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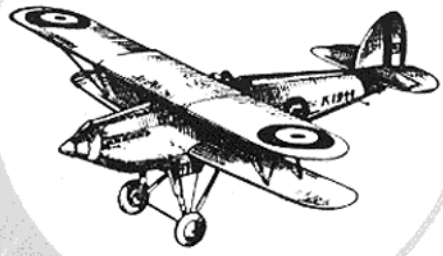

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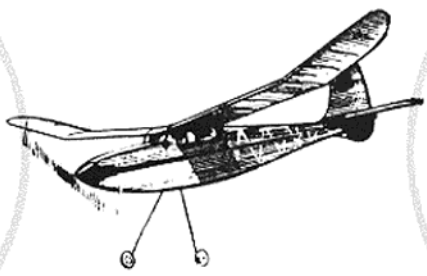

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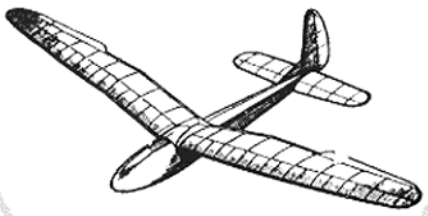

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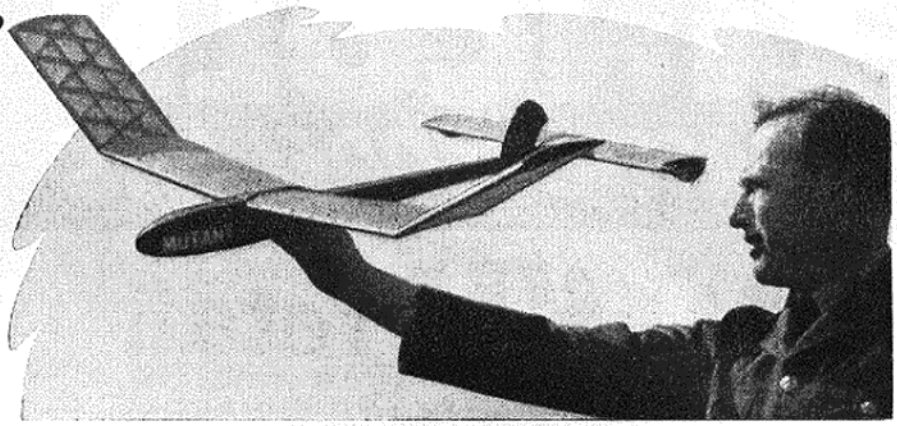

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The designer with his model

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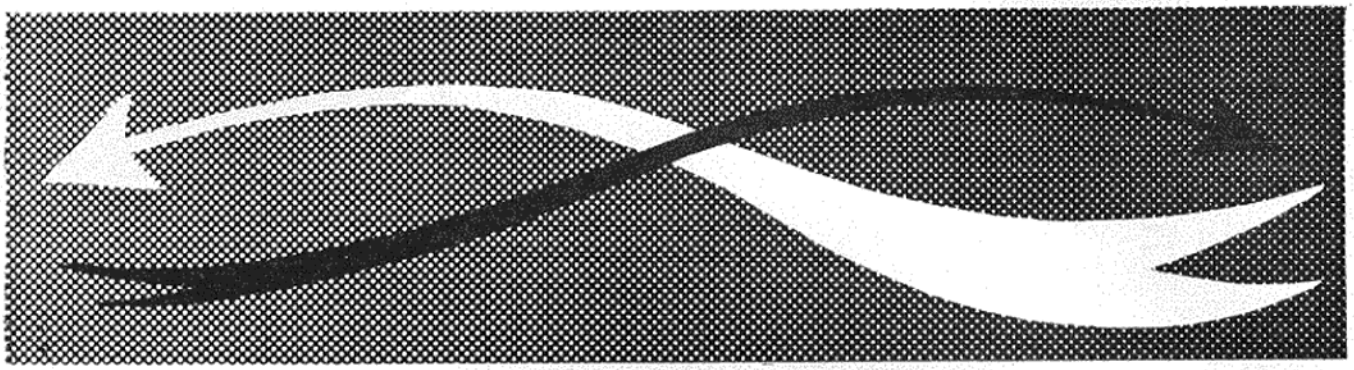

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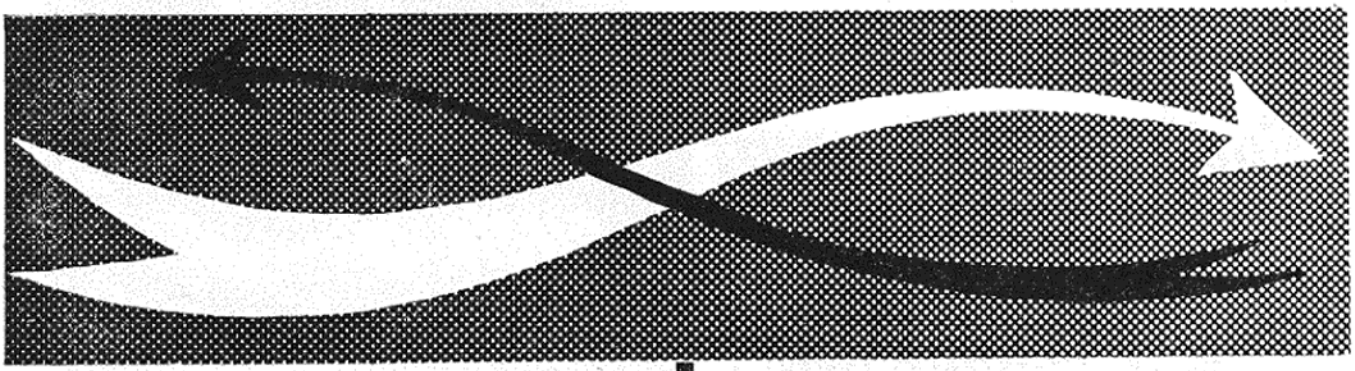

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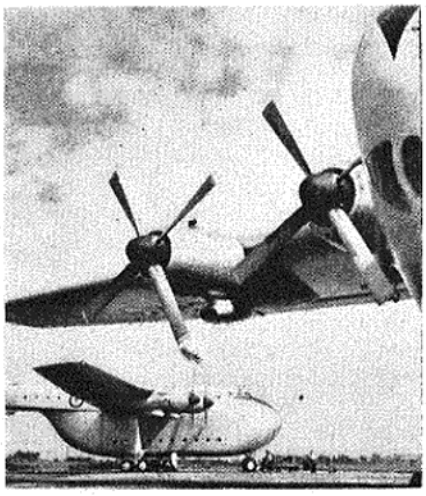
Cover Story

A lady that carries a punch — that's the Blackburn *Beverley*. The massive freight hold has nearly 6,000 cu. ft. in which to stow military stores, while the Passive tail boom can accommodate a large number of troops. And the *Beverley* is a stunner in other ways too. The snappy take-off run of 810 yards is amazing enough, but the landing run of only 350 yards really takes your breath away. The *Beverley* is one of the largest aircraft ever in service with the R.A.F. and spans 162 ft. Loaded weight is 135,000 lb.



THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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Letters TO THE EDITOR

The R.A.F. Replies

DEAR SIR,—Referring to the final paragraph of your "Here and There" item "Conscription Restriction" in the May issue of MODEL AIRCRAFT, I feel that I must make a protest on behalf of the service.

It is true that many modellers may "lose the threads" during their period of National Service. It is equally true that such a state is entirely due to their own lack of initiative and enthusiasm.

Aeromodelling is an officially recognised sport in the Royal Air Force and be there but one enthusiast on a station, he will be given facilities to carry on his sport and hobby. Where there are sufficient interested personel to form a club, modelling can also be cheaper than in "civvy street" due to help given by the institute funds.

Regarding the possibility of posting, it is a well known fact that the vast majority of National Service airmen never change their station after completing initial training. Even if they did there would be no need to abandon modelling. I am a "regular," and although I may be moved half-way across the world at anytime, it would not interfere with my modelling activities. This, of course, goes for many members of the R.A.F., some of them well known in the aeromodelling world.

Yours faithfully,

R.A.F. Cardington, Beds. E. J. D. WIDDICK, Sergeant.

Fearnley with Facts

DEAR SIR,—According to the Pylonius News Service I have given up museum scale models. Wrong! The Gloster *Gladiator* will be remembered long after the 1,001 jet jobs are forgotten, while the free lance jet shown in the photograph was built for a special display. Pylonius said I had never heard of them! I will quote the facts and let our intelligent readers work it out for themselves. *Gladiator*, 60 hours, and not near flight trials. Jet framework designed and completed in 6 hours.

At the present time I have in a flying state one pylon, one pylon frame, one Wakefield, one R/C, one flying boat, five flying scale models, one scale yet to fly, and a delta for lightweight radio. The pylon was built simply for the club area cup (which we won) and only confirms my worst fears of this branch of flying. While there is no comparison

(*Continued on page 192*)

MORE RULE CHANGES

RESULT OF F.A.I. BALLOT

THE results of the F.A.I. ballot of National Aero Clubs have now been issued and, as was expected, the 50 grm. rubber weight for Wakefields; the 300 grm. per c.c. power loading and 20 grm. per sq. dm² wing loading for power models will come into operation in 1958.

We are, however, rather puzzled by the reason given for the decision to alter the speed and team race rules, which was the desire to limit speeds. We would have thought that a better solution would have been to have increased the minimum line diameter from 0.010 in. to 0.012, or even 0.014 in. This would not only have limited speed far more effectively than increasing the size of the model, but it would also have greatly increased safety factor, which is surely a desirable object.

The old team race rules (wing/tail area 125 sq. in., depth/width at cockpit 3 in. × 1.6 in.) have produced models that were manoeuvrable, good looking and pleasant to handle. With the new rules (wing/tail area 186 sq. in., depth/width at cockpit 4 in. × 2 in.) we will have team race models that would fly well, and far more safely, with a racing "29" engine.

The C.I.A.M. have apparently decided that they cannot frame a rule banning "whipping" as this is too difficult to define. It is added—somewhat naively we think—that if a competitor does "whip" he should be disqualified by the contest organisers.

We are also surprised that the new formula for speed models (31 sq. in. per c.c. of motor, 3.5 oz. per 15½ sq. in. max. wing loading) was put forward by the Czechs. This effectively *trebles* the size of the average 2.5 c.c. world championship class model. Surely, in this class of flying, where the sole object is to achieve the highest possible speed with a given size of motor, no restrictions in the design of the model were called for.

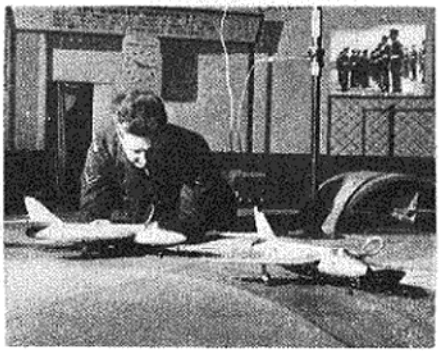
Let us hope that the above rule changes will be the last that we shall have for some time to come from the C.I.A.M., as if there is one thing more than anything else which has aroused the indignation of contest fliers throughout the world it is the continual rule changes made by the Commission.

Oh, you lucky glider fliers, you can still fly and win with models that were designed when the A/2 international class was first introduced, but just wait, unless a "freeze" takes place your turn will surely come!

R.T.P. at the M.E.

A STAR attraction of this year's M.E. Exhibition will be the Royal Air Force flying scale r.t.p. layout, which is one of the most realistic and ingenious flying demonstrations we have seen. The scale jet models are propelled by compressed air, which is fed from a centre pylon by flexible tubes to the jet orifice of the aircraft.

Retractable chocks prevent the models moving during pre-flight "warming up" in the central parking area. When the chocks are removed the aircraft are taxied via a guide ramp on to the runway, and as the power is gradually increased they move forward into a realistic formation take-off.



A R.A.F. Corporal makes last minute adjustments to the Hunter before take-off.

The two machines fly together under entirely separate control, speed and height being governed solely by the pressure of air supplied, as there is no elevator control. An electric motor raises the undercarriage after take off and lowers it for landing.

After landing, the models are taxied to the appropriate position on the main runway, the guide ramp and chocks are raised, and the aircraft run into their parking place ready for the next demonstration.

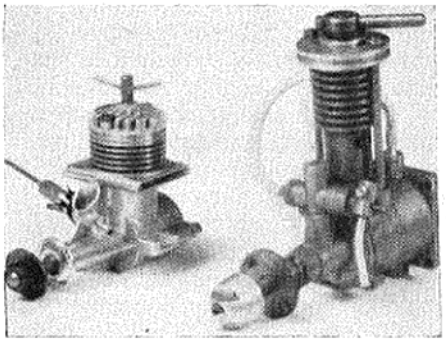
As a final realistic effect the flight is synchronised with a tape recording of take-off and landing procedure as normally conducted by radio telephone between aircraft and control towers on R.A.F. stations.

MOTOR MUSEUM

ANTIQUITIES have always had a fascination for many people, and while the museum pieces we have in mind are hardly old by any standards, to the younger modellers

of today they appear antiquated. The Hallam Nipper, Ohlsson "23," Arden, Owat, Milford Mite, Leesil, Ace, Majesco, the mere mention of these engines to older fliers, evokes reminiscences of the early pre- and post-war days of power flying, the birth of power duration and C/L. Yet to most youngsters they are just meaningless names, and at the moment there is little likelihood of their being able to examine these pioneers of the modern high performance engine.

However, there must still be examples of many unique and interesting engines available, but as the years progress so specimens of the older motors will disappear. A suggestion that a "Motor Museum" be founded, to house a permanent and complete collection of model engines, has aroused much interest and we would be pleased to hear from enthusiasts who have old, interesting, or "one off" motors that they would be prepared to donate or loan, should such a museum prove a feasible idea.



Same capacity, but what a difference! The new Frog 80 and the 1948 Frog 100.

One suggestion is that an initial display of engines might be made at this year's *Model Engineer* Exhibition. The organisers would be willing to provide suitable display cases, and this could form the basis of a permanent collection.

If you have any ideas on this matter, particularly with regard to the organising and permanent housing of such a display, drop us a line. Also, if you have an engine you think might be suitable for inclusion, let us know, but please don't send any engines to us yet.

QUIZ WINNER

This month's lucky quiz winner is K. Willis of Burton-on-Trent, and for those who wish to check their entries the correct answers were:—1. (a), Oliver Tiger. (b), Dooling. (c), McCoy. (d), Torpedo. 2. (d), Bramco. 3. (d), Sabre. 4. (c), 5 min. 5. (b), unrestricted glider. 6. (b), Japan. 7. (b), 14 S.W.G. 8. (b), 1950.

INDOOR FLYING AT MANCHESTER

poorly supported but good fun

INDOOR flying is the complete antithesis of a normal model meeting, everything is done in slow motion, competitors and spectators alike creep around on tip-toe, while launches possess the statuesque grace that is revealed when a film of a normal launch is shown in slow motion.

The Corn Exchange, Manchester, because of its small size and draughty atmosphere, is far from being the ideal hall for an incursion into the realms of microfilming, but nevertheless a new record and several notable flights were put up at the meeting organised by the North Western Area, with the financial support of the S.M.A.E. and the Midland Area, on April 13/14th.

In view of the clamour that there has been to arrange an indoor meeting we were surprised to find that this meeting was poorly supported, particularly by local clubs. However, what the competitors lacked numerically they more than made up for in enthusiasm, and took full advantage of the rules which allowed as many flights as desired, the best of these counting for final positions. (Full results on page 210.)

The first day was set aside for testing and record attempts, but due to the high wind outdoors times were limited to 4 min. across the hall, until late in the evening, when, the wind having dropped, Mac Grimmett, forsaking the noise and dirt of the combat circle, flew an interesting tailless design to beat the existing record for this type by 61 sec. to 5 : 14.

Fortunately it was calm for the competitions on the Sunday and the hall was virtually draught free, with very little drift, though there were several noticeable thermal spots, particularly when the sun shone on the glass dome.

First excitement came just before lunch when O'Donnell's under 100 sq. in. entry was circling in the dome at 9 min., and to add to the interest D. Poole's machine was only slightly lower with a similar time. The floor was cleared and all interest focused on the two aircraft, but Poole's motor was expended while the model was still quite high and it glided in for 10 : 46, O'Donnell, however, with more turns on, kept going for 12 : 38.

For a long time it seemed that this would be the highest time of the day, as most models were fouling the roof, balcony, or one of the many columns that surround the hall. However, Monks, after a rather doubtful start, when the model circled near the pillars, found some drift which carried him nicely into the dome to return 13 : 53.

Meanwhile O'Donnell had added a fin from an old model to the trailing edge of his wing to bring the machine into the over 100 sq. in. class and promptly proceeded to put up a time of 11 : 50 to beat the really big models into first place.

Australian flier Alan King had the lightest (and flimsiest) model which in a "calmer" hall would undoubtedly have had a far greater potential than its time would indicate. In addition, he also flew Bob Copland's veteran over 100 sq. in. machine to second place after having had to re-cover a wing tip damaged in collision with a pillar on its first flight.

At intervals the peace and decorum were shattered by the intrusion of chuck gliders, which, although limited to ¾ oz. weight, were shattering in their impact upon surrounding obstacles, fortunately leaving the latter undamaged. Eventual winner, J. H. Dixon, flew an orthodox long moment arm, polyhedral design, with great consistency, and nicely judged his launching position for the model to circle in the centre of the hall.

Although the Manchester Corn Exchange does not compare with Cardington the times recorded were quite high and we are sure that if a more suitable venue were found where regular contests could be held, this "slow motion" branch of modelling could well become very popular.

FULL "PHOTO REPORT" ON PAGES 190 and 191

GEOF LEFEVER'S Contest Winning Design

OTTAIR

THIS is the model that took Geof Lefever to the top of the eliminators last year, despite his having to make serious repairs to the wing after the third flight, and which he subsequently flew into seventeenth position in the Wakefield contest.

In addition to presenting the model as it was flown to the '56 rules, the plan details the necessary modifications for a 50 gram 1958 model.

Fuselage

Cut four sides from medium $\frac{1}{16}$ in. sheet, select two for the actual sides and to the inner faces of these cement the $\frac{1}{8} \times \frac{1}{16}$ in. longerons and spacers. Splice in the $\frac{1}{8}$ in. sq. rear longerons, and add the diagonal spacers. The ply rear motor anchorage can now be cemented in place, and the two sides joined with $\frac{1}{8} \times \frac{1}{16}$ in. spacers placed vertically. Note that the four spacers immediately under the wing mount are from $\frac{1}{8} \times \frac{1}{4}$ in. Cement the top fuselage sheet in place, attach the undercarriage, then add bottom sheeting and ply nose former. When dry cut access door for motor peg. It is advisable at this stage to lightly cement the noseblock in place so that it is shaped as the fuselage is sandpapered.

Fin and Tailplane

The construction of the fin is quite orthodox, but it must be borne in mind that it is an integral part of the fuselage, and care must be taken to ensure that the correct amount of turn is " built in."

Again, the tailplane is perfectly straightforward with the geodetic construction making it surprisingly warp resistant. A neater job results if the slots for the spar are cut after the ribs have been cemented in position.

Wing

It is well worth while spending quite a lot of time on the wing and it is essential that the correct grade of wood is used for the l.e., t.e., and the mainspar. The latter in particular must be hard and springy if it is not to crack in high winds.

Laminated tips can be a headache, but by cementing all the laminations together with plenty of cement, and forming round pins set in the plan at $\frac{1}{8}$ in. intervals, while the cement is still liquid, the wood is quite pliable and readily takes the required shape. Once in position, however, they should be left for at least a day to dry out.

Insert the normal $\frac{1}{16}$ in. ribs first, then when these are dry the geodetic half ribs can be added before cementing the main spar in place. As with the tailplane, it is easier to cut the spar slot on the diagonal ribs after they are in position.

The wing mount is constructed mainly from medium hard $\frac{1}{16}$ in. sheet, and should be held in shape with rubber bands, while drying. Cover with tissue and cement to fuselage after the latter has been covered.

Finishing

Cover the fuselage with heavyweight Modelspan doped on with a soft rag. Black is a good colour and should be finished off with two coats of thin glider dope. The fin is covered but not doped or water shrunk until it is cemented in place, which should be after the top surface of the rear end of the fuselage has been covered and doped, but before the sides and bottom are covered.

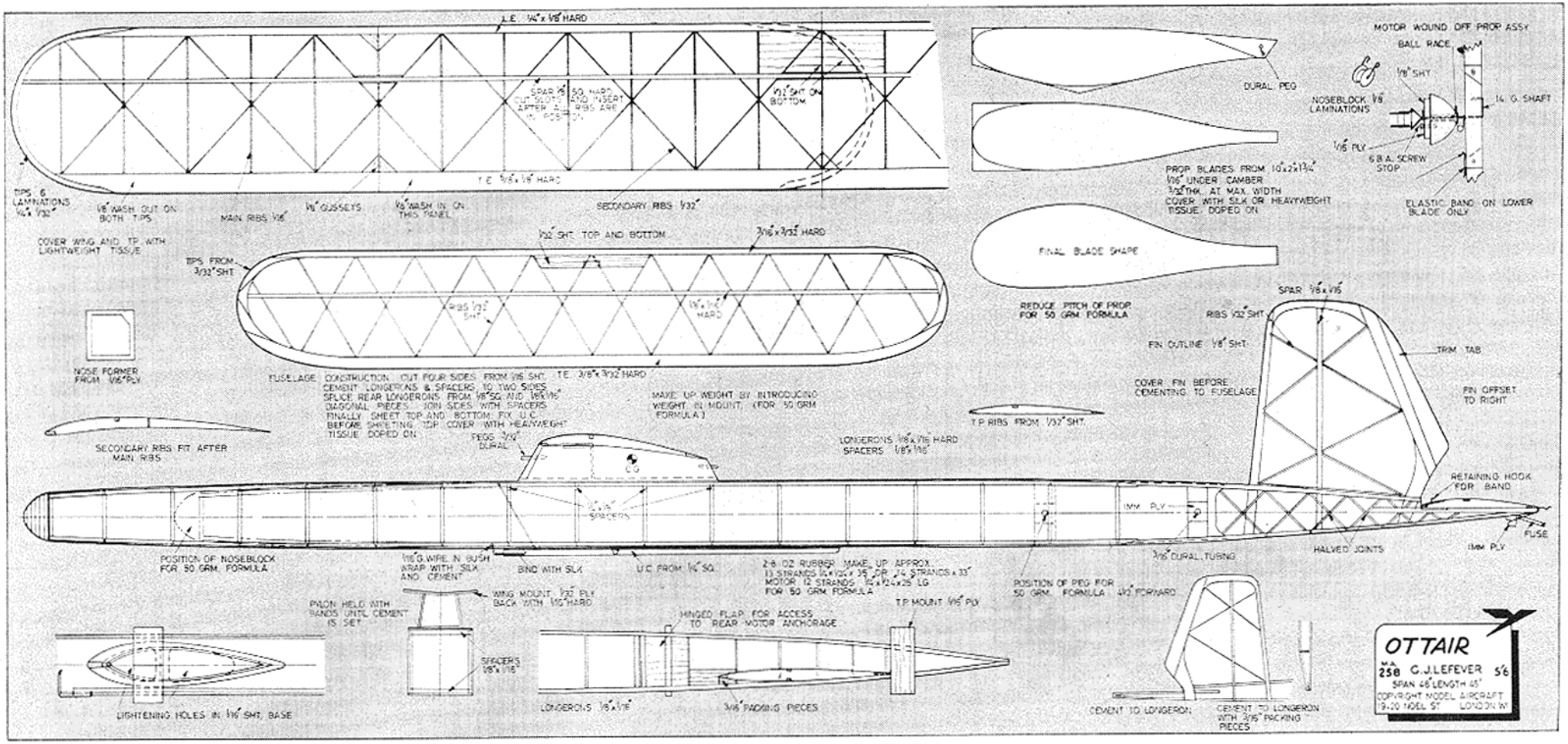
The fin, tailplane and wing were covered with jap tissue but Modelspan is quite suitable, bright colours (red, orange, yellow, etc.) being the best for visibility.

