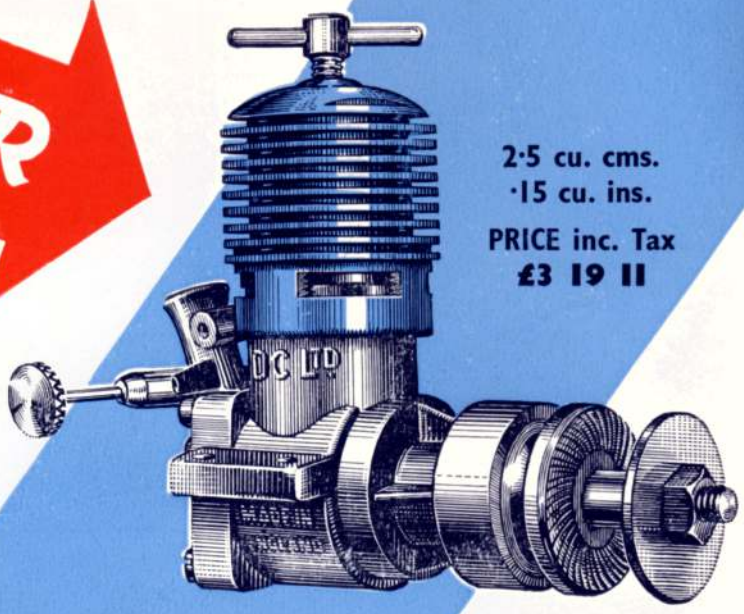
AERO MODELLER

APRIL 1959

- **Super-detailed Bristol Bulldog IIa drawings for modelling**
- **New racing engine reviewed**
- **Latest in home-built radio control**

1'6

RAPIER



2·5 cu. cms.
·15 cu. ins.

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For the Expert . . .

Leading contest modellers are finding the Rapier ideal for international class competition flying. Easy starting and top rate performance are rapidly increasing its reputation on the contest field. Twin ball races give friction free running and a domed piston and 360 degree porting give maximum gas flow efficiency. The downdraught carburettor with rear rotary valve induction plus refinements such as the positive lock needle valve and provision for two-speed control all contribute to produce an outstanding motor.

Engineered to last a Modelling Lifetime!

Mk II SPITFIRE

1·0 cu. cms.
·06 cu. ins.

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For the Beginner . . .

A worthy successor to the original Spitfire with all its virtues of easy starting, flexibility and long life maintained, plus sparkling increased performance. For your first power model this is the ideal motor and one that will give years of faithful trouble-free service

We thank our customers all over the world for their interest and enquiries regarding the D C Twin. This unique motor will be available to modellers during April 1959. Orders should be placed with your local model shop to avoid disappointment.

DAVIES CHARLTON LTD., Hill's Meadows, Douglas, Isle of Man

the SOLARBO BALSA STORY

continuing

Following his return from a tour of the Americas, John Paterson, Managing Director of Solarbo Ltd., takes up the story of Balsa wood and its many applications from the last article appearing in the November issue . . .

ABOUT LIQUID GAS STORAGE

THE SCHEME FOR handling liquid gas up the Mississippi, which I described in the November issue in actual fact was never brought to fruition.

A considerable amount of work was done and a vast amount of money was spent, and from it no doubt many lessons were learned. A barge 264 ft. long and 52 ft. wide with five tanks 40 ft. diameter were constructed and these tanks were lined on the inside with a 12 in. thickness of Balsa wood.

I was told when I was in the United States recently that they did get to the point of filling one of these tanks with liquid methane or liquid nitrogen, but the Balsa wood insulation lining failed and cold spots occurred on the outside of the tank. I must make it clear that I have this information second-hand, but I have every reason to believe that it is true and indeed, I gave my opinion when I first heard about the work that the Balsa wood used in the way they were doing would not stand up to the shrinkage stresses set up by the very low temperature.

In these tanks, the Balsa wood was put in in layers with the grain of the wood running always circumferencially round the tank. A very elaborate apparatus was designed to do this, and it was suggested that the Balsa wood would be put in a state of compression so that it would not shrink as much under the impact of the very low temperature.

To put that more simply, you know that all materials shrink with cold and also if you put a piece of wood in a vice and squeeze it, it will compress. These two things are similar; they both make the material get smaller, but I don't think they are really quite the same thing, and certainly not with a piece of Balsa wood. In the first case, the individual fibres of the wood shrink in themselves and in the second the actual cells in the Balsa wood are compressed.

I have always insisted that if you want to use Balsa wood to get the maximum utilisation of its strength, you must cross-laminate it. There is nothing new in this. This is why you have plywood. But with Balsa wood I think it is even more important, because Balsa wood is very weak in certain respects and surprisingly strong in others.

Let me give you some figures from actual series of tests which we had carried out in connection with the work we have done on this natural gas problem and which I shall describe in a later article.

Compression with the grain, *i.e.*, on the end grain	800 lbs./sq. in.
Compression across the grain	100 lbs./sq. in.
Tension with the grain	2,500 lbs./sq. in.
Tension across the grain	150 lbs./sq. in.

Balsa wood is also weak in what is known as longitudinal shear, or in ordinary words, splitting down the grain. You modellers all know this and you can see that if you put another piece of Balsa wood crosswise, you tend to stop the first piece of Balsa from splitting.

In an earlier article in this series, I did tell you what tension and compression were. If a single piece of Balsa wood is subjected to very low temperature, it is going to try and shrink both longitudinally and across its width. If you think of a piece of Balsa wood being held all round its four edges so that it cannot actually shrink, then in trying to shrink, it will put the wood in tension. In other words, it's trying to pull away from its edge holding.

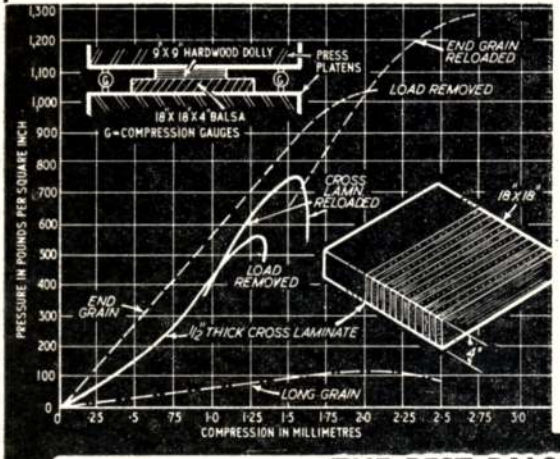
Now if you look at the figures above you will see that in order to pull it apart, by pulling from the ends of the wood, you have to pull with a force of approximately 2,500 lbs. per sq. in., but if you try and pull it apart across the grain, it will only stand about 150 lbs. per sq. in.

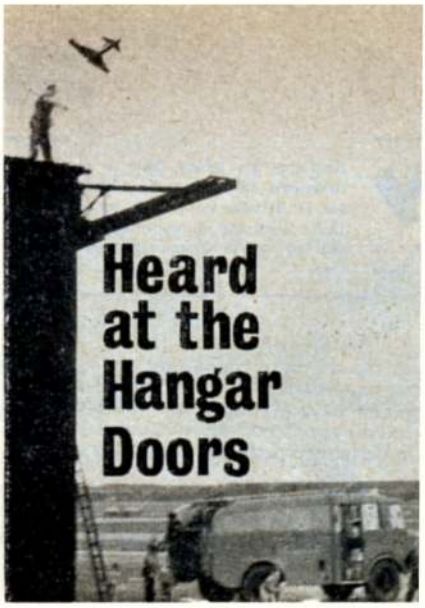
You can see therefore how cross-lamination stops the wood from splitting.

Let's look now at what Balsa wood will stand in compression. If you look at the figures you will see that Balsa wood loaded end grain will take 800 lbs. per sq. in., but if you put a load on the side grain, it will start to crush at 100 lbs. per sq. in.

If you take a piece of cross-laminated Balsa wood looking like the sketch and you put it in a hydraulic press and test it, you will find that it won't just take a load of half the two compression figures I have given you above, but will take something more than that. The reason for this is that the pieces of Balsa wood with the grain going longitudinally now act as a beam and use the strength of Balsa wood in tension in the strong direction.

In the graph opposite, you will see some relative figures showing how strong this cross-laminated Balsa wood is. These figures are not from the same source of fact as the others I have given and they show another curious thing about Balsa wood.





AERO MODELLER
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Editorial Director D. J. Laidlaw-Dickson

Advertisement Director C. S. Rushbrooke

Editor
R. G. MOULTON

Editorial and Advertisement offices:
38 CLARENDON ROAD, WATFORD, HERTS.
TELEPHONE: WATFORD 32351 (Monday-Friday)

CONTENTS VOLUME XXIV
No. 279 APRIL, 1959

Special features

Regular features

On the Cover: Bristol Bulldog—Photo by courtesy of the "Aeroplane".

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:

MODEL AERONAUTICAL PRESS LIMITED. SUBSCRIPTION RATE: (Inland) 23/-, (Overseas) 22/- per annum prepaid including the special Christmas Number.

Quick Change!

All clubs affiliated to the S.M.A.E. will have read in their copies of *Model Flying* as issued in February, that the ½A team race specifications are to be amended to adopt the previous Class A model size (that particular class having already been changed to meet the current F.A.I. specs.). The change arises from a proposition by the London Area and is based in effect on two reasons. Firstly, it was deemed advisable to extend line-length when it was found that the hot stuff ball-bearing 1·5 engines were taking the small 55 sq. in. models around at up to 80 m.p.h. on the 38 ft. 2½ in. radius. To extend lines to the next convenient length of 42 ft. 6 in. meant a loss in control over the small airframe in strong wind conditions. Secondly, the large number of now obsolescent Class A models, kits, plans, etc., could be put to good use in offering a more convenient model size to meet the requirements. The proposal was adopted and a decision made in Council to pass the matter to the rule book committee.

The point that strikes us about this procedure is that there will be a lot of people who would rather have seen a price limit put upon the type of engine used, or a rule eliminating ball-race engines. This would have brought the ½A class back to its proper position as one for the impecunious—for want of a better term—a "Junior" class. What can the pioneering Cambridge M.A.C. and R.A.F.M.A.A. think of such a sudden change. They introduced the up-to-1 c.c. racer purely for fun. We did our best to encourage it, and several manufacturers are launching, or about to launch, simple kits to suit the lads. We are strongly reminded of our words of last August when we forecast that two seasons of ½A would see development butting its never-satisfied head against the tough barrier of purchasing power and who can afford the fastest engine. (Page 432, if you wish to refer.) Those two seasons seem to have flown very quickly!

Did the Area delegates attending this decisive Council meeting weigh the pros and cons with the backing of personal experience in flying ½A? Did the delegates attend the meeting with full briefing from their respective areas on the subject? If the answers to these questions is negative, then we can only say that the change has been signed, sealed and stamped with undue haste and that in twelve months' time we shall see a plea for yet another class based on the original Cambridge or R.A.F.M.A.A. rules.

British Nationals

The annual Whitsun event moves from Waterbeach this year to R.A.F. Station Scampton in Lincolnshire. This is the aerodrome that is so vast, it extends across the A15 major road north of Lincoln and has created a several-mile-detour for motorists. It is a "V" bomber base, and both security and the litter problem will be keenly observed. Be sure to take back all you bring there—including the tissue pieces and especially those fuel bottles and tangled lines.

New Record Schedule

The introduction of new classes and categories for lightweight models has meant that no less than 62 different record categories exist in the S.M.A.E. lists and this unwieldy total is now proposed to be clipped to 38. By deleting special categories such as Wakefield, A/2, lightweight, etc., and combining the power classes, outdoor records would make up a list of 25 and indoor another 13. Such a streamlining will give better prominence to the outright record for each class of model with division only for the various configurations. For example, in Rubber, the duration records would apply to monoplane, biplane, canard, scale, tailless, helicopter, rotorplane, float plane, flying boat and ornithopter without distinction in size or weight apart from the limitations of the S.M.A.E. general rules.

Coincidence?

We had just planned the heading picture for this feature when by airmail from Convair came the picture at top right. This shows the projected Mach 3 airliner of the future. Note the canard layout, the 1970 supersonic look that calls for subsonic performance over populated areas to avoid boom damage and noise. Fuselage walls will have to be water cooled, and windows replaced by

T V screens. What does such an awesome project have to do with aeromodelling and the heading picture? Take a closer look and you'll see that the model being "rescued" by the R.A.F. Fire Service from a hangar roof bears a striking resemblance to the Convair machine. We can be sure that the Convair canard will fly—the model has a very stable flight pattern and the shape has long been employed by our staff members Doug McHard and Pete Holland.

Appeal for information

A register of aircraft of historical importance and existing in Great Britain is to be compiled by the Royal Aeronautical Society and this may be taken as the first step towards a National Aeronautical Museum. Information is needed to re-fit the present Nash and Shuttleworth collections, especially for the Fokker D VII and Farman types. If you have any literature or knowledge of the vintage aircraft in these Collections, the information would be most welcome.

Many lofts and attics still hold relics of the past and the Royal Aeronautical Society appeals to all who might know the location of such treasures to write to the Secretary of the Committee, A. S. C. Lumsden, Royal Aeronautical Society, 4 Hamilton Place, London, W.1.

Passing of a Pioneer

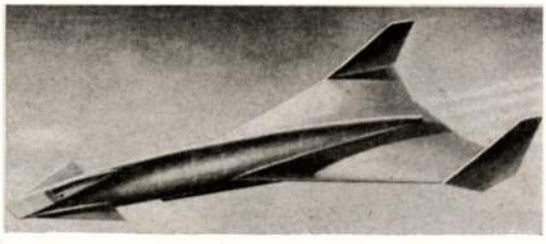
Frederick James Camm, editor of the George Newnes *Practical* series of publications, died on February 20th aged 63 years. The aeromodelling movement will always owe a great deal to "F.J.C.", brother of Hawker's more famous Sir Sydney, and indeed only last month, in our Jubilee reminiscences, it was recalled that the S.M.A.E. title was adopted on a proposition of his. His many-sided interests as an horologist, cyclist, model engineer, radio technician and editor have tended to push into the background his aeromodelling activities. When still in his teens, before the 1914-18 war, he designed and built an 8 c.c. petrol aero engine of considerable merit, and later in 1937 produced one of the earliest then sub-miniatures of 1·155 c.c. Another of his claims to aeromodelling fame was the introduction to this country in 1931 of the now ubiquitous balsa wood. Throughout his life he maintained a close and active interest in aeromodelling, holding at various times the model-editorships of *Flight*, *Aeronautics*, *Aircraft* and *Flying*, and organising the model section of the annual Royal Aero show until its cessation. As editor of *Practical Mechanics* he published regular articles on all aspects of aeromodelling, and only in recent months produced a most valuable publication on radio control. We knew him personally for some thirty years, and valued his praise and kindly criticism: we mourn his passing and will feel his loss.

"Oh, why are we waiting?"

The *Daily Herald's* "Letter of the Day" for February 7th read:

"Model plane enthusiasts in Russia are given Government subsidies. We aeromodellers in this country do not ask for subsidies, but only for space in which to fly our planes. As it is, we are hounded by local bye-laws, and forbidden to fly from many playing-fields and open spaces. If this country wants scientists and technicians it must foster them in their youth."—ALAN COSWELL (aged 16).

We salute Alan's sentiments and applaud the *Herald* for publishing them, but isn't it the old, old story?



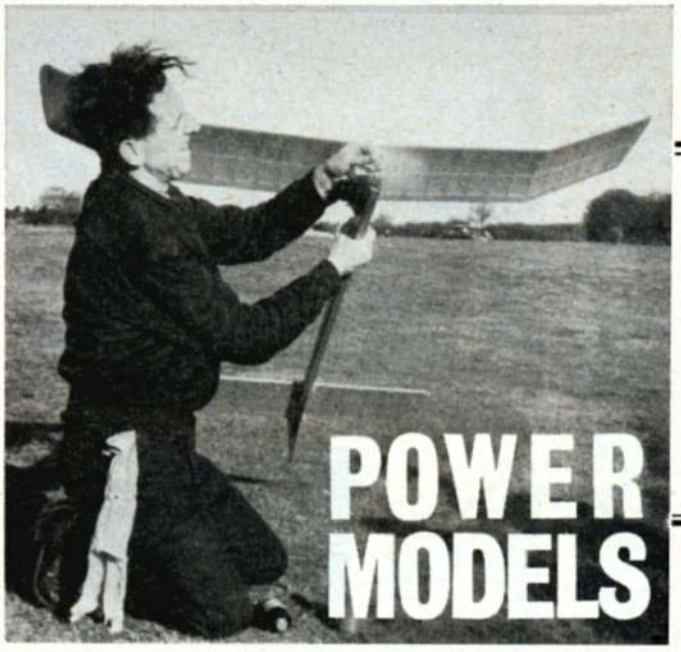
As long ago as 1947 a Special Advisory Committee on private flying, under the chairmanship of Air/Cdre. Whitney Straight, said: "The committee is strongly of the opinion that the respective activities of model making, gliding, and power flying should be co-ordinated on a national scale. These activities, starting with modelling by young people still at school, form a natural chain in the progress of aviation training.

Mr. and Mrs. Bob Bradshaw welcome Mr. J. B. Robb, Managing Director of Revell (Great Britain) Ltd., to the Champagne Party which marked the launching of their new Hove showrooms. Retailers intent on combining business with pleasure should soon make this a popular trade rendezvous on the South Coast, particularly as Bradshaws are carrying a growing number of exclusive model trade lines

"We have been much impressed by evidence from the Society of Model Aeronautical Engineers concerning the activities of the model aircraft movement. The movement has great scope and an abundance of enthusiasm, and is clearly of national importance."

Since that date things have steadily got worse: fewer and fewer flying fields are available to aeromodellers, yet louder and louder grow the cries for technicians. The remedy is largely in the hands of authority; let us have action, and from thousands will come the experts of tomorrow, just as the aviation leaders of today have been gleaned from yesterday's aeromodellers.

The Humber Oil Company entertained many members of the model aircraft trade at its first staff dance in Hull. Mr. and Mrs. Barton are seen in centre of this view of the social occasion where the many personalities of the Toy and Model trade were able to make acquaintance with this go-ahead company



POWER MODELS

Expert's Forum No. 4

The imperturbable
George Fuller
gives details of his
"Musical" series and
their trimming for
Contest success

OVER THE PAST few years the standard of power model flying has increased enormously, so that practically every contest is now won by a fly-off. The days of winning a contest in spite of a poor flight are over. It is surprising how much work has to go into developing and trimming a model in order to achieve maximum score. I know from personal experience. It took me several flying seasons to develop my idea of the ideal layout.

Many approaches to power model design have been tried over the years since the first introduction of the diesel engine, and I have come to the conclusion that the only type of power model which is consistent in all types of weather is the pylon model. Results prove how the pylon model beats the other types in the majority of contests. I have built an enormous number of various models over recent years and the final result is the *Dixielander* power model. This has a 350 square inch wing and is powered by 2·5 c.c. engines. For 1959 I intend to employ 3·5 c.c. which might be considered too much for such a small wing. In fact a few years back I would have thought the same myself and would have given anything to have known how to handle the power, but after much experimenting and quite a few write-offs, I have at last arrived at (in my humble opinion) one of the most consistent models I have ever handled.

My approach to trimming is such that the trim of each *Dixielander* could be duplicated with ease. The most trying part of power flying is finding the time to build new models. One usually loses at least one model per season, and that is why my models are kept on the straightforward and simple side, with no complicated construction features. I like to keep a stock of three power models, and as soon as one is lost or wrecked, I construct another.

One example of the ease of flying my type of layout is that a fellow club member, flying in his *first* power season, was in the fly-off with a *Dixielander* at the 1958 Croydon Gala. I only wish that I could have done the same when I was a beginner at power flying!

The model usually weighs about 15-oz., some have been lighter, but it is better to have a strong model and not to have to worry much about damage. I use 40 per cent. tail area with a moment arm of 3-chords from wing tailing edge to tail leading edge and the tail is set at 3 degrees incidence. I find this is the right angle required, but of course, it must vary on different size models and with different tail sections and areas. The wing is also set at 3 degrees incidence, but now we come to one of the most important items, this is the warp used to control the power. The starboard inner panel of the wing is washed-in (TE Down) 3 degrees. This is the actual wing incidence and the model must now always turn to the right, any tendency to go left under power must be counteracted by moving the fin trim-tab over to the right. Warps in the wing now act as an aileron, giving the rolling tendency as the model climbs, if you do not have sufficient warps the model tends to half loop, which although fairly safe, cuts those vital seconds or even minutes off total duration.

Presuming that the wings are warped correctly (with the tips washed-out 2 degrees to stop the model going into a series of stalls when the motor cuts) add tail ballast until the centre of gravity is back under the wing trailing edge. The wing section I use is my own design, based on NACA 6409, on the tailplane, normal thin Clark Y is sufficient. Sections are quite important in order to combine power with glide. Should you be going to design a model yourself, I suggest you go for the NACA 6409 type airfoil. Thrust lines should always be neutral. Any down or side thrust is just a waste of power in my view. Glide trim can easily be adjusted by the usual tilting of the tailplane to get turn (see drawing) and by adjusting ballast at the tail end. Under no circumstances change the tailplane incidence for glide trim, do this only by adjusting the tail end ballast. I have tried fins in different positions and found the most efficient position behind the tailplane, always make sure the fin is large enough, a fin that is too small usually results in a spiral dive. Always go on the large size and if necessary cut down afterwards. One point that stands

out in my mind, is that if the model *looks* right it should fly right.

Often I am asked why do I have a pylon the shape I use. Shape does not make a lot of difference, it merely becomes a trade mark just the same as a fin shape.

If everything is to satisfaction with centre of gravity on wing trailing edge, warps and incidence correct, engine run-in and above all, a good timer fitted (this is very important for two maximum flights and an over-run is enough to break any aeromodeller's heart as I well know from bitter experience), we now wait for a calm day to get the model trimmed. Fit wings and tail firmly into place with strong rubber bands, view model from the front and see that the tailplane is tilted level with inner wing panel. Find some long grass and hand glide. If the model dives, add ballast to the tail end or if it stalls, remove ballast. The glide should be just on the stall turning slightly to the right. Once you are satisfied, power can be tried.

