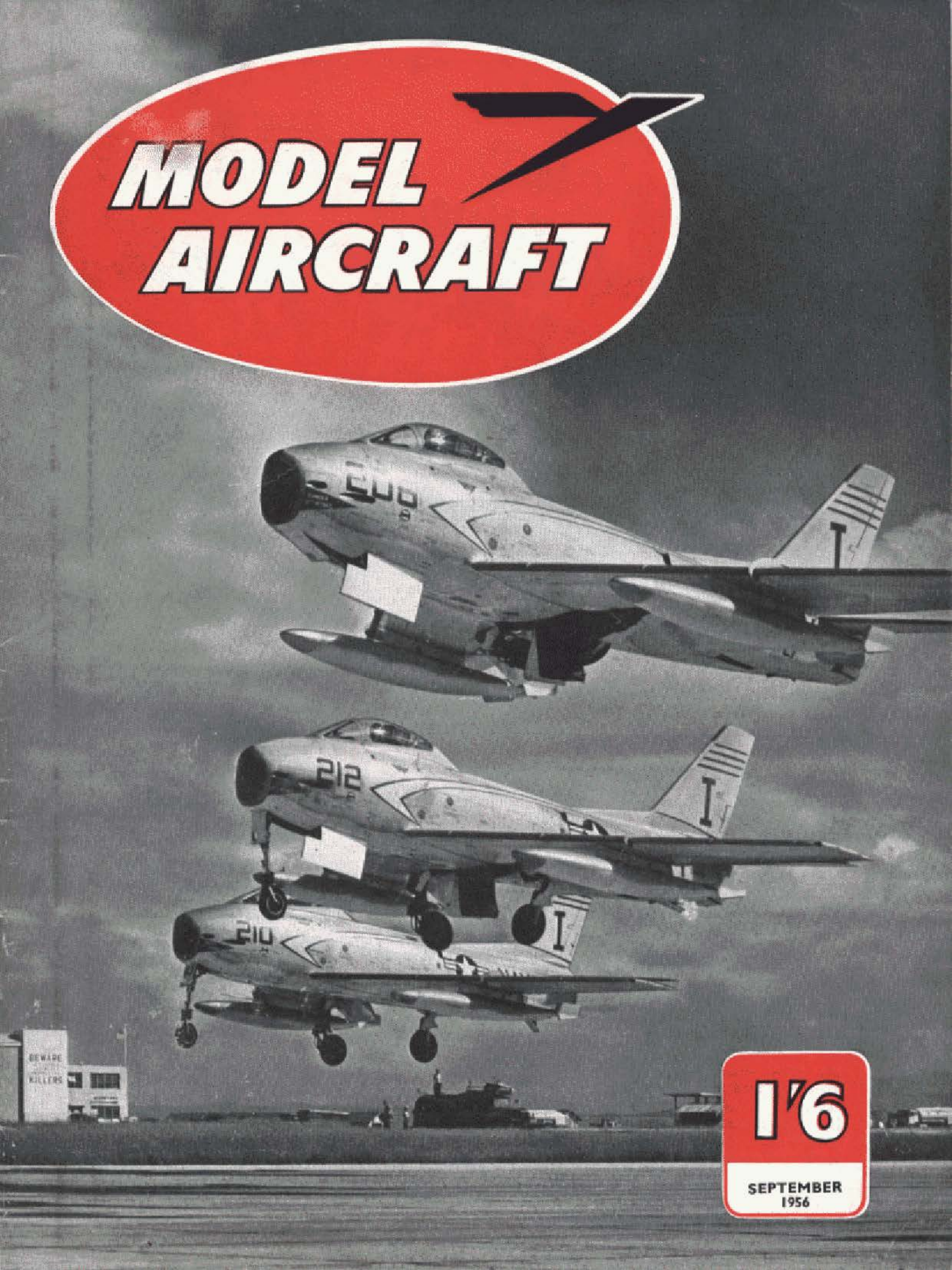
MODEL AIRCRAFT



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SEPTEMBER
1956

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Husky 36 in. span

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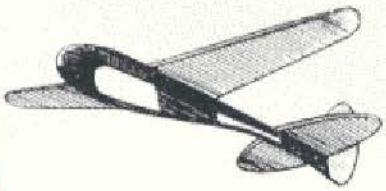

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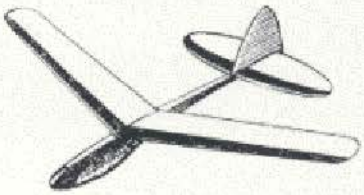

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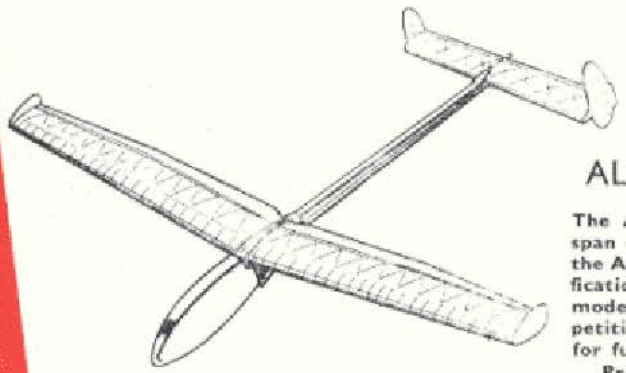

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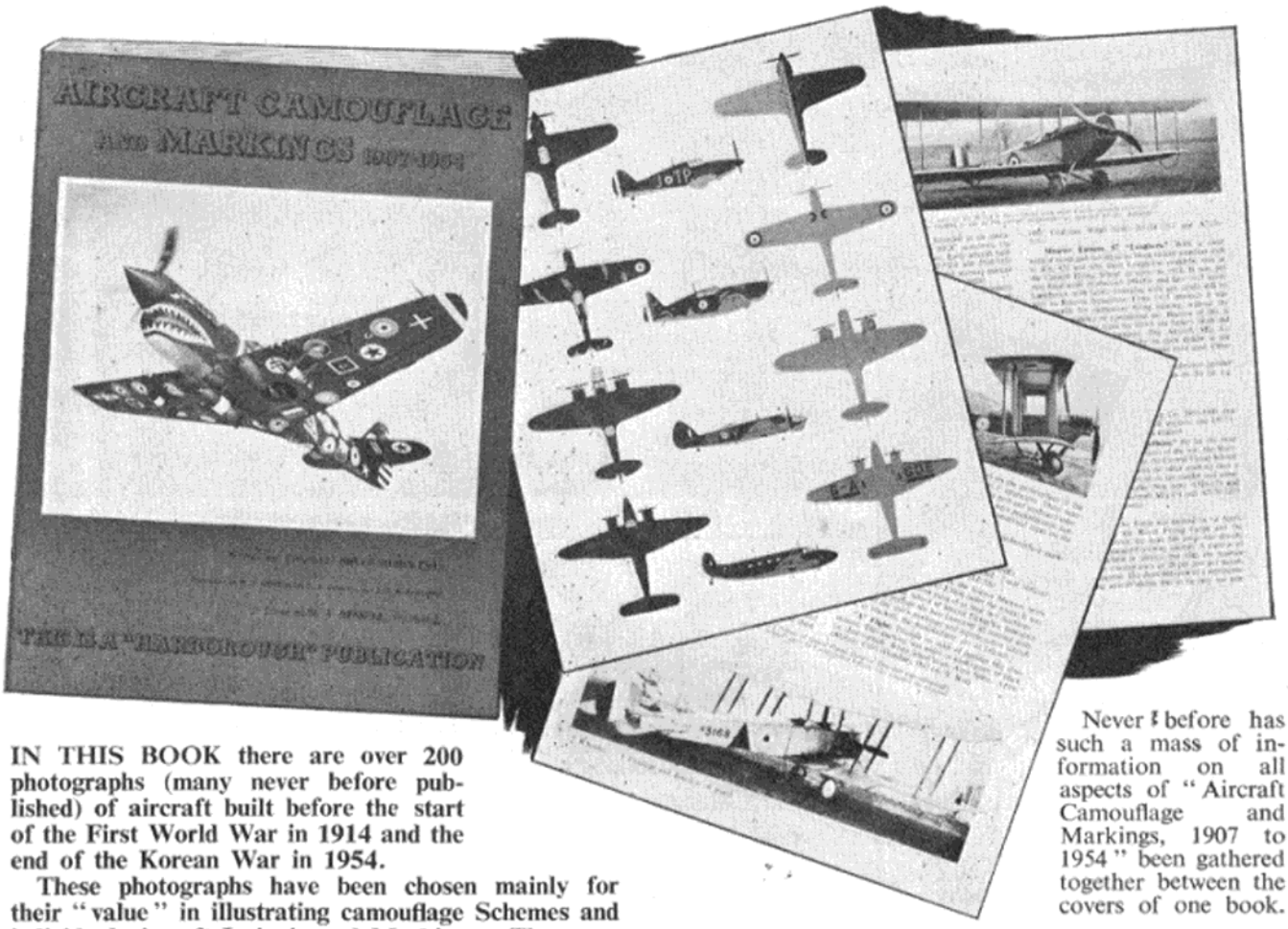

IN THIS BOOK there are over 200 photographs (many never before published) of aircraft built before the start of the First World War in 1914 and the end of the Korean War in 1954.

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A line-up of Bristol Britannia airliners outside the Filton Assembly Hall

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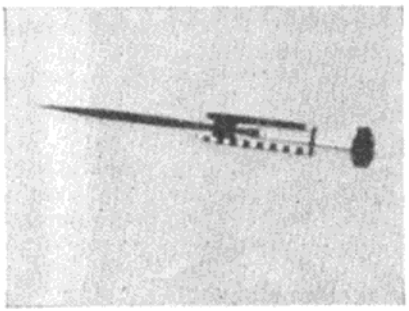
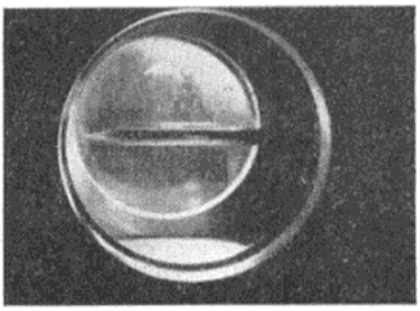


A Bristol ramjet test vehicle seen soon after launching



A model being tested in Bristol's supersonic wind tunnel

A Bristol Type 173 tandem-rotor experimental helicopter

BRISTOL AIRCRAFT LIMITED

MODEL AIRCRAFT

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SEPTEMBER 1956 No. 183. VOL. 15

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Cover Story

Guantanamo, in Cuba, is the location of this fine ground-to-air shot of North American FJ-3 "Furies" taking off on a training sortie. And if the "Furies" have a familiar look about them, but the name doesn't mean much, then compare them with a photograph of the "Sabre," from which the "*Fury*" *was developed as a* carrier-borne fighter. Guantanamo Air Base is leased to the U.S. by the Cuban Government, and at the time this photograph was taken the "Fury" squadron was engaged on mirror-aid landing practice and air-to-air gunnery shoots.

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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Letters TO THE EDITOR

In Defence of "Speed"

DEAR SIR,—I feel that your views, and those of your contemporary, as to the justification in holding further World Speed Championships, cannot go by without more comment.

To say, in fact, that speed model flying never has merited world championship status, is, to my mind, and I am sure to those of other "speed fans," in this and other countries, a grossly exaggerated and unfair statement. Surely, the noble efforts of such fliers as Peter Wright and Raymond Gibbs in international competition proves that there is still sufficient interest in this country at least to merit such championships. Even the gloomy factor of having to provide one's own finance fails to damp the enthusiasm and interest which is so obviously present.

On the contrary, much has happened in the last two and a half years, for there has definitely been a re-birth in speed *C/L flying, probably due to an* increase in the number of American engines available on the English market, while the number of speed models at meetings this year (e.g., Dartford) has considerably increased.

Admittedly, the introduction of the "works" entries and professionally tuned "special" engines has created an undesirable atmosphere in what is supposed to be a purely amateur sport, but surely the latter factor has affected team racing in a similar way. Therefore, if team racing were given world championship status the "undesirable atmosphere" would be even more appreciably felt with this class of model, especially with the performance of a group rather than an individual in what only could be described as a "vicious circle."

Therefore, don't let such relatively new sports as team-racing and R/C replace such a firmly established annual speed competition, especially now, when we hold two of the three F.A.I. World Speed Records!

Yours faithfully,
Sidcup, Kent. BRIAN BLACKWELL.

Progress Backwards

DEAR SIR,—I think your articles on the "Bulldog" and TU-104 were superb. I would like to see more such, but I suppose I mustn't be greedy. The amount of work in those articles is self-apparent, and we can't expect such

(*Continued on page* 332)

World Speed Championships

OUR Editorial statement in the July MODEL AIRCRAFT that the World Speed Championships should be dropped has brought protests from the British C/L speed fans—all ten of them !

A typical comment is that of D. Platt of Wanstead, Essex, who says:—" Regarding works entries and professionally-tuned engines destroying the amateur status of the event—I agree, but what can we do about it ? . . . Any power contest where time or speed is the deciding factor, is dependent on the power output of the engine and the hottest motor MUST win, *all things being equal*." (Our italics.) The weak point in this argument is that there is a great deal less chance of " all things being equal " in F/F power model flying than there is in C/L speed.

M. G. Smith and R. J. Edmonds of the High Wycombe club suggest that " team racing should become the premier C/L event, with stunt, speed and combat as supporting events." It seems rather odd to us to " defend " C/L speed by suggesting that it should be replaced by team racing. In any case, all classes of C/L flying, including speed, are already catered for on an international basis by the Criterium d'Europe meeting.

Another correspondent, Brian Blackwell of Sidcup, Kent, claims that " in the last two and a half years there has definitely been a re-birth in speed C/L flying." Well, we certainly knew it was dead, but its re-birth seems to have escaped our notice !

To sum up. It seems that none of our readers can put forward any sound reasons why this event should continue, but this is perhaps not surprising when it is borne in mind that there are possibly only ten *top-class* speed model fliers in this country and probably no more than 50 in the world.

In these circumstances—even if the unwanted commercial angle is ignored—what real justification can there be for continuing the World Speed Championships ?

STOP PRESS

Cranfield Results

1st. R. Draper, G.B.
2nd. D. Posner, G.B.
3rd. L. Conover, U.S.A.

Winning Team—Great Britain

Pre-War PAA Load

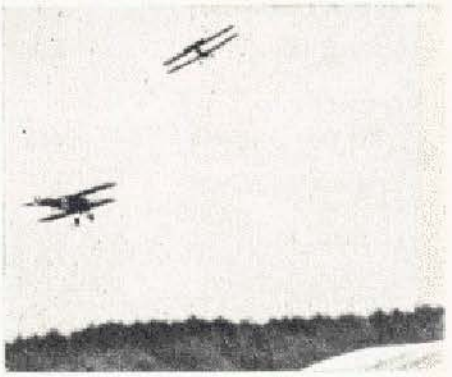
IT seems the PAA-Load contest is not as modern as most people suppose. Digging through some old records we found details of Maxwell Bassett of Philadelphia winning first place in the " First Payload Contest " at Hadley Airport, New Jersey, in October, 1936 (time and payload not specified). Maxwell Bassett, as the real old-time fliers may remember, was the man who produced the first power duration model in 1932—and then proceeded to win all the " open " duration contests in America against rubber models until they had to alter the rules and make power models a separate class. Then he went on and won most of the power contests for the next two or three years !

Finishing Money

ST. ALBANS M.A.C. will allow free entry to the Concours d'Elegance event at this year's All Britain Rally, provided entries are made in advance and accompanied by details of the model to be entered (for advance publicity). Entrants on the day will have to pay 2s. A further increase in prize money for scale models makes the Concours Contest one of the most valuable in the Rally.

The reason for these changes is that the organisers regard the Rally as Britain's aeromodelling " shop window " and hope to increase the quantity and quality of Concours entries by this means.

Things are seldom . . .



AUTUMN, 1916, and the Somme offensive nears its close. From high in the skies two aircraft have steadily lost height in the throes of a dog fight. An observer in another machine has raised his camera and caught the German aircraft manoeuvring into position for the *coup de grace*—at least that's what this picture might have shown. Actually it's just two scale controlliners having a peaceful dog fight at the N.H. Gala ! Realistic angle was obtained by our photographer laying flat on his back, and the " wing " in the corner is, in reality, the roof of one of the canvas hangars.

Man Powered Flight

WHEN Mr. B. S. Shenstone, M.A.Sc., F.R.Ae.S., read his paper on man-powered flight to the L.S.A.R.A. recently, he was

dealing with a subject that has been the dream of man throughout the ages.

Now, a group known as the East Anglian Man-powered Flying Club has been formed in Suffolk, its object being to collate all recent data on suitable transmissions. To assist the project, Mr. O. Kozak—who had considerable continental experience in such projects in the thirties—has given 3 acres of his estate in Brandon to be used as a flying field. In addition, the club has a 60 × 20 ft. hangar, a workshop and a laboratory.

If the club is successful, it is anticipated holding a national competition for the first successful man-powered aircraft airborne for a minimum of 5 min. at an altitude of not less than 10 ft. The prize would be £1,000 or more.

Anyone interested in the club should contact the Secretary, East Anglian Man-powered Flying Club, Brandon, Suffolk. Tel.: Brandon 279.

21st Anniversary

APPOINTMENT of Bob Copland as British Wakefield team manager reminds us that it is 21 years ago that Bob first started to make a name for himself as a model builder and flier of outstanding ability. Those 21 years also represent a period of continuous activity on the contest field, with the Wakefield remaining throughout his prime interest. It was in 1936 that Bob first won a place in the British Wakefield team—before some of the participants in this year's final were born. No modeller anywhere in the world has remained consistently at the top for so long, nor achieved so many individual successes in a specialised field.

Verbal Decision Final

THE Combat event at the Northern Heights Gala provided a classic example of what can happen when rules are inadequate or incorrectly phrased.

After most heats, and the final, animated discussion took place as to who was the winner. The rules unequivocably stated that the flier with the longest remaining streamer would win. The fact that this person had probably spent most of the heat on the ground and was an indifferent performer in the air, gave rise to all the trouble. If, as originally intended, the heats had been flown two in a circle the trouble would not have arisen. However,

Steward v. Smith in the verbal round of the combat. Here counsels for the plaintiffs present their learned arguments to the Judge (in trilby). Result—a win for Smith.

flying three at a time, the two who had a real "bash" cut their own throats as it were.

All of which adds up to the fact that it's time the S.M.A.E. produced a standard set of rules.

Schneider Floatplane at M.E. Exhibition

ONE of the major features of the "Model Engineer" Exhibition—being held this year at the New Horticultural Hall, Westminster, from August 22nd to September 1st—will be a R.T.P. model of the Supermarine S.6B, designed and built by members of the Epsom and District Model Flying Club.

It will be remembered that the Supermarine S.6B won the Schneider Trophy outright in 1931, and set up a world speed record of over 407 miles per hour. The model will take off from a 25 ft. square water tank and fly at an actual speed of 25 m.p.h.—equivalent scale speed of the record breaking flight.

The S.M.A.E. stand this year will be in the body of the Hall and an attractive interior has been designed by Malcolm Young. The society's press secretary, Mr. K. J. A. Brookes, is hoping to have on view some models which were flown at the recent International Meeting for Power Duration Models at Cranfield. In addition, on the central model counters at the Exhibition, will be a wide variety of aircraft which have been entered in the competitions.

Ten Years' Service

FOLLOWING our announcement in an earlier issue of the retirement of Mr. D. A. Gordon from his post of hon. gen. secretary to the S.M.A.E., at their last meeting, the council confirmed the appointment of Major S. D. Taylor to fill the vacancy thus created.

The council expressed their extreme gratitude to Mr. Gordon for the ten years of service which he has devoted to the society—a period during which many changes have occurred—and expressed the hope that he would continue his association with the society's activities. Readers will doubtless remember that last year Mr. Gordon was awarded the Paul Tissandier Diploma by the F.A.I. for his services to model aviation.

A suitably inscribed presentation clock was presented to Mr. Gordon at the World Power Championships, at Cranfield.

"Funny thing—I once made a model of the Bagsby Superjet—and the wing fell off that too!"

the de Havilland CHIPMUNK

"Chipmunk with 16 air so there's choice of Danish Air signia is sh

Scale expert FRANK BUCKLAND tells you how to build an authentic control line model of this famous training aircraft for 2·5 to 5·0 c.c. engines

A COMMON sight these days is the pert little *Chipmunk* as it cavorts about the skies in its role of R.A.F. basic trainer or light club aircraft. Its well balanced lines delight the eye, and a more attractive post-war aircraft would be hard to find. Its model counterpart is strong and is a pleasure to build and fly. Engines of 2.5-5 c.c. are suitable, with performance to match power.

Fuselage

The construction of this model follows usual practice, but to save wasting time the following sequence should be adhered to. Make all formers, mount bearers, add tank, bellcrank support and bellcrank. Cement longerons to *C* and *D*, allow to set and add remaining formers; tail wheel gear should be fixed to *I* before mounting on longerons. Make tail plane and fin and rudder, sand to shape and cement accurately in position after connecting up controls. Check for free movement. Sheet-in air outlet in firewall and add small hardwood pieces to bearers to take rear cowling screws.

Commence sheeting fuselage by cutting two full length side pieces, 1 in. deep and tapered at rear; when these are glued in position over the $\frac{1}{4}$ in. square longerons, the body will be quite firm and accurate. Complete planking of rear fuselage using strips of $\frac{1}{4}$ in. width as long as possible to reach along below cabin to firewall. Plank bottom of fuselage before fitting wings and also area in front of cabin. When cement is dry, cut slot in fuselage bottom to take *rear* dihedral brace. Wings can be faired neatly into fuselage with small pieces of soft balsa or plastic wood, and don't forget the fin fairing piece. Make nose block from a hardish piece of balsa. Cockpit floors can be cemented to tops of longerons.

Wings

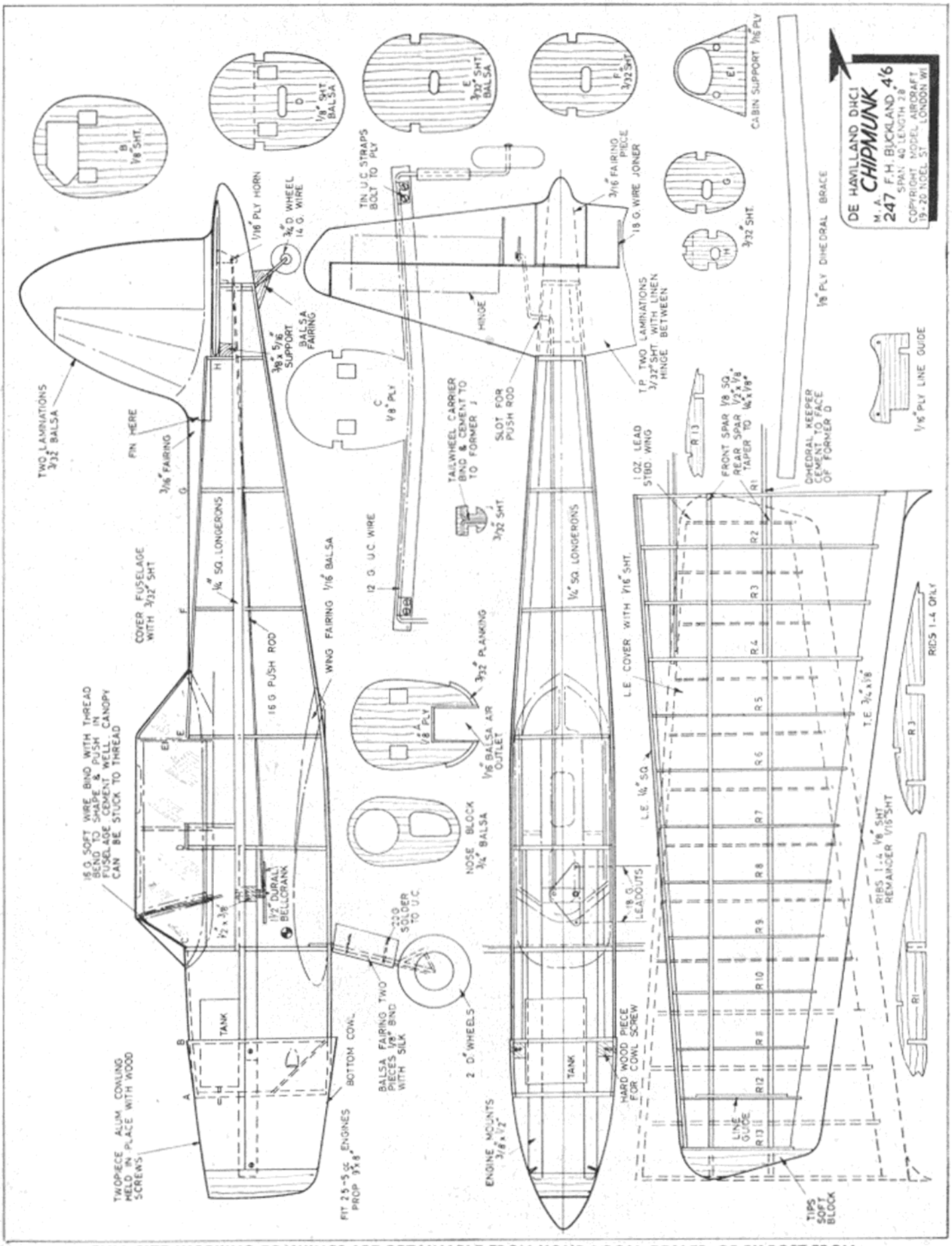
Build on plan in the usual way. One wing half should be built with the dihedral keeper integral. When dry, this component should be offered up to the fuselage after first cutting a slot immediately in front of former *D* to take the keeper. Cement securely at al priate places. Next add wing to the dihedral and carriage braces and allow thoroughly after checking fo acy of alignment.