The prop. blades should be carved to 3/32 in. thick at the point of maximum width, and kept as light as possible ; they will be far more durable if covered with silk or tissue and polished with metal polish after several coats of dope have been applied.

Ottair should present no trimming troubles provided the correct washout as indicated on the plan is built in. The first few flights should be made in calm conditions, but little can be learnt from hand gliding and half-a-dozen should suffice to show that the glide trim is approximately correct.

One hundred hand turns should result in a long right-hand circle under power and will give sufficient height to check the glide. Once this is correct, increase turns 50 at a time making slight adjustments to the thrust line as required.

With 700 turns on in evening air, regular flights of around $3\frac{1}{2}$ min. should be obtained when properly trimmed ; and finally, never forget the D.T.



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Topical Twists

by PYLONIUS

Stringing a Yarn

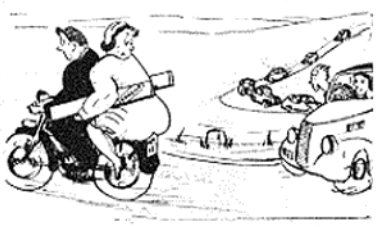
Just on the point of emerging from our winter hibernation we weather-bound model types view the coming season through a dreamy haze of ever-blue skies and becalmed fields. The only blight on the summery horizon is the disturbing thought that we haven't yet begun that winter building programme. The first shock of disillusionment comes with the dear old Damage Cup, and we can only console our storm-battered selves with the prospect of that one flyable day, which appears by kind permission of the Northern Heights Model Club.

Significantly, the donors of the wind-blown Damage Cup are currently advertising a range of kites—presumably as a highly strung diversion for highly strung modellers. On a more humane level, the revival of the ancestral kite might be a kindly attempt to restore happiness into the family circle. It could recall those happy days when the kite was an essential part of the family outing; when no picnic was complete without perspiring Dad being badgered by little Bertie " For a go of me kite. . . ."

Since the model plane replaced the good old fashioned kite, all is gloom and despondency, with poor old dad the chief sufferer. It goes without saying that Bertie the Builder hasn't a clue on flying the thing, and looks up expectantly to all wise and omniscient Dad to send the model soaring higher than any jet plane. Dad, full of paternal confidence, then proceeds to demonstrate to eager Bertie the simplicity of flying a toy plane. Bertie's hero worship of Dad becomes somewhat dimmed when Dad, with admirable restraint, desists from jumping on the wretched model, and hands it back to a tearful and accusing Bertie with a crumpled wing and the noseblock stove in another two inches. Mum meanwhile gives Dad a choking off for being too much of a dolt even to fly a toy aeroplane. And all return home in a state of utter dejection—each with a face as long as the kite that would have made the afternoon such a jolly one.

Rogues' Gallery

Since the greater bulk of the population is car-borne—except modellers, to whom a battered two stroke is the height of opulence—the spectator menace has become a nightmare. A familiar sight on the week-end roads is the carton-burdened two-stroker vainly trying to outdistance a pursuing procession of cars. In spite of all evasive ruses he is ultimately tracked down to his flying lair, where he is quickly encircled by a mass of machinery and milling bodies. But, dare his model so much as dislodge a Sunday hat or scratch a bit of secondhand paintwork he's forthwith denounced as a public menace, and the official booter-offers move into action.



To aggravate matters, we have in our ranks that familiar old pest, the gallery fiend. Usually he specialises in the untrimmed power model, which is flown, or rather devastated, into the thickest ranks of his adoring public.

Unlike the normal modeller, who avoids the week-end rubber-necking squadrons like the plague, the gallery fiend thrives best on a " dense " concentration just down wind of the launching site. Then, with fiendish relish, he proceeds to test fly, using full power and a detachable tailplane. After the first few sorties the surviving onlookers seek safety in the comforting presence of a matronly looking radio job. The question then posed is whether the audience scatters itself as widely as the now not matronly looking radio job.

Any valiant members of the audience still remaining are harried and put to flight by the catapult squads. After which everyone retires home after a relaxing day in the open.

Our Flying Youth

A well known club states its intention of keeping a check on junior members. Not, as you might suppose, by means of a barbed wire compound, but by systematically identifying and cataloguing the flitting specimens. This is indeed a herculean task which most clubs wouldn't think of attempting; accepting a complete weekly change of junior membership as the normal order of things. Now and again a flicker of interest is raised when a junior turns up at two consecutive club meetings. A few opportunists even try to persuade the child phenomenon to put in an appearance on the flying field. Not to fly a model, of course; that would be asking too much, but a good model chaser is a boon to tired old legs.

Scotch that Language!

When the " Do-it-yourself " home-wrecker either clouts his much abused thumb or takes a death defying dive into a quart pot of emulsion, he is permitted to express his violent feelings by at least one colourful adjective.

The poor old " Do-it-yourself " model wrecker is allowed no such outlet when his home made efforts come to grief on the tarmac. Among the hysterically laughing audience there are a few who have a sensitive ear cocked for the least whisper of a naughty word. Let the infuriated modeller utter one syllable which doesn't appear in the expurgated edition of " Tiny Tots " and the protectors of public morals wipe away the tears of mirth and stalk off to lodge indignant protests.

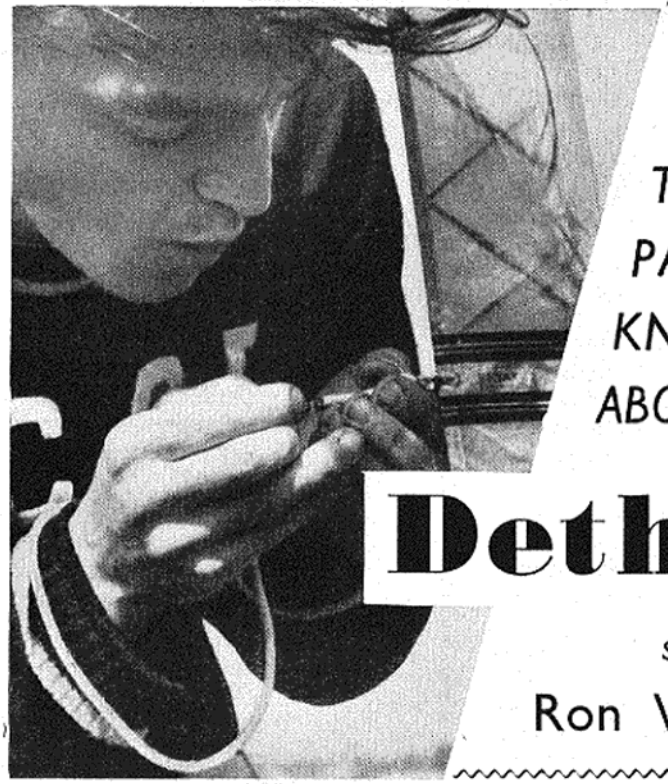
All this occurs to me upon reading that a few Scottish types unleashed bluish epithets in the genteel atmosphere of the Nationals. They can be forgiven. In the wilder flying grounds of the Highlands the only spectators are the sheep, which are not particularly sensitive about the comments of others who can't keep their wool on. And who can blame our Scottish friends for mistaking a crowd of model spectators for a flock of sheep when the habits and expressions are so similar?

Still, I don't think Scottish officials should be too alarmed at the thought of any offence being caused at the Nationals. Diligent though our League of Purity might be, it is hardly likely that they are equipped with interpreters.

Records Galore

One club, we read, is kept going by pop. This does not mean that the vigour of their flying activities is only sustained by prodigious quantities of light mineral refreshment. No, the pop referred to is of the juke box variety; a sort of high pitched whine which can be heard above the din of a 5 c.c. engine.

This predilection for crooners who can compete with a model engine perplexes me. I always thought that the throbbing note of a diesel in full song was the sweetest music to any modeller's ears, but times seem to have changed. In order to restore some semblance of peace to the clubroom, and to prevent Elvis from straining his tonsils unduly, the manufacturers will have to produce an engine that sounds like a pop record, which shouldn't be too difficult.



O.O.S.? THEN IT PAYS TO KNOW ALL ABOUT

Dethermalisers

says

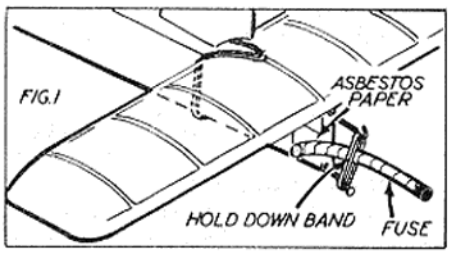
Ron Warring

DETHERMALISERS are not devices fitted solely to duration models to bring them down out of thermals. They can be used just as effectively on sports models to limit the duration of flight—and so save yourself a long chase—or make it possible to fly high performance models from restricted flying fields. Properly used, you can *rely* on an efficient dethermaliser to bring a model down to earth safely, and within bounds.

Two items are involved—the method of upsetting the normal trim of the model for "dethermalised" or rapid, safe descent; and some sort of timing device for triggering the dethermaliser at the required time. The almost universal "timer" used on models is the burning fuse. It sounds crude, but it is light, inexpensive, reliable and accurate. In fact, the fuse method of timing is almost as foolproof a method as it is possible to achieve. And it works perfectly on all types of models.

Ordinary stranded lampwick is a satisfactory fuse material, and the most commonly used variety is $\frac{3}{16}$ in. diameter, white in colour with a spiral red marking around it. This marking is a convenient measure, rate of burning being usually about 75 sec. between adjacent marks. It is perfectly satisfactory used as bought and it does not need soaking in saltpetre, etc.

The triggering off device is almost universally a rubber band which is burnt through by the fuse. The band, in other words, is holding the dethermaliser unit—whether it be a parachute release, tipping tail, etc.—in the normal position for flying. Burning through the band allows the dethermaliser action to come into effect—see Fig. 1. There is no need



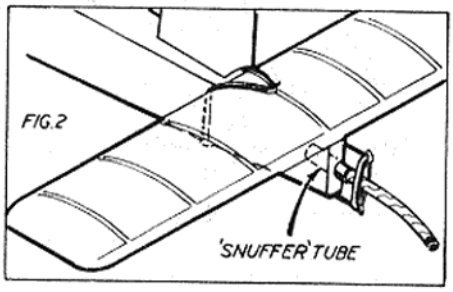
to use a cotton or thread loop with the band, with the fuse burning through the thinner cotton. It will burn its way just as effectively through a small rubber band and in about the same time. Don't complicate the system. Make it as simple as possible so that it is easy to re-rig, as this will encourage using the dethermaliser every time.

The burning fuse, as used in Fig. 1, has one objection to its use. When the dethermaliser is triggered, the burning end is thrown off the model. The chances of its falling on anything combustible and starting a fire are remote, but cannot be ignored. Apart from the burning end starting a heath fire on very dry common land, if the dethermaliser is triggered *after* the model has landed, the fuse end may land on the tissue covering and set the model alight.

This can be overcome by fitting a small metal tube to take the end of the fuse, as in Fig. 2. The fuse should be a push fit in this tube, so that it is retained when the dethermaliser is triggered. Then, as the remaining length of fuse burns down, it will go out once it reaches the tube. A $\frac{1}{2}$ in. length of aluminium tube functions perfectly as a "snuffer" and is easily attached to the model. This also effectively insulates the model from the fuse when burning normally by ensuring that the free end is not likely to twist or be blown against the surface of the model.

Of all the methods of bringing a model down rapidly and safely, the tipping tail action is by far the most popular. It is one of the simplest dethermalisers to rig, and as powerful in action as any. The main points to watch are to provide a firm and fairly wide seating for the leading edge of the tailplane, about which the tipping takes place, with some positive method of keying or locating the trailing edge of the tailplane in the "down" position so that the trim is always the same. Any "lock" of this type must, of course, be free enough so that the tailplane tips readily when released at the trailing edge.

The method of producing the tipping action is by a rubber band or bands—the same bands which normally hold the front of the tailplane down on the fuselage. The trailing edge is then held down by a small



band, it being this band which is burnt through to release the tailplane and let it tip. It is simply a matter of arranging the anchor point for-

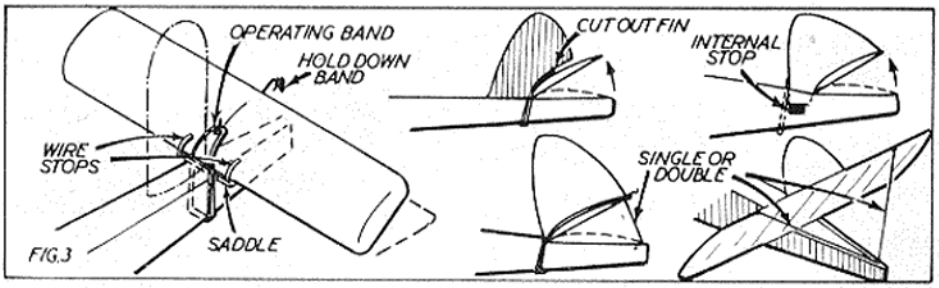


FIG.3

ward band(s) in the best position to give the necessary upwards pull. Some typical installations are sketched in Fig. 3, which should make this point quite clear.

It is also necessary to make sure that the tailplane tips exactly the amount required, and in this position is still quite rigidly attached to the fuselage. The angle of tip governs the rate of dethermalised descent. Up to about 30 deg. angle of tip, the descent is not very rapid—not fast enough, in fact, to be fully effective as a dethermaliser. An angle of 35 deg. is generally best for all types of model—see Fig. 4. If the angle is too high the model may go into a series of loops instead of sinking on an even keel. The tipping angle can be limited by a thread, or if the front seating is not all that stable, by two lines; the latter is generally used on power models. Only point to watch is that the threads cannot contact the burning fuse in flight and so get burnt through. Often they can conveniently be folded away under the tailplane. If the design allows, the necessary "stop" can be incorporated in the fin.

If the tipped tailplane is not secure in the dethermalised position, or is tilted to one side, the descent will be erratic. A tailplane which is free

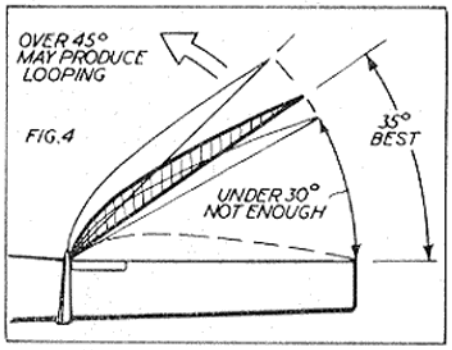


FIG.4

to flop about will make the model flop from side to side as it comes down, and the extra air loads created by these manoeuvres may pull the tailplane right off. If the tailplane tilts in the up position, or slews to one side, the model will spin instead of sinking straight down on an even keel. The latter is very effective as a dethermaliser action, but harder on the model when it strikes the ground. Some contest modellers use it deliberately on rubber models, which can usually take hard landing shocks.

Even a straight sit down, however, is hard on large power models with one-piece wings. The sudden arrest of downward movement puts a considerable strain on the wing centre section joint—and even sometimes splits the upper surface covering. Either the tip angle of the tailplane can be adjusted to give a slower rate of descent—at the expense possibly, of being slower to come out of thermals—or an alternative form of dethermaliser tried.

The other type of dethermaliser which is simple to rig—and sometimes the logical first-choice where design layout makes a tipping tailplane impractical—is the drag 'chute, which is stowed either inside the fuselage in a suitable compartment, or simply strapped to the side of the fuselage. The latter method is usually employed only on lightweight rubber models.

The amount of drag produced by the opened 'chute—and thus the rate of descent—is largely controlled by the area of the 'chute. For positive dethermaliser action the 'chute area may have to be as large as one half the wing area with silk or nylon 'chutes (rather less for tissue 'chutes, but these are suitable only for the smaller models).

Equally important, however, is the point of attachment of the 'chute to the model. For best effect this is nearly always near or at the rear end of the fuselage—see Fig. 5—which gives a steep nose-down descent, but at moderate speed so that the model is not likely to be damaged on striking the ground. The same area 'chute attached farther forward may not produce anything like the required rate of descent. If attached to the fuselage, the effect is relatively small. This method is used as a "recovery" device on radio controlled target models—and could probably be extended to amateur R/C models fitted with expensive equipment—but the area of 'chute required is very large—up to ten times the wing area.

A drag 'chute is ineffective on very long fuselage models, and, in fact, this design layout is often difficult to dethermalise effectively. The tipping tailplane will normally merely produce stalling (shallow angle of tip) or tight loops (normal tip angle). The solution in such

cases may have to be tipping the wing, opposite to a tailplane dethermaliser, so that it assumes a very coarse angle of attack (45-60 deg.). This is not so easy to arrange from the mechanical side, and so is seldom used. For most models, the tipping tail dethermaliser is the logical choice—failing that, the drag 'chute.

Whatever form is used, make sure that it is completely foolproof in operation—and operate it every time

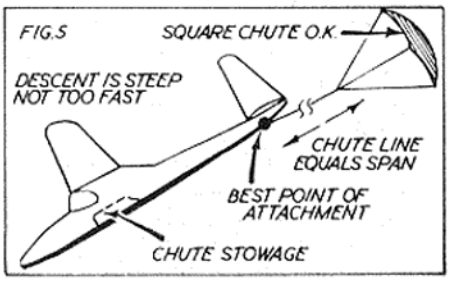


FIG.5

there is the slightest chance of its being required. Learn *controlled* F/F with dethermalisers fitted to your models and you will soon come to regard them as an essential feature of every design capable of a reasonable flight performance.

Modelling— *the Czech way*

Passing on tips to visiting modellers from Russia, Rumania and Bulgaria, is speed expert Zdenek Husitka (centre).

NOW that team results in world championship events have achieved equal prominence with the individual results, it is becoming more and more important for fliers to work as a team.

Most outstanding evidence of team working was by the Czechs at the Speed and Glider Champs. in Italy, when they won both team awards with amazingly consistent flying (in speed all members were within 2 k.p.h. of each other and in glider all had totals within 44 sec. of each other).

An interesting insight into the methods which led to this achievement is contained in the following despatch from our Czech correspondent.

In Czechoslovakia facilities are provided for developing a hobby on a national scale—aeroclubs, apprentice training centres, schools, at any and all of these there may be "circles" intent on designing and flying models. The "circles" benefit by the help and knowledge of experts. There are talks and demonstrations, and regular courses of instruction are available, governed in scope by the requirements of international model flying regulations. After a year, the students can sit for an examination covering relevant aspects of aerodynamics, meteorology, technical drawing and model design, and enter for proficiency tests in model flying and control.

To pass the examination and tests is a qualification for joining construction groups, mostly attached to aeroclubs, which take the good work further. Members receive model building material for the most part free of charge. They can always call on the advice of experienced constructors, and, at the same time, explore on their own, possibilities in new designs, provided the results satisfy approved minimum standards and that they can be entered for competitions in the appropriate class.

Along with this there are many district, regional and national competitions to go in for, from which the best modellers emerge to take part in international meetings.

Already 20,000 young people hold a modeller's certificate, a sizable number out of a population which totals only about a quarter that of Britain, and besides a growing number of skilful devotees the hobby seems to be helping to produce not a few capable pilots for full size aircraft!

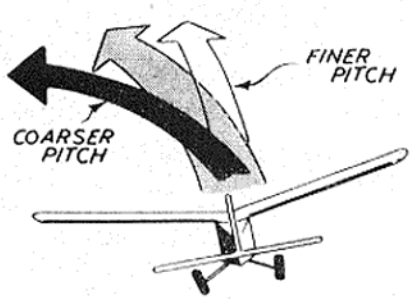
PROPS AFFECT TURN

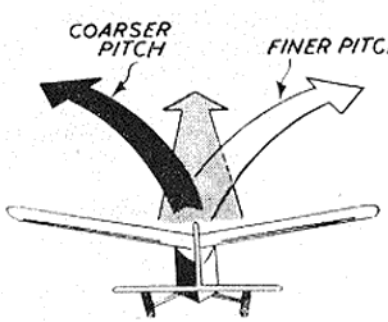
A CHANGE in propeller pitch will usually alter the turn trim on a power model. Fitting a coarser pitch prop slows the motor and increases the torque reaction, so that there is a greater tendency for the model to turn left. Fitting a finer pitch propeller has the opposite effect. Only if the propeller diameter is also altered so that the engine runs at the *same speed* as before will the turn trim remain unaffected.

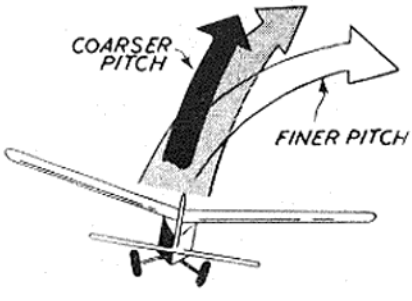
If the model already has a pronounced left turn, fitting a coarser pitch propeller may tighten up this turn to a dangerous degree (first diagram). In this case, to take off some of the original turn, try fitting a slightly finer pitch propeller.

If the model flies straight and you want to induce a safe turn, fit a coarser pitch propeller to give a gentle left turn and a finer pitch propeller to give a right turn. This is a good method of trimming the power flight on a radio model, having arrived at a setting for a nice straight glide. You can trim by propeller pitch rather than having to mess about with sidethrust.

A right turn is seldom as safe on a power model as a left turn since gyroscopic action tends to force the nose down. On a left hand turn the opposite effect is produced. Thus on a model which is already turning fairly sharply to the right, fitting a finer pitch propeller may wind that turn up into a spiral dive. The best treatment here is to use a coarser pitch propeller (right hand diagram) and play safe.

