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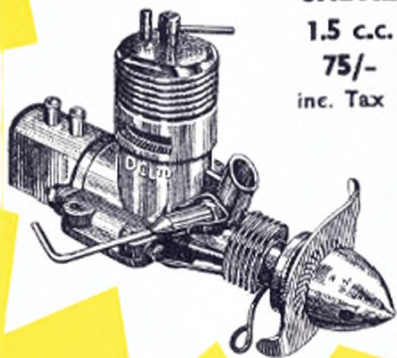
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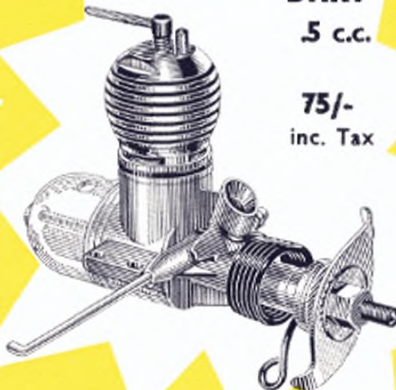
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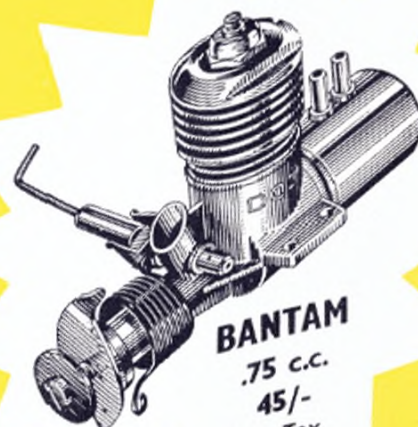




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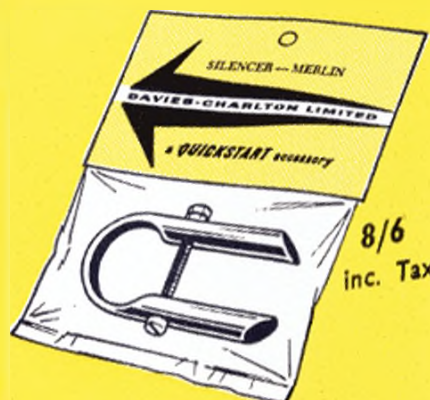
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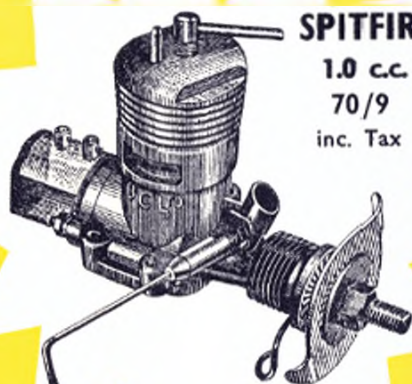


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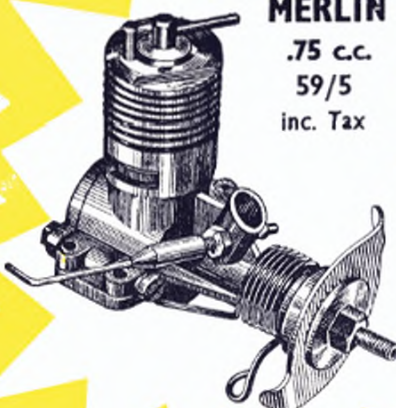
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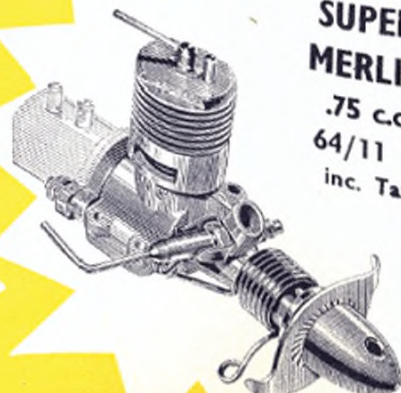
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July 1966

VOLUME XXXI No 366

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Editorial Director **D. J. LAIDLAW-DICKSON**
EDITOR **R. G. MOULTON**
Assistant Editor **J. FRANKLIN**
Advertisement Manager **LIONEL HARRIS**

COMMENT

As the contest season moves into top gear with the fullest rally calendar we have ever known, it is time to take stock of several side issues connected with aeromodelling. A reader refers to our "image" on P.379 and it is that which concerns us most.

We are reaching the stage where a sensitive public will seize upon any opportunity to denounce the hobby in terms of danger. Accidents and near misses among inquisitive bystanders who crowd the local field fliers have provided disturbing arguments. The moral is to FLY WITH CARE and—dare we say it—become insured.