Bend the undercarriage t and bolt to the braces as sho tin straps, then add leg Do not omit the small wire for the fairings, as these twisting and provide a firm Cover top of wing leading ed balsa back to the first spar soft block tips. Navigatio can be made from old toc handles. Make wing fairings line guide to port wing ar lead weight to starboard tip. wing and fuselage with tis

Mount engine, and ad block, then make the thin alu cowling. Note that the top overlaps the bottom half a line, and that only two scr used each side. Fix rea former and wire front sup described. Paint cabin floo and inside cockpit green. cabin from celluloid. A p hances the appearance of the

Finished model is silver d over for R.A.F. types exc roundels, identification (black) and training stripes (Also there is a matt bla dazzle panel on the cowling. ence to photographs will he Most civil types have polishe surfaces, and here metallise comes into its own. (See Au September, 1954, issues of AIRCRAFT.) This paper sho be applied to wood surfaces. must be silver doped to fabric covering of original. should also be silver doped.

Royal Air Force "Chipmunks" are silver overall with the usual yellow bands denoting trainer aircraft. Note the black anti-dazzle panel on the cowling.



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NORTHERN HEIGHTS GALA DAY

FINE and warm—of course it was, and out came the crowds in their hundreds to enjoy, what is to many provincials, their one annual pilgrimage to a centralised contest.

Sports fliers, both C/L and F/F, were going full blast all day, while those who went for the more serious business of contest flying were soon meeting "earthy" opposition from agricultural types downwind.

Apart from the usual acrimony at the C/L circle all went well and an enjoyable day was had by all.

CONTEST RESULTS

The Queen Elizabeth Cup—Wakefield Models

1.	B. Rowe ...	St. Albans ...	789 points
2.	R. Monks ...	Birmingham ...	783 ,,
3.	R. Chesterton ...	Northern Heights	742 ,,

Flight Cup—Open Glider

1.	W. G. Winder ...	D.H. Hatfield ...	8 min.
2.	P. B. Hauffe ...	Worthing ...	6 min. 56 sec.
3.	P. C. Carey ...	Mill Hill ...	6 min. 36 sec.

Fairey Cup—Open Rubber

1.	P. J. Crossley ...	Blackheath ...	8 min.
2.	R. Lennox	Birmingham ...	7 min. 30 sec.
3.	C. M. Christie ...	St. Albans ...	6 min. 56 sec.

De Havilland Trophy—Open Power

1.	V. Jays	Country Member	6 min. 11 sec.
2.	K. Glynn	Brixton	5 min. 50 sec.
3.	P. Buskell	Surbiton	5 min. 31 sec.

Thurston Helicopter Trophy

1.	C. M. Ingram	Southampton
2.	R. Parham	Worcester

R.A.F. Flying Review Cup—Radio Control

1.	D. J. Fisher ...	Country Member	21 feet
2.	G. Kemp	Country Member	72 ,,

Keil Combat Cup

1.	M. Smith	High Wycombe
2.	Warren	Enfield
3.	L. Steward	W. Essex

Concours D'Elegance

Section 1. Power Driven Models
M. Gaster ... ... Int. Power Duration

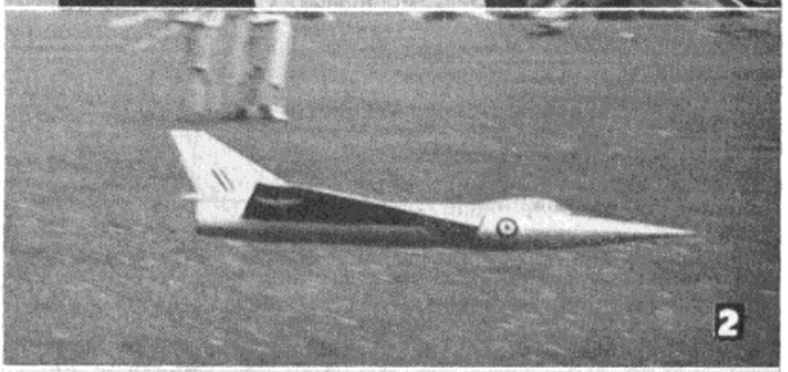
Section 2. General Flying Models
K. Tansley ... ... A/2 Glider

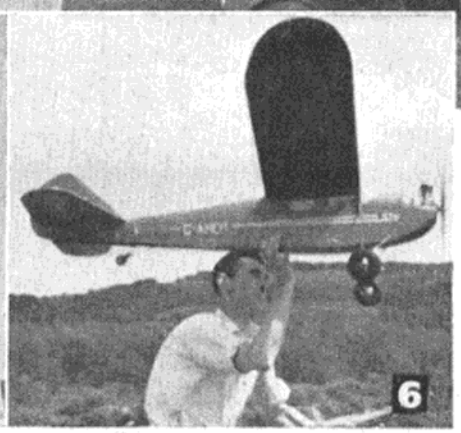
Section 3. Flying Scale Models
R. Chivrall ... ... Auster

Section 4. Unorthodox Models
V. Werton ... ... Autogyro

Gala Champion—A.M. Challenge Cup

R. Lennox ... ... Birmingham



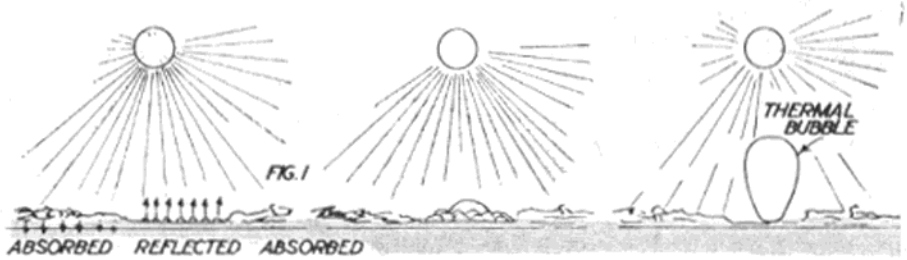


1. Better known for their T/R activities, N. Butcher, P. Cameron and R. Martin of Croydon, were this time flying combat.
2. Phil Smith, of Bournemouth, pleased the crowd with his scale FD.2 (full details in "Over the Counter").
3. Typical N.H. scene—a family party with a nicely made F/F Fokker EIII.
4. Bruce Rowe, of St. Albans, launching for his final flight, which brought him victory in the Queens Cup.
5. Lady Boyle presented the prizes again this year. Courtly bow comes from Concours winner Ken Tansley.
6. Among the entrants in the R/C was Ted Hemsley seen here launching his model.

Ron Warring gives the LOWDOWN on LIFT

ALMOST any time is thermal weather. Models will pick up "lift" on even the dullest and coldest of days—sometimes at night when the sun has gone down and frequently in the rain. Thus, although thermals are caused by heat, what really matter are localised areas of *difference* in heat—or coolness. As a general rule, however, the hotter the weather the stronger and more numerous the thermals.

On a hot day the sun's rays are distributed equally over the ground. Some areas will heat up much more rapidly than others—roads, runways, the roofs of buildings, for instance, will heat up more quickly than grass or trees or water. Thus above surfaces which tend to reflect heat rather than absorb it, the air gets hotter and tends to expand. It is possible to see this taking place in the shimmering of the air above a really hot surface, or feel the heat reflected from such a surface.



Little bubbles of heated air tend to form on the hot surface, held down by the surrounding cooler air, and eventually a sufficient number of these smaller bubbles join together to produce enough buoyancy for a larger bubble to rise as a whole. This thermal bubble, as it is called, will then break away and ascend, and will go on ascending until it has cooled off again to the same temperature as the surrounding air at that height.

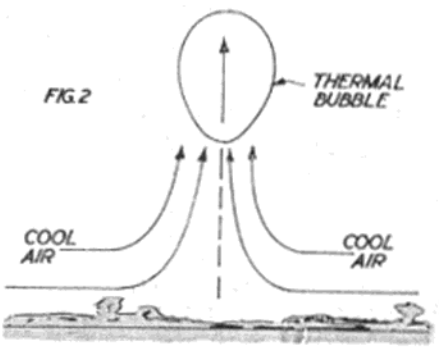
The stages in this process are illustrated in Fig. 1. This is the classic explanation of the formation of thermal bubbles or upcurrents from a "reflector" surface surrounded by heat-absorbing areas. During the time of the day when the sun's heat is about constant (and it is not obscured by varying clouds), thermals will be produced at definite points at regular intervals.

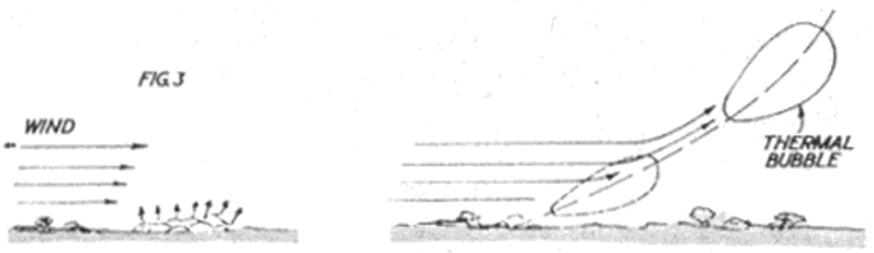
When a thermal bubble breaks away there is a secondary effect. Air from the surrounding regions is drawn in to take its place and is also drawn up following the bubble, thus giving a region of steady upcurrent rather than just a "bubble envelope" of lift—Fig. 2. How long this lasts depends on the size and strength of the original bubble. On hot, relatively calm days you can actually *feel* this effect—a sudden rush of air or "puff of wind" indicating that you are in the path of cooler air being drawn in to take the place of a thermal bubble which has just ascended nearby. In extreme cases the time interval between the release of individual thermal bubbles may be so short that there is virtually a continuous updraught over a particular region. In other cases the updraught may be very limited in effect and the height to which it reaches before dying out.

If there is a strong wind blowing the thermal bubbles will tend to be torn away rather earlier—Fig. 3. The resulting upcurrent, however, is not necessarily weaker, for the already moving air sweeps upwards after it to "fill the gap," as it were (or you can consider the air drawn upwards after the thermal bubble) and so the resulting upcurrent may, in fact, be just as strong. On the other hand, wind always produces a turbulent state of affairs, the air blowing over the ground being slowed down by friction and in turn slowing down succeeding layers of air so that they tend to roll up around each other rather than flowing smoothly—Fig. 4.

Below about 100 ft. the air flow is far from steady. Over the next 100 ft. or so it is beginning to smooth out, and above 300 ft. is relatively steady except for any vertical motions produced by thermal activity. This is assuming that the air is blowing over relatively flat ground. Obstructions will create even more violent turbulence which will have a greater effect in depth. In the case of wind blowing over a ridge or a hill, a considerable region of turbulence may be created downwind with a relatively steadier stream deflected upwards to some considerable height—Fig. 5.

Full size gliders make use of this form of upcurrent in slope soaring although it is of little use to models. Models lack the speed of penetration to keep in the upcurrent region and so are carried downwind—into the turbulent area generally or, if they have gained sufficient height, into the wake of the upcurrent, which should then ensure a long flight even without further lift of any sort. If you do have to fly off a hill in fairly windy weather, therefore, it is best practice to launch from *in front* of the top of the slope so that the model stands, a better chance of





climbing over the downwind turbulent region. Fig. 5.

Although models can pick up thermals right from ground level—in some cases very strong thermals have even picked up parts of models from the ground and carried them aloft!—the best chance of finding thermals seems to be at a height of 200 ft. or more. The reason is not entirely clear but is probably that as the thermal rises it expands, and so covers a greater area. Hence there is more chance of the model flying into the thermal.

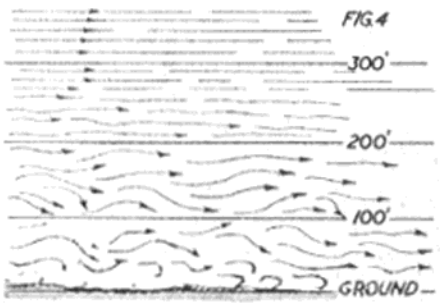
The helpful size of a thermal is quite small, although again it varies considerably with the conditions. Some thermals seem to broaden out more than others so that two or three models will go circling up together in the same area of lift. Quite commonly, however, one model will find a thermal and be drawn steadily up, whilst others flying quite nearby will completely miss the upcurrent. Thus there is a lot of luck about finding a thermal. We can only guess at likely positions and try to fly the model over them, or try to estimate by secondary effects when or when not to fly.

Inside the thermal or upcurrent there is a definite circulation of air. It has often been stated that models trimmed for straight flight will go right through thermals. Unless they have strong directional stability, however, a model flying straight into a thermal will naturally tend to circle with the direction of rotation of the thermal, and thus tend to stay in it.

It is quite common to find a model suffer a violent change of trim on flying into a really powerful thermal but still stay in that thermal and continue to go up, even if virtually spinning or stalling.

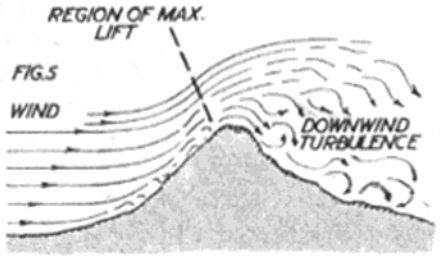
Whilst modellers have accepted the existence of thermals as commonplace most have, until comparatively recently, been reluctant to accept the implications of the ensuing down-flowing current of air which must follow a thermal. Yet this is a very significant factor in contest flying, for although the downdraught velocities are not as high as the upcurrents in regions of lift, the area affected by them is very much greater. On a question of pure chance, therefore, it is easier to fly into a region of downdraught than into a region of lift.

Convection lift, which is another form of heat lift typified by the shimmering appearance of air above a reflector surface, can give a steady



area of rising air from off a heated surface. On the other hand, a mass of air heated up as a whole by convection will also rise, giving a region of moderate but quite extensive lift. Such regions of lift are commonly found in early evening at the close of a warm day when the wind has died. A whole belt of rising air with an upward velocity of 1 ft.-3 ft. per second may be present over a particular area for some time, giving an entirely false idea of how good a particular model is when flying in it! Such lifting area will, of course, also be accompanied by downdraughts in accompanying regions.

How to judge just when to fly in an important contest is part guesswork, part experience—and part luck. As a general rule, on sunny days the air is more unstable before noon, since the different "reflector" and



"heat absorbing" surfaces of the ground have still to stabilise in temperature. An early flight frequently catches a good thermal. Yet strangely enough the majority of fliers always hold back during this period, waiting to see somebody else first chance their luck.

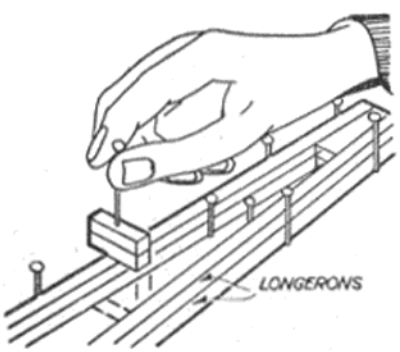
Some couple of hours after noon the "temperature differences" over the ground surfaces are probably the nearest to stability and so one would expect the minimum of thermal activity. Usually this is so. There will still be thermals about, but they are likely to occur at more widely spaced intervals. Quite often, in fact, one finds a more or less dead spot during the middle of the afternoon when thermal flights are few and far between. Those thermals which do occur, however, can be very powerful ones.

Clouds considerably modify the thermal conditions. Puffy cumulus clouds are a sign of considerable thermal activity, the cloud topping a large thermal, provided it is not *diminishing* in size. Approaching cumulii nearly always herald upcurrents, if you can time the launch right! On the other hand, a sudden chilling of the air nearly always implies that cool air is spilling into the region and if you launch your model then you will probably find it struggling in a downdraught throughout its flight.

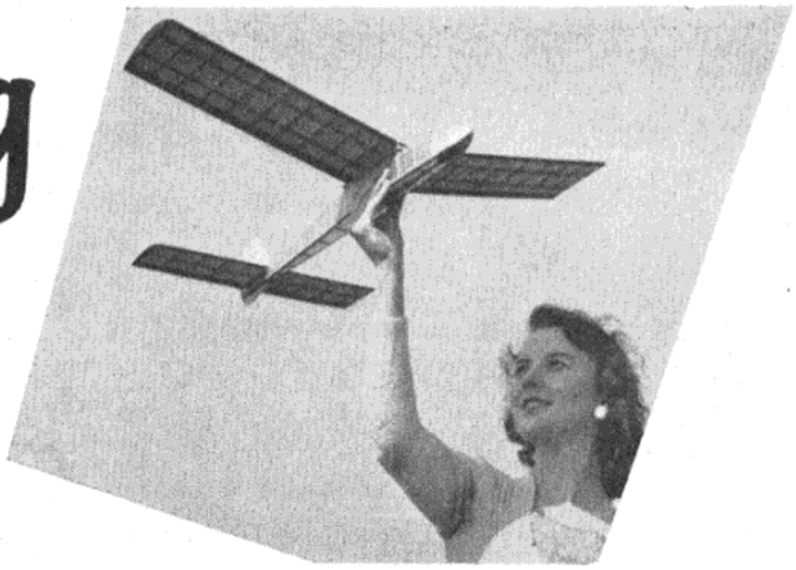
REACHING AN AWKWARD SPOT

Placing the end spacers in a small fuselage is often tricky. There is not enough room to get your fingers in between the longerons, and tweezers—if you have them—are a bit awkward to manipulate anyway.

Try cutting the spacers to exact size, laying one on top of the other and piercing with a long pin. Coat the ends with cement, grasp the pin and lower the two spacers in position. It's as simple as that!



Trimming and Flying



IF we were asked: "Which is the most important stage, building a model or flying it?" we would be tempted to reply: "Neither!" because in between completing a model and flying it, there is a certain amount of checking and adjusting to be done which is without doubt the most crucial stage of all.

Trimming, as we call this procedure, does not take very long and with a model glider is quite a simple business if tackled correctly. Properly carried out, it can result in a highly satisfactory performance—even from a model which is by no means an exhibition piece as regards constructional neatness. On the other hand, the most beautifully made model can be quickly reduced to a wreck if vital adjustments are ignored.

The NEW M.A. BEGINNERS' COURSE PART VII

Let us assume that we have before us the completed *Tutor* glider components: fuselage, wing and tail unit. The first thing to do is to give each of these a final check. We have already mentioned the importance of avoiding warped flying surfaces during the covering and doping stage. Check the wing and tailplane again to make sure that neither of these has since developed a warp.

To do this, hold the unit in both hands at arm's length with the trailing edge towards you (Fig. 1). By lowering the leading edge slightly, you can now sight across the chord (lower surface) and note whether the trailing edge is precisely parallel with the leading edge, as it should be. An alternative method, of course, is to lay the component on a perfectly flat and true surface—if such is available.

There are two main types of warp. The first, a longitudinal twist, means that one part of the wing will be inclined at a different angle to the airstream from another. The second is a longitudinal curvature and generally means that the wing or tail is bowed upwards slightly.

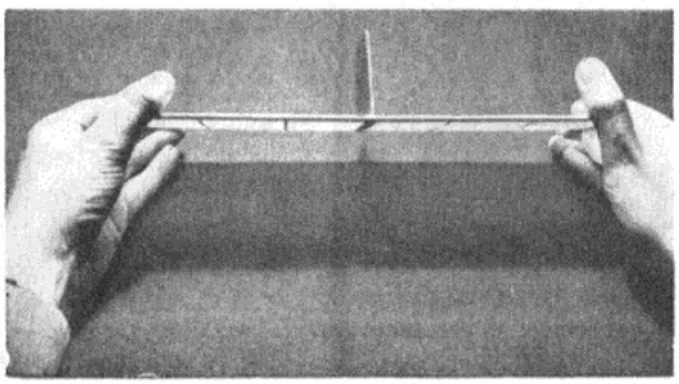
The most likely warp to be encountered in a wing is the twist in which the tips are at a different angle from the centre section. In a few cases, a slight warp of this type *can* be tolerated. If, for example, the trailing edge at *both* tips is turned upwards slightly (*not more than* $\frac{1}{8}$ *in. in the case of the "Tutor" glider*) and to an equal extent in both tips, this may be ignored.

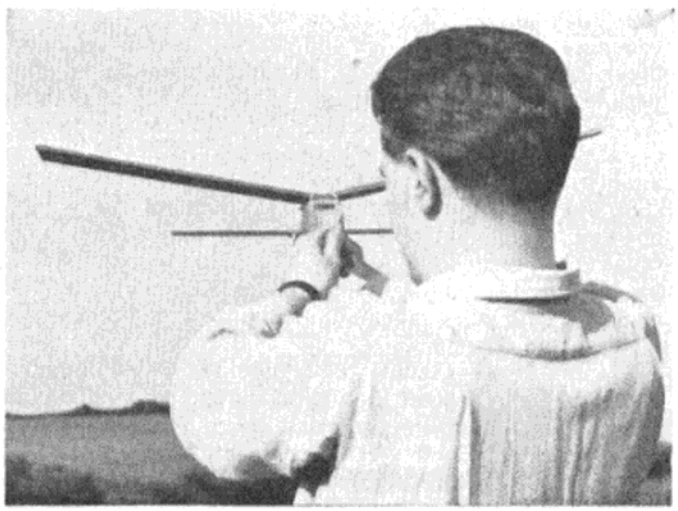
Any other twist must be corrected.

A slight upward curvature from tip to tip (not uncommon with certain types of tailplane structures) may

Fig. 1 (below). Checking the tailplane for warps by lining up the leading and trailing edges.

Fig. 2 (right). Checking the alignment of the flying surfaces on the fuselage.





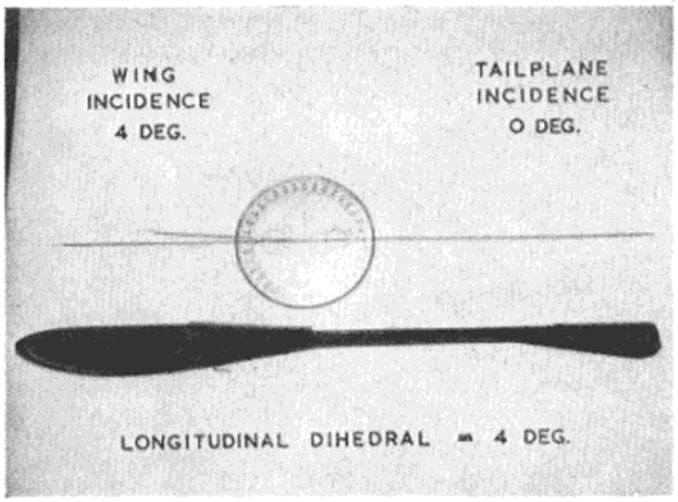


Fig. 3. The meaning of longitudinal dihedral. (Mercury "Gnome" glider fuselage.)

also be ignored—*provided that the surface is not also twisted longitudinally.*

While it is best to avoid warping at the outset by careful attention to covering and doping and leaving the unit pinned down as long as possible, a twist can be taken out as follows.