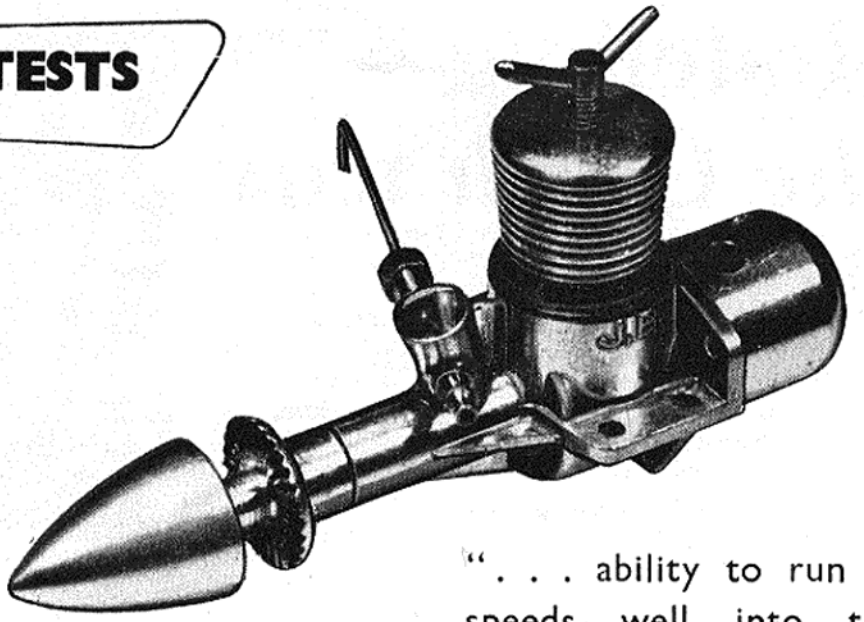






The J.B. BOMB

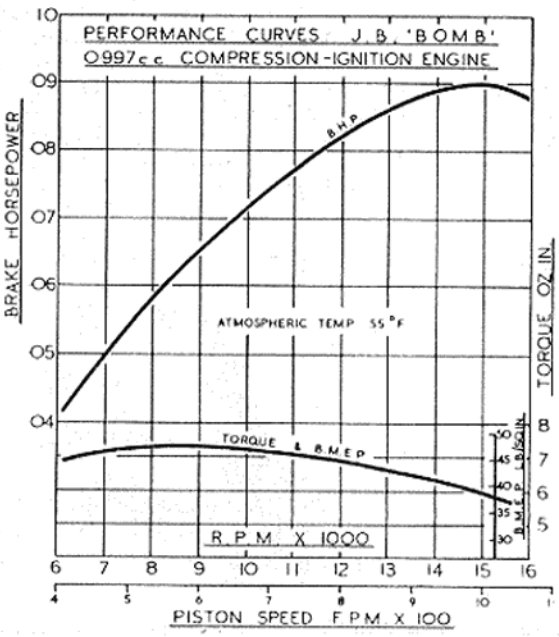
1 c.c. DIESEL



"... ability to run at speeds well into the 'teens without appearing 'busy'"

THE J.B. "Bomb" 1 c.c. diesel is basically a small bore version of the 1.5 c.c. J.B. "Atom" diesel which was dealt with in the M.A. Engine Tests early last year and we have no hesitation is saying that this basic design makes a far better 1 c.c. engine than it does a 1.5. In both handling characteristics and specific power output, we found the "Bomb" markedly superior to its large bore brother.

The "Bomb" is, of course, one of a series of four engines all built around the same crankcase and shaft assembly. In addition to the "Atom" already mentioned, there are also glow-plug versions of both models. The main differences between the 1 c.c. and 1.5 c.c. models are to be found in the cylinder and piston assembly. Bore is reduced from 0.539 in. to 0.440 giving a more normal stroke/bore ratio of 0.91, and porting has been changed. In place of the "Atom's" inclined circular transfer ports, fed via flutes on the outside of the liner, the "Bomb" uses internal transfer flutes. With almost 1/10 in. reduction in bore, the liner has a very much thicker wall at its base and as a result, the transfer flutes are both tapered and of ample volume. Port timing is also modified, the liner being positioned lower in the crankcase (the top of which is machined off for the purpose) and a revised piston design, using a ball-joint small end, is now employed.



The "Bomb" is easily distinguishable from the "Atom" by its smaller diameter cylinder barrel, having nine closely spaced cooling fins in place of the six fins of the larger model. Like the 1.5 c.c. unit, however, it is nicely finished externally and of attractive proportions; its low cylinder height, long shaft, long spinner and polished natural aluminium finish, makes this one of the prettiest engines on the market.

The J.B. is, of course, of the shaft induction type and has lugs for both beam and radial mounting. The latter sensibly provides for three-point attachment with mounting bolts well spaced to support the considerable overhang. Since the screw-in crankcase-backplate is not recessed, however, mounting bulkheads will have to be fretted out whether the rear mounted tank is retained or not. The needle-valve assembly is installed at a slight angle, inclining the control-stem backward and slightly upward when fitted for normal right-hand use. Thanks to the long crankshaft, however, it is quite practicable to reverse the assembly (after shortening the wire stem) where it is preferred to have the needle-valve vertical in a side-mounted C/L installation.

Specification

Type: Single-cylinder, air-cooled, reverse-flow scavenged two-stroke cycle, compression ignition. Shaft type rotary-valve induction with sub-piston supplementary air induction.

Swept volume: 0.997 c.c. (0.0608 cu. in.).

Bore: 0.440 in. Stroke: 0.400 in.

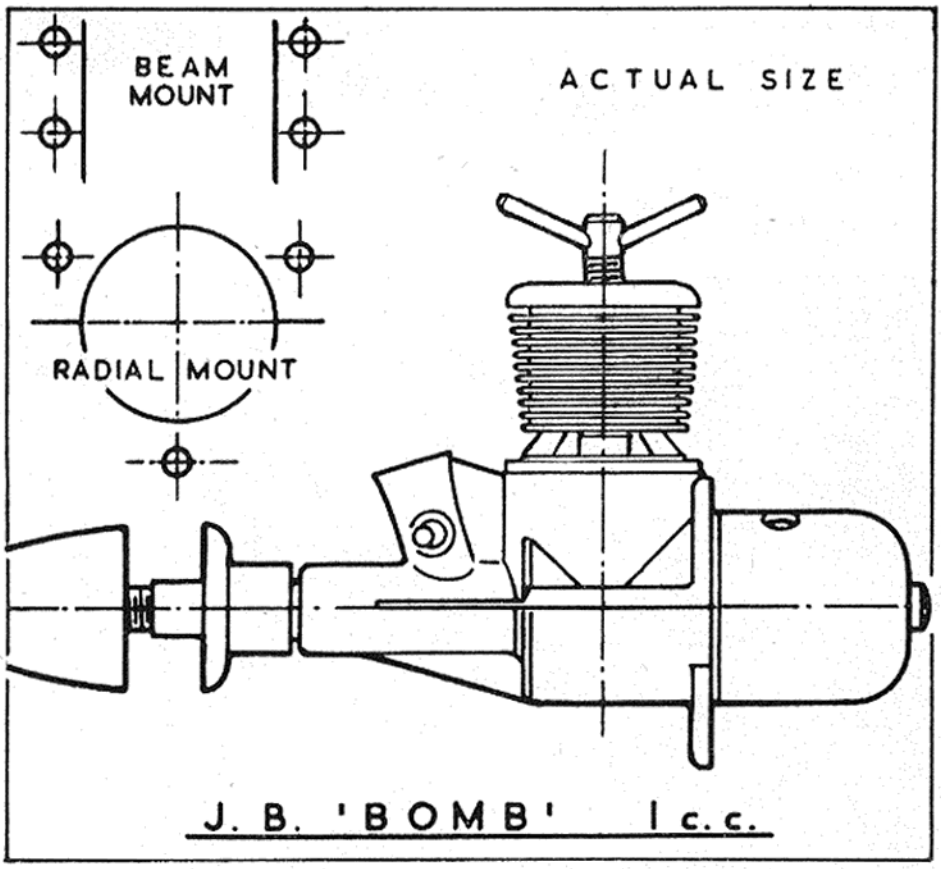
Stroke/bore ratio: 0.909 : 1.

Weight: 3.0 oz. complete with fuel tank as supplied. 2.7 oz. without tank.

General Structural Data

Pressure diecast LM.2 alloy crankcase and main-bearing with integral carburettor intake and screw-in rear cover. Case hardened steel cylinder with three radial exhaust ports, three internal radial transfer flutes

and screwed into crankcase casting. Screw-on finned cylinder barrel of machined dural bar. Counterbalanced S.14 steel crankshaft, case-hardened. Lapped mechanite conical-crown piston and case-hardened mild-steel connecting-rod with ball-joint small end. Extended prop. driving hub of duralumin on mating crankshaft taper. Duralumin spinner nut and detachable fuel tank. Spray bar type needle-valve assembly. Beam and radial mounting lugs.



Test Engine Data

Running time prior to test: 1 hour.

Fuel used: 35 per cent. I.C.I. technical ether, 35 per cent. Shell Royal Standard kerosene, 28 per cent. Castrol "R," 2 per cent. amyl-nitrate.

Performance

Starting characteristics of the "Bomb" are quite good, on various props., but show to best advantage on the smaller sizes, e.g. not larger than 8 × 3, 7 × 4, etc. The engine is in marked contrast to its bigger brother in its ability to run at speeds well into the 'teens without appearing "busy," a performance which is reflected in the high r.p.m.—almost 15,000—at which the peak b.h.p. is realised.

For general F/F work where it is desired to take some advantage of the engine's performance, a 7 × 3 propeller would appear to be a suitable choice and will give a static r.p.m. in the 11,000/11,500 r.p.m. bracket with reasonably easy starting.

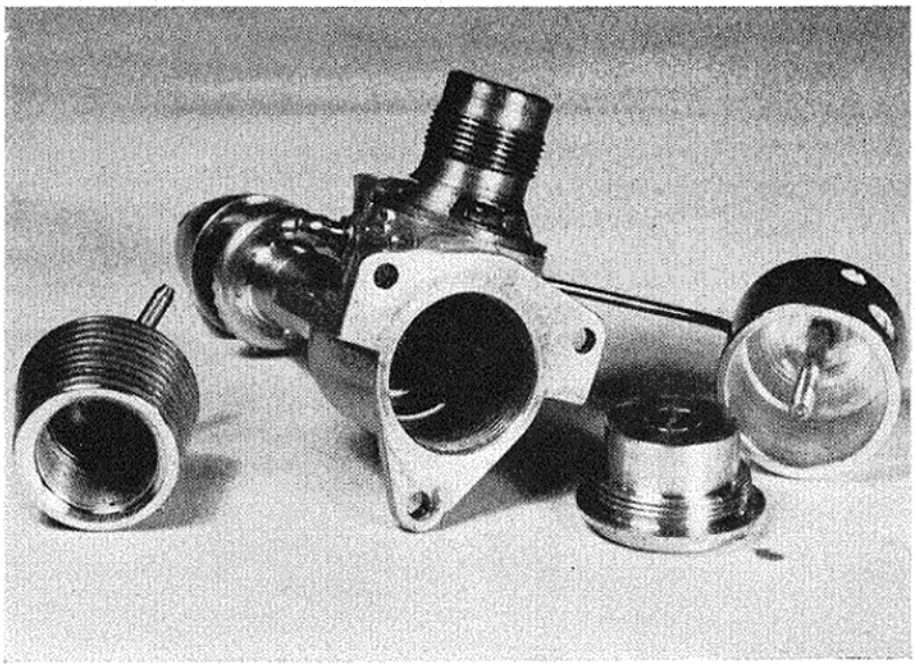
On dynamometer test, the "Bomb" recorded its best torque at around 9,000 r.p.m. where a figure of 7.3 oz. in. was obtained, equal to a b.m.e.p. of approximately 47.5 lb./sq. in. This is not more than a good average level, but the "Bomb" scores in that its torque curve is unusually flat over a wide r.p.m. range, the result of which is to extend the horsepower curve to an above average peak.

Both controls on the test engine were entirely satisfactory. The compression adjustment was smooth working and effective. There was no tendency for the contra-piston to tighten in the bore when hot and it readily returned to a lower setting when the compression screw was slackened off. The needle-valve control was responsive without being over-sensitive and held settings at all speeds.

Power/Weight Ratio: (as tested less tank) 0.53 b.h.p./lb.

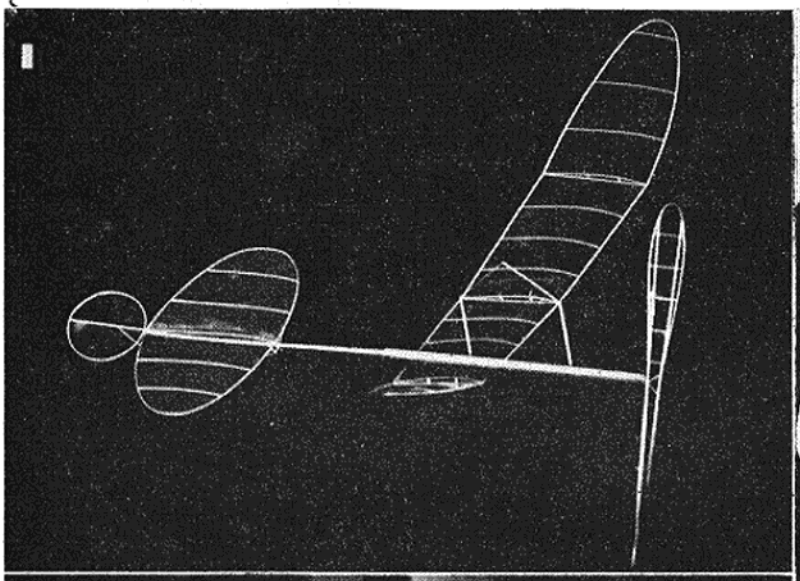
Specific Output: (as tested) 90 b.h.p./litre.

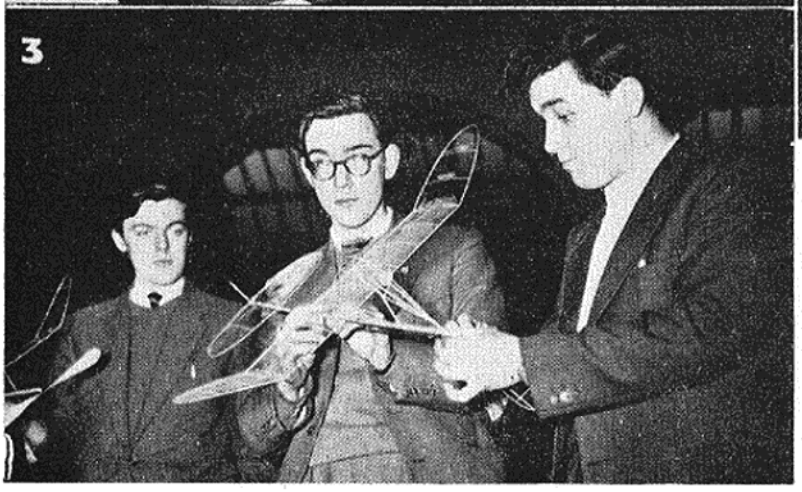
A dissembled view showing the main components of the J.B. "Bomb."



Next Month's Engine Test will be of the P.A.W. Special 2.49 c.c. diesel

Micro at Manchester





1. A fitting heading photo is this shot of Ray Monks's model which won the under 100 sq. in. class and puts up the highest time of the day.

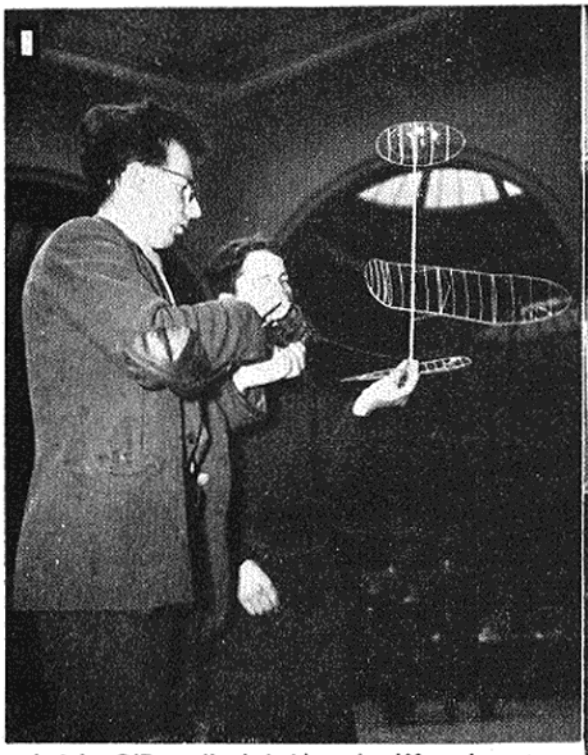
2. Reg Parham believes in "doing it himself" as he winds his ornithopter.

3. Phil Read assists D. Poole to wind as G. Walker watches.

4. Alan King holds Bob Copland's model, which he flew proxy, while Ray Monks puts on the turns.

5. M. Robson and C. Chamberlain of Stockton wind the former's model.

6. Ray Monks does some repairs on his tissue model ; while he was doing this his microfilm model was making its winning flight yet his hand was quite steady.



1. John O'Donnell winds his under 100 sq. in. entry. Model was later "modded" to be eligible for the over 100 sq. in. class, which it won.

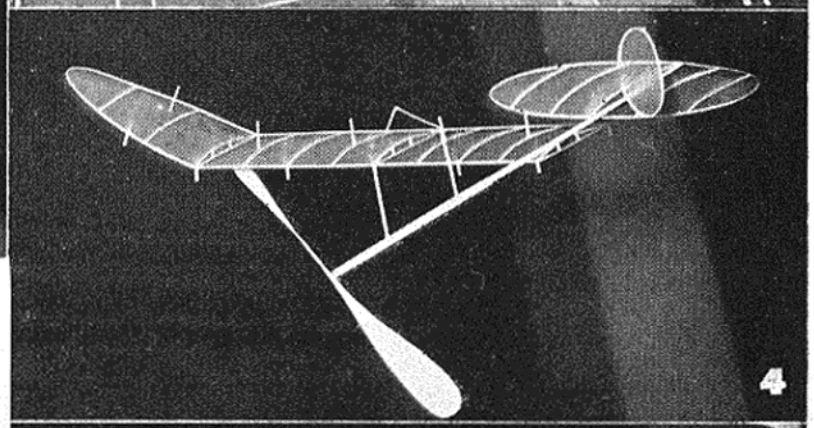
2. Graham Walker of Birmingham patiently waits for the first "burst of power" to run off before releasing.

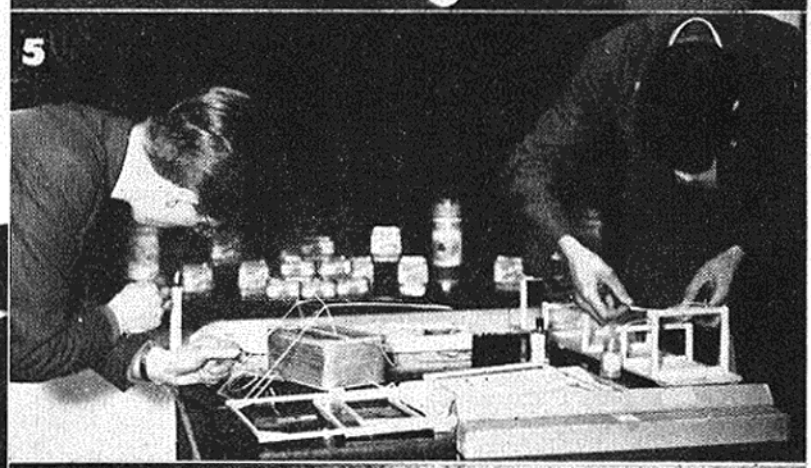
3. A general view of the hall from the balcony.

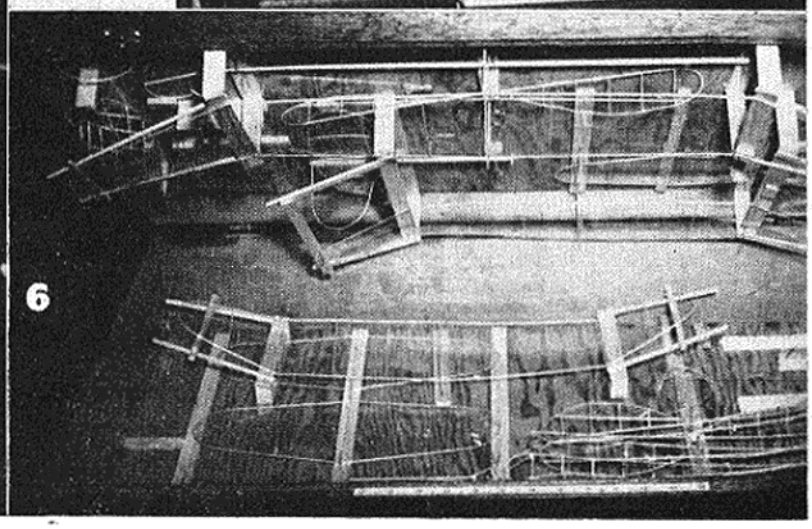
4. Phil Read's tissue covered entry. Note the king posts on the wing for the (invisible) wire bracing.

5. C. Chamberlain (Stockton) and A. W. Spur Middlesbrough) put in a spot of repair work.

6. Models arrived in everything from suitcases to the traditional "coffins." Reg Parham's, however, had this neatly fitted box.





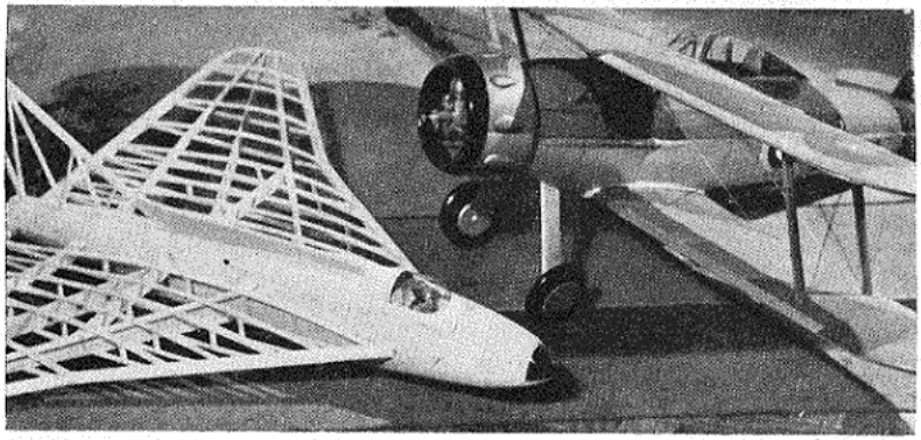


Letters

Continued from page 179

between a pylon and a scale job, I would say that they are about as hard to trim as each other. There is not such a very wide difference in the trim technique as many people think.

It is only a matter of time before the pylon is available from the local sports outfitters as a ready made plastic job, and then we can really call it a sport, and give up that horrible side line of having to laboriously build our aircraft. Future clubs will hear lectures on "Launching a Plastic Projectile and how to Follow Through." Something of the science of rock 'n' roll will be taught to get the right hip sway for a really sound launch. But there I go, kidding again. Someone will take me seriously and start writing screaming letters to the Editor so I had better not develop this theory to its logical conclusion.



Eric Fearnley's free-lance jet with his Gloster "Gladiator."

One thing really does please me, and gives me hope. My four-year-old son has thrown his expensive plastic scale job where it rightly belongs, in the bottom of his toy box, while his cheap balsa chuck glider is thrown up and down the field until it is almost beyond repair. We are not breeding a new generation of robots after all!

Yours faithfully,

Grimsby, Lincs. ERIC FEARNLEY.

F.A.I. Free-for-all

DEAR SIR,—The F.A.I.'s latest decisions must surely be the last straw on a camel's load of blunders. It would appear that the majority of the committee is made up of people who wish to adjust the rules to suit the convenience of their aero clubs rather than the needs of aeromodellers.

International contest aircraft are usually highly developed machines which have been modified over a period of years. With this in mind some permanence of the rules for at least five years is imperative.

Secondly, why is the S.M.A.E. so keen on the three minute maximum rule, when in this country we still fly contests to three flights of 4 min. and can apparently find aerodromes which will accommodate such flights?

The 3 min. maximum was adopted because of the supposed lack of suitable airfields, but what country is it which could not get the use of one aerodrome once a year for one big international contest? I think it would be agreed that four flights of 4 min. would be all that was necessary to ensure the most reliable and best model winning. The 1954 rules would be kept, since I don't think that any feats of development could produce "genuine 4 min. models," in the next five years.

