtagh
2. D. Brown
3. T. Morelli



KNOW YOUR ENGINE

PART TWELVE

Choosing the Propeller

Two props to choose for this German WAFA experiment with contra-rotating pusher on a rear shaft-driven gearbox

SELECTING THE BEST propeller for a particular engine to go with a particular model can be a very complicated business, if you take into account all the theoretical aspects involved—or just a simple case of "cut and try", using a number of different propellers until you find one which gives the best results. Neither method on its own, however, guarantees that you will get the best possible results. Whatever propeller size may be worked out as being the best possible for a particular design case still has to be proved in practice, and there are so many factors which can affect the result that the finer details can only be worked out by practical tests.

Fortunately, this does not apply to the majority of power models. For everyday or "sports" flying, in fact, the modern engine is far more powerful than it need to be for the job, so if the propeller efficiency is low it does not matter. It may even be a good thing in that it makes the model that much more docile to handle.

Since practical results are what we are after we do not propose to go into the theory of propeller design and performance but only touch on those aspects, important for an understanding of how to compare and select different propeller sizes. For those interested in the theoretical side we recommend a study of the books and more technical articles previously published on the subject. We would emphasise, however, that full size propeller theory does *not* hold good in model sizes, particularly where small diameter propellers are concerned. Propeller efficiency appears to drop alarmingly once propeller diameter is reduced to about six inches and below. It appears, in practice, that much of this loss of efficiency can be recovered by increasing the pitch of a small diameter propeller. This would appear to indicate that, in the smaller propellers at least, much of the useful work in producing thrust is done by the *back* of the blade rather than the front or upper surface of the blade (aerofoil) section. Hence blade section seems to become less important as propeller size diminishes, except for the general rule that the greater the thickness of the blade section the more drag it has and thus the more power it requires to rotate it.

The pitch of a propeller, as quoted, is more often than not an arbitrary figure. Pitch is measured on the assumption that a propeller acts like a screw. Rotate a screw in a matching nut or screw thread and it will advance into (or out of) the thread a distance equal to the *pitch* of the thread in one revolution. In this case there can be no slipping between the threads, unless they are stripped, and so the pitch is clearly defined.

Pitch	Hub Thickness
4	·25
5	·32
6	·38
7	·45
8	·51
9	·57
10	·64
11	·70
12	·76
14	·89

All dimensions in inches.

TABLE I. Pitch as a function of propeller hub thickness for blade layout as Fig. 3

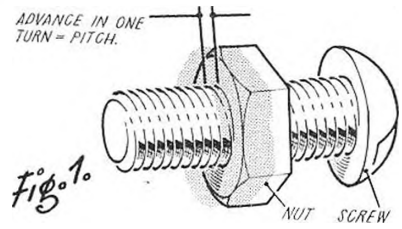


Fig. 1.

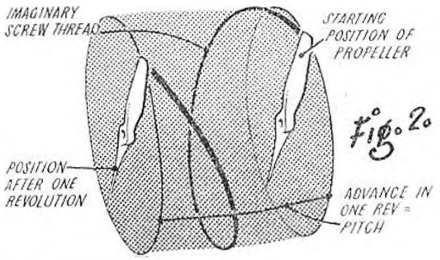


Fig. 2.

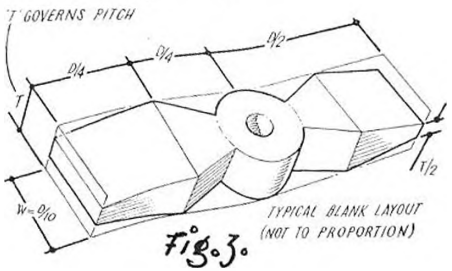
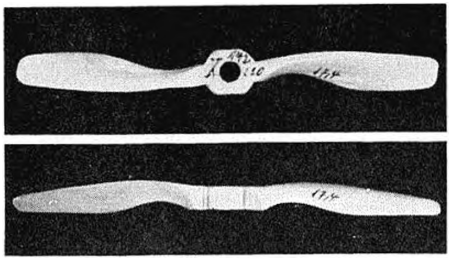


Fig. 3.



