MODEL AIRCRAFT

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THE JOURNAL OF THE S.M.A.E.

MODEL AIRCRAFT

The Journal of the Society of Model Aeronautical Engineers

FEBRUARY 1947

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PHOTO NEWS

FROM ABROAD

Above: From Holland comes this striking photograph of P. Vriend's fine "Gull" sailplane, which so nearly wrecked the hopes of the English team which visited Holland in September by its excellent performance.

Above: A group of competitors belonging to the S'Hertogenbosch Aeroclub taken at the second Dutch Nationals. Reading from left to right, these are W. Lunemburg, J. V. Asten, J. V. Lier and P. Vriend.

Left: Father Amiard continues the good work amongst his young flock in Normandy. Here is a photograph of his beginners' class at the Villa des Cedres.

Below: Sailplaning in Switzerland is amongst the most highly developed anywhere in the world. Both tow-line gliding and slope soaring is indulged in and some machines having a very high performance have been produced in that country, and the "Albatross" being launched is one of these. Snow does not, apparently, in any way restrict gliding activities.

From Belgium comes this photograph of Mons. Baeté, of Louvain, with the sailplane with which he was successful in a contest held at Namur during 1946.

News Review

Cover Story

This month's picture is of Mrs. Gunter, of the Bushy Park Club, who has for some time been a regular competitor in petrol contests in various parts of the country.

The picture was taken immediately after she had gained third place in the Petrol Duration Contest, held at Stoughton Aerodrome, Leicester, in September, with some very consistent flying.

Her model naturally follows closely the lines of those flown by her husband, "Gussie" Gunter, and bears a close relationship to the general style of the petrol models constructed by the members of the Bushy Park Club, but she deserves considerable credit for the consistency of her performance and for holding her own with the mere males.

The participation of ladies in our contests is welcomed and we hope that Mrs. Gunter's success will lead more ladies to take up competition work with aero-models seriously.

S.M.A.E. Area Councils

The interest which clubs in general are showing in the S.M.A.E. Area Scheme is very gratifying, and at the recent Area Meeting, held at Leeds, there was considerable enthusiasm shown by the clubs represented and many useful aspects of the scheme were discussed which should lead to improved working during the 1947 season.

Several new Areas are undergoing formation, and the latest to group itself effectively is the South East Coast Area, with headquarters in the Brighton district.

We wish it the very best of luck and we hope its example will be followed by other districts which are still operating in a detached manner.

The advantages which are to be gained by pooling local resources when such things as rallies are being organised are alone worth combining for, apart from the advantages and pleasure derived from the goodfellowship arising from regular contact with kindred spirits in other clubs.

From reports received, it would appear that a certain amount of financial assistance will be forthcoming from the S.M.A.E. to enable areas to function satisfactorily.

Statistics which have recently been compiled show that only a small percentage of model aircraft enthusiasts support the club movement and that quite a few clubs operate quite on their own without contact with other clubs. This is to be regretted, since it greatly restricts their scope and the contributions which they can make to model aircraft development and, incidentally, their own enjoyment.

It is to be hoped that all clubs which are not at the moment taking effective part in the Area Scheme will consider the matter seriously and either join one of the happy groups of clubs already organised, or form an area group of their own.

Light-fingered Gentry

We regret to learn that E. S. Bassett, of Doncaster, suffered the misfortune of having the engine and transmitter of his radio control model stolen while he was transporting it to London for exhibition at the Dorland Hall Show.

It appears that these two components were stolen from his car, which was broken into while he was stopping at a hotel on the way to London, and all modellers are asked to keep an eye open for these items and report their finding immediately. Since the engine is a five cylinder radial just recently received from America, it is unique, and should easily be recognised, as it is about the only one in this country.

Now! All you model enthusiasts, keep a sharp look out!

The Canard

There was a time when the vast majority of model aeroplanes were of the "canard" or tail-first type, and indeed in the early days of aeromodelling they reigned supreme so far as performance was concerned.

It is, therefore, interesting to note that there are a number of "canard" designs now built, or in the course of building, and that interest in the type is reviving.

This interest is not confined to models, and quite a number of full-sized "canards" are making their appearance.

Another old aeromodel feature which is being revived amongst full-sized machines is the "pusher" airscrew and it will be interesting to watch the developments which take place in this direction.

Both of these design features have their good points and model aircraft designers might well give them serious thought for the next machine they have on the drawing board.

Dates for Your Diary

We hear that the Midland Area Council are arranging to hold a Spring Rally on Perton Aerodrome, Wolverhampton, on April 13th, starting at 11 a.m.

There will be the following events: (1) Concours d'elegance (for competition models only); (2) Open Rubber duration; (3) Open Glider; (4) Petrol or Diesel duration (20 sec. motor run).

Cover is provided and there are ample runways for the power models.

This event will be held in conjunction with the S.M.A.E. Area centralised events for the Flight Cup and M.E. No. 1 Cup, so that visitors can fly for these events at the same time.

The Use of Aerodromes

The S.M.A.E. has for some time been in negotiation with the Air Ministry with the object of obtaining permission for Model Aircraft Clubs to use Ministry-owned aerodromes for model aircraft flying, particularly on Sundays, when the 'dromes are not in normal use. Negotiations have been long, due to the many legal technicalities involved, but agreement is now in sight and the S.M.A.E. hope to be able to be of real help to the clubs in this matter.

Briefly, the Air Ministry are prepared to consider the use of any aerodrome available on the following terms.

Use of aerodrome authorised by them is limited to members of established model aero clubs who must apply for permission to use the aerodrome.

Identification will be by the presentation of the club membership card showing the member fully paid up and the member's National Identity Card may also be called for at the discretion of the officer commanding the station.

Clubs granted permission are required to enter into a Deed of Licence and Indemnity with the Ministry which has now been standardised and which, while authorising the use of the airfield at such times as may be arranged from time to time by the officer commanding, calls for reasonable guarantees from the clubs against damage to the aerodrome and adequate insurance cover against third party risks.

An essential feature of the agreement will, therefore, be the taking out of an adequate insurance policy to cover the risks involved and the S.M.A.E. is in negotiation with its insurance company for the preparation of a suitable policy.

The Air Ministry will make a nominal charge for the use of the airfield and also for the legal fees entailed for the Deed, but the total cost to the clubs is not expected to exceed three guineas.

In addition, where clubs desire to avail themselves of the normal aerodrome storage facilities the Air Ministry are prepared to sanction this on the basis of 1s. per model per day or £1 per month.

Any clubs which desire to use a local aerodrome under these terms should let the chairman of the S.M.A.E. know as soon as possible and he will be pleased to send a copy of the proposed Deed, which provides full details of the terms.

It must be understood that the position of aerodromes is at the moment very liquid; they are being closed down, converted, transferred from one command to another, etc., and no guarantee can therefore be given that they are available or that permission can be granted in every case.

The Air Ministry is, however, treating every application sympathetically and the S.M.A.E. has already obtained permission for the use of such important airfields as Burton Wood and Doncaster, amongst others, for the clubs interested.

Photographing Models

It is the natural desire of every model aircraft constructor to have a pictorial record of the results of his craftsmanship for future reference.

There is a mistaken impression amongst many aeromodellers that expensive cameras and equipment are necessary to obtain good results. This is far from being the actual fact of the case where "still" photographs for record purposes are concerned, and excellent results can be obtained with quite ordinary and inexpensive equipment, if you "know how."

To guide those who desire to obtain good photographs of their models, an excellent book on the subject has just been published by Messrs. Percival Marshall & Co. Ltd., bearing the title "Photographing Models," in which the author, John H. Ahern, F.R.P.S., clearly outlines the basic requirements for obtaining good results with the minimum of equipment. Those of you who wish to obtain good photographs of your models cannot afford to be without this excellent guide to procedure, equipment, lighting, exposures, etc. Perusal of its pages will give you the answer to your problems.

It costs 3s., plus postage, from the publishing offices of this journal.

ON SHOULDER-WING MODELS

By R. H. WARRING

SHOULDER-WING models have shown a tendency to become more and more popular, even with slabsided types, and it is to be expected that streamlined-slabsiders of the type mentioned in a previous article on " Spiral Stability " will appear in some numbers during the 1947 flying season.

Now these notes are intended to be purely practical and are confined to the *structural* side of such a layout, since considerable experience with this type of model has indicated the weak points in wings using tongue and box fittings—at the expense of several broken wings!

The writer definitely favours the tongue and box method for shoulder-wing attachment—both for gliders and rubber models. It is the only method whereby it is fairly easy to keep the weight down to a figure comparable with the orthodox high-wing layout and, above all, it is easier to get an *accurate* line up. It is a flexible fitting in that it knocks out in a crash landing and it is *positive*, for the wings are always fitted in the same position and at the same rigging incidence.

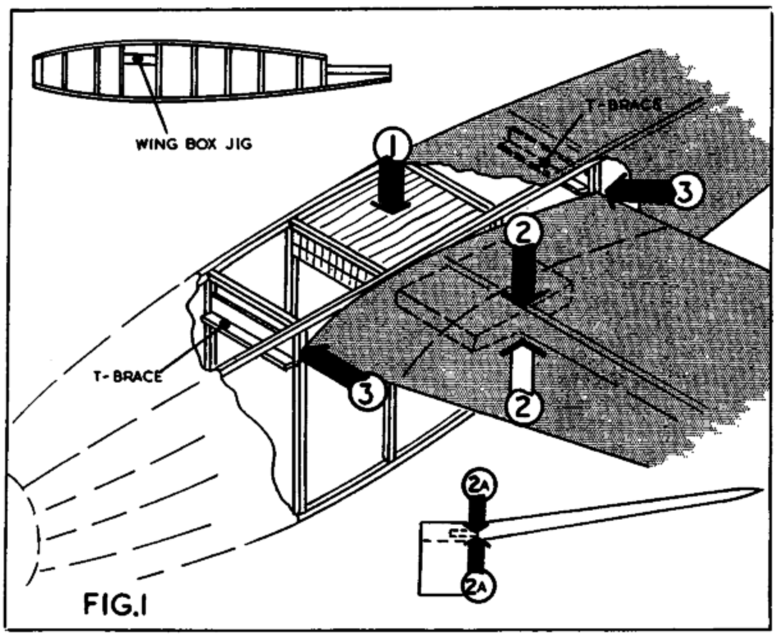


FIG. I

There are two ways of using the tongue and box fitting. The tongue can be fitted in the fuselage, with boxes in the wings; or the tongues can be fitted in the wings, with the box in the fuselage. The former is the stronger of the two; the latter can be made lighter.

For all rubber models and for gliders up to about 250 sq. in. wing area best practice is to fit the box in the *fuselage*. On larger gliders fit the *tongue* in the fuselage.

Method 1—Fuselage Box

It is quite easy to line up the box at the correct rigging incidence in the fuselage—particularly if the latter is slabsided. A jigging piece can be cemented to the fuselage sides during assembly—see Fig. 1.

Weak points are as follow :—

(i) The box itself will tend to split under the up and down (vertical) pressure of the tongues. This is prevented by binding the boxes with cement and silk or thread, or bamboo-paper. *All wing-boxes should be bound* in this manner before cementing in place.

(ii) The vertical stresses on the wings caused by flying or landing loads (or launching loads with a towline glider) will be concentrated *at that point of the main spar* where the tongue ends. There will also be another concentration of stress on the tongue itself at the end of the box.

The latter is easily counteracted by sufficient thickness of tongue. For all models in this category a tongue cut from $\frac{3}{16}$-in. sheet balsa should be adequate to meet all the stresses it is likely to receive.

The first point, however, needs more careful attention—and quite a number of failures have occurred on shoulder-wing models at this point. The solution is to distribute this load along the

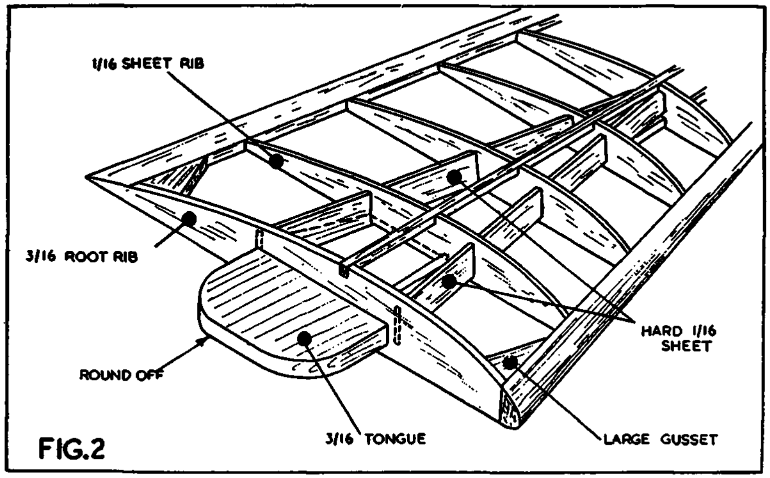


FIG.2

tongue is generally governed by the size of box resulting, remembering that these boxes have to be accommodated within the wing. Since this method is generally applied to gliders and sailplanes, weight is not so vitally important — hence birch-ply is generally chosen.