There is one very important point. If the F.A.I. passes these new rules, the S.M.A.E. is bound to withdraw the Wakefield Trophy from the International Rubber Competition, since in the rules laid down in 1928 by Lord Wakefield, it states that the trophy will be for annual competition.

Yours faithfully,

Ayr, Scotland. W. N. CLIFF.

Australian View

DEAR SIR,—So the F.A.I. has imposed one more limiting restriction on aeromodelling and decided to hold the International events, in effect, once every two years.

Consider the record:—

Seven speed classes, reduced to three, finally to one.

The Wakefield rules have been so messed around that the event no longer arouses its former enthusiasm.

All fuselage cross sectional area rules abolished, encouraging "freaks."

The muddled rules of F.A.I. team racing, only recently sorted out.

Finally, this business of the International events.

The International aeromodelling movement is in a position to go ahead by itself, without the interference of an organisation which evidently has no great desire to interest itself in International contests.

The remedy is obvious.

Once a year, hold an International aeromodelling Olympics. The best country to be responsible for organising same and to hold an annual conference. Team managers could be the individual delegates from their respective countries.

The conferences will be for the purpose of considering any proposed rules changes, new contests, organisation of contests, etc., and will be in two parts.

The first part will be for the purpose of airing a proposed change.

The second part, held one year later at the next contest, will be merely a voting session, on the basis of the previous year's motions.

The one year time delay will give every country an opportunity to discuss the motions and to decide the "party line."

Let's hope that something can, and will, be done along these lines. The aeromodelling movement, Internationally speaking, is being restricted and legislated out of existence.

Yours faithfully,

Geelong, Victoria, Australia. STEVE HALLAAN.

New Rules a Challenge?

DEAR SIR,—I do not agree with the F.A.I.'s constant changing of rules and the proposed grouping of championships, but why all the uproar about the rules themselves and why should it kill the Wakefield and F.A.I. Power? If people stop building these models because they cannot be used in open contests they must be a lot of pot hunters that aeromodelling can do without. Surely the new rules offer a challenge to builders to overcome the disadvantages that they imposed.

It would be better to stop griping and to get to work developing models to show the F.A.I. that constant rule changing is not the way to restrict model performance.

Yours faithfully,

Malpas, Ches. JOHN RIELEY.

Washington Supports Wakefield

DEAR SIR,—I was happy to hear that the S.M.A.E. Council takes such a "dim view" of the F.A.I.'s action. It restores my faith in the S.M.A.E.

I have polled 15 members of this district who are Wakefield enthusiasts and their unanimous opinion was—"Let the F.A.I. run their own rubber event—we shall still support the Wakefield."

Referring to the March issue of MODEL AIRCRAFT—let's have more of those wonderful scale articles like the Bristol Bulldog and "Tiggie!"

Yours faithfully,

Seattle 16, Washington, U.S.A. CHUCK WOOD.

Motors of the Moment

by Peter Chinn

ONCE more the flying season is with us and it is time to look at the latest offerings of the various engine manufacturers. One or two firms are not yet ready to release details of new models, but, on the whole, 1957 looks like being quite a good year for the engine enthusiasts.

Great Britain

To set the record right, we had better start by clearing up a question which is bothering a number of people: the "rumours" of a new "Mk II" Frog 249. One or two eagle-eyed critics have been taking the writer to task for publishing a test report on the modified Frog 249 in the American model Press, while keeping the home front in the dark. The truth of the matter is that we were asked by Frog designer George Fletcher not to mention the engine in Britain until given the O.K., as it is, for the present, an export-only model. However, it was obvious that the so-called Mk. II's existence would not remain a secret indefinitely, and it has now been agreed that curiosity should be partially satisfied by a brief description of the new engine. We would emphasise, however, that this is still an "export-only" model, although we understand that the engine will become available on the home market very shortly.

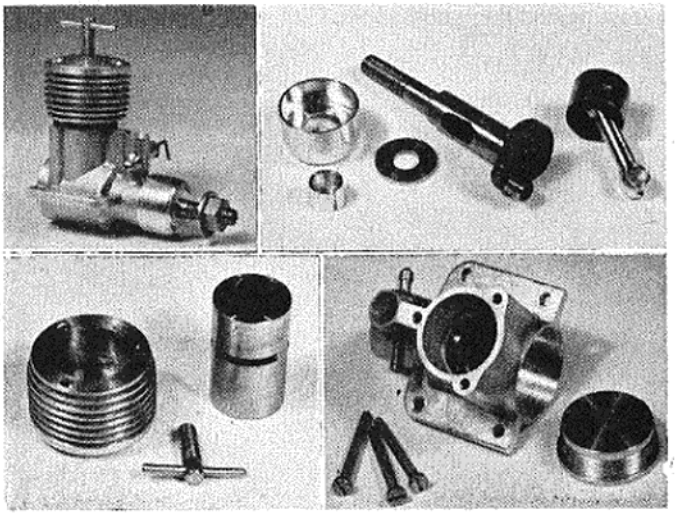
The story begins a year ago—when, having been introduced by the writer to the Frog 249 BB, the American importer, John Maloney, of World Engines, duly impressed with this pleasing design, persuaded I.M.A. to get to work on producing a specially "hopped-up" version for the U.S. market. The outcome was the "Frog 249 BB. Modified"—the title requested by World Engines—and of the first small sample batch, one was sent to the writer for dynamometer testing, while another received combat and stunt evaluation at the hands of Assistant Editor Norman Butcher. (Any Oliver Tiger owners who were a trifle nonplussed at the speed of Norman's Frog 249 powered model last year will now know the reason why. . . .)

Externally, the Modified Frog is virtually identical with the stock model. Changes are mainly confined to the cylinder liner which, in place of the inclined circular transfer ports of the original model, reverts to circumferential slits. Transfer of the charge through the latter, however, is smoothed by a carefully contoured skirt section, and the entire liner is lowered fractionally, thus shortening the exhaust timing slightly and increasing the effective expansion period, while lengthening the sub-piston induction period.

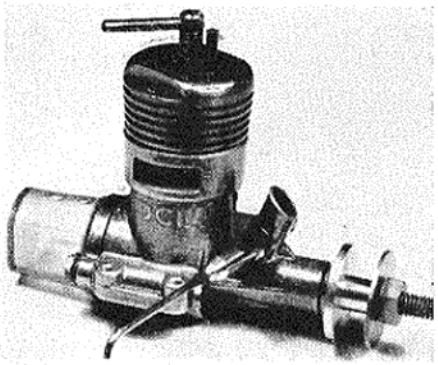
The result of these modifications was to raise the peak output, on test, to 0.280 at 14,400 r.p.m., compared with the 0.255 b.h.p. recorded in our Engine Test report on this motor in the January, 1956, issue. Most noticeable was the marked increase in torque in the region of 11,000-13,000 r.p.m., while the maximum b.m.e.p. was nearly 58 lb./sq. in.

All this is accompanied by the same easy handling qualities which characterise the standard 249 BB. and we feel sure that the improved Frog, when more widely available, will prove popular. We should, perhaps, mention in passing that the price of the engine in the U.S. is $19.95 (or £7 2s. 6d.), compared with $14.95 (approximately £5 7s. 0d.) for the standard model.

A bid for top place in the 2.5 c.c. competition class is being made with the Eifflaender new P.A.W. 2.49 Special. This is another motor for which we have been doing prototype tests for the manufacturers



Latest British contender for International class honours is the P.A.W. 2.49 Special. Designed by J. G. Eifflaender, the engine features a single ball bearing and an oval crankshaft port. A speed of 92 m.p.h. has been recorded by a team racer fitted with one of these units.



Successor to the popular Allbon Spitfire I is D.C.'s new Spitfire Mk. II.

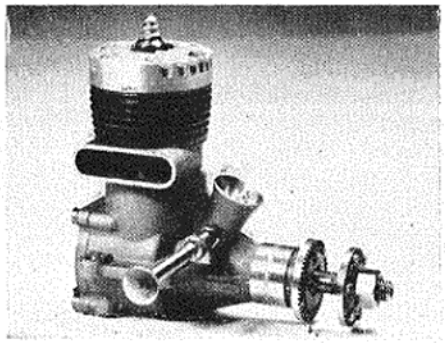
and it would be fair to say that the P.A.W. Special is one of the hottest British engines we have yet handled. Initial tests indicated a maximum b.m.e.p. reaching the seldom-equalled level of 60 lb./sq. in., with the horsepower curve rising to 0.28 b.h.p. at 14,000 r.p.m. This is not the final story, however, because since these tests, Gig Eifflaender has modified both induction and transfer porting and lightened the piston and with this latest version, it is hoped to flatten the torque curve and get the engine up to the magic 0.30 b.h.p.

The new Rapier 2.5 c.c. from Davies-Charlton was, of course, dealt with in last month's MODEL AIRCRAFT. Also from this manufacturer comes a replacement for the popular 1 c.c. Spitfire. This, the Spitfire II, follows the same layout as adopted for Davies-Charlton's Merlin 0.8 c.c. and Sabre 1.5 c.c. Just as the Spitfire I was a small bore version of that old favourite, the Javelin 1.5 c.c., so the new model is basically the same as the Sabre. At the time of writing, we have not yet got around to testing the Spitfire II, but we feel that it has only to equal its predecessor to be a success, for the Spitfire I was certainly one of the pleasantest 1 c.c. engines ever offered.

U.S.A.

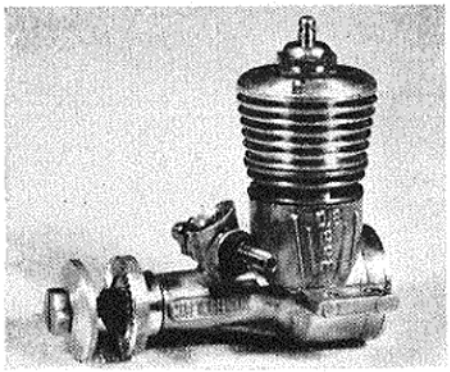
Recent letters from R/C enthusiasts have voiced the complaint that engine designers are not paying sufficient attention to their needs—notably for larger multiple-control models, where an engine speed control is required. One solution to this is now offered in the shape of the Miles 5.64 c.c. spark-ignition engine which we first mentioned in the April issue and which has a butterfly throttle coupled to the contact-breaker.

In the United States, the Fox Manufacturing Company have responded with a complete range of R/C versions of their well-known 0.19, 0.25, 0.29, 0.35 and 0.59 cu. in. models. Each of these is obtainable with alternative speed-control systems. The first, and cheapest, is a simple two-speed set-up using twin needle-valves. The second is a variable speed control utilising an exhaust valve with coupled intake clapper. This latter system, incidentally, is on the same principle as that first seen on Jim Walker's Firecracker 0.065 C/L engine. A Fox 35 (fitted in this case with a Bramco throttle) was, of course, used by Howard Bonner to win the multi-control R/C event at last year's U.S. Nationals.



The latest production version of the highly successful O.S. Max 35.

Also newly announced in the U.S. is a new version of the popular Herkimer Cub 049B glowplug engine. This, known as the 049S, is fitted with a simple "self-starter." The starter is of the self-rewinding cord type contained in a drum on the crankcase nose; one simply pulls the cord, spinning the engine over several revolutions and, upon release, the cord winds itself back around the starter pulley. The system is basically the same as that employed with some types of outboard motors. It has also been employed in the past by a few amateur model engine constructors—notably among the model power-boat fraternity—and at least two other American manufacturers of half-A size engines have, been supplying engines so equipped for ready-made "toy" models.



The German Webra Piccolo-Glo of 0.8 c.c. shows greatly improved handling qualities compared with the earlier Piccolo diesel.

Japan

There is no doubt that the M.A. Engine Test in the April issue of the outstanding new Japanese Enya 15-D diesel with its loop-scavenged cylinder is causing some manufacturers nearer home to think again. Within a week of the appearance of the report, at least one designer had shelved the reverse-flow scavenged cylinder of a new design, pending experiments with a loop-scavenged version. We hope, however, that it will not be thought that the looped-scavenged cylinder is the only factor contributing to the Enya's success.

Loop-scavenged cylinders have, after all, been tried on diesels before (albeit, generally, with somewhat restricted porting) and designers whose loop-scavenged experiments do not immediately bear fruit may do well to have a closer look at other features of the Enya. They might also be encouraged by the words of Saburo Enya, who modestly disclaims any special credit and says that the design of this, his first diesel, was largely a result of compromise, as so few Japanese modellers were experienced in the handling of diesels. We have the impression that, at the risk of giving the engine something less than its present easy-handling characteristics, an even hotter performance might have been realised.

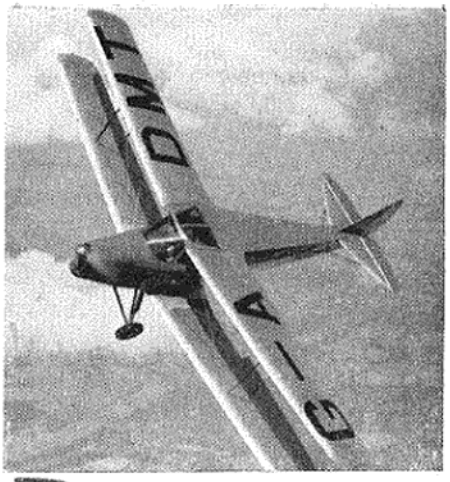
Also for 1957, the Enya company has introduced an improved version of the Enya 15 glowplug model, first marketed nearly two years ago. We have tested both these engines and, while the earlier motor was notable for its delightfully easy starting, the new model, known as the 15-1B, has a 12 per cent. higher peak b.h.p. and a 1,200 r.p.m. higher peaking speed, which firmly place it among the top-liners in the 2.5 c.c. glowplug class.

The engines of the other leading Japanese manufacturer, O.S., have, of course, been enjoying some enviable successes lately. Seven first places in the Australian Nationals by O.S. Max engines was no mean achievement. Recently we have obtained examples of the latest production versions of the Max 29

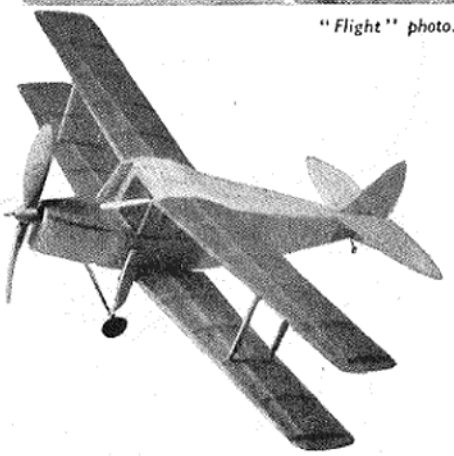
(Continued on page 204)

Just two evenings' work and you've got a fine little free-flight model of the

D.H.87B HORNET MOTH



"Flight" photo.



CONTRARY to popular belief, biplane models fly quite well and so for this month's flying scale model we have chosen the de Havilland *Hornet Moth*. This was a popular pre-war two-seat cabin biplane, which first flew in 1934. The original *Hornet Moth I* (the D.H. 87A) had sharply tapered elliptic wing tips, with a span of 32 ft. 7 in. The wings were subsequently redesigned with square tips and the span reduced to 31 ft. 11 in., with improvements in handling qualities and stability. This version was known as the *Hornet Moth II* (D.H. 87B). Other small detail differences were included in the Mark II—undercarriage fixing slightly revised, tailplane position lowered—which was also produced as a twin-float seaplane version. Our model, which spans 16¾ in., is of the *Hornet Moth II*, and a few are still flying.

The *Hornet Moth* had side-by-side seating in the cabin, with dual controls. Engine was the 130 h.p. Gipsy-Major, which gave it a top speed of about 125 m.p.h. and a cruising speed of just over 100 m.p.h. Range was 620 miles.

The fuselage was a wooden box structure with internal longerons and external formers carrying stringers, with fabric covering overall. Wings were of two-spar construction with a plywood covered leading edge and again fabric covering overall. The wings, incidentally, could be folded by lifting up trailing edge flaps, unpinning the front spars from their attachment points, and folding the wings back alongside the fuselage. The tailplane consisted of a fabric covered wooden frame but the fin was ply covered.

The model follows similar construction to the previous models in this series. The tail surface areas have been increased slightly from scale, but otherwise the outline follows that of the full size aircraft. The tailplane, as drawn, is about the minimum size required for satisfactory flying and could be increased in area still more, if you prefer. With the given size, however, the scale appearance of the complete model is retained.

Start by cutting out the six fuselage formers from medium hard $\frac{1}{16}$ in. sheet and the two sides from very light sheet. Note that the actual length of the sides is slightly longer than the plan view length of the fuselage drawing, this to allow for the curvature of the sides in plan view. Slots to be cut in the sides before assembling are: slot to take former 2; slot to take the $\frac{1}{8} \times \frac{3}{16}$ in. cross braces (top and bottom of the cabin); slot to take the wing mainspars (alongside the slots for the braces).

The two sides are assembled on formers 3 and 4, curving to the shape of the sides and holding in place with pins until set. The two fuselage ends can then be joined and formers 5 and 6 inserted. Check that the curve is the same on the two sides. The front of the fuselage can then be joined with former 1, cementing in former 2 to assist in maintaining the correct top curve. The bottom of the front sides pulls in more sharply, but this will follow naturally if former 2 is properly located.

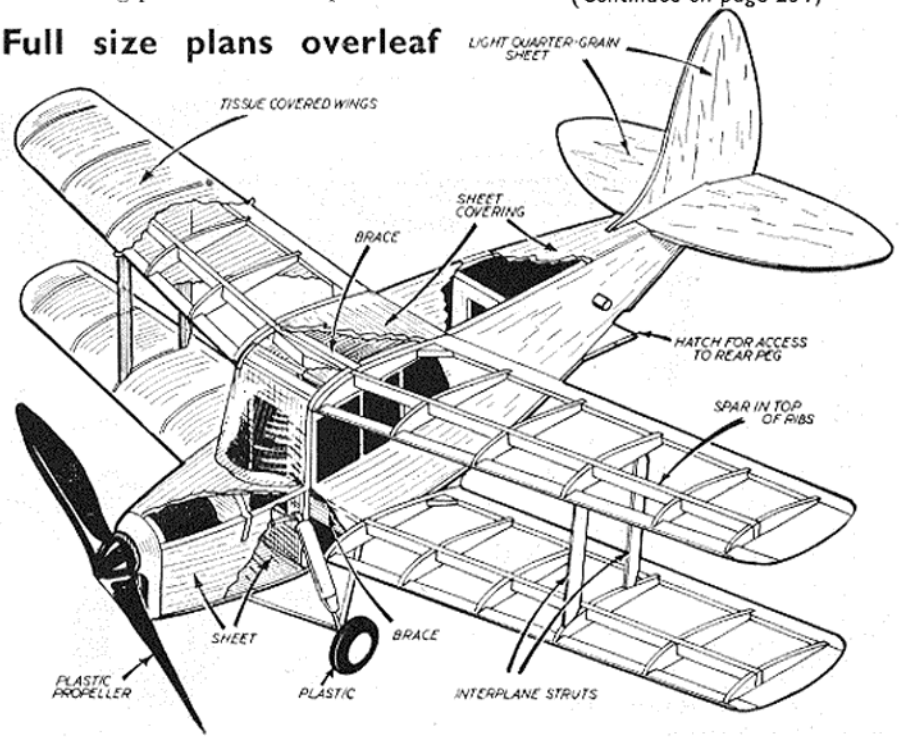
Bend the main undercarriage legs and thread through holes pierced in the sides. Then sew to former 3 with cotton and cement well (if you prefer, you can bind the legs to former 3 first and then assemble the sides). Now cement the bottom sheeting in place. When set, trim off flush and round slightly with sandpaper. The front undercarriage legs are then sewn to the bottom with a needle and cotton. Cement this binding for added strength.

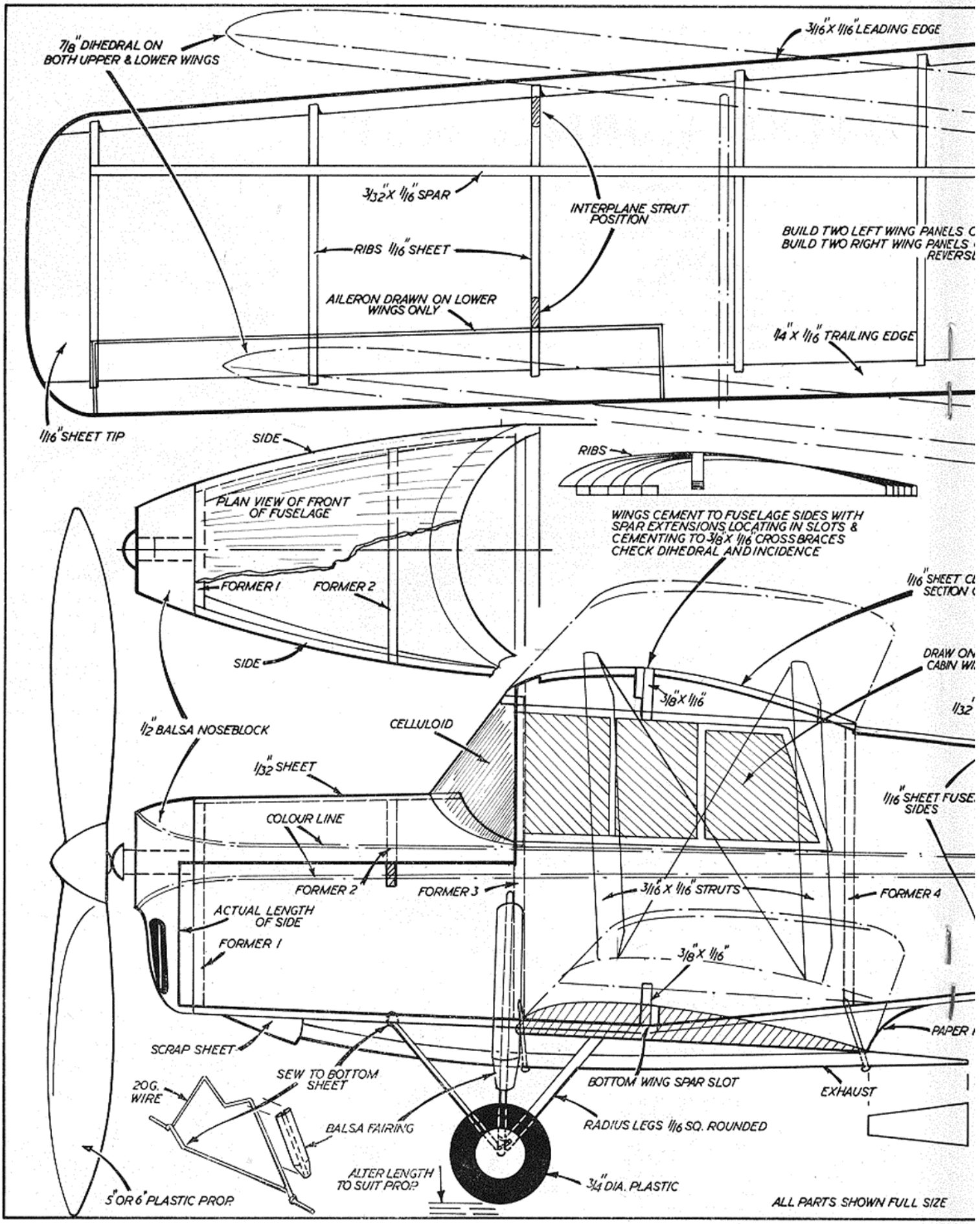
The fuselage is then completed by adding the cowling, rear top decking and the centre section covering. It is best to cut and fit the tailplane before adding the top decking sheet as this can then be fitted flush up to the tailplane. The noseblock can also be rough shaped and cemented in place, finishing to blend with the fuselage lines when set.