Which brings us to another issue, that of allegiance to the National Body, the S.M.A.E. How many of those who enjoyed the "Nats" at Hullavington were not members of the S.M.A.E. we dare not guess. These enthusiasts, for whom actual contests mean little, may not be aware that the facilities they so often relish at airfields are negotiated entirely by the Society. If you've any inclination to join the body which is formed of, by, and for aeromodellers—don't hesitate, send your application in right now!

Third of our side issues is that concerning ignorance of the rules. It never ceases to astound us how wide the gulf is between those who know enough to skate around rule ambiguities to their advantage and those who simply never read a rule book!

Time indeed to examine our "Image" or we shall never lose that "playing with toys" identity.

cover

Typhoons intrude. Fast action by 193 Squadron, Royal Air Force is portrayed by artist Laurie Bagley. Retro-modded after their Dieppe action white noses were first seen, these "Tiffie" 1Bs were based at Harrowbeer in Devon 23 years ago, and display their cannon spring covers plus the misspelled nick-name of aircraft "T", for which your editor was to blame!

next month

A smart little stunter, reduced in size from Yuri Sirotkin's famous "Spacehound", suits 2.5-3.5 cc. engines. Full size plan for a Cox 010 free flyer, plus massive picture spread of the British Nats on special pull-out large sheet. More on tuned length exhausts. D.H.2 drawings and a tip top report on the Nats in full detail. Out on July 15.