Hold the unit comfortably in front of you with both hands across the chord and positioned at each end of the section to be straightened. Exert sufficient twisting action to bring the surface back in alignment, plus a fraction in the opposite direction. Now hold it thus in front of an electric radiator, or some such similar source of heat, for about 20 to 30 sec. so that the whole section becomes slightly warmed. You will probably feel a slight tendency for the surface of "relax" at this point. The surface should then be transferred (while still holding it set) to a cool part of the room for a minute or two. On release, it will be found that the offending warp has been removed. You will soon find it quite a simple matter to reset surfaces true by this method.

The next thing to do is to check the alignment of the wing and tail on the fuselage. First make sure that they are level on the fuselage—i.e. that one side is not lower than the other and that the wing and tail are in line with one another. The quickest way to check this is to hold the model at arm's length in front of you as in Fig. 2.

Now hold the model vertically in front of you to check that the wing and tailplane are not "skewed"—i.e. that they are at right angles to the centre-line of the fuselage in plan view. If you do not have a very good "eye" for this sort of thing, a simple check can be made with a pin attached to a length of thread. First push the pin into the tail of the fuselage and measure the distance to a convenient point on the wing tip. Check this against the corresponding point on the other wing tip. (On the *Tutor* fairly accurate alignment of the wing is ensured by the fact that the V centre-section in cradled between the top longerons.) The same method is used for aligning the tailplane. In this case, of course, the pin is pushed into any convenient centre point on the fuselage, towards the rose.

To enable alignment to be quickly re-established at any time, it is a good idea to mark the respective components with suitable centering lines. Alternatively, in the case of tailplanes with fixed vertical fin surfaces, a better method is to "key" the tail unit on to the fuselage so that it cannot move and upset directional trim.

The simplest way of doing this is to cement four small pieces of $\frac{1}{16}$ in. sq. balsa on the underside of the tailplane so that they butt against the sides of the tail platform, front and back, on both sides.

Both wing and tail surfaces are usually held in place on the fuselage with rubber bands. These form an effectively firm, yet shock-absorbent, method of attachment. Make sure that you have sufficient rubber to prevent the surface from lifting during flight, and remember that strong bands, lightly stressed, are better than thin bands stretched to their limit.

The essence of successful flight is stability. In Part III we discussed the general principles of aeroplane flight and how stability is obtained in various directions, namely longitudinal stability, lateral stability and directional stability. The latter two, we discovered, were effected by the *dihedral angle* of the wings and the rearward *vertical fin area* respectively. Both these features are readily apparent in our elementary glider model. Longitudinal stability, we found, was obtained by rigging the wing at a larger angle of attack than the tailplane.

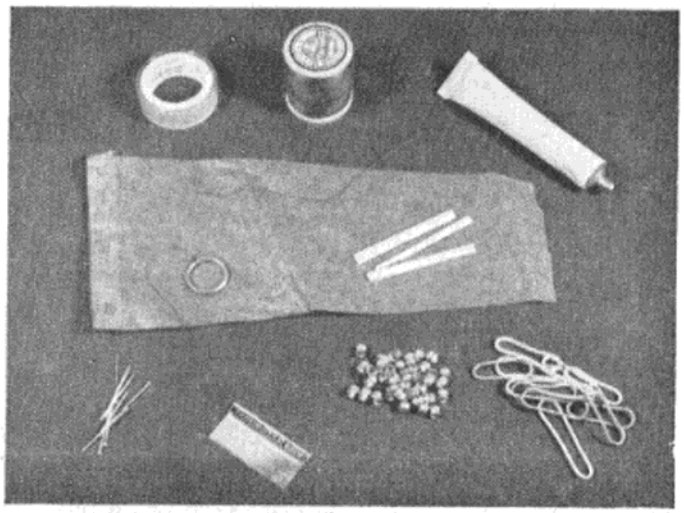
Referring to Fig. 3, we see how this can be checked. The model used in this illustration is a Mercury *Gnome* glider. The fuselage was laid on a sheet of paper and lines were drawn parallel to the tailplane and wing platforms. Using a protractor as shown, the wing angle of incidence was found to be 4 deg., while the tailplane was at zero degrees.

Sometimes a model may have only 3 deg., 2 deg. or even slightly less, difference between the wing and tail angles of incidence—the angular difference being known, as the *longitudinal dihedral angle*. The essential point to remember, however, is that a longitudinal dihedral angle must be preserved and that it is unwise, therefore, to make changes to the wing and/or tail incidence that will seriously reduce the longitudinal dihedral, when trimming the model.

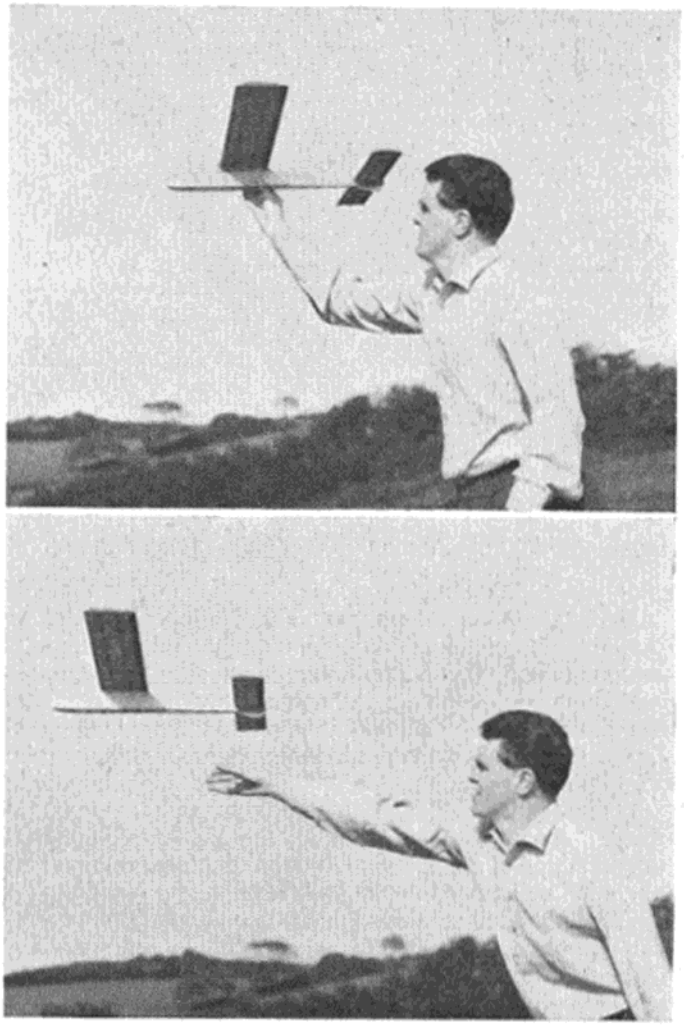
To avoid this possibility, the model is provided with a nose ballast box. By this means, longitudinal trim may be altered merely by adding or taking away weight, to adjust the centre of gravity position.

The plans of the *Tutor* show the balance point (c.g.) at about 38 per cent. chord—i.e. a little under 2 in.

Fig. 4. A simple field kit: cellulose tape, button-thread for tow-line, cement, coloured tissue pennant, towing ring, thin strips of balsa for incidence packing, pins, razor blade, lead ballast and rubber bands.



Figs. 5 & 6. An expert test-glide hand-launch. Note how the model is smoothly projected into its natural flying attitude.



back from the leading edge of the wing. On the test model it was found that, in fact, the model flew satisfactorily with the centre of gravity about half an inch farther back, with a consequent saving in ballast weight. It is suggested, therefore, that ballast is added to the weight box until the model balances at about 50 per cent. chord. If subsequent test flights indicate that this is not sufficient ballast for your particular model, it is a simple matter to add some more.

We are now ready to gather together the various small items of " field kit " needed for our test flights (Fig. 4). The first requirement, of course, is the ballast weight we have already mentioned. Lead shot is very suitable. Alternatively, you can use air-gun pellets as shown, about 3-4 dozen 0.177 calibre being required, or you can chop up any old bits of scrap lead or solder that you might have handy. To seal the ballast box hole and prevent inadvertent changes of trim due to accidental loss of shot, some cellulose tape is useful—or a simple plug can be devised.

For a towline, some strong button-thread is all that is required. Tie a curtain ring or hoop of wire on the end and cement a pennant of coloured tissue—about 6 in. × 4 in.—to the thread a few inches down. The pennant has a number of uses : it enables one to determine the exact moment when the model is released (of particular importance for precise flight timing); it assists in disengaging the line from the towhook and it is helpful in locating the towline should this be dropped in the grass.

Further useful additions to the field kit are a tube of cement, some strips of 1/32 in. balsa, some spare rubber bands, pins and a razor blade.

Needless to say, a calm day is essential for test flying. Fresh or strong winds are not only dangerous for the model, they also make it extremely difficult to judge the effect of different adjustments. Often it will be found that the evening, or early morning, is the best time. Don't fly the model near trees, thick hedges or buildings. Long grass or soft turf are the best spots from which to conduct initial tests.

Assemble the model, check alignment and make sure that the rudder tab is central. Hold the model slightly behind the balance point and with the nose into the wind. (The word " wind " is not to be taken too literally, of course; as we have said, calm conditions are the rule for testing.) Point the model downwards very slightly. Do *not* point the nose skywards.

There is a knack in getting a smooth launch. One does not need to run with a model of this size, but it should not be merely tossed into the air. Launch as smoothly as you can, letting go of the fuselage as your arm is extended to its fullest extent and with a follow-through action. Figs. 5 and 6 show this action precisely.

The model should glide down gently on an even keel. If it should veer left or right, look again for warps and check fin alignment. If necessary, use the rudder tab to counteract excessive turn (Fig. 7).

It is difficult to say how far the model should glide when correctly adjusted since this depends on the strength of any wind present. An almost imperceptible air movement will shorten the distance, but, in conditions of dead still air, a good model should touch down ten or a dozen yards away when it is launched from a height of between five and six feet.

Fig. 7. Any tendency for the model to veer left or right can be corrected by slight adjustments to the rudder tab.

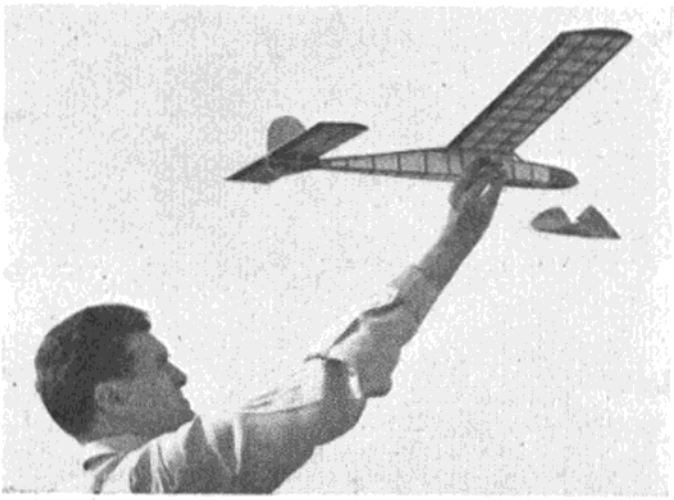


Fig. 8. The position for towline launching: wings level and nose slightly raised.

If you can launch from atop a slight slope, so much the better. This will give a longer flight that will give you a better opportunity to check the effect of adjustments.

If the model stalls, i.e. raises its nose, slows up and then dives, this may be due to your having launched it too fast, or to the wind being too strong, or to a little of each. Therefore, check this again before making any adjustment.

If the model continues to stall, you can do one of two things: add ballast or pack up the leading edge of the tailplane. On the *Tutor*, it is inadvisable to increase the angle of incidence of the tailplane as the longitudinal dihedral is small and adding further ballast is, therefore, the preferred method. If, however, the model tends to dive, the trailing edge of the tailplane should be packed up with thin strips of balsa until the model just begins to stall.

Fig. 9 (below). Ready for the start of a towline launch. Note how the operator is indicating to his helper that he is ready to proceed.

Two courses are now open to you. Either you may remove a little packing (or add a little ballast) sufficient to iron out the slight stall, or you may adopt the contest-flier's method of setting the rudder tab over to give a slight turn. This latter is the more popular for towline launched flights. The turn will automatically dispose of the slight stall and the model will be flying very close to its minimum sinking speed.

Basic towline technique needs a little practice but is really quite simple if you observe the rules. For this you will require the services of a helper.

Use only 25-30 ft. of line to start with. Slip the towing ring over the rear hook. The model should be held straight into the wind as for a hand launch, but with the nose inclined upwards slightly (Fig. 8). Your helper should now hold the model in this position while you take up the other end of the towline.

On a given signal, your helper should be prepared to release the model as you trot away, towing the model behind you. Keep an eye on the model while you are towing. It should climb fairly briskly at first, but if it fails to climb and merely slips off the hook, you are not towing fast enough. Try again.

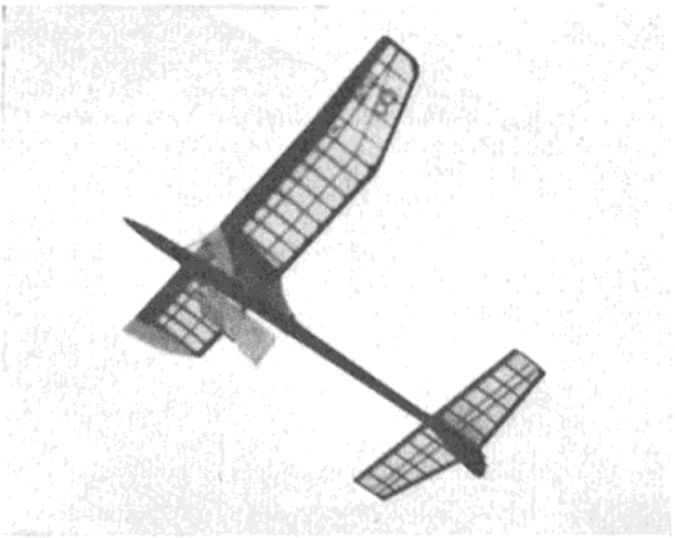


Fig. 10. Going up. A typical climbing attitude a few seconds after release.

Slow up your tow when you feel the model pulling strongly. If the model turns off one way, run in that direction so as to line up the model with the direction of the tow.

Eventually you will reach a point where the model cannot be persuaded to go any higher. This point is dependent on the design of the model, the position of the towhook relative to the c.g. and on your skill. At this point you should stop towing and let the line go slack. It will slide off the hook and the model will begin its glide.

We have purposely avoided mention of the finer points of towline technique. These really go with more advanced models and need not concern us in our present ground work.

You will observe that most model gliders are fitted with two or more tow-hooks, or an adjustable hook. The rearward positions are for calm weather towing, while the forward hook can be used under more windy conditions. When you have gained some practice, the towline length may be gradually increased to 100-150 ft.

Topical Twists

by PYLONIUS

A Speedy End

The model journals have been unkind enough to hint that the speed boys are having it too cushy. They have wildly suggested that the holidays with pay scheme should be terminated forthwith. This seems most unjust. Anyone who flies (sic) a speed model deserves some compensation apart from the usual tin pot and the few meagre pounds which barely covers the cost of engine tuning. There are, after all, only four or so pylon prancers left in the business, and without some sort of inducement such as a free holiday abroad they might not feel inclined to suffer the yoke any longer. And think what a castastrophe that would be to this column.

A Matter of Degree

Contrary to popular belief model flyers are a pretty brainy bunch—well, a brainy bunch, anyway. There are exceptions, of course, but I've always been a good lad to my mother.

I'm reminded of this egghead business by a report that yet another modeller is about to have a Sunday off to take his B.Sc. Come to think of it, though, I can't remember having met a modeller who wasn't about to take his B.Sc. It seems to be a sort of occupational disease, coming on in the late teens and persisting well into middle age. Possibly when the B.Sc. taker begins to get a bit doddery—dragging along his grandson for model retrieving, for instance—I suppose the worried parents take a firm stand and hide the modelling equipment.

A few B.Sc. takers, possibly with an ostrich size in eggheads, do manage to squeeze in the exams. and an odd thesis or two between Wakefields, but when they do their studying is quite another matter. The typical B.Sc holder is to be met at every model event from Land's End to John o' Groats, not to mention a few continental forays. Each time out he has half a dozen new models to his credit—all up to exhibition standard and trimmed to a hair. You're wondering how he manages to squeeze 48 hours into a day, when, lo and behold, you learn that he's just got his degree and is something or other in aircraft. While you're staring at him boggle eyed, he picks up the shattered pieces of his power job and trots off to design a new jet airliner.

Not many years ago anyone trailing a glorious B.Sc. behind his name wouldn't dream of venturing out of doors without a top hat and spats. If, during his evening constitutional through the local park, a vagrant A Frame Pusher was to come within ten feet of his august person he'd be whipping off a stiff letter to *The Times* that very night. Now it is rarely anyone but a B.Sc. or a potential one who ever flies a model plane. A fact which must be quite distressing to the few non-model flying B.Sc.s, striving to live up to the dignity of their high academic status. "Oh, yes. I know a chap whose got a degree. Flies model aeroplanes. Saw him only last week, as a matter of fact, being chased out of a field by a farmer. I think he's a B.Sc.—though that wasn't quite what the farmer was calling him."

Flying Kit

These model flying types just won't leave the poor old kit biz people in peace. Apart from this column, which leads them a dog's life generally, there is a steady succession of busybody characters demanding all sorts of extravagant things from the trade—even kits of models that actually fly!

The latest gent to rear up in righteous anger seems to think that its high time the trade gave up parlour games and turned its attention to model flying. He's already made umpteen frustrating attempts at the bulkhead puzzle. He frankly admits that cutting twenty 1/32 square notches in a bulkhead 1 in. in diameter of substitute teak is beyond his fumble fingered powers. He's also prepared to haul up the white flag to the fascinating problem of covering a wing consisting of two $\frac{1}{16}$ cheesy spars and two 5 in. spaced ribs. All these games might make a welcome change from television and no doubt they keep the kiddywinkies happy on long winter nights, but all he asks is a five bob kit that not only can be built by anyone less than a watchmaking version of Ted Evans but will also stagger across a flying field.

The trade came back at him right away. They wanted to know where he got the ridiculous notion that the kit biz had anything to do with model flying. After all, the kits they produced were selling like hot cakes, even if the flying prowess of hot cakes wasn't all that it could be. Anyone who really wanted a flying model aircraft could copy a plan out of a model book, buy a few sticks of balsa and he's half way (and, in some instances, all the way) to becoming an expert. And let him think himself lucky. Most people in the kit trade, with the possible exception of the designers, were model flyers themselves once. For the sake of old times they aren't going to allow our clear, unsullied airfields to be invaded by a swarm of rampant kit chuckers. Why, if only half the people who built kits were to charge over to the local airfields on Sunday morning you wouldn't be able to move for wreckage.

A Poor Look-Out

Frankly the model spectator is getting more than a bit fed up. All the same old sideshows going through the same old creaking routines with nothing new or exciting in sight. The radio circus puts on the same moth eaten figure-eight act, stunt models look much the same inverted as up the right way, whatever that might be, team racing remains a dark, confusing mystery, and speed models can't be seen anyway. In fact, the situation has become so desperate that, at a recent meeting, a few baffled bogglers were seen to be lurking in the F/F areas. Some abandoned characters even strayed into the remote wilderness of the rubber event, where their presence was viewed with the darkest suspicion. They were taken to be snooping airfield officials on the look out for some booting-off pretext. The rubber modellers, not being used to strangers, felt quite embarrassed. One veteran recalled that he hadn't seen a spectator since the days when they would come by the coachload on the offchance that someone would get a diesel engine started.

The model that this brave old veteran was flying wasn't perhaps of that early spectator vintage, but I'd swear having seen the same trousers and shirt in the pre-diesel era. This raises a vital question. If the novelty glutted public is going to watch some model flying for a change, our F/F scarecrows will have to spruce up a bit. I'm not saying they should go in for shaving, or anything cissyish like that, but the removal of some of that oil-soaked motor cycling kit would improve the appearance of the airfield no end. With the exception of a few devil-may-care types who casually discard their crash helmets when the temperature hits eighty, full riding kit is the established order of things even in a pulverising heat wave. The fact that modellers are becoming more car-conscious may improve things, though the sort of decrepit wreck that is all the vogue is no easier on the eye than the animated bundle of gas surplus clothing.

P. L. GRAY describes an interesting German fighter

The SIEMENS D.IV

(*Photos by courtesy Imperial War Museum*)

THE Siemens-Schuckert D4 was built during the late summer of 1918, the firm being a subsidiary of the giant Siemens electrical combine. Construction was fairly orthodox; the wings had wooden spars and ribs, were wire braced both internally and externally, and were fabric covered. The scalloped trailing edge was a result of using a wire instead of a wooden member; the leading edge was sheeted back to the main spar. The ailerons were operated through torque tubes, those in the upper wing being actuated by push rods.

The fuselage was built up on a square framework over which were fixed formers of perfectly circular section to which stringers were attached, the final covering being butt joined plywood panels which made a semi-monocoque structure. A novel feature was the fuselage handgrips, near the cockpit and tailplane, which were simply a portion of stringer exposed by cutting away the ply covering.

The upper section of the fuselage forward of the cockpit was panelled with aluminium, likewise the belly between the undercarriage legs, which had two rows of louvres in it. Fin and tailplane were plywood covered, while the rudder and elevator were a light welded steel structure, covered with fabric; the interplane "V" struts were of wood. The undercarriage struts and spreader bar were of round steel tube faired over with aluminium sheet shaped to a streamline section. The axle was sprung with elastic cord, likewise the tailskid which was made of ash.

Power unit was a direct rotary Siemens-Halske of 160 h.p. (modellers, note 11 cylinders) which had a front mounting frame in addition to the usual rear mounting structure. It was housed in a circular aluminium cowl, a large portion of the front lower half of which was cut away. The four-bladed airscrew was made up of eight alternate laminations of ash and walnut and then polished; the pitch was quite coarse. Armament was the usual twin Spandau machine guns synchronised to fire through the airscrew.

As a point of interest I have drawn the fin, rudder and under-fin of the prototype; other visible ways in which this aircraft differed from the production model were: provision of a tapered headrest; both wings were of the same narrow chord, i.e. 3 ft. 3½ in.; slight taper on outer half of aileron trailing edge. The spinner was plain, slightly sharper and smaller, but this arrangement lead to the crankcase overheating. Therefore, on the production model the diameter of the spinner was increased and four circular louvres impressed in it facing the direction of rotation in order to scoop in the cooling air.

The D4 competed in the mid-summer (1918) trial held at Aldershof, Berlin, —for which most manufacturers submitted prototypes—to find a successor to the Fokker D7. These competitions were held by the Germans from time to time and prominent pilots were withdrawn from the Front to test and express their opinions on the aircraft.

It was during this trial that Oblt. Willy Reinhard, who was credited with 20 victories, lost his life on July 3rd, 1918, when the Friedrichshafen D2a he was flying broke up. An amusing anecdote about Reinhard is that he was appointed by Von Richthofen, in his will, to command the famous "circus" —imagine the concern in the R.A.F. had a "Wingco" nominated his successor in his will.

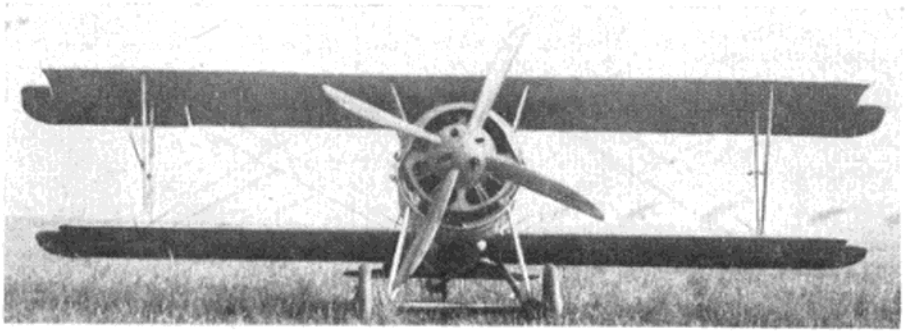
The D4 was eventually approved and after the aforementioned "mods" went into production later that year. Due to cessation of hostilities it hardly had a chance to get into operational service, although Staffels were re-equipping with it as evidenced by the photograph showing an aircraft with a Staffel identity band round the fuselage. This aeroplane was undoubtedly endowed with all the assets to manoeuvrability—short moment arm, four large balanced ailerons, generous balanced tail surfaces, no dihedral, plus the gyroscopic effect of the rotary engine on turns to port. Unlike the Fokker D7, it could not have been an easy aeroplane to fly, but in the hands of a skilled pilot it was undoubtedly a useful fighting machine. German sources credit a speed of 138 m.p.h. at sea level, with a climb to 7,800 ft. in three minutes.