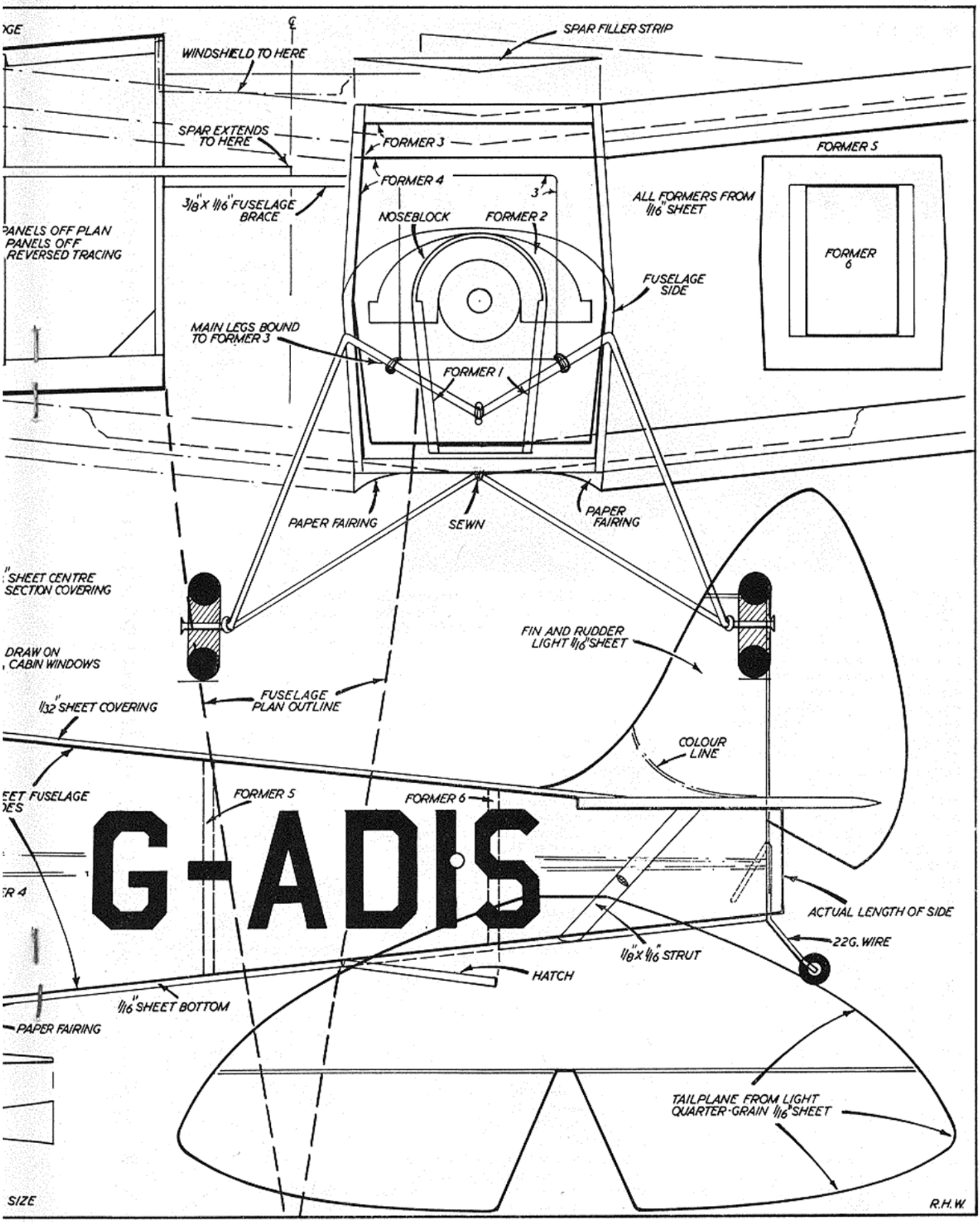
The wing panels are built up over the plan. Two off the plan drawing are required for the top and bottom left wings. Then make a tracing of the plan, reverse, and build two right wing panels. Construction is quite straightforward, but the ribs should be notched into the trailing edge for added strength. Tips are $\frac{1}{16}$ in. sheet, sanded to shape after assembly.

(Continued on page 204)

Full size plans overleaf

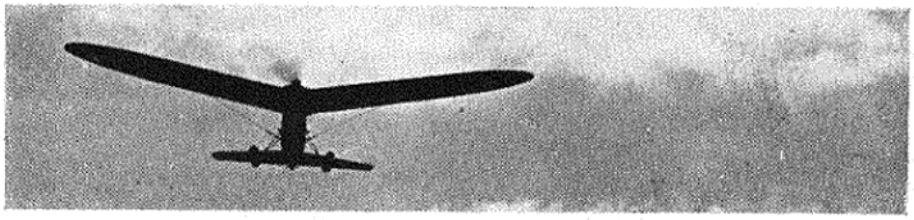



7/8" DIHEDRAL ON BOTH UPPER & LOWER WINGS
3/16" X 1/16" LEADING EDGE
3/32" X 1/16" SPAR
INTERPLANE STRUT POSITION
RIBS 1/16" SHEET
BUILD TWO LEFT WING PANELS
BUILD TWO RIGHT WING PANELS
REVERSE
AILERON DRAWN ON LOWER WINGS ONLY
1/4" X 1/16" TRAILING EDGE
1/16" SHEET TIP
SIDE
RIBS
PLAN VIEW OF FRONT OF FUSELAGE
WINGS CEMENT TO FUSELAGE SIDES WITH SPAR EXTENSIONS LOCATING IN SLOTS & CEMENTING TO 3/8" X 1/16" CROSS BRACES
CHECK DIHEDRAL AND INCIDENCE
FORMER 1
FORMER 2
SIDE
1/16" SHEET
SECTION
DRAW ON
CABIN WI
1/32"
3/8" X 1/16"
1/2" BALSA NOSEBLOCK
CELLULOID
1/32" SHEET
1/16" SHEET FUSE
SIDES
COLOUR LINE
FORMER 2
FORMER 3
3/16" X 1/16" STRUTS
FORMER 4
ACTUAL LENGTH OF SIDE
FORMER 1
3/8" X 1/16"
PAPER
SCRAP SHEET
SEW TO BOTTOM SHEET
20G. WIRE
BOTTOM WING SPAR SLOT
EXHAUST
BALSA FAIRING
RADIUS LEGS 1/16 SQ. ROUNDED
ALTER LENGTH TO SUIT PROP
3/4" DIA. PLASTIC
5" OR 6" PLASTIC PROP
ALL PARTS SHOWN FULL SIZE


SPAR FILLER STRIP
WINDSHIELD TO HERE
SPAR EXTENDS TO HERE
FORMER 3
FORMER 4
FORMER 5
3/8" X 1/16" FUSELAGE BRACE
ALL FORMERS FROM 1/16" SHEET
NOSEBLOCK
FORMER 2
FORMER 6
FUSELAGE SIDE
MAIN LEGS BOUND TO FORMER 3
FORMER 1
PAPER FAIRING
SEWN
PAPER FAIRING
FIN AND RUDDER LIGHT 1/16" SHEET
FUSELAGE PLAN OUTLINE
1/32" SHEET COVERING
COLOUR LINE
FORMER 5
FORMER 6
G-ADIS
ACTUAL LENGTH OF SIDE
22G. WIRE
1/8" X 1/16" STRUT
HATCH
1/16" SHEET BOTTOM
PAPER FAIRING
TAILPLANE FROM LIGHT QUARTER-GRAIN 1/16" SHEET
R.H.W.

RADIO CONTROL NOTES ON

Transmitters

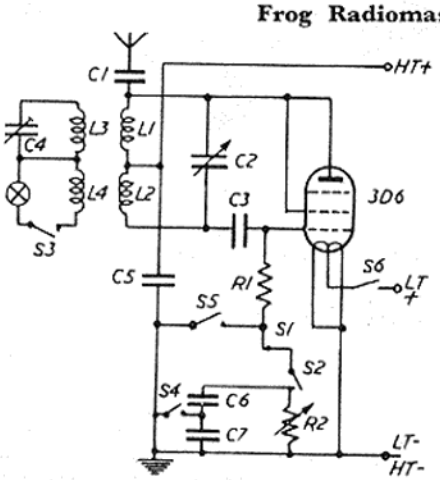


THE R/C transmitter is, comparatively speaking, a simpler and less critical unit than the receiver. A good transmitter will not normally give any trouble as regards operational efficiency, provided battery voltage is checked regularly and attention is given to the condition of the switching leads. A ground range of half a mile is more than adequate for model aircraft use as this will be considerably greater when the model is in the air.

Some transmitters are subject to drift, such as could be caused by physical displacement of unsupported coils. Also performance will tend to vary depending on where the transmitter is set down or its distance above the ground. Signals are not, however, directional on the 27 megacycle band with a conventional rod aerial (although theoretically there is a "dead" spot immediately overhead). The only attention required to the aerial is to ensure that all joints are kept clean (e.g., on plug-in aerial lengths) and a good tight fit in the transmitter socket. The socket itself may tend to work loose in time and should be tightened up as necessary. Conventionally it is bolted to the transmitter case for rigidity.

Even an absolute beginner should experience no trouble with any of the current commercial transmitters, provided he follows the instructions and pays attention to the simple points of maintenance mentioned in the following notes.

Frog Radiomaster Transmitter



This is a very compact unit housed in a red enamelled steel case. The case consists of two identical pressings, hinged together. The top unit carries the transmitter circuitry and components, mounted on an aluminium chassis plate and the bottom the batteries. A metal plate blanks off and completely protects the transmitter itself from accidental damage. A carrying handle is fitted to the top of the case. The aerial plugs into the top of the case and can be either quarter-wave (8 ft.) or eight-wave (4 ft.)

All controls are mounted on the top of the case, and consist of four push-buttons, two switches and a knob. For aircraft work, in particular, it is a little inconvenient to operate these with the unit on the ground, but otherwise the unit has the advantage of extreme compactness and portability.

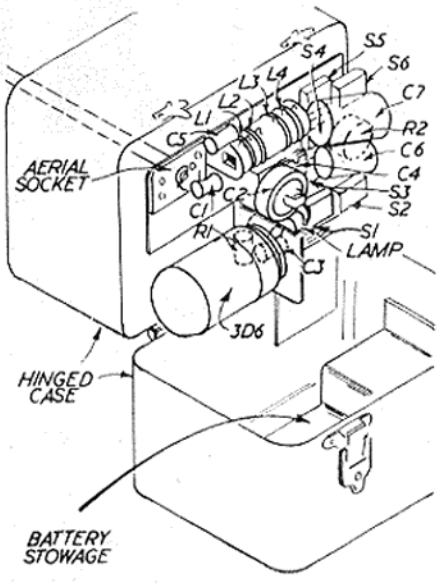
The circuit has been designed by G. Somerhoff and can generate either an unmodulated carrier wave or a pulsed carrier wave in which the pulse rate can be varied (by the knob control) between 1 to 10 and 1.2 to 1. Operation of the pulse is controlled by an on-off switch. A separate push-button (blue) increases the pulse rate from about 2 per sec. to approximately 40 per sec.

Valve is a 3D6. The circuit incorporates a built-in pre-set absorption wavemeter by means of which the set can be tuned and the frequency checked by observation of the brightness of the indicator lamp (on the Mark I), brought into operation by pressing the white button. On the Mark II receiver this serves as a check on radiation strength. The Mark II receiver is intended principally for export and incorporates a crystal for frequency stabilisation.

Data

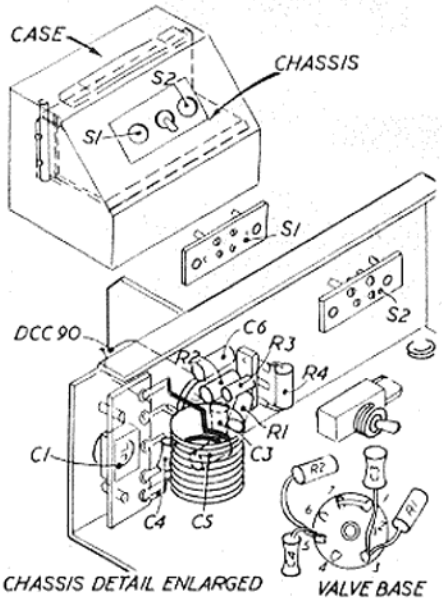
Size: $8 \times 5\frac{1}{2} \times 4\frac{1}{2}$ in.
Weight: 9 lb. (with batteries).
Batteries: H/T—90 volts (Ever Ready B 117). LT—1.5 volts (Ever Ready AD 4).

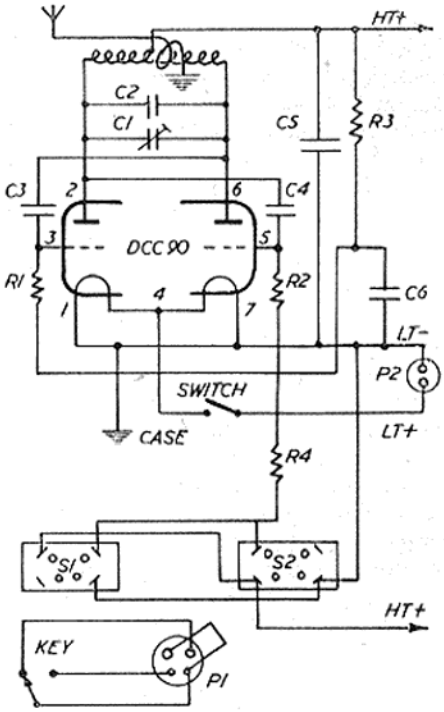
Component values:
C1—not identified.
C2—variable.
C3—not identified.
C4—variable.
C5—0.01 mfd.
C6—8μF.
C7—1.0 μF.
R1—3.3 kΩ.



E-D Mark II

This is a dual purpose transmitter, capable of transmitting either a normal carrier signal (switched on and off for conventional single channel control); or carrier on switching on or off a modulated tone. The type of circuit





gives a rather crude form of modulation in which it is difficult to control the energy content of the pulses, but this is probably quite acceptable for the type of operation this transmitter is intended. Alternative operation is provided simply by plugging the keying lead (P1) into either S1 or S2. All connections to plugs and sockets are drawn on the circuit diagram viewed from the soldering side. A DCC 90 valve is employed.

Battery requirements are 120 volts H/T and 1.5 volts L/T, these batteries being accommodated in the metal case, although efficient operation is maintained down to 100 volts H/T. A 4 ft. aerial is standard, plugging on to an aluminium tube mount fitted to the side of the case.

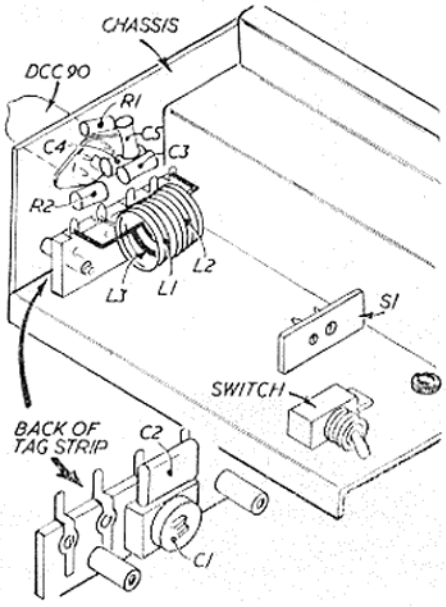
A point to watch is that with the transmitter switch off and the keying lead plugged in a small H/T current can still flow through the circuit. When not in use, therefore, the keying lead also should be withdrawn, although this is not necessary between normal periods of operation.

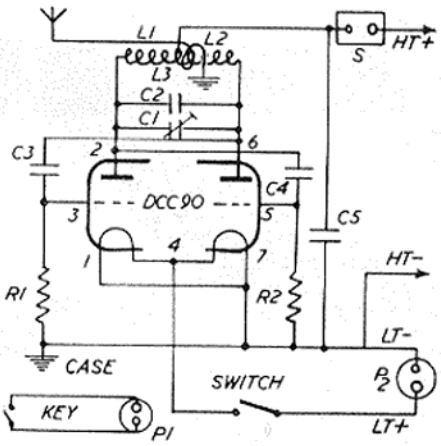
Component values:—
R1—10 kilohms.
R2—10 kilohms.
R3—180 kilohms.
R4—4.7 kilohms.
C1—variable trimmer.
C2—not identified.
C3—50 $\mu\mu$F.
C4—50 $\mu\mu$F.
C5—not identified.
C6—0.1 μF.

E-D Mark III

This is a carrier only transmitter for normal single channel operation, based on a DCC 90 valve. In the accompanying circuit diagram all connections to plugs and sockets are as viewed from the soldering side. P1, on the end of the keying lead, plugs into socket "S." The earth connection is made to the case.

The transmitter is mounted on an aluminium chassis, fixed inside a $9\frac{1}{2} \times 7\frac{1}{2} \times 7$ in. rectangular aluminium outer case, the remaining space being for accommodation of the batteries. An aerial mount is fitted to the side of the case to take an aluminium tube (sectioned) aerial of 4 ft. or 8 ft. length, as required. A carrying strap is fitted to the top of the case. Construction of the transmitter is conventional, with the coils L1, L2 and L3 wound from 16 s.w.g. enamelled wire, unsupported by a former. It is important, therefore, that these coils are not displaced mechanically by handling.



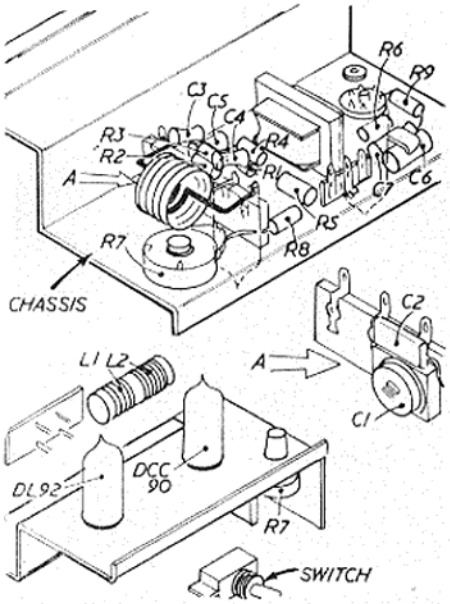


Battery requirements are 120 volts H/T and 1.5 volts L/T.

Component values:—
R1—10 kilohms.
R2—10 kilohms.
C1—variable trimmer.
C2—10 $\mu\mu$F.
C3—50 $\mu\mu$F.
C4—50 $\mu\mu$F.
C5—not identified.

E-D Mark IV

This unit incorporates a twin triode (DCC 90) and a pentode (DL 92) in a modulated carrier circuit. In the normal condition, switched on, a carrier wave is transmitted.[1] One of three modulated tones can then be superimposed, as required, but only one at a time. Each tone is independently adjustable via



the rheostats R10, R11, R12 in the control box circuit. Overall adjustment is provided by the variable resistance R7 in the transmitter circuit.

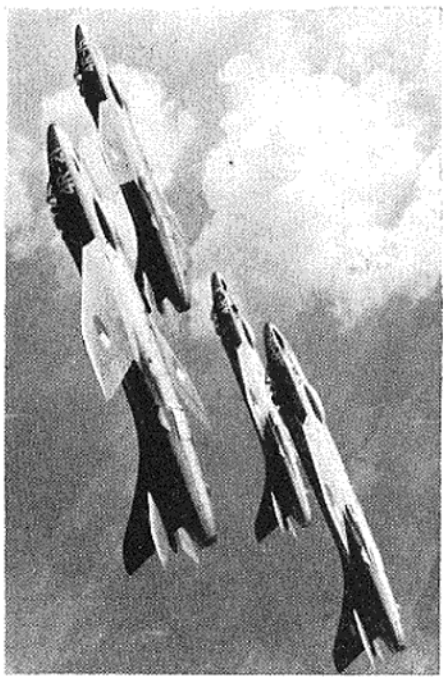
All connections to plugs and sockets on the circuit diagrams are drawn from the soldering side. SIS2 in the control box consists of a double-pole double-throw wafer switch. S3 is a push-button switch. Plug P on the control

(Continued on page 210)

AVIATION NEWSPAGE

by J. W. R. Taylor

FOLLOWING A FACE-LIFT at North American's Los Angeles Division Modification Center, the B-45 *Tornado* jet-bomber shown above was returned for further service with the U.S.A.F. in January. It was the first of a number of B-45's which are being modernised and overhauled under a programme involving a thorough structural check, installation of new kits of wiring, controls and additional electronic gear. Main external change is replacement of the original glazed nose by a " solid " one with under-nose fibreglass radar housing.



First jet-bombers to enter U.S.A.F. service, 96 B-45A's were procured in 1947-8, followed by 10 improved B-45C's and 33 RB-45C reconnaissance aircraft in 1948-50. Most have been replaced in first-line squadrons by later types, including the Douglas RB-66B *Destroyer*; but a few are still flying with bomber and P.R. units, the rest serving as target tugs, flying instrument laboratories and test beds for new missiles and engines. In their time, they were the first jet-bombers to drop an atomic bomb and the first to be flight refuelled.

* * *

There have been **MYSTERE-IOUS GOINGS-ON** over Southern England in recent weeks, with strangely-marked military aircraft landing and taking off from several fighter stations. Reason is that the R.A.F. and other N.A.T.O. air forces have planned a series of exchange visits, on the first of which eight *Mystere IV's* of No. 10 Wing, French Air Force, flew to Biggin Hill, Kent, while eight *Hunters* of No. 41 Squadron went over to the French Air Base at Creil. A similar five-day exchange was made by eight *Hunters* of No. 65 Squadron from Duxford and the same number of Fokker-built *Hunters* of a Royal Netherlands Air Force squadron from Leeuwarden.

* * *

Talking of markings, the colourful **THUNDERBIRDS INSIGNIA** on the C-119G *Packet* transport illustrated . . . does not imply that the U.S.A.F.'s official aerobatic team has swopped its *Super Sabres* for something bigger. This particular *Packet* is used to carry around the crew of mechanics and equipment needed to keep the Thunderbirds' six F-100C's in perfect shape, and the retinue includes also a similarly-painted T-33 *Shooting Star* two-seat trainer.

More familiar in civilian guise as the *Convair-Liner* 240, this **MC-131A SAMARITAN** air ambulance is one of 26 aircraft of this type bought in 1952-54 for service with the U.S. Military Air Transport Service. In addition to the M.A.T.S. badge aft of its fuselage insignia, it carries a large Red Cross on its fin and the word " Continental " to show that it is based in the United States.

First pressurised twin-engined air-evacuation aircraft used by M.A.T.S.,

Left : Dutch Air Force " Hunters " in the camera pose which now seems to be the prerogative of " Hunters." Below, on the left, the C-131A air ambulance, on the right, the C-119G " Packet " workshop of the U.S.A.F.'s Thunderbirds aerobatic team.

the MC-131A carries 37 passengers in rearward-facing seats or 27 stretcher cases, or a combination of both.

* * *

NO MORE B-36's are likely to be seen over Britain, as the U.S.A.F. now has sufficient eight-jet B-52 *Stratofortresses* in service to be able to scrap the giant Convair bombers that have been the "big stick" of Strategic Air Command for so many years.

About 400 B-36's were built between 1947 and 1954 and 270 of them, worth around £357 million, were still flying with S.A.C. at the beginning of this year.