Fastest prop in the 2.5 c.c. class at the Criterium d'Europe was this 142 x 220 mm. (5⅝ x 8 21/32 in.) Czech Modelling Institute special used by Josef Sladky (see p. 416). Static r.p.m. is marked as 17,400, which gives some idea of the terrific power of his engine. Blades are trimmed at the root for r.p.m. improvement and like all Czech props, have sweep-back

It is equally clearly seen that pitch can be measured as the distance between two similar points on adjacent threads on the screw—*Fig.* 1.

The pitch of a propeller is defined on similar lines, assuming that it is screwing itself through some medium where it cannot slip. If easier to visualise, you can consider it as an element of a large imaginary screw thread screwing into a matching thread tapped in "solid" air—*Fig.* 2.

Since the propeller is only an element of the complete screw thread, however, its pitch can only be measured as the theoretical geometric advance per revolution. Mathematically this can be calculated as 44/7 *times* the radius *times* the tangent of the angle of the blade at the radius (*i.e.*, Pitch$=2\pi R \tan \theta$). The possible radii dimensions vary from zero (at the hub centre) to half the diameter (at the tip), with a corresponding different value of the blade angle (θ) for each. For the pitch to be the same all along the blade from centre to tip, radius *times* the tangent of the blade angle must be the same.

This accounts for the characteristic twist of propeller blades, the greatest blade angle being near the root (where the radius is the smallest) and the least blade angle at the tip. In a carved propeller this necessary "twist" is arranged for in the shaping of the blank—*see Fig.* 3. In machine-cut propellers the necessary twist is incorporated in the movement of the cutters along the blade. But most practical propellers are a compromise between a propeller with true pitch angles all along the blade and one which is easy to produce, so that effectively the propeller, as finished, departs from a *true geometric pitch design*. *Fig.* 4, for example, shows the theoretical blade angles required for a 10 x 4 propeller at one inch blade stations compared with the blade angles actually produced by carving from a typical blank of the type shown in *Fig.* 3.

Normally these differences are small, and can be ignored. In some cases departure from true geometric pitch may be deliberate. Some authorities claim, for instance, that increasing the pitch angle (over the true geometric angle) towards the tip increases the propeller efficiency; others that reducing the pitch angle towards the hub reduces drag (and thus lets the propeller turn faster for the same power). The most important point, however, is that where such differences do occur, the pitch of the propeller is different along the blade length and so which pitch figure is quoted as being *the* pitch of the propeller, for selection of comparison purposes, will depend on which point this pitch is measured or calculated from; *Fig.* 5, for instance, shows the actual pitch of the carved propeller of the previous example at different blade stations.

Various "standard" methods of measuring pitch quote 5, ·6 and ·75 of the full radius (half diameter) as the stations at which the propeller pitch should be measured. Measurement at half radius is generally best for model work, since most propeller blanks are laid out on this basis. On power model propellers, too, the depth of the blank, and thus the thickness of the propeller, is left constant from the centre to the half radius and so the thickness of the hub becomes a suitable measure of pitch for any given family of propellers. If the width of the original blank is measured at half radius, and also the hub thickness, then—

$$\text{Pitch} = \frac{11 \times \text{diameter} \times \text{T}}{7 \times \text{W}}$$

Most commercial wooden propellers depart from a true family layout (that is, the blank layout is not scaled up or down exactly from a standard shape) and so nominal pitch cannot be determined simply by measuring the hub thickness (T) which is a more useful method of quick identification with a true family of propellers, *e.g.*, laid out like *Fig.* 3.