VERON

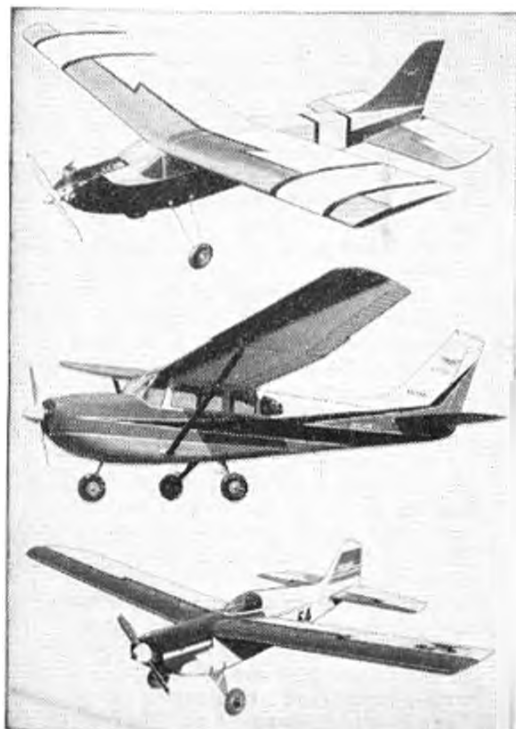
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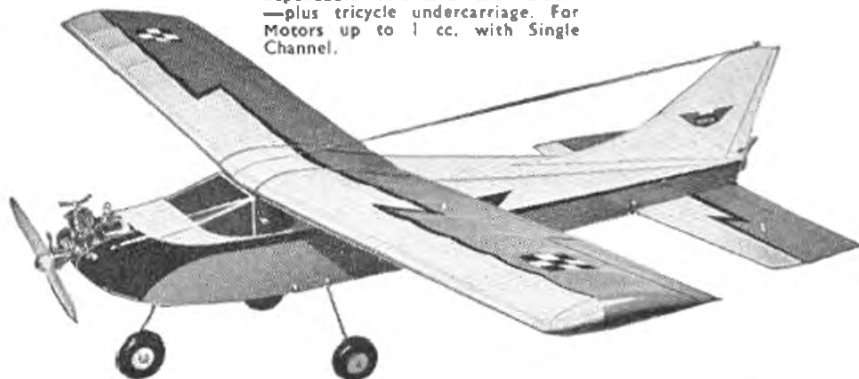
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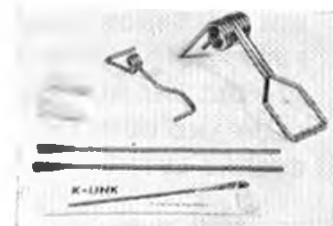
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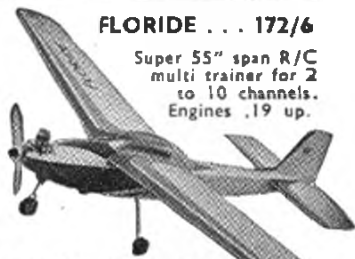
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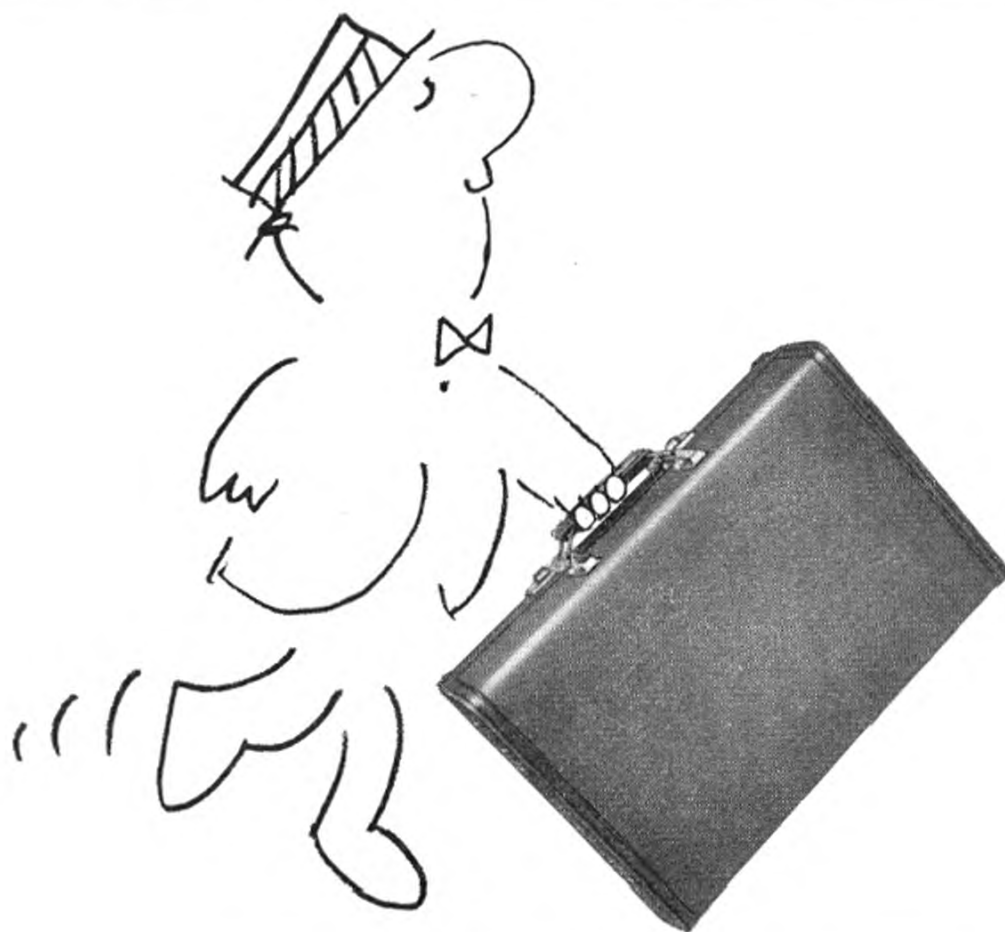
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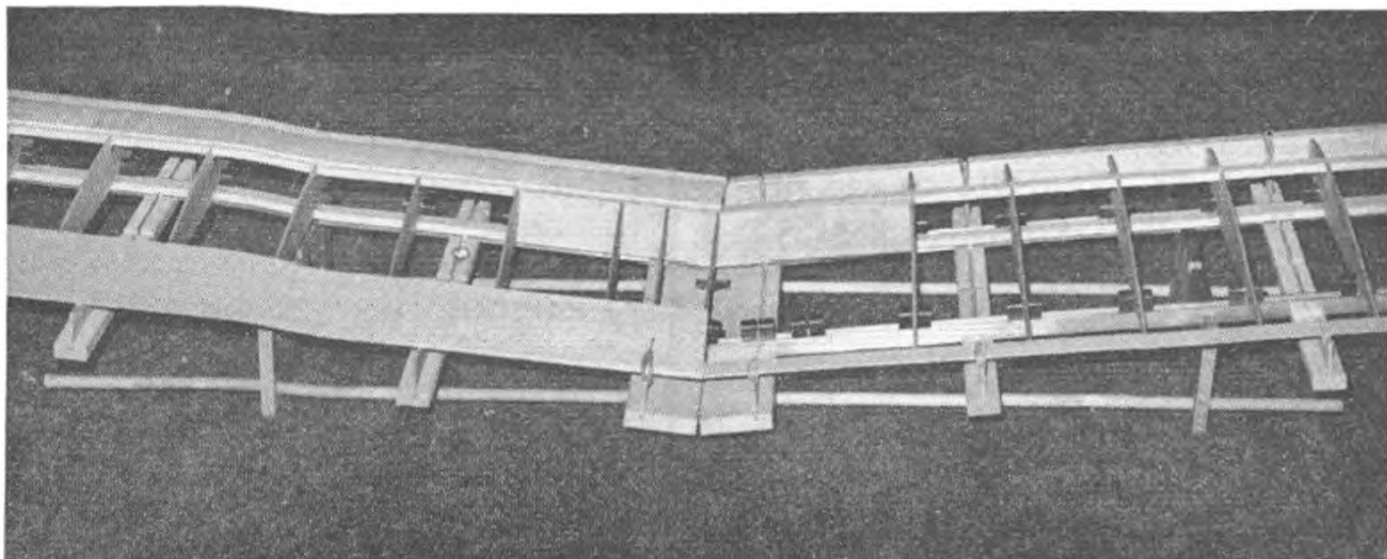
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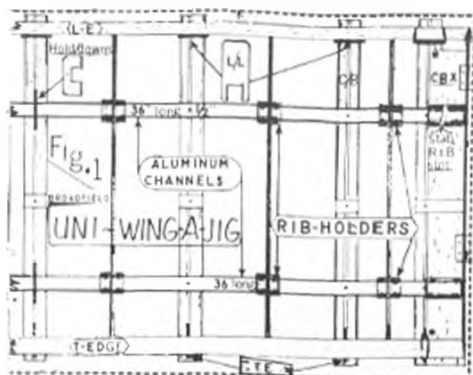