* * *

STARLINER has been chosen as the official name for Lockheed's Model 1649A long-range development of the *Super Connie* with straight-tapered wings, following T.W.A.'s announcement that they will call their 1649A's "Jetstream Starliners."

Previously known as the *Super Star Constellation*, it is already being delivered to several airlines for use on transatlantic non-stop services.

* * *

The **DOUGLAS ZMB-1 DING-DONG** air-to-air guided missile with a nuclear warhead must be almost ready for service, because the U.S.A.F. has announced that the Convair F-106A, McDonnell F-101B *Voodoo* and Northrop F-89J *Scorpion* will each carry two of these weapons, plus a number of GAR-1 *Falcons*. Although termed a long-range missile, the *Ding-Dong* will be lethal over a considerable radius, which would seem to present some break-away problems for the launching interceptor.

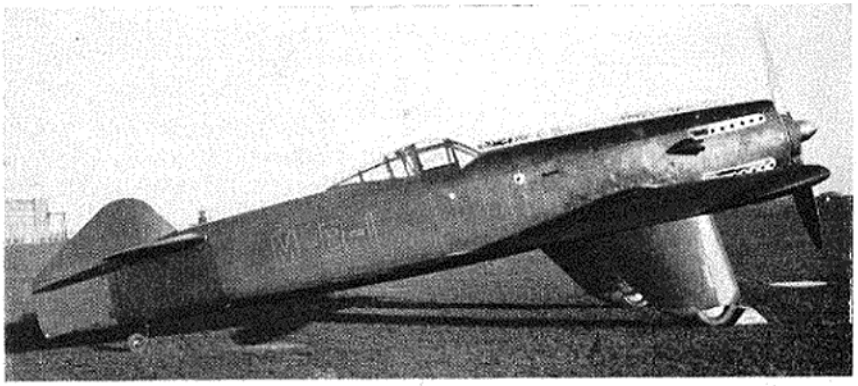
* * *

Unusual **MIXED MARKINGS** carried by the *Ercoupe* lightplane below consist of a civil registration (NC87160) and the new military-style insignia of the Civil Air Patrol. The latter are similar to current U.S.A.F. markings, except that the white star is replaced by a white equilateral triangle with a red three-bladed prop. in the centre.

FROM THE PAST . . . . . No. 13

The Martin-Baker M.B.2

THE MARTIN-BAKER M.B.2 fighter, as befits No. 13 in our "From the Past" series, was an unlucky aeroplane. Built as a private venture to Specification F.5/34, it made its first flight on August 3rd, 1938, and soon proved that its performance was as good as that of any contemporary fighter, despite its fixed undercarriage. Another attraction at the time of the R.A.F.'s panic expansion programme was that it had been specially designed for quick and cheap production. Yet nobody ordered it.



The entire structure of the M.B.2, including the wing spars and ribs, was made from round-section thin-gauge steel tubing and, although square cut, its fuselage lines were exceptionally clean. Good spin recovery characteristics resulted from placing the rudder below the level of the tailplane, and the aircraft handled well, with a top speed of 350 m.p.h., although its 24-cylinder Napier Dagger III air-cooled "H" type engine was rated at only 805 h.p. Armament consisted of eight wing-mounted 0.303 in. Browning machine-guns, outside the propeller disc.

Martin-Baker designed a version with a retractable undercarriage, more power and consequently higher performance, which could have been in service in time for the Battle of Britain. Instead, it was by then a forgotten prototype—one of aviation's many promising "might-have-beens."

Span: 34 ft. Length: 34 ft. 6 in. Height: 9 ft. 9 in.

Even more surprising are the Czech military roundels carried by the **L.60 BRYGADYR** (*below*), because this particular machine is to all intents and purposes a very un-military agricultural aircraft, with spray-booms mounted under its wings.

In large-scale production for agricultural, ambulance and liaison duties, the *Brygadyr* is powered by a 220 h.p. Praga Doris B engine which gives it a max. speed of 118 m.p.h. and range of 435 miles at 112 m.p.h. Like the wartime Fieseler *Storch*, which it resembles in some respects, it has extensive flaps and slots which enable it to take-off in 126 yd. and land in 93 yd., with a stalling speed of 34 m.p.h. Normal payload consists of a pilot and two passengers, or 75 gal. of spray or dust in a hopper in the rear of the cabin, or two stretchers.

Below: This Ercoupe has civil registration letters and military-style insignia. Right: the L. 60 Brygadyr.

Gt. Lakes Trainer

by

Alan Kingswood

A neat control line biplane for 2.5-.3.5 diesels

THE full size counterpart of this attractive model was produced by the Great Lakes Aircraft Corporation in considerable numbers in the early 1930s and in many versions. It was one of those designs—so few and far between—that could be "mucked abaht wiv" and still fly—a tribute to its sturdiness which is reflected in the model version presented here.

Commence by cutting out the fuselage sides from medium $\frac{1}{8}$ in. sheet balsa (cut both from one sheet if possible), then cut out the formers from the material specified. Drill bearers and bolt engine in place, slide on the ply formers and double cement or glue them in position. Bend the undercarriage from piano wire and bind and cement in place. Form cabane struts and bind to the respective formers but do not solder diagonal brace to cabane at this time. Cement fuselage sides to the bearer assembly, pull rear end of fuselage together and double cement. Cement remaining formers in place after cutting holes for push rod.

Bind and cement ply upper wing fixing braces into place on centre-section cabane struts. Install the fuel tank (a Mercury pressure tank was used on the original). For stunt work ensure that the centre lines of the tank and carburettor line up. Bolt bellcrank into position with push-rod in place. Lock by soldering nut in place or by using Simmonds or nylon nuts. Make sure when soldering that no flux gets on control plate pivot.

Cut out the tailplane and elevators connecting the latter with a piece of $\frac{1}{8}$ in. dowel, and sand to the section shown. Use your favourite method of hinging. Cement in position on fuselage and hook up elevator push-rod and horn. The lead-outs can now be added but make sure they are firmly fixed to the control plate. Cut out, sand and fit vertical fin and rudder, ensuring clearance for elevator yoke and fit rear decking spine. Bind tail skid to ply and firmly cement in place.

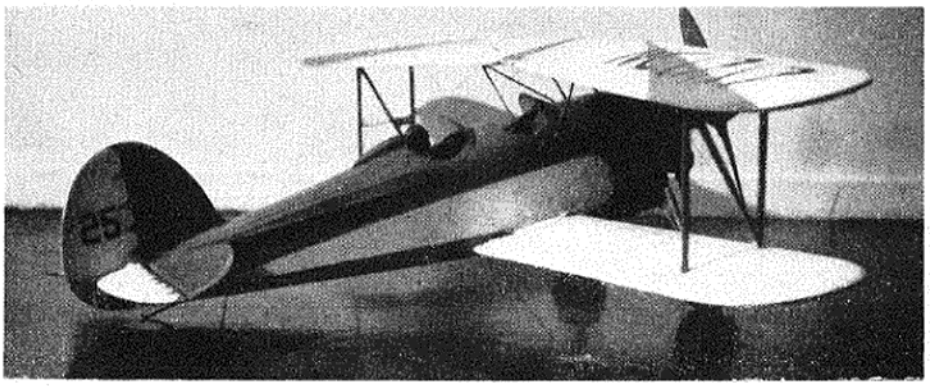
Build wings on plan—packing up leading edges and trailing edges. When dry remove from board and carve l.e., t.e. and tips to shape. Note lower wings have leading and trailing edge stubs left at root. Cut out interplane struts from ply, slide into position in upper and lower wings and offer assembly up, *without cementing*, to fuselage. Pin interplane struts temporarily into position as these give correct relationship of wings to each other. Ensure that wire cabane struts fit into top wing without springing it out of place. Remove wings and without moving cabane struts from position add diagonal braces.

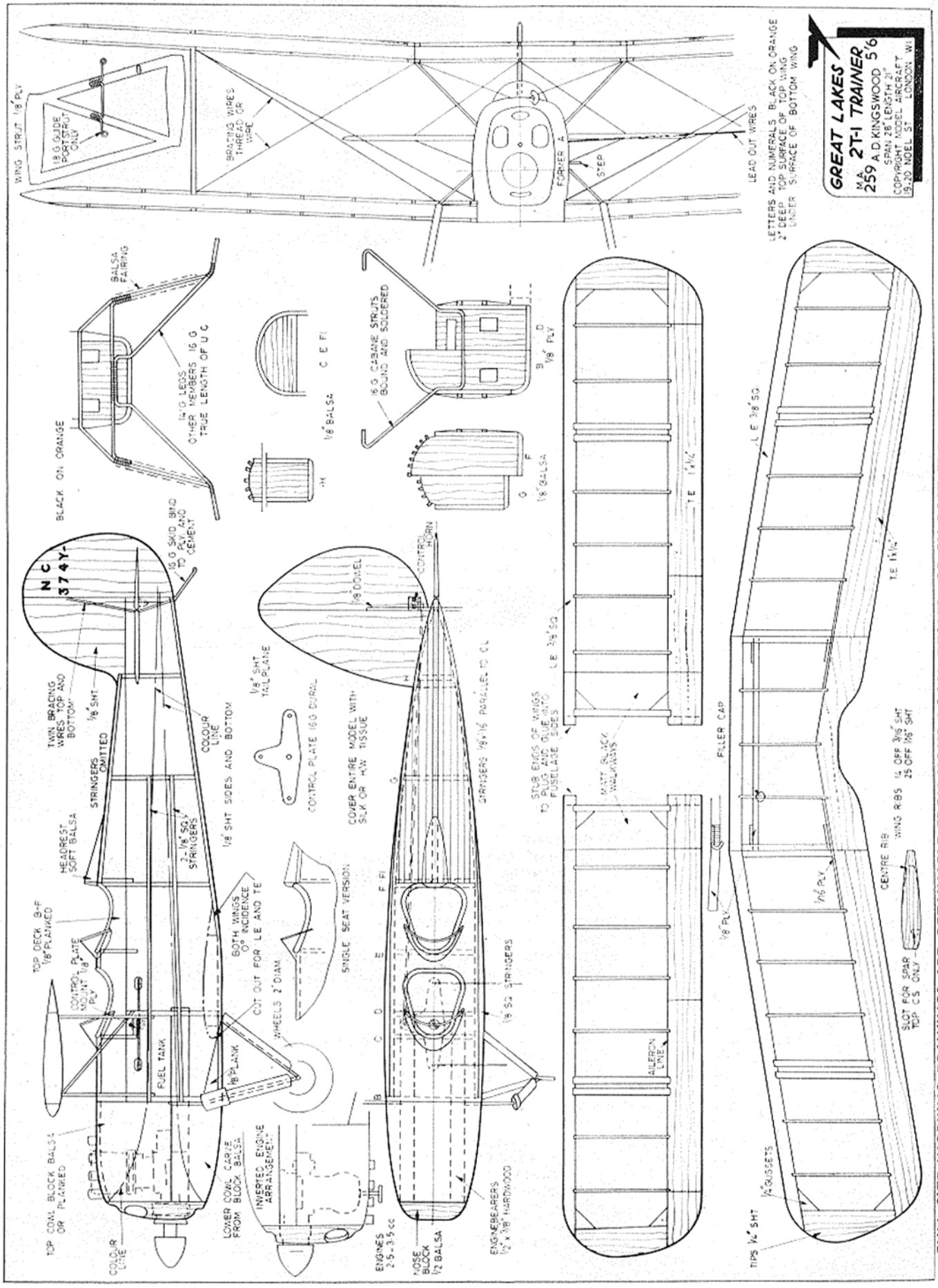
Check all fuselage interior fittings and cement side and top decking stringers in place. Plank top of the fuselage and cut out holes for cockpits. Before fixing $\frac{1}{8}$ in. sheet bottom it is advisable to fuelproof the inside of the tank compartment as it is difficult to keep drops of fuel out, especially when using a pressure bottle for refuelling. Also provide a drain hole in the fuselage bottom. Add cowling blocks and carve to shape. When dry remove and carve inside to fit round motor, then fuelproof inside most carefully.

Cover entire model with silk. It is well worth the trouble for the extra durability. Covering the sheeted sections of the fuselage helps prevent the ingress of fuel and stops the wood splitting at stress points.

Cut the covering away at the underside of upper wing at interplane struts, underside of upper wing at cabane struts, upperside of lower wing at interplane struts. Cement top wing in position on cabane struts then cement interplane struts into underside of upper wing. Cement lower wing in place, double cementing at fuselage/wing joint. Check alignment of wings before cement sets—it's difficult to change later. Add undercarriage fairings, line-guide, headrest and windscreens.

Finish with several coats of sanding sealer, rubbing down between each coat with wet and dry paper. A minimum of four coats should be applied and the addition of a little coloured dope to the filler is useful—use light base colour only. Wing bracing adds enormously to the strength and should be used. Polish with wax or "Autobrite" for final finish and lastly add the wheels. You should now have an almost indestructible model with quite a lively performance.





FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 19-20, NOEL STREET, LONDON, W.1, 5s. 6d., POST FREE

MOTORS OF THE MOMENT

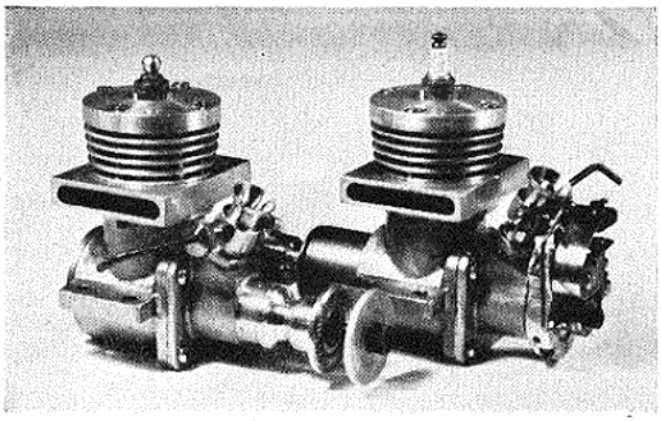
Continued from page 194

and 35. These show minor improvements over the original type Max 29 and 35, which we first described in MODEL AIRCRAFT, February, 1955.

Italy

Due any time now from the Super-Tigre factory is the G.30, a new contender for the 2.5 c.c. diesel class, with twin ball bearing shaft and rear rotary valve induction. The 1.5 c.c. G.31, already on the market, has, of course, been previously described. A G.32 has also been designed, this being a 1 c.c. diesel with rear induction and roller main bearing, but most interest, undoubtedly, attaches to the G.20 replacement which has been under development since last year.

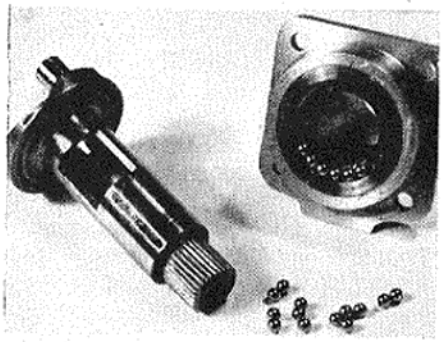
The finely made Barbini B.40 with its unique ball and roller bearings, continues in its glow and diesel versions. One or two small improvements have been made since our published test report on the B.40 TN (124 m.p.h. in last year's World Speed Championships) in the January issue, but, unfortunately, it has been discovered that, due to the effects of the hardening process applied to the crankshaft, a source of error in the position of the crankpin has crept in, as a result of which, some B.40's have been found to be fractionally outside the 2.5 c.c. displacement limit. In this connection Signor Barbini and Messrs. Solaria, the distributors in Milan, have adopted a most honourable and generous course of action and have circularised all retailers and owners of TN and TR model B.40's telling them of this and asking them to return their engines for inspection and, if necessary, free replacement of the crankshaft. We are moved to point out that the B.40 was certainly not alone in being oversize. For many years some manufacturers have been notoriously unreliable in this connection.



Two new Miles engines: the prototype "35" stunt/combat shaft/valve motor described last month, with, right, the second prototype spark-ignition R/C engine with rear drum valve induction, ball-bearing shaft and coupled throttle and contact-breaker.

Germany

The three Webra glowplug models, the 0.8 c.c. Piccolo-Glo, 1.7 c.c. Sport-Glo and 2.45 c.c. Mach-1 Glo, have already been mentioned in these columns. In the two smaller models, the manufacturer's professed intention was to provide easier starting for beginners (these engines being also intended as standard equipment in two new Schuco ready-built C/L models) and, having tested all three, we can say in all sincerity that they have succeeded.



Featured by the Miles 35 engine is this ½-in. dia. crankshaft with massive rectangular intake port and special ball thrust bearing.

Latest from the Johannes Graupner organisation is a new version of the 1 c.c. Taifun Hobby engine. Known as the Hobby RS, this substitutes a clapper valve for the previous shaft valve and has a vertical rear intake *à la* Frog 149.

THE HORNET MOTH

Continued from page 195

The wings should be tissue covered, top and bottom, watersprayed and doped before fitting to the fuselage. The fuselage can also be tissue covered, if you want it coloured. Otherwise leave it white. Coloured dopes should not be used to finish as these will make the model too heavy for flying.

The wings cement directly on to the fuselage sides, with the protruding spar ends fitting through the slots and cementing to the cross braces in the fuselage. It is best to fit one pair of wings first—top or bottom—at the correct dihedral angle and then line the second pair of wings up with these, when set. Then cement in the interplane struts which, if cut accurately to length, will assist in aligning the wing pairs.

The remaining details required to finish the model can then be followed from the plan. The fin cements on top of the tailplane and must be aligned square. The oleo struts on the main undercarriage legs are shaped from strip balsa, grooved to fit and fastened in place by binding with tissue wetted with cement. The radius legs are simply rounded from $\frac{1}{16}$ in. square strip and cemented in place to the bottom of the fuselage and bound to the undercarriage axle joint as well, if you wish).

The exhaust is fitted centrally and can be made from reed cane or $\frac{1}{8}$ in. square balsa strip, rounded. The fishtail end can be shaped from scrap sheet and cemented in place. Exhaust stays are simply pins pushed right through the pipe and up into a fuselage former.

A hatch, hinged with tissue or cellulose tape, should be cut in the rear fuselage, as shown, for access to the rear peg for fitting and changing motors. The tailplane bracing struts are sanded to section from $\frac{1}{8} \times \frac{1}{16}$ in. balsa and cemented in place. A colour line on the fuselage can be doped on, using masking tape to get a straight edge, or cut from coloured tissue or transfer strip. The registration letters can also be cut from tissue or transfer strip. These letters also appear across the top of the upper wing and the bottom of the lower wing.

A 5 in. diameter plastic propeller will give a reasonable flying performance without having to depart too much from a scale size undercarriage. Performance is improved with a 6 or 7 in. propeller, but the undercarriage leg length must be increased accordingly.

Balance point for flying is roughly on the wing mainspar of the upper wing. If very much out from this position on the finished model, add ballast weight to the nose or tail to trim. Once the balance is approximately correct, however, all the necessary trimming can be done by warping the tailplane trailing edge upwards or downwards. For power trim, some downthrust is necessary to prevent stalling. This can be incorporated in the hole drilled through the noseblock to take the bushing, or a packing strip used behind the top of the bushing.

More about Free Flight

IN Part VII we dealt with the trimming and flying of a simple built-up glider. The same basic procedure is followed with larger types of gliders and with powered F/F models, but with the addition of further stages which we shall describe here. To jog your memory on the main points, it is suggested that Part VII "Trimming and Flying" is re-read in conjunction with the present article.

Once again, the importance for waiting for calm weather before attempting to fly a new model and of carrying out a careful "final inspection" cannot be over-emphasised. Check the wing and tail surfaces for freedom from warps and make sure that they are accurately aligned on the fuselage. Power-driven models are especially sensitive to warped or misaligned surfaces. It is also important that your first F/F power model should not be overpowered. For the 35 in. span Veron *Cardinal*, for example, a 0.75 c.c. to 0.8 c.c. engine is quite large enough. You can, in fact, use an engine of this size in a 40-45 in. span model quite satisfactorily. For the 52 in. *Deacon* and similar models, an engine of not more than 1.5 c.c. is advisable and even a 1 c.c. beginner's engine such as the E.D. Bee will provide quite enough power.

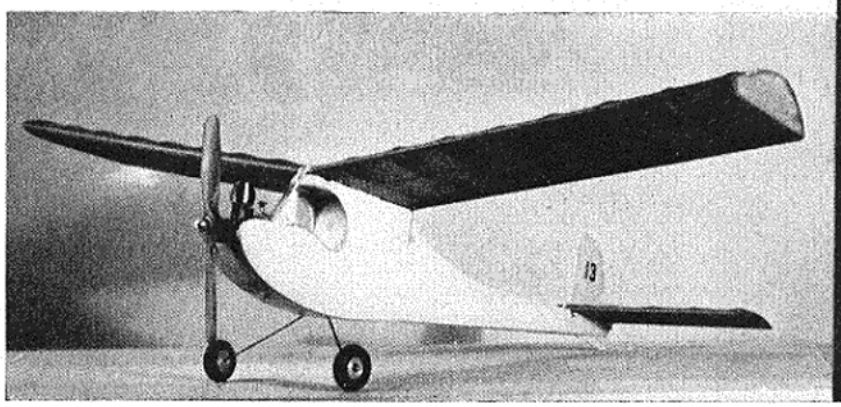
The NEW M.A. BEGINNERS' COURSE PART XVI

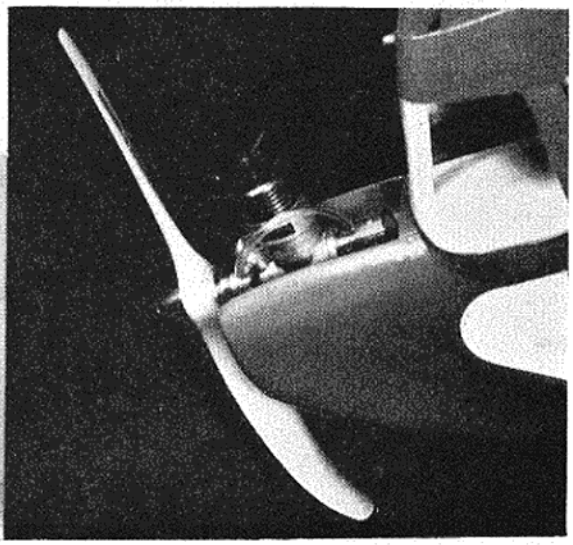
The point to remember concerning the choice of an engine is that no useful purpose is served by employing more engine power than is just required to climb the model at a shallow angle. Anything in excess of this means that the model will fly faster, and be more tricky to trim. It will climb more rapidly and although this may sound more exciting, it also means that you will only be able to allow a short engine-run on each flight. A short spectacular climb is only necessary with contest models and this kind of model should be attempted only when some experience with a more docile type of power model has been gained.