(*To be continued*)

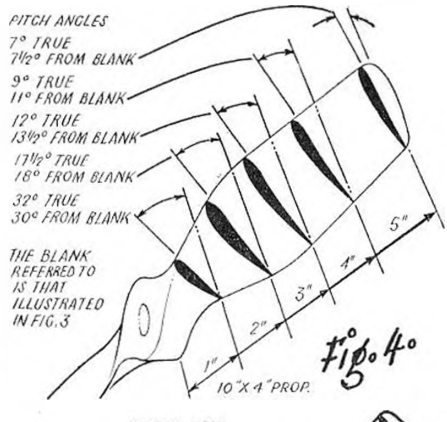


Fig. 4

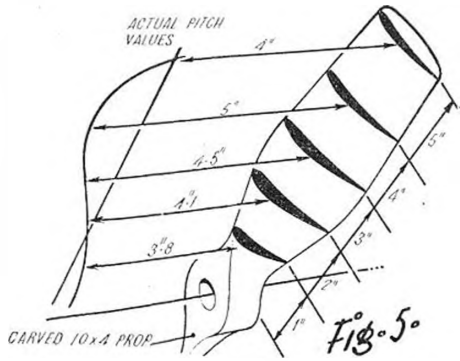


Fig. 5

CLUB NEWS

WELL, I MUST TAKE back those harsh comments I made last month to the London Area, for they really did pull their weight at the Nationals and contrary to my suggestion I found that they have no need for any "system" in order to run their area centralised events. Perhaps I should have directed my spleen upon other areas who should be ashamed of their very poor support of the organisation at Waterbeach. How about the champion areas in the various free-flight classes undertaking organisation of the same events for the ensuing year?

London

Wakefield fans will be very pleased to know that there is to be a special contest for models to the new formula (50 g. rubber) as the All-Britain Model Aircraft Rally run by the **ST. ALBANS** club. Clipper Cargo will permit engines up to 1·5 c.c. allowing 1·5 PAA models to be used and a new class in Concours for unorthodox types is introduced. A new club has been formed to cater for the control-line interest in the Northwick Park area, known as **KENTON M.A.C.** with a membership of 22, while **NORTHWICK PARK** club maintain its free-flight interest. South, in **SPRINGPARK M.A.C.**, three members recently spent an energetic weekend cycling an 80-mile round trip to collect a Mick Farthing lightweight, which had flown away the previous weekend in massive thermals. New members are always welcome at this club which meets at the Assembly Rooms, Coney Hall, Beckenham on Tuesday evenings. **VICKERS-ARMSTRONG M.A.C** held a club event in blustery weather on May 19th, best flight of the day being R. Knight's 5 : 12 o.o.s. J. Smith came out tops with an A.P.S. *Woodford Special*.

At **DARTFORD M.F.C.** the club's annual C/L Rally on May 26th, was marred by very strong winds, but this did not deter the 80 class entries and a large number of combateers. Class A was carried away by R. Allen of Enfield and Class B by the now invincible Walker/Tuthill Team. Highlight of the meeting was the combat final, which lasted for over ten minutes between Smith of High Wycombe and Meakins of Southgate. The latter was contest testing a new Mercury *Toreador* flying wing kit design by H.J.N. and it was a very close match with Smith finishing up minus tail assembly to make both of them even so to speak! **HAYES M.A.C.** had very wet time at the Nationals, but Jim Baguley made it worthwhile placing third in Payload. The club registers disapproval of the handling of the International Tailless Meeting and also deprecates behaviour of some of the campers in particular a party who launched a power model minus wings and damaged one of the Hayes tents.

S.M.A.E. Results

GUTTERIDGE TROPHY

1.	Giggle, P.	Southampton	11·37
2.	Bennett, F.	Croydon	10·07
3.	LeFever, G.	South Essex	9·56
4.	Read, P.	Birmingham	9·56
5.	O'Donnell, J.	Whitefield	9·45
6.	Sharp, F.	Blackheath	9·30

ASTRAL TROPHY

1.	Monks, R.	Birmingham	12·00 plus 4·31
2.	Buskell, P.	Surbiton	11·57
3.	Posner, D.	Surbiton	11·49
4.	Green, M.	Croydon	11·31
5.	Mack, B.	Henlow R.A.F.	10·50
6.	Lanfranchi,	Birmingham	10·40

ENFIELD D.M.A.C. are naturally glowing with their victories in recent Class B Team Racing and are particularly proud of an all-time record for 10 miles in 7 min. 3·5 secs. at Dartford. Some of the free-flight boys have been getting in some good times, hoping to put the club on the map in this sphere of the hobby.