First power test

Set the timer for five seconds engine run at about ¾-full power. Launch into wind at a 75 degree angle and if you have everything correct, a fast, near vertical climb, turning to the right should result, but usually there is some slight building error, such as a lack of wing incidence. You will note the angle at which I launch when trimming. This is quite safe, if the model is under-elevated it will tend to kick its nose down, if too much incidence, it will try to loop, still with only five seconds motor run and ¾-power the motor should cut before any damage results. If the model dived, place 1/32 in. ply packing under the wing leading edge and try another flight as before. If not enough, add 1/32 in. more, remembering to do things in easy stages. On the other hand, should your model try to loop you will have to pack up the wing trailing edge. Once you have the correct incidence for the power pattern you will have to adjust your ballast in the tail end for glide, owing to the change of wing incidence. Ply is a must for packing as balsa becomes squashed under the pressure of the rubber bands, which will automatically result in a trim change.

Now we come to the moment of full bore, have your engine going flat out, timer set once again for five seconds run and launch into the wind this time vertically, *not* forgetting to set the dethermaliser. Never set the dethermaliser too short, if it should come into operation while power is on, it usually results in tearing the wings apart, not to mention damage to the engine on hitting terra firma. Once you are happy with your flight pattern, which should be a vertical climb, rolling slightly to the right with a skid out on top into a flat glide, you can now try the fifteen second maximum motor run. Launch vertically again, which I find by experience to be the safest way to release powered models.

One can improve performance by experimenting with an extra piece of weight in the tail end or a shade more incidence on the wing. By perserverance you find out which settings give the best duration.

A good open power model should be capable (in still air conditions) of six minutes plus, off fifteen seconds engine run. I think a greater duration will be obtained in the next two years with the adoption of the 5 c.c./10 c.c. class power model, and I personally shall not be satisfied until I get a power model which will be capable of around the eight-minute mark. At the moment I am in the process of laying down a design for the ETA 29, which I hope will be capable of the target duration I have set.

If you are thinking of building a FAI model, the same trimming could be used as on lightweights with exception of the change over from power to glide. With the increased weight when the motor cuts, a series of stalls will result and this persisted with my model until I used an auto-rudder, which solved all my troubles. It comes into action a second before the motor cuts and since being used, the model has never stalled once the motor stops. One club member found he had the same trouble with his model and also cured it with auto-rudder, my findings were also backed by the 1958 World Championships, when the first three power models all had auto-rudder or some device for the change over.

Hoping to see all of you in the fly-offs at those open events in this 1959 season—good luck and good flying!

DIXIELANDER DETAILS

George Fuller's functional pylon model design which will soon appear in kit form under the famous "Yeoman" trademark has a most impressive listing o contest successes. Among the many high placings in both large and minor events are the following more important honours:

3rd HAMLEY TROPHY, 1957
11 : 04

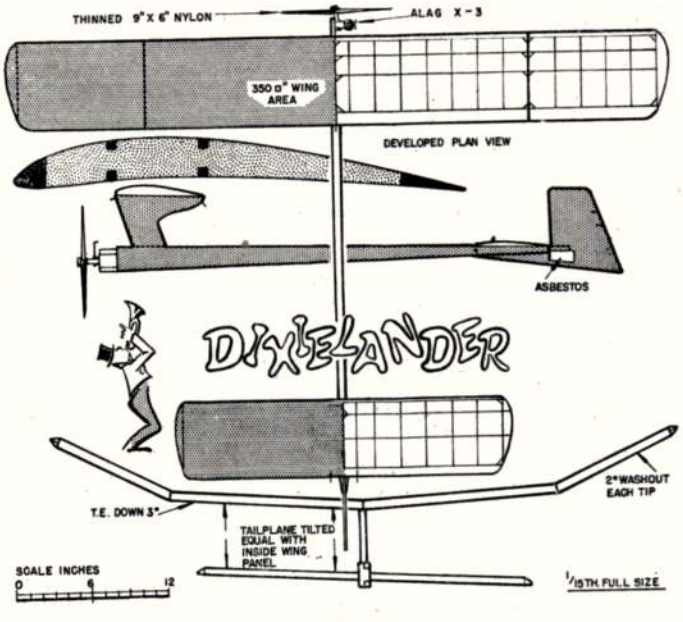
10th HAMLEY TROPHY, 1958
12 : 00 + 6 : 13

1st NORTHERN HEIGHTS GALA, 1958 8 : 00 + 4 : 10

1st CROYDON GALA 1958
12 : 00 + 4 : 19

1st SOUTHERN AREA, GALA, 1958 9 : 00 + 4 : 14

The consistency of these fly-off times in 1958 galas where competition was by no means slight, reflects how well George has tamed his Jazzy simpleton to more than match many a more complex creation



PRINCESS

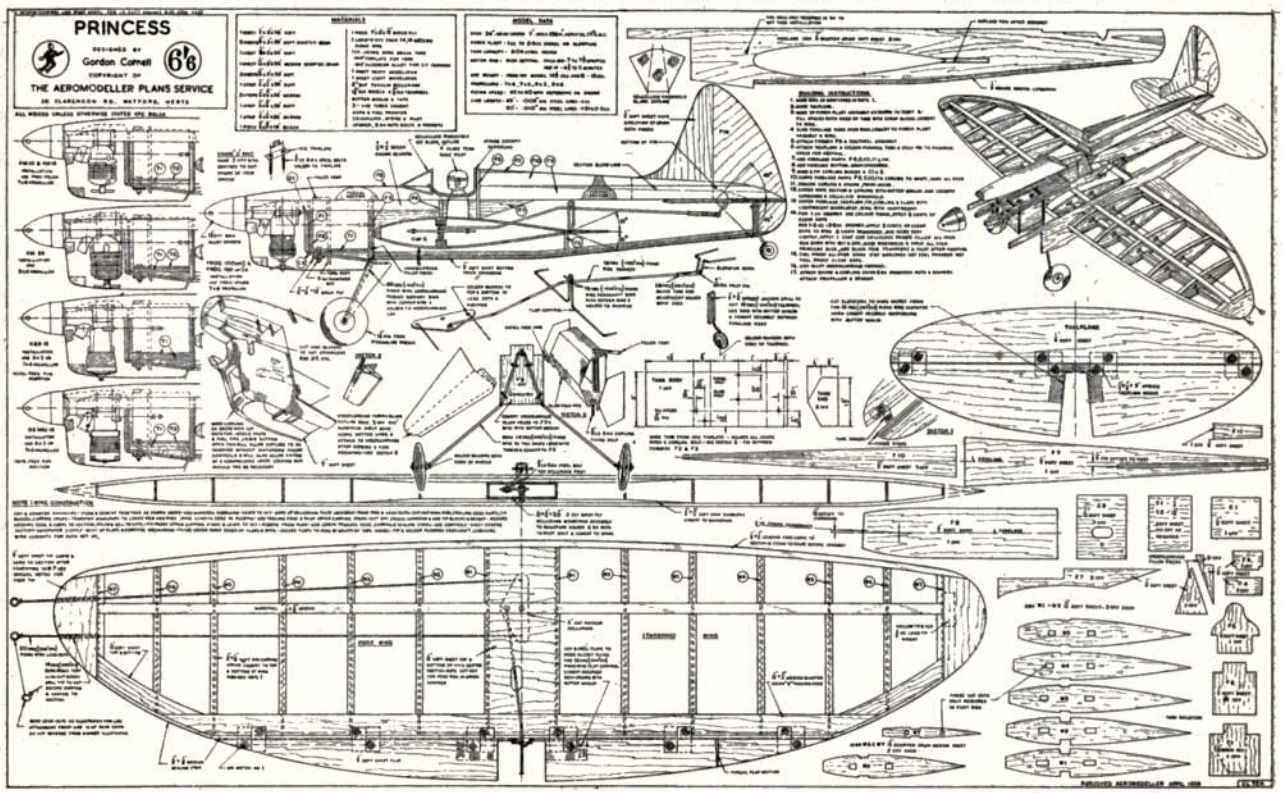
A 36 in. SPAN CONTROL-LINE AEROBATIC MODEL FOR A WIDE RANGE OF ENGINES FROM 1 c.c. to 2·5 c.c. BY GORDON CORNELL

Super-detailed plans for this elegant design which has an enviable reputation for smooth flying on low power

"PRINCESS" is one of the most advanced small stunt designs to date, and has been developed through a series of designs capable of completing the S.M.A.E. Stunt Schedule. The plans show the very latest version as flown in the World Championships at Brussels, 1958, where it earned plaudits for very smooth performance with such a comparatively small engine as the Frog 150. Whilst its appearance might suggest a difficult model to build, its construction is relatively simple making it eminently suitable for the intermediate modeller and since the plans are very comprehensive, let's get down to the facts that will make your model a success.

Almost any 1 to 2·5 c.c. engine is suitable, the originals have been powered by the new Frog 150R and a K & B15. If you choose to use 1 c.c. keep the weight down to approximately 13 oz. The tank may appear unconventional but it is theoretically correct; when a few more modellers use this type we will see far less overruns due to the engine leaning out—it gives most consistent feed in flight. Make the cowling exactly as shown on the

FULL SIZE COPIES OF THIS 1/7TH SCALE REPRODUCTION ARE AVAILABLE PRICE 6/6 PLUS 6d. POST AS PLAN CL724 FROM A.P.S.



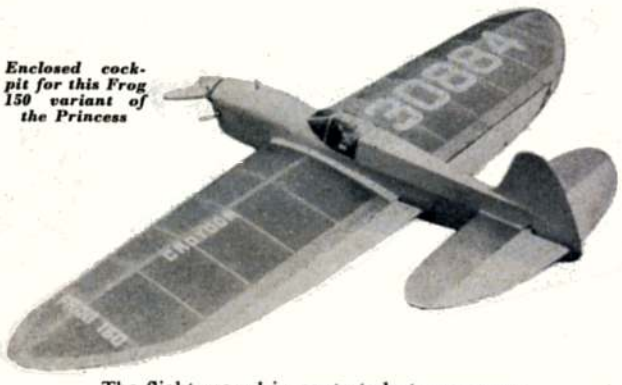
plan giving plenty of airspace around crankshaft and cylinder, otherwise you will have the overheating troubles I experienced at Brussels.

A brief word on materials, select each piece carefully for the job it is to do, making sure it is the correct cut and texture as stated. Since balsa varies in weight from 6 lb.-16 lb. per cubic ft. here is the difference in weight between being light or heavy. There is a lot of balsa in this model, be careful. Use plenty of cement, it does not weigh enough to cause concern, at least not measurable.

When finishing, do not spare dope and *fuel proofer* since this little extra weight soon pays off. An under-doped or unproofed model soon suffers from ingress of fuel and up goes the weight above the well-finished model, at the same time becoming completely unreliable. Spare no expense, it is cheaper in the long run.

Flying the Princess is easy, but do not take any chances. The undercarriage shown on the plan is for *grass*, if the model is to be flown over tarmac fit a longer tailwheel assembly to make model sit almost level on ground (this tailwheel assembly will not allow the model to take off on grass so choose warily). Line length required will vary according to weight and speed should be between 45 ft.-50 ft. (It was flown in the Gold Trophy on 55-ft. lines.) Use only steel lines ·008 in. to ·010 in. diameter.

Use a good commercial grade of fuel and retain the same engine settings for starting and running for every outing, by so doing you will soon find reliability.



Enclosed cockpit for this Frog 150 variant of the Princess

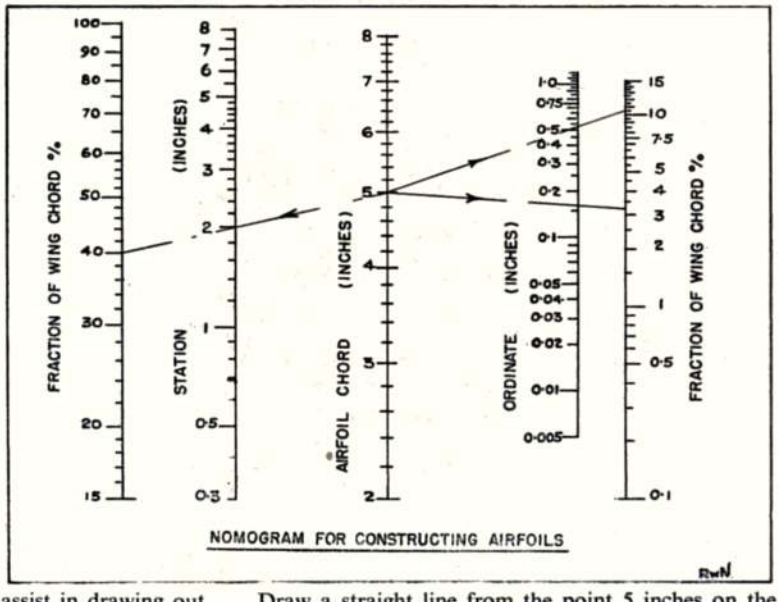
The flight record in contests last year were:

Fifth: Gold Trophy.
Second: Enfield Controline Rally (lost by ½ point).
Fourth: British Team Trials.
Second: Wanstead Controline Rally.
Thirty-second: World Championships (Brussels).
Third: Southern Area Rally.

The plan has been specially drawn to cope with a wide variety of engine sizes and has full instructions to enable the modeller with at least one controline type under his belt to follow the building stages without cause for query. We *know* the "Princess" is going to be a number one favourite among plan builders with the popular A.M.15, Frog 150 and newly introduced (to British shops) Enya, Fox and OS15's. For smoothness, the "Princess" is a beauty deserving of its regal name as you'll soon find out in that first exciting lap.

An easy way to obtain airfoil sections

described by R. W. NEW



NOMOGRAM FOR CONSTRUCTING AIRFOILS

RWN

THIS NOMOGRAM is designed to assist in drawing out airfoil sections. In the case of wings where the airfoil chord is not constant, numerous calculations may be involved, and this reduces the number of computations.

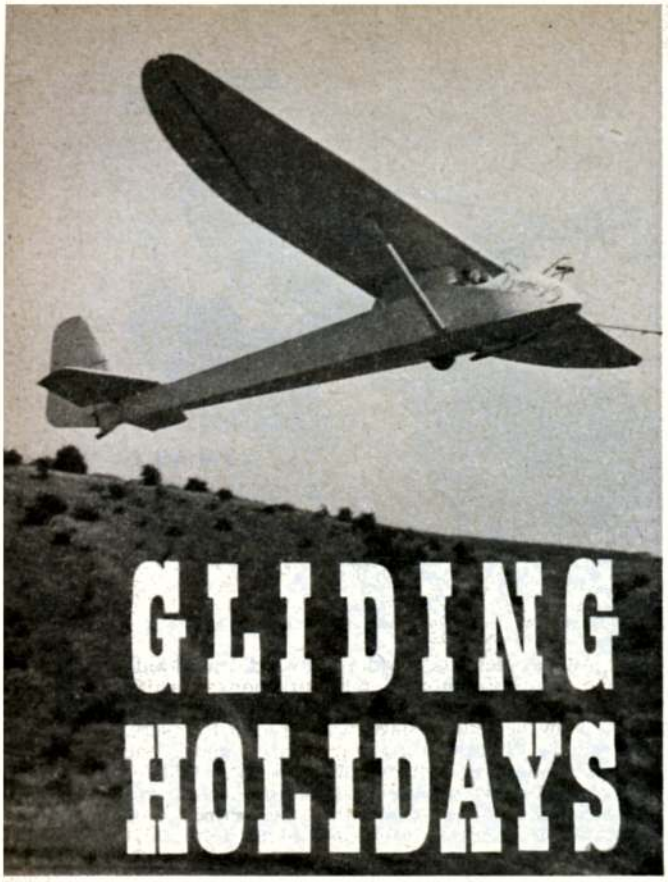
To illustrate its use consider the Benedek section B-8556-b, published last month. Assuming a wing chord of 5 inches, find the dimensions involved at the following positions.

Station	...	...	40 per cent. chord
Upper	...	...	10·5
Lower	...	...	3·2

Draw a straight line from the point 5 inches on the centre scale, to the extreme left hand scale at the position marked 40 per cent. Read off the value in inches at the intersection with the station scale, namely 2 inches.

Similarly, draw a straight line from the centre scale to the extreme right hand scale at position 10·5 per cent., and a further line to position 3·2 per cent. Read off the values at the intersections with the ordinate scale, namely 0·53 inches and 0·16 inches respectively.

Normally, accuracy to two decimal places is sufficient.



GLIDING HOLIDAYS

AN AEROMODELLER'S REAL "DO-IT-YOURSELF" HOLIDAY DESCRIBED BY MRS. ANNE INCE

A SLIM GRACEFUL aircraft rests one wing gently on the grass, its cockpit open whilst overhead the small white cumulus clouds sail by. On the airfield our attention is directed to a nearby pilot who is busy clipping himself into his parachute. This completed, he climbs into the cockpit, fastens the safety straps and checks that the barograph is ticking in the locker behind his head. He smiles at those around him and shuts the canopy with a firm click.

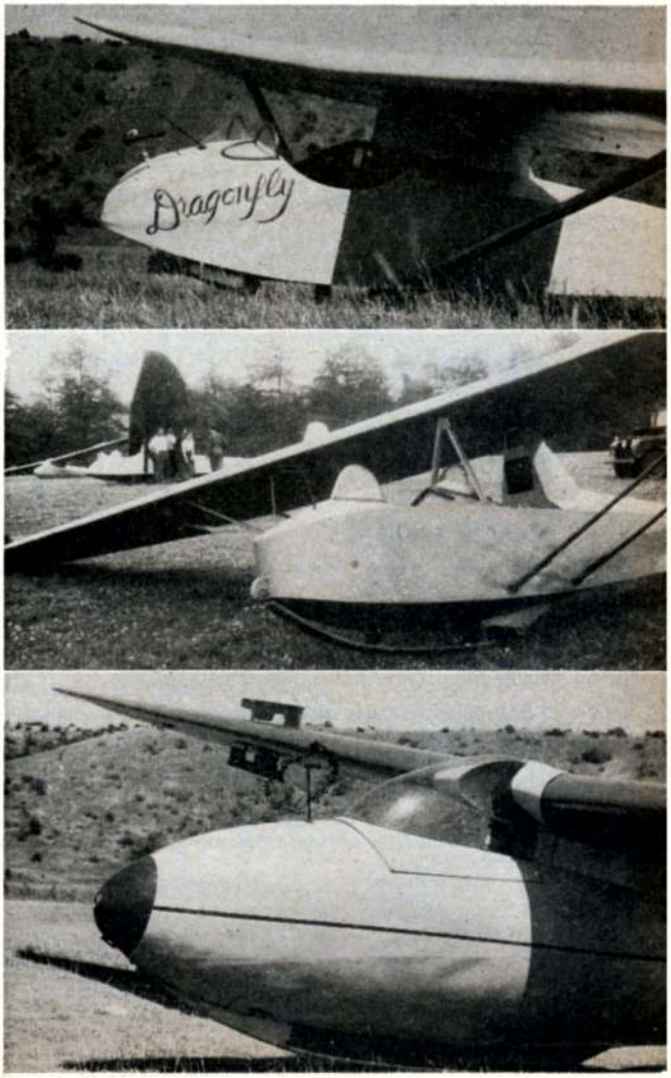
After a quick check on controls he calls "Wing up, please" and someone raises a wingtip as another helper fastens a long length of cable into a hook near the nose of the aircraft.

As the spectators move clear, the pilot asks if "all is clear above and behind?" After receiving that assurance, he gives an order to "Take up slack". A helper near the wingtip waves a bat and slowly the cable taughtens until the glider is poised motionless on wheel and skid. "All out", shouts the pilot and the batsman responds by waving two bats over his head.

At the far end of the field these signals are clearly seen by the winch driver, who opens the throttles. The glider rolls forward gathering momentum until kite-like it leaves the ground and climbs steeply away, higher and higher. To those watching the angle seems very steep, and even the pilot will be in a nearly reclining position in his cockpit. This attitude feels remarkably comfortable when accompanied by that firm push in the back, which means you are getting a good launch. At just over 1,000 feet above take-off the speed of the launch slackens off and the cable is released by the pilot, who pulls a yellow knob in the cockpit.

Settling down on the circuit, our pilot is aware of the lack of noise—there is just a small whisper from the air flowing past the cockpit. On a calm day he may be able to hear the voices of those on the ground wafting faintly upwards. Whilst keeping a good lookout for other aircraft the pilot searches for signs of thermals. Perhaps there may be a gaggle of birds lazily floating round above the trees marking a good source. Our pilot banks the glider into a gentle turn and finds lift.

With satisfaction he notices the hand of the altimeter slowly winding round in hundreds of feet, then, just when he feels all is going well, the variometer—a highly sensitive rate of climb indicator—shows that he is no longer gaining height. Hurriedly he searches for another thermal while the altimeter unwinds itself back again.



Editorial pictures taken during visits to the London and Bristol Gliding clubs at Dunstable and Nympsfield show the types of trainer used in most Gliding Holiday courses. Above is a Slingsby T.21, known in Service circles as the Sedburgh. It has side-by-side seating as in the close-up at top right. Below it is the Cadet Mk. 3 with tandem seating, and at right, the Olympia for those who graduate to solo soaring

This is gliding—held by its ardent followers as the king of sports—with all its joys of attainment, its frustrations of lost chances and the "thermal that got away".

Each year many of the 34 gliding clubs affiliated to the British Gliding Association, run holiday courses lasting from five days to a week. For a very modest 12 guineas upwards one can spend a week combining an introduction to flying with an enjoyable out-door holiday. The actual price of the course may vary with the time of year and the duration of the course. There are some 160 courses run at 15 different gliding clubs to choose from in 1959. The all-in fee covers full board and lodging, flying charges and instruction.