This enables a thickness of $\frac{1}{16}$ in. or $\frac{1}{8}$ in. to be safely employed. The boxes should preferably be of medium-hard $\frac{3}{16}$-in. sheet balsa. These thicker sections are advisable to prevent distortion.

main spar instead of letting it concentrate itself at any one point. This is simply done by fitting auxiliary spars as shown in Fig. 2, which give a triangulated structure capable of distributing localised loads. If the apex of this structure is taken about 25 to 30 per cent. along the span no trouble should be experienced with normal-size main spars.

These auxiliary spars should be of hard $\frac{1}{16}$-in. sheet and should be as deep as possible within the wing-section profile. Their root ends should be cemented to the tongue along its length inside the wing.

On a typical Wakefield wing with the main spar consisting of two $\frac{1}{8}$ in. × $\frac{1}{16}$ in. balsa spars top and bottom and in the same vertical plane and 80 per cent. aerofoil depth auxiliary spars of hard $\frac{1}{16}$-in. sheet, a load of 16 oz. could be sustained at the wing tip without any signs of failure.

(iii) During heavy landings the wings will either be knocked out backwards or jerked forwards. The fuselage must therefore bear the pressure of the wing trailing-edge or leading-edge root and must be stressed accordingly. These positions should correspond with a vertical strut or former in the fuselage and the exact point of contact should be braced *across* the fuselage to its opposite member. "T"-section bracing of hard $\frac{1}{16}$-in. sheet is the lightest and most effective.

Method 2

With the tongue in the fuselage the thickness of this

The main points to watch are :—

(i) The tongue must be securely cemented and braced in the fuselage.

(ii) The boxes should be a snug fit and *must be bound* as in Method 1.

(iii) The same localisation of stress will occur—this time at the end of the box. A similar method of triangulation is advised—like that shown in Fig. 3.

Dihedral

Dihedral should *always* be incorporated on the tongues. With Method 1 the tongues are fitted into the wings at the correct angle—a typical scheme being shown in Fig. 4. With the second method the tongue can be partially sawn through, cracked and set up to the correct dihedral, as in Fig. 5.

Loose Fit

After usage—and indeed under different climatic conditions—this type of fitting may

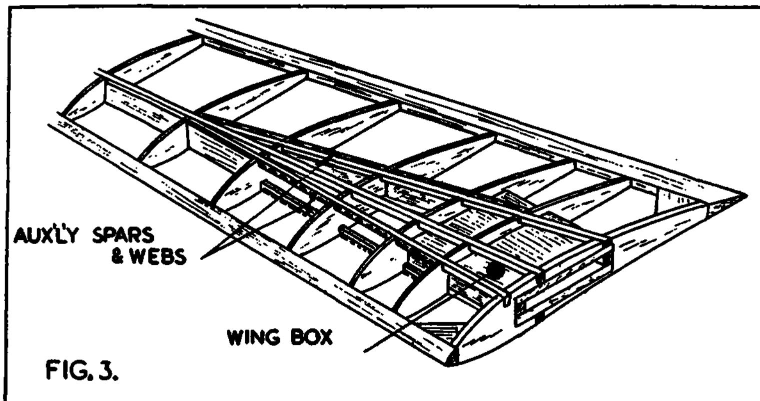


FIG. 3.

tend to become loose. This should not be very marked *provided that the original fit was quite tight*, but can become annoying.

The simplest remedy is to smear the top and bottom of each tongue lightly with modelling clay, which takes up the slack and grips the inside of the box. In bad cases a shim of thin paper may be called for. A tongue and box fitting should be as tight as it is possible to get it without risk of damage during *assembly*. Never mind about whether or not it will knock out in a crash landing, provided the ends of the tongue are sensibly rounded and can knock out. The fact that you can get the wing *in* will ensure it coming out!

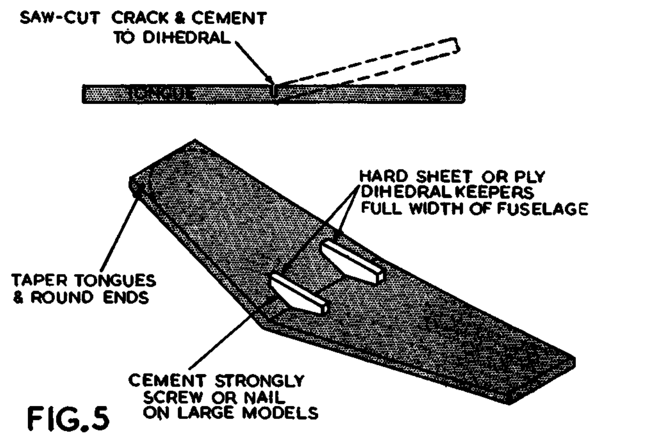


FIG. 5

As a further precaution against wings slipping or vibrating out of alignment—particularly necessary when making a wing-tip and propeller launch r.g.o. in a high wind—the writer is considering fitting press studs to the wing leading- and trailing-edge roots, mating with studs in the fuselage.

Weight Increases

Increase in weight, using the triangulated root-spar arrangement should be about 10 to $12\frac{1}{2}$ per cent. over orthodox construction. That is to say, a pair of orthodox Wakefield wings weighing $1\frac{1}{4}$ ozs. should weight about $1\frac{3}{8}$ ozs. when so treated.

Further Application

This system of spar bracing can usefully be extended to orthodox one-piece wings to distribute the localised load on the centre joint which occurs, particularly when the model turns over on its back. This applies specially to one-piece petrol model wings.

In the latter case it must be appreciated that the maximum load will now occur at the apex of the triangulation and the main spar itself should be further strengthened for two or three bays outwards to further distribute this load. Here the type of construction employing a top and bottom spar for the main spar scores, for hard $\frac{1}{16}$-in. sheet webs between these spars is generally adequate, with but a fractional increase in weight.

General

We have, of course, only been able to deal with one or two special cases, but sufficient has been said to give the reader a sound insight into the problems involved and direct his design efforts into the right channels.

The main thing to keep in mind is the necessity for avoiding the sudden termination of members which are under load and their arrangement so that the load is distributed as evenly as possible over the whole structure.

Only by careful consideration of the loads to which our model aircraft structures are submitted and the use of our materials in such a way that they are employed to the best advantage, will enable us to achieve maximum strength for minimum weight. Care in this direction is well worth while.

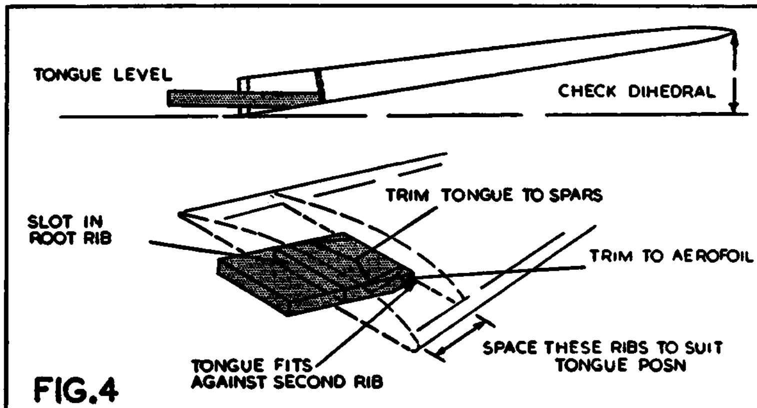
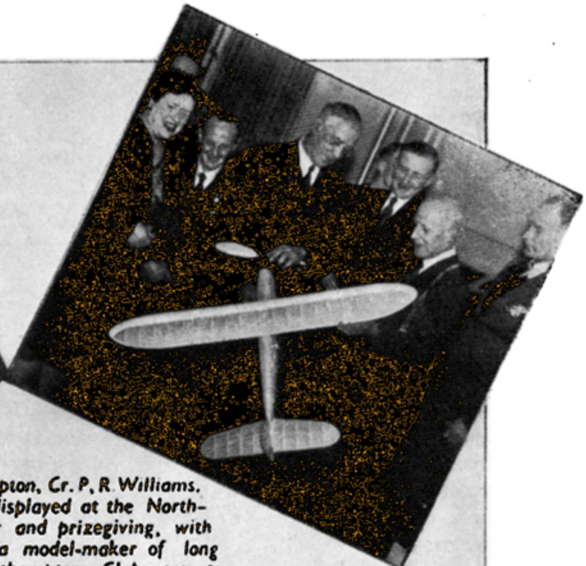


FIG. 4

MODELS ON DISPLAY

INDOORS AND OUTDOORS



The Mayor of Northampton, Cr. P. R. Williams, inspects the models displayed at the Northampton M.A.C. dinner and prizegiving, with the practised eye of a model-maker of long experience. The Northampton Club are to be congratulated in staging a very successful event.

Some of the competitors in the model aircraft section of the Llanwern Fete, Newport, Wales, August 31st, 1946. The model aircraft events were organised by the Ebbw Vale Model Flying Club.

"RICH MIXTURE" By "C.E.B."

Compression Ignition Reflections

I WOULD like to give you particulars of an almost fantastically small diesel engine that I have been flying around in a model with clock-like regularity. Can you imagine a perfectly robust and reliable model engine that weighs, complete with airscrew, 1¼ ozs.?

Once started, *this engine is not in the least touchy*. It runs just like a clock until the little fuel tank is dry, although starting requires a certain knack that one has to know.

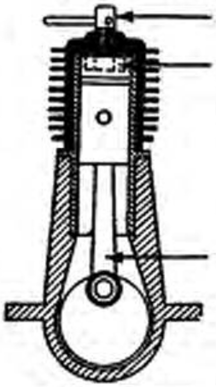


Fig. 1.

This little 1¼ ozs. power plant means that small models of the rubber-driven size can now be flown by a really reliable midget engine. It is no stunt, as six of these little engines have been made up together as a prototype, and they have all performed equally well. Mr. Colyer, the designer, and I flew two models all one day recently until we were sick and tired of retrieving them, but we wanted to know all about their peculiarities, if any modifications were required to the engines or models, and if the engines would fly larger or smaller models and what sort of weather they would fly in. It was almost too easy!

These wee engines open up a new field of simple power model construction and provide extreme portability.

The illustration, Fig. 2, shows this "mite" fitted to my little model "Humming Bird."

We found that this engine flies models from 6 ozs. to 11½ ozs., complete with engine, with a Wakefield climb.

One point in favour of these very small engines and their correspondingly small air-frames, is that they can be flown with safety in high winds that would be dangerous and expensive for larger models.

Handling C.I. Engines

Last month I discussed compression ignition engines in general; summing up with the view that they will become very popular provided they are well built and *provided people understand how to start and operate them.*

This month I am therefore discussing the fuel and the operation of compression ignition engines in order to help readers who buy these simple but intriguing engines. There is really no difficulty in either starting or operating these, provided one understands how the diesel works.

First of all let us understand what a model two-stroke diesel engine is, and then how it works. We shall be far more sensible in our actions when starting and operating them.

Fig. 2.—Colonel Bowden's tiny ("rubber-sized") power model, "Humming Bird," powered by a diesel of approximately ½ c.c. and weighing only 1¼ ozs. complete with propeller. This engine can fly models from 6 ozs. to 11½ ozs. complete with engine.

The model aircraft diesel is merely a normal miniature two-stroke engine that has no electrical ignition, and, of course, no sparking-plug. This statement sounds elementary, but a reader wrote to me recently complaining that he could not start his diesel and there was *no spark* !

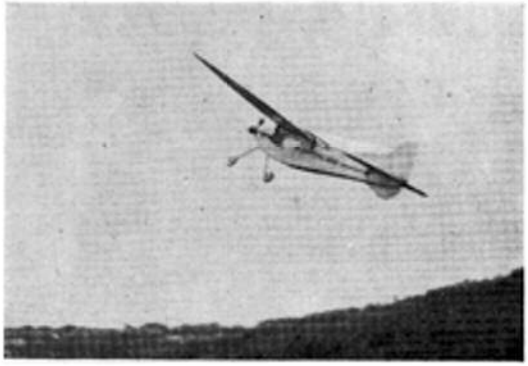


Fig. 3.—The diesel-engined "Humming Bird" has wing-tip slots and flies with complete stability in high winds that would upset larger models.