Colour detail of the production D4's was as follows:—

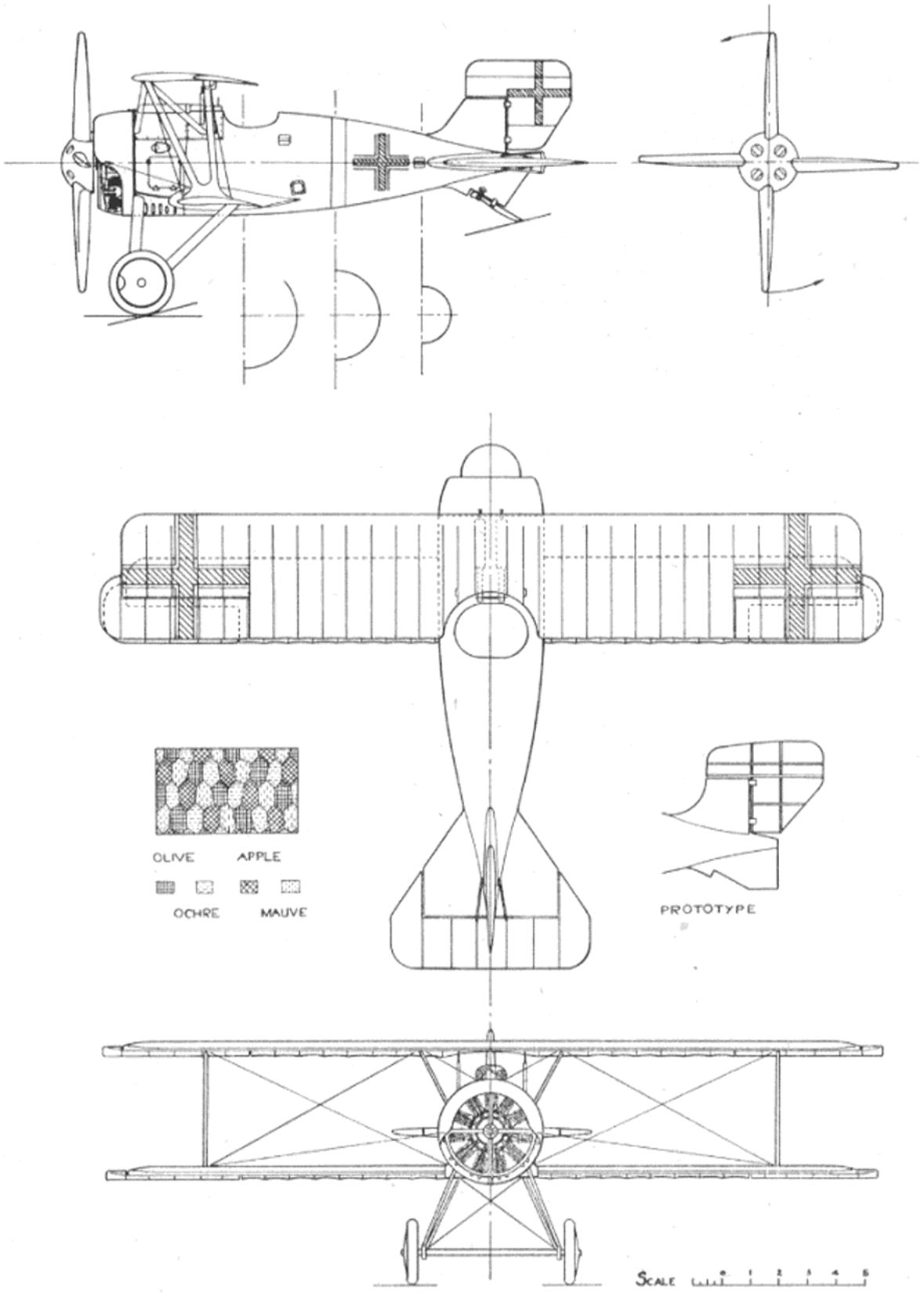
Wings and elevator were covered with fabric printed with a lozenge pattern of the size and colour indicated on the plan. On the under-surface a pinkish shade was substituted for the mauve. Fuselage, fin and tailplane were painted dark green, also the centre section and undercarriage struts. Interplane "V" struts were natural varnished wood on the aircraft illustrated and the attachment appears to be a yaw meter. As will be seen, the crosses were of the Latin type with narrow white outline to the sides only, with the exception of those on the white fabric covered rudder, which had no outlining. Insignia of Staffel 14 is reported as bright blue fuselage band in position shown.

Ernst Udet is said to have used a D4 and I have seen a photograph of him standing in front of one. In his book "Ace of the Black Cross" is mentioned the fact that he had the letters LO painted below the cockpit on all the aircraft he flew. This was an abbreviation of Lola, the name of his fiancé.

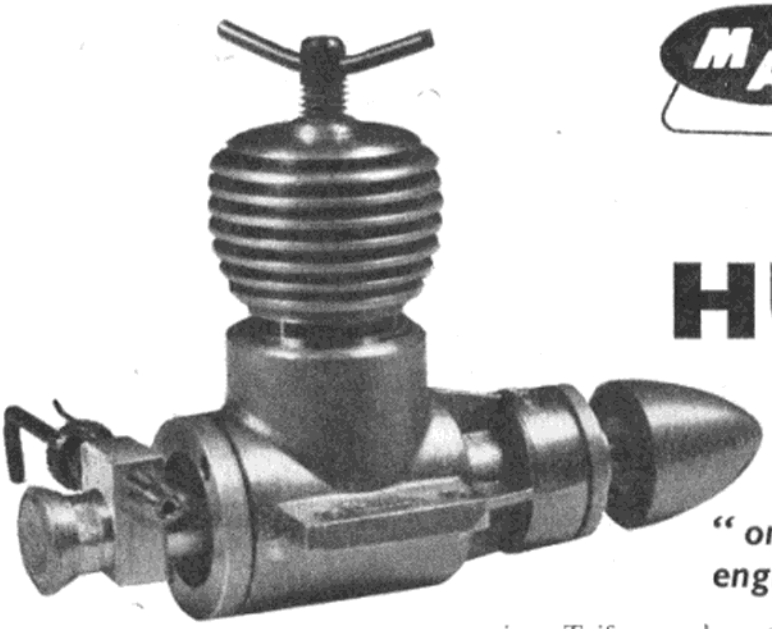
Leading dimensions:—Span 26 ft. 7 in. Length 18 ft. 6 in. Height 10 ft.



SIEMENS – SCHUCKERT D4.



SMA 64



MA ENGINE TESTS

The Taifun HURRIKAN

1·48 c.c. diesel

"one of the most interesting model engines yet seen from Germany"

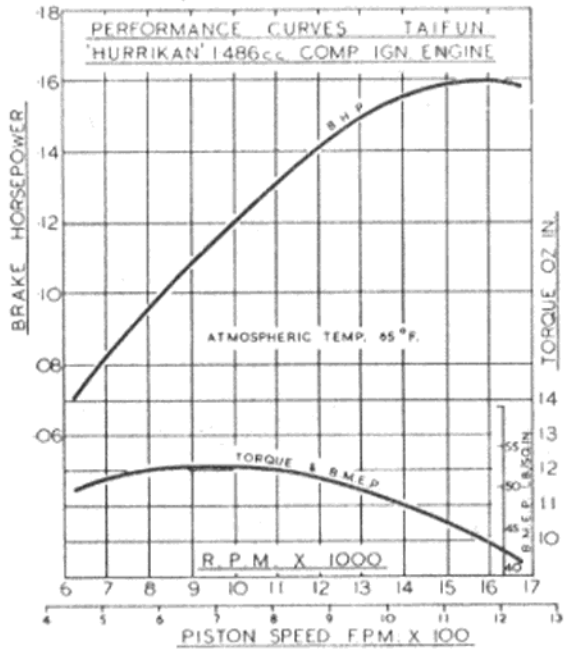
JUST going on the market in Germany is the new Graupner Taifun Hurrikan engine. A high speed 1.5 c.c. diesel, the Hurrikan is an out-of-the-rut design having twin ball-bearings and reed-valve induction.

This is the seventh Taifun engine we have had through our hands. Previous models have been the original 2.5 c.c. shaft-valve, ball-bearing Taifun produced in 1953, the subsequent disc-valve 2.5 and 3.5 models, and the other three models in the current Taifun range, the Hobby, Rasant and Tornado.

The Hurrikan bears a distinct external family resemblance to all previous Taifuns and continues the cylinder design of the current Hobby, Rasant and Tornado. Piston, connecting-rod and crankshaft design are also similar, except, of course, that a solid shaft replaces the ported shaft of the rotary-valve models.

Taifun engines have always been well made, with clean diecasting and good quality machining, and the Hurrikan is no exception. As with the other current models, Arden-type radial porting is used, consisting of four exhaust slots and four internal transfer grooves.

Perhaps the most interesting feature of the engine is the reed-valve induction unit. This more closely resembles the classic American Cox design than any of the reed-valve systems which have followed it. The method of assembly closely follows that of the Cox original, and the Hurrikan even has the same type of multi-jet carburettor and screened intake.



The base of the unit consists of a machined duralumin body which screws into the rear of the crankcase, and also includes the carburettor intake. On the crankcase side of the body are mounted the reed-valve parts consisting of two reeds, an aluminium backing plate which protects and presumably limits the amplitude of the reed movement and a ring housing which is a press fit over the inner boss of the body and retains the reeds and backing plate in position. Reeds are of spring brass rather than copper-berrylium. The inner reed is of 0.003 in. thickness and the outer reed is 0.005 in. On the carburettor side, the needle valve parts are carried in a separate unit which fits over the carburettor body and feeds into an annular groove in the latter from which four jets enter the venturi at 90 deg. spacing. The needle-valve unit is clamped in position by a screw-on filter over the carburettor intake. The complete needle-valve assembly can be rotated and locked in any convenient position to suit the installation.

Specification

Type: Single-cylinder, air-cooled, reverse-flow scavenged two-stroke cycle, compression-ignition. Reed-valve induction with sub-piston supplementary air induction. Circumferential exhaust and transfer porting. Conical crown piston.

Swept volume: 1.486 c.c. (0.0907 cu. in.).

Bore: 13 mm. (0.5118 in.). Stroke 11.2 mm. (0.4409 in.).

Compression ratio: Variable.

Stroke/bore ratio: 0.862 : 1.

Weight: 3.8 oz.

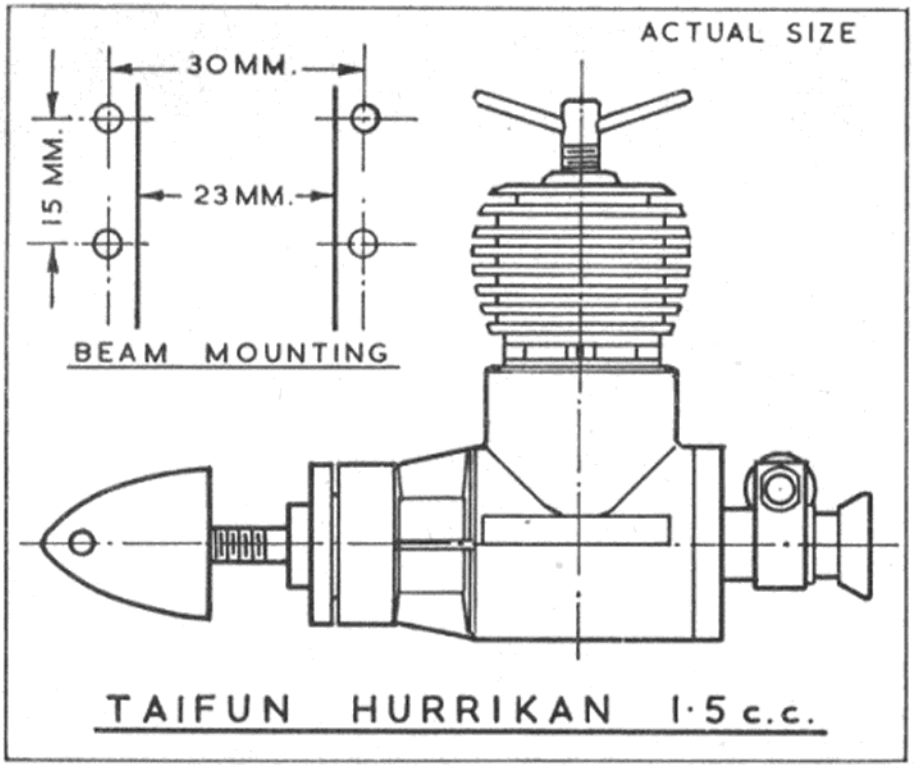
General Structural Data

Pressure diecast aluminium alloy crankcase and main bearing housing. Nickel-chrome steel cylinder liner screwed into crankcase and vertically located at base by annular seating. Nickel-chrome steel crankshaft, semi-balanced and running in two ball-journal bearings. Machined duralumin connecting-rod. Cast-iron piston. Duralumin finned cylinder barrel, colour anodised (green) and screwed on to liner. Machined duralumin backplate/induction-unit body. Beam mounting lugs.

Test Data

Running time prior to test: 1¼ hours.

Fuel used: 40 per cent. technical ether, BSS.579, 35 per cent. Shell Royal Standard kerosene, 23 per cent. Castrol "M," 2 per cent. amyl-nitrate.



Performance

As it is usual for most people, when reading these reports, to form an initial impression of a new engine's performance by the level of maximum power output it produces and as it will be evident from the accompanying performance curves that the Hurrikan's peak output is above average, it is necessary to first add a warning.

Placed on test alongside any reasonably good plain bearing 1.5 diesel, and equipped with normal popular size props, the Hurrikan would not show any very startling improvement. Up to 10,000 r.p.m. or so—i.e. using a prop of around 8 in. × 4 in., the average user might be forgiven for concluding that the Hurrikan has little or no advantage to offer.

As soon as the Hurrikan is allowed to run at 12,000 r.p.m., and above, however, there is quite a remarkable difference. Instead of the power curve flattening out at anything between 12,000 and 14,000 r.p.m., as is usual with most diesels, there is but a slight falling off in torque and the engine seems to take on a new lease of life. A useful torque continues to be delivered well beyond average peaking speeds, with the result that, on test, the peak power was realised at some 16,000 r.p.m., where an output only fractionally below 0.16 b.h.p. was obtained. This, of course, is very good indeed.

General handling characteristics of the Hurrikan are quite satisfactory. Starting is not exactly "first-flick," and the engine is more likely to respond to the knowledgeable touch of the expert in this respect.

Running qualities were good. At high speeds, 13,000-16,000 r.p.m., the engine was quite remarkably smooth running. Also noteworthy was the way in which it would hold a continuous high speed. The Hurrikan was obviously not in the least distressed by being obliged to turn over 100,000 times in a continuous run of just over six minutes' duration after only an hour's running-in. It was observed that the engine was relatively clean running and that residual oil blown out was exceptionally clean. (It will have been noted from the test data above that an oil content of only 23 per cent. was used, as is permissible in a well-constructed ball-bearing diesel.)

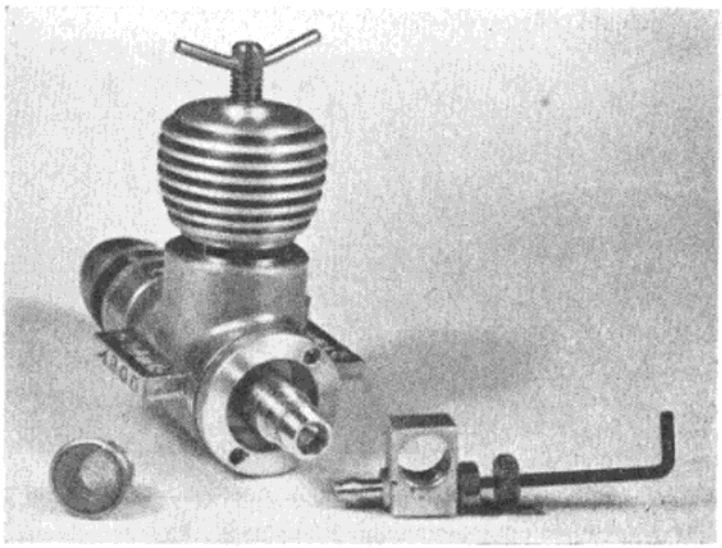
To get the best from the Hurrikan, it is, of course, desirable to run it at 12,000 r.p.m. or faster and a slightly smaller prop than is usual with 1.5's (such as a 7 in. × 4 in. or 7 in. × 3 in.) may, therefore, be advisable.

Both controls were satisfactory in operation. There was no tendency for the contra-piston to stick and the engine responded readily to the compression lever, hot or cold. Compression adjustments were held firmly irrespective of engine speed. The needle-valve was non-critical (perhaps a shade too much so) and the simple wire ratchet fitted held settings firmly at all speeds.

To summarise, the Hurrikan is certainly one of the best and most interesting model engines yet seen from Germany. It is well made and delivers a peak performance which is only equalled by two other 1.5 c.c. engines in the world at the present time.

Power/Weight Ratio (as tested): 0.674 b.h.p./lb.

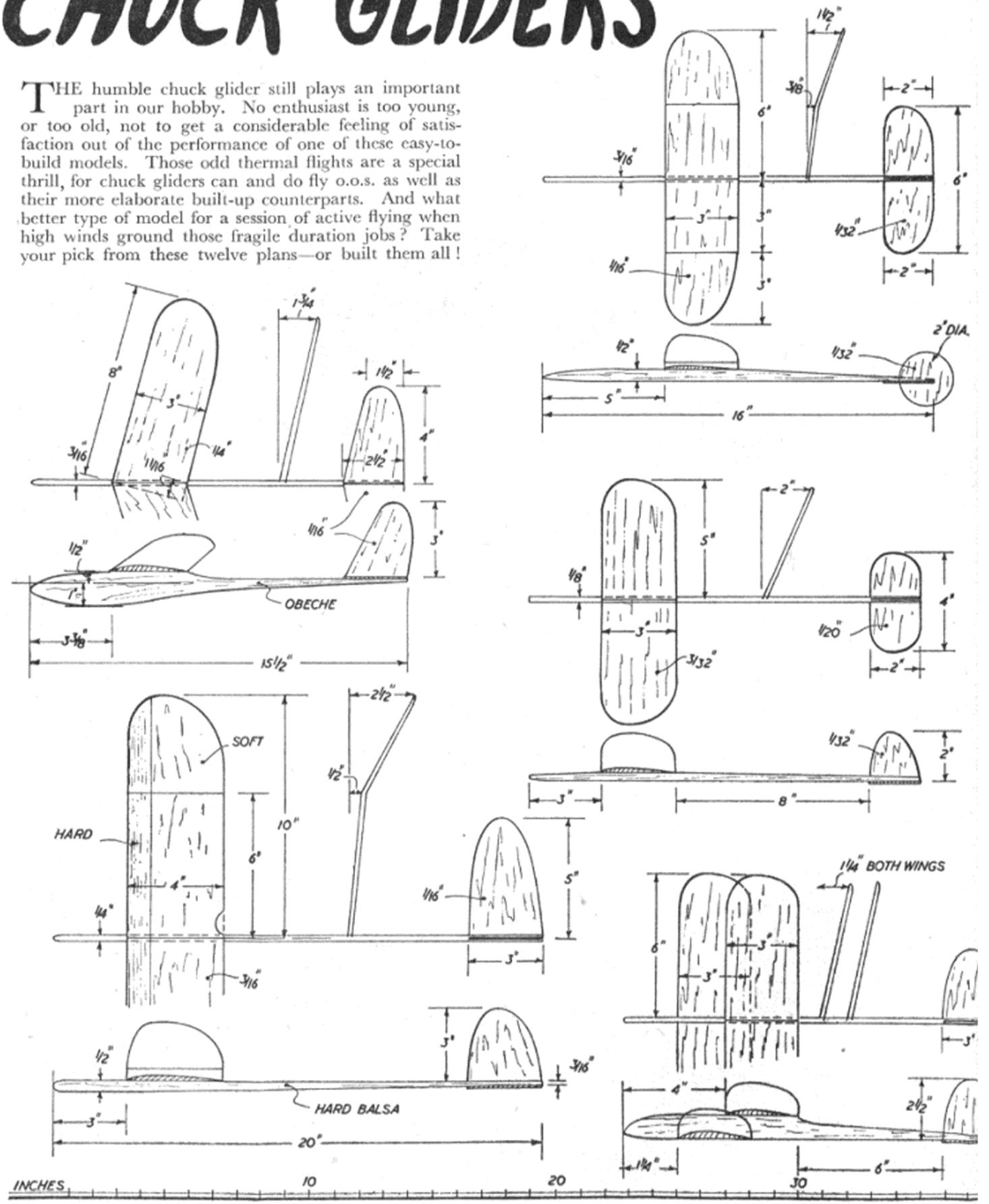
Specific Output (as tested): 107 b.h.p./litre.

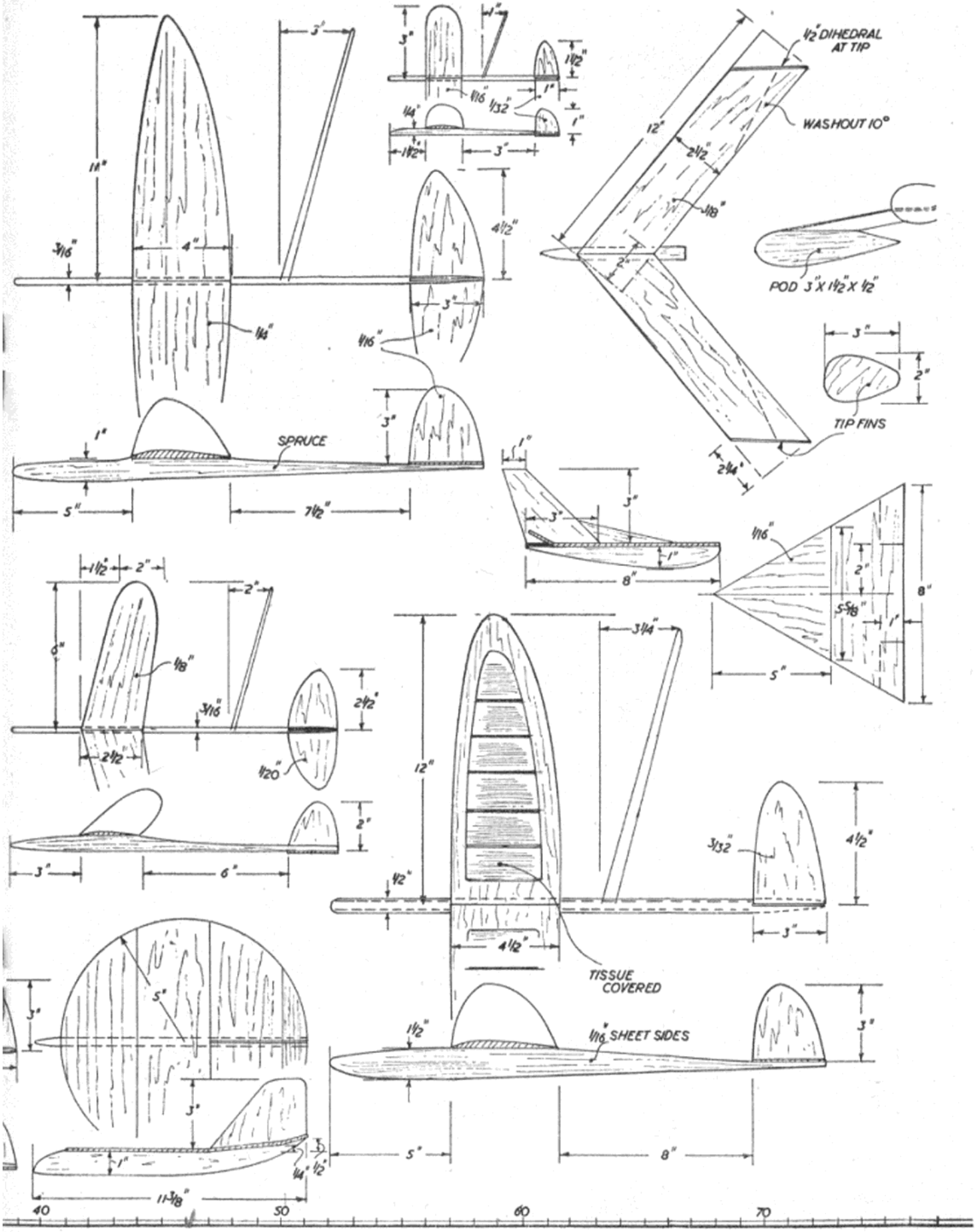


Rear view of engine, showing the detachable needle valve assembly and the gauze filter

CHUCK GLIDERS

THE humble chuck glider still plays an important part in our hobby. No enthusiast is too young, or too old, not to get a considerable feeling of satisfaction out of the performance of one of these easy-to-build models. Those odd thermal flights are a special thrill, for chuck gliders can and do fly o.o.s. as well as their more elaborate built-up counterparts. And what better type of model for a session of active flying when high winds ground those fragile duration jobs? Take your pick from these twelve plans—or built them all!