Accommodation varies from club to club. With some, the accommodation in a local hotel or guest house, whereas others have bunkhouses on the site. Most clubs have a bar and if you are unlucky enough to be dogged by bad weather, there are often talks and film shows to attend or excursions to local "amenities". Many clubs will guarantee a minimum number of launches and if these are not achieved due to bad weather, a rebate may be allowed.

Instruction will be either in side-by-side or tandem two-seater training gliders with a qualified instructor in charge. After one or two circuits with the instructor for "air experience", one starts learning in earnest. First in use of the controls; what makes the glider go faster—or slower. Then how to make it turn, how to fly straight and level and how to take off and land. Later come the spins and stalls and gradually the pupil becomes aware that he is doing more and more of the flying and the instructor less and less.

Somewhere between 30 and 50 circuits should find the pupil ready to go solo. He will probably notice he is getting more and more cable break practice, and then suddenly, between launches the instructor will climb out and call for ballast. This is strapped in, and with a word of encouragement, the instructor gives the signal for the first "solo" launch.

Gradually as one builds up experience, circuits no longer consist of a mad rush take-off, circuit planning and landing. There is time to settle down and look for lift near the airfield. When one has learnt to locate and use this lift, the whole world and fascination of soaring flight lies open for exploration.

Many different types and ages of people meet on courses—there are usually between eight and twelve taken on each course. In the last two years approximately 2,600 people have taken part, about 10% of these were women, and a very high proportion are aeromodellers. Anyone from the age of 16 is welcome—this is the earliest age at which solo flying is permitted in this country. Some clubs do take 14-year-olds by special arrangement. It is often possible to take non-gliding members of your family with you, though again, special arrangements may have to be made with the club concerned.

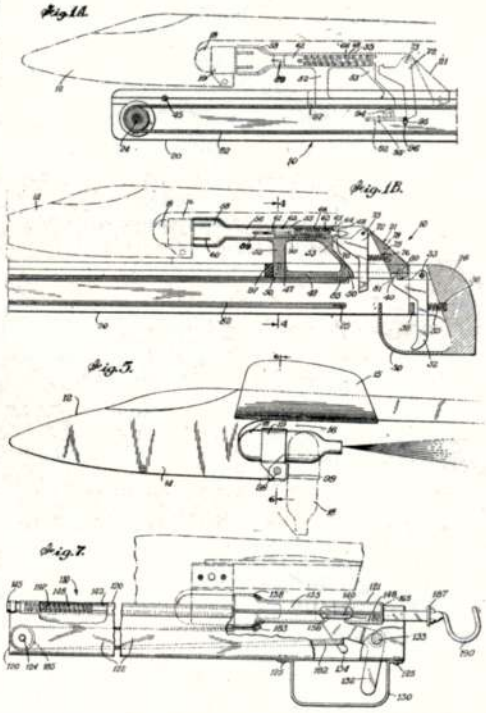
Holiday courses are held as far north as Aberdeen to the Isle of Wight in the south. Many of the gliding sites are situated in beautiful countryside. There is the Midland Gliding Club, perched on top of the Long Mynd in Shropshire. Another hill site is that of Bristol, set in the heart of the Cotswolds near Stroud. This club have introduced over 1,300 people to the sport of gliding during the last ten years. The Cornish Gliding Club have a flat site practically on the cliff edge at Perranporth, and in the north the Scottish Gliding Union operates from a large field bordering on Loch Leven near Kinross. This is to mention only a few of the fifteen sites.

Further information can be obtained from the British Gliding Association, Londonderry House, 19 Park Lane, London, W.1. Telephone Number: Hyde Park 3341.

For more details see page 189.

IMPORTANT PATENTS

U.S.A. No. 2,860,620 W. L. Effinger, Jr.
APPLICATION DATE 15/2/56



An interesting combined catapult and firing pin for CO_2 powered models by the renowned President of Berkeley Models, U.S.A.

THIS INVENTION provides an ingenious catapult launching device for jet propelled model aircraft, more particularly, models propelled by CO2 cartridges. The catapult vamp carries a spring urged carriage which includes in addition to aircraft supporting means, a capsule firing mechanism adapted to actuate the CO2 cartridge immediately prior to separation of the aircraft from the carriage. *Fig.* 1B shows the catapult in the loaded condition with its cartridge firing pin in a rearward position while *Fig.* 1A shows the cartridge being fired by forward movement of the pin 89, etc., as the carriage approaches the end of its travel. Note how the thrust is transmitted from the carriage by the bell-mouthed thrustor 58 and also how the cartridge, when expended is permitted to swing downwardly under its own weight and to fall clear of the airframe as in *Fig.* 5.

FINLAND'S FINEST A/2 GLIDER FOR SEVERAL YEARS

Sans égal

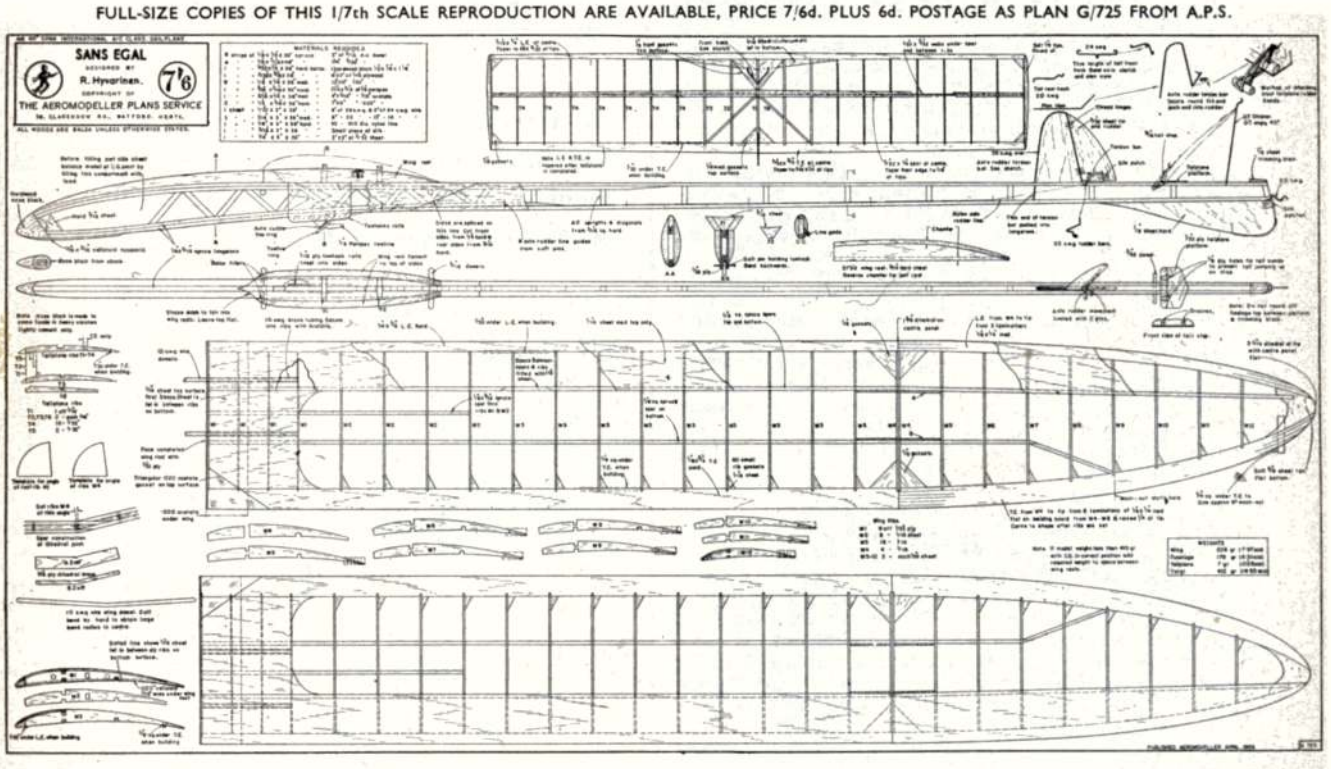
by Reino Hyvärinen

DURING THE LAST four-and-a-half years this leading Nordic country's A/2 from the Finnish Champion modeller, has flown in eleven national and four International competitions. The lowest placing has been 8th and last year *Sans Egal* won four major competitions, including a winter event at Hanko in ideal conditions with 900 secs., the Chrysler-Plymouth meeting at Whitsun with more than two minutes lead over the next of 37 entries, the Finnish Nationals in strong wind, and most important, at the Nordic Countries Championships in Norway in rain the glider won with 90 seconds margin. This displays the excellent all-weather characteristics which make it so very suitable for the normal English climate. Its still air average is 2 : 45—2 : 50. Thermal hunting and holding characteristics are good and the wing is very strong (it has never broken in towing).

Hardwood is used for the wing spars and fuselage longerons, which give elasticity and strength, they provide a long life for the model, and are very essential for all-weather work. However, the inertia of moments are still not great due to careful selection of materials at outer components, for example, the tailplane weight on the original is only 7 grammes (¼-oz.) and the tail-boom is light and flexible. One can, however, hold the model just in front of tailplane and wave it in any direction, thanks to hardwood longerons!

The wing tips are laminated to their elliptical shape from ⅛ in. strips, and the necessary carving is done after assembly. The section changes to a straight bottom at the ultimate tip and it is quite easy to produce the washout when carving T.E. (and L.E.). Special care must be taken to get the wing tips light by balsa selection. Centre panels of the wing are easy to make, first notch T.E. and fasten ribs to it not forgetting to pack up with ¼ sq. in. Then

FULL-SIZE COPIES OF THIS 1/7th SCALE REPRODUCTION ARE AVAILABLE, PRICE 7/6d. PLUS 6d. POSTAGE AS PLAN G/725 FROM A.P.S.



add the upper main spar and L.E., the other spars can be added after removing from board. However, the centre strengthener ⅛ in. x 3/16 in. must be set in ribs before cementing them to T.E.

Wing halves are joined to each other with wire dowels, which are hand bent to desired dihedral. They are also used to get different angles of attack on wing halves so that they give desired towing and thermal turning characteristics. For example, if the left wing angle needs to be increased, then push the wire dowel deeper in the metal tube in the *right hand* half and the rear dowel deeper in its tube to *left* hand half. This makes a variation in angle of attack. The wire dowels also flex in bad gusts, and the centre dihedral may be varied according to the weather by bending the dowels. Metal tubes in the original were wound from thin brass plate, so they have a greater elasticity than with solid wall tube, when the wire is pushed farther than normal into the tube.

The tailplane was an experiment in following the basic rules of structural strength. Hence the tapering spars. L.E. and T.E. are tapered after assembly. Covering is Jap tissue, which is doped no more than necessary to avoid excess weight. Fuselage sides are first cut to approximate shape and joined (¼ in. and 3/16 in. sheets) Then the ply tow hook rails are inlaid and cemented to sides. Assembly is done on the starboard side, over which the longerons and spacers are cemented firmly. Before adding the port side sheet, set the nose ballast in its compartment by testing the G.G. with wing and tailplane at their positions. After this the nose ballast is cemented firm.

When the port side is cemented in place, the wing platform is set in its position, and the fuselage rounded to its final shape. To get the model to its minimum weight of 410 grammes, add the extra ballast between the wing platform sides.

Towhook is of ⅛ in. perspex, and it can be moved along its rails to find the best possible position for kite-like thermal-hunting. The original model has a right-turn of about 100 feet diameter which can be changed according to the weather. After a satisfactory glide is attained, the best towhook position is sought, and the final glide turn made after that. You now have a model that will stand up to 40 m.p.h. gusts, will tumble over rough ice from tip to tip and will win contests!

At left, Airfix Wellington III has moving turrets, retractable u/c, swinging guns. Sqdn. letters are in light grey or red, roundels modified, from kit

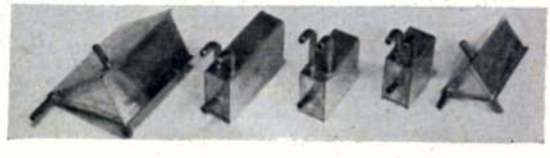
FULL MARKS to **AIRFIX** for their 6s. Wellington III kit, not only is it a top class piece of plastic moulding, but they have also chosen to model an aircraft very familiar to our editorial eyes. That's the reason why our heading picture shows "C" Charlie of 75 (N.Z.) Sqdn. based at Feltwell in 1942, with suitable embellishments from our war-time notebook. For those interested, the changes are: Serial X 8124, Shadow Scheme "B" (a mirror image of kit leaflet), tail leading edges rough painted mustard colour to simulate de-icing lanolin, '42 markings, liberal red primer patches over Flak punctures, rusty cowl rings and exhausts and, of course, the elevator horns should be cut back 1/16th in. to make it a true Mk. III tail. Also from Airfix is the Grumman Gosling, a rather unusual choice, but a pleasant subject well executed for the 2s. range.

German radio control equipment has often attracted British enthusiasts for its neatness and its advanced design, so we are pleased to learn that **ED JOHNSON** who has been such a fine contest-winning demonstrator of Stegmaier gear, is now importing OMU sets and other accessories. Of particular attraction are some of the relays. One has a double set of contacts and pulls in at 4 m/A, falling out at 1·5 m/A and with single contacts the figures are 2·5 m/A and 0·8 m/A respectively. Hand-held transmitters, claiming 2,000 yards range and crystal controlled, retail at £8 10s., and at the other end of the scale is the stick-controlled multi-channel job at £31 for tone or carrier and having 2½ watt output. The receivers are no less attractive, all with single tuning control, carrier or tone, transistorised and with novel adaptation for plugging in the multi-reed bank on the 2-oz. Multi receiver. Included in the same range is a 25s. non-skip actuator with 15 ohm coil for economic operation.

The **TRIANG** Toy Fair included the range of International Model Aircraft and brought many new items to light, most impressive being the two versions of the new Frog 349 diesel, and the new range of World War II fighters to 1/72nd scale in plastic. Retailing at 2s. 9d., the W.W. II series includes the Kittyhawk, Typhoon, Thunderbolt, Focke Wulf 190 (radial version) and Zero. Each is moulded in the underside colour and will, we are sure, more than satisfy those who demand a high standard of accuracy in detail. Among new kits yet to appear under the **FROG** label is a fine 49s. 6d. Hawker Tempest control-line pre-fab 26-in. span model with plastic moulded pilot, nylon bellcrank, nylon spinner and scale wheels. Included in the projected range of plastics are: Fairey Rotodyne, Spitfire II, Blenheim I, Hampden, Wellington, Dragon Rapide, all to 1/72nd scale and the 1/96th scale Lancaster. Latest in **Mercury** Minipak range are the three scale wheel sizes, 1¼ in., 1½ in. and 1¾ in. at 3s., 3s. 6d. and 4s. 6d. per pair. These are just the job for scale types, having moulded ribbed hubs, pneumatic section treaded tyres and plenty of centre metal to bore out for larger wire axles or bolts. Weight is little more than the accepted streamline wheel and appearance of any scale job will be enhanced with their use.

ERRATA.—*Our quotation of engine size for the K K Spectre last month should have been 2·5 c.c. and not 3·5 c.c. This model will easily fly "the book" with a hot 2·5.*

New r/c Products are some of the OMU items including the 8-channel reed/relay bank, and the latest F. Rising escapements in Perspex casing, marketed by Mercury



Latest Mercury range of tanks at right include 10 c.c. to meet latest rule changes at 3/3, others are 3/7 each

Jim Fullarton reports on the Twelfth

Australian Nationals

THE WHOLE OF THE excellent ex R.A.A.F. Aerodrome at Camden, N.S.W. (40 miles from Sydney) was made over exclusively to model fliers for the week of December 27th to January 2nd by the Dept. of Civil Aviation, and with a heavy entry and good flying weather, it was probably the biggest and best Australian Nationals yet.

One of the most interesting events promised to be Radio Control, which for the first time had an entry of Multi-control jobs. They were quite an assorted batch, including an 8-reed Citizenship outfit, a Waveguide with Good Bros. Duo-proportional, a 6-reed Smog Hog, a Galloping Ghoster, several Bonner Varicomp entries, and a strong team from Queensland, using cascaded compound escapements. Most unusual arrangement was by Sydney flier, Syd Lake, who had a four-channel set, using bandpass filters instead of reeds. He obtained motor control by applying up and down elevator at once!

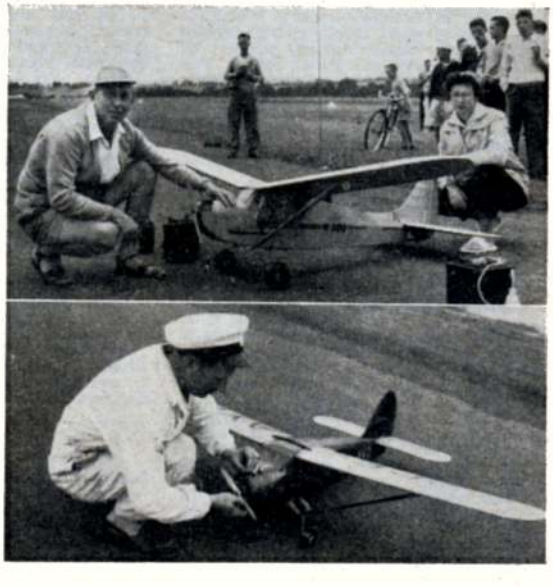
The actual event was on the last day, and during the week there was much secret radio work and early morning test flying being done in the various camps. One can guess what happened. By the time the contest started, most of the Multi's were out of the running, and it was won by Geoff Tuck with an ancient rudder only model. Second man, Jim Herlihen did manage to pull off three beautiful consecutive loops at great height with his trip elevator job before it drifted away out of range. The worst prang of the meeting was by another Queenslander, Cec. Lea, who had a really big machine with two Hill receivers, and home-made compound escapements. After straightening out from its spiral dive, it came straight on in at frightful speed to utter destruction.

The meeting started with the Stunt event, the entry being so large that it spilled over into several more days. Most models seemed to be Palmer Thunderbirds or variants thereof, and O.S. motors again predominated. The defending champion, Bob Hyde, retained his title with a Fox powered Thunderbird. This chap really is good, and we may yet see him in Europe, as he had ideas about an overseas trip this year.

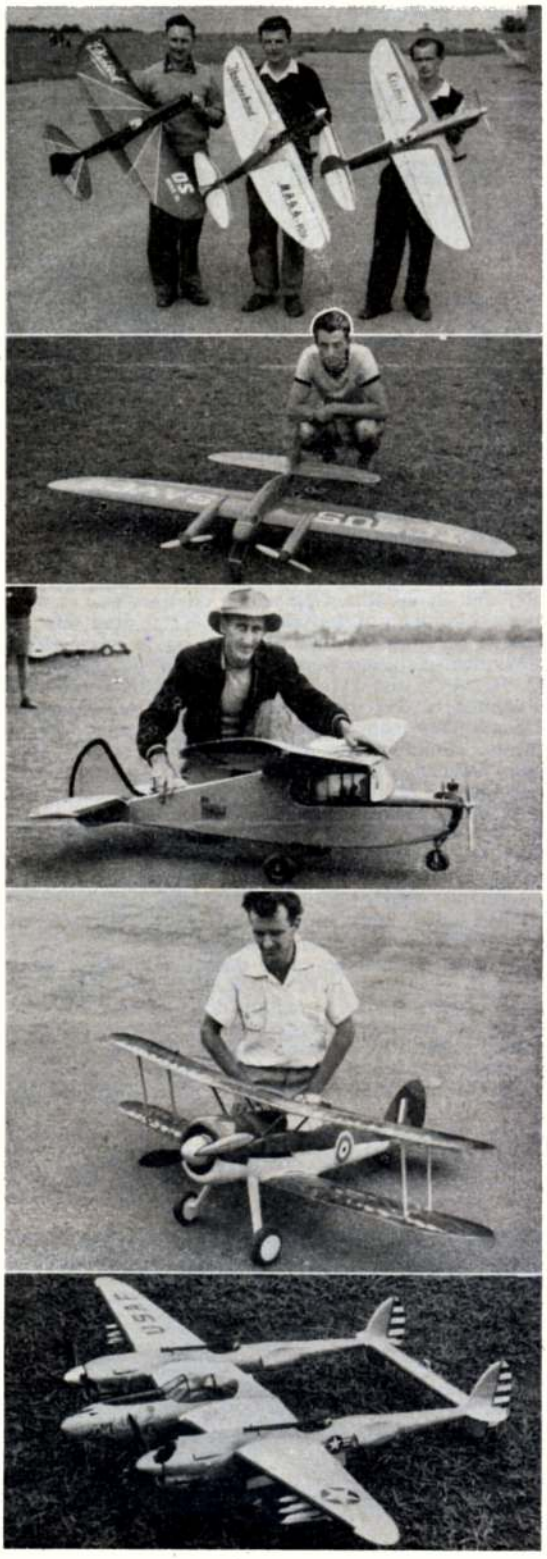
The interesting feature in Team Racing was the use by several entrants, in particular the South Australians, of benzene based fuels for greater lappage. Class II winner, Wes Penfold, obtained 55 laps at just under 90 m.p.h. from his Enya 29 in this way. There is a certain loss of speed however, and in Class III Mike Ware's fast O.S. 35 racer on ordinary fuel with three stops turned the tables on the benzene burners from S.A. despite their one stop run. Unlucky man in T/R was Kev. Green (S.A.), who has some terrific times to his credit, including a 7-min. 27·6 secs. in Class II (on 60-ft. lines). He was disqualified for changing his pilot in an elimination, which seemed rather a hard decision to most of the other competitors. In free flight, the International Big Three, Wakefield, Nordic and F.A.I. Power were held in three pre-breakfast and two afternoon rounds which provided mainly non-thermal conditions.

Fullerton's Wakefield, which started off with three consecutive maximums, showed a vast improvement on last year's form, mainly due to a new 24 in. diameter 22 in. pitch prop. with very narrow blades, inspired by helicopter rotor theory.

Jim also won power in less convincing manner, as Basil Healy (2nd) could have been in an unbeatable position but for a short motor run in an earlier round. Basil used the same scaled-up Stomper as last year, while Fullerton's was a gadgeteer's delight, with trim-elevator via two airdraulic timers in series to bring the elevator up about 5 seconds after the motor cuts.