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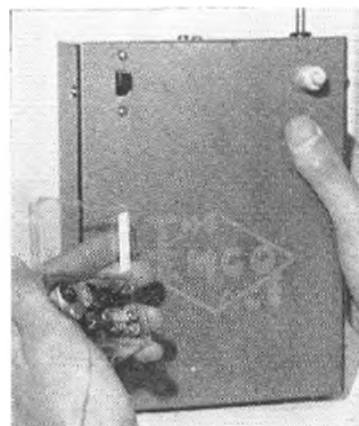
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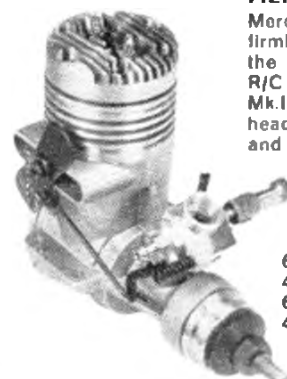


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Not very often are we able to show a photograph of a full size aircraft and its miniature counterpart, both of which are flown by the same keen aviator—none other than Jack Morton who has demonstrated his other radio controlled Tiger Moth model so often at rallies. Jack recently went solo in 'LNA', and has the full mastery of the model. Second view of the model in action is at the Wycombe Airpark rally May 21st where hundreds of professional flying personnel were enthralled at the aerobatic display by this and other models. Note that kinky aileron for out of wind take-off.

INVITATIONS to compete in Continental contests for free flight have been extended to all S.M.A.E. members. As each has a particular attraction, both as an opportunity for meeting many European notables as well as combining with a holiday, the the general details are worth noting. First is the *12th European Criterium for Free Flight Power*. 1967 rules will apply — meaning the use of standard fuel, and most European Nations are expected to be represented. Held from July 30th to August 2nd at the scenic lakeside airfield of Lesce Bled in Northern Yugoslavia, this event has its own special attractions. Next, on the weekend of August 14th/15th, the French organisation is running the "*Pierre Trebod*" International for F.A.I. classes in Rubber, Glider and Power at Peronne in Northern France. Slightly nearer to London than is Manchester, this one offers a chance for quick cross-channel weekenders. Then on September 11th the *13th Walldorf International* for all F.A.I. Free Flight



classes *plus* A 1 glider. Chuck Glider, the novel and challenging A/2 power event, Flying wing and Coupe d'Illiver take place near Heidelberg. Sounds like a marathon! Enquiries to W. Muller, 6909 Walldorf, Lilienthalstr. 8, W. Germany, will bring further info. For the others, contact our office and we'll forward details.

SCALE ENTHUSIASTS who were attracted by the announcement of the DUTCH international in our April issue are similarly asked to apply to us for more info. At time of going to press, the airfield had not been secured so a location cannot be announced for the September 17th/18th event.

STAY AT HOME internationalists who like postal contests will be interested in the Czechoslovakian organised autumn events for A/1 and A/2 glider classes. This is open to all comers, and further details can be obtained through

Zdenek Flieger (how appropriate) Vitezného Unora 10, Prostějov, Czechoslovakia.