1/2" DIHEDRAL AT TIP
WASHOUT 10°
POD 3" X 1 1/2" X 1/2"
TIP FINS
SPRUCE
1/16" SHEET SIDES
TISSUE COVERED
40
50
60
70

Aviation NEWSPAGE

By J. W. R. Taylor

Heading photo shows the F3H-2N DEMON production all-weather fighter with 9,700 lb. Allison J71-A-2 turbojet and afterburner, pictured at the Aviation Writers' Association meeting held at San Francisco.

EXPERIMENTAL PIPER TRI-PACER shown below has a *Gannet*-type power plant consisting of two 90 h.p. Continental engines instead of the usual single 150 h.p. Lycoming. This combines twin-engine safety and take-off performance with low drag, weight-saving compared with a conventional twin and no yawing problems after an engine failure. The engines are mounted one above the other and the lower one is a normal installation complete with starter and generator. The upper engine is without these units and is inverted to bring the crankshafts close together. Co-axial propellers are used, with the rear prop driven through eight ½-in. belts from the lower engine and rotating freely on the extended crankshaft of the upper engine.

In this experimental installation, two fixed-pitch metal propellers are mounted 6 in. apart, with 4 in. greater pitch on the rear one to offset the help it gets from the forward prop. and so keep them at the same max. r.p.m. Main disadvantage is interference, particularly as the props rotate in the same direction. They tend to stay synchronised and either throttle can be advanced more than 100 r.p.m. before the propellers get out of alignment. Apparently some peculiar noises and vibration result when they are not synchronised.

This type of power plant will not be adopted for the *Tri-Pacer*, as it weighs 175 lb. more than the single Lycoming, with nose-heavy trim and reduced speed to offset better take-off and climb. But Piper believes that the idea may be useful for future types where quick take-off is of primary importance.

* * *

TREBLE DJINN. Latest photographs of an S.O.1221 *Djinn* show that it now has cabin doors and small

auxiliary fins, giving it a most unhelicopter-like triple tail. Continued development of this sturdy little French 250 h.p. two-seater has raised the all-up weight steadily from 1,320 lb. on the prototype to 1,675 lb. on current production machines, one of which has taken off under test at 1,765 lb. As the empty weight is only 684 lb., this must come as a shock to the experts who predicted that the *Djinn* could never be successful with a jet-rotor system that simply pushes out compressed air at the rotor tips without combustion. Rotor diameter has increased with weight from 32 ft. 10 in. to 36 ft.

French military contracts for the *Djinn* total 100, of which 60 are for the Army, and Sud-Ouest have many other orders. Following on 28 pre-production aircraft, the first genuine production *Djinn* flew on June 4th this year. Army flight trials have included launching a number of air-to-ground wire-guided anti-tank missiles.

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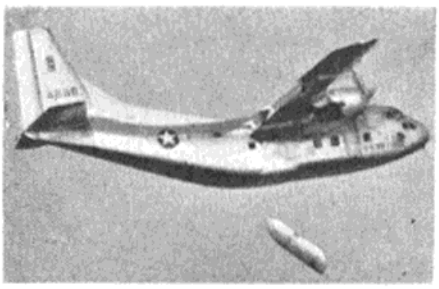
LITTLE-KNOWN FEATURE of the U.S.A.F.'s Fairchild *C-123B Provider* transport, which can now be



seen in Europe, is that it carries all its fuel in jettisonable external tanks, comprising two 450-gal. underwing pylon tanks and two 730-gal. main tanks, which form the rear portions of the nacelles for its two 2,500 h.p. Pratt & Whitney R-2800-99W en-

gines. Idea is that the tanks can be jettisoned before an assault-type landing to reduce fire risk. In addition, if any tank is hit during combat, it can be dropped quickly by standard bomb-release gear.

The picture left shows the starboard nacelle tank of a *C-123B* being jettisoned during operational tests over Chesapeake Bay.

* * *

Owing to shortage of space, "From the Past," No. 5, has been held over this month and will appear in the October issue.

* * *

Pictures on this page, **EXCLUSIVE TO MODEL AIRCRAFT,** show some of the latest American fighting planes demonstrated at this year's Aviation Writers' Association convention at San Francisco. Pride of place among U.S.A.F. exhibits went to a Convair *F-102A* delta-wing interceptor, which carried the insignia of the Air Force Flight Test Center on its nose. Delegates were told for the first time that the *F-102A* is armed with Hughes GAR-1 *Falcon* air-to-air missiles and 2-in. folding fin rockets.

The *Falcons* are carried internally in missile bays on the underside of the fuselage: the rockets are stowed in firing channels built into the rapid-acting missile bay doors. All are fired automatically by the Hughes electronic control system as soon as the target comes within range. The mixed guided-unguided armament is significant, because homing missiles often become misguided in heavy cloud.

CAPTIONS: TOP TO BOTTOM

CONVAIR F-102A. This machine is from the Air Force Flight Test Centre.

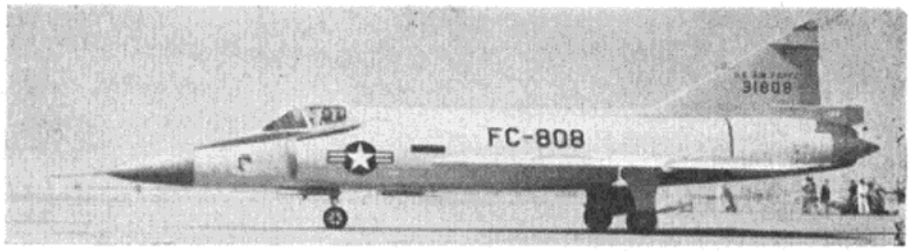
DOUGLAS F3D-2T2. Newly-revealed operational trainer version of "Skyknight" from FAWTUPAC (Fleet All Weather Training Unit Pacific). Two 3,400 lb. Westinghouse J34-WE-36 turbojets.

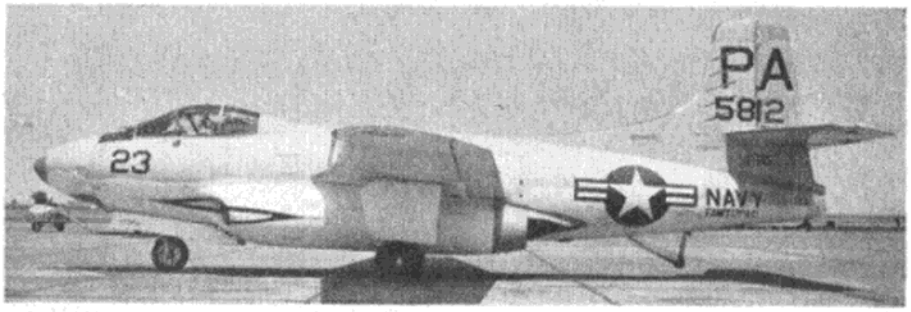
DOUGLAS A4D-1 SKYHAWK. First production version. It has rear fuselage petal air breaks, two external fuel tanks and a bomb. Simplified A4D is, of course, the world's smallest atom-bomber, with 7,800 lb. Wright J65-W-4 (Sapphire) turbojet and delta wings so small they do not need to fold aboard ship.

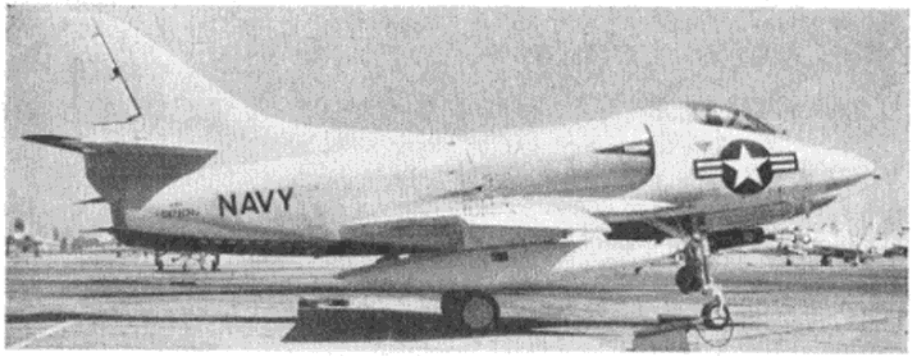
NORTHROP F-89H. This is the new version of the "Scorpion" to carry Hughes GAR-1 Falcon air-to-air missiles. Presumably 104 standard 2.75 in. air-to-air rockets are retained in tip pods for all-weather efficiency (see Newspage). Machine from 84th Fighter Interceptor Squadron. Two 7,500 lb. (with afterburner) Allison J35-A-35.

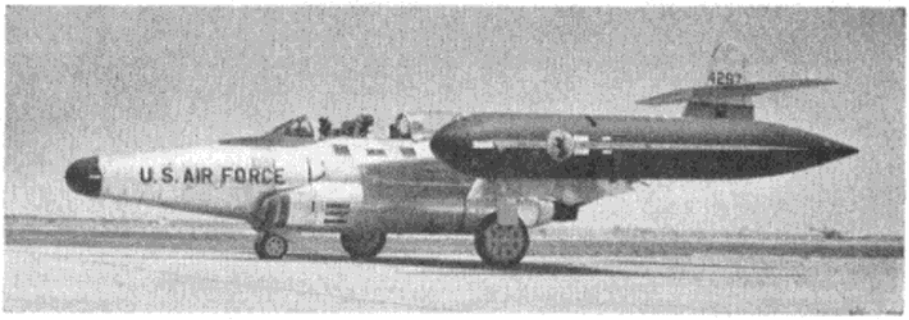
DOUGLAS F4D-1. Production "Skyray" with 9,700 lb. P. & W. J57-P-2 turbojet and afterburner. Note the wing folding details, external tanks and bomb.

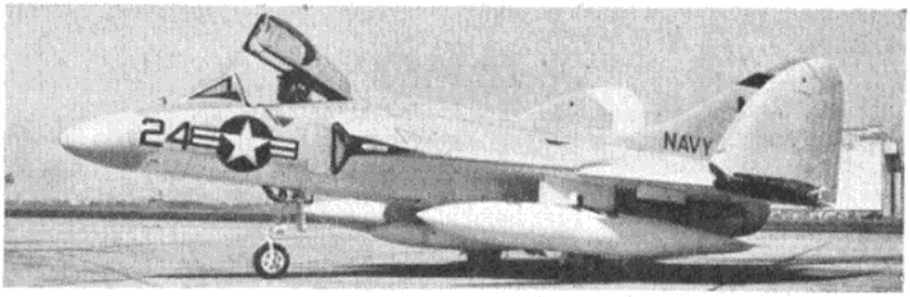
DOUGLAS B-66B. Production nuclear bomber. 9,750 lb. Allison J71-A-11 turbojets. Max. speed over 650 m.p.h. Normal weight 78,000 lb. Photo shows newly-extended jet tailpipes (afterburners?) with additional fairing structure aft of original pylons, also v.i. tailplane.

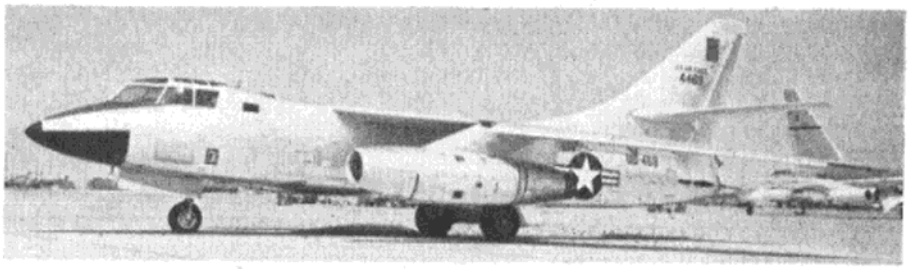


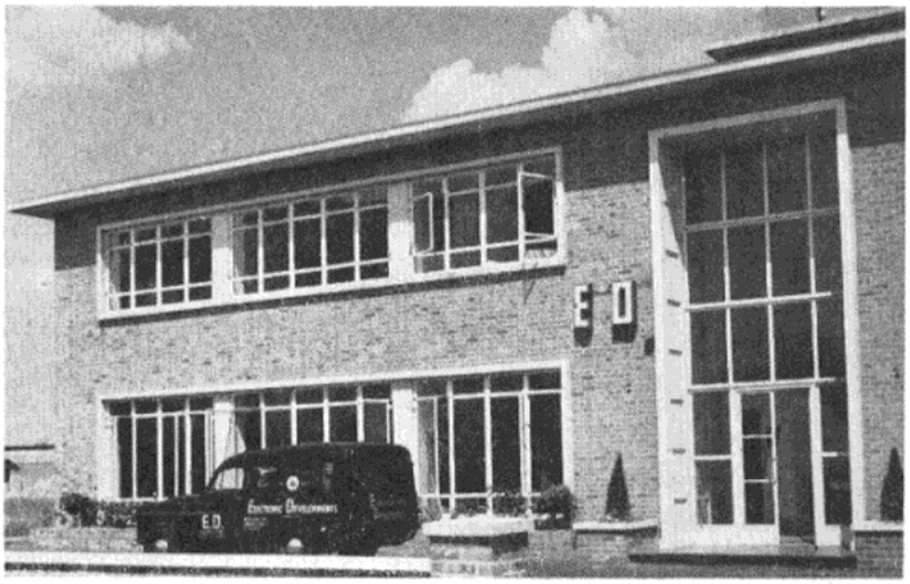












E.D's New Home

ELECTRONIC DEVELOPMENTS are the oldest company in this country still engaged in the quantity production of a range of model engines. It was in 1946 that work commenced on what was intended to be a sideline, and early in 1947 the E.D. Mk. 11 appeared on the market. This was shortly followed by the Competition Special, and the success of this motor rapidly convinced the manufacturers, that in the model engine field there was to be found a market that was far more than just a sideline.

From that day on, the old factory at Kingston was devoted more and more to engine production and less to other interests, until at the time of their leaving Kingston to take over the new factory at Molesey, over 90 per cent. of production was devoted to power units.

The new factory was built to their specific requirements, and with a floor area of 10,000 sq. ft. is over twice the size of their original premises.

We were more than impressed by the obvious thought that had gone into the layout, not only with regard to production but also for pleasant working conditions.

The main workshop is divided roughly into three parts : machine shop, assembly benches for both engines and radio, and stores. The machine shop section contains approximately 50 machines—internal, external and centreless grinders, milling machines, drills and 16 capstan lathes. To watch a " Bee " cylinder and fins emerge from a bar of metal in some eight operations, which take just about a minute to perform, is an education in itself.

In the assembly section are also contained the machines with which each piston is lapped into its respective cylinder—this is the operation which ensures that these components are a perfect matching fit.

Each engine is individually tested before it leaves the factory, and for this purpose a special and more or less noise-proof room exists at one end of the factory. The first start is made with an electric motor, but once the compression and needle settings are determined, each motor is started at least once by hand.

Although the main part of the premises are single storey, the " office block " at the front has two. Much of this space is devoted to the administrative side of the business, but the ground floor left hand corner (in our photos) is a very nicely laid out canteen, with its own self-contained kitchen.

Situated as the factory is—rather out in the wilds at the moment—the management have taken the trouble to see that staff requirements are well catered for, and we noted even a Coca-Cola dispenser in the main workshop. Indeed, the fact that none of the staff left when the changeover from the old factory was made speaks well for the manner in which the firm is controlled.

The constitution of E.D.'s must be almost unique, as half of the shareholders and all of the directors actually work in the factory. Mr. J. Donald, the present managing director, has been responsible for many changes that continue to keep the company among the leaders of model aircraft engine manufacturers.

The motors that E.D.'s produce are known all over the world and need no description here ; however, a few historical notes might be of interest.

The second motor produced, the 1947 Comp. Special, is STILL in production. Four years ago an effort was made to delete it from the range but orders kept coming in and, when we were looking round the machine shop, there sure enough were a batch of Comp. Special cylinders being machined.

Since it was first introduced in 1948 the Bee, in its Mks. 1 and 2 versions, has sold over 300,000, which must surely be a record, while the 2.46 is still highly thought of in the 2.5 class although it is five years old.

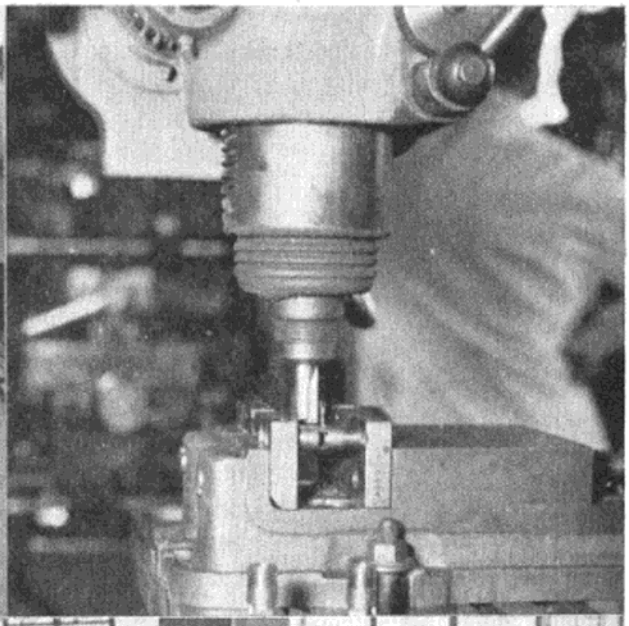
The general longevity of E.D. designs speaks well for the foresight and modern thinking of Basil Miles, who has been their designer from the start.

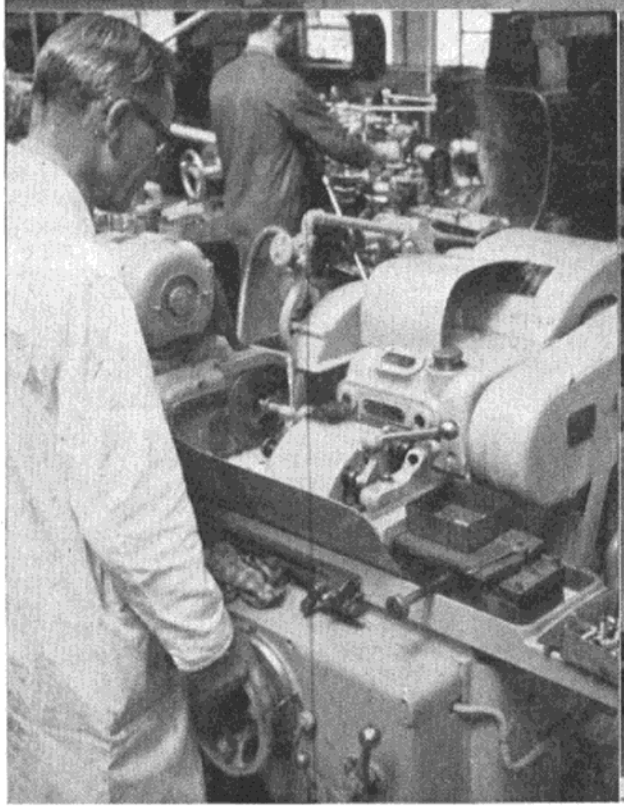
The possibilities of producing a R/C set suitable for the average hamfisted amateur were considered in 1949, the result being the 3-valve Mk.1, which appeared early in 1950. This was followed by the single valve Boomerang in 1954, which was sold boxed ready to install in a model, and was one of the first successful attempts to market a more or less foolproof radio.

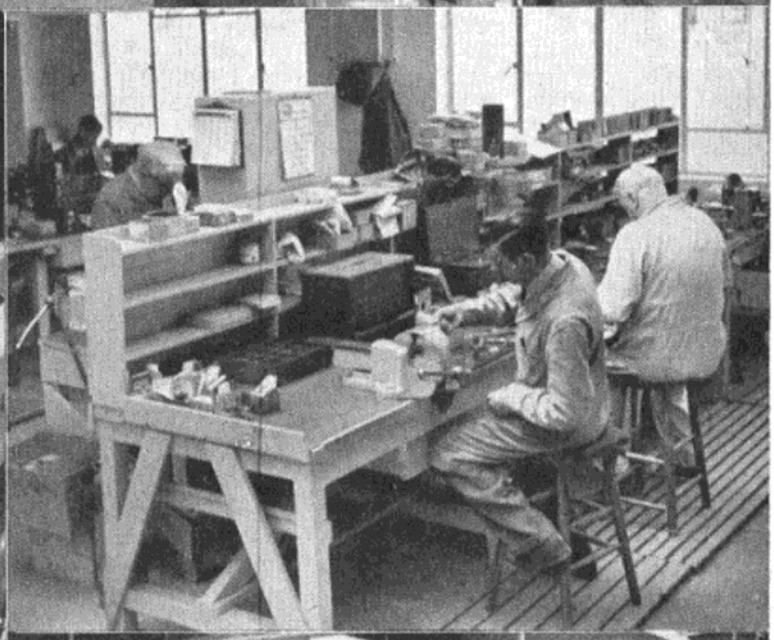
Experiments continued meanwhile with multi-channel receivers, and this research, which included the successful Cross Channel R/C flight, has put E.D.'s well to the forefront in the world radio market. George Honnest-Redlich has supervised all R/C designing.

The future ?—Well firstly there is the transistorised receiver, which, although it will be slightly more expensive than normal receivers, will go a long way towards bringing reliable R/C within the reach of everyone.

And motors ? The new ball bearing 1½ c.c., which bears a marked similarity in appearance to the 2.46, will be appearing shortly, and knowing the amount of careful design and thought that E.D.'s bestow on their products, we are certain that it will be worthy of their reputation.







Top left photo shows a part of the section of the factory that is devoted to the assembling of R/C components.

Top right. An everyday sight in the machine shop for almost 10 years—parts for the Comp. Special being machined. In the operation shown, the transfer "flat" is being machined on the cylinder.

Centre left. A stage in the manufacture of a 2.46—the outside of the cylinders being ground.

Centre right. Another assembly bench, but this time for motors. The same department also handles engines that have been returned for repair or servicing.

Lower right. A general view of the Machine Shop showing a few of the impressive array of capstan lathes.

Letters

continued from page 309

mighty efforts too frequently.

I enjoy "Pylonius" tremendously at times—at others, I could cheerfully break my building board over his head. Which is surely the right attitude. If Mr. Fearnley knows the identity of "Pylonius," he should have the sense to keep quiet. To admit *knowing* him is to court social ostracism, to say nothing of spoiling everybody's fun.

Mr. Mace's yearning after the good old days interested me a good deal. But diesels and Jetex have been invented and cannot be un-invented. We cannot return to the past.

We might, however, return to the ideas of the past, and that, I think, is worth considering. Our strange obsession called progress—this "every day in every way we are getting better and better" attitude—just does not fit the facts. Technical details may be constantly improving, but is anything else?

Take the Wakefield rules, for example. Before the war, the rules were well known and respected. The contest gained prestige and popularity with every passing year.

Today, after a period during which the rules were changed so often that nobody knew *what* they were, we are faced with requirements so extreme that even before they come into force, they are subject to the most violent criticism. "The Wakefield, in fact, now appears to have become something of an oddity, rather than a serious performance model." You've said it, Mr. Warring!