STOP PRESS!

A/2 Glider Team Selection Results.

R.A.F. HEMSWELL, June 30th

1.	Hannay, J.	Willasey	15 : 00
2.	Wiggins, E.	Leamington	13 : 00
3.	Burgess, R.	Doncaster	14 : 22
4.	Tyrell, B.	Leicester	14 : 19
5.	Wareham, R.	Bournemouth	14 : 10
6.	French, G.	Laindon	14 : 01

Southern

Extract from the **SOUTHERN CROSS** report on the Nationals, "Sunday night was remarkably peaceful and apart from about 40 minutes circa 1.15 a.m., spent in re-erecting the tent all went unconsciously until breakfast arrived". This just about sums up the camping atmosphere at Waterbeach, but I am rather surprised that they say "unconscious", for motors were running at the first light of day, which I believe was about 3.12 a.m.! The Club is taking a wise precaution of not flying after July 7th at Thundersbarrow until September, owing to the danger of crop damage. Encouraging news from the **COUNTY PRIMARY** School Club at Aylesham, indicates that there will be some good quality model building from those parts in a few years time. At the moment the lads are being encouraged by a very enthusiastic Master and they are graduating through a series of A/1 and sport power designs. Eleven models were sent along to the Dover Club Exhibition.

SOUTHAMPTON M.A.C. are naturally pleased with P. Giggle's successes having won the Gutteridge Trophy as well as the Thurston Cup. A new trend among the club control-liners has been an interest in Radio Control boats . . . shame! Members of the **LANCING D.M.A.C.** hold their meetings every Tuesday at 8.10 at the Youth Centre, Irene Avenue, and there is great building activity with the club participating in the July Carnival and giving flying displays. Several A.P.S. *Nord II* are being completed for the Epsom Slope Soaring Rally at Box Hill. **READING D.M.A.C.** had a fine time on June 2nd in the terrific weather at R.A.F. Booker, near High Wycombe and George Bravey produced a flying wing to the new A/2 specification for tailless which was last seen floating over a very large cornfield.

South Midland

HIGH WYCOMBE M.A.C. C/L Rally on May 12th had very mixed weather with alternate sunshine and pouring rain, but as suggested in some of the reports last month, all participants had a very fine time with some very fast racing over closely cropped grass and Norman Butcher taking the honours in Combat. There were a total of 81 entries in the three main events and I believe that they created such a row during the course of the day, that the local Council is somewhat embarrassed on having given permission through its by-laws for the club to use this recreation ground. **ABINGDON AND D.M.C.** must be one of the few clubs that own a car. They purchased a defapidated old Jowett sperially for club transport and it seems to get them around to galas and rallies quite efficiently. One of the "big" efforts built by a member of this club is a 10-ft. control-liner scale Blackburn Beverly, naturally with four engines.

OXFORD METEORS put on a good show at the last area rally at R.A.F. Henlow with five members in the first seven places and had to make a return trip to this part of Bedfordshire to recover models at a later date.

South Western

The Devon Rally which was to be held on May 26th was cancelled owing to force eight winds, will take place on September 8th at Woodbury Common, nr. Exmouth and further details can be obtained through D. G. Baudet, 80 Moorfield Road, Withycombe, Exmouth.

Western

SOUTH BRISTOL added novelty to their indoor season by including a model aircraft Carrier and a few people managed to land on it at the conclusion of r.t.p. flight.

BRISTOL ACES have hopes for full use of Filton when the R.A.E. move out and are participating in several control-line displays in coming months.