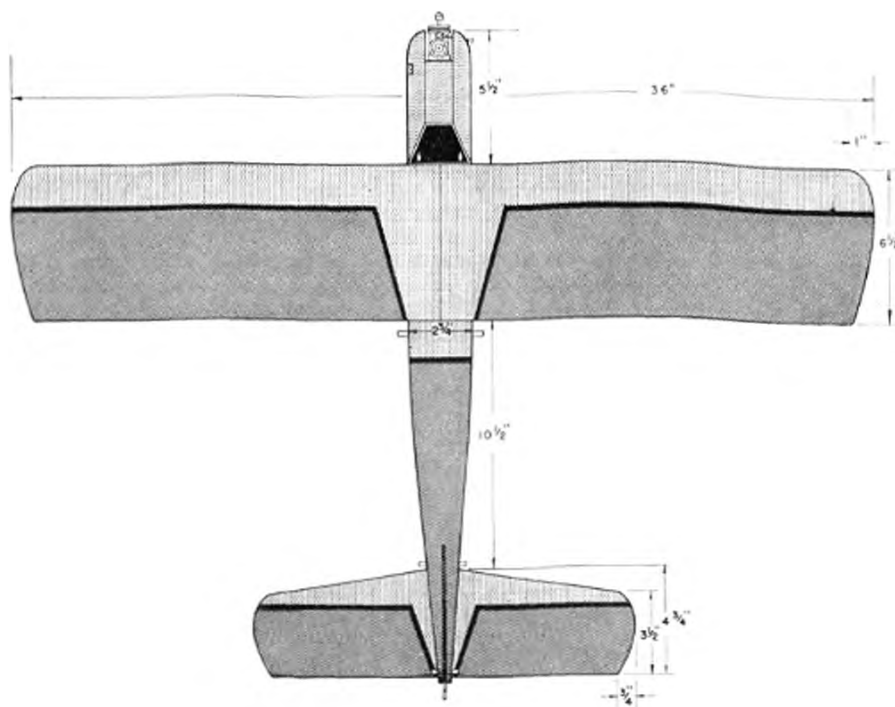
LOOKING FORWARD to 1967 and the World Champs for R/C *multi* scheduled for the airfield at Ajaccio in Corsica, we have been lucky to contact a tour organiser of national repute who can offer reduced rate terms for a two-week (15 days—14 nights) holiday at Ajaccio around the contest period of June 21st/26th. Travel would be by regular airline, not charter, and the inclusive figure for the period would be in the region of £70 per person. This is a saving of up to £10 on regular travel plus normal hotel charges, etc., for the same period. Those interested are invited to submit names for inclusion in the list of "probables" for the organised tour.

FLASH BACK to our cover for May issue which you'll recall featured the red and white D.H.

Heard at the HANGAR DOORS

STRICTLY SIMPLE

David Boddington
tests a new kit
for the single-channel
radio control flier
—the KeilKraft 'Gyron'



In April issue, our contributor specialist on single channel R/C expressed surprise that no British Manufacturer had produced an all-sheet balsa design for simple radio control. KeilKraft almost immediately released the GYRON in prompt response! This happy coincidence enabled David Boddington to thoroughly assess construction and flight tests of the kit as well as the new Raven S/C radio.

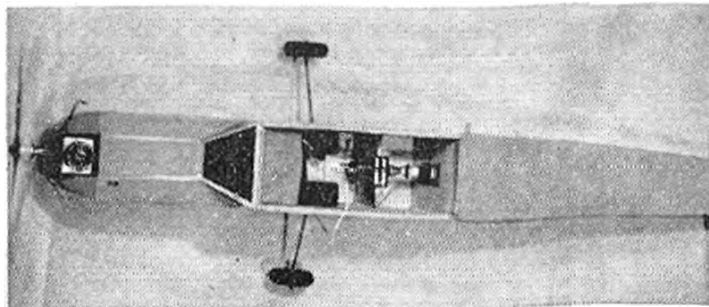
RECENTLY introduced into the KeilKraft Radio Control stable is the 'Gyron' designed by Dave Platt. This 36 in. span model for single channel radio features all sheet construction and is suitable for the popular .049 cu.ins. range of engines. It is reminiscent of American designs in particular with regard to the wing and tailplane incidences, the latter at a high positive angle to allow the engine to be installed without downthrust. Beauty, it is said, is in the eye of the beholder and I must admit that to me this design does not rate as a raving beauty. It has, however, a certain functional appeal.

Due to the amount of prefabrication in the kit a conventional full-size plan is not necessary and the sketches and instructions included are both adequate and explicit. Contents are comprehensive including preformed U/C gear, wheels, fuel tank, hardware, three colours of tissue, transfers etc. All the balsa was selected mainly of medium grade and no parts required substitution, unfortunately although the diecutting was accurate it did not fully penetrate the sheet and required further cutting with a sharp knife. The same applied to the plywood die cut parts and these were more difficult to release using a modelling knife, the plywood also tended to be on the brittle side breaking away at the edges where parallel to the grain. I understand that the diecutting on later kits has been improved but if you do get parts that do not free

from the sheet readily don't be tempted to 'break' them out as it takes much longer to clean up all the edges than by cutting.