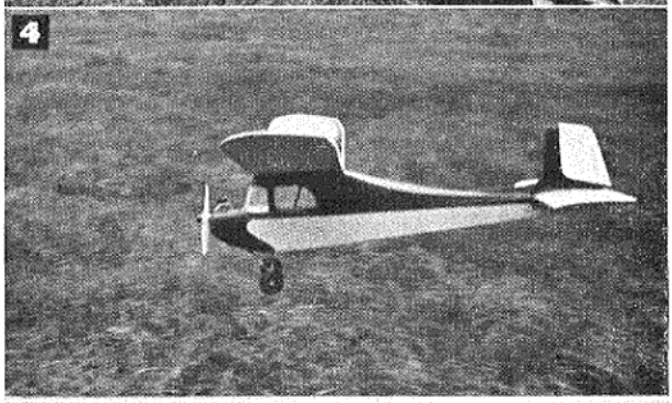
Ideally, the choice of a propeller depends both on the engine and the model, but with our general-purpose type model, this is not over-critical. For the *Cardinal*, when fitted with an engine such as the Mills 75, an 8 in. diameter prop., of 4 in. pitch, is very suitable. For 1 c.c. engined models, a 9 × 4 prop can be used. Where a 1.5 c.c. motor is used, in a model

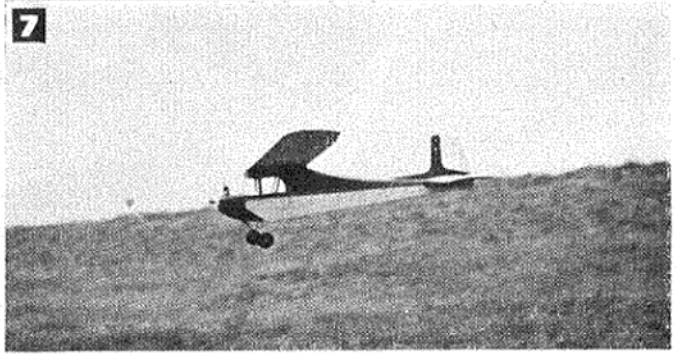
Fig. 1. (below) The popular Veron "Cardinal," fitted with a Mills 75 engine; an ideal beginner's combination.

Fig. 2. (right) For all general-purpose flying, a plastic propeller will save the cost of frequent replacement.









such as the *Deacon*, a 10 × 5 or 9 × 6 prop is advised. These sizes will hold the revolutions of the engine down to a suitable figure. Do not fall into the error of using a small propeller, such as would be used with a power-duration or C/L model. Incidentally, the use of a flexible plastic prop for your first power model is strongly recommended. Shown in Fig. 2 is a Frog nylon prop.

Having checked your new power model thoroughly, fitted the wings and tail and, if necessary, corrected the point of balance, with the addition of ballast, the first test glides can be made. Try to find a decent area to test and fly the model. Don't risk damaging it by flying near trees, hedges, etc., and remember that the model is capable of flying a good deal farther than your first models, so don't fly near a built-up area.

Start off by hand launching from waist level by kneeling down as shown in Fig. 3. A power model will descend a little more steeply than a glider, but the glide angle should not be steeper than in Fig. 4. If it is steeper than this, pack up the *trailing* edge of the tailplane with a piece of $\frac{1}{16}$ in. balsa and try again.

If, on the other hand, the model levels out and loses speed, as in Fig. 5, and then drops its nose, a tendency to stall is indicated and a little ballast weight can be added to the nose. Adding weight to the nose is preferable to packing the *leading* edge of the tailplane (or reducing the wing angle of attack) as, with models having a small longitudinal dihedral angle, the latter practice may reduce longitudinal dihedral to a point where longitudinal instability is induced.

Launching from waist level is a precautionary measure only and as soon as you are satisfied that the model shows no dangerous tendencies, all further test gliding should be from head level as shown in Fig. 6. Short test glides carry with them the risk of wrongly interpreting the model's trim if the model is launched too slowly or too fast, since there is insufficient height for the model to settle into its normal glide path.

The ideal final test glide set-up is to find a gentle slope of, say, 1 in 12 and launch the model down this. Such a slope was, in fact, found for our test glides with the *Deacon* and the model, with trim "spot-on," is seen gliding almost parallel to the slope in Fig. 7.

Needless to say, the model should descend on an even keel and with no tendency to bank left or right. A warped wing or misaligned tail unit may cause this, but any slight turn can be usually corrected with the rudder.

General purpose type power models are usually trimmed, initially, to fly straight, both in the glide and under power. Due to the torque of the engine tending to bank and turn the model left, it is usual to install the engine at a slight angle (about 2 degrees) inclining the thrust angle to the right as shown in Fig. 8.

For the first power flight, the engine should be slowed down as much as possible. With a diesel, this can be done by slackening back the compression screw and opening the needle-valve. See Fig. 10.

Glowplug engines cannot be throttled down so easily as diesels, but running the engine with the needle-valve opened widely, to produce so-called "four-stroking," will reduce r.p.m. somewhat and a further slight reduction

Flying the "Deacon": 3—The first few test-glides should be from a low level as shown. 4—In this picture the model is gliding a trifle too steeply. 5—Here, the model is slightly tail heavy, has lost flying speed and is about to drop a wing to the right. 6—Test gliding is continued by launching from shoulder height. 7—Gliding the model down a gentle slope is excellent for checking on final trim.

in thrust can be obtained by putting the propeller on backwards so that the back surface of the blade faces forwards. (See Fig. 11.)

The transition from glide tests to power tests should be as gradual as possible. In other words, to start with, all the model has to do is to just maintain height under power, or enter a very shallow climb as in Fig. 12.

Needless to say, only enough fuel for an engine run of about 10 sec. should be in the tank. Alternatively, the model can be fitted with one of the engine-run limiting devices on the market. These usually consist of a small pneumatic cylinder which operates a fuel cut-off valve after a preset delay period. A very simple and effective version of this is the Elmic Mini-Timer shown in Fig. 18, which can be fitted in any convenient place between the tank and carburettor. This timer dispenses with the need for a separate fuel valve, since it is arranged to squeeze the plastic tube to cut off the supply to the engine.

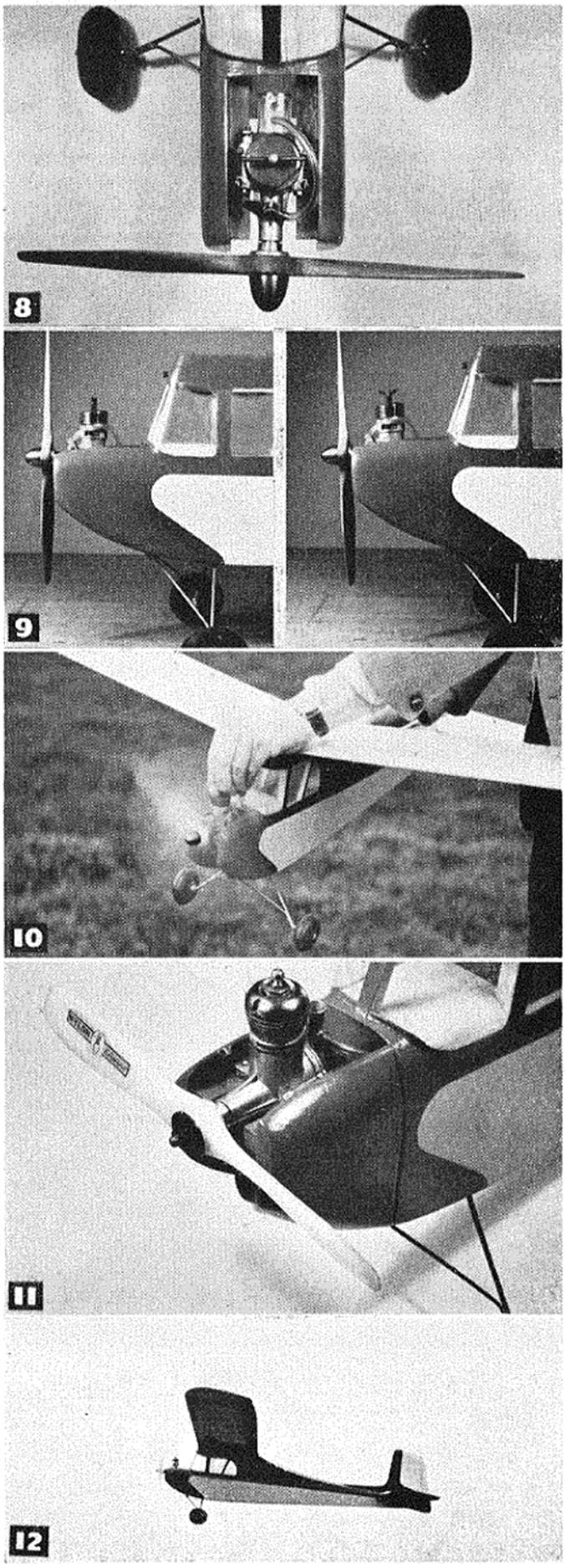
It is unlikely that you will experience any trouble with your first reduced-power flight. For each successive flight, increase engine revolutions very slightly and watch the model carefully. The climb should be straight or slightly to the right and, when the engine cuts, the model should continue circling gently to the right as it descends. The rudder tab can be set to give the required turn, but be very cautious how you use the rudder and move it only about $\frac{1}{16}$ in. at a time, otherwise the model may be forced into a tightly banked turn which may develop into a spiral dive. This applies most particularly when you have restored engine r.p.m. to their normal level.

Never make an adjustment and increase power at the same time. If, for example, the model is not turning sufficiently, make the rudder adjustment and fly the model again before increasing engine r.p.m.

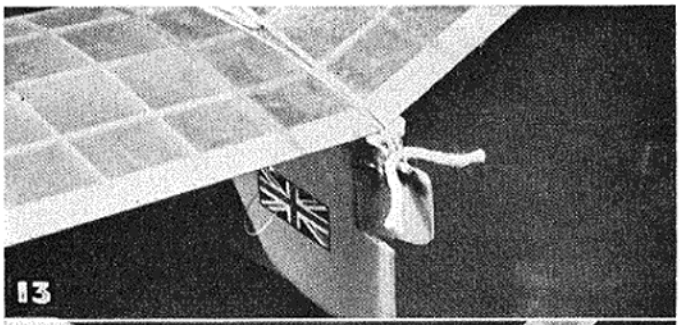
Usually it is best to avoid making any readjustment to balance or to wing and tailplane angles during the power tests. These should be approximately correct following the glider test adjustments. However, when flying in a circle, as opposed to straight flight, there is a tendency with all models, for the nose to drop very slightly and if it appears that insufficient height is gained or the subsequent glide is unduly steep, it is permissible to reduce the nose weight slightly or pack up the trailing edge of the tailplane until this is improved. Use no more than 1/32 in. packing at a time.

As soon as you have the model flying to your satisfaction, make a note of any adjustments found necessary so that the model can be correctly set up on the next outing. Any packing strips used to adjust flying surface angles can be cemented in place. Most power modellers make a practice of a brief check with a test glide at the beginning of each flying session and this is particularly advisable when the model is new because newly constructed airframes sometimes acquire minor warps and changes of shape during their first month or so.

So far we have not mentioned dethermalisers. Nowadays, most F/F models are fitted with these devices and you will be well advised to use one with your first F/F model, especially during hot weather or if you allow the model to climb to over 100 ft. Under these conditions



Flying the "Deacon": 8—Slight right thrust will help to overcome the left turn due to engine torque. 9—A small downthrust angle of 2-3 degrees is usually recommended. 10—For initial power flights, the engine should be slowed down by reducing compression. 11—If a glowplug engine is used, thrust can be reduced by fitting the propeller backwards and running the engine on a rich mixture. 12—First flight! Under reduced power, the model climbs away steadily at a shallow angle.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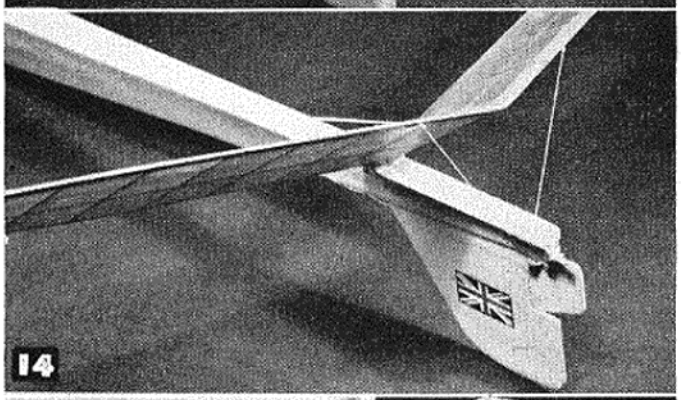
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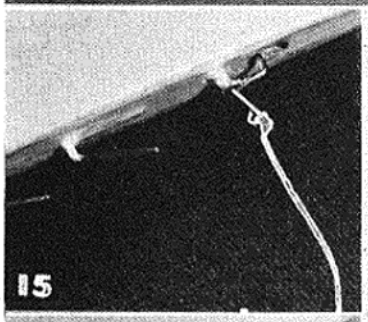
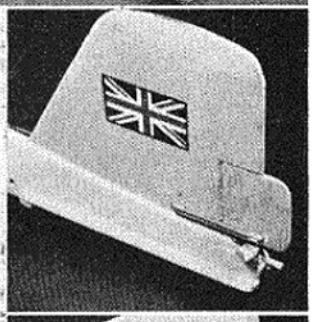
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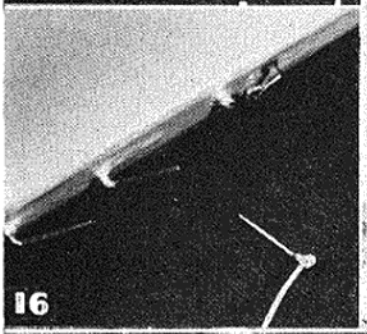
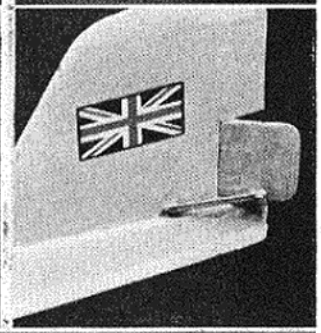
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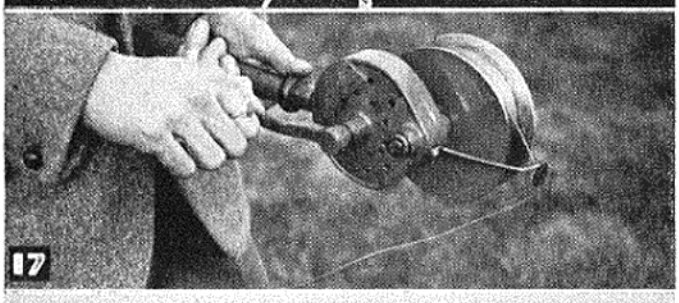
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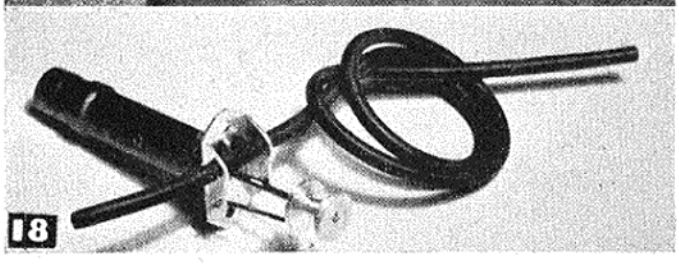
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any F/F model is liable to be caught in a thermal up-current. This may merely extend the flight for an additional minute or two, or, on the other hand, the model may easily be borne upward until it is out-of-sight and may be lost.

A dethermaliser is designed to remove the risk of loss by bringing the model down after a predetermined period—usually 3 min. There are various types of d/t. One employs a small parachute which, when opened, slows up the model and causes loss of lift. The most popular type, however, is the " pop-up " tailplane. In this, the whole tailplane is pivoted at the leading edge, and tensioned with rubber so that, when released, the trailing edge pops up and inclines the tail at a negative angle of about 40 deg. This results in a complete stalling of the wing and the model will descend on an even keel almost vertically.

The usual method of releasing the trailing edge is by means of a fuse between the strands of a separate rubber band holding the trailing edge down. The best fuse material is a small diameter lamp-wick. It is lit, of course, just before the model is released.

A typical dethermaliser layout is seen in Figs. 13 and 14 on a Nordic A2 class towline glider. Note the thin steel wire bracing which limits the tailplane movement to the required angle. The extreme rear of the fuselage is covered with asbestos paper to prevent damage from the smouldering fuse.

A device which is widely employed on towline gliders, especially those of the contest type, is the auto-rudder. The purpose of this is to hold the model on a straight course during the tow, which then becomes circling flight as soon as the model is released from the towline.

The operation of a typical auto-rudder is shown in Figs. 15 and 16. The rudder is tensioned by means of a rubber band against a stop suitably positioned to give the required turning radius. On the other side is fitted another stop, against which the rudder is centralised by the pull of a thin steel wire or nylon line, leading forward, through the fuselage, to a position just behind the tow-hook. Here a sliding trigger is fitted which can be locked in the forward position by means of a pin as shown. This pin is attached to the towline ring by means of a loose length of strong thread. Thus, when the towing ring slips from the towhook the pin is jerked out and the rudder snaps over.

In conclusion, one final word regarding trimming a power model for circling flight.

The main object of circling flight is to prevent a model from flying too far and going out of sight (which it may easily do if allowed to head in a straight line) and an adjustment which gives one right-hand circuit about every 20 sec. is about right. However, you may find that, with the rudder set for this in the glide, the model has an excessively tight right turn under power. In this case, reduce the amount of side-thrust on the engine.

Fig. 13. A typical dethermaliser installation. The fuse is placed between the rubber bands holding down the trailing-edge. 14—When released, the tailplane rises to a negative angle of approximately 40 degrees. 15—A typical auto-rudder installation on a towline glider showing the release-pin in place and the rudder centralised for towing. 16—When the model is cast off, the release-pin is automatically withdrawn, allowing the rudder to move over for circling flight. 17—For towline gliders, a winch is invaluable. Shown is an excellent geared winch made from a hand bench grinder. 18—The fitting of a flight timer and fuel cut-off valve is strongly recommended for free-flight power models. Shown is the Elmic Mini-Timer/cut-out.

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

WHITEFIELD M.A.C.

Eleven models were entered in the Northern Models Exhibition and eight places were obtained, including one first and three seconds. Most unusual model was M. Allen's gigantic C/L flying wing with an Enya 63 Glowplug for power.

We managed to collect a total of 31 min. in Keil Team Power. Quite good considering the blustering weather. Top scorer was Brian Eggleston with his "Creep" design who scored 10½ min.

On the same day Alan Ulard topped the club with 9.20 in the S.M.A.E. Cup A2 Elims. J.O.D. was second best with 5 min.+. He managed to find four downdraughts—most unusual ! !

A "Precision Comp." was held recently. The rules being four flights, nearest of 5 min. total being the winner. J.O.D. was the eventual winner by 1 sec. after a tie with J. Trainor. J.O.D. was flying a timer-operated tip-up tail glider in this event.

CARDIFF M.A.C.

The last indoor meeting started quite mildly with a Jetex 350 circulating at 50-60 m.p.h. Of course, this seemed much faster in our club room where everyone has to breathe in to allow the models to pass.

However, things soon warmed up when two half models were strapped together to provide a unique (thank goodness !) twin. This circulated a bit too fast for our timekeeper, who we afterwards found hiding under a table (coward !).

Things really began to warm up then when this freak was set off one way and a rubber model the other. After an everlasting fraction of time the inevitable happened in a big way—bits everywhere. Surprisingly enough, the rubber model came off best.

PERTH M.A.C.

The club has been busy already this season. First came Ron Irvine's S.A.A. Class V speed record of 129 m.p.h., using a McCoy 60. Then we took 2nd place in the ½A team race at the Kelvin Hall, Glasgow—besides doing a Kamikaze Act in the carrier event ! Latest effort has been a speed of 144 m.p.h. with the McCoy 60, which is awaiting ratification. This is a result of teamwork by our Ron Irvine and Mr. Barclay, and Walter MacFarlane of Glasgow Barnstormers.

THE SOUTHERN AREA

We held a Spring Rally at Stoney Cross aerodrome in conjunction with the Team Power and A2 Eliminators and this new venture of combining Team Race and Radio competitions brought more support from clubs for the two S.M.A.E. events.

BAILDON M.F.C.

At the first area contests we took 1st and 2nd places in A/2 and Rubber, and 1st, 4th, 5th, 6th and 7th in the Keil (giving us a team aggregate of 35 : 36) whilst in the Area Knock-out our A and C teams beat Hull and York respectively. Arthur Collinson's "Creep" gave him the highest individual time in the Keil with 10 : 36 (including two maxs.) and the other qualifiers were secretary Stan Eckersley (9 : 29), Frank McNulty (8 : 13), and Johnny Godden (7 : 38). In the A/2 Eliminator our comp. secretary, Gerry Tideswell, achieved the highest individual score of the day in any category by logging 13 : 07 ; in 2nd place was George Cameron with 12 : 49, and the Area Open Rubber was won by Ken Rutter with 8 : 47, Henry Tubbs being second (7 : 35).

The following week our B team visited the wilds of Derbyshire (it was wild, too) to fly Sheffield S.A.M. in the Knock-Out. However, the home team—after a good start—had some very bad luck and the issue was decided in our favour from four flights (during which the recovery squads wore themselves out scrambling through the swamps and forests 1½ min. downwind).

PLYMOUTH M.F.C.

We are organising this year's Devon Rally which will be held on May 26th, at Crownhill Down, near Plymouth, and will be open to clubs in Devon and Cornwall.

Competitions include: Rubber, Glider, F/F, Power, R/C and an R.O.W. event as a suitable pond is available.

Full details of competitions and directions to Crownhill Down can be obtained from the Hon. Secretary, A. H. THOMAS, 38, Pemros Road, St. Budeaux, Plymouth.

SUNDERLAND & D.M.A.C.

We still have the use of R.A.F. Usworth for flying, and have recently obtained a room from the local Boys' Club Association for our monthly meetings.

Our new secretary is R. Hepple who is very keen to make the club go ! Anyone interested should get in touch with him. (See change of secretaryships.)

DROGHEDA M.F.C.

Our annual contest will be held on Sunday, August 11th, at Butlin's Holiday Camp, Mosney, Eire, commencing at 12 noon.

Events are Combat: Class "A" and "B" team race, and Flying Scale Models.

Valuable prizes of engines and kits will be awarded in each event and points will be awarded in each event to the first three competitors as follows; 1st, 10 points ; 2nd, 5 points ; 3rd, 3 points, and the holder of the highest number of points will be awarded the Butlin Perpetual Trophy and replica.

Entry fee is 2s. in each event or 5s. for entry in all four events.

Entries from English competitors will be welcomed and those wishing to do so should get in touch with the Hon. Secretary, PATRICK HUGHES, 16, Mary Street, Drogheda, Ireland.

WEST BROMWICH M.A.C.