East Anglia

Several o.o.s. flights have depleted the stock of models in the **NORWICH M.A.C.** T. Wilkinson lost his *Seraph* and M. Woodhouse his *Teal* and P. Smith a *Corsair*. Wot—no D/A's? C. Sparrow is the rubber champ of the month . . . with a name like that he should have no trouble in getting airborne! **ANGLIA M.F.C.** are very proud of their two places out of the first three in the Thurston Cup, which was a stout effort indeed and N. Willis is very sorry about that launch in the fly-off. Certainly his model is capable of more than 60 secs. in usual circumstances.

Midland

A new club has been formed in the **HOLLYWOOD** and **WYTHALL** area, nr. Birmingham, and a hearty welcome is extended to all. Meetings are held at Emanual Hall, Highters Heath Lane, Hollywood, next meeting June 14th on alternate Fridays. **LITTLEOVER M.A.C.** are making an effort to get back in the news and to celebrate the clubs' 10th year, a C/L rally was held. D. Keeling established a new club speed of 111 m.p.h. with a much modified E.D. 2·46 *Team Racer*. Maybe he should have entered for the speed eliminators at the Nationals!

WEST BROMWICH were quite naturally put out by the abandoning of the Combat event at the Nationals. They remain convinced that the conventional model is best for Combat and take great glee in recounting the number of wings that went to their doom. A Transatlantic power contest is to be held with lakewood Flitemasters, near Chicago in the U.S.A. with F.A.I. power rules to count.

Northern

A new club has been formed known as **KING EDWARD VII** School, Sheffield. **SHEFFIELD S.A.** held an exhibition in close conjunction with the Ship Model Society and the outstanding model was a streamline Wakefield by A. Naylor. **HUDDERSFIELD FLYING TIGERS** had the luck to "win" the Combat after the draw out of the hat at the Nationals, but A. Farrar has made a gesture which the whole club fully endorsed in returning his prize back to the S.M.A.E. to be put into the International team travel fund. D. Dickinson is especially sorry about the accident which occurred during the Camp at Woodford, when as a result of a line tangle and completely losing control, somebody caught his model in the back and received injury. This was a Combat event with three in the circuit. There is obviously a need for safety rules to be applied to Combat flying and it is hoped that a general guide will soon be issued from the S.M.A.E.

For Your Diary

July 14th
Scottish Gala—All F/F Classes, Radio T/R Speed—West Freugh, Aerodrome, Stranraer.
July 28th
Slope Soaring Rally, Epsom D.M.F.C., Box Hill, Albatross Trophy.
August 5th
Chester C/L Rodeo—T/R Combat-Stunt—Chester Roodee Racecourse.
August 4th
Northern Gala-Linton on Ouse nr. York. (Includes U.K. Challenge Match.)
August 24th/25th
P.A.A. Festival-Abbotsinch, Paisley.
August 25th
South Midland Rally—All Classes—Cranfield.
September 1st
Huddersfield Rally—Open F/F all Classes Combat.
West Hants Rally—T/R Stunt Combat—F/F All Classes.
September 8th
Devon Rally—Woodbury Common, nr. Exmouth.
September 22nd
All Britain Rally—All Classes.
September 29th
South Coast Gala (South Eastern Area Rally)—F/F All Classes, Ashdown Forest.

North Western

More trouble at Ternhill due to a member burning the remains of his model and causing the bushes to be set alight. This had to be smoothed over by the Area and it is hoped that in future, some of the modellers will think before they act in an irresponsible manner. **CHESTERFIELD SKYLINERS M.A.C.** have now become affiliated to the S.M.A.E., but are suffering from an epidemic of Gremlins and the only unbreakable machine in the club being J. Margrave's *Phoenix*, which is covered entirely in nylon. Wreckages from the Nationals included several bent and decapitated E.D. Racers. This is another club registering disapproval over the Combat at the Nationals—especially after paying 5s. for Associate entry fee. **BLACKBURN M.A.C.** have been struck by the coventry *Cresendo* design, having three in the club and a rash of new combat, team racers, and radio jobs, are coming along. New members are welcome at the rooms in New Water Street, near Wooldworths on Fridays. **BRINNINGTON M.A.C.** have convinced a local pram and baby-wear stockist to carry a supply of model goods, which I suppose is rather a victory—I only hope they don't start covering their models with Playtex Baby Panties (may be it would not be such a bad idea after all for Combat flying wings!)