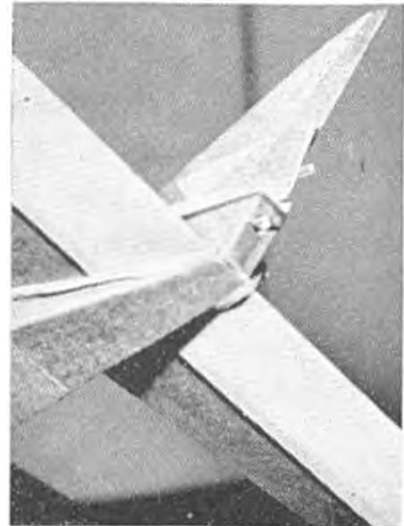
Construction proved to be quick, simple and straightforward and should provide no difficulties to the raw beginner; the wings are made very easy to assemble by the printed positions of wing ribs and gluing the leading and trailing edges direct to the bottom sheet. I used P.V.A. glue extensively in building the 'Gyron' as this type of adhesive is more suitable for doublers, block balsa, ply to balsa parts etc. The main criticism of the construction relates to the wing seating on the fuselage. Neither of the fuselage formers at the front and rear of the cabin area are "Vee'd" to take the wing dihedral. The remedy for this is to (a) Cut formers F:3 and F:7 with a dihedral Vee or (b) to add $\frac{1}{8}$ in. x $\frac{3}{16}$ in. balsa rails to the top of the fuselage to allow for the wing projection. The instructions also state that with one wing panel flat the other tip should be propped up $1\frac{1}{2}$ in., this should read 3 in. i.e. $1\frac{1}{2}$ in. under each tip. Fitting the engine and escapement is

Plan view of fuselage shows slight right offset for the Frog 80 diesel engine, the Elmic Conquest escapement on the bulkhead and Raven Rx in sorbo packing at front of capacious R/C compartment.

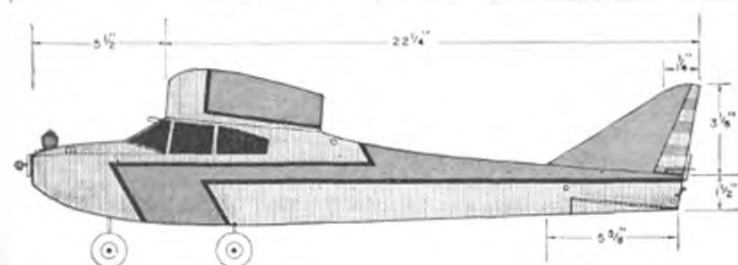




Left, the test model, an excellent 69/8d. worth. Note low set tailplane, trike U/C and use of all-sheet covering.



Right, the tail end shows tapered rudder operated by torque bar and tailplane with fairing attached underneath.



suggested at an early stage of the fuselage construction and although it is recommended that these are well protected it is preferable to be able to *fix* these after the completion of the model. This can be arranged by Aralditing or soldering the engine mounting nuts to a thin metal plate glued to the rear of the front bulkhead, this will also allow adjustment to side thrust on radial engines. The escapement former can be fitted into the fuselage by slide rails although there is just sufficient room to screw the escapement in position on the fixed former after completion providing a small screwdriver is used. Incidentally why is an Elmic Compact shown on the drawing? No provision is made for engaging a secondary control and it would be also difficult to fit a 'kick up' elevator.

The completed model uncovered, and less radio gear, weighed 15 ozs. including the engine. Final weight with radio installed came out at 22 ozs., compared with the 20 ozs. quote in the instructions.

Flight Tests

With a Frog 80 installed, together with a Raven S/C receiver, a Conquest escapement and battery box containing three No. U7 1.5 volt batteries, the balance of the model came out as shown on the drawing. After checking the operation of the radio, test glides were undertaken and indicated that the 'Gyron' was slightly under elevated, but with no noticeable turn. The first power flight confirmed that there was slight under elevation but also a fairly sharp turn to the right resulting in a dive to the right. A piece of $\frac{1}{16}$ in. packing was inserted over the leading edge of the tailplane and a "tweak" of left rudder applied.

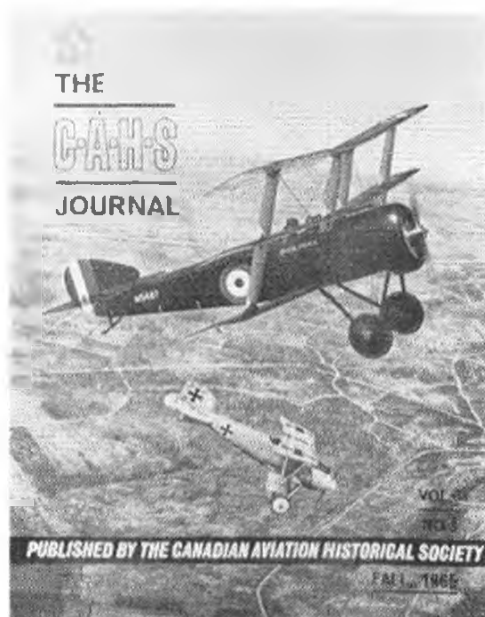
Following the next launch (which needs to be fairly fast) the model climbed steadily, but again to the right, requiring constant pulsing to the left to prevent the nose dropping into a right hand spiral. So much left rudder pulsing was necessary that the escapement rubber