At top left to right: John Tuckett with Inchworm A/2 winner. Basil Healy has dural fuselage on his Wakefield, at end is author Jim with his OS Max 15 F.A.I. winner. At right, top is Wal Marcin with Bonner Varicomp R/C entry and below, the scale winner, a Noorduyn Norseman by Ken De Bomford which has now topped the event for three years



Top to bottom at right: Stunt trio Bob Hyde, Tony Farnan and Ken Taylor with popular T'birds. Twin stunter with wing message is 85-in. 7¼lb., Sabre 29 and 35 motors, does everything, by Neil Whymark. Cecil Lea with twin Hill Rx job in centre picture. Large Gladiator with dummy prop is by Bob Greenhill, placed third in C/L scale, has Frog 500. At bottom is the second placing Lockheed Lightning with two Frog 500s by Stewart Allan. Note the underwing rockets and metallised finish

A/2 glider attracted a large entry, and produced some keen competition, the scarcity of thermals being reflected in the moderate times. The winner flew a standard Inchworm kit design. Of the Power Ratio events, Class III was the most spectacular, with some really impressive big jobs in action. Kev. Green had an Enya 29 in an 8-ft. span Hypen, while the consistent Healy used a Dooling 29 in an original pylon design.

There were no 4-engined scale entries this year, but the winning Catalina (two Frog 500's) was a lovely piece of work. It had gun blisters that opened, sprung undercarriage, and even true scale screw-in fuel fillers in the upper surface of the wing. Second place winner, Stewart Allan, also used Frog 500's in his Lightning, which flew particularly well. In the F/F Scale, Ken De Bomford's veteran Norseman scored its third Nationals win. This job flies with remarkable stability and penetration, while its rugged knock-off construction makes it virtually unbreakable.

With 62 starters, the one-hour scramble that concluded the meeting, was a real epic of aeromodelling. At the word "Go", the air was filled with a screaming, roaring collection of models of every type, ranging from massive Ramrods to diminutive Ebenezer bipes. Timekeepers were right in the firing line, and should have been issued with tin hats. All previous records were shattered, and the first four competitors passed the 2,000 second mark. It made a fitting conclusion to a great meeting.

Results

F.A.I. POWER
1. J. Fullarton, Vic. 690 secs.
2. B. Healy, N.S.W. 683·4 secs.

WAKEFIELD
1. J. Fullarton 846·7 secs.
2. D. Boughton, Vic. 631·9 secs.

NORDIC A/2
1. J. Tuckett, N.S.W. 747·7
2. M. Buckmaster, Vic. 728

SPEED-CLASS I
1. T. Farnan and G. Rice (Team, Vic.) 110·2 m.p.h. (O.S. 15)

CLASS II
1. J. Finneran, N.S.W. (Dooling 29) 127·8 m.p.h.

CLASS III
1. L. Cantwell, N.S.W. 120·4 (McCoy 60)

F/F POWER RATIO—CLASS I
1. K. Millard, N.S.W. 12·2 ratio

CLASS II
1. M. Nichol, Vic. 16·8 ratio

CLASS III
1. K. Green, S.A. 13·6 ratio

STUNT
1. R. Hyde, Vic.
2. T. Farnan, Vic.
3. K. Taylor, Vic.

COMBAT
1. B. James, N.S.W.

H.L. GLIDER
1. D. Boughton 212·7 secs.

JETEX
1. D. Boughton 294·2 secs.

F.A.I. SAILPLANE
1. R. Greenhill, Vic. 876·2

F/F SCALE
1. K. De Bomford, Tas. (Norseman) 171 pts.

RADIO CONTROL
1. G. Tuck, Vic. 84 pts.

SCRAMBLE
1. K. Green 2,228 secs.

TEAM SPEED—CLASS I
1. J. Rae, N.S.W. (Oliver) 10 m. 46·5 secs.

CLASS II
1. W. Penfold, S.A. (Enya 29) 8 m. 53·6 secs.

CLASS III
1. M. Ware, Q. 9 m. 16·7 secs.

C/L SCALE
1. W. Woodcock, N.S.W.

NATIONAL CHAMPION
1. D. Boughton, Vic.

Top State
AEROMODELLER SHIELD
NEW SOUTH WALES

FAMOUS BIPLANES

Number 20

Bristol Bulldog

described & drawn by G. A. G. COX

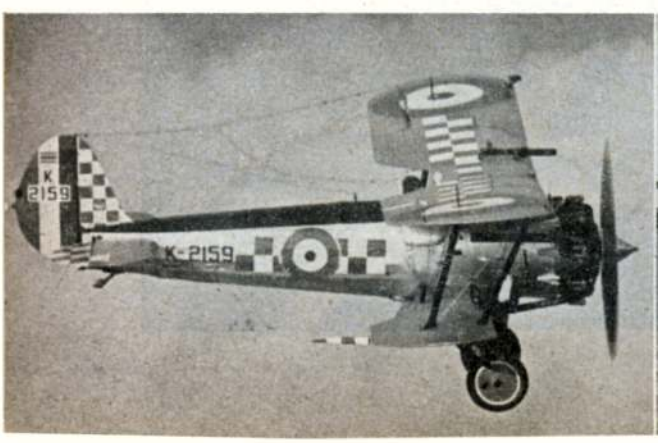
THINK OF A peacetime fighter—and think, as likely as not of the Bristol Bulldog, the pugnacious little machine which seems so typical of that colourful period of Air Force history. One of the second generation of post-1918 fighters, the Bristol 105 was designed to Spec. F9/26 as a replacement for the obsolescent Siskins and Gamecocks: the prototype, J.9480, first flew in 1927 and in the following year a contract was won in competition with other types. No. 3 squadron was the first to be equipped with the Bulldog in May, 1929; subsequent deliveries went to squadrons 17, 19, 23, 29, 32, 41, 54, 56 and 111. Total purchases by the R.A.F. amounted to 293—nearly three-quarters of its fighter strength, but many more were sold to eager foreign buyers. Bulldogs flew with the colours of Australia, Siam, Sweden, Finland, Denmark, Latvia, Estonia and even the U.S.A., the only British warplane to be bought by America between the wars. This, a standard Mark IIA was sent to Anacostia for evaluation by the U.S. Navy, but it would appear that tests were more stringent on the other side of the Atlantic, because as a result of a terminal velocity dive the machine suffered wing damage. A second, strengthened version was sent to America, but no order was placed.

The first 46 Bulldogs to be delivered to the R.A.F., J.9567 to J.9591 and K.1079 to K.1101, were Mark II's, the K. batch having a slightly different rear fuselage structure. All others were Mark IIA's, which incorporated several minor modifications including a central oil cooler between the main legs instead of two flush-fitting radiators near the leading edges, a slightly wider track, and larger tyres. Other modifications incorporated during the production of Mark IIA's were a larger fin, a castoring tailwheel and a circular hatch under the trailing edge for access to the flying controls which necessitated small fairings at the wing roots looking rather like half a teacake.

The Bulldog was an all-metal aircraft. The basic fuselage frame was of steel tube with steel strip formers and stringers, giving the characteristic vee bottomed shape. Forward of the cockpit, the covering was of polished aluminium sheet, as were the cockpit sides, the panel on the starboard side being bulged to give the pilot easy access to the machine gun on that side. The lower wings were attached to a centre section mounted under the main fuselage frame in the manner of the F.2B, but in this case the gap was faired over with fabric panels. Both wings were cut away to an extraordinary degree to reduce the pilot's blind spots to a minimum. All struts were of steel tube faired with balsa, as were the fuel delivery pipes from the tanks in the upper wings. The tailplane was unusual for the period, being of the cantilever type.

All R.A.F. Bulldogs were powered by the 490 h.p. Bristol Jupiter engine, all uncowled, but the experimental Mark III and all the machines delivered to Finland, mounted Mercury engines in a cowling similar to that fitted to the Gauntlet. Armament consisted of two synchronised Vickers ·303 machine guns and, if necessary, four 20-lb. bombs. The Bulldog's maximum speed was 174 m.p.h. at 10,000 ft. and it could climb to 20,000 ft. in 14½ minutes; its service ceiling was 27,000 ft.

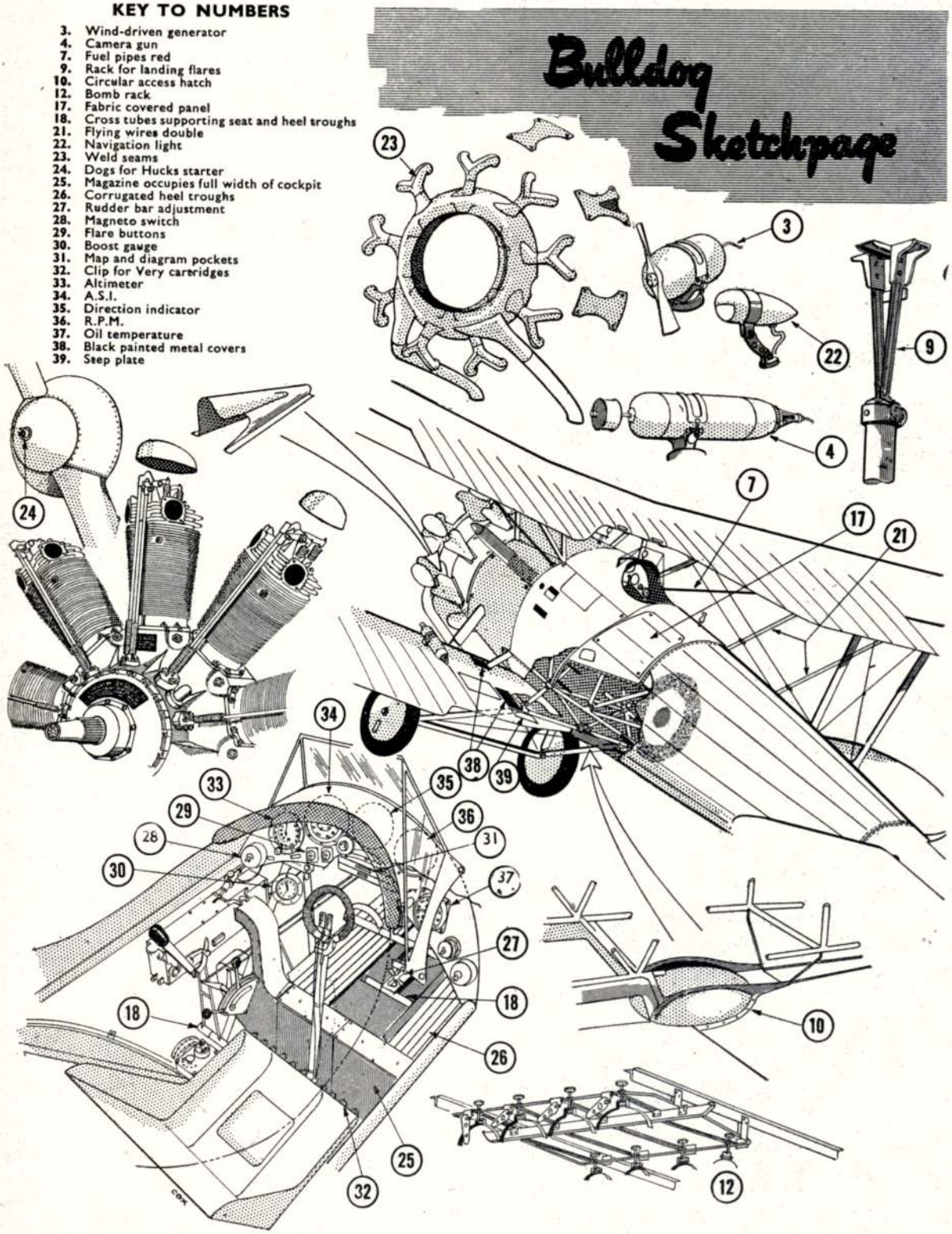
Below, left: Sqdn.-Ldr.'s machine, 19 Squadron. Note bulge in cockpit side for access to gun, white ring on wheel discs. "Flight" photograph. Below, right: a Bulldog II of No. 17 Squadron, with drogues attached to upper wings and rudder. In the background, Sidestrands of 101 Squadron and Gamecocks. Photograph reproduced by courtesy of the" Aeroplane". Bristol photo of prototype J9480 above shows minor differences from production models. Note generous strut fairings, rectangular cylinder fairings and W/T hatch, bracket type tail light

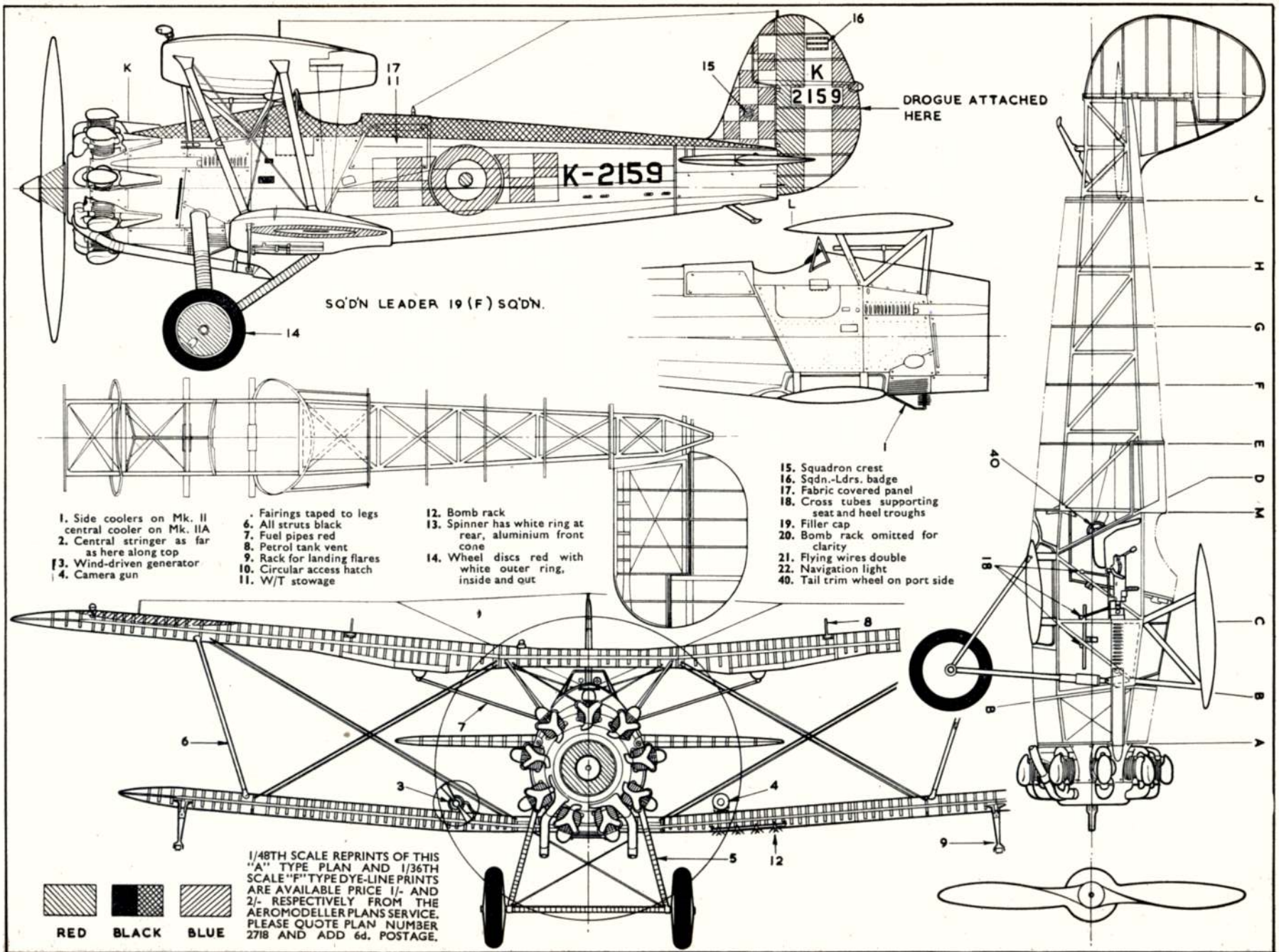


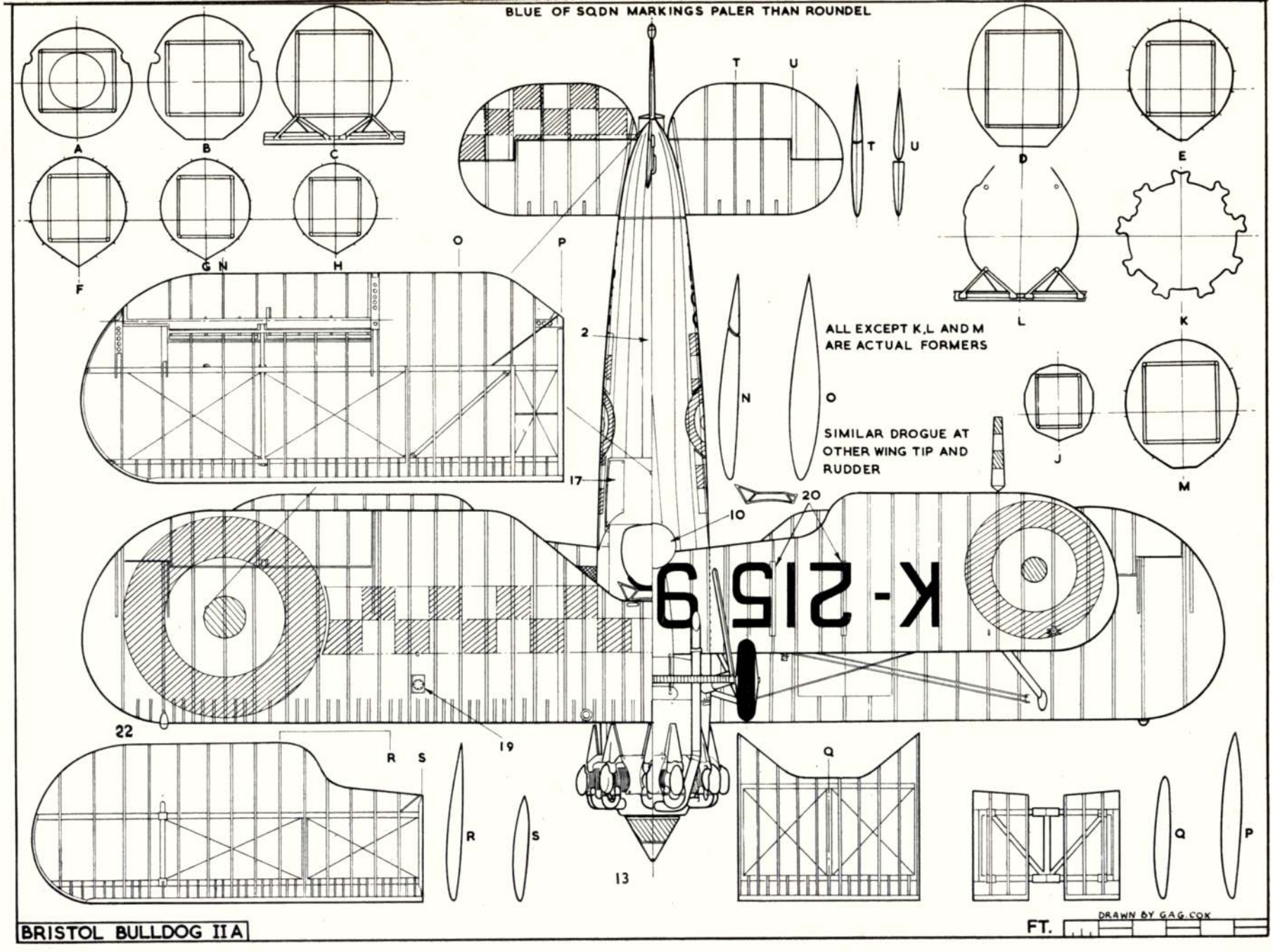
Bulldog Sketchpage

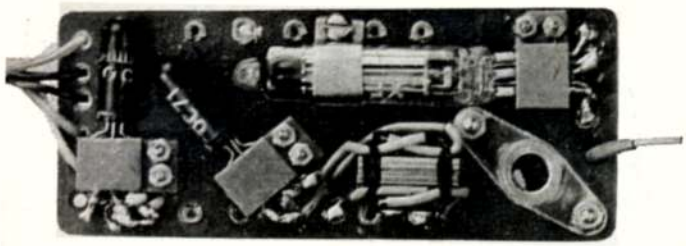
KEY TO NUMBERS

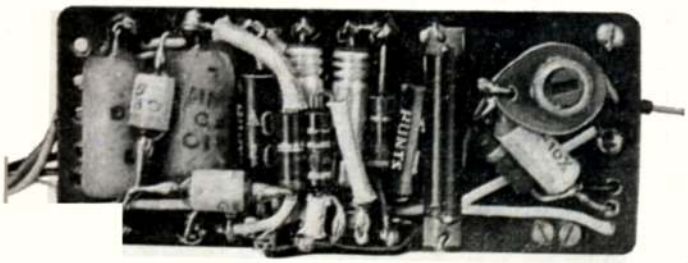
3. Wind-driven generator
4. Camera gun
7. Fuel pipes red
9. Rack for landing flares
10. Circular access hatch
12. Bomb rack
17. Fabric covered panel
18. Cross tubes supporting seat and heel troughs
21. Flying wires double
22. Navigation light
23. Weld seams
24. Dogs for Hucks starter
25. Magazine occupies full width of cockpit
26. Corrugated heel troughs
27. Rudder bar adjustment
28. Magneto switch
29. Flare buttons
30. Boost gauge
31. Map and diagram pockets
32. Clip for Very cartridges
33. Altimeter
34. A.S.I.
35. Direction indicator
36. R.P.M.
37. Oil temperature
38. Black painted metal covers
39. Step plate

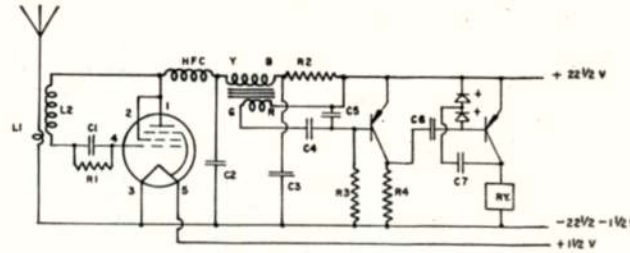



K-2159
K
2159
DROGUE ATTACHED HERE
SQ'D'N LEADER 19 (F) SQ'D'N.
1. Side coolers on Mk. II central cooler on Mk. IIA
2. Central stringer as far as here along top
3. Wind-driven generator
4. Camera gun
5. Fairings taped to legs
6. All struts black
7. Fuel pipes red
8. Petrol tank vent
9. Rack for landing flares
10. Circular access hatch
11. W/T stowage
12. Bomb rack
13. Spinner has white ring at rear, aluminium front cone
14. Wheel discs red with white outer ring, inside and out
15. Squadron crest
16. Sqdn.-Ldrs. badge
17. Fabric covered panel
18. Cross tubes supporting seat and heel troughs
19. Filler cap
20. Bomb rack omitted for clarity
21. Flying wires double
22. Navigation light
40. Tail trim wheel on port side
RED
BLACK
BLUE
1/48TH SCALE REPRINTS OF THIS "A" TYPE PLAN AND 1/36TH SCALE "F" TYPE DYE-LINE PRINTS ARE AVAILABLE PRICE 1/- AND 2/- RESPECTIVELY FROM THE AEROMODELLER PLANS SERVICE. PLEASE QUOTE PLAN NUMBER 2718 AND ADD 6d. POSTAGE.