The normal model petrol engine has a compression ratio of approximately 5 or 6 to 1—that is to say, the charge of gas (a mixture of atomised petrol and air) is compressed to 5 or 6 times its original state as drawn in at atmospheric pressure before the spark, created by an electrical coil and battery with a make and break mechanism, ignites the compressed gas when the piston is at the top of its stroke in the cylinder. The gas ignites and burns with great rapidity to produce an explosion which applies considerable pressure on the piston and turns the engine round, causing it to suck in more gas which is transferred into the cylinder head, where it is again ignited when the next spark occurs, timed to take place at the right moment in the region of top dead centre by the make and break mechanism.

In the model diesel we have exactly the same type of engine and cycle of operations, except that we cut out the electrical spark mechanism altogether, and in its place we raise the compression ratio to something between 16 to 1 and 20 to 1. It means to say, in simple terms, that if we alter any given petrol engine design to function as a diesel we put the cylinder head nearer the piston top when the piston is at the top of its stroke (top dead centre, or T.D.C.) so that the combustion space inside the cylinder is much smaller. The charge of gas is therefore compressed to a much higher pressure somewhere about three times as high than in the case of the petrol engine.

You will know that when you pump up your bicycle tyre quickly the valve and flexible tube that the compressed air travels through becomes hot. This is exactly what happens to the highly compressed gas in our diesel engine, only it gets very much hotter because the operation is far quicker and the pressure much greater. In fact, so hot does the gas become, as the piston reaches the top of its stroke, that it is capable of igniting certain fuels spontaneously, which then expand or explode automatically without any assistance from an electrical spark produced by a sparking-plug.

It will be realised that in the compression-ignition engine (the diesel as it is generally called), we have some far more hefty stresses and strains to contend with, due to this high compression and explosion, than we have in the petrol engine. It is therefore vital to have a more robust engine for the same capacity or size of engine.

Also from your point of view you should realise that you are compressing the fuel mixture at these huge pressures, and you should treat your engine with care and not over-compress the mixture, either when starting or when running. You have, on most model diesel engines, a means of altering the compression within certain limits. On a few there is no provision for altering the compression at all, and we will discuss this later.

If you look at Fig. 1 you will see that the cylinder head is provided with an inverted or "contra" piston, which can be screwed down by means of a "tommy bar" on the top of the cylinder. As the contra piston is screwed down the space left for the gases is obviously reduced, and when the piston comes up on its compression stroke the gases that have been sucked in through the induction passage will be well and truly squeezed. The less the space, the higher the compression—naturally !

CORRECTIONS

It is noted that several typographical errors crept into "Rich Mixture" in the January issue, second paragraph.

1. The British engine referred to as the 2-c.c. Myeses should be the 2-c.c. Majesco.
2. The engine built by Mr. Bagent is of .8 c.c. capacity, and not 8 c.c.
3. The French Micron engine expected by the author is again a .8-c.c. engine, and not one of 8 c.c.

(To be continued)

PETROL DURATION MODEL

Designed by RAY MONKS for the Ohllson "23" engine

THIS model distinguished itself by winning the S.M.A.E. Petrol Duration Contest, held at Leicester, on September 15th, 1946. Considering that the model was designed and built by Ray Monks during a spell of ten days' leave from his army duties, and was flown in the contest practically straight off the drawing board, its performance in winning the contest in the rough weather which prevailed was remarkable, and singles it out as an exceptionally sound design.

Performances which it has made since the contest bear out its early promise, and the design is offered to those of our readers who desire to build a sound high-performance machine for competition, which is yet straightforward in construction, with every confidence.

The Fuselage

The fuselage is built up on three longerons (two on the datum line) and a backbone, with formers at intervals to maintain the contour of the balsa sheet covering.

The method employed for construction is to make up the tops of the formers (triangular portions) and cement them to the main longerons, on a perfectly flat board, in their correct locations. The backbone, which is in two pieces, is then fitted in position, together with the members forming the wing support, before lifting the structure from the building board.

The semi-circular bottom formers are now cemented in position and the whole fuselage planked with $\frac{1}{16}$ in. medium hard balsa sheet commencing with the underside, which is planked with strips up to the main longerons.

Note that the under fin is formed integral with the fuselage from two sheets of $\frac{1}{16}$-in. hard balsa which fair into the tail-plane platform.

For ease of construction the interior fitments, such as the coil, condenser, battery box, timers, and booster plugs, should be fitted after the bottom has been planked but before planking the upper portion.

Any good timer will do, but the mounting must be modified to suit the timer you select. The mounting shown suits a "Snip" De-luxe lightweight timer.

It should also be noted that the entire fuselage between formers Nos. 1 and 2 is lined with celluloid 1/32 in. thick, to prevent the ingress of petrol and oil into the rear of the fuselage. A good point this! The lining should be fitted before the planking of the upper portion of the fuselage is carried out, not forgetting to fit drain tubes at the bottom, and that the top is left open at the wing mounting platform to provide access to the compartment when necessary.

The battery box consists of layers of stiff brown paper strip wrapped and glued together, using a battery as a former. Remember batteries vary somewhat in size, so do not wrap too tightly. The batteries recommended are either of the following: 630, 631, 730 or 731. When thoroughly dry the paper battery box is cemented to No. 2 former, as shown in the drawing.

The condenser is also mounted on No. 2 former, to which it is attached by suitable clips according to its type.

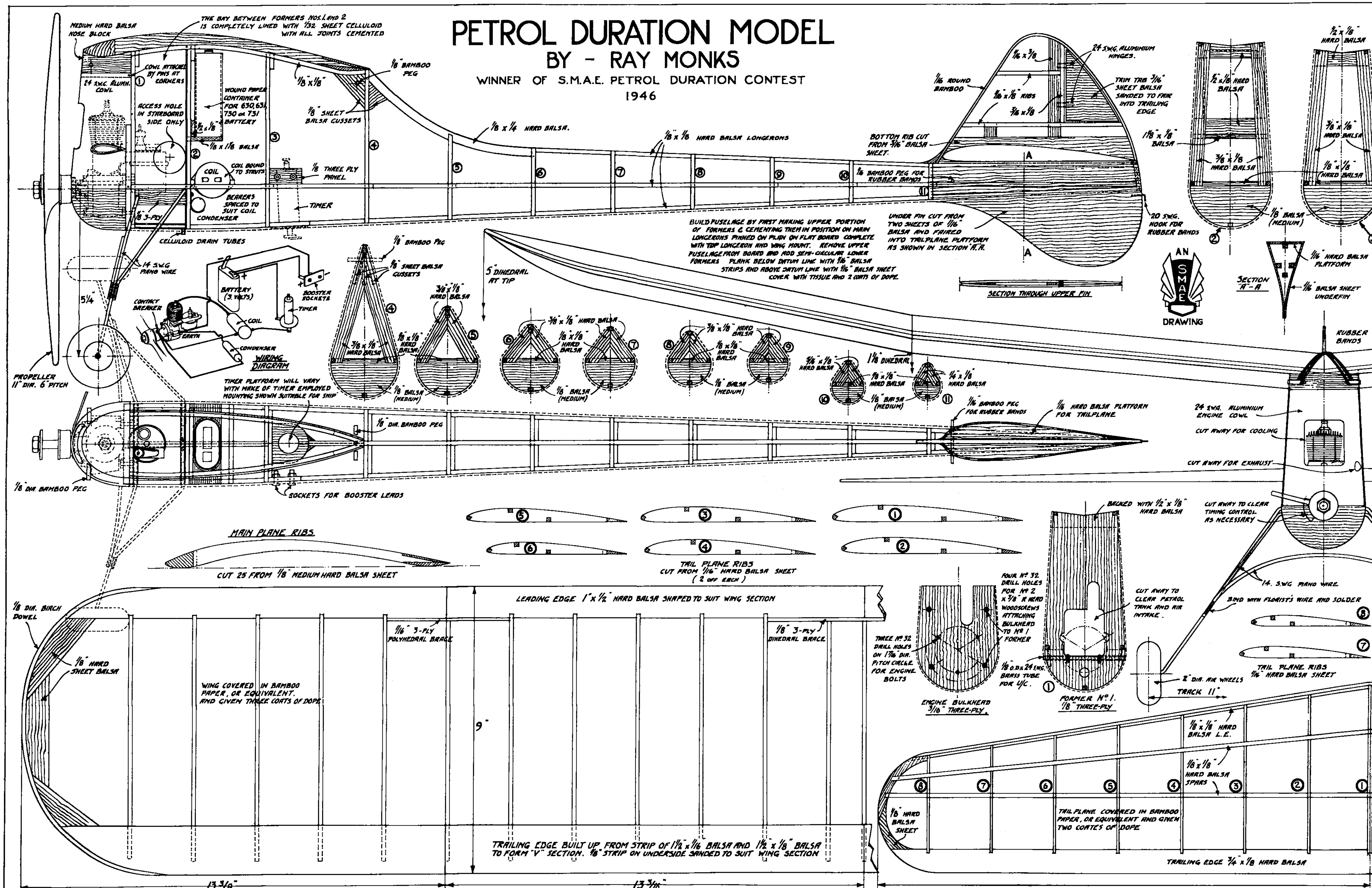
The coil is bound in position on to two cross members in the bay between formers 2 and 3. These should be of hardwood.

When all interior fittings are properly in place on the front fuselage bay and the celluloid lining is properly fitted and petrol tight, the planking of the upper half of the fuselage can be undertaken.

It is to be noted that the designer, in common with several other successful contest flyers, uses workshop tuning technique with his models. That is to say, all engine tuning is carried out on the bench and once the right setting for the fuel valve is determined it is left in that position and not disturbed.

Modifications to the mixture to facilitate starting are carried out by choking the air intake pipe with the finger.

To give access to the end of the air intake the designer has made a 1 in. dia. hole in the starboard side of the fuselage through which he can introduce his finger for choking purposes while starting up. Those who delight in refinement can, of course, fit a spring-loaded



Full-size working drawings of this model are obtainable from our Publishing Office at 5s. 6d., post free.

hinged flap to automatically close the opening when the finger is removed.

The Engine Mounting

The prototype was powered with an Ohlsson "23," but any engine of similar capacity should prove satisfactory.

The engine is bolted directly to a special bulk-head, cut from 3/16-in. thick three-ply, by its radial mounting bolts. This bulkhead is, in turn, screwed to the 1/8-in. three-ply former (No. 1) of the fuselage by four 3/8-in. × No. 2 round-head wood-screws, and these serve as a safety device in case of a heavy landing, as they pull out before serious damage to the engine can take place.

The lower part of the engine is faired with a hard balsa block suitably shaped on its exterior and hollowed on its interior to clear the engine crankcase.

The engine is completely cowled with a simple sheet cowl bent from 24 s.w.g. aluminium sheet and fixed with pins at its four corners; a suitable block of medium hard balsa being fitted to the top of former No. 1 to support its upper edge.

An aperture is cut in the centre of the cowl to permit the entry of sufficient cooling air, and another aperture is cut in the port side to coincide with the exhaust pipe of the engine, which does not actually reach the cowl, but experience has shown that there is sufficient force behind the exhaust gases to bridge this gap without difficulty.

The Upper Fin

The upper fin is made with an outer contour of 1/16-in. bamboo, with 1/16-in. × 1/4-in. balsa ribs, and is permanently attached to the fuselage. The lower rib is cut from 1/8-in. balsa sheet and a suitable aperture is left for the insertion of the tailplane.

A trim flap is fitted. This is made from 1/8-in. sheet balsa and hinged by small strips of 22 s.w.g. aluminium sheet. After fitting, the trim tab is sanded to fair smoothly into the fin outline bamboo member.

When completed, the fuselage and fin should be covered with stout tissue and given two coats of dope.

Tailplane

The tailplane is a single unit and quite straightforward in construction. It has no dihedral and is attached to its support platform, on the fuselage, by rubber bands passing over the pegs provided.

Cover the tailplane with stout tissue, water spray, and give two coats of dope.

The Wing

The wing is made in one piece with a solid balsa leading edge measuring 1 in. × 1/2 in. and a built-up trailing edge consisting of two pieces of balsa arranged in the form of a "V."

The upper trailing edge member measures 1 1/2 in. × 1/16 in., while the lower member measures 1 1/2 in. × 1/8 in., and is sanded to give the correct reflex trailing edge to the Marquart S.2 section employed.

The wing tip contours are bent from 1/8-in. birch dowelling (by steaming) and backed up with 1/8-in. hard sheet balsa segments.

The ribs are cut from 1/8-in. medium hard balsa sheet and are notched into the leading edge and inserted between the "V" of the trailing edge members.

When building, make sure the correct polyhedral angles are built in and that the plywood stiffeners at the breaks are well cemented in position. Make sure, of course, that there are no warps.

Cover the wing with bamboo, or similar, paper, or silk, if you can get it, and give two coats of dope, after wet spraying.

The Undercarriage

The undercarriage is constructed from five pieces of 14 s.w.g. piano wire, bent to shape as shown on the drawing and bound and soldered together at their junction.