eventually unwound and on the glide, left rudder stuck on resulting in a "graveyard" spiral. It says much for the strength of the model that practically no damage was incurred, and little for my diligence in checking the winds on the escapement rubber. On consequent flights, with a small adjustment to rudder and a shim off the tailplane packing, the trim was correct (in calm weather) for both power and glide, although a reduction in packing would be required in windier weather to increase "penetration". The 'Gyron' is not overpowered with a Frog 80 as it has quite a high flying speed and its flight characteristics deteriorate at slower speeds; a hot .049 cu.ins. engine would appear to be ideal for it. Rudder control is very positive and if held on for a 90° turn or more, the nose drops rapidly; indeed if held on to the right a spiral dive will result and recovering from this can *only* be effected by application of *opposite* rudder; centralising the rudder is not effective. This no doubt is due to a combination of the incidence angles of the wings (5° positive) and tailplane (5 1/2° positive) and the engine sidethrust.

The review model incorporated approximately 1 1/2° right side thrust and it is suggested that this should not be exceeded except for the most powerful engines. Left turns can be maintained without losing height, providing the rudder is not held on throughout the turn. On the glide rudder is less effective, but at all times adequate. Although the spiral diving characteristics are not ideal for a beginners model, it allows the more proficient flyer to engage in some lively aerobatics, and from a 3/4 turn in either direction, the 'Gyron' will execute very snappy barrel rolls. True loops were not achieved with the review model, but with a little more power, these should be quite possible.

Summarising: the 'Gyron' is a rugged model capable of taking most of the hard knocks which, in the hands of the inexperienced, it is likely to get. As a beginners model it is not in the same class as its companions the "Super Sixty" and the "Mini-Super" for it does not possess the same inherent stability and forgiving characteristics. For the more ambitious S/C flyer, it should give some sporting flying suitable for most weather conditions; this type of flyer may wish to fit a larger fuel tank to give longer flights.

The only modifications suggested to the construction, other than mentioned, are reinforcing the wing trailing edge to prevent the rubber bands cutting into it, and reinforcing the fuselage at the position of the front tailplane dowel where a split occurred in the sheet side.



Sopwith Triplane

Dear Sir,

I remember that some years ago, there was some controversy amongst scale modellers as to what was the right colour to paint models of Collishaw's Sopwith Triplane. The following extract from a letter which I have received from Air Vice Marshall Collishaw may be of interest to your readers, and you might care to print it in a forthcoming edition.

"In respect to the so-called Black Flight in No. 10 Naval Squadron in the Summer of 1917—at the outset the three flights, A, B and C were respectively coloured red, black and blue on the nose spinners and wheel covers for the purpose of helping aircraft crews to identify aircraft when they landed, because at that time, the very light Sopwith Triplanes had to be held by the wing tips both going out and after landing to proceed to the hangars. It was found that the small black coloured features were insufficiently conspicuous and so the fuselage and engine covering plates were also doped black. At that time the aircraft crews began to call it the 'Black Flight'—following this idea I arranged for all the aeroplanes in 'B' flight to be provided with names in which the word Black was a dominant feature e.g. 'Black Maria' 'Black Prince' etc. When 'B' flight made a name for itself, Press Correspondents introduced the name of the 'Black Flight' to the public and it was consequently perpetuated. Exclusive of the forepart of the fuselage



and the engine covering, plates, plus wheel covers being black, the remainder of the aircraft colouring was the normal RNAS dark khaki colour with a greenish tinge".

Weybridge.

Colin Pengelly

We reproduce a fine drawing by R. Bradford on Autumn edition of Canadian Aviation Historical Journal, at left.

Magnet Steering

Dear Sir,

Reading your article on magnet steered gliders in the December Aero-modeller and finding how to obtain the Graupner magnet, I was encouraged to take up a model started and abandoned two years ago. I got the information for the steering unit from a 1955 Aero-modeller hence the original Grammer tin, rudder and wire turbulator.

I think this is the most enjoyable form of model flying I have experienced because such long duration can be achieved without the model covering large distances when wind conditions are favourable. Unfortunately, risking a non-dethermalised flight in very low wind, I lost the model, which was found 2 weeks later, hopelessly waterlogged, about 1½ miles from the launching site.

As a matter of interest the model used a 6in. x 78in. wing with B6456f section and a 21in. x 3½in. tail using a modified B6356b section. Fuselage moments were approximately the same as shown in the December '65 Aeromodeller. With 80% C.G. and a weight of 15 ozs the layout worked very well.

I am now building another model of more or less the same design except that it will use a Mamo steering unit, easily obtained in Germany and the higher aspect fin and rudder. I shall also build in a good D/T with £3 worth of magnet in the nose!

B.F.P.O. 36. Germany.