BLUE OF SQDN MARKINGS PALER THAN ROUNDEL
A
B
C
D
E
F
G
H
J
K
L
M
N
O
P
Q
R
S
T
U
ALL EXCEPT K,L AND M ARE ACTUAL FORMERS
SIMILAR DROGUE AT OTHER WING TIP AND RUDDER
2
10
13
17
19
20
22
K-2159
BRISTOL BULLDOG IIA
FT.
DRAWN BY G.A.G. COX







A year in development by Tommy Ives

AEROTONE

Flight proved under all conditions with Galloping Ghost control by P. Lovegrove

THIS RECEIVER HAS the advantage that it has only one tuning control; there is no adjustment to the point of sensitivity.

It is also A.C. coupled and is not affected by temperature changes to any material extent. It is not unduly difficult to construct, but is not recommended as a first attempt at a home-built radio. Provided the valve stage is efficient—this is most important—the remainder of the circuit functions quite automatically. Those who have made the popular AM. transistor set will have no difficulty.

The system of operation is such that, with slight modification it can be used either as a single channel tone receiver or a reed receiver. When used as a single channel receiver the two diodes and feed-back capacitor (C.7) make it very sensitive. In this form current change on signal should be between four and six milliamps depending on the relay used, while the standing current is negligible at 0·1 to 0·2 mA.

For small size, the 25-volt subminiature components are essential. The set has overall dimensions of 3 in. x 1¼ in. x ⅝ in. and with a B.7G plug it weighs 1¾ ounces. So with the average relay the all-up weight will be around 2½ ounces. If the relay is required to be incorporated, the panel should be extended to accommodate its size.

Constructional details

Detailed building instructions have been omitted as they have already appeared in connection with previous receivers. It cannot be emphasised too strongly that every soldered joint must be above suspicion.

The position of the holes in the panel drawing and the indication of the position of the various components should be sufficient to enable the average constructor to proceed with confidence.

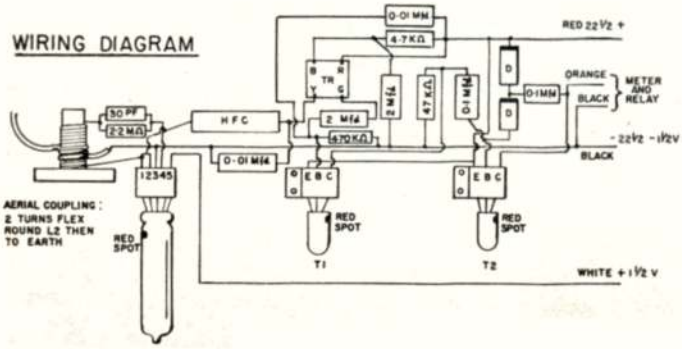
Prepare the panel with holes as detailed in sketch. The transformer can be fixed by using a piece of 20 g. copper wire as a strap passing the ends through the holes and bending over. Fix the various holders in place. Wind the tuning coil as specified connecting the anode end first to the tag close to the coil. Hold the finishing end through a hole in the base whilst binding it to the coil former. Wax the whole winding. A small blob of wax placed on the coil may be heated by the soldering iron. Connect the upper end of the winding to the clip or fixture at the top of the former (a small piece of Formica or Paxolin ⅜ in. square and a tight fit on the coil former). Connect an aerial of say 2 ft. 8 in. length to the nearest earth point to the coil. Wind 2 turns of the aerial wire on to the coil preferably at the middle or top end and thread the remainder through the hole provided in the panel. Proceed with connections as follows:

(1) Anode and screen pins 1 and 2 of valve holder to soldering tag 44. (2) 30pf capacitor from grid pin to top end of coil (*see* trimming notes), (3) 2 meg. ohm. resistor across 30pf capacitor. (4) Anode tag 44 to HFC tag 13. (5) Transformer lead (yellow) to HFC tag 20. (6) Transformer lead (blue) to capacitor tag 18 (C3). (7)4·7 k resistor between C3 tag 19 and tag 12 (opposite sides of base). Join tags 12 and 9. (8) Fix temporary flex leads to filament pins 3 and 5 in holder. (9) H.T. flex to C5 tag. Plug in the valve.

That completes the first stage of the construction and the valve circuitry is ready for testing. Cut off valve pins to a length of ⅛ in. Slip some ⅛ in. lengths of flex sleeving on alternate pins and plug the valve into place (correct way round!). Connect the negative of a 22½-volt battery to a black lead and the positive to one of the headphone leads. Connect the red lead to the other side of the phones. Now connect a 1½-volt battery to the white (positive) lead and the other black (negative) lead and one should hear a faint hiss in the phones. Valve current should be about 0·1 to 0·2 mA. Switch on carrier wave and the rushing noise will cease at some position of the dust core. Now key the modulation and the tone note will be heard faintly. Use the highest frequency of modulation your transmitter will allow.

Finish the construction as per circuit:

Connect battery supplies as before and with headphones in the H.T. lead, recheck the valve stage. Switch off, plug in Tr. 1 and the hiss and modulation note should be proportionately louder. But the bypass effect of C3 prevents loud volume. Plug in Tr.2 with the phones and a 5 m/A meter in series with the relay. Key the



This feature on **AEROTONE** has been written for the experienced radio equipment constructor. A separate booklet with additional stage - by - stage diagram and copious 44 stage assembly sequence information plus tuning hints, is available as a special printing from AEROMODELLER Plans Service. Quote RC/728 and remit 2s. 3d. to cover cost and postage. It is particularly recommended to those who have made only one receiver.

What is a tone receiver?

A tone (or audio) receiver is one in which a tone or modulated signal is received and amplified and which is so arranged that the amplified tone causes a change of current in the last stage.

This is distinct from a carrier operated receiver in which a change of current occurs in the first stage and is amplified in any additional stages.

Why a tone receiver?

(a) With carrier operated receivers some form of sensitivity control is necessary. (There are exceptions such as the Wright receiver.) The sensitivity adjustment may be affected by fluctuations in the L.T. or H.T voltages and in some cases by temperature variations.

(b) Two controls are necessary with these receivers.

The tone receiver has only one control (for tuning) and sensitivity is unaffected by reasonable voltage variations. Provided the valve stage is efficient it is easy to construct. It forms the basis of a multi-channel reed Rx if at any time a change to this type of Rx is desired.

What transmitter is necessary?

Any modulated Tx will operate the Rx, *e.g.*, the E.D. Mark II. Any existing carrier Tx may be modified by the addition of a modulator (*see* A/M., March, 1958).

Why not all transistors?

(a) The cost is very much greater.

(b) R.F. transistors are subject to temperature fluctuations and great care is necessary in arranging for temperature stabilisation.

(c) With an R.F. transistor in the first stage, efficiency could be affected by voltage fluctuations.

(d) All-transistorised would not be a receiver for the novice.

Why a separate relay?

This is largely a matter of choice. Points to be remembered are:—(a) The relay is the only component affected by vibration and needing suspension. (b) When a relay is included there is a greater mass in the event of a crash or heavy impact. (c) Relays are costly and one will do for several receivers. (d) Only one additional wire connection is necessary.

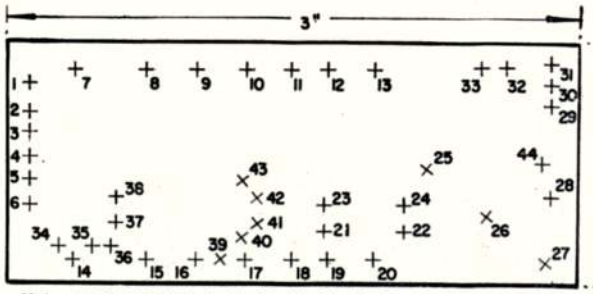
modulated signal and the note should be louder. The feed back arrangement causes the tone to be less powerful than might be expected. There should be a current change of 4 to 6 m/A depending on relay resistance (phones disconnected). The standing current in the absence of a signal should be 0·1 to 0·2 m/A. If higher than this, try increasing the value of C5 0·02 or up to 0·1 if necessary, or alternatively connect a resistor of 5·6 k to 10 k between tags 15 and 9 (Tr.2 base and emitter) until standing current is lowered.

If current fails to rise, disconnect the diodes and a very loud note should be heard on keying the Tx. If so, the diodes or C7 must be faulty. Choose diodes with a reasonably high back resistance not less than 100 k. GEX34 diodes are suitable. The cheap type will do quite well provided the back resistance is as specified. If the tone is not loud with the diodes disconnected suspect C6 or Tr.2.

This completes the single channel receiver. In the case of the reed receiver, leave out the diodes and C7 and connect a 470 k resistor between tags 15 and 11. A tuning condenser for the reed unit should be connected between tag C of Tr.2 (or tag 14) and tag 11. Value from 0·02 mfd. upwards.

Components

Subminiature valve holders. (Three.)
Polystyrene coil former ¼ in. in diameter.
H.F. Choke. Wind a $\frac{3}{16}$ in. birch former 1 in. long full with 40 g. enamelled wire.
C1, 30 pf.
C2, ·01 mfd. Hunts miniature.
C3, C4, 2 mfd. subminiature (25 volt).
C5, ·01 or more. Hunts miniature.
C6, C7, ·1 mfd. miniature. T.C.C. 150 volt $\frac{3}{4}$ in. by $\frac{7}{16}$ in.
R1, 2·2 meg. ohm ¼ watt.
R2, 4·7 k ¼ watt. R3, 470 k ¼ watt. R4, 47 k ¼ watt.
Transformer. Ardente 5-1. 2 Diodes, greater than 100 k, *e.g.*, GEX34.
Valve. Hivac XFY34 or similar.
Transistors Hivac TM1, Brimar TS2 or TS3, Mullard OC71, Surplus redspot type.
Coil winding. Thirty turns 32 g. enamelled wire.



Holes 1-6 (incl.) 21-24 (incl.) 28, 32, 33, 37, 38, 42, 43 all No. 50.
Holes 7-20 (incl.) to suit tag.
Holes 29, 30, 31, 40, 41, all No. 54. Holes 25, 27, No. 43.
Hole 26, 9/32". Holes 34, 35, 36, 1/16".

Notes on adjustment of the valve stage

The efficiency of the valve stage will determine whether the receiver is a success or not. The amplifier can only pass on the signal received as in any case it is very small and it will be realised that time spent on the valve stage will be well repaid.

The receiver is most sensitive when the valve is oscillating gently at the radio frequency. At the same time it must be quenching correctly so that any modification of the H.F. circuit must not go beyond the point at which the quench oscillation is inefficient. A simple test for this is to estimate the strength of the tone signal received.

Values are given in the instructions for assembling, but due to the fact that valve characteristics vary and component tolerances may also vary by as much as minus or plus 20 per cent. it is not possible to give a rigid specification.

In the case where the valve stage is inefficient the following changes may be tried. Note to make only one change at a time.

1. Grid capacitor. This may be varied from 20 pf to 50 pf but do not go below 20 pf.
2. Grid resistor. Vary between 1 meg. ohm and 3·9 meg. ohm.
3. H.F. Coil. Wire gauge may be varied from 28 g. to 36 g. but use the thickest gauge consistent with sensitivity.
4. Aerial coupling may be increased to 3 turns.
5. Aerial length may be increased to 3 feet.

In the case of (1) reducing capacity will increase sensitivity.

In the case of (2) varying R1 will affect the quench frequency and may improve sensitivity.

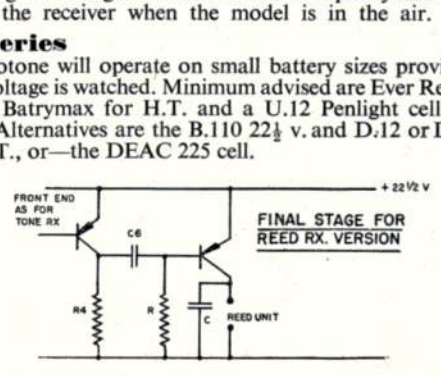
In the case of (3) reduction in wire gauge may improve matters and a reduction in the number of turns will reduce H.F. oscillations due to the fact that the tuning slug will need to be screwed further in to the coil and will thus produce losses in the H.F. circuit. Do not overdo this as sensitivity may suffer.

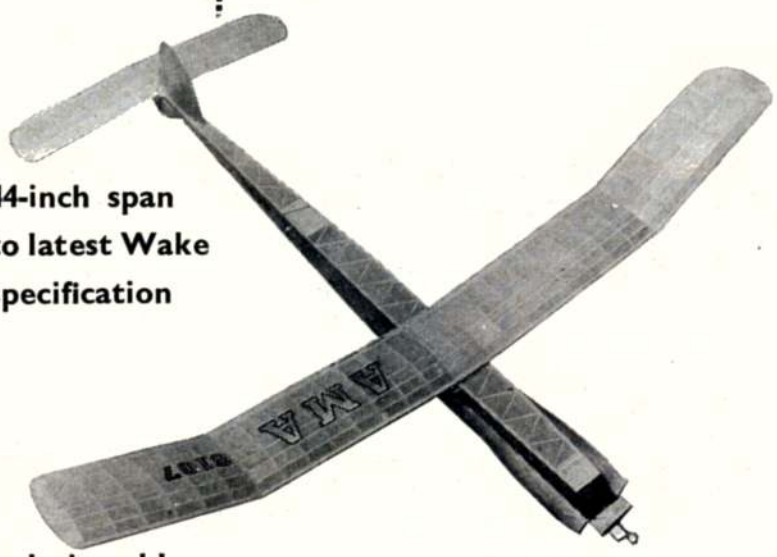
In the case of (4) an increase in aerial length will place a greater load on the grid circuit and reduce oscillation.

Too great a length will increase earth capacity and may affect the receiver when the model is in the air.

Batteries

Aerotone will operate on small battery sizes provided that voltage is watched. Minimum advised are Ever Ready B.122 Batrymax for H.T. and a U.12 Penlight cell for L.T. Alternatives are the B.110 22½ v. and D.12 or D.18 for L.T., or—the DEAC 225 cell.





44-inch span to latest Wake specification

Can a top-class Wakefield be made suitable for the novice? One of the most famous clubs in the world thinks so—and uses this design to boost interest in contest flying. Detailed plans and instructions cover all points.

designed by Joe Elgin & George A. Reich

O-HIGH-O

THIS DESIGN HAS been prepared through the courtesy of the Cleveland Society of Model Aeronautics, an organisation new in name only. The club is the outgrowth of the *Cleveland Balsa Butchers*, whose beginning dates back to 1937 and the C.S.M.A. has probably been more successful than any other group in that country in representing the U.S. in World Championships. Since 1951, no less than six times has the club had a member in the U.S. Team. In pre-war years (then the C.B.B.), the club was represented several times on the Wakefield Team, and in 1939, Dick Korda attained the highest honour in Aeromodelling by winning the coveted Wakefield Trophy.

In recent years the rules governing Wakefield models have undergone several changes that now enable a model builder, without previous experience with this type of model to compete favourably. This Wakefield design is a simple straightforward model, yet designed to be able to hold its own with the best of Wakefield models.

Wing construction

Start by first cutting out wing ribs as shown on the plan using $\frac{1}{16}$ in. sheet balsa, soft to medium. The leading edge, trailing edge, and spars should be medium hard. The trailing edge can be purchased already shaped.

Covering the plan with waxed paper will prevent the glue from sticking to the paper. Start construction by first pinning the leading edge, trailing edge, and the three lower spars in place on the plan. Note that the trailing edge will have to be packed up as shown on the plan. The ribs can now be cemented in place. Be sure to match the lower surface of the rib with the underside of the T.E. where these two join. The upper spars can next be cemented in place.

After thoroughly dry, the dihedral can then be put in by first cutting through at the dihedral joints where shown on the plan, leaving the $2\frac{1}{4}$ in. centre section pinned on the plan. Before gluing the inner wing panels back in place with ends raised one inch, trim off the ends of the L.E., T.E. and spars so they fit without any gap between. Next glue in the $\frac{1}{16}$ in. plywood dihedral keepers. The three centre ribs will have to be shortened $\frac{1}{16}$ in. on each end to allow the plywood to be slipped in place. The extreme wing panels, in a similar manner, can be glued back in place with their proper dihedral. The plywood dihedral keepers are not necessary at this joint, but be sure to put in the reinforcing gussets.

With the use of a sanding block, fair in leading and trailing edges with the ribs to produce a nice smooth framework.

Tail construction is similar to that of the wing. Note the *negative* dihedral (anhedral) for added lateral stability.

Make the rudder outline of $\frac{1}{8}$ in. thick stock as shown, and glue in the $\frac{1}{8}$ in. square spar. After thoroughly dry, take up from the plan and proceed to make the symetrically shaped cross-section by gluing in the $\frac{1}{16}$ in. and $\frac{1}{8}$ in. strips. Glue to the leading edge first and let dry completely before bending and gluing to the spar and trailing edge.

Make one fuselage side at a time by first pinning (not through but on either side) the top and bottom longerons in place. As most balsa comes in 36 in. lengths, the longerons will have to be spliced to make the required length. Make a long splice, about 1 in., and locate this splice as shown on the plan at the point where the fuselage is filled in. Use medium $\frac{3}{16}$ in. square for the forward portion and a lighter wood towards the tail end.

Next cement in the uprights and fill in where shown, then put in the diagonal pieces. Make the other side in the same manner, noting that the diagonal pieces slant in the opposite direction. This type of construction (Warren Truss) involves more work; however, it produces a very rigid framework.

The next step is to join the two sides with cross pieces

to make the rectangular shape. Start by first putting the two sides flat against each other and wrapping a rubber band around the extreme ends. Keeping the ends of the sides even, spread out the sides at the wing position and glue in temporary cross pieces top and bottom (not diagonals) to make a body width of 2¼ in. After drying, cement in the $\frac{3}{16}$ in. square cross pieces at the rear motor peg position. The $\frac{3}{16}$ in. square cross pieces at the nose can then be put in, and after this the $\frac{1}{16}$ in. by $\frac{3}{16}$ in. diagonals may be put in position on either side of the temporary cross pieces. After these have dried, take out the temporary pieces and finish putting in the rest of the diagonals. The nose section may then be filled in as shown and the $\frac{1}{32}$ in. sheet cemented to the underside of the fuselage.

Covering

Jap tissue is recommended, however, any lightweight model tissue may be used.

Cut the tissue so the grain will run length-wise to the section to be covered. For example, cut a strip for a fuselage side about 1 in. wider than actual width with the grain running from nose to tail. Start at the nose and using a small artist's brush, cover the framework with unthinned clear dope about three or four inches back along the longerons. Then stretch the tissue over the doped portion as tightly as you can, smoothing out the wrinkles and making sure the tissue is completely doped to the framework for the area. Then lift up the undoped portion of the tissue and apply dope to three or four inches at a time until the whole length of tissue has been doped to the framework.

After the whole framework has been covered, use a small hand spray (or your fingers with extreme care) and cover all tissue covered parts with just enough water to wet the tissue.

When dry, the tissue will be tight and ready for doping. Use clear dope, thinned with an equal part of thinner. Give all parts three coats using about a 1 in. flat soft-haired brush.

Propeller

Use a block of medium hard balsa of the size as shown on plan and carefully follow the steps in the illustrations. After the filler blocks have been glued in place as sketched, start carving with a sharp knife as detailed.

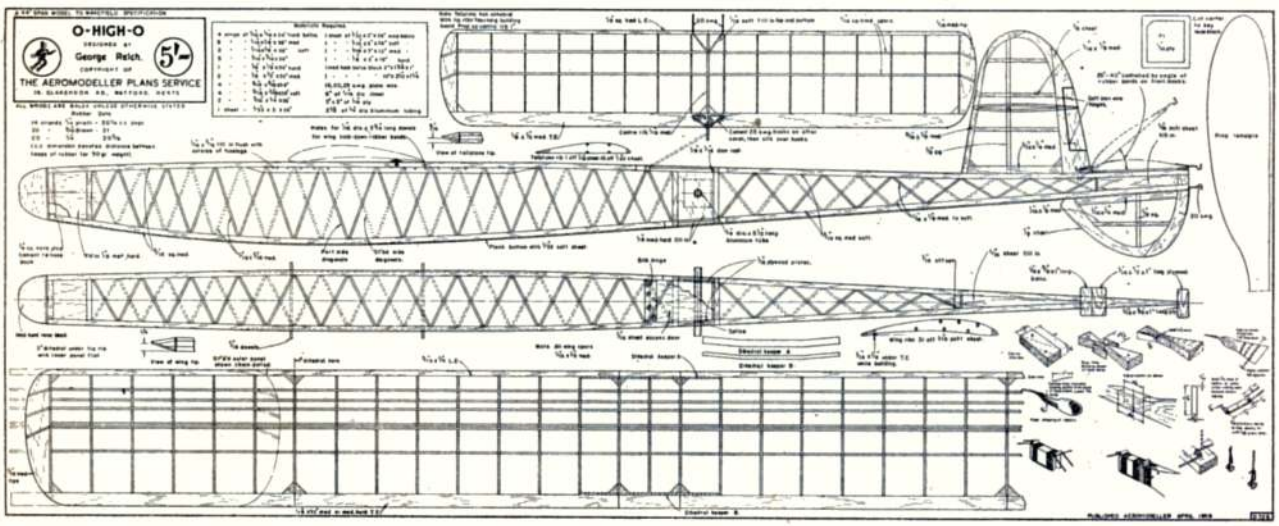
Tired Motor?