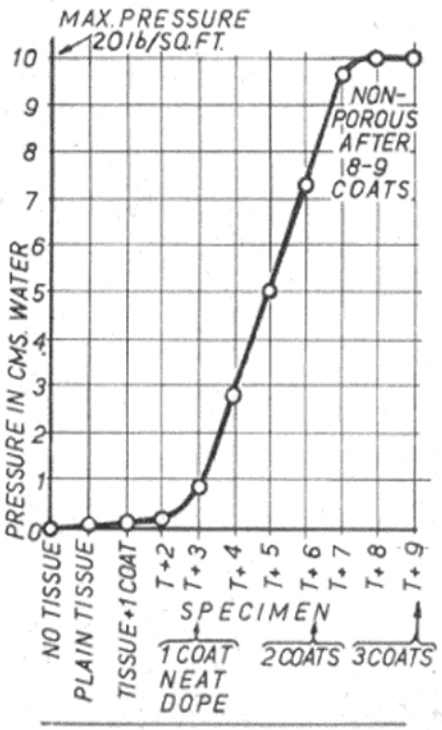
How did we get such rules? We were told in effect: "The high performance of modern contest jobs must be limited, in order to make contests practical." If this is the only reason, why not return to the old rules? Nothing kills climb and glide like a hefty chunk of frontal area, or a fixed undercart. But it is not efficient? Well, no, it is not. But there is little point in seeking still greater efficiency, if our flying fields are too small to allow even our present models to show their paces.

A return to the old rules would limit performance, without extravagant extremes in any direction. It might also result in a more realistic model (hear me out, you functionalists, please!). and this might attract back into the contest field the semi-classical and sports modellers, who find the modern functional jobs just too ugly to bother with.

Some people will be asking why I want to put development back 20 years. But I regard a return to the old rules, not as an end in itself, but as a fresh start—a jumping off place for somewhere new. As Captain Fisbee says, in "The Teahouse of the August Moon," "It's a step backwards . . . in the right direction."

Yours faithfully,

Edgware, Middx. D. Longman.



Tissue Tester

Dear Sir,—Most articles on covering state that tissue should be given two or three coats of dope to tighten and airproof. On the face of it this seems simple enough, but after noticing a general all-round improvement in the performance of my models after a third coat of dope, I decided to investigate the actual airproofing properties of the dope.

The "dope" used was Joy-Plane No. 1 thick (for no other reason except that I happened to be using it at that time), diluted with two parts thinners. A large sheet of lightweight Modelspan was brushed fairly liberally with the dope, a small specimen being removed after each coat. Several tests were carried out with each specimen to get a representative result. The apparatus used is shown diagrammatically (lower left).

The area of tissue involved in each test was slightly more than 1 sq. cm., and the results are shown on the graph. Since the actual disposition of the points depends on the rate of flow of air (viz. the quicker air is supplied to the tissue, the more the pressure recorded, even though the maximum pressure obtainable is the same), the rate of flow was adjusted to give results that arranged nicely on the graph, and were not all squashed up at one end.

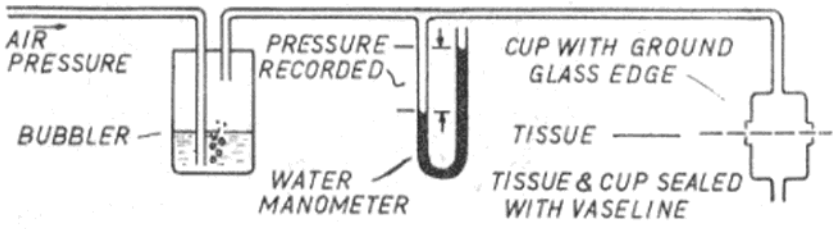
From the graph, one can see how important those "extra coats" are, since without them pressure is lost.

While it is not everybody who could set up such an apparatus to test his tissue with, there is a simple test to determine whether or not the tissue is porous: take a little vaseline, or similar substance, and rub it well into the tissue. Then wipe off the excess. If small globules can be detected beneath the tissue, the tissue is porous. If not, then the tissue is effectively air-proofed. A trial on a once-doped piece of tissue will reveal the effectiveness of this test.

While the above experiments are not fully comprehensive, they do seem to show that there is considerable room for research on both the effectiveness of different dopes, and on the actual performance with porous and non-porous wings.

Yours faithfully,

Sidcup, Kent. G. A. Dean.



Combat Combatant

Dear Sir,—After the happenings at some recent galas, I feel that the time has come for some definite rules to be adopted for combat flying. As the S.M.A.E. appear lethargic in this matter, it would seem advisable to press on without their aid and to decide on suitable rules through the model press.

For a start, it would be interesting to have comments on the following suggestions for rules:—

1. Combat to be open to engines of up to 3.5 c.c. 2. Line length to be 50 ft. ± 6 in. 3. Heats to consist of two models only. 4. Streamers to consist of 10 ft. of crepe paper, attached with 2 ft. of string to a hole or loop in the model. 5. Two points awarded for every cut; no extra points for cutting all the streamer at once. 6. Scoring shall commence from the time both models are airborne and shall cease five minutes later. A team not started within three minutes shall be disqualified. 7. A team shall lose one point for every minute or part of a minute spent on the ground after both models are airborne. 8. A pilot flying more than two consecutive laps below 6 ft. altitude shall be warned and after a second time disqualified.

What ideas have other readers?

Yours faithfully,

West Wickham, Kent. M. Dilly.

PETER CHINN on POWER TOPICS

A FEW days ago I received a telephoned invitation to dine with Sir Robert Bird. Sir Robert is, of course, vice-president of the S.M.A.E.; indeed, a "personality of note."

We have to confess, however, that, as an interviewer, we would surely make the Cholly Knickerbockers of this world weep, for, so engrossed did we become in Sir Robert's reminiscences of early motoring and aviation, that we

Sir Robert Bird, Bart., who is a keen model enthusiast and vice-president of the S.M.A.E.

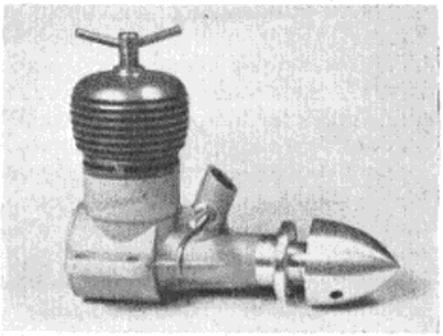
quite forgot to ask him anything about the model aeroplanes he used to build.

Our meeting with Sir Robert on this occasion preceded a visit (for which we had the pleasure of escorting him) to the firm of Albatross Marine Ltd., whose speedboats are doing so much to uphold British prestige all over the world in the design and construction of small craft. One of the many aeromodellers who have joined the ranks of model boat enthusiasts, Sir Robert is using the Albatross hull form, scaled down to about 4 ft. length, for his next model. Previously, his models have been based on Thornycroft seaplane tender hulls.

These are by no means ordinary model power boats. In the first place, they are powered by conversions of the 35 c.c. B.S.A. "Winged Wheel" cycle-motor. Sir Robert has fitted the cylinder with a water jacket and a closed circuit cooling system. Furthermore, having experienced considerable trouble with water dousing the normal high-tension spark-ignition system, he has converted them to glowplug! When Sir Robert told us that, with the compression ratio raised, he is running these engines on a methanol/nitromethane/nitrobenzene fuel, we really sat up!—as, indeed, did B.S.A. engineers, we gather, when they heard about it and about the hot performance that their modest maid-of-all-work had been persuaded to deliver.

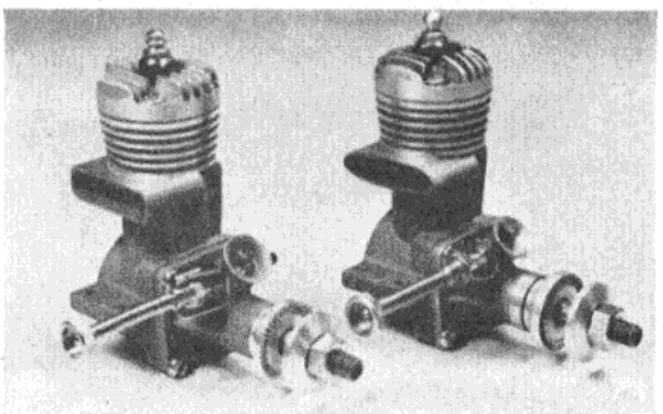
Another modification to the engine is the adoption of a simple, model type, needle-valve carburettor in place of the original Amal unit. We were able to inspect two of Sir Robert's boats powered by these engines. They are estimated to be capable of about 20 m.p.h. and are normally run on the sea—either at Poole or in the Bay of Cannes. Being free-running and fast, these boats need plenty of open water, of course. The hulls are strongly built and very seaworthy, being capable of satisfactory running in a chop of up to 6 or 8 in.

Sir Robert's interest in models began with his retirement from public life (which included over 20 years in the House of Commons) in 1945, and started with rubber-driven model aeroplanes. Her Ladyship, says Sir Robert, became a



The East German Schlosser 2.5 c.c. engine, which is of a construction notably superior to earlier East European model engines.

little weary of chasing them, however, and so it was that he turned to boats—which at least do not involve climbing trees. Before that, Sir Robert numbered among his many interests, motoring, aviation, photography and cine-photography. He took colour photographs 40 years ago, which have since amazed the exponents of



The new and the old. The new Enya 19 Model 4003 (left), which is a development of the original 19 seen on the right.

"new" colour photography. He flew in an aeroplane in the days when they were "flying machines" and every flight an event and an adventure. He first drove a motor car in 1897, and is thus a member of that very exclusive society, the Circle of Nineteenth Century Motorists.

There will always be people who sniff at the hobby of model building. It is indeed reassuring—if reassurance is needed—to know that men of the stature of Sir Robert Bland Bird, Bt., K.B.E., M.R.I., are among its keenest supporters.

New Engines

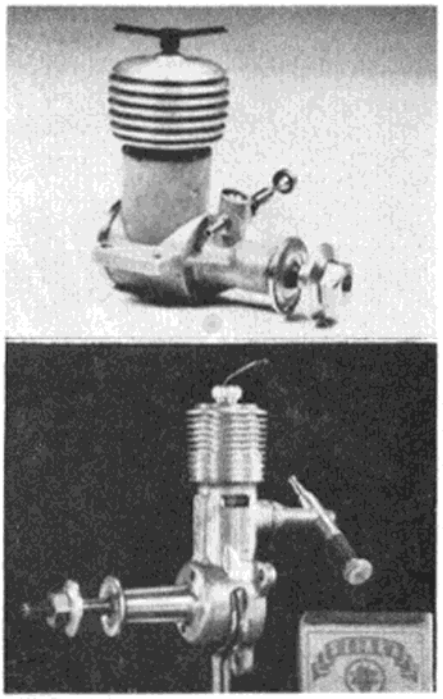
Our newest acquisition in the 2.5 c.c. engine class is a pair of Enya 15 glowplug motors. The Enya 15 is the latest model from the noted Japanese designer, Saburo Enya. It will be remembered that we have previously dealt with the Enya 19 and 29 models and found them to be well made, robust engines of good performance and easy to handle.

The new 15 (bore and stroke 15 × 14 mm. = 2.474 c.c.) is generally similar in design and is certainly one of the most interesting 2.5 glowplug engines currently marketed. Unlike the Torpedo 15 and Max 15, the Enya uses a one-piece alloy crankcase and cylinder barrel with inserted iron liner. Die-casting here is really excellent, as is the fit of the liner in the barrel. The cylinder head is another very clean die-casting, with deep finning and has the usual brass plug insert common to most Japanese engines. All the castings have a matt grey finish and have machined joint faces, fin edges, etc.

The crankshaft is fully counterbalanced and runs in a bronze bushed main bearing. It has a 9 mm. journal, 30 mm. in length. A long, rectangular induction port 9.5 mm. × 7.5 mm., gives a 108-deg. intake period. A good, solid prop driver is fitted on a matching taper on the crankshaft. The lightweight lapped piston is coupled to the crankpin via a diecast alloy connecting rod, which is bushed at the big end and the full-floating gudgeon-pin is fitted with end pads. The needle-valve is of nickel plated brass and is much superior to those seen on most model engines, some of which are simplified almost to the point of crudity.

We hope to report on the performance of this engine in a later issue.

Enya make a range of glowplug engines from 0.09 to 0.60 cu. in. The latter is a new model and replaces the previous 0.63 model. Both these big Enyas, incidentally, carry an unusually long guarantee period of 12 months. Enya is also working on a 2.5 c.c. diesel of promising design. Another new Enya model we have tried is the 4003 type 0.19 cu. in. model, which replaces the previous 4002 type which was dealt with in the "Engine Tests" series in the March, 1955, issue of MODEL AIRCRAFT. This engine has new castings throughout which embody larger gas passages, but is otherwise similar to the previous version of this easy-starting and pleasant-handling engine.



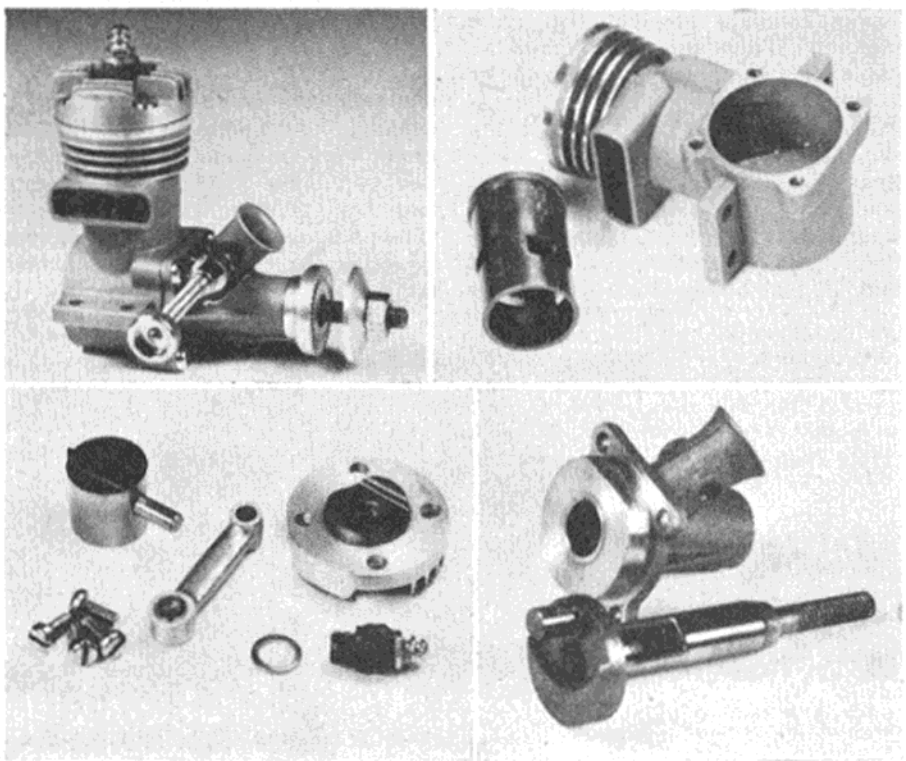
The Hungarian Proton SM-03 2.5 c.c. diesel and (below) the "Daru" diesel, which is also from Hungary.

We mentioned the Hungarian 2.5 c.c. Proton SM-03 engine in the July MODEL AIRCRAFT. We now show what this short-stroke engine looks like in one of the accompanying photographs. In view of the Proton's erroneous identification in another magazine as a Hungarian Daru motor, we also show a picture of the Daru, which, as will be seen, is a long-stroke diesel of the three-port type and of quite different design.

Also from Eastern Europe, by the courtesy of a friend in Western Germany, we have obtained an East German Schlosser 2.5 c.c. motor.

The Schlosser 2.5, with its smaller 1 c.c. brother, has been favourably received by East German modellers and, we would say, with good reason, for, while it is in no way startling on the design side, the quality of its construction, unlike that of some engines seen from East European countries, is of a very high order indeed.

(Continued at foot of next page)



A promising addition to the ranks of International class engines: the new 2.47 c.c. Enya 15 glowplug engine.

New Film— Old Aircraft

M.A. Goes to the "pictures"

IT is not often that a film, while being splendid entertainment in itself, at the same time affords an aeronautical treat of an unusual variety. Such was our impression after leaving the trade showing of

A still from the film. Is that "Bulldog" the genuine article ?

"Reach for the Sky," the story of Douglas Bader, the legless air ace. Kenneth More, as Bader, plays his role with just the right touch, and gives such a convincing portrayal that we intend seeing the film again just to concentrate on the aircraft side of things !

As far as is practicable, this aspect is completely authentic and we were pleasantly surprised at the fine condition of the Avro Type 504 seen in the opening sequence. This aircraft, a 504N, was in rather a sad state when first discovered in a hangar at Portsmouth. It then went to de Havilland's, who later presented it to the Shuttleworth Trust. Avro's undertook the work of converting the 504N to a 504K, which meant rebuilding the mainplanes and forward fuselage. Serial number of the machine is E3404 and it will be maintained in flying trim at the Trust's headquarters at Old Warden, near Bletchley.

The Bristol *Bulldog* belonging to the Science Museum was also featured and we were so busy taking in the lines of this old timer that we completely forgot to make a note of the serial number. A 'phone check to the Science Museum revealed that they don't even know it—can any reader help ? A mock-up of the *Bulldog* was used for certain sequences, and when you see the film see if you can spot it.

This was the "Hurricane" built by the studio from odds and ends.

Finding these old aircraft proved a big headache for the film's producer, but he has done a convincing job. It was easier, of course, when it came to the more modern types. *Hurricanes* and *Spits* are a little more plentiful, and were collected from all parts of the country; the *Hurricane* used in the close-ups though, was a mock-up built at Pinewood Studios. However, the *Hurricane* seen being put through its paces at zero feet is no dummy !; for this sequence it was flown by Flt. Lieut. Leonard Smith, formerly of R.A.F. Waterbeach. This particular aircraft is completely serviceable and is now kept at Biggin Hill.

POWER TOPICS

Continued from previous page

The crankcase and rear cover, which have a sandblasted finish, are exceptionally clean die-castings, while the other parts, all of which are machined, are very well turned out. The piston/cylinder fit, on the example we have, is exceptional and there is no slackness whatsoever in the connecting rod bearings. The engine is of the conventional shaft induction, radial port type, using three exhaust ports and six internal transfer grooves.

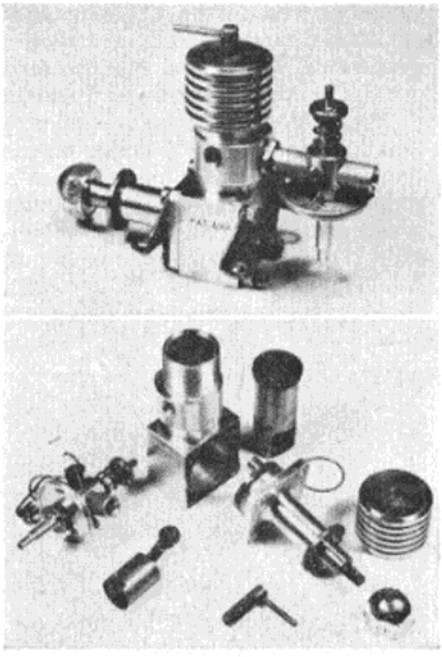
A novel feature of this engine is the method of retaining the prop, which is not by means of a spinner-nut, as might be supposed from the photograph. This assembly actually consists of a countersunk screw-head stud which screws into the end of the crankshaft, clamping the prop against the driving hub by means of a machined alloy disc. This disc is threaded on its periphery and it is over this that the spinner is then screwed.

Puzzle Corner

It is not often that we come across an engine with which we have not previously had some acquaintance, but such was the case with the Wilsco 79 engine featured in one of our photographs. Judging by its general design, we would put the date of its construction between 1947 and 1949.

Of $\frac{3}{8}$ in. × $\frac{7}{16}$ in. bore and stroke (0.791 c.c.), the engine is nicely made and has one or two novel features, among them a somewhat unusual throttling-cum-cutout device. It is not fitted with integral mounting lugs, there being, instead, a pair of steel brackets attached to the crankcase, front and rear. All the bearings are well fitted and there is virtually no end play on the crankshaft.

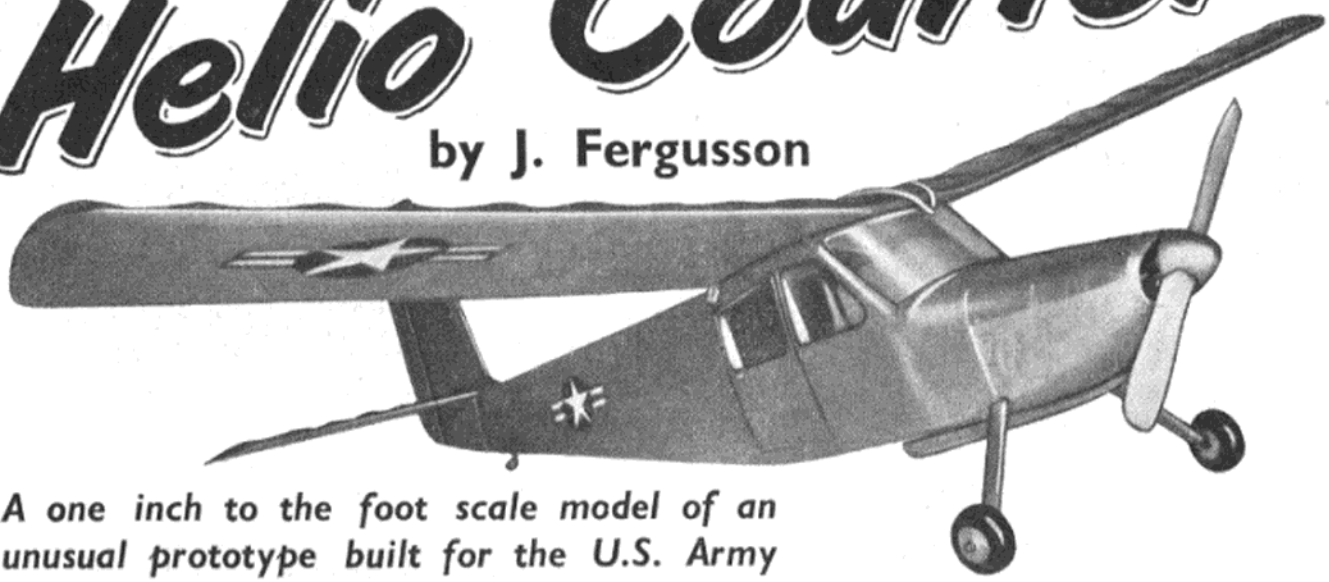
Can anyone throw any light on the origin of the Wilsco 79 and on its subsequent fate ?



Do any of our readers know the history of this Wilsco 79 engine ?—see Puzzle Corner.

The Helio Courier

by J. Fergusson



A one inch to the foot scale model of an unusual prototype built for the U.S. Army

THE Helio *Courier* represents the third stage of an interesting development attempting to produce a light aircraft that combines—among other features—quick take-off and climb, fully controllable flight at low speeds, freedom from stall and spin, high cruising speed, and low landing speed.

A two-seat prototype was built, followed by a four-seat version known as the Helio-Four. It was this latter aircraft that provided the basis for the *Courier*, of which one example was delivered to the U.S. Army for evaluation tests. This machine is designated YL-24 and has the serial number 22540 on the fin and rudder.

The model is to 1 in. = 1 ft. scale and has lived up to the stable reputation of the full scale job in all of its 200 flights to date. The only damage so far has been tissue tears on corn stubble, and a broken prop or two. At the P.A.A. Scottish Rally held at Heathfield, it gained an equal 2nd in the scale event with only two flights.