Any good rubber-tyred wheels, 2 in. in diameter, may be employed.

The spring of the arched cross member of the undercarriage is sufficient to keep it in position in its tubular sockets in the fuselage, but, as an added precaution, rubber bands may be introduced over the upper ends of the legs and under the fuselage.

Flying

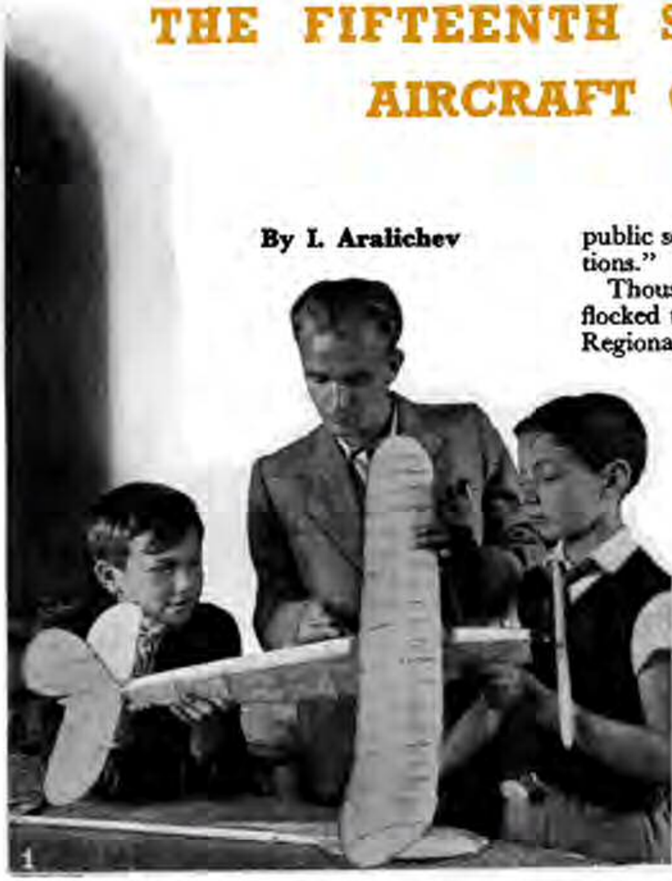
No provision was made for trimming in the original model, but there is scope for this by moving the coil or battery box if found necessary.

A certain amount of trimming can be effected by packing the underside of the leading or trailing edge of the wing, but this should only be employed as a temporary measure and the trim set by moving the weighty items of equipment.

In the prototype all that was found necessary was a thin packing under the leading edge of the wing.

THE FIFTEENTH SOVIET MODEL AIRCRAFT CONTEST

By I. Aralichev



NEARLY 200 young aircraft model makers from all parts of the Soviet Union participated in the recent Fifteenth All-Union Aircraft Model Makers' contest staged at Silikatnaya Station, in the suburbs of Moscow. Each contestant had won the right to participate in preliminary competitions conducted throughout the summer in various areas of the country.

Nikolai Babayev, chief of the Central Aircraft Model Making Laboratory, told me that more and more schoolboys and students are taking up aircraft model making.

When asked what his laboratory was doing now, he replied :

" The same as in prewar years—elaborating programmes and methods of work for aircraft model making circles, offering technical advice, etc.

" These circles now total over one thousand. Circles have been set up at Osoaviakhim Air and Chemical Defence Society Clubs, Pioneers' Palaces, aircraft factories and schools. The greater part of the circles are functioning at public schools and in young pioneers' organisations."

Thousands of people, adults and juveniles, flocked to Silikatnaya and the adjacent Moscow Regional Parachute and Glider Club during the All-Union contests. Small coloured flags pointed the way to the starting points for the different types of models, gliders, hydroplanes and fuselage craft with miniature petrol, jet, and diesel engines. Pilots of the Air Force were on duty in the air following the flights of the competing models. Judges sped on 'planes and motor-cycles to places where models landed.

Four international and eight All-Union records were established in this competition, Two international records were set by a model with a petrol engine made by George Lyubushkin, of Kuibyshev. It stayed in the air two hours forty-nine minutes and reached an altitude of 2,800 metres. Two other international records were made by a model with rubber drive, designed by Ivan Kostenko and Vasili Nasonov, of Moscow. It stayed up in the air one hour forty-two minutes and flew a distance of 800 metres. All these records were registered by the sports committee of the Chkalov Central Air Club of the U.S.S.R.

Among the interesting models in the competitions were models with retractable chassis, folding propellers working on heavy fuel, etc. The prize offered by the Ministry of Aircraft Industry of the U.S.S.R. for the best models was awarded to Georgi Lyubushkin.

I learned from Babayev that aircraft model making was first taken up in the Soviet Union twenty-three years ago, and that his chief task is to develop aircraft model making on a wider scale and to set new records in all classes.

[This article is published to afford British modellers the opportunity of understanding the difference between the conditions under which modellists in the U.S.S.R. operate and our own. It explains why Russia has featured so prominently in the world's record list.—Ed.].

SCALE EFFECT —

By P. R. PAYNE

LAST month we saw that there are two methods of counteracting the adverse effects of very low speeds on the efficiency of an aerofoil ; delaying the laminar boundary layer separation as far back as possible ; or the development of an aerofoil section with a very low " critical VL." It is this second method that I intend to deal with this month.

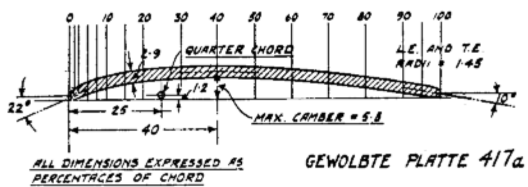


Fig. 1. Here is shown the wing section developed by F. W. Schmitz as a result of his experiments on low-speed wing sections. This section possesses a low critical value of VL with turbulent flow of the boundary layer. Note the position of the maximum camber and the thin parallel section.

Gewölbte Platte 417a Ordinates

Percentage of Chord	Upper Surface	Lower Surface
0	1.45	1.45
1.25	3.0	0.05
2.5	3.65	0.45
5.0	4.7	1.55
7.5	5.6	2.5
10	6.3	3.3
15	7.15	4.2
20	7.75	4.85
30	8.6	5.7
40	8.8	5.9
50	8.45	5.55
60	7.85	4.95
70	6.9	4.0
80	5.7	2.8
90	4.25	1.3
95	3.55	0.6
100	1.45	1.45

Now by the " critical VL " I mean that value at which the laminar boundary layer over the front portion of the wing becomes turbulent, instead of breaking away completely from the upper surface. As we saw last month, there is a very great improvement in performance when this occurs, and if it can be obtained at a sufficiently low value of VL, it would seem the answer to our problem.

In the past, various aeromodellers have interested themselves in this problem of obtaining a turbulent boundary layer, and two methods have been advanced.

The disruptor, which is essentially a thin wire attached to the wing surface near the leading edge ; thin enough to be completely in the boundary layer, but sufficiently thick to cause turbulence—or so its adherents hoped. In practice all that it generally did was to assist laminar separation. Its one virtue lies in the improvement of stalling characteristics.

The turbulator. This is usually a wooden rod, attached a short distance in front of the leading edge. This does have the desired effect when the aerofoil is operating just below its critical value of VL, but otherwise it merely increases the overall drag.

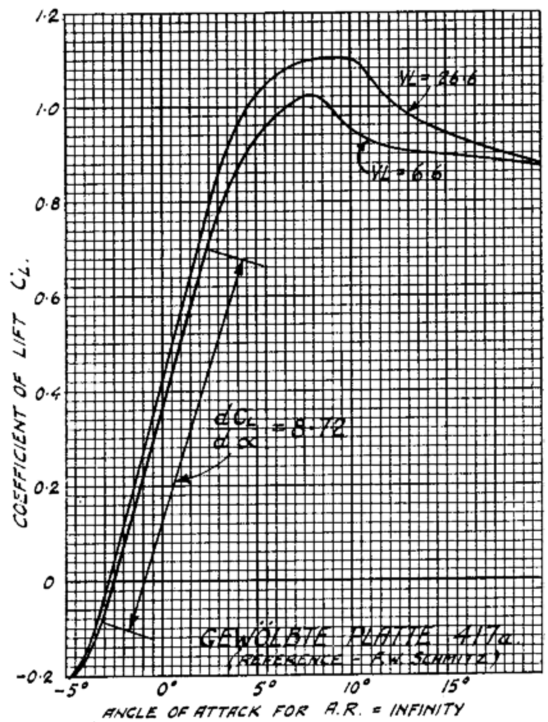


Fig. 2. The effect of changing the value of VL from 6.6 to 26.6 can be seen from these two curves. Note the steep slope of the stable port of the curve between the angles of attack, – 3° to + 2½°, and the slightly more stable conditions at the region of the stall at VL = 26.6, as indicated by the flatter peak to the lift curve.

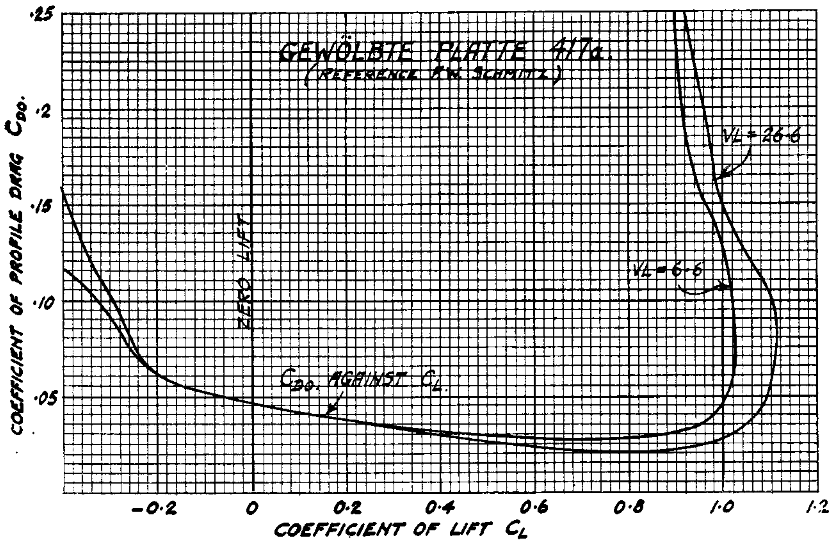


Fig. 3. In this graph the profile drag is plotted against the lift and it shows that the profile drag decreases steadily up to a lift coefficient of 0.8 corresponding with the point where the lift curve commences to be unstable. The profile drag then increases sharply.

These results have led to the development of aerofoils whose profile shape itself is responsible for the low critical VL.

Space forbids a detailed analysis of the theory behind the design of "turbulent flow" sections here, but in a later article I hope to go into this aspect fairly comprehensively, because it is of paramount importance to all designers, irrespective of whether they have facilities for actually developing their own profiles. In any case, it is becoming increasingly easy for those who lack access to a low-speed wind tunnel to carry out really comprehensive investigations by means of the "glide test" system being developed and used by the L.S.A.R.A.

This month, however, I am giving results, rather than principles, in the form of complete data on a well-tried "turbulent-flow" section: Gewölbte Platte 417a, the drawings for which are self-explanatory. Notice particularly the erratic behaviour of the C_M curve after the stall. The $C_{CP} = \dfrac{C_M}{C_L}$

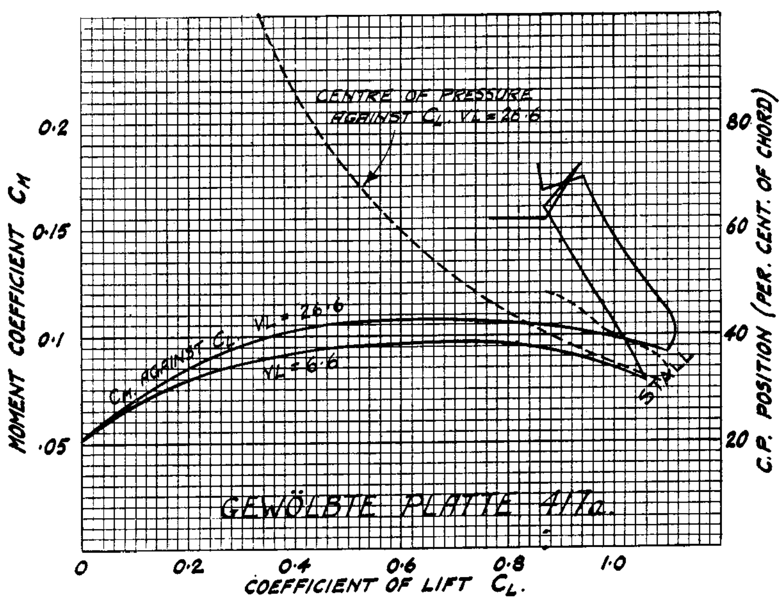


Fig. 4. Plotting the moment coefficient against the lift coefficient demonstrates clearly the state of unstability of the centre of pressure which arises in the region of the stall, and again shows the slightly better behaviour of the section at a value of VL = 26.6.