Rubber modelling enthusiasts will be specially happy to know that reaction on the part of the leading British rubber manufacturer was exceeding quick after we published John O'Donnell's candid comments in Part 1 of our series, "Expert's Forum" (*January issue*). We can only hope that as a result of co-operation between manufacturer and our most experienced modellers, we shall eventually have a world-beating quality of flat rubber strip to suit the so demanding 50 grammes of motor needed for International Wakefield Competition.

This will be the underside of the blades. Next go on to stage 4 and carve and sand the top (or front) surface of the blade to the shape shown, then turn over and carve the undercamber as shown. Check each blade to see that both are of the same thickness, then the prop. should balance when rotated on a shaft through the hub. Next thin the hub out, working from the front of the prop. to a thickness of $\frac{3}{4}$ in. as shown in stage 5. Then cut the final blade shape, using the template on the plan. Finish by resanding the blades to airfoil shapes with smooth curve. Blade should have $\frac{1}{16}$ in. to $\frac{1}{8}$ in. undercamber at the widest blade shape and progressively less toward the tip. Final blade thickness should be $\frac{1}{8}$ in. max. at widest point and taper to $\frac{1}{16}$ in. at the tips.

Before cutting the blades at the hinge position be sure the prop. balances. If it does not, check the outline of the two blades to make sure they are identical, and also check the thickness of each blade. Then finish with two coats of sanding sealer or dope.

FULL SIZE COPIES OF THIS 1/7th SCALE REPRODUCTION ARE AVAILABLE PRICE 5/- PLUS 6d. POSTAGE AS PLAN D 726 FROM A.P.S.



ENGINE ANALYSIS No. 58

SILVER STREAK

A new 2·5 c.c. racing diesel with unique twin roller bearing shaft and high standard of manufacture

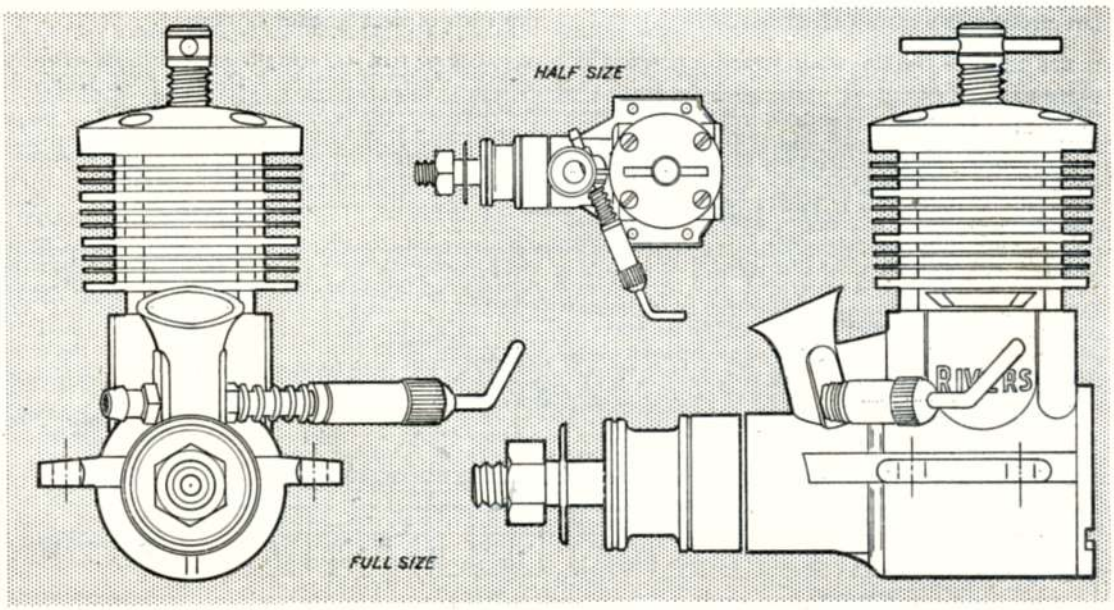
Reviewed by
R. H. WARRING

AN ENTIRELY NEW engine from a manufacturer "outside" the model trade is something of a rarity these days, especially in a competition class, where absolute performance is the criterion of success. The Rivers "Silver Streak", however, has a thoroughly sound background and is not entirely without an aeromodelling history. Graham Rivers, son of the proprietor of A. E. Rivers Ltd., is a control line enthusiast and has been subjecting the prototype and development engines to a considerable amount of flight testing over the past few months with the Hayes club.

The firm of A. E. Rivers Ltd., are precision engineers and sub-contractors to the full size aircraft industry—in particular having made parts for the Fairey Delta and currently engaged on sub-contract work for the Fairey Rotodyne. One would therefore anticipate a high degree of accuracy and full size "know how" to be applied to a model engine production, which is indeed the case. The standard of workmanship throughout is of the highest order and generally better than that found on normal production engines.

Outwardly the "Silver Streak" is quite similar in appearance to the Oliver. Internally it is essentially an original design and one which has been subject to considerable development. The most interesting feature is the design of the crankshaft and bearing which utilises rollers for anti-friction mounting but dispenses with usual raceways and cages. The large diameter shaft is stepped at each end of the bearing length and runs in a hardened steel bearing sleeve. Each stepped section contains seven "free" 1.5 mm. diameter rollers, separated circumferentially by spacers. The roller journals are ground to within minus .0002 in. at .350 in. diameter. The top diameter of the shaft is ground to .4682 in. minus .0004 in. minus .0006 in., ensuring that the rollers are at least .0002 in. proud of the top shaft diameter. The bearing housing or sleeve is honed to .4684 in. diameter which gives an optimum running fit on the rollers of .0002 in. to .0004 in.

The result is that the shaft is supported entirely on the 14 rollers (seven at the rear and seven at the front) which gives very smooth, free running. Roller length is

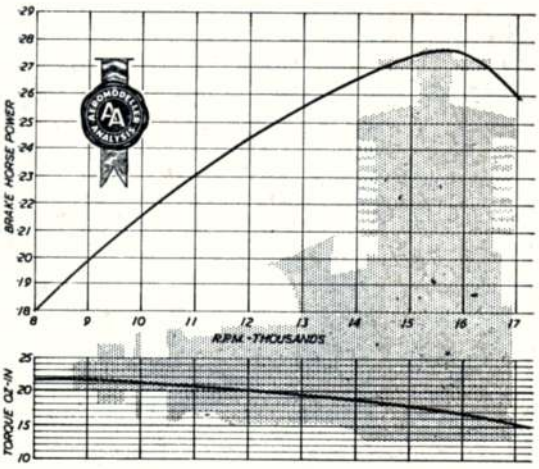


Analysis findings

PROPELLER—R.P.M. FIGURES

Propeller dia. x pitch	*r.p.m.*
10 x 6 (Frog nylon)	8,000
9 x 6 (Frog nylon)	10,600
9 x 3 (Tiger)	12,000
8 x 4 (Tiger)	14,500
7 x 3 (Trucut)	18,400
7 x 4 (Trucut)	16,000
7 x 5 (Trucut)	13,800
7 x 6 (Trucut)	12,300
8 x 4 (Trucut)	13,500
8 x 6 (Trucut)	10,200
8 x 8 (Trucut)	8,300
9 x 4 (Trucut)	10,800
9 x 6 (Trucut)	8,400
10 x 4 (Trucut)	8,000
9 x 4 (Stant)	11,000
8 x 4 (Stant)	14,200
8 x 6 (Stant)	12,700

Fuel used: Mercury No. 8



Specification

Displacement: 2.49 c.c. (.152 cu. in.)
Bore: .5782 in.
Stroke: .5782 in.
Bore/Stroke ratio: 1.0
Bare weight: 5.6 ounces
Max. B.H.P.: .277 B.H.P. at 15,800 r.p.m.
Max. torque: 22 ounce-inches at 8-9,000 r.p.m.
Power rating: .11 B.H.P. per c.c. (1.83 B.H.P./cu. in.)
Power/weight ratio: .049 B.H.P. per ounce

Material specification:

Crankcase: light alloy gravity die casting
Cylinder: hardened steel, stress relieved
Cylinder jacket: dural, turned
Piston: Meehanite, ground and honed
Contra-piston: Meehanite, ground and honed
Crankshaft: 85-ton steel, hardened on journals, tempered on crank pin and threaded length
Bearing sleeve: hardened steel
Bearings: rollers (sleeve and rollers forming an integral twin roller race assembly)
Connecting rod: DTD 363 dural
Spray bar assembly: brass, 4 B.A.
Prop. driver (hub): machined from dural
Manufacturers: A. E. Rivers (Sales) Ltd., 15 Maswell Park Road, Hounslow, Middlesex.
Retail price £6 10s. (incl. P;T)

approx. .3 in., so the load is effectively distributed over this length of shaft at each end. Whilst inherently rollers tend to have more friction than ball races, this design in dispensing with cages, etc., and reducing the number of rolling elements, appears to have very low friction and the load-speed capacity is well within the requirements of the design. It gives a very smooth feeling bearing and one which remained almost perfectly cool at all load speeds. Also there is little or no tendency for wear to develop on the bearing. The manufacturers state that a 100-hour running test on a prototype was conducted to investigate bearing wear, which was of the order of less than .00005 in. over this period.

This particular bearing arrangement chosen for the production engine, although relatively complicated as a production job (particularly as regards the crankshaft), is a simplified version of a patent ball and roller bearing devised by A. E. Rivers and used on the first prototype engines where a larger number of rollers are employed separated by rows of balls. The load is still carried by the rollers in this design, the balls being a clearance fit and virtually acting as fully flexible spacers with alignment ensured by the inclusion of one solid spacer in each bearing set (mainly used to prevent skewing). A. E. Rivers state, that this form of bearing can be supplied on the "Silver Streak" as a special, at an additional cost.

The crankshaft itself is machined from 85-ton tensile alloy steel, hardened on the roller journals to Rockwell 60 and with a tempered propeller shaft and crank pin. The port opening is extremely large in size, possibly larger than necessary. The bearing sleeve is of steel, hardened and stress relieved. It is ground on the overall diameter to a .002 in. force fit in the crankcase casting and the bore is honed. The crankcase bores and faces are machined in one setting and bores tested to within .0005 in. for 90 degrees over a 4 in. test bar.

The cylinder is of hardened steel and of conventional pattern, plugging into the crankcase to a depth governed by the exhaust flange. The liner can be fitted only one way, the front part of the skirt being machined away to clear the crank web. Exhaust ports are cut through the cylinder flange and four transfer ports are drilled at an angle upwards immediately under the flange in the pillar areas to overlap the exhaust ports by about half their depth. Transfer passages are milled in the outer cylinder walls in a triangular form, with the transfer ports forming the apex of each triangle.

The cylinder is stress relieved and ground all over, the bore finished by honing to a surface finish of the order of 2 micro-inches. The conical top piston is of Meehanite, ground and honed to plus or minus .0002 in. on .5782 in. nominal diameter and each cylinder is then honed to suit each piston individually. Particular care is taken with regard to piston fit which, on the new engine, tends to be a little on the tight side so that some considerable amount of running in is necessary before maximum performance is realised. The manufacturers themselves stress the importance of running in carefully, and according to their instructions, and up to 5-6 hours running-in time is probably an average requirement to get the best out of an individual engine.

Paste coating and hollow screw

The contra-piston is of Meehanite, again ground and honed to fit and once again quite a tight fit, although reasonably easy to move. It is actually assembled with a molybdenum disulphide paste coating and three grooves are cut in the contra-piston wall to retain this lubricant. Certainly it retains its setting at all speeds with no tendency to slacken off, but equally will follow a decompression setting instantly. It would probably make for slightly more comfortable handling if the compression screw tommy bar was lengthened to the full diameter of the cylinder, although it has already been lengthened on the production model compared with the prototype. The compression adjusting screw is hollow to lighten, which also avoids "point contact" on the contra-piston.

The cylinder jacket is machined from dural and is a fairly easy "plug" fit over the cylinder. It, together with the cylinder, is held down by four screws through the head and engaging in four spigots in the crankcase casting. The spacing of these screws is not perfectly symmetrical (closer spaced laterally than fore and aft) so they partially overlap the exhaust ports, which may give an initial impression that the liner has rotated slightly. Certainly this arrangement has no adverse effect on performance, nor is the asymmetric tightening down of the cylinder likely to produce any distortion with the thickness of liner employed.

The connecting rod is fully machined from dural with a generous size "ball" little end and lubricating hole in the big end. The crankpin is ground to .197 in. diameter and the connecting rod big end drilled and reamed to 5 mm. (.1965 in.) and the last half-thou. honed out. Gudgeon pin is hardened steel ground to .184 in. diameter, and is a light press fit in the piston. The propeller driver is also fully machined from dural, overlapping

please turn page

Rivers Silver Streak (Cont.)

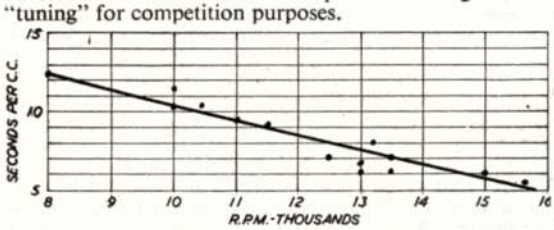
the front of the crankcase bearing length by a matter of some ¼ in. and keyed to the shaft by being driven onto a short splined length on the shaft.

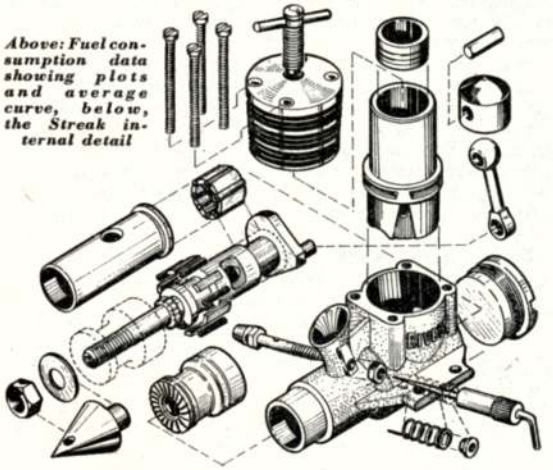
Handling and running characteristics of the "Silver Streak" are extremely good. It definitely prefers a fairly heavily nitrated fuel (*e.g.*, minimum 3 per cent. amyl nitrate or nitrite) but starts readily on finger choke or prime to give a rich mixture. When hot it starts readily on a prime without altering the needle or compression settings, which is an attractive feature for team racing, in which field this engine will undoubtedly have a particular appeal. Both the controls are essentially non-critical although the faster the speed the finer the setting adjustments required for optimum performance.

Excellent torque is given low down, and the "Silver Streak" runs steadily at 8,000 r.p.m. and below. At the other end of the speed range it continues to run consistently and smoothly at speeds in excess of 18,000 r.p.m. with propeller loads, developing maximum power output at just under 16,000 r.p.m. A particularly pleasing feature was the absence of vibration at high speeds, although there were one or two propeller sizes on which it was not as happy as the others—*e.g.*, 8 x 3½ Tiger and 6 x 9 Tiger. Also, it tends to get snappy on starting with small props.

Summarising, a really rugged engine, built to last and manufactured to some of the highest standards we have come across in the model world. Performance wise it bids fair to winning itself quite a reputation on the flying field—and if the price is a little higher than the average 2.5 c.c. diesel, it seems worth every penny extra for the quality of the workmanship alone.

More than probably, too, this will be the first of several engines from the same stable. A bored out 3.5 c.c. version of the "Silver Streak" is undergoing development and is stated should be ready by May-June. And with such a specialised design, too, we imagine Messrs. Rivers would not be loath to accept standard engines for "tuning" for competition purposes.





Above: Fuel consumption data showing plots and average curve, below, the Streak internal detail

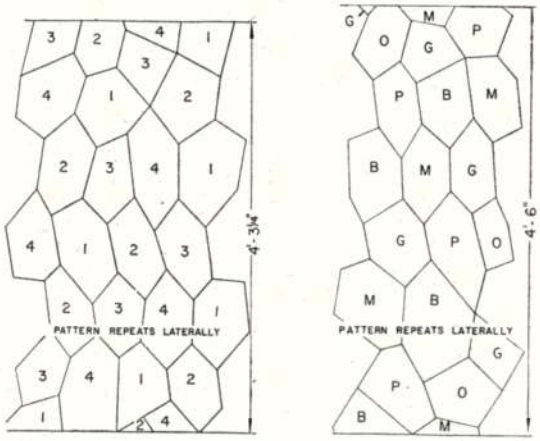
SINCE THE APPEARANCE of the articles on German W.W.I. camouflage in November, '57 to January, '58 issues, much further research into the subject of the printed lozenge fabrics has been conducted by Mr. H. D. Hastings of Mount Vernon, N.Y., who has kindly made his findings known.

Two criteria were sought: (*a*) the establishment of an *exact* "repeat" section of a fabric bolt; (*b*) a precise colour reference to the dyed losenges. It was decided to start with fabric still known to be in existence and an approach was made to Dr. McGrath of the Australian War Memorial Museum, Canberra, who supplied sufficient information for a true representation of the pattern and colouration of fabric on the Albatros D Va in this museum, to be prepared. This fabric covers the undersurface of the wings, the top having been, unfortunately, painted over a dark green shade—almost black. A full-size reconstruction of the lozenge pattern

Below left: The Halberstadt C.V. hanging in the Musee de l'Armee in Brussels has its fabric covering at an angle of approximately 45 deg. and uses a mixture of both four and five colour patterns on various parts, see text. At right is H. D. Hastings' picture of the Albatros D.Va. in the Canberra War Museum showing how an additional strip is used at the trailing edge to make up full width

World-wide research provides the last and authentic word on WW1 fabrics

COMPILED BY P. L. GRAY



Pattern 'A' **Pattern 'B'**

Patterns above are to 1/24th scale for modelling convenience. Photo opposite page shows the Fokker D.VII in the Musee de l'Air, Paris, with white vertical tail and standard fuselage fabric pattern and marking as on the Canadian Museum example quoted in text

was subsequently sent to Dr. McGrath, for comparison with the original, and after correction can now be certified as correct. For pattern and colours, see diagram. The same pattern and colour fabric is also applied to the Pfalz in that museum—both sides of the lower wing and the under-side of the upper wing being so covered. As with the Albatros, the top surface of the top wing has been over-painted dark green.

With regard to colours, commercial paint chips were matched to the fabric shades and these, in turn, were carefully matched to "The Munsell Book of Color", a standard reference of some 1,000 shades. This work is in two vols., and although not readily available from libraries, it can probably be specially procured for a short loan. The writer was able to obtain it for a period of four days only, but during that period prepared the traditional colour descriptions appended to the diagrams for the benefit of modellers who may not be too exacting about their colour values—for those who are, the Munsell references are included also.

Similar action was taken in respect of the Fokker D VII at Knowlton, Quebec, which aircraft was personally inspected by Mr. Hastings. The fabric pattern subsequently prepared, and verified for correctness, was found to be different from that of the Albatros D Va at Canberra, and it will be seen also that this D VII fabric is composed of a four-tone colour scheme, whereas that of the Albatros is a five-tone scheme.

It would appear there was considerable variation in the way in which the fabric was applied to airframes. On the Albatros the fabric is fixed spanwise with a narrow strip added to the trailing edge to bring it up to full-chord width (*see* illustration). The fabric on the Fokker D VII in Knowlton is afixed chordwise. That applied to a Halberstadt C V hanging in the War Museum in Brussels, is at an angle of approximately 45°. Strangely enough the fabric applied to the lower starboard wing of this machine is the same four-colour pattern as that of the Knowlton Fokker D VII, while the fabric covering the lower port wing and tailplane is the five-colour fabric of the Albatros!

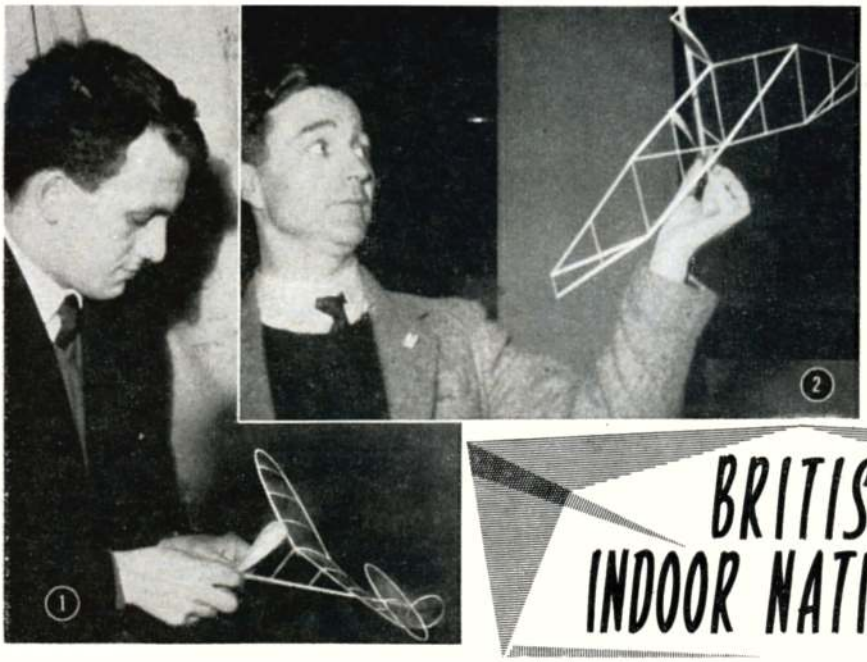
It is interesting to note that Mr. Hastings made a survey of photographs of some 51 different Fokker D VII aircraft of which 38 were covered with the so-called "Knowlton" or "Canberra" patterned fabric. The remaining 13 machines were either completely painted over or the photographs were too indistinct for the fabric pattern to be properly identified.