North Eastern

WINGATE D.M.A.C. is now affiliated to the S.M.A.E. and has gained interest in free-flight, radio and control-line. One of the members is now busily making the *Relayor* as detailed in the June issue and I am assured that he will find it most successful. **SUNDERLAND D.M.A.C.** have the use of the local Associated Boys' Club's premises and flying takes place at R.A.F. Usworth. Local unattached modellers will be welcome at club meetings at 33 Norfolk Street, Sunderland.

Scotland

The **MONTROSE** Gala on June 2nd was a battle against the elements as strong winds took models straight out to sea and exact judgement was required to get D/T action over the beach. At least one power model was lost and R. Davidson rescued his *Eliminator* from the edge of the waves to go on and win the Challenge Cup. A.P.S. plans were prominent at this meeting, although one exception was A. Fraser's 8-ft. glider, which I am assured was apparently made from firewood. A number of grass fires in the area has created an air of caution and it is intended to clamp down on non-snuffer users in future. **ANGUS D.A. LEAGUE** had a Comp on May 26th. H.M.S. Condor in perfect weather with D. . Petrie taking open power and A. McCullen of Kirriemuir topped in A 2 with *Inchworm*. A record number of models were flown that day and I hope that this is an indication of increasing in activity over the border. **PRESTWICK M.A.C.** had trouble getting down to the Nationals with a transport breakdown, and didn't arrive until late, missing their chance in the Davies Team Race, Class A.

Pen Pal

Pen Pal required for D. Greenfield, 4003 50th S.W. Seattle, Washington, U.S.A., preferring a Swiss aeromodeller interested in free-flight.

New Clubs

KENTON M.A.C.
E. de H. Rowntree, 36 Pinner Park Ave., Harrow, Middlesex.
HULL (INTERNATIONAL R/C M.S.)
D. Greene, 18 Fitzroy Street, Hull.
STRATFORD ON AVON M.A.C.
S. Richardson, Kendall Avenue, Stratford on Avon.
WINGATE D.M.A.C.
G. Trudgill, Wayside, Durham Road, Wingate, Co. Durham.

Secretarial Changes

BRISTOL & WEST M.A.C.
K. Horry, 32 Downleaze, Sneyd Park, Bristol, 9.
BEDWORTH M.C.
J. P. Hobbs, 34 Poplar Avenue, Bedworth.
CRITTALL (BRAINTREE) M.A.C.
C. C. Horne, 49 Hay Lane, Braintree, Essex.
DEBDENAIRS M.F.C.
P. Oliver, 23 Covert Road, Chigwell, Essex.
HORNCHURCH M.F.C.
L. P. Spink, 46 Balmington Road, Dagenham, Essex.
HUDDERSFIELD D.M.A.C.
A. Bradley, 32 Roundway, Honley, Huddersfield.
MODEL AERONAUTICS COUNCIL OF IRELAND
M. Greer, 34 South Hill, Dartry, Dublin.
NORTHWICK PARK M.A.C.
J. Curry, 13 Byron Road, North Wembley, Middlesex.
REGENTS PARK M.F.C.
G. Edwards, 59b Polygon Buildings, Polygon Road, London, N.W.1.
WEST BROMWICH S.M.A.E.
E. Palmer, 64 Upper St. Mary's Road, Smethwick.