Fuselage

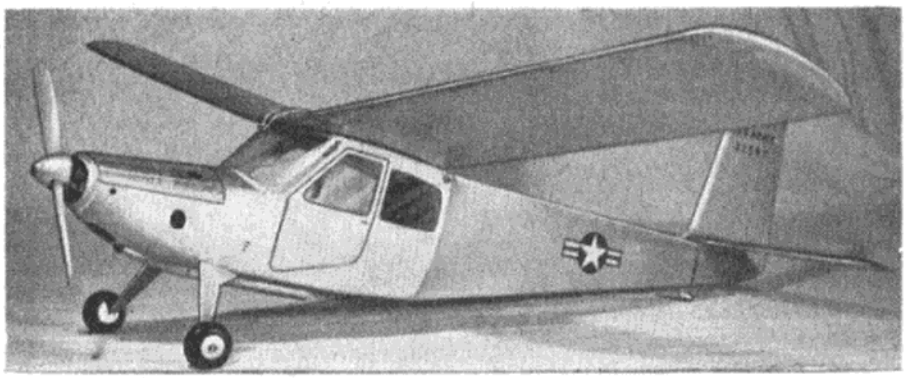
Construction, although it looks complicated at first glance, is in fact very simple. A basic structure of $\frac{1}{8}$ in. sq. longerons and $\frac{1}{8}$ in. × $\frac{1}{16}$ in. struts with $\frac{1}{16}$ in. sheet stringers is overlaid to the rear of the cabin with 1/32 in. sheet: 1/32 in. × $\frac{1}{4}$ in. flanges to the longerons give a reserve of strength at the vulnerable rear end of the fuselage. There are only two real formers in the fuselage, a $\frac{1}{16}$ in. sheet dashboard and a $\frac{3}{16}$ in. ply firewall.

The only other shaped part in the fuselage to cause the least thought is the nose block, and this is shown on the plan. It is, however, necessary to carve or build up a mould for the lower cowling, as this is made of papier mâché (a couple of pages of newspaper applied wet in layers with plenty of photo paste, then removed and doped when dry). The top cowling is detachable, being made of thin aluminium from a biscuit tin and polished with metal polish.

It is fixed by short straight pins into the $\frac{3}{16}$ in. ply engine mount sides. The undercarriage is of 14 gauge wire bound and cemented to the firewall and finished with shim brass fairings soldered on. The cabin sides and belly former pieces are of $\frac{1}{16}$ in. × $\frac{3}{8}$ in. strip glued on and then shaped to suit the contours of the fuselage.

The Wing

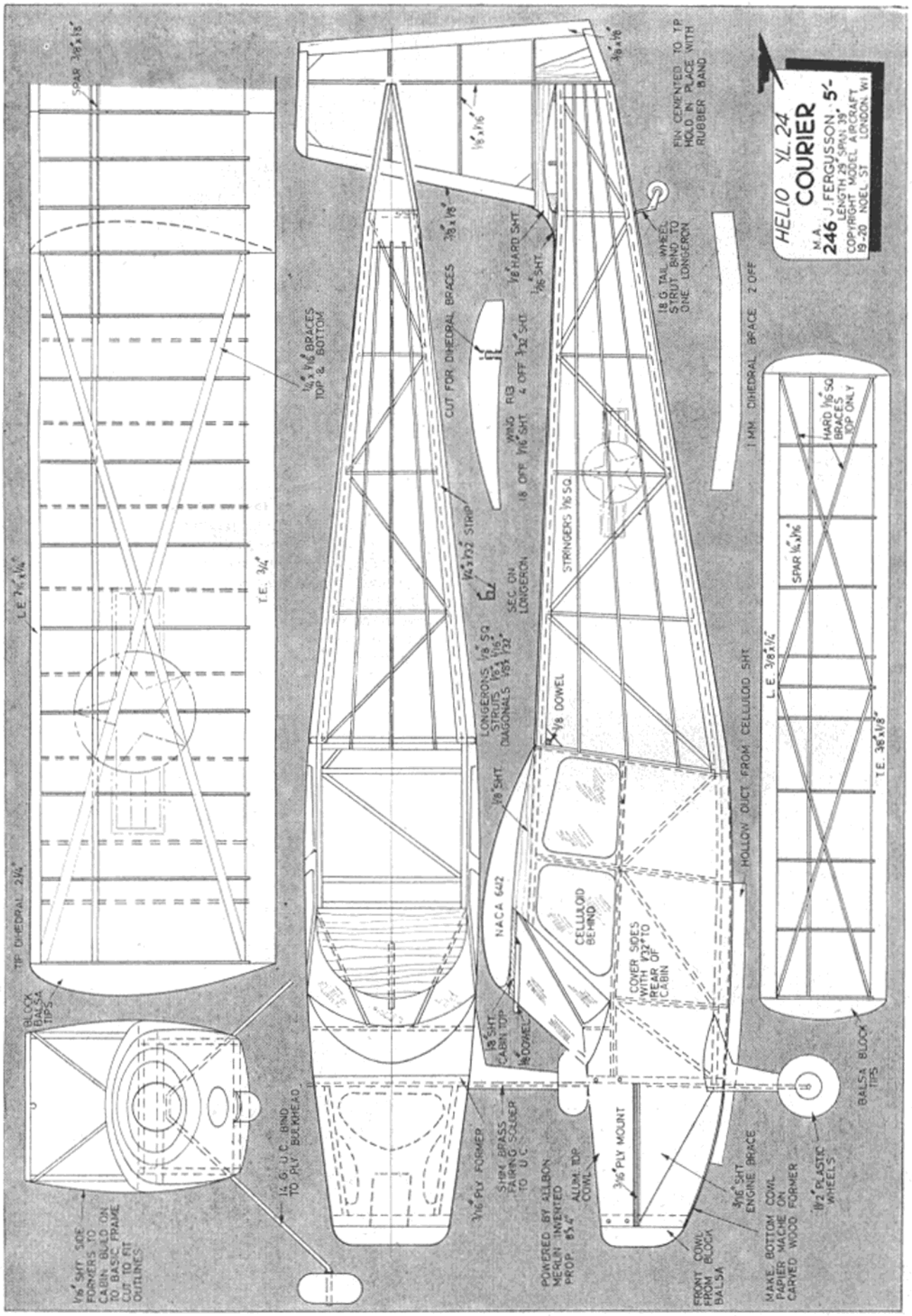
This is a simple, single spar structure with no sheet work at all but incorporating an anti-warp web structure. This definitely makes the wing and tail absolutely warp free, and greatly adds to the ability of the model to withstand hard knocks. The tail and rudder are simple enough not to cause any headaches.



Flying

The engine is an Allbon Merlin or similar motor, mounted 2 deg. right and 1 deg. down, swinging an 8 in. × 4 in. prop, the blade pattern of which is the same as the aerofoil used on the wing panels—N.A.C.A. 6412.

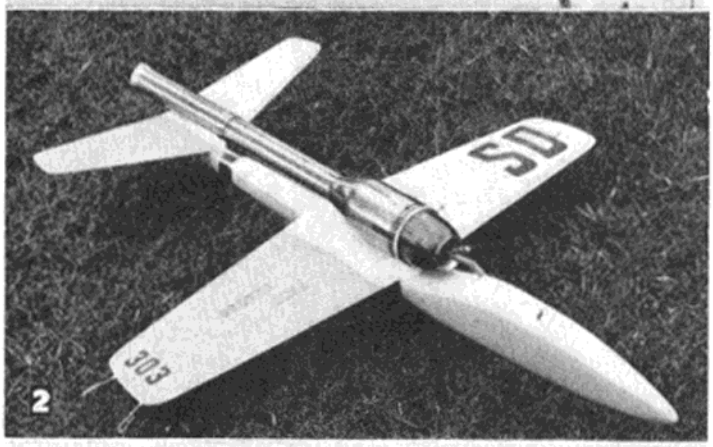
The flight pattern is left turn on power and right on glide. The climb is very steady in approx. 60-80 ft. circles and is, in fact, scale-like. The glide? Well that really is something, so be sure to fit a timer.



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. 0d., POST FREE

PHOTONEWS

1



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3

IT is never a pleasant task to reject photos that readers send to us for publication, and we thought it a good opportunity this month to list the most common faults that make a picture unsuitable.

The most obvious fault is that many of the photos are out of focus—no more need be said! Or, if the camera is too far away from the subject, the image on the negative is so small that it will not enlarge clearly. Finally, the most common fault is unsuitable background. Many photographers, once the model is in the viewfinder, are oblivious of the forest of legs and feet, the dustbin, or the wife's rockery, all of which are doubtless aesthetically beautiful but hardly synonymous with model aircraft—with the possible exception of the dust bin! So choose a neutral background, or better still a "model" one.

Photo **No. 1** this month shows better than any words the type of picture that lightens the first-thing-Monday-morning-feeling in the office. Mrs. Arnold, of the Bournemouth M.A.S., is holding aloft hubby's own-design rubber powered tailless model. Power is delivered via a feathering airscrew and although the model performs well, it has proved a little tricky to adjust.

Australian modeller Tony Farnan sent us photo **No. 2,** which is a nicely made replica of the American-designed *Squirt*. Power is supplied by the Japanese built O.S. Type 11 pulse jet, and with an all up

4

weight of 32 oz. the model should achieve the 140 m.p.h. that the designer hopes for.

Yet another American-designed model (photo **No. 3**)—this time a Piper *Tri Pacer*, built by C. Read of the Newport Pagnall M.F.C., from a Sterling kit. The model spans 59 in., is powered with a 2.49 B.R. Elfin, and looks very smart in its cream and crimson colours.

The influence of combat flying on model design is evidenced by the increasing number of flying wings seen these days in C/L circles (ugh !). The E.D. racer version in photo **No. 4** is by K. Lindsey, and at 19 oz. all up weight, with 200 sq. in. of area, it will do most stunts with ease. Mottled effect is from the camouflaged nylon with which it is covered.

That perennial favourite, the Cessna L.19 *Bird Dog*, is the subject of our next photo (**No. 5**) and this time is the work of Pete Sanderson, of Spalding, Lincs.

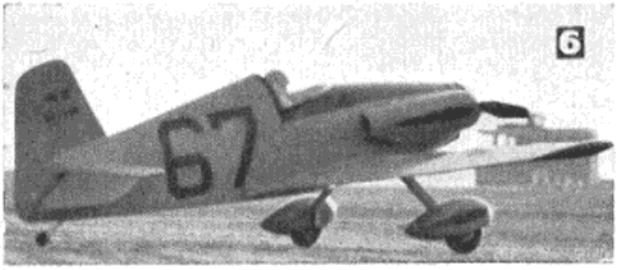
Photo **No. 6** shows how the addition of buildings in the background gives an air of authenticity to a picture. In this instance it is J. Finch's Elfin 1.5 powered *Midget Mustang* that was realistically "shot" by J. Ling's camera.

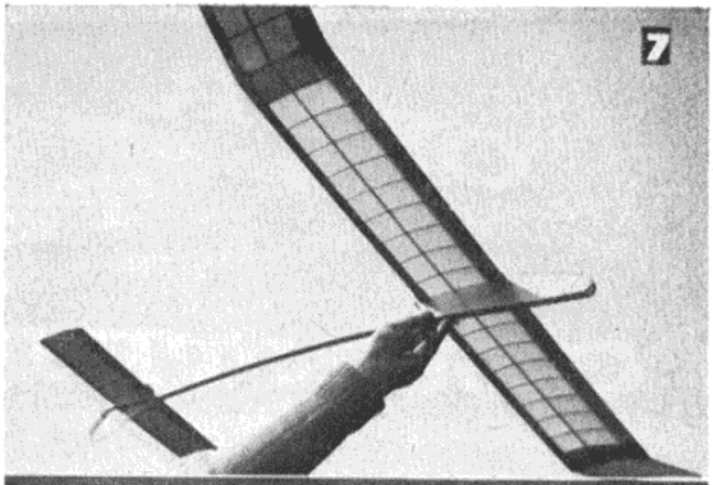
Gliders built to the A.1 formula are becoming quite popular nowadays and in photo **No. 7** we have rather a nice example built by reader Keith Saunders. This model is of 48 in. wingspan and uses an aerofoil shaped fuselage. Unfortunately no performance figures were given.

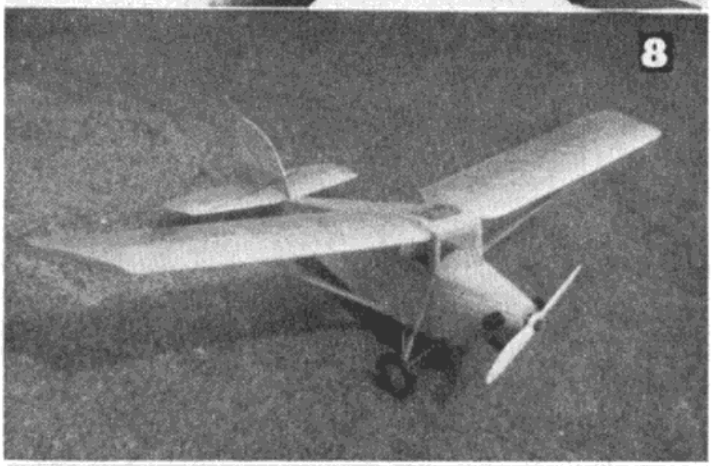
Another old favourite is the ABC *Robin* (photo **No. 8**), which appears in many guises. This one—built and photographed by P. Babb—is 48 in. span, powered by an Allbon Javelin, and is finished in silver with light blue trimmings.

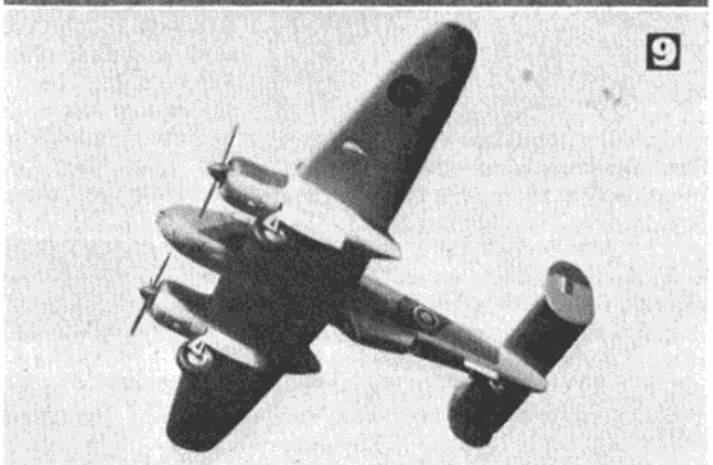
Perhaps better known for his work on low speed wind tunnel research, Maurice Gates can nevertheless turn out a nifty line in models and the nicely posed machine in photo **No. 9** is his 1/72nd scale Bristol *Buckingham*.

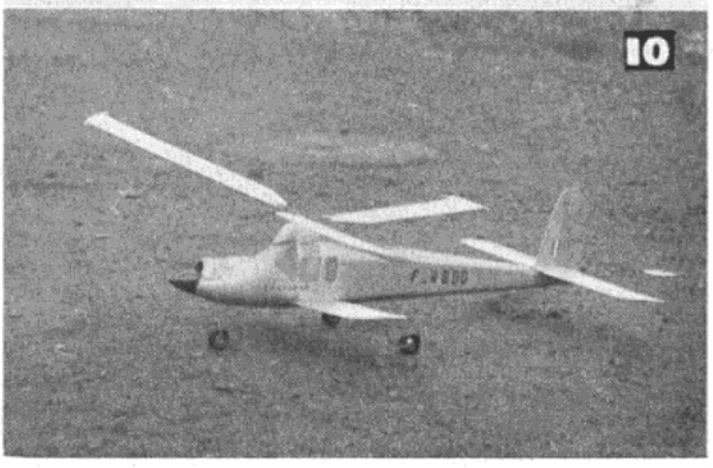
Interesting machine in our last photo this month (**No. 10**) is the Farfadet Gyrocopter, a scale F/F model built by Wilfried Kroger from plans drawn by S. Fickert. Power is supplied by a McCoy Duraglo and we are told that it performs well.





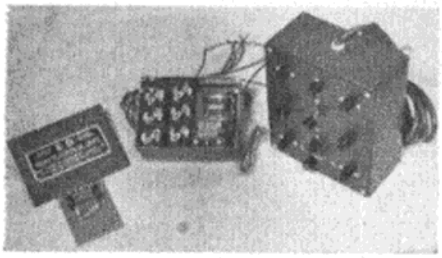






OVER THE COUNTER

On our recent visit to E.D.'s we took the opportunity to closely examine and photograph some of their R/C components. The illustration shows the six-reed unit, receiver and control box. This is the only six-reed equipment commercially available in this country, and is



deservedly popular. It did, in fact, form the basis of much of the equipment used at the recent International R/C Comp. in Belgium.

* * *

A. A. Hales Ltd. enter the model aircraft field with a range of "Yeoman" rubber-driven flying scale kits this month. Previously boat kit manufacturers, Hales' new aircraft models are something of an eye-opener for completeness and simplicity of construction. All parts are die-cut from light density balsa, and colour printed with authentic detail. The fuselage assembles on locking formers, wing dihedral is self-aligning, wing camber being formed automatically by cementing. No built-up construction anywhere, nor tissue covering.

Wing span averages 18 in. in the series which, with a 6 in. plastic propeller, gives an excellent flying performance including take-offs from smooth surfaces. Every stage in assembly and trimming is covered in pictorial detail by an elaborate step-by-step plan. Just the kits for the younger enthusiasts, and we imagine many old timers will find them just as much fun. Three models—the *Bird Dog*, *Puss Moth* and *Autocar*—should be out now, all price 5s. 11d.

* * *

The demand for more rapid production during the war led many manufacturers to devote much time to research into adhesives, and while many of those developed have little application to model aircraft, for certain jobs some of these glues—notably the "impact" type—are unsurpassed.

As an experiment we applied Evo-Stik to the ends of two sheets of ¼ in. balsa, allowed them to dry for 10 min., then brought the two pieces together with a 2 in. overlap. We then immediately tried to break the joint, but only succeeded in breaking the balsa. The use of this

adhesive for field repairs, sheet covering, etc., thus becomes immediately apparent. Until recently, Evo-Stik Impact Adhesive 528, has only been available in large containers for industrial use, but now the manufacturers, Messrs. Evode Ltd., of Stafford, are supplying it in tubes, which are obtainable from model shops at 1s. 9d. each.

It is claimed that Evo-Stik makes an equally effective joint with rubber, plastics, metal, glass, leather and fabrics.

* * *

We have recently tested some samples of a new Modelspan lightweight tissue which is of a somewhat closer texture than standard and approximately 50 per cent. thicker. Weight, however, is only very slightly up and, at 0.0278 oz. per 100 sq. in. (undoped), almost identical with that of Japanese tissue. The general characteristics remain typical of Modelspan, except that wet strength is much higher (although this tissue is not categorised as "wet-strengthened") and dope absorption is reduced.

It is not known at this writing whether or not this new type tissue will become a standard production line.

* * *

A marine version of the Frog 149 is shortly to appear with a water cooled head and matched flywheel. The conversion will, we understand, be applicable to both the diesel and glow versions of this motor.

* * *

A ducted fan model of the *Fairey F.D.2*—latest creation of Veron designer Phil Smith—was a centre of attraction at the Northern Heights Gala.

Asked whether it was prototype for a new Veron kit we were told that it was in process of development, and if successful, a kit would be considered.

Scaled at approximately 1½ in. = 1 ft. the model comes out at 39 in. span and 48 in. long—all up weight 16 oz. with an Allbon *Spitfire*. Phil eventually intends to use a 1½ c.c. motor but figures that the model should prove its ability to perform on the lower power first.

Thrust was obtained via a new type of twelve-bladed fan, and these are now being developed for production in several sizes suitable for all engines from 1 c.c.-5 c.c.

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

BRADFORD M.A.C. & LEEDS M.F.C.

The clubs' second open power contest was held at Baildon in adverse weather conditions as usual! Silvio, using an ancient and much-modified *Swiss Miss*, showed us all how and logged 5 : 24 with only two flights, despite the fact that 2½-3 min. was the limit of visibility and it was blowing half a gale. Second and third were Messrs. Pannett and Pickles, the only two out of the six entries to complete three flights, with 4 : 59 and 3 : 30 respectively.

In the Keil, although we otherwise had a glorious day, the wind direction made timing for 4 min. impossible; however, we did eventually make a belated start and concentrated the whole contest into two crowded hours. Once again Silvio was way ahead with 11 : 16, which included two max's; Arthur Collinson came second and J. A. B. Pannett next, with 8 : 47 and 7 : 20; eight flew in all. Our one entrant in the Frog Junior, Pete Rennison, recorded 4 : 41, with a lightweight rubber model.

We attended the Woodford Rally in force, but although several of us started or finished well nobody returned a perfect score. Best in power was—again!—Silvio, with 5 : 41.

SCOTTISH AEROMODELLERS ASSOCIATION

Scottish modellers had a very successful weekend at the Nats. G. Wilson, Maybole, won the super scale trophy with his authentic model of the Prestwick *Pioneer*. J. Harris and J. Muir, of Prestwick, using a Muir tuned *Oliver*, were second in Class A and were unlucky not to carry the trophy back across the border. A. W. Barclay, Perth M.A.C., using one of his home brewed Etas, was third in class B.

Three new S.A.A. speed records have been ratified. R. Irvine, Perth, did 130 m.p.h. in Class V with a *Barclay McCoy*; A. Barclay, Jnr., Perth, did 107 in Class III, using Barclay's Eta; N. Carr, Dundee, did 98 in Class II, with an O.S. Max.15.

HALIFAX M.A.C.

Eight members went by Rolls-Royce to the Nationals on Whit-Monday—and the 'orrible man at the gate charged us instead of bowing us in. Our flying was not in the Rolls class, however, showing evidence of a long period of weather unconducive to trimming. H. Hirst was our top scorer with 8 : 47 flying his heavy 190 sq. in. lightweight.

And so to the Trials where K. Grant scored 11 : 28, and got soaked by falling into a pond climbing a tree looking for a Wakefield that was not lost. It's true, a branch broke, and the model had been returned. Ken Attiwell scored 10 : 10. Lady Luck did not look after them that day. J. Magson also had an off day in the A/2.

The lightweight craze should not last long now the new rules are postponed. We were rather reluctant to shelve some very promising Wakefield designs, for this is mainly a Wakefield club. And maybe we can prang some of these three-year-old faithfuls within the next year.

ENFIELD D.M.A.C.

We are now beginning to find things a bit hectic as the season progresses, from the competition side, our recent clash with Brentford in the L.D.I.C.C. first round resulted in a win for us, alhough in view of the atrocious weather we feel this was probably more luck than judgment! At Stratford, Don Walker, piloting with Ray Tuthill as mechanic and Jim Moseley assistant, cleaned up the class B again, with the fastest time we have so far recorded, an average of 81 m.p.h. in the final.

ENFIELD GALA REPORT

Once again the Enfield C/L Rally ran off very smoothly in almost ideal weather conditions, warm and with only the lightest of breezes. The result was some very good flying by the large entry, although the times in the T/R were in general rather slow. In the Speed and Combat however the performances were excellent.

Two new British records were established. Mike Bassett of Sidcup broke the class 1 record with his Oliver Tiger Cub model, at 87.0 m.p.h. "Gadget" Gibbs, extracted 159.8 from his Checksfield/Carter/McCoy 60 model. This almost qualifies as a new world record. In addition to this he also pushed the "Nipper" up to over 125 on 10*thou* lines.

Once again the speed resulted in a "photo finish," and after several rechecks, Gadget got the verdict by .3 per cent.

In the combat there was some very hectic flying in the heats and semi finals, and after 2 rounds there were 4 competitors still in the running. The 4 elected to go straight into a 4 up finals, then the fireworks really began! J. Templeman of Sidcup with his Oliver powered wing finally chopped his way into first place (still in one piece too!!!) followed by Martin of Chingford, a long way behind.