BASIC LOZENGE PATTERN "A" (4 Colour)
Taken from Fokker D VII (Alb) 6810/18 Knowlton

Lozenge Key	Top Surface Munsell	Code	(Approx. Colour Description)	Lozenge Key	Bottom Surface Munsell	Code	(Approx. Colour Description)
1	10.0 PB	5/2	(Pale violet tinged grey)	1	10.0 B	6/2	(Pale cobalt blue tinged grey)
2	5.0 G	3/2	(Dark blue/green tinged grey)	2	10.0 GY	6/2	(Pale leaf green tinged grey)
3	10.0 YR	6/3	(Warm beige)	3	10.0 YR	7/4	(Pale terra cotta)
4	5.0 GY	6/3	(Light sage green)	4	5.0 R	6/4	(Reddish pink tinged grey)

BASIC LOZENGE PATTERN "B" (5 Colour)
Taken from Albatros D Va in Australian War Memorial Museum, Canberra

M	Top surface over-painted dark green/black	M	10.0 RP	6/2	(Pink tinged blue)
O		O	10.0 YR	8/6	(Cream tinged crimson)
P		P	5.0 R	6/6	(Bright reddish pink)
G		G	10.0 GY	6/4	(Leaf green tinged grey)
B		B	5.0 BG	6/6	(Pale cerulean blue tinged grey)



Good times despite limited space at the Manchester venue for the ultra-lights

reported
John O' Donnell

BRITISH INDOOR NATIONALS

FOR THE THIRD consecutive year the Corn Exchange, Manchester, was the venue for the S.M.A.E.'s only Indoor event. Efforts by the organising N.W. Area to secure the use of the nearby Royal Exchange (which offers rather more usable space) had terminated with discovery that it is not available for hire. The Corn Exchange is hardly an ideal site as it is rather small, obstructed, and consistently draughty (in both vertical and horizontal directions). Several of the more experienced competitors do not consider it worthwhile to build really light structure high-time models until a better site is available, and much wishful reminiscing about Cardington was heard.

Flying arrangements were identical to last year, with Saturday afternoon and evening available for test flying, followed by the contests on the Sunday. Both days were divided into approximately 30 min. chuck glider and two-hour separate free-flight sessions.

The Saturday appeared comparatively quiet, as a number of competitors (including most of the Birmingham contingent) did not arrive till the following day. Those who were there, seemed to be playing it safe and not going up near max. turns—although about four flights of 8-9 mins. were made. A flight of 6:31—roughly a minute in excess of the current record—was unofficially made by A. M. Robson's Class A (under 30 sq. in. wing area) model. Chuck glider flights were not generally impressive, with best scores of 30-32 secs.

Contest organisation on the Sunday was rather free and easy, which was ideal for those who wanted to test fly or watch, but which gave a rather crowded floor. Conditions for free-flight were hardly ideal, and best technique appeared to comprise a comparatively robust (if "heavy") model with adequate stability, and flown on sufficient power to maintain height in a downdraught during the latter part of a flight. This set-up could, however, result in a climb to the roof in about 2 mins. and a good chance of a trip up to the peripheral balcony to retrieve the model. Considerably more tissue models were seen than in previous years as a remarkable number of flyers had managed to obtain "$\frac{1}{4}$-thou." condenser tissue. With more power, heavier loading and a less-slow flying speed than their microfilm counterparts, the tissue models seemed better able to cope with the weather as a glance at the results will confirm. Tissue winner J. O'Donnell flew his last year's model to break his own British record. The model is to Ted Gonzoph's design out of Zaic's Year Book, and the winning flight was made on the residual turns after the preceding rather short flight had been terminated by a pillar at 20-30 ft., and ended with a "dead-stick" glide for 40-odd seconds. Late in the day Eric Barnacle turned in 11:02, finally "hanging up" at the top of one of the pillars. Third place went to A. M. Robson with 8:25, who went home minus his model which was perched on a ledge in such a position that even the N.W. Area's hydrogen balloons could not dislodge it. He was naturally much more concerned about his 14-in. carved prop than the model.

The microfilm class was a Birmingham clean-up with Phil Read producing a convincing win as he managed a best flight of 12:05 and another of 11:00 plus. Only other flight in the double figure class was Ray Monks' 10:10 which placed him second. Well down (in minutes) was third placer Dan Poole with 7:22. General microfilm trends were very much towards Birmingham's techniques—*i.e.*, medium height pylon, fin behind the tail, and very thin, slack "crinkled" microfilm .Bracing wire was usually about 1 thou. nichrome. Flying conditions were well illustrated by a flight of Monks' large (150 sq. in. wing area, 0.032 oz. structure weight when new) model that went up and down in 4:00 without hitting any obstacles, on sufficient turns to have turned in 17 mins. on Cardington results. Air space was often rather congested and mid-air collisions were commonplace—J. O'Donnell had no less than four!

The Hand Launch Glider event (to use American terminology) saw the usual amount of broken balsa; and much hectic repairing during f/f periods. Few flyers seemed to have either taken the event seriously, or analysed the requirements—as most models either lacked any finish or were too heavy and needed too much space for the hall. Last year's winner, H. O'Donnell, had to miss the event with 'flu and his brother John was unable to match Hugh's strength of arm. This left Whitefield clubmate Terry Ellison to win the event, and push up the British record to 38 sec. His winning model was rather large at 18-in. span, weighed 0.5 oz. and featured a thinned $\frac{1}{16}$-in. really soft sheet wing, and a dope-less talcum powder finish. Very close behind came G. Freeston of Sheffield flying H. O'Donnell's "Platero" design to 37 sec. and Eric Barnacle just another 0.2 sec. behind. Eric was the only double prizewinner. Launching techniques varied considerably—Ellison's model climbed practically straight, with an initially considerable amount of right bank decreasing till the model swung into its left glide, whilst Freeston launched right-handed with left bank to climb and glide left. Floor congestion made official flights rather difficult especially as an orderly queue of waiting flyers was not organised.

The meeting concluded with the usual presentation of prizes. The awarding of badges and diplomas in addition to the "£.s.d." prizes at the contest, instead of months afterwards, was much appreciated.

In summarising, it can be said that interest is a little up on last year, especially in the tissue class—but that scores are definitely limited by the geometry and internal airflow of the hall. For scores to even approach those done in the States a considerably larger, if less conveniently situated, venue will have to be found.

HAND LAUNCH GLIDER (Best flight out of 10 attempts)
27 *competitors*

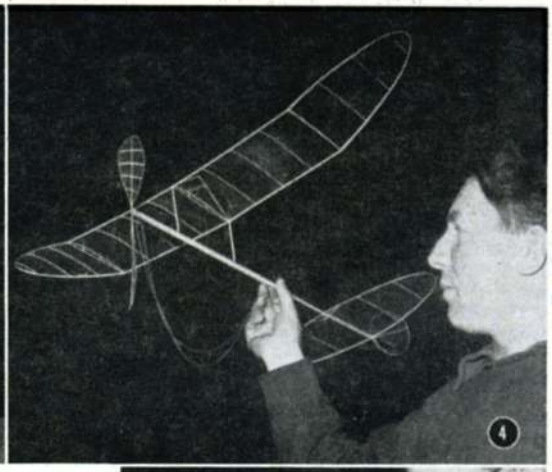
1. **J. T. Ellison**	... ...	**Whitefield** ...	**38.0 secs.**
2. **G. Freeston**	... ...	**Sheffield**	**37.0 secs.**
3. **E. Barnacle**	... ...	**Leamington** ...	**36.8 secs.**

TISSUE COVERED F/F (Best flight out of unlimited number of attempts) 19 *competitors*

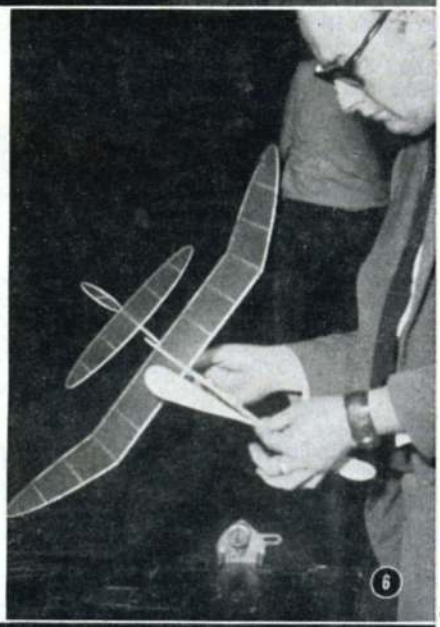
1. **J. O'Donnell**	... ...	**Whitefield** ...	**11 : 18**
2. **E. Barnacle**	... ...	**Leamington** ...	**11 : 02**
3. **A. M. Robson**	... ...	**Tees Group** ...	**8 : 25**

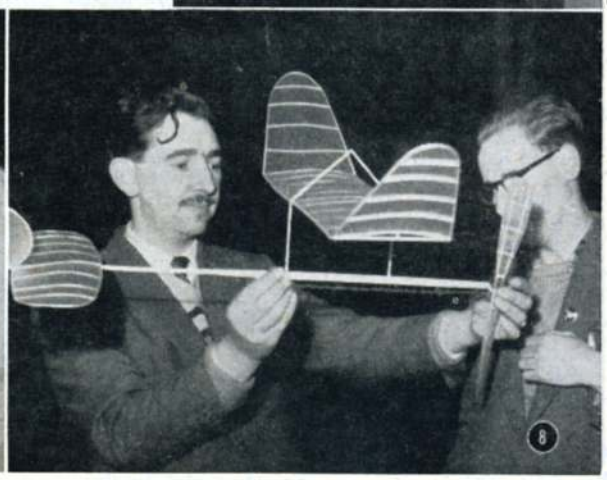
MICROFILM COVERED F/F (Best flight out of unlimited number of attempts) 17 *competitors*

1. **P. Read**	... ...	**Birmingham** ...	**12 : 05**
2. **R. Monks**	... ...	**Birmingham** ...	**10 : 10**
3. **D. Poole**	... ...	**Birmingham** ...	**7 : 22**



(1) D. Morley of Lincoln with his new record holding class A model. (2) Reg Parham up from Worcester with his tailless creation. (3) J. O'Donnell's tissue covered winner away on gentle launch. (4) Ray Monks placed third in microfilm with clubmate Phil Read first, seen launching in (5). A. M. Robson of Tees placed third in tissue, picture (6), note rudder offset. (7) What, no S.M.A.E. numbers? Chuckers-up Eric Barnacle (third) and G. Freeston of Sheffield (second) confer perhaps over their 0.2 secs. difference. (8) is W. Nelson preparing to launch while Sheffield clubmate D. Smith checks over





THE AUCHENGARGLE WORLD CHAMPIONSHIPS

DESCRIBED BY THE CLUB HISTORIAN BRIAN HOLMES AND DECORATED BY "RUSS"

"WONDER WHERE they'll hold the World Championships this year", murmured Tumps McWhippet, as he idly thumbed the club model mag.

"The Red Square or the moon", answered Joe Small, pausing in the act of heaving a paper dart, "It is the Russkis' turn, isn't it?"

"Was", replied Joe, "but it says here that they've given it the jolly old veto".

"Must be a bit pushed for flying space with all those rockets popping about", chipped in Thermal McGraw "And I don't suppose they go much on the idea of a horde of modellers stampeding over their collectivised crops."

"Cranfieldski again", said Joe, cryptically, as he watched his paper missile sail into the rafters to make contact with the empennage of the sleeping Drambuie.

"That's talking wet in more ways than one", snorted Tumps.

"These Foreign chappies haven't yet recovered from our last dose of climate, Some of them are still leaning over at a forty-five degree angle."

Joe was silent for a moment, lamenting the loss of his paper masterpiece, which had disappeared into the ravenous beak of the disturbed seagull.

"Well, it wouldn't be fair to the Russkis to ask them to fly in one of our home brewed tempests", he commented. "These sputnik boys don't just stick a few ready-made sticks of balsa together to pass away a wet weekend; they build their models on the five-year plan, out of dried grass and senna pods."

"What's more," chimed in Tumps, "If you happen to prang your model, by the time you've built another you're too old to chase it."

"How do they trim those dried grass jobs," asked Thermal innocently, "With a lawnmower?"

"Canna ye young hooligans behave yourselves", roared McSwindle, "Just world champion nuisances, if you ask me."

"Can't remember asking you," answered Tumps, cheekily. "Anyway", he went on, "I don't see why we couldn't run a World Champs. as well as anyone."

"That's right", agree Joe Small, "All you need is a few assorted flags and a rubber stamp."

"Not to mention a flying field", sneered McSwindle. Tumps refused to be diverted by trivial details.

"And we've at least one stop watch with a fly-off hand."

"You mean, fly back", corrected Joe.

"You couldn't have seen our stop watch, lately." McSwindle broke in again.

"And what do you propose to do about the language difficulty?" he asked.

"Oh, I think we could find an interpreter for you and the Maestro", answered Tumps.

Paris in the spring evokes a mood of lighthearted gaiety, but the atmosphere in the F.A.I. Council Chamber was anything but, as the Maestro rose to speak.

"Its a verra poor show that nae one is prepared to put on a wee bit of a contest for the laddies", thundered the Maestro. "Shame on ye all, however, gentlemen, etc."

Groans of despair in many languages, including Billingsgate. "Where, gentlemen", continued the Maestro, unabashed, "We have the bonniest flying ground outside Chobham Common; the contest experience (eight entries in the McPoodle Trophy); the best accommodation (the Ben McSplurge caves are the most sumptuous in the Northern Hemisphere); and the linguistic skill (we can even understand the Sassenach)."

"And", the Maestro went on, "I make only one wee provision: that I, H. T. McGillicuddy, lead the British Team to victory."

Thus saying, the Maestro retreated through the nearest window, just escaping international homicide by the skin of his sporran. After calm had been restored, the Chairman rose to speak.

"The worst had befallen us, gentlemen. Either we accept the ultimatum or forego the world championships. May I remind you that we have completed a most successful year of rule making, and it would be most embarrassing not to have any contests to which to apply our rules."

There followed a deathly silence, broken only by the steady plop of delegates jumping off the balcony.

So it came to pass in the following August that the sleepy township of Auchengargle burst into a mood of cosmopolitan gaiety. The ancient Town Hall was ablaze with the flags of many nations, and the Rampant Haggis added a continental touch by putting their wooden benches out on the pavement. It was that rare thing, a Scottish flag day.

Seated in his administrative headquarters, the saloon bar of the Rampant Haggis, the Maestro was conferring with his chiefs of staff.

"And what are ye still doing here", he thundered, sighting Snooky, "You were detailed to meet the train."

"Bit it doesn't arrive until Thursday", protested Snooky.

"That's nae excuse", said the Maestro, sternly, "Last Thursday's train is a wee bit late. To your post, laddie."

"Now", commanded the Maestro, "Can we have your visitors' report, Mr. McSwindle? Come the four corners of the world and we will shock them, hey?"

"Not 'arf we won't", agreed Joe, feelingly.

McSwindle looked dubious.

"Weel, so far we've got the laddies in the blue rompers. Then there was few characters with furcaps and snow on their model boxes. Only they turned out to be some of the Teuchlie Torrie boys playing, a silly joke. There's also some laddies who've installed a lathe and die casting machine in the basement here—they could verra well be the

Hungarians."

"Any more?" asked the Maestro, anxiously.

"There's a stout laddie in a straw hat. Says his name's Jake or Snake. Seemed verra concerned aboot his fellow countrymen. Said their automobile was a wee bit too wide to get through the pass." McSwindle went on to recite the long, but mostly unidentified list.

"That's nae bad", commented the Maestro, then, turning to speak, he broke off as he caught sight of the two strangers at the bar.

"Shhh", he hissed, his nose flashing a warning red, "Secret agents'..

"Secret fiddlesticks", snorted McSwindle, "The only secret thing in Auchengargle is the closing time of the Rampant Haggis", The Maestro wagged a conspiratorial finger.

"They're after the plans of the secret model", he whispered. "What secret model?" demanded McSwindle, "You mean the Tibetan model with the fuselage of compressed yak fur, or the Bulovian model—the one with the solid gold noseblock."

"What are ye blathering aboot?" creid the Maestro, "I mean the McGillicuddy Special, the design that will revolutionise model flying."

"What, does it turn cartwheels, or something", asked Tumps. The Maestro looked instrutable.

"Apart from the retracting propeller and the lifting C.G. variator, I canna say a word," answered the secretive Maestro. "Now, I must away to safeguard my plan."

He scuttled off, leaving a bewildered and unbelieving group behind him.

Not to be outdone in matters of ceremony by anyone, Auchengargle had decided to hold a grand procession to the flying field. So, on the morning of the contest the national teams were lined up outside the Town Hall with banners at the ready. They had been waiting there for four hours, and now, from beneath the banners, came murmurs of world revolution.

"Things look ugly", said McSwindle.

"Be uglier still when the Maestro turns up", observed Joe Small. "Wonder what could have happened to the old devil?"

"Looking for his C.G." chimed in wee Bawbee Laurie.

"What d'you mean, looking for his C.G.?" demanded McSwindle.

"All I know is, that his model is equipped with some super special C.G. and now he's lost it", explained Bawbee.

"What's the little horror blathering about?" asked Joe, exasperatedly.

"What I say", insisted the small informant, "He forgot where he put the C.G. on the model."

"Well, why doesn't the old fool look it up on the plan?" asked Joe, wearily.

"That's just it. He can't find the plan—says its been stolen."

"Is that all", roared McSwindle, "we canna wait for him any longer. Take over Mr. Small."

Joe whipped up a smart salute then turned to the parading modellers.

"Parade 'shun! Slope model boxes! By the left, to the flying field, quick march!"

They marched happily away. All, that is, with the exception of Joe, who couldn't remember the Tongonian word for halt.

Upon arrival at the flying field McSwindle called the team managers to one side, leaving the remaining quarter of the procession to disperse to the cowshed.

There was blue sky over the contest field—something which few Auchengarlians had seen before. But a stiff westerly breeze was blowing across the airfield.

"This has upset our plans," observed Tumps.

"Why?" asked Snooky Munro.

"We shifted the muckheap up to the wrong end."

"Anyway," said Snooky, "it's high time we commenced flying, Maestro or no Maestro."

The first contestants were already waiting on the take-off area. Each had in attendance six timekeepers, four helpers, two team managers and a trainer. Added to this were a few hundred other officials of varying degrees of obscurity. The few contestants who could find enough elbow room in the general congestion were already piling on the turns.

One competitor—two dozen "officials"

Away flew the first batch of models spiralling up to score easy maxes., but the McGillicuddy Special was still grounded, awaiting the return of its absent owner. Joe Small looked worried.

"All these maxes.," he groaned, "and still no sign of the white hope. Wish there was something we could do. I can't understand all these easy maxes."

"I can", cried Tumps, smitten by sudden inspiration, "It's the muckheap, we'll have to shift it."

Away went the duty squad to perform their patriotic task. A little while after they had left a familiar figure hove into view. It was the Maestro, looking dishevelled.

"It's nae good," he moaned to McSwindle, "I canna find the plan anywhere. The rogues must have stolen it."

"Dinna fret yourself, laddie," comforted McSwindle. "Keep your pecker up."

"He'll need to!" broke in Joe Small, "we've found the missing plan—on the muckheap."

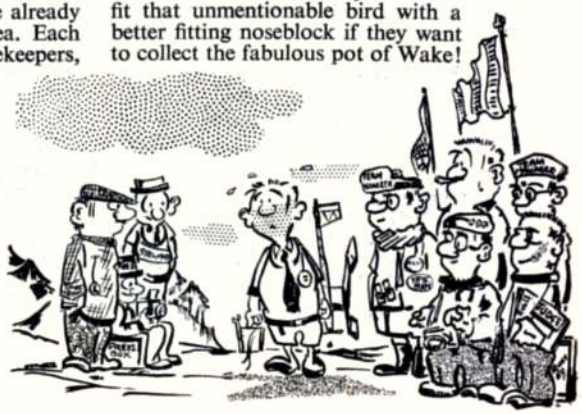
"Saved at the eleventh hour," cried the Maestro, "Clear a space in yon area, and let us join battle."

The Maestro got away to a perfect athletic launch; the spring mechanisms in his heels working to perfection. But, as the model corkscrewed up in a perfect spiral, it suddenly changed into the familiar, flapping shape of Drambuie.

"Me model! Me model!" cried the Maestro in acute anguish.

"I told ye to behave yourselves," cried McSwindle, "now ye've woken up yon sleeping beauty."

"Wasn't us," said Thermal, looking hurt, "it must be its feeding time." And those were the last words we ever heard from our bold hosts for the World Champs. as they hot footed off to the Highlands with the wrath of the International Jury on their heels. Next time they'll have to fit that unmentionable bird with a better fitting noseblock if they want to collect the fabulous pot of Wake!



CLUB NEWS

THOSE S.M.A.E. FEE increases continue to feature in club reports. One sane reaction to last month's comment hails from J. F. Evans, Hon. Secretary of Portsmouth M.A.C., who states: "I don't like paying increased prices, but if prices of insurance for airfields and so on go up, then the people who use them must pay more.

"As for the expression 'the S.M.A.E. is killing aeromodelling' this may be dismissed as cool calm unadulterated rot. In my opinion, aeromodellers are killing the S.M.A.E. for at the recent Southern Area Annual Meeting only three clubs turned up.

"Shame on all Southern Clubs including my own!