This section was developed by F. W. Schmitz as a result of his investigations into the question of low-speed aerodynamics for models, and which he describes in his book "Aerodynamiko des Flugmodells," which raises a number of interesting points worthy of further attention.

The whole question of the design of low-speed model aircraft sections is, of course, still a very open one owing to the very small amount of authentic data of a quantitative nature available for us to work upon. We cannot afford, therefore, to ignore any experiments which are likely to help us towards our ultimate goal—the production of better model aircraft sections—hence our proposal to deal with this matter more fully in these pages.

There is quite an appreciable amount of ground to cover yet before we fully appreciate all the problems of low-speed aerodynamics.

C. Christianson's

GO-HI MARK VI GLIDER

ALTHOUGH this machine has not put up any spectacular performances in competitions, it has shown itself to be a consistent performer under the severe type of weather which is encountered in the north. It is simple in design and easy to construct.

Its performance is sufficiently good to have registered several fly-aways under difficult weather. It can be recommended to those who require a good all-weather machine.

The Fuselage

The two sides are built up in the usual way by constructing them on top of one another on the plan, to ensure absolute similarity.

All longerons, struts and spacers are of ⅛-in. square hard balsa.

When the sides are thoroughly dry they may be removed from the plan and built up with horizontal spacers, starting in the centre at the wing-mount positions and working outwards.

The underside is planked to give a "V" bottom from the nose to the tow hook position. The tail portion is filled in at the top and bottom from station F10 to the tailpost, with $\frac{1}{16}$-in. sheet balsa to provide platforms for the attachment of the tail-plane and underfin. The latter consists of sheet balsa, $\frac{1}{16}$ in. thick, cut to shape and cemented to the underside of the fuselage.

The model is provided with a simple, but effective, auto-rudder control, consisting of a hinged wire lever working between the members of the twin towing hook and coupled to the rudder cross bar by a 22 s.w.g. piano wire coupling rod. Bias is given to the rudder by a rubber band stretched from the leading edge of the fin to the other horn of rudder bar, in the popular fashion.

The two sides and top of the fuselage, between the stations F.1 and F.2, are filled in with ⅛-in. sheet balsa to make a weight box with the $\frac{1}{16}$-in. bulkhead former. Access to the weight box is through a ¼-in. square hole in top filling sheet, which is closed with a balsa plug, which is trimmed off flush when the correct trim has been obtained. Don't forget to fit the wing mounts before covering.

The fuselage is covered with two layers of English tissue, the second being doped on to the first. Three final coats of dope are then given with light sanding between each coat.

The wing is built up in one piece and is of orthodox and straightforward construction, and should provide no difficulty in construction. The designer's wing section should carefully be adhered to.

The wing has no central dihedral, but sharply dihedraled tips. It is covered with a single layer of English tissue, water sprayed, and given one coat of clear dope.

The tailplane construction is also straightforward and simple. Here again the designer's section for the ribs should be adhered to carefully, to obtain the best results.

It should be covered with a single layer of English tissue, water sprayed, and given one coat of clear dope.

The fin leading edge is $\frac{3}{16}$ in. × $\frac{1}{16}$ in. hard balsa, and the trailing edge is cut from $\frac{1}{16}$-in. hard balsa sheet. The construction of the hinged rudder is clearly shown on the plan, together with its articulation and linkage to the tow hook lever. The fin is provided with 20 s.w.g. piano wire pegs at the leading and trailing edges, engaging with brass tubes in the fuselage, for its attachment.

When finished it should be covered with a single sheet of English tissue and given two coats of clear dope after water spraying.

The rudder should be set so that it is perfectly in line with the fin when the hinged tow hook lever is pulled right forward. The rudder bias is controlled by providing a stop for the rearward movement of the tow hook lever where it emerges from the fuselage bottom.

Trim the model by adding lead shot in the weight box until it is just off the stall.

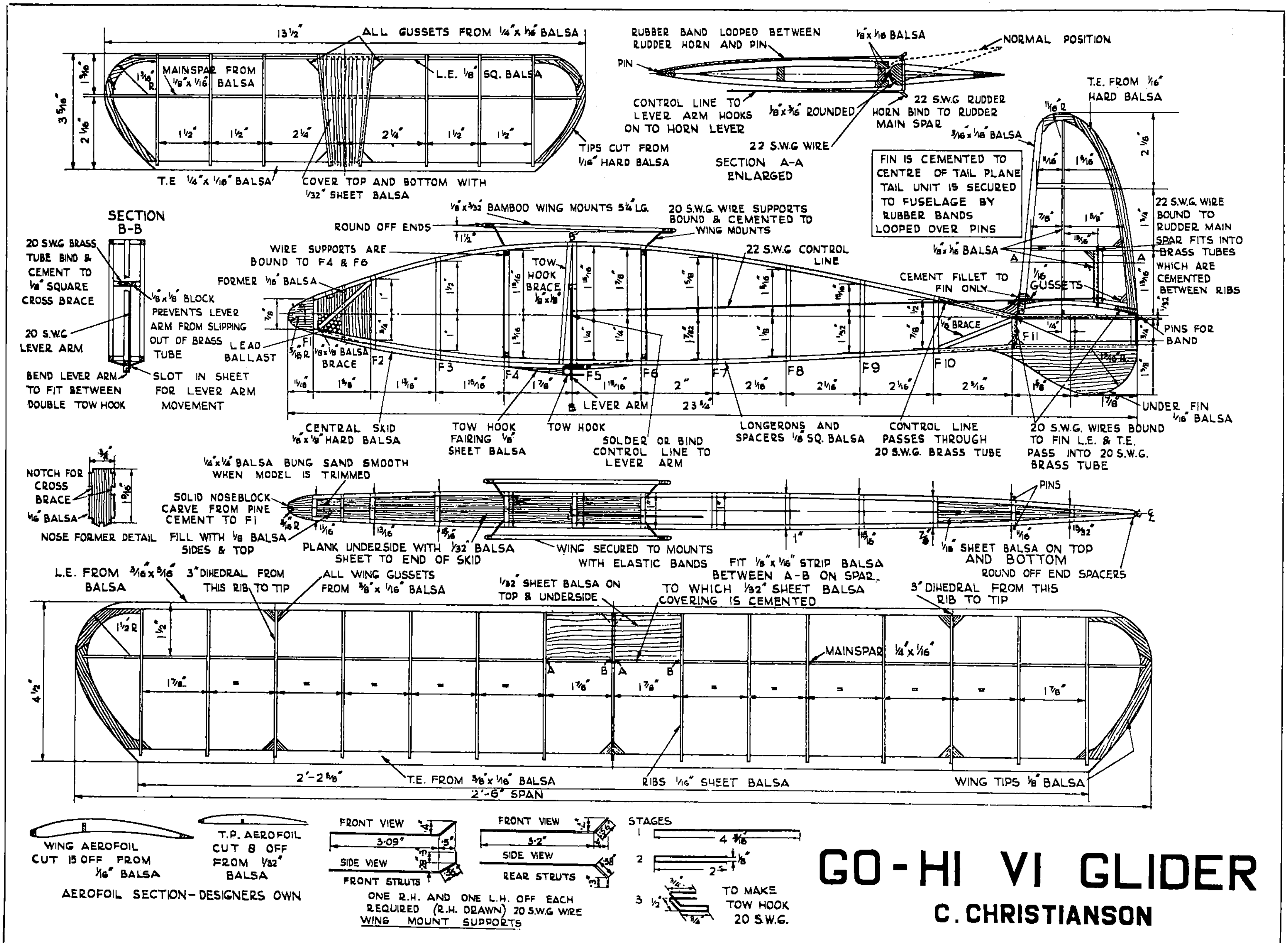
Data

Span = 30 in. Length = 23¾ in.
Wing area = 130 sq. in. (approx.).
Wing loading = 3.95 ozs. per sq. ft.
Wing incidence = 1½ degrees.
Tail incidence = 0 degree.

Finished Weights

Fuselage (with lead shot) ...	2.6 ozs.
Tail-plane and Fin	0.3 oz.
Wing	0.7 oz.
Total	3.6 ozs.

The fuselage cross section complies with F.A.I. regulations, and it can therefore be used in contests controlled by F.A.I. regulations by weighting it up to the F.A.I. loadings.

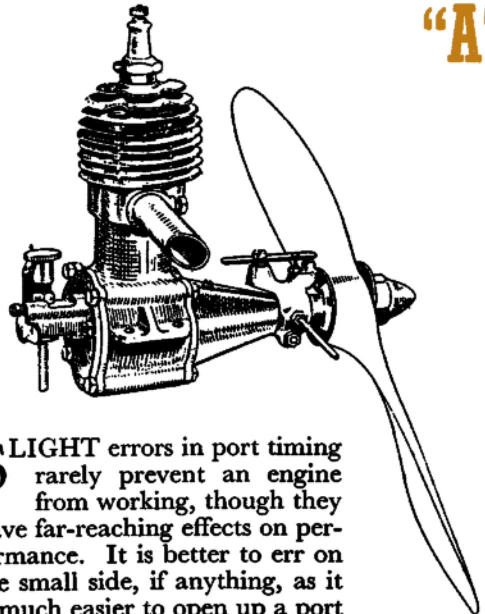


Full-size working drawings of this model are obtainable from our Publishing Office, at 4s. 6d., post free.

"ATOM MINOR" MARK III

6 c.c. Engine

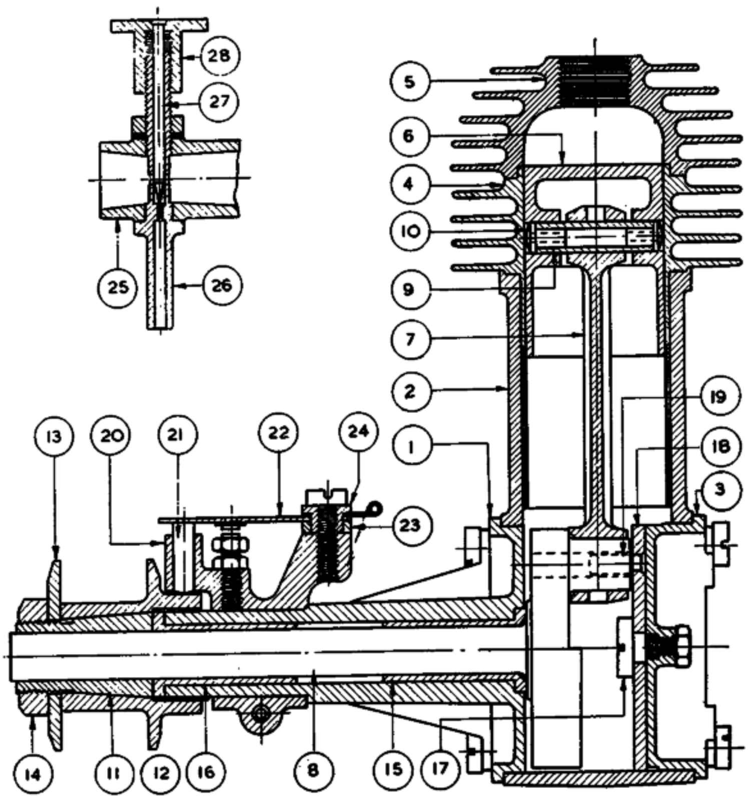
Edgar T. Westbury



SLIGHT errors in port timing rarely prevent an engine from working, though they have far-reaching effects on performance. It is better to err on the small side, if anything, as it is much easier to open up a port than to make it smaller. After cutting the ports, all internal burrs should be carefully removed with a half-round scraper and the cylinder bore lightly lapped with a fine abrasive to remove possible high spots before re-assembly.

Assembling the Engine

The position of the various parts is fairly clear from the drawing, and no hand fitting should be involved if they are properly machined. But do not neglect the obvious points, such as putting the piston the right way round, that is, with the deflector nearest to the transfer-port side. The contact-breaker, hub collet and cam are best assembled before attaching the front housing to the crankcase, as this permits of holding the crank web firmly in the vice (using soft clamps or packing to avoid marking it) while screwing up the hub nut. The latter should first be tightened just sufficiently to enable the hub to be turned stiffly with the fingers, to facilitate setting the contact-breaker timing. Set the control lever in its normal working position, as considered suitable and convenient for the way in which the engine is to be installed, and with the crankpin 30 deg. before top dead centre in the direction of rotation, set the cam so that the points are just breaking ;



(1) front housing ; (2) body ; (3) rear housing ; (4) cylinder ; (5) cylinder-head ; (6) piston ; (7) connecting-rod ; (8) crankshaft ; (9) gudgeon-pin ; (10) end rods ; (11) hub collet ; (12) hub ; (13) hub washer ; (14) hub nut ; (15) inner main bush ; (16) outer main bush ; (17) pivot screw, (18) rotary valve ; (19) driving pin ; (20) contact-breaker bracket ; (21) push-rod ; (22) spring blade ; (23) insulating washer ; (24) insulating bush ; (25) air intake ; (26) jet tube ; (27) jet needle ; (28) adjusting-head.