Since someone discovered that microfilm isn't so difficult after all, it's been the current rage in the club. Luckily we have managed to use a local cinema for occasional indoor flying, and we invited some of the Birmingham boys to give us a demonstration. This encouraged us further and Mac Grimmet, who is anti-flying

CONTEST CALENDAR

May	26th	Devon Rally, Crownhill Down, near Plymouth. F/F and R/C.
June	9-10th	**THE BRITISH NATIONALS**—R.A.F. Waterbeach, Cambs.
,,	9th	*THURSTON CUP. U/R Glider. SHORT CUP. 2.5 c.c. Class PAA-Load. GOLD TROPHY. C/L Stunt. S.M.A.E. TROPHY. R/C. DAVIES TROPHY. Team Race "A." SPEED—All classes. International Eliminator. A/2 TAILLESS. International Eliminator.
,,	10th	*SIR JOHN SHELLEY CUP. U/R Power. *MODEL AIRCRAFT TROPHY. U/R Rubber. INTERNATIONAL TAILLESS. A/2 Specification. SUPER SCALE TROPHY. Power Scale. AEROMODELLER TROPHY. R/C. DAVIES TROPHY. Team Race "B." SPEED—All Classes. International Eliminator. COMBAT.
	16th	Woodford Rally. Novocastria Rally. Newcastle Town Moor. F/F, Combat, Concours.
,,	23rd	Northern Heights Gala, Halton, Bucks. Clwyd Slope Soaring, North Wales. Open, A/2, R/C, and Tailless Glider.
,,	30th	**INTERNATIONAL TRIALS**—Centralised.
July	7th	PILCHER CUP. U/R Glider. WOMEN'S CUP. U/R Rubber/Glider. D/C. JETEX CUP. Jetex. Enfield C/L Rally. Enfield Playing Field (by Gt. Cambridge Rd.). Hyde Cheshire Rally, F/F, R/C and Combat.
,,	14th	**SCOTTISH GALA**—Centralised.
July	14th	CATON TROPHY. U/R Rubber U/R Glider. U/R Power. TAPLIN TROPHY. R/C. TEAM RACING. "A" and "B" Classes. SPEED. All Classes.
,,	28th	Epsom Slope Soaring, Box Hill. F/F and R/C.
Aug.	4th	**NORTHERN GALA.** C.M.A. CUP. U/R Glider. FROG SENIOR CUP. U/R Power. FLIGHT CUP. U/R Rubber. RIPMAX SHIELD. R/C. PAN AMERICAN TROPHY. 1 c.c. Class PAA-Load. TEAM RACING. "A" and "B" Classes. SPEED. All Classes.
	5th	Chester C/L Rodeo, Chester Race Course. T/R "A" and "B" and Combat.
,,	11th	Drogheda, M.F.C. Rally, Butlin's Holiday Camp, Mosney, Eire. Combat, Scale, T/R.
,,	25th	South Midland Area Rally, Cranfield.
Sept.	1st	Huddersfield Rally, F/F and Combat. West Hants Rally, Beaulieu Aerodrome, near Southampton. F/F, T/R, ½A. "A" and "B," Stunt and Combat, R/C, Glider and Power.
,,	8th	Croydon Gala, Chobham Common. F/F.
,,	15th	HALFAX TROPHY. U/R Power. †MODEL ENGINEER CUP. Team Glider. Area.
,,	29th	TEAM RACING. "½A," "A" and "B" Classes. Area. South Eastern Area Rally, Ashdown Forest. F/F.
Oct.	13th	K.M.A.A. CUP. U/R Glider. †FARROW SHIELD. Team Rubber. Area.
,,	27th	HAMLEY TROPHY. U/R Power. FROG JUNIOR CUP. U/R Rubber/Glider. D/C.

* Area Championship events.
† Plugge Cup events.

wing with his combat models, decided to build a flying wing in micro-film and it flew; quite well ! (so well indeed he broke the indoor record at the Manchester meeting).

Some people who haven't been bitten by the micro-film bug are continuing to play with " old fashioned " team racers and combat jobs. The new Norman Long engine the " Viper " is being used by some of the team race enthusiasts. Combat models are still being built and pranged with remarkable rapidity; it always seems that the oldest models survive.

CROYDON & D.M.A.C.

Our annual gala is to be held at Chobham Common on September 8th. The usual classes of unlimited power, rubber and glider (both tow and throw) also include slope soaring which in previous years has attracted a very large entry since almost any type of model can be used. Flight maximum for this class only is 1 min. and last year three maximums and a fly-off of over four min. were needed to win this event. As in previous years Croydon members will not be competing.

NORTH LINCS M.A.C.

Special features of our second exhibition included a compressed-air model built by a World War I ace, Flt. Lt. Woods (who shot down 17 E.A. in his Nieuport) believed to have been flown in 1911, and still in working order. Nationals winner in radio, John Nixon had his model and both the radio trophies on show; a MODEL AIRCRAFT Max Holste Broussard was operated round the pole by designer E. Fearnley, the A.M.25 substituted by a Mills .75 fitted with silencers and an oil sump to reduce mess and noise. An electrically-operated half-speed device was fitted to it by E. Cartwright. On the last day this model was removed and the Colonial Skimmer substituted, when it almost broke through the sound barrier (in more ways than one !).

Special displays were put on by the R.A.F. recruiting centre, B.O.A.C. through the local travel agency, and Mason Bros., the local model shop, the proprietor nearly killing himself in his efforts to assist the club. (Yes, we know how lucky we are !)

Best in show winner of the HAW trophy was Roland Craggs with a radio control delta (one of 15 radio models on show !). Best junior was J. Clements with a pylon job. This won him the Fearnley trophy ! ! ? ? A new member, Mr. Gosling from Leamington won glider, Tony West solids, and E. Fearnley scale, Alan Ely, control line, Bill Brown sport section.

The club membership is now 70 plus, and meetings are held at our full time club room every Thursday, address 149, Welholme Road, Grimsby. Everyone welcome.

CHANGE OF ADDRESS

HUDDERSFIELD D.M.A.C., A. Bradley, 32, Roundway, Hanley, Huddersfield.

NEW CLUBS

583 SQDN., A.T.C. AEROMODELLING CLUB. C. Claxton, 4, Concrete Houses, Pill, Milford Haven, Pembrokeshire.

STRATFORD-ON-AVON M.A.C. S. Richardson, 4, Kendall Avenue, Stratford-on-Avon.

CHANGE OF SECRETARYSHIP

SUNDERLAND M.A.C. R. Hepple, 4, Romney Avenue, Sunderland, Co. Durham.

PEN PALS WANTED

For 17-year-old Canadian, Alec Stenson, A3, St. Josephs Buildings, Robinson Road, Hong Kong, who is mainly interested in C/L and solid scale models.

And for Czech enthusiast Pavel Janihelka, V. Surich 12, Prague 2. Czechoslovakia, who would like to correspond, in English, with a youngster on aircraft subjects in general.

EXCHANGE OF MAGAZINES

We have two requests from Czech enthusiasts who would like to exchange modelling magazines with someone in this country. If you want to find out what's going on in Eastern Europe, then get in touch with either George Kubicka, 690, Gottwaldova Street, Roudnice, n./L, Czechoslovakia, or Milan Vydra, Vratislavova 28, Prague, Czechoslovakia.

CONTEST RESULTS

INDOOR MEETING, MANCHESTER

MICRO FILM UNDER 100 sq. in.

1. R. Monks ..	Birmingham	.. 13 : 53	7. M. Grimmett	West Brom.	..	7 : 13
2. J. O'Donnell	Whitefield	.. 12 : 38	8. G. Walker ..	Birmingham	..	7 : 04
3. P. Read ..	Birmingham	.. 11 : 16	9. J. Hartley ..	Wolves	..	6 : 12
4. D. Poole ..	Birmingham	.. 10 : 46	10. T. Titley ..	Birmingham	..	6 : 09
5. A. King ..	Australia	.. 8 : 21	11. A. Spurr ..	Middlesbro'	..	5 : 42
6. R. Parham ..	Worcester	.. 8 : 09	12. T. Chambers	Stockton	..	1 : 12

MICRO FILM OVER 100 sq. in.

1. J. O'Donnell	Whitefield	.. 11 : 50	1. D. Poole ..	Birmingham	..	6 : 53
2. R. Copland ..	Northern Heights	11 : 46	2. P. Read ..	Birmingham	..	5 : 12
3. P. Read ..	Birmingham	.. 9 : 42	3. R. Monks ..	Birmingham	..	4 : 43
4. R. Monks ..	Birmingham	.. 9 : 04	4. R. Parham ..	Worcester	..	4 : 33
5. D. Poole ..	Birmingham	.. 8 : 24				

TISSUE COVERED Max. Weight 2 oz.

CHUCK GLIDER Maximum Weight ¾ oz.

1. J. H. Dixon ..	Unattached	.. 0 : 30	7. T. Titley ..	Birmingham	..	0 : 17
2. J. O'Donnell	Whitefield	.. 0 : 27	8. M. Grimmett	West Brom.	..	0 : 18
3. R. Monks ..	Birmingham	.. 0 : 26	9. D. Morley ..	Lincoln	..	0 : 14
4. H. O'Donnell	Whitefield	.. 0 : 22	10. B. Jukes ..	West Brom.	..	0 : 15
5. J. Hartley ..	Wolves	.. 0 : 19	11. A. Ward ..	Whitefield	..	0 : 07
6. M. Watson ..	Whitefield	.. 0 : 19	12. E. Lord ..	Accrington	..	0 : 03

S.M.A.E. CUP. A.2 ELIMINATOR

1. V. Jays ..	Surbiton	.. 13 : 15	7. P. J. Crossley	Blackheath	..	12 : 23
2. G. Tideswell	Baildon	.. 13 : 07	8. B. Rowe ..	St. Albans	..	12 : 22
3. K. Oliver ..	Foresters	.. 13 : 01	9. J. Cartwright	Hull Peg.	..	12 : 22
4. G. Cameron	Baildon	.. 12 : 49	10. R. Burwood	Surbiton	..	12 : 00
5. G. LeFever ..	South Essex.	.. 12 : 48	11. L. Burrows..	Blackheath	..	11 : 49
6. B. Dowling ..	Wayfarers	.. 12 : 29	12. D. Greaves..	Leamington	..	11 : 45

GAMAGE CUP

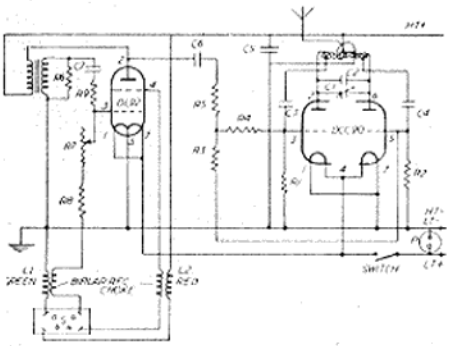
1. E. A. Barnacle ..	Leamington	.. 7.39
2. E. E. Wiggins ..	Leamington	.. 6.54
3. R. Lennox ..	Birmingham	.. 6.45
4. T. B. Chambers ..	Stockton	.. 6.06
5. J. O'Donnell ..	Whitefield	.. 6.03
6. L. E. Moore ..	Leamington	.. 5.57
7. D. Greaves ..	Leamington	.. 5.57J
8. S. Taylor ..	C/M	.. 5.46 ¦
9. P. Morley ..	Lincoln	.. 5.31¶
10. A.W.F. Alexander	Cowley	.. 5.26
11. P. Giggle ..	Southampton.	.. 5.09
12. J. Punter, ..	Cowley	.. 4.45J

KEIL TROPHY

1. Coventry ..	..	..	..	37 : 04
2. Baildon ..	..	..	..	35 : 56
3. Whitefield ..	..	..	..	30 : 57
4. Surbiton ..	..	..	..	28 : 21
5. Walsall ..	..	..	..	26 : 40
6. Birmingham ..	..	..	..	25 : 56
7. Thameside ..	..	..	..	25 : 44
8. Ashton ..	..	..	..	25 : 02
9. Henlow R.A.F. ..	..	..	..	22 : 16
10. Lough. College ..	..	..	..	21 : 44
11. Wigan ..	..	..	..	19 : 00
12. Novocastria ..	..	..	..	18 : 09

Transmitters—(*Continued*)

box circuit plugs into socket S on the transmitter. A quarter wave aerial is standard for the transmitter, fitting on to a standard E-D type mount on the side of the case. Size of the case is approximately 10 × 8½ × 7½ in. and total weight (with batteries) 11½ lb.

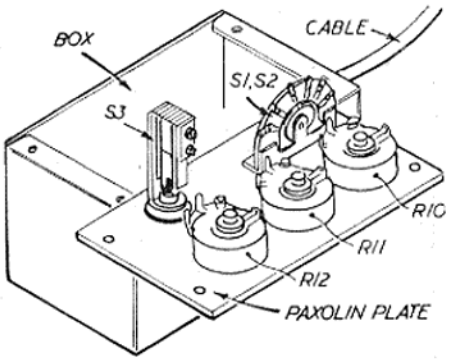


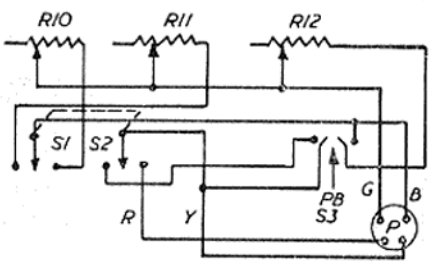
The control box is 6 × 5 × 2½ in. and weighs 1¼ lb.

Battery requirements: H/T 120 volts. L/T 1.5 volts.

Component values:

R1—10 kilohms.
R2—10 kilohms.
R3—10 kilohms.
R4—10 kilohms.
R5—10 kilohms.
R6—12 kilohms.
R7—100 kilohms (variable).
R8—10 kiloms.
R9—10 kilohms.
R10, R11, R17 } variable.
C1—variable trimmer.
C2—10 $\mu\mu$F.
C3—50 $\mu\mu$F.
C4—50 $\mu\mu$F.
C5—not identified.
C6—not identified.
C7—not identified.





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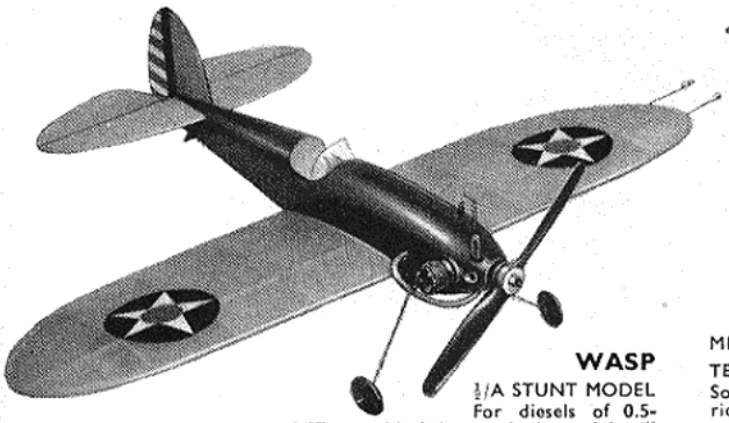
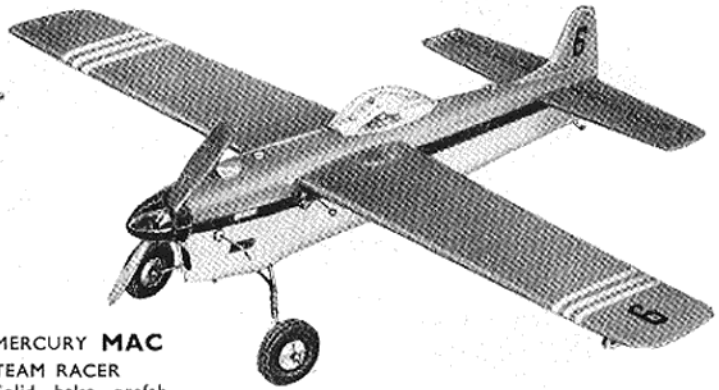


WASP

½A STUNT MODEL

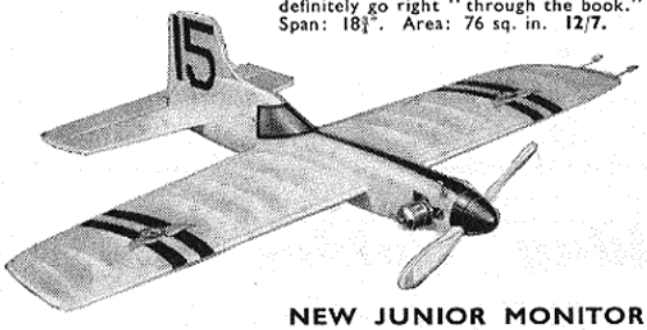
For diesels of 0.5-0.87 c.c., this baby aerobatic model will definitely go right "through the book." Span: 18¾". Area: 76 sq. in. **12/7.**



MERCURY **MAC**

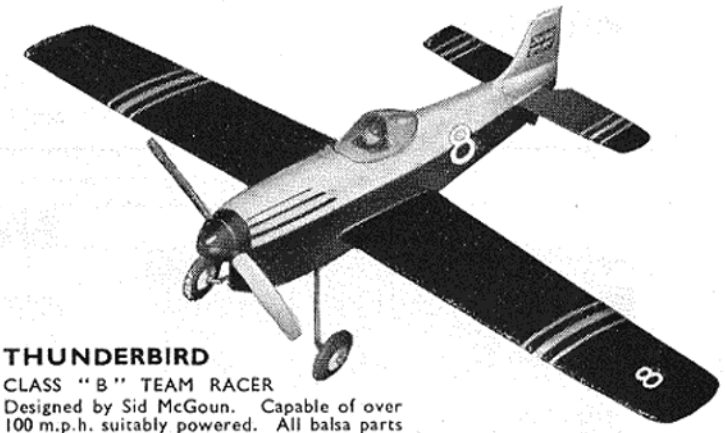
TEAM RACER

Solid balsa prefabricated kit designed by Sid McGoun. A constant contest winner, for 2.5 c.c. diesels. **18/-.**



NEW JUNIOR MONITOR

Stunt and combat model for 2.5 c.c. engines designed by H.J.N. Hollow log fuselage construction makes this a really tough machine and a "quicky" to build. A fast combat ship. Span: 30". Wing area: 167 sq. in. **23/1.**



THUNDERBIRD

CLASS "B" TEAM RACER

Designed by Sid McGoun. Capable of over 100 m.p.h. suitably powered. All balsa parts prefabricated. Another contest winner by Mercury. **29/8.**

MONARCH STUNT MODEL DE LUXE

Designed by Henry J. Nicholls. The Stunt model supreme for diesels of 2.5-3.5 c.c. with coupled flaps and elevators. A sure contest winner.

Wing area: 382 sq. in.

Span: 42"

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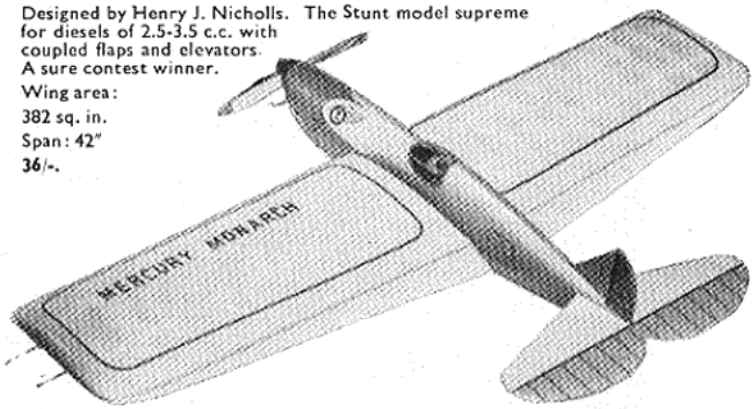

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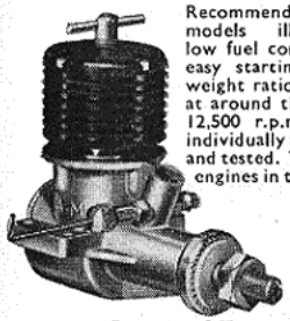

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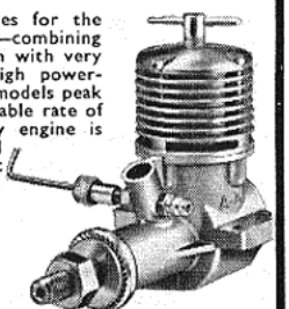

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THIS YEAR'S ATTRACTIONS

THE ORGANISERS are determined to make this year's Exhibition the greatest ever so far as attractions are concerned. Already a big programme has been worked out in detail, but with over three months to go, much more will be achieved and there are several surprises in store. The foregoing programme, therefore, is not a complete one.

★ ★ ★

Such well-tried and popular features as the water tank and the live steam track will, of course, be included. The Exhibition could not function without them or the tireless enthusiasm of the Societies and Clubs manning them. However, demonstrations will this year be considerably enlarged and centralised. In addition to individual demonstrations of sail making, boat building, period ship modelling, metal working, soldering, brazing, etc., commercial firms will show the making of model aircraft and also plastic assembly and finishing.

★ ★ ★

The R.A.F. is giving a display which shows two high speed flying models of jet fighters. These are real jets driven by compressed air, which take off from a circular runway and fly independently at variable speeds in a circle of 30 ft. in diameter. The flight of the models is synchronised with a tape recording of the take-off and landing procedure between the aircraft and the control tower as it is actually done at R.A.F. stations. The models are built accurately to scale with retractable undercarriages.

★ ★ ★

An outstanding attraction at this year's "M.E." Exhibition will be the model diesel car racing layout. The North London Society of Model Engineers are supplying the track, and the Model Rail Car Association will be organising the demonstrations. The latter are inviting member clubs from all parts of the country to bring their cars and to be represented on the layout at various times during the Exhibition. Models of most of the prototypes will be on view, running at speeds of approximately 30 m.p.h. on the track—giving a scale speed of over 300 m.p.h. It is expected that there will be a demonstration for 15 minutes in every hour. Most of the leading suppliers have promised their support, and scale banners, hoardings, directional signs and other equipment are being provided. Twelve pits with scale fascias add their quota to the air of realism that is being aimed at.

★ ★ ★

Other attractions will be provided by the National Clubs and by the Services and Nationalised Industries. Vickers Ltd. will be giving a large display showing the many activities of their model engineering societies and this promises to be one of the biggest attractions at the Exhibition.

JUNE 1957

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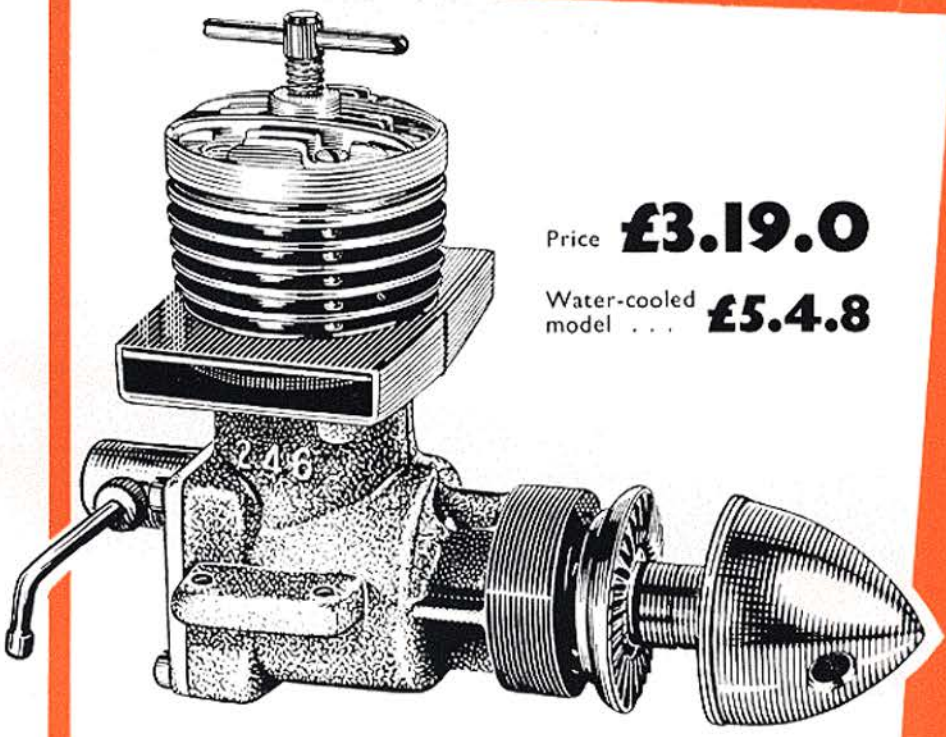

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