"This is surely a case of a dog biting the hand that feeds it. Contest organisation, airfields for contests, Insurance and so on for £1 a year (about 5d. a week per airfield) is certainly cheap on anybody's reckoning and as to the accusation that the Society is changing us to a nation of sport flying modellers, I can't name any modeller who would change his branch whether it is Control-line, Radio, Power duration or gliders for a mere 7s. 6d. a year."

Southern

A recent "count up" in **PORTSMOUTH M.A.C.** found that they have 123 engines in the club, mainly 2·5's. (Paw's, Fox's, Olivers and Enya's) and a few large foreign glows. The Secretary recently achieved hovering flight for about 15 seconds with his Veco 35 *Slo-Mo-Shun* stunter when the needle vibrated open and the model came into wind. Chairman, Dave Johnson, who has a habit of producing something not quite normal, is now flying on ALL SHEET AM.15 stunter. It has flap and elevator control and beats most ½A team racers for speed.

CHICHESTER AND D.M.A.C. was reformed about two years ago, and now has about fifty members, of which at least thirty are active. By kind permission of a local farmer, they have a flying field adjacent to the Goodwood Motor Circuit, with a club room, which was bought with £90 profit from a couple of dances, also they had enough to buy a new motor-mower for cutting control-line and take-off areas. Just shows what enthusiasm can do! Current interest includes R/C with six models flying in February.

Biggest item in **SOUTHAMPTON M.A.C.** was the marriage of Pete Giggle and Mavis Pepper on February 14th. The club members wish them all the very best in the future, but they regret their loss to the Stevenage area. We too extend best wishes to Pete and Mavis and expect to see them in the South Midland Area before long.

An inter club combat battle was held on February 1st between the **SOLENT HEIGHTS M.F.C.** and the comparatively new **BEMBRIDGE M.F.C.** in the Isle of Wight. Bembridge club had the disadvantage of lack of "hot" engines. Most noticeable when trying to keep up with Solent Heights Oliver Tiger Powered *Unlimited's*, which were timed at 92 m.p.h., and were doing eights at this speed.

In the end the Solent Heights came out on top, after many mid-air collisions, one Oliver Tiger had nearly 50 ft. of steel line round the prop.!

London

The area has decided to "float" its eliminator programme so that only one eliminator takes place on any one day. Not a bad idea as Chobham is the venue for each of the six days, making this a full March/April session for the boys in "Smoke". **WANSTEAD** have got this year's point system off to a good start by holding three club competitions in the first three weeks of January. ½A T/R to the new rules, and speed, were won by Bert Graham using a Super Tigre G.31, and the A T/R to the old rules by Eddie Vernon. "Pongo" Smith won glider with an *Aiglet*, and power by Len Soanes with an A.M.10 powered O/D model of 18-months' vintage. Combat is now receiving attention after last year's T/R craze. A club combat competition was won by Dave Howell using an Oliver powered conventional model. ½A Combat has also caught on.

This is also a new fad in **KENTON M.A.C.**, who held a club ½A Combat event, despite cold winds and failing light in January, the winner of the senior section was M. Beggs, flying a reduced size Sword powered by Frog 150R. I. Bone was first in the Junior section with an A.M.10 wing. Membership has fallen off recently no doubt due to a long winter with no flying competitions to bolster enthusiasm and new members would be made welcome at Northwick Park any Sunday afternoon.

Ignoring the freezing cold (20° F. at 8 a.m.) a handful of **FARNBOROUGH M.A.C.** members arrived at Chobham for the first club competition of the new season.

M. Brown emerged victorious with his new *Osprey* glider which proved ideally suited to the weather conditions and was more than a match for the power bods., the latter being restricted to 10 sec. motor run.

A new club has been formed in the South London Area. It is known as the **DULWICH M.F.C.** and meetings are held every Wednesday at Dog Kennel Hill School.

Facilities exist for construction and indoor flying and film shows will be held regularly. All enquiries about membership should be made to the Secretary, J. C. Barnes, 4 Copleston Road, Peckham, S.E.15.

A snap engine census was taken among **HAYES M.A.C.** members recently—interesting facts discovered were, that between them they own 150 plus motors, ranging from ·1 to 10 c.c. and coming from as far apart as Russia, Japan, Italy, and Hungary. The big shock came when they estimated their value—over £600. First examples of the new Rivers 2·49 racing diesel they were testing have shown it to be really hot.

HODDESDON M.F.C. had a good year terminating with the usual prizegiving Christmas Party. Latest project is a 2A team-racer to be built solely by the juniors under the auspices of R. Davis. A spout of rubber bits bought recently out of club funds have provided the subjects of some very exciting R.T.P. team races. These are taken as the best time over twenty laps on a 6-ft. line. Best time so far is four minutes.

DARTFORD M.F.C. Annual Rally will be taking place at Central Park Dartford, on June 7th. The classes being combat to S.M.A.E. rules, Class A and B T/R and there is a possibility that they will also include ½A this year, but only if there is sufficient demand. ½A seems to be getting more popular now and its about time the 1·5 class became more widely recognised, but we should never lose sight of the fact that it was created for the "boys" who can only afford P.B. engines.

Membership of **HORNCHURCH M.A.C.** is now mounting rapidly, not surprising considering their flying field (best in the London area). Surprise winner of a chuck glider event was speed king Ray Gibbs, who put his *Popeye* pylon arm to good use with a series of high altitude chucks. Pilots are now going into strict training for their new 124 m.p.h. team racer. No secret fuel mix—just a standard brew from the *Model Aero Engine Encyclopaedia*.

South Eastern

Verbose report from **LEATHERHEAD M.A.C.** leads one to think their P.R.O. could do with a precis. They have 19 members, fly most types, money in the kitty, and an obvious keenness to keep up with all that's new. Unfortunately, that's not news and three solid foolscap pages labour the point—Let's keep these reports short, snappy and newsy, eh?

SPRINGPARK M.A.C. membership stands at 42, 20 estimated to be active members. Subscriptions have been raised to meet the increased S.M.A.E. charges.

The new season opened well for them on January 11th, with a convincing win of 25 : 43 to 18 : 34 in club competition against **BLACKHEATH M.A.C.**

RAMSGATE AND D.M.C. holds its meetings on Wednesday and Friday evenings from 7.30 p.m. to 9.30 p.m. at Effingham Street, Ramsgate, and a cordial invitation is extended to anyone interested, especially those keen on model railways!

EAST GRINSTEAD M.F.C. are now preparing for the local Hobbies Exhibition, where they have a stand. Mike Smith is well under way now with a C/L Rotodyne for two A.M.25's, which stands a good chance of carrying off the scale prize, though some members of the club including Mike, are rather doubtful as to its flying capabilities. The club flies every Sunday at Felcourt, near East Grinstead, and new members especially of the F/F variety, are welcome. The club now has its own weather forecasting system, as one of the members works in the Met. office at Gatwick.

NORTH KENT NOMADS are holding a Concours D'Elegance shortly to ensure that members have not been fire-hugging during the winter. They also have two lady members who have put down their knitting to take up aeromodelling and two well performing gliders have been the result.

East Anglia

CLACTON club has been very active with numerous scrambles, and combat sessions. Club challenge trophy (competed for on a points basis) was won by D. Coe. The control-line boys have been busy churning out combat models, the *Ogre* being most popular, and there has been a recent trend to experiment with C.L. Autogiros, one of which made a spectacular free flighting escape and looping continuously

IPSWICH M.A.C. had their picture in the local paper after twenty members and friends attended the Annual Dinner. Quite all right though—they weren't misbehaving! Following their last year's success, bookings are already rolling in for the club to run fete displays during the coming season.

From 10,000 feet over East Anglia, one can see never less than four airfields. Despite this, the only regular free flight venue for the **NORWICH** boys is Thetford Heath, some 25 miles away from home. Restrictions at their doorstep ground, R.A.F. Horsham St. Faith, result in only a small corner of that excellent field being available for model flying. Former York members and one-time regular Northern Area fliers, Arthur Wharrie and Tony Finucane, are now Secretary and Chairman respectively of this old-established club. Negotiations for a suitable field are urgently in hand—otherwise with control liners twirling in the local parks and the free fliers operating at a distance, there are dangers to the unity of the club—and my prize too for this best report of the month, printed exactly as received. P.R.O.'s please note the concise presentation of facts.

South Midland

Five new Olivers have just come into **ABINGDON AND D.M.F.C.** so we should soon be seeing some more hot combat jobs in this obviously wealthy group.

Provision of a clubroom has resulted in a big revival of interest in **NORTHAMPTON M.A.C.** in rubber models. Several *years* ago this was *the* club for promotion of new Wakefield design trends—I hope that new blood and the old hands will regain their once proud reputation. In **BISHOPS STORTFORD** there is a nucleus of keen modellers anxious to build up a club worthy

of the name. Local unattached enthusiasts should contact K. King of 51 Ward Crescent, Bishops Stortford.

Western

Where have the trophies gone? That's a question the area secretary would like to have answered and I would be pleased to pass on any information.

A large scale purge of non-subscribing members in **SOUTH BRISTOL M.A.C.** is now taking place under the direction of the new razor-keen treasurer. Accounts from last year show that the club spent over £300 at their favourite model shop!

The very active chairman, Andy Wilson, has just completed a scale twin Piaggio amphibian. No flights as yet, but it is powered by two Darts.

Mike Barnett—he is just 17 and in the **BRISTOL R.C.M.A.C.**—has been giving some very consistent demonstrations of touch-and-go landings, and also some good low-level "beat-ups", with his ancient Junior 60 powered by an Enya 29 fitted with throttle control. Don Cole tried to get out of the rut with a very nice looking low-wing, with elevator and rudder control, but its initial flight was rather unfortunate and so he is now free to concentrate on his new Taplin Twin-powered Smog-Hog. This has flown very nicely on its maiden flight all on its very own—a gentle way of stating that his radio didn't work. However, he agrees that the model did far better without any interference from him.

BRISTOL AND WEST M.A.C. activities this year are to cater for the less experienced modellers, and they are starting with a series of eight "one-off" contests for the K.K. Senator on Durdham Downs. Indoor flying is taking place at a badminton court near Bristol, with Messrs. Wade and Davies flying microfilm and Mr. Wade also "having a flutter" with an ornithopter. Is the name "Bronco" stamped all over it the trade name of a new covering material ?

South Western

Although there is now no South Western Area, the shield awarded for competition between clubs in the Devon and Cornwall area is still available and usually the competition for same has taken place in conjunction with the Devon rally. This year, at the request of the **EXMOUTH** Club (the holders), the competition will be held on June 21st at Crownhill Down, between Lee Moor and Plympton, and near Plymouth.

This is open to clubs and members in the South Western area and consists of Rubber, Glider and Power contests, unrestricted, to general S.M.A.E. rules except that 4 min. maximums prevail. Organisation will be in the hands of the **PLYMOUTH M.F.C.**

Midlands

B. Colby and T. West of **MIDLANDERS A.E.** have had much success with their Class "A" and "B" T/R "Ferty" designs and have clocked well over "the ton" with their Class B ETA Mk. 6 job. J. Goldingay has been chewing streamers in the club's combat events and won the annual cup for this event.

At the North West Area Winter Rally **OUTLAWS (CANNOCK) M.A.C.** started the season as they intend to continue with Ken Bridge sharing first place in combat. Unfortunately lack of sufficient moonlight prevented the final from taking place and the three finalists split the prize money This result rather put to shame the many P.A.W.- or Oliver-powered "*Peacemaker*" fanatics, as Ken used an O.D. wing with Frog 2·49(mod), assisted by super-efficient pit work by Brian Millington. At long last, Olivers are beginning to filter in, and dubious eyes are being cast over the F.A.I. T.R. rules, in an effort to instil a little more variety than at present.

There has been a great increase in F/F interest in the **WEST BROMWICH M.A.C.** The interest is so great that even some of the juniors are foresaking the everlasting combat models, and are indulging in the club competitions!

WALSALL M.A.C. was well represented at R.N.A.S. Stretton, with five entries in Combat, of which D. Swain was eliminated in the semi-final and J. Burke in the quarter-final. In F/F Power D. Pym got two maxes, but missed out on his third flight due to some packing which came adrift from the tail of his Webra-powered model.—Will they never learn to stick it in?

LEICESTER M.A.C. have another film show arranged for Wednesday, April 22nd, at the Technical College, starting at 7 p.m., which sounds as good an opportunity as any to get to meet the lads.

S.M.A.E. Contests

March 29th
Astral Trophy (F.A.I. Power)
S.M.A.E. Cup (A/2 Elim.)
Women's Cup
(U/R Rubber-Glider)
Jetex Challenge Cup
Area

April 19th
F.A.I. Power Eliminator
Weston Cup (Wakefield)
Lady Shelley Cup (Tailless)
Area

R.A.F Henlow, Beds

Northern

WHARFEDALE AND D.A. visited both the Northern Rally at R.A.F. Linton-on-Ouse and the North Western at Stretton. The T/R at Linton was hampered by thick fog and the late arrival of Heath and Thornaby clubs forced a prize money share-out between the finalists of the A and B events due to lack of daylight. Wharfedale were 1st, 2nd and 3rd in the ½A event, only a final being flown. They don't know how other modellers went on who left Linton after dark, but it took the Wharfedale lads threequarters-of-an-hour to navigate their way off the 'drome. They even used a compass and nearly lost two bods who wandered off into the fog trying to find a landmark! The weather was much better at Stretton, but again the T/R events were badly supported, ending with two all-Wharfedale finals. Frank Baxter and Ken Long won Class A and B events respectively.

East Midland

CLEETHORPES carried off the Butlin Trophy for the second year in succession, and R. L. Goddard of Cleethorpes was this year's winner of the *Victor Ludorum* and Open Power cups. Other winners were T. Woodward of **FORESTERS** (Glider) and A. G. Balding of Cleethorpes (Open Rubber). Arthur Collinson and Stan Eckersley of Bradford very kindly made the long journey down to Lincoln to show Silvios's colour films of international events at home and abroad. Interest in indoor flying seems to have taken on in the area, with Cleethorpes running regular R.T.P. events, and **NORTH LINCS** and **LINCOLN** doing free flight.

North Eastern

NOVOCASTRIA M.A.S. had a Dixieland band for dancing at their social, but no Georgie Fuller! Sadly missed was Stan Wood and his family who emigrated to Canada at the end of last year. Club membership has shot up these last months, the club went through a bad patch when some of the old faithfuls left owing to other commitments, but the membership is up to forty again now. Control-line flying seems to be the favourite amongst the younger members, but the seniors seem to have turned from team-racing to gliders, even the only active lady member has changed from controline and built a glider.

North Western

Accompanied by **HESWALL, WALLASEY M.A.C.** went by coach to the N.W. Winter Rally at Stretton and John Done came third in glider with his latest A/2. The club's R/C project is now finished and now awaits suitable weather for tests. Most members are busy making new A/2s for this year's trials.

SHARSTON D.M.S. had J. Feeney placed seventh in Power, flying a *Eureka* (Enya 19) at Stretton and D. Nunnerley reached the quarter finals in Combat.

Joe Barnes of **LIVERPOOL AND D.M.A.S.** flew a Pee Wee version of a *Ramrod* in Power at Stretton and surprised everyone by getting a max! In his first flight the glide was spoiled by the weight of the d/t fuse, causing it to stall! Arthur Searl's all-sheet A/2 was comp. flown for the first time and performed very well, though it did look rather frightening on the line, the wing dowels are made from 16 s.w.g. wire and the wing flexes quite a bit on tow. In Radio Allen Jones and Stan Catchpole have been developing a single channel tone Rx which is proving very reliable. The club now has Bursco Aerodrome for club flying, any Saturday or Sunday.

E. LANCASHIRE M.A.C. Vice-Chairman Arthur Garnett and Chairman Eric Ford set a fine example to all members by placing first and second in Power at Stretton. Winning model was a modified "*Creep*" with a Webra 1·5 c.c., and second place model was a rather elderly, but none the less efficient, "*Super Phoenix*". (FROG 2·49 c.c. Mod.)

Big talking point in **WIGAN M.A.C.** at the moment is, what has happened to the English Electric trophy competition? They started with this comp. early last year, and after beating all comers were told that a venue was to be found that would be suitable for the final. That was last October!

They are very fortunate in Wigan to have a lot of good seniors who have not forgotten what it is like to be at the junior stage without encouragement, and have consequently been quick to respond to pleas for help from the younger end, and this is also paying dividends in the growth of the club.

Pen Pals

Requesting aeromodellers *in this country* to write to them are E. J. Toner, 160 Grange Street, Franklin Square, New York, aged 27, an airline pilot and ex-Naval flier with scale interests; Louis J. Isern, 2022 Faunce St., Phila 15, Pa., U.S.A., keen on control line. H. G. Machnow, Weberstr. 10/IIr, Magdeburg 514 100R-GDR, Germany, interested in swapping German, Polish or Czechoslovakian modelling books.

Requesting pen pals *overseas* are P. D. Pritchard, 24 Railway Terrace, Blaengara, Nr. Bridgend, with an interest in plastics. G. Organ, 171 Green Lane, Stowlawn, Bilston, Staffs, to exchange plans and books. N. Marshall, 44 Wath Road, Wombwell, Nr. Barnsley, Yorkshire, who would like to hear from Scandinavian modellers.

THE CLUBMAN

For Your Diary

April 26th
High Wycombe C/L Rally, F.A.I., B., T/R, Combat, all S.M.A.E. rules at R.A.F. Booker.

May 3rd
"Macclesfield Advertiser" Rally, all classes, Woodford, Manchester.

June 7th
Dartford C/L Rally, Combat A, B, T/R, at Central Park.

June 21st
Northern Heights Gala, all classes except T/R, Stunt, Queen's Cup for Wakefields, at R.A.F. Halton.

August 2nd
Surbiton Gala, open free flight, at Chobham Common.

August 16th
Devon Rally, F/F Rubber, Glider, Power, R/C, Combat at Woodbury Common, near Exmouth.

August 23rd
South Midland Gala, all classes at College of Aeronautics, Cranfield.

October 4th
South Coast Gala, venue to be announced.

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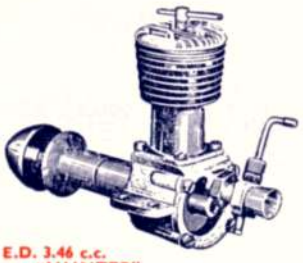

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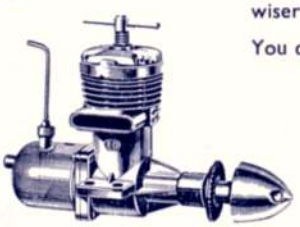

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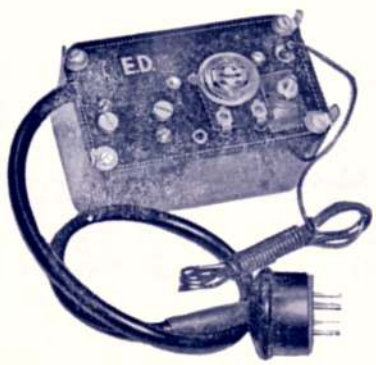

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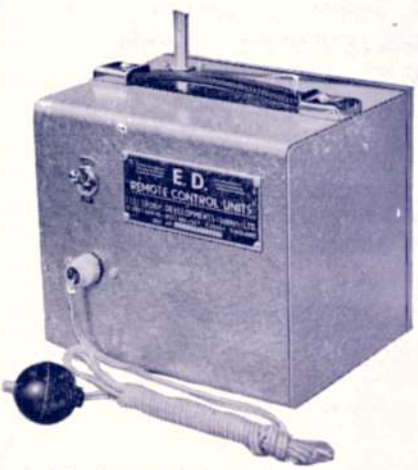

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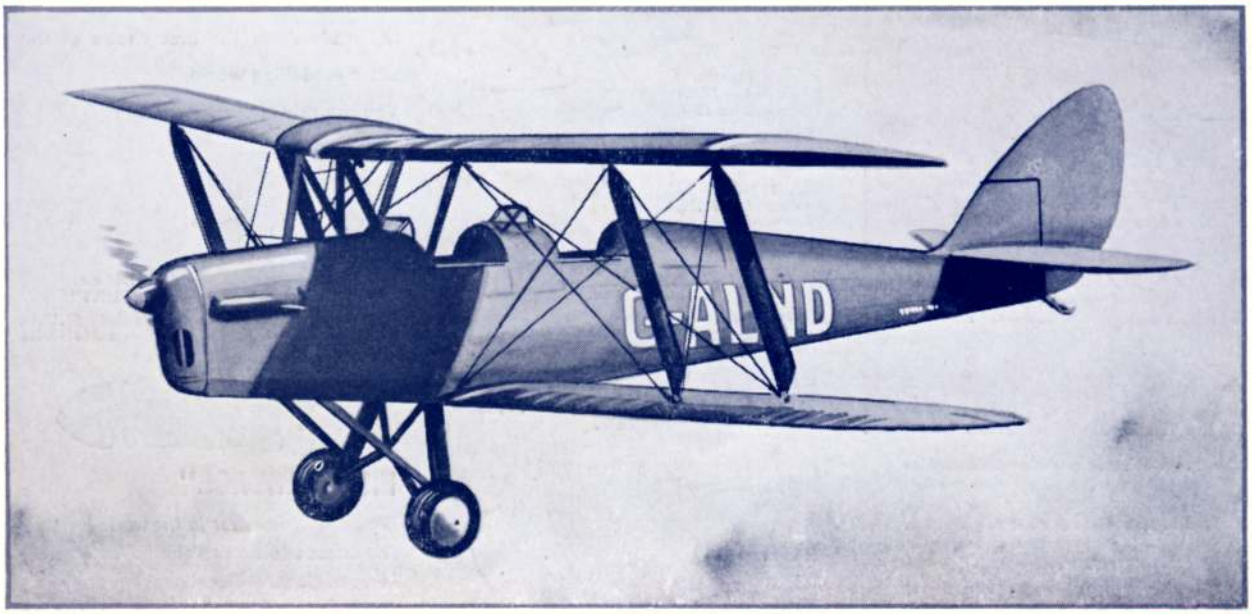

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