BRITISH NATIONALS RESULTS

"AEROMODELLER" R/C Trophy (48 *entries*)

			Pts.
1.	Honnest-Redlich, G.	A.R.C.C. (Multi)	270
2.	Knowles, F.	Croydon (S.Ch.)	202·5
3.	Boys, H.	Rugby (S.Ch.)	188·75
4.	Rice, B.	Croydon (S.Ch.)	170
5.	Soper, J.	A.R.C.C. (S.Ch.)	141·25
6.	Donahue, R. ...	Kersal (Multi)	139

S.M.A.E. R/C Trophy (43 *entries*)

			Pts.
1.	Nixon, J.	North Lines. (S.Ch.)	172·5
2.	Donahue, R. ...	Kersal (Multi)	146
3.	Honnest-Redlich, G.	A.R.C. (Multi)	115
4.	Parkinson, G. ...	Kendal (Multi)	100
5.	Fox, J.	Hatfield (S.Ch.)	93·75
6.	Firth, R.	York (S.Ch.)	90

Thurston (Glider) (380 *entries*)

1.	Giggle, P.	Southampton	12+1 : 33
2.	Willis, N.	Anglia	12+0 : 40
3.	Greygoose, R. ...	Anglia	8 : 58
4.	Woods, D.	Luton	8 : 43
5.	Winder, G.	De Havillands	8 : 24
6.	Woodward, T. ...	Foresters	8 : 13

Short Cup (Payload) (22 *entries*)

1.	Glynn, K.	Surbiton	6 : 12
2.	Monks, R.	Birmingham	5 : 59
3.	Baguley, J.	Hayes	5 : 34

Team Race Davies Trophy (Class A) (114 *entries*)

1.	Edmonds, E. ...	High Wycombe	8 : 12 (10 miles)
2.	Bassett, M.	E. London	
3.	Allen, J.	Enfield	

Davies Trophy (Class B) (70 *entries*)

1.	Tuthill/Walker, ...	Enfield	7 : 59 (10 miles)
2.	McGoun, S. ...	W. Essex	
3.	McFarlane, W. ...	Glasgow	

Sir John Shelley (Power)

1.	Green, M.	Croydon	12 : 00
2.	O'Donnell, J. ...	Whitefield	11 : 57
3.	Lantanchi, S. ...	Leeds	11 : 18
4.	Jackson, D. W. ...	Ashton	11 : 15
5.	French, G. R. ...	Anglia	10 : 59

Model Aircraft Trophy (Rubber)

1.	Monks, R.	Birmingham	12 : 00
2.	Boxall, F.	Brighton	11 : 42
3.	Wannop, V. A. ...	Edinburgh	11 : 40
4.	Greave, D.	Leamington	11 : 42

Super Scale

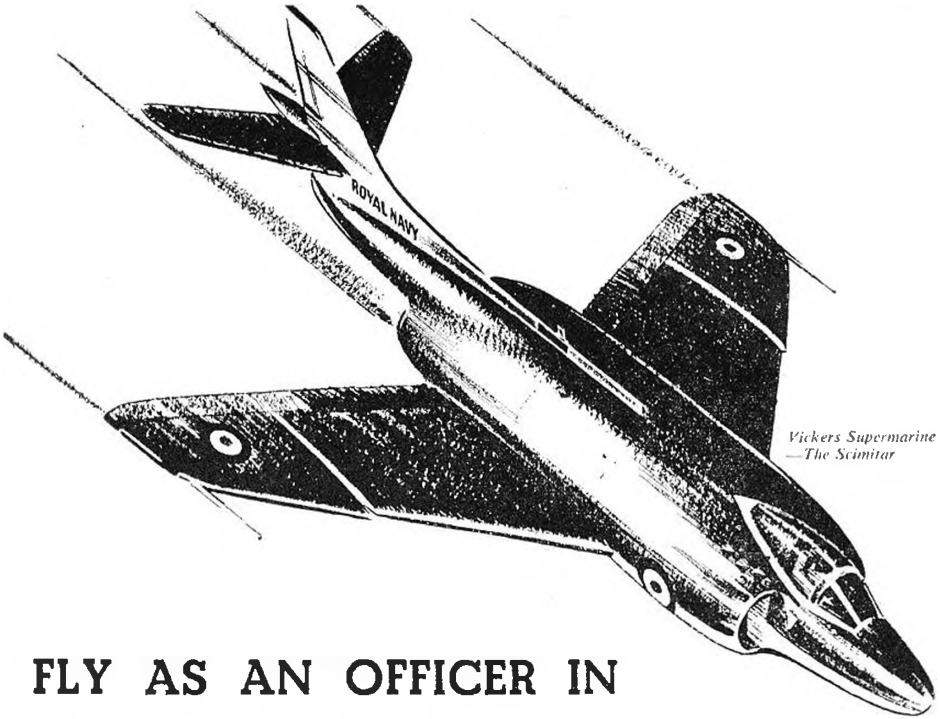
			Pts.
1.	Norman, F. O. H. ...	R.A.F.M.A.A. (Colerne)	79
2.	Godfrey, Cpl. ...	R.A.F.M.A.A. (Waterbeach)	77
3.	Datkiewicz, Z. A. ...	P.A.F.A.	76