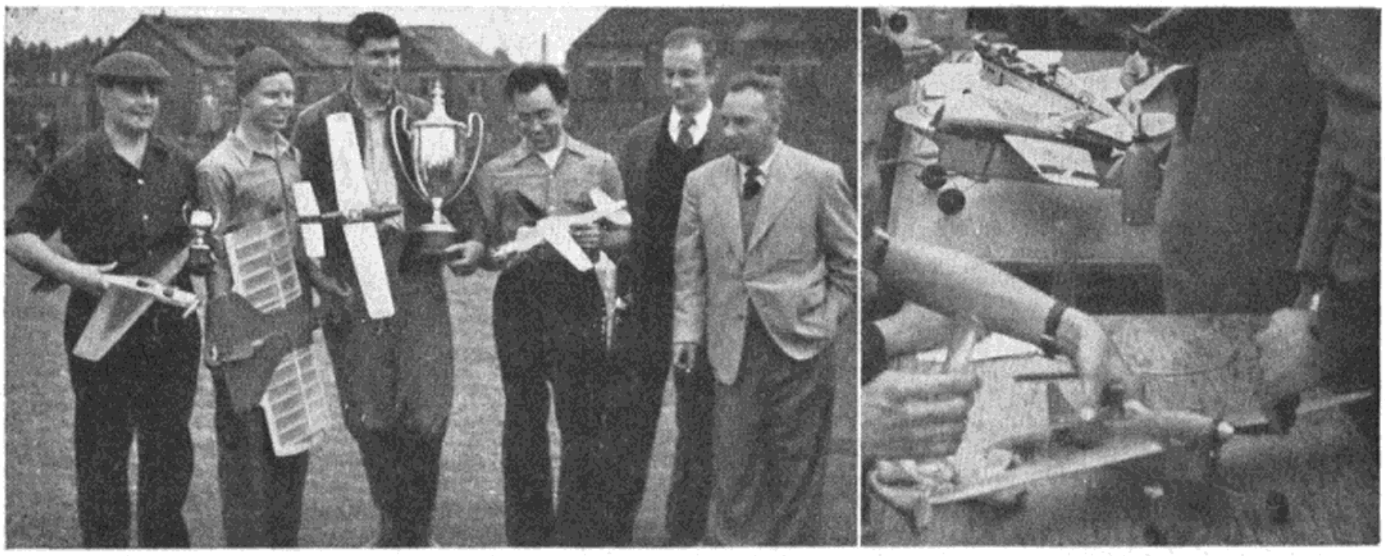
In the T/R everything went off very smoothly. Class A went to Dick Edmonds of High Wycombe with the "Time Traveller." Class B went to Sid McGoun, West Essex, with his new model which was doing 103 m.p.h., the slow time being accounted for by having to change a prop, which then promptly broke again as soon as "Stoo" flicked it, and had to be changed again.

Results: Class A Team Race: 1, Edmonds, R., High Wycombe, 8 : 38. Class B Team Race: 1, McGoun, S., West Essex, 9 : 15.4. Combat: 1, Templeman, J., Sidcup. Handicap Speed: 1, Gibbs, R., East London, 103.4 per cent., 159.8 m.p.h., 10 c.c.; 2, Bassett, O. M., Sidcup, 102.9 per cent., 87.0 m.p.h., 1.5 c.c.; 3, Gibbs, R., East London, 98 2 per cent., 125.2 m.p.h., 2.5 c.c.; 4, Edmonds, R., High Wycombe, 92.5 per cent., 101.6 m.p.h., 2.5 c.c.

COVENTRY AND D.M.A.C.

Our congratulations to Ron Draper, who just missed the British power team last year, but who made it this time by placing second in the trials. We wish him every success in the coming world championships. Our only other trials competitor, L. Watts, in the A/2 class, found the usual downdraughts that seem to follow him around the contests, and he only totalled just under 7 min.

At the Midland Area Rally at Wellesbourne, he club put up a good show against some stiff opposition, and took one second and two third places. R. Minnion placed third in the glider with a couple of max's and then hit a downdraught to total over 9 min. In the power event, Ron Draper came second again, just missing a maximum score by 2 sec. A. Barr came third with two max's in 3 min. 9 sec. It is interesting to note that both these members



Enfield C/L Rally. Left: All the winners. See Enfield club report for full details. Right: Line up of models at T/R check.

Jeff Moulton (Chester M.F.C.) with the A. V. Roe Junior Champion's Trophy, presented for the first time at the Stockport Express Rally.

were flying identical models—Ron's design F.A.I. power job *Criterion* 62, and both Torp 15 powered. Fourth place was taken by J. Bickerstaffe, of Rugby, flying a 56 in. version of this design.

In the Keil Trophy on the same day, and in conjunction with the power event, R. Draper's and A. Barr's times put them second and fifth respectively in the National results.

BRIGHTON D.M.A.C.

The year seems to be proving a very successful one from contest results so far. Alan Mussell placed fourth in the Hamley, while at the Nats. Reg Boxall placed first in the Thurston after a fly-off and Alan Mussell third in the P.A.A. load event. At the Trials Fred Boxall once more reached the British team, this time in A/2, placing second and in the Wakefield Reg and Fred came tenth and twelfth.

Alan Mussell cleaned up the power event at the West Hants rally flying his *Kismet*, while Peter Brown came fourth with a *Zoot Suit*.

WEST OF SCOTLAND

Contests just lately have been following one another at the rate of almost one per week. At the Area gala day, at Lanark, Joe McMaster's model climbed fast to win power. Clubmate J. Findlayson won the rubber, while R. Sleight took the glider title to Prestwick.

The Scottish Nationals were held at H.M.S. *Condor*, near Arbroath. The results showed no great upheavals, R. Parsons, Prestwick, won the power, clubmate R. Sleight the glider, and J. Findlayson retained the rubber trophy. The blustery conditions resulted in a rather unusually high number of models left in the cornfields, which lay downwind from the 'drome. The results of the eliminators for the Scottish U.K. team are:—

Glider: R. Sleight, B. Harris, W. Meechan, A. Smith; Power: R. Parsons, M. McMaster, G. Blair, J. Muir; Rubber: J. Findlayson, J. Robertson, J. Ouston, D. Petrie.

We welcome newcomers Smith and Petrie to the team, and remind all members that two trimmed models are essential.

CARDIFF M.A.C.

Recently the club has been a hive of activity, the reason being that we have a model engineer exhibition at Sophia Gardens Pavilion, Cardiff, from September 9th to 16th.

The task of organising flying displays and an exhibition of, we hope, approximately 300 models, has fallen to us.

We are organising flying displays in various parts of the city and we are also having slides showing models advertising the exhibition, which will be shown at all the principal cinemas in and around Cardiff.

JARROW M.A.C.

Last month we combined with South Shields M.A.C. to pay a visit to Woodford. An enjoyable time was had by all, although we returned home empty handed. Our power fliers seemed to have caught "starter's cramp" from the South Shields lads and a great deal of energy was spent in fruitless flicking.

Scale man, N. Smith, came in third in this event with his superbly detailed *Tiger Moth*, which is complete down to the pilot's cigarette and the cockpit "no smoking" notice. Our cheers were cut short, however, when we discovered that prizes in the scale event were awarded only to second place. We were not impressed by the small size of flying area allowed, but the boys *were* impressed by the combat, the high climb jobs—and a girl called Mildred !

KIRKCALDY M.A.C.

The local model shop proprietor (also a modeller) supplied some old kits for auction in aid of the S.M.A.E. International Fund—they raised about 30s. A sheet of genuine pre-war Jap tissue sold for 2s. 9d. Hotted up E.D. racers are the order of the day at the moment with an Oliver Tiger in the club's possession and three more on order. G. Smith had to have stitches inserted in his hand when his K. & B. 29 back-fired while starting. Ron Frazer damaged his radio gear in a complete write off recently.

CHEADLE D.M.A.S.

At long last the club managed to clean up at the local Woodford rally. Responsible for this achievement were Garth Evans, who gained the first in rubber with two 3 min. max's plus a 6 min. fly-off; Wally Nield, who put up the top glider time of 5 : 22; and P. Gibson, who managed 4 : 05 to top the junior power times. Also prominent in rather a different manner were the C/L boys, Tom Jolley and Neil Francis, who, in organising the combat event, produced the most fantastic amount of carnage yet seen at this meeting.

HAYES M.A.C.

So far this season we do not seem to be attaining the same degree of success as last year. Nothing was won by our members at either the Midland Area or the W.H.A.A. gala at Andover. J. Baguley, however, was very unlucky at the former, having two clear max's in rubber, and then using a smaller model, having a third clocked off at about 2 : 30. He finally placed fifth. E. R. Welbourne attained the same placing at Andover in glider, with J. Marshall seventh, these places being due to the small entry, not to high times.

Our efforts at the Northern Heights gala were attended with even less success, J. Marshall scoring a near max. in the first Queen's Cup flight, but then had a motor blow out. A happier note is struck by the Irish member of the club, John Thomson, placing top in his country's power team.

HALIFAX M.A.C.

We have not exactly had the luck of the draw in this year's Northern Area Knock-Out Competition. We drew Bradford, second last year, and beat them in the first round. In the second round we drew Hull Pegasus, last year's winners, and on July 1st we spoiled their hopes of a double victory. The contest, flown on a windy, sunny, stormy day (yes, we had the lot !) ended dramatically when Hull, having lost two models and broken one, retired at 7 : 57 for four flights. Halifax then had 8 : 58 from five flights with all models in hand.

CROYDON AND D.M.A.C.

Last month we held our annual gala. For once the weather was ideal, overcast and very calm in the morning and sunny in the afternoon and still calm. The entries were not as good as was hoped for, but the quality of flying was, on the whole, good. In the rubber fly-off R. Lennox of Birmingham beat one of the Boxalls (can't remember who was wearing the brown shirt) by just over 45 sec. Easily the most popular event was the slope soaring. Each competitor had five flights, the best three counting with a minute maximum. Unexpectedly a fly-off was needed to decide the winner. It was between J. Baguley, flying an 8 ft. stick model and B. Cox, flying an A2. They both launched together and flew close for the first minute and then each went its own way. Baguley eventually was the winner with 4 : 07 and Cox second with 1 : 42. R. Lennox was also presented with the Thurston Trophy and declared the gala champion

Results

Rubber

1. Lennox, R.	Birmingham	12 : 00 + 5 : 16
2. Boxall ..	Brighton ..	12 : 00 + 4 : 30
3. Hedgeman, P.	Hayes ..	12 : 00 + 2 : 26

Power

1. French, G. ..	Laindon ..	12 : 00
2. Fuller, G. ..	St. Albans ..	11 : 08
3. Posner, D. ..	N.W.M. ..	11 : 00

Glider

1. Lacey, P. ..	Henley ..	11 : 17
2. Baguley, J. ..	Hayes ..	11 : 11
3. Partridge ..	Whyteleaf ..	10 : 19

Slope Soaring

1. Baguley, J. ..	Hayes ..	3 : 00 + 4 : 07
2. Cox, B. ..	St. Albans ..	3 : 00 + 1 : 47
3. Taylor, J. S.	Watford ..	2 : 58

Chuck Glider

Barker, J. ..	Surbiton ..	2 : 03

SEAHAM & D.M.A.C.

For the first time for many years the F/F brigade have made some (temporary) converts from the C/L addicts. This is because the club championships are in full swing. Leaders at present are Tom Oliver and Bill Hume, and the leading junior is J. Calvert. The Sailplane was won by Jack Armes, who turned in the best times of the day in any class. Rubber was won by Bill Hume, whose model had the most peculiar performance any of the club had ever seen. It climbed no higher than 20 ft. or so and stayed there for an average flight of 1½ min. !

After 10 years of discussion we at last have a club badge. It consists of a particularly repulsive demon (or devil) standing on a scroll bearing the word "Hellraisers." The demon is black and the background white. The design was by George Wylie. The names of the recent designs are interesting. "Hellhound," "Sathanus," "Bogey," "Temptress," etc.

DERBY M.A.C.

The loss of a glider at each of the comps. we have attended (Nationals, Woodford) this year was offset in a way by K. F. Leeson's fifth place in the Thurston Cup. The F/F boys are seriously considering R/C as a lesser evil than "hunt the glider."

We now have a proper cup for our C/L version of the famous Kings Cup.

Run on similar lines to the full size, we limit engines to 1.5 c.c. and models must complete 50 laps per tank to qualify. Pit stops not allowed. Models must be semi-scale or scale.

ASHTON M.A.C.

The Clwyd slope soaring contest was well attended by the club and for the third year in succession J. Chadwick came away with a medal. His 6 : 35 o.o.s. to win first place in the open contest speaks well for his slightly modified job which he has used these last three years.

Congratulations to Dave Jackson on gaining third place (joint) in the Astral. We are hoping he will be more in the news in 1957.

The Woodford Rally brought the club out in full force—Jack Arden smashing his way to second place in combat and K. Pratt obtaining fourth in Jetex. B. Hay just failed to get the junior championship by a few seconds.

CHANGE OF ADDRESS

NORTHAMPTON M.A.C. F. E. Smith, 19, Broughton Place, Eastfield, Northampton.

CONTEST CALENDAR

Aug. 25-26th		Scottish P.A.A. Rally, R.N.A.S. Station, Abbotsinch, nr. Glasgow.
,,	26th	South Midland Area Rally, Cranfield, Beds.
		Devon Rally, Woodbury Common, nr. Exeter.
Sept.	9th	*K.M.A.A. CUP. A/2 Glider. HALFAX TROPHY. F.A.I. Power.
,,	16th	All Brit. Rally, Radlett, Herts.
,,	23rd	*MODEL ENGINEER CUP. Team Glider. GUTTERIDGE TROPHY. Wakefield.

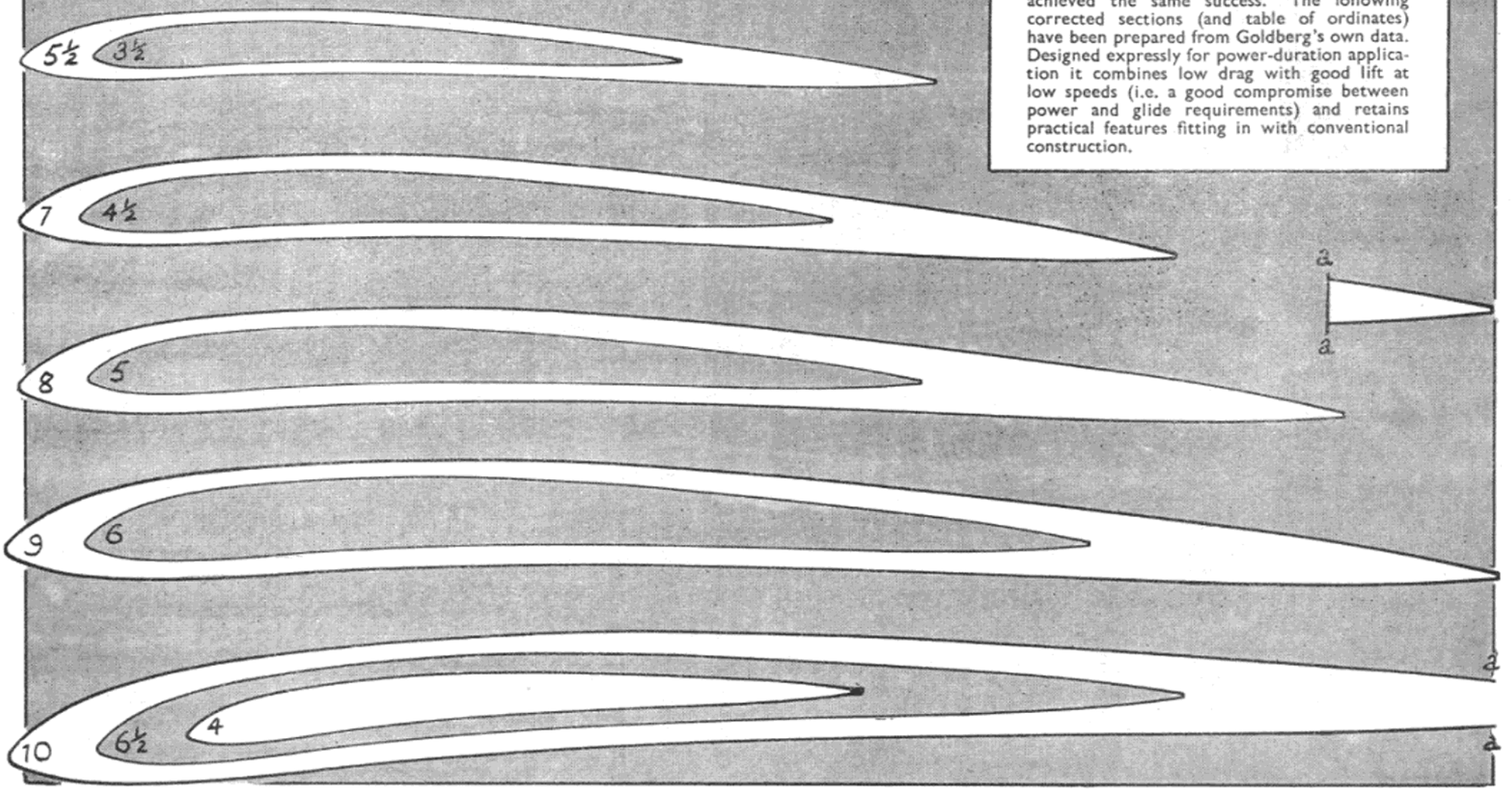
*Plugge Cup Event Area.

STATION	0	2·5	5	10	20	30	40	50	60	70	80	90	100
UPPER	5·1	8·0	9·0	10·0	11·1	11·3	11·2	10·7	9·8	9·0	8·0	6·7	4·6
LOWER	5·1	3·9	3·6	3·5	4·0	4·4	4·5	4·4	4·1	3·9	3·6	3·8	4·3

GOLDBERG G–6

(corrected)

The section published previously under this heading, although drawn from a normally reliable source, was not an authentic reproduction of Goldberg's original. It does, in fact, correspond quite closely to a later section in the same series but one which has not achieved the same success. The following corrected sections (and table of ordinates) have been prepared from Goldberg's own data. Designed expressly for power-duration application it combines low drag with good lift at low speeds (i.e. a good compromise between power and glide requirements) and retains practical features fitting in with conventional construction.



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SPECIAL ATTRACTIONS

Demonstrations by craftsmen of the skills needed in model making, including Mr. Robert Thorogood who will be building a solid scale model similar to the one with which he won the 1955 Championship Cup. Miniature coal-burning locos on the live steam track. Rail-car racing track with miniature petrol-engined racers. Two intricate model railway layouts. Full size model of locomotive cab with the usual controls. Steam-driven fairground roundabout. Also on the Marine Tank will be a control-line model, built by the Epsom & District M.F.C., of the Supermarine S6B seaplane. The model's speed—25 m.p.h.—represents the proportionate speed of over 400 m.p.h. by which the S6B won the Schneider Trophy in 1931.

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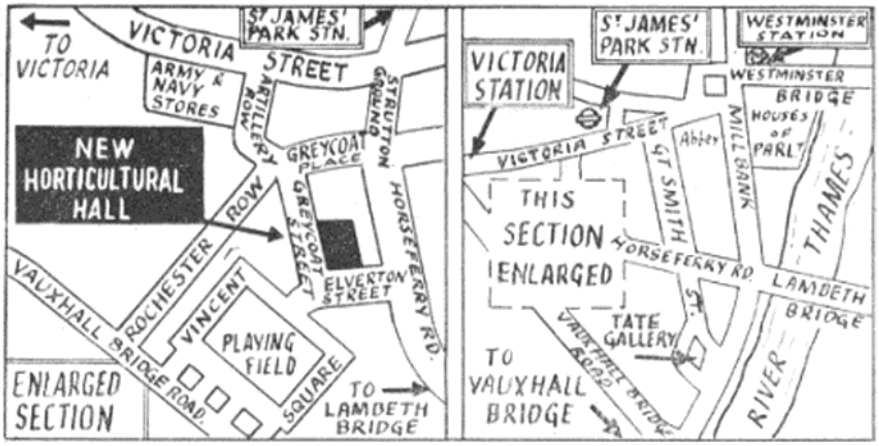

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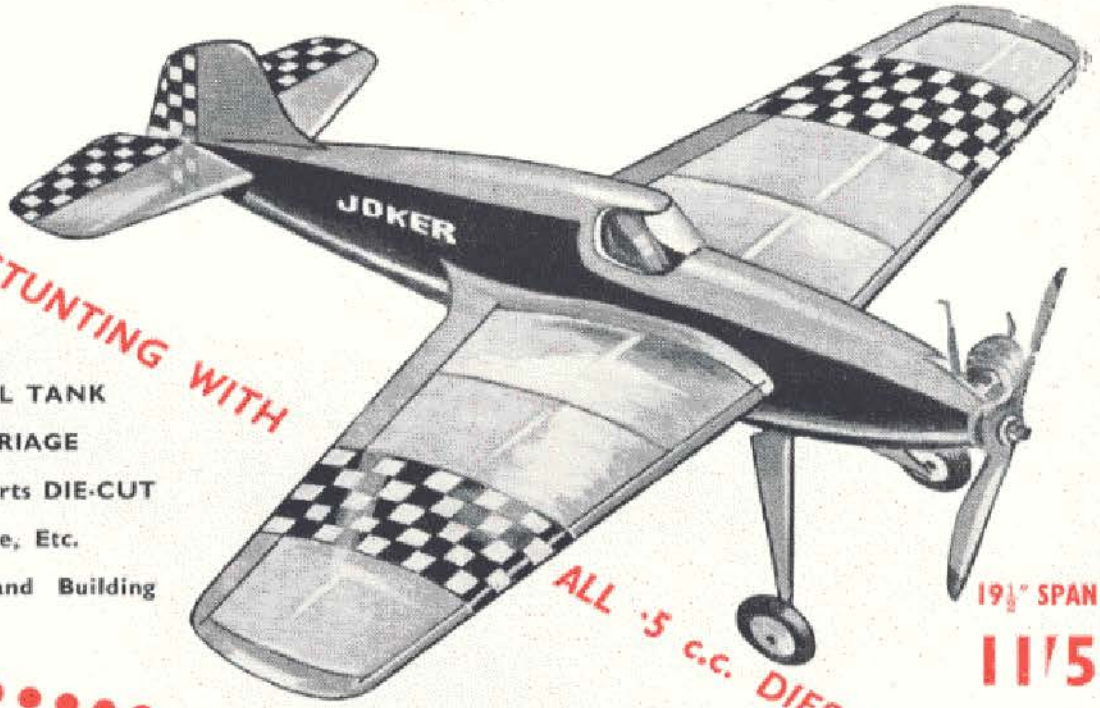

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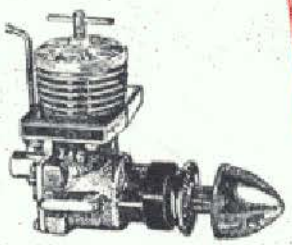

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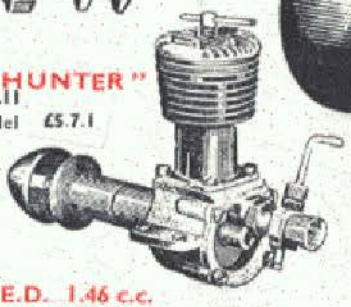

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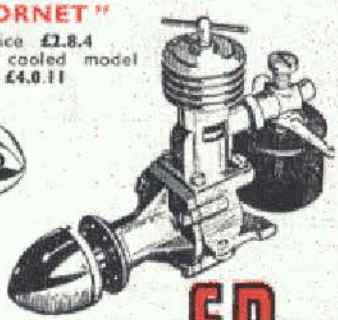

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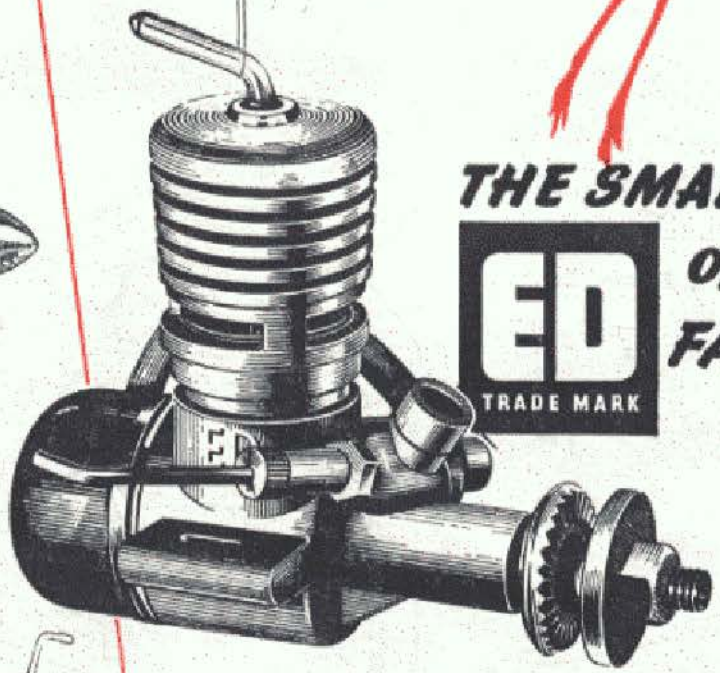

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