Sectional Assembly Drawing of the "Atom Minor" Mark III engine.

then fully tighten the hub nut, taking care that the hub does not shift. It may be found desirable to hold the hub with a pair of gas-pliers during this operation, interposing a strip of thin leather in the jaws to prevent marking the hub. After the assembly has once been pulled up tightly, the hub nut may be removed for fitting the airscrew or flywheel, without relaxing the grip of the hub collet.

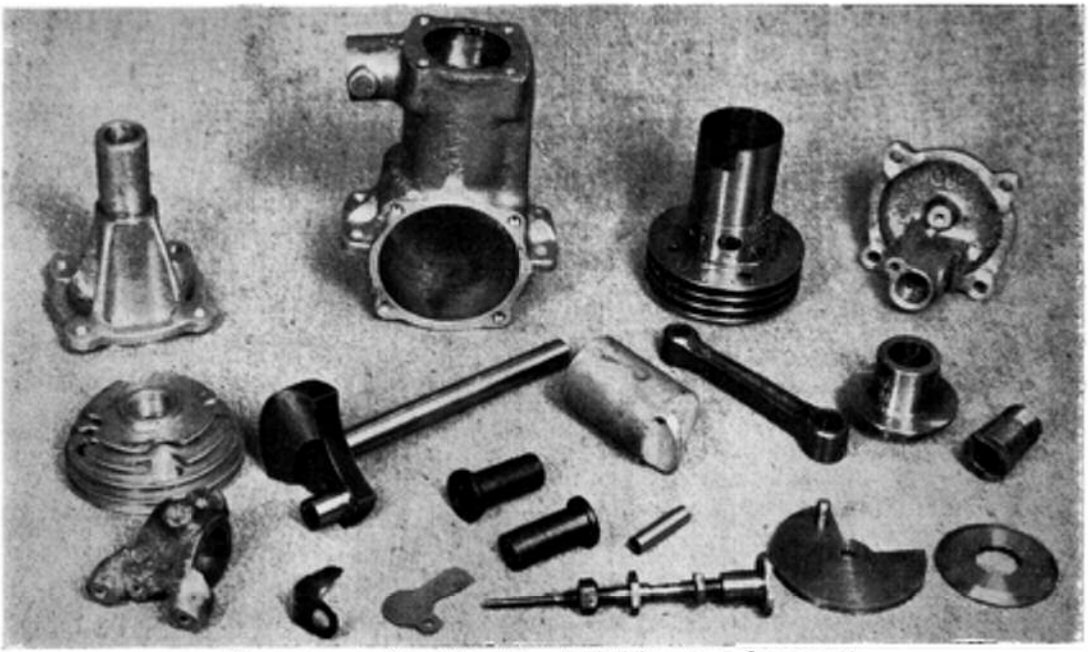
To remove the hub at any time, it is advisable to make an extractor to hook over the flange, and with a hollow screw to bear on the end of hub collet ; this will be found to work much more expeditiously and easily than by the use of brute force, which may distort the hub and burr up the threads of the collet.

The airscrew boss will be held quite firmly between the hub flange and the washer, without the need for spikes or serrations which are often provided on commercial engines, and not uncommonly serve the purpose of tearing up the boss of the airscrew more effectively than anything else. It is much better to avoid too positive a drive to the airscrew ; as already explained, the ability to slip under excessive torque may be very useful in a crash landing.

No packing of any kind should be necessary in the joints of the engine, beyond a smear of shellac varnish or similar preparation on the joint faces. Steel screws should be used for holding the parts together ; the cylinder holding-down screws should preferably have threads only long enough to screw properly home, though such screws may be difficult to obtain, and may have to be specially made. If this is done, they may with advantage be made with hexagonal heads, and distance collars under the heads, raising them sufficiently to project above the cylinder-head fins, so that a spanner can be comfortably applied.

The fuel tank used with this engine may be of any convenient type, and situated in any convenient place. A metal fuel pipe is strongly recommended, though a sleeve of petrol-resisting rubber may be used as a connector. The fuel recommended for this engine is ordinary petrol, as used for motor vehicles, with the admixture of a fairly heavy oil, such as Castrol XL, in the ratio of one part oil to four of petrol ; with this fuel, about three-quarters to one turn of the jet screw, from the closed position, should be about correct.

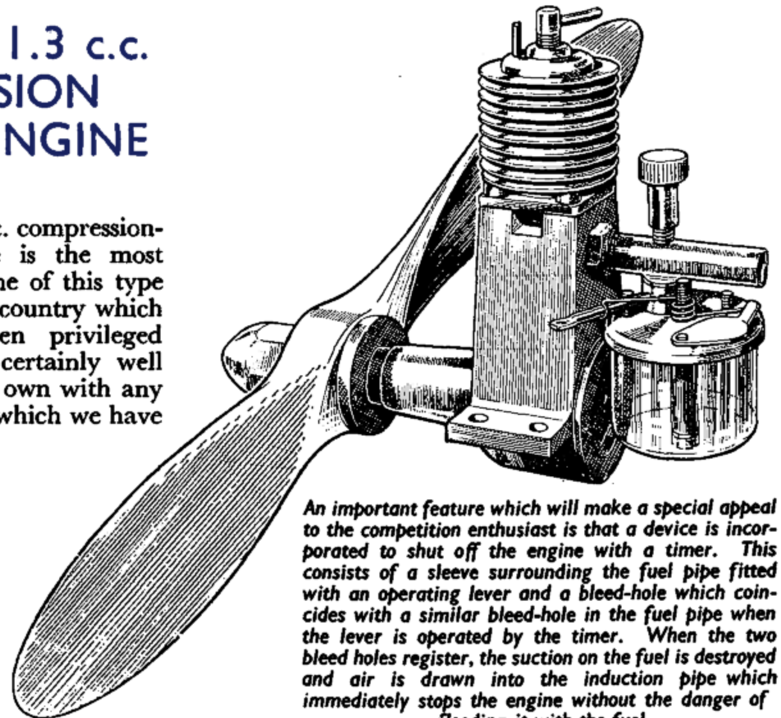
I shall give some directions in getting this or any other new engine working, and obtaining the best results with it, in later articles. The directions for constructing the engine should enable constructors to produce a thoroughly efficient and dependable engine, and the emphasis which has been placed on the need for care in the more important machining operations will, it is hoped, be the means of avoiding a good deal of unnecessary trouble and disappointment when the engine is put into service.



The components of the "Atom Minor" Mark III engine before assembly.

THE MILLS 1.3 c.c. COMPRESSION IGNITION ENGINE

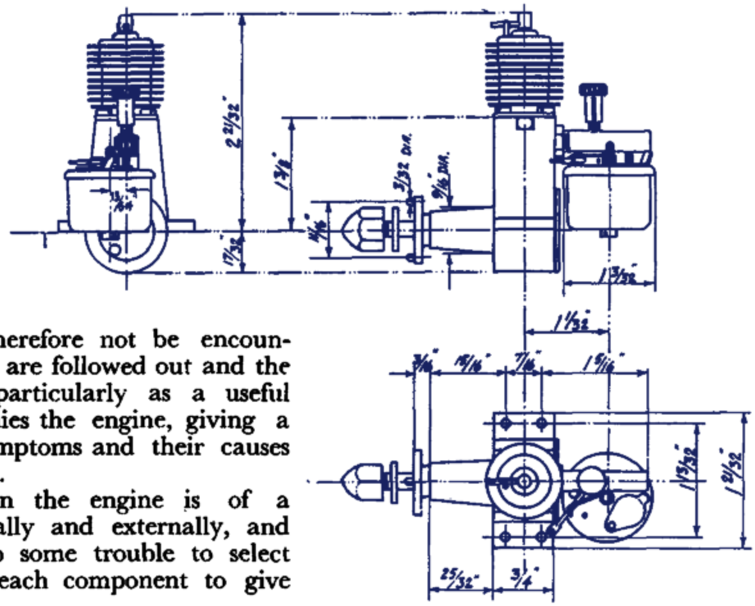
THE Mills 1.3 c.c. compression-ignition engine is the most promising engine of this type in production in this country which we have so far been privileged to handle and it is certainly well capable of holding its own with any of the foreign engines which we have tested.



An important feature which will make a special appeal to the competition enthusiast is that a device is incorporated to shut off the engine with a timer. This consists of a sleeve surrounding the fuel pipe fitted with an operating lever and a bleed-hole which coincides with a similar bleed-hole in the fuel pipe when the lever is operated by the timer. When the two bleed holes register, the suction on the fuel is destroyed and air is drawn into the induction pipe which immediately stops the engine without the danger of flooding it with the fuel.

Used with the special fuel developed by the manufacturers, it not only starts easily but develops a satisfying power output and runs with a healthy crackle from its exhaust.

The makers have employed the commendable scheme of testing every engine individually before despatch, noting the setting of the contra piston and fuel valve and recording them on an inspection certificate which is included with the engine on packing. Difficulty in starting up the engine should therefore not be encountered if the instructions are followed out and the controls correctly set, particularly as a useful brochure also accompanies the engine, giving a comprehensive list of symptoms and their causes for the benefit of owners.



The workmanship on the engine is of a high order, both internally and externally, and the makers have gone to some trouble to select the right materials for each component to give long life.

Tests carried out by the makers indicate that the useful life of the engine runs into several hundred hours, or much longer than is likely to be required by the average aero-modeller.

At £5 5s. 6d. the engine is attractive value for the money and bound to please.

NEWS from the S.M.A.E. and CLUBS

The Bristol Aeroplane Company "Aces" Club team entered in the Bartlett Trophy contest held on Filton Aerodrome, 1946.

THE LONDON AREA NEWS

Below are the results so far received by competition secretary, A. R. Parker, in the London Area r.t.p. contest. The Blackheath-Streatham battle was postponed by mutual consent.

North Kent		*v.*	*Zombies*	
J. Knight	... 172.0		(Retired)	
	183.5			
A. D. Hall	... 142.2			
	160.0			
Total	... 657.7 sec.		Zero.	

Harrow		*v.*	*Hayes*	
D. Spence	... 0		J. Marshall	... 52.0
	8.0			139.2
A. Crook	... 93.5		F. Brench	... 79.0
	22.0			91.0
Total	... 123.5 sec.		Total	... 361.2 sec.

Chingford		*v.*	*Northern Heights*	
Tillett	... 0		R. Copland	... 205.0
	24.5			200.0
P. Russell	... 56.0		R. C. White	... 153.5
	49.0			166.0
Total	... 129.5 sec.		Total	... 724.5 sec.

Report of the L.A. Council Meeting, Dec. 5th, 1946

Herewith a short summary of the December L.A. Council meeting. The minutes of the previous L.A.C. meeting were read and adopted.

A letter from Mr. A. F. Houlberg was read thanking the London Area for its letter of condolence to his wife and himself on the loss of his daughter.

An application for affiliation from the Nomads M.A.C. was held in abeyance, pending the clearing up of some obscurity in their letter of application.

The publicity secretary was instructed, in future, to forward the News Sheet to all clubs who had affiliated to the S.M.A.E., and formed part of the L.A.

Upon the instruction of the L.A., A.G.M., the Council considered the indoor gala and possible venue. Endeavour is being made to obtain the Old Horticultural Hall.

The Council also discussed the A.G.M.'s direction to restrain clubs from holding their individual open days. The matter was one of a delicate nature where loss of goodwill might easily occur. Further consideration, however, would be given upon receipt of a full list of L.A. clubs from the S.M.A.E.

NORTHERN NEWS

By "NORTHERNER"

Since my last notes I have had the pleasure of attending the first open meeting in the North for discussion of Radio Control of Models. There were interested enthusiasts from various parts of the country, representing all sections of the model movement, and all were keen on doing something to develop radio control of models. The discussions that took place were far too long to report here, but they did prove that there is great keenness, and before the meeting concluded it had been decided that a permanent body be set up for the discussion, guidance and development of the radio control of models. This new body has been named the "Radio Controlled Models Society," and meetings, for the time being, are to be held monthly, in Manchester. In February the society hopes to be able to arrange for the well-known radio control enthusiast, Peter Hunt, to give a lecture. All interested, whether they be young or old, beginner or expert, are invited to attend the meetings of this new society, so you chaps who have been doing a little experimental radio control with your model aircraft, come out in the open, and let the model world see how well advanced the model aircraft enthusiasts are in this new field.