Speed

				m.p.h.
2·5	c.c.	Gibbs, R. ...	London	120·4
5	c.c.	Lawton, S. ...	Macclesfield	115
10	c.c.	Mendham, M.	Watford	137

Gold Trophy (39 *entries*)

				Pts.
1.	Russell, P. G. ...	Worksop	E.D. 2·46	248
2.	Chislett, D.	Dagenham	Frog 500	219
3.	Jolly, T.	Whitefield	Fox 35	213
4.	Platt, D.	Wanstead	Veco 19	207
5.	Eifflaender, T. G. ...	Macclesfield	O/D Special	195
6.	Grimmett, M. ...	W. Bromwich	O. Tiger	149



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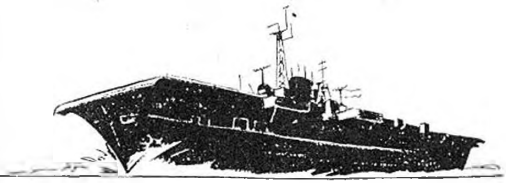

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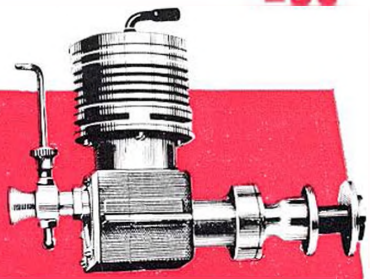

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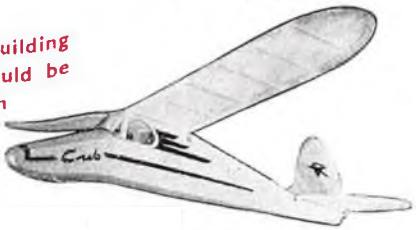

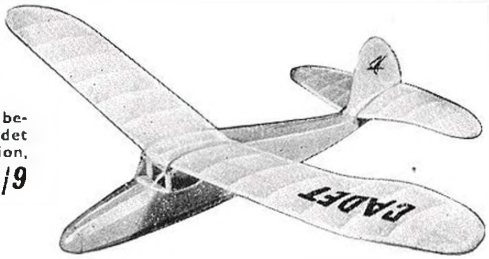

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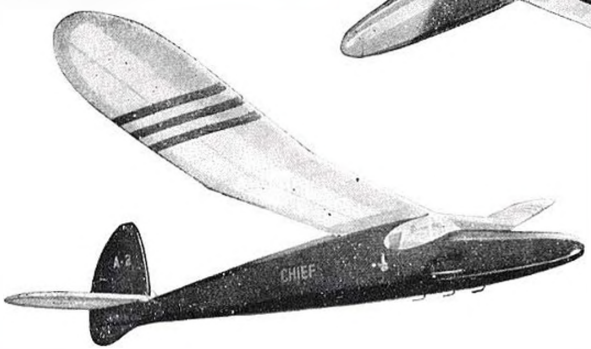

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