Now let us turn to the usual club reports, which I regret to say, are still very few. The first and most prominent comes from the newly formed *Merseyside Regional Council of Model Aero Clubs,* which is holding an indoor club contest for the "Aeromodels" Challenge Cup. I have received a full detailed list of results from Mr. Molyneux, the competition secretary of this council, and I am only sorry that I cannot publish it all, but I am afraid I will have to confine myself to giving you a list of the positions of the clubs to date. St. Helens M.A.C., 22 points ; Aintree M.A.C., 22 points ; Merseyside M.A.C., 18 points ; East Liverpool M.A.C., 15 points ; Wallasey M.A.C., 13 points ; Warrington M.A.C., 6 points, and Longview M.A.C., nil points. The best individual flights to date are : Class A, 120 sec., and Class B, 93 sec., both by Mr. R. Scott, of St. Helens M.A.C. Good luck, M.R.C., you are doing good work. From the *Farnworth Aero-Modelling Engineers* there is news that they now have a new headquarters, after having been without one for some time. Their club records are : Sailplane, F.A.I. (tow), 4 min. 15 sec.. Sailplane (E./L.), 3 min. 50 secs., o.o.s. ; sailplane, tailless (tow), 2 min. 34 sec., o.o.s. ; rubber (H./L.), 2 min. 42 sec., o.o.s., and indoor (free flight), 1 min. 48 sec., and r.t.p. (class A), 1 min. 57 sec., all held by C. M. Holden, and then D. Nuttall holds r.t.p. (class B) with 1 min. 2 sec., and sailplane, open (tow), 9 min. 50 sec. The report ends with the words, "Yes, there are other members besides these two." It sure does make you think. By the the way, from the *Whitfield Youth Movement Model Aircraft Club*, there is news of some improvement in the indoor flying, on Wednesday nights. This club is still hoping to arrange a public exhibition in conjunction with the local model engineering club in early February. Petrol and C.I. engines and models look like being very popular with this club next outdoor season.

NEWS FROM THE CLUBS

AMPLEFORTH COLLEGE M.A.C.

At the end of the term two prizes were given for indoor flying. M. H. Brackenbury and D. Goodman tied to win the Twomey Speed Contest, and R. A. Twomey, flying a canard "Dumbo," received the Brackenbury prize for the longest indoor r.t.p. flight. This model, by the way, r.o.g.'s off a wire skid at the nose and the propeller at the tail ! It is very amusing to watch !

The club's sailplane record and best outdoor flight was made by F. G. Van den Berg's 44-in. span "Gadfly," with a towline-launch flight of 1.21, on December 15th. The model miraculously missed several trees by obeying the shouted directions of the spectators with an accuracy almost of radio control ! Both "Dumbo" and "Gadfly" were designed by Twomey.

Another achievement in a club so young is the first flight of a rocket-propelled model. It was designed, built and flown by R. E. Gore-Lloyd.

BRISTOL AND WEST M.A.C.

The first half of the winter season finished with the annual prize giving, by the club president, R. T. Howse. M. Garnett distinguished himself for the second time in three years by collecting four cups, namely, the Twin-float Seaplane Trophy, Harris Cup, Petrol Cup, and Moon Thermal Cup. A. H. Lee did even better by collecting both the Club Championship and Consistency Cups, whilst his Wing (red) won the Wing Trophy for the second year running. After the ceremony, the ladies got together and provided refreshments, and a sweepstake was held for a Northrop Gamma, flown r.t.p., the winner, Bob Moon, taking the model and the kitty. Messrs. Lee and Garnett then attempted to demonstrate a 4-c.c. diesel and a 10-c.c. spark ignition engine, and provided much entertainment in their efforts to start. Eventually the 10-c.c. ran well, but the least said about the diesel, the better.

Recently, the Bristol Aeroplane Company Aces Section ran an exhibition for model engineering, open competitively to anybody under twenty-two. The model aircraft show was, perhaps, the biggest one there, but it was interesting to note that the model engineering stands attracted the most attention. Ken Sergent won the cup presented for the best effort by a junior, with a beautifully-finished Bowden Contest model, Cyclone-powered, and fitted with control line adaptors. R. Parkhouse exhibited a very interesting tail-less flying boat with a 10-c.c. engine, driving a pusher airscrew.

SOUTH-EAST BIRMINGHAM M.A.C.

The indoor flying season is now in full swing. The first free-flying (microfilm) competition, held on October 21st, resulted in a win for R. Oliver, with an aggregate for two flights of 2;30.5. J. Phelps was 2nd 1;34.5, and K. Thomas 3rd 1;13.5.

A "round-the-pole" duration contest was held on November 11th. K. Thomas, flying a microfilm-surfaced model, gained first place with an aggregate of 4.50 ; T. J. Patrick was a close second with 4.45. The third prize was awarded for consistency of performance, and was won by D. Felton.

A "solid" competition, held on October 25th, was very well supported. It was won by J. Sawyer's Hurricane II. This model, besides having working controls and flaps, has a perfectly detailed dummy engine beneath its removable cowling, and a tiny electric motor to revolve its airscrew. It is to 1/36th scale.

R.T.P. scale models are popular, A contest for this type took place on December 16th, it was won by T. J. Patrick, flying a 1/3-in. scale Miles M.48, with an aggregate of 58 sec.

CHINGFORD M.F.C.

Round the pole flying is now taking place at the Wellington Road School, every Friday night.

On Friday, December 13th, a dozen or so members went, at the invitation of Northern Heights Club, to their clubroom to see a film show. Friday the 13th proved unlucky, in that the operator and his gear were fog-bound with his car at Hounslow. Bob Copland stepped into the breach with a talk on "Competition Models," which received the attention it deserved. The latter part of the evening was allowed to develop into a free discussion.

The following Friday, the Northern Heights Club came to fly against us—We had no optimistic hopes. We learnt a lot, as the figures below will prove. We make no excuses in spite of the fact that Tillet could not get his model cleanly away, but we are determined to do better in future.

Times were :—*Chingford M.F.C.*, Tillet, L., 24.5 sec., aggregate 24.5 ; Russell, P., 56 sec.. 49.0 sec., aggregate 105. Total 129.5.

Northern Heights, Copland, R., 205 sec., 200 sec., aggregate 405 ; White, R. C., 153.5 sec., 166 sec., aggregate 319.5. Total 724.5.

COVENTRY AND DISTRICT M.A.C.

We have been unfortunate in losing one of our best modellers. R. Toms, who has now returned to Canada. He was the club's mainstay in indoor flying, as well as holding several club records, including lightweight glider, 4 min. 11 sec., and r.t.p. 3 min. 38.8 sec.

The club's total for the December indoor contests was 565.7 sec.. made up from R. Toms' 218.8 sec., and 176.7 sec., and B. Roberts' 170.2 sec.

The following is a list of the outdoor contests winners :

President's Trophy :—1st, R. Toms, agg. 196.6 sec. ; 2nd, L. Watts. agg. 153.9 sec. ; 3rd, B. Roberts, 147.6 sec.

Junior Cup (open rubber) : 1st, B. Roberts, 72 sec.

AttendanceTrophy : 1st, A. J. Barr, 52 points ; 2nd, R. Toms, G. Ginns. 47 points ; 3rd, P. Ginns, 46 points.

Club Cup : A. J. Barr, 4 min. 12.2 sec.

Glider Contest : 1st, P. Ginns, agg. 130.8 sec. ; 2nd, R. Cook, agg. 96.7 sec. ; 3rd, R. Toms, agg. 53.8 sec.

KINGSBURY M.F.C.

Recent weather has not offered many opportunities for flying, but on December 28th, G. D. Miles set up a petrol duration record of 2 min. 40 sec. on a 20-sec. motor run, in cold, frosty weather. The model, a slabsider, with

" Korda " type wings, mounted on a pylon, has a span of 45 in., and is powered with a Mills' diesel. Weight 11 ozs.

D. Posner's model, also powered with a Mills' diesel. enjoyed a short, but gay life, before looping under power, and failing to pull out in time.

He has now completed a modified version of the model, but this has yet to be test flown. It is very original, employing a 6-sided " flat-fish " fuselage.

NORTH KENT M.A.S.

Our first opponents in the London Area r.t.p. contests were Zombies. We anticipated a keen tussle, and members turned up in force.

However, John Knight put in a first flight for North Kent and clocked 172 sec. D. A. Brockman came on for Zombies, but failed to make a flight. Later Zombies withdrew and left our team to complete their flights.

Results were :

North Kent—	1st	2nd	Agg.	Total
J. Knight	172.0	183.5	355.5	
A. D. Hall	142.2	160.0	302.2	657.7

Indoor meetings are held every Friday evening at Graham Road Schools, Bexley Heath, and as many as sixty members frequently attend. Mr. A. R. Parker conducts a regular building class, and Mr. R. Smith is arranging a series of talks and demonstrations with the help of the senior "talent." The first issue of a club magazine has been produced, edited by Mr. P. C. Newport, now returned from the forces.

LIVERPOOL M.A.S.

New officers were elected at the Society's inaugural post-war meeting, held in December, and it was unanimously agreed to revise the old constitution and rules.

Members are happy to be together again after seven years' break in official activities. Whilst intending to support S.M.A.E. events as fully as possible in the coming season, it is felt that priority should be given to our own activities if that " Happy family " spirit is to be retained.

Interesting machines to appear next season will include a sailplane by Tom Comber, with a wing span of 10 ft., and 8¼ sq. ft. of wing area. The 5-ft. long fuselage is being built in his usual manner—by planking thin plywood over a removable form and then winding around this inner skin several layers of glue-soaked surgical bandage. The form is removed by an ingenious means, leaving a pure monocoque fuselage of terrific strength. This machine will be fitted with a compass-actuated rudder, the main function of which will be to remove the luck element from slope-soaring.

LUTON AND DISTRICT M.A.C.

On December 5th, the annual general meeting of the club was held in place of the indoor scale competition. Mr. K. N. Collins in the chair. After the secretary, E. C. W. Clark, had given an inspiring report on the activities of the club, the treasurer, Mr. R. Brown, gave us a hopeful outlook for the future, and then dropped a statement which he expected to be a bombshell, and that was, the advisability of raising the annual subscription in order to cope with a rise in S.M.A.E. affiliation. One can imagine his surprise when it was unanimously approved by the meeting, there being not *one* " grim " face.

The members then showed their appreciation of the committee by re-electing them *en bloc.* There were, however, two resignations, the chairman of the committee, Mr. Sam Barret, had to resign, owing to pressure of business, and Mr. Jimmy Jones was elected chairman. Last year was Mr. Jones's first year off the committee, due to his absence from the town, and he said he was overjoyed to be serving the club again. The other resignation was Mr. E. W. Thorne, whose place was filled by Mr. Bob Minney, as representative for the juniors.

On December 14th, a re-union supper and social was held, which was a great success. The president, Mr. K. N. Collins,presented the year's cups. Mr. Bob Minney had to be supplied with a tray to carry his cups, five in all, and nine certificates. The cups represent Wakefield, Open Rubber, Sailplane, Flying Scale, and the Championship Cup (the Lutonia), showing Bob to be a grand all-rounder. Other cup winners were R. Brown, R. Hinks, C. Houghton.

Mr. Miller won the photographic competition with two grand photographs of his two equally grand flying scale models of a Thunderbolt and Auster.

The indoor flying meetings have been going well and there has been some grand fun. Bob Minney has been experimenting with an ornithopter, and his speed model has clocked an unofficial 38 m.p.h. on test, although we think his scale Hurricane is almost as fast.

MERSEYSIDE M.A.S.

On December 21st, the society entertained the Wallasey M.A.C. for a two-round inter-club r.t.p. meeting. The teams were four-a-side, two class " A " and two class " B," and the outcome was as below :

Class " B "		*1st*	*2nd*		
Name	*Club*	*Flt.*	*Flt.*	*Agg.*	*Points*
T. Comber ...	Merseyside ...	7.25	7.0	14.25	1
J. Jones ...	Wallasey ...	60 ·	5.2	65.2	3
W. Jackson	Merseyside ...	73.0	97.0	170.0	4
A. Molyneux	Wallasey ...	31.1	26.5	57.6	2

Class " A "		*1st*	*2nd*		
Name	*Club*	*Flt.*	*Flt.*	*Agg.*	*Points*
R. Gosling ...	Merseyside ...	18.0	86.5	104.5	3
J. Baguley ...	Wallasey ...	66.0	6.0	72.0	2
D. Hughes ...	Merseyside ...	55.0	62.25	120.25	4
P. Phillips ...	Wallasey ...	14.1	51.75	65.75	1

Total : Merseyside 12 points, Wallasey, 8 points.

NORTHERN HEIGHTS M.F.C.

The winter season has seen a revival of the club league system, whereby the membership has been split up into three teams, each carrying one of the club's colours, red, black, and gold, and vying with each other for points for the President's Trophy.

One of the most amusing evenings saw a rubber-winding contest, verbal barracking being allowed. The effect of a book being dropped at 999 turns can be imagined ! The contest was literally a howling success.

An " Indoor Oddities " night produced (amongst other interesting types) a microfilm helicopter, a whip powered Taylor Cub, of 6-in. span, and several r.t.p. (or round the gramophone motor) gliders.

With the aid of Mr. Sam Mayo, of Streatham, our secretary has been able to arrange for talking film shows in the club room. These are all of aeronautical interest, and are given by the Central Office of Information.

SALE AERO CLUB

Little interest is being shown this season by members in indoor duration flying, but I. Reay, a very active junior member, has raised the indoor speed record to 25 m.p.h. with a model of his own design.

The club journal, " Saleplanes," is now well established. A recently introduced feature is the publication of plans of successful models, designed and built by club members.

STOCKTON AND DISTRICT MODEL FLYING CLUB

On December 26th and January 1st we held the indoor Class A and B competitions for the Club Cup. Results as follow : —

December 26th. Class B, aggregate three flights. A. M. Robson, 172.2 sec.; G. Parker, 103.4 sec.; D. R. Leaward, 71.0 sec.; L. Anderson, 60.8 sec.; B. Rowbanks, 51.2 sec.

January 1st. Class A, aggregate three flights. A. M. Robson, 159.5 sec.; D. R. Leaward, 93.8 sec.; G. Parker, 92.4 sec.; W. Forsythe, 87.0 sec.; D. Waite, 7.8 sec.

Final results :—1st, A. M. Robson, 331.7 sec.; 2nd, G. Parker, 195.8 sec.; 3rd, D. R. Leaward, 164.8 sec.

THE SOUTHERN CROSS AERO CLUB

A very successful exhibition of model aircraft was held by the Southern Cross Aero Club, in the Robertson Hall, Brighton, from January 6th to 11th, which drew no less than 217 competition entries from clubs in the Southern Area.

The exhibition was opened by Air Commodore Sir Harry Broadhurst, K.B.E., C.B., D.S.O., D.F.C., A.F.C., who stressed the value of model aircraft construction as a first step in an aviation career, and pointed out that if the nation is to forge ahead in the field of civil aviation it must encourage aero modellers. Other distinguished speakers who supported the exhibition were the Mayor of Brighton, Alderman T. E. Morris, the Mayor of Hove, Councillor H. C. Andrews, and Mr. Anthony Marlowe, K.C., M.P.

Tribute was paid to the hard work and enthusiasm which Sqd. Ldr. Curtis-Wilson, M.B.E., J.P., had applied to fostering the air cadet movement in the district, and encouraging air-mindedness in general, and it was a pleasure to see him supporting the efforts of the S.C.A.C.

In the unavoidable absence of Mr. F. G. Miles, F.R.A.E.S., the president of the S.C.A.C., Mr. Rewell, the chairman, presided at the opening function, supported by Mr. A. F. Houlberg, the chairman of the S.M.A.E.

The exhibits displayed a commendably high standard of both workmanship and original design, and were well capable of holding their own in any company. The competition entries were judged by Mr. A. F. Houlberg and Mr. Harry York, the press secretary of the S.M.A.E., with the following results :—

Sen. Championship ...	T. Rendle, S.C.A.C. (Loafer).
Jun. Championship ...	T. G. Wright, S.C.A.C., (Mick Farthing II).
Jun. Rubber Championship	T. G. Wright, S.C.A.C. (Mick Farthing II).
S.C.A.C. Championship	T. Rendle, S.C.A.C., (Loafer).

Power Models—

1st—Major C. L. Bagley (original design), B. & D.M.A.C.; 2nd—A. Sawyer (Bowden contest), unattached; 3rd—F. J. Hemsley (Scorpion), S.C.A.C.

Experimental Models—

1st—T. Rendle, (Zephyr tail-less glider), S.C.A.C.; 2nd—L. White (Jet propelled flying wing), S.C.A.C.; 3rd—E. W. Gravett (Tail-less glider, E.W.G.34), S.C.A.C.

Flying Scale Models—

1st—L. R. Willard (Hornet Moth), S.C.A.C.; 2nd—F. Hemsley (original design), S.C.A.C.; 3rd—F. Hemsley (Hawker Typhoon), S.C.A.C.

Gliders (Senior)—

1st—R. Rendle (Loafer), S.C.A.C.; 2nd—E. W. Gravett (Sokol), S.C.A.C.; 3rd—L. A. Willard (Albatross), S.C.A.C.

Gliders (Junior)—

1st—J. C. Wright (Minimoa Gull), S.C.A.C.

Duration Models (Senior)—

1st—F. Hemsley (Lancer), S.C.A.C.; 2nd—A. H. Hart, M.B.E. (Flying Minutes), S.C.A.C.; 3rd—L. R. Willard (Eager Beaver), S.C.A.C.

Duration Models (Junior)—

1st—T. G. Wright (Mick Farthing II), S.C.A.C.; 2nd—T. Trodd (Isis), B. & D.M.A.C.; 3rd—F. Mace (Air Cadet), A.T.C.

Solid Scale Models (Senior)—

1st—F. W. Dee (D. H. Vampire), H.A.M.C.; 2nd—M. Hepper (Lancaster), A.T.C.; 3rd—L. E. White (Walrus), S.C.A.C.

Solid Scale Models (Junior)—

1st—Pearce (M.E. 262), A.T.C.; 2nd—Pearce (H.N.K. 162), A.T.C.; 3rd—O. R. D. Macdemitria.

WALTHAMSTOW M.A.C.

In the S.M.A.E. Cup, E. H. Aylward, flying a 20-in. span lightweight rubber job, was placed 2nd with an aggregate of 296.8 sec., o.o.s. A. W. Green, flying a 30-in. span parasol model was placed 3rd.

Now that nearly all the senior members have acquired petrol or diesel engines, many gas jobs are well on the way.

WINDSOR M.A.C.

The Windsor M.A.C. (Manchester) has been re-formed under the new title of South Manchester Aeromods, and any old or prospective new members are advised to get in touch with Mr. G. K. Bletcher, 2, Leacroft Road, Chorlton-cum-Hardy, Manchester 21, as soon as possible. This club, started on January 1st, 1947, has had sufficient response from old and new members to warrant applying for S.M.A.E. affiliation.

CHANGE OF TITLE

Windsor M.A.C. (Manchester) have changed their title and are now known as **South Manchester Aeromods.** Hon. Sec.: G. K. Bletcher, 2, Leacroft Road, Chorlton-cum-Hardy, Manchester 21.

CHANGE OF ADDRESS AND NEW SECRETARYSHIPS

Brentford and Chiswick M.F.C.: Hon. Sec., F. J. Johnson, 140, Duke Road, Chiswick, London, W.4.

Bushy Park Model Flying Club.: Hon. Sec., Mr. M. A. Wright, 75, Wensleydale Road, Hampton, Middlesex.

Caterham Model Flying Club: Hon. Sec., Mr. G. Shepphard, 144, Chaldon Road, Caterham, Surrey.

Edgware M.A.C.: Hon. Sec., R. H. W. Annenberg, 69, Lodore Gardens, The Hyde, Kingsbury, London, N.W.7.

Farnworth Aero-Modelling Engineers: Hon. Sec., C. M. Holden, 2, Lavender Road, Farnworth, Nr. Bolton, Lancs.

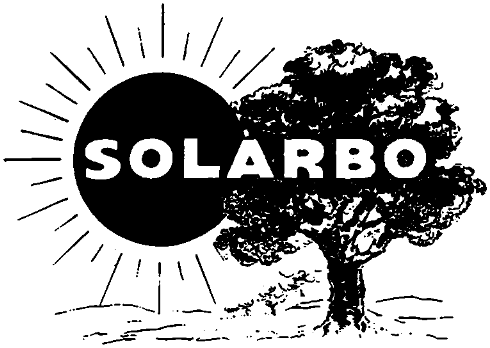
Rhyl and Prestatyn M.F.C.: Hon. Sec., N. P. Reason, 10, Westbourne Avenue, Rhyl, Flintshire.

Southgate and District Model Flying Club: Hon. Sec. Mr. H. J. Childs, 41, Eversley Park Road, London, N.21.

Tunbridge Wells Model Aero Club: Hon. Sec., Mr. C. Faircloth, 8, Poona Road, Tunbridge Wells, Kent.

Victoria M.A.C.: Hon. Sec., R. W. Clark, 31, Temple Buildings, Old Bethnal Green Road, London, E.C.2.

Wigan M.A.C.: Hon. Sec., N. Merton, "Glenburn," Brock Mill Lane, Wigan.



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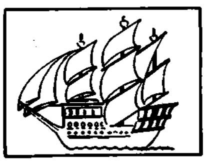

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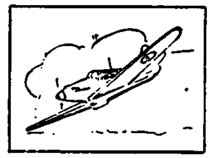

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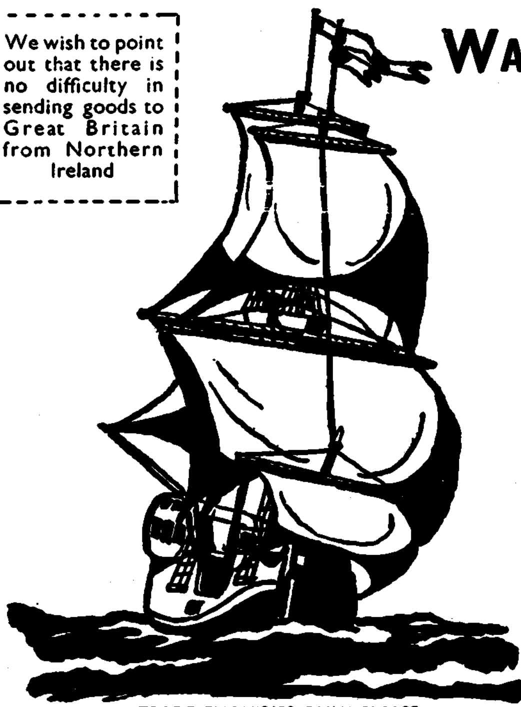

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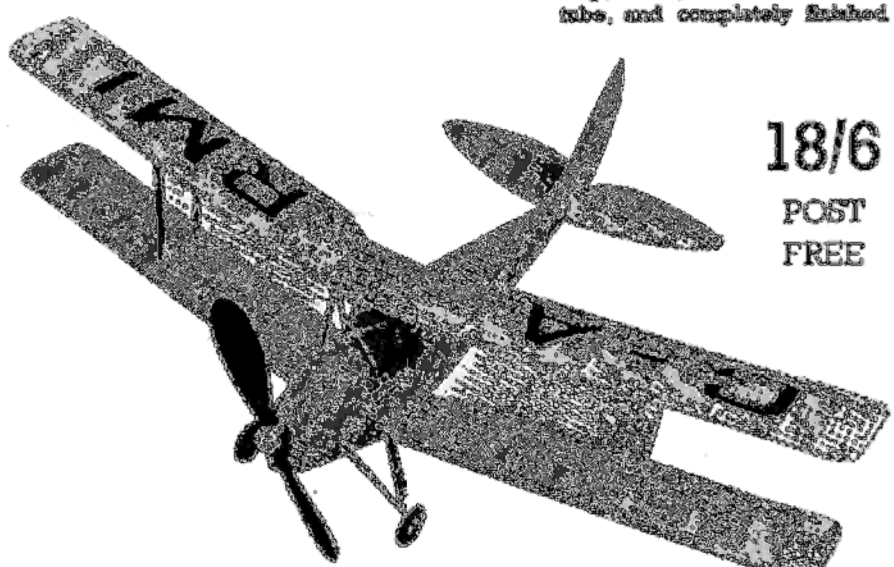

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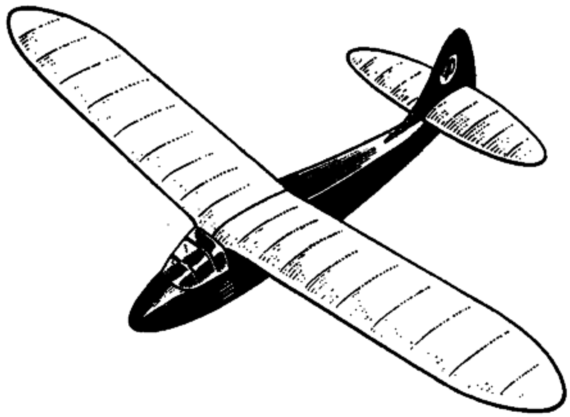

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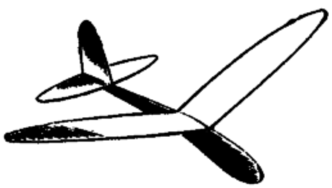

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