M. H. Glifford.

(Photo, bottom left)

Scale origins

Dear Sir,

To lay claim for the originality of the "International scale of 1/72nd" is, I think, akin to claiming that one invented the Foot rule. However, I feel that I must get my twopennys-worth in on this. As you will note from the enclosed cutting from "Flight", dated 4th March 1920, I was making, and advertising for sale, models to this scale, over 46 years ago.

Actually, as a lad working in a north London factory on Avro 504 wings, I was making and selling to my work-mates, 1/72nd models of the 504 in 1917 but, alas, I cannot produce evidence of this.

Anyway, why 1/72nd scale? Personally, I think it came about because the few modellers then around making 'solids' depended for their G.A. drawings on "Flight" and although these were not of a uniform scale for all machines published, they were about right for an average size two-seater aircraft. When I decided to make my first 504 model I found that the 36 foot span of the full-size aircraft gave, at 1/72nd scale, the

nice 'round' figure of 6 inches for a model. One of the attractions for this size model was that the bits and pieces fitted nicely into my carpenter's apron pocket and I could, when the foreman was not looking, easily fish them out and do a little 'homework'!

Thus, so far as I was concerned, the 1/6in. to a foot scale was born as it was still large enough for smaller machines, such as the "Camel", and yet did not rule out the "Vimy", but I was glad that I never received an order for a H.P. VJ1500 at this scale.

It is said that there is nothing new under the Sun and so this letter, if published, will probably result in a flood of claims from folk who were building 'seventy-seconds' before 1917 but, so far as my memory serves me, most of the models of the first World War period were all about ½ or ¼ inch to the foot scale.

After the 1914-18 war, jobs in the aircraft world were hard to come by and I 'graduated' as a clerk into a solicitors office in Savile Row, just a step from the modellers "Mecca" of those days. This was Parsons "War Seal" exhibition showrooms at 315-7 Oxford Street. I wonder how many of your readers will remember this? I entered a number of their competitions and at one of their Prizegivings, held on 10th July, 1919, presented both Alcock and Brown with models of the "Vimy" (1/72nd scale, of course).

Our models of that period were of soft white wood as Balsa had yet to be 'invented'. The last models I made were also of this material, being of matchsticks and entered in the 1946 Model Engineers Exhibition. The scale for these was 1/120, or 1/10th of an inch to the foot and if anyone prides himself (or herself) on their skill as a modeller, have a go at a Fokker "Tripe". At this small scale the models look quite attractive if left in the 'nude' with just the essential markings. Burgh Heath, Surrey.

P. T. Capon

Classifieds

Dear Sir,

Thank you for printing my advertisement in the April '66 issue of "Aero-modeller"; the response has been much greater than I expected.

I do wish, however, that people would be just a little more careful over their replies to advertisers.

So far, out of 73 replies, I have had to pay six lots of excess postage due to people using insufficient stamps. I have also had eleven letters incorrectly addressed, two unsigned, three with no return address, and one that was simply illegible!

London, S.W.19.

R. J. Shallcross.

Rally dates

Dear Sir,

It was a great disappointment to me and many other contest fliers last year, that so many other rally dates clashed due to the lack of liaison between organizing bodies.

At the end of last season your magazine stated that, for '66, it would act as a "clearing house" for contests and venue announcements. Up to this time it has done this very well and I am sure it will continue.

However, the South of England Gala and the North Western area Rally clash on April 10/11th, for which no one holds your system responsible, was by no way an accident. All modellers who have attended will agree with me that the intolerable car parking arrangements, coupled with an RAF restriction which upon investigation was found to be non-existent, at the Torn Hill contests in the past few years, has left a wound on all those who usually enjoy a weekend of competitive flying.

It is for this reason that the London Area organised the southern contest to correspond with it. I am sure that all south England and a good few midlanders would rather come to a 'park where you fly' contest than to battle it out against the elements and harsh organisation with nothing for protection but a rusty hangar wall.

It should be mentioned that I do not speak in an official capacity.
Brockley, London. *Dave Hipperson.*

Image barrier ?

Dear Sir,

With regard to the use of silencers there can be no doubt about their use where the public image of the model flying movement is in jeopardy. Every concession to good public relations is a step in the right direction. Are we, I wonder, deluding ourselves into thinking that once we have overcome the noise problem everything in the garden (or rather the flying field) will be lovely. I am prompted to say this in view of the following facts.

There are many other groups of noise producing weekend sportsmen other than aeromodellers. To name just a few: Motor cycle grass track enthusiasts, go-karters, scramblers, and dragster fanatics. All of whom can make more noise than a whole field full of aeromodellers.

Apart from the go-kart enthusiasts I don't believe any of the above have made any attempts to cut down the noise they produce. There are cases in many parts of the country where the use of an airfield is granted for motor cycle racing or dragster racing and is forbidden to aeromodellers. This fact indicates that we do not hold as good a public image as other sports, and are not taken seriously by the powers that be.

The decision of the S.M.A.E. with regard to the use of silencers is I think a wise one, but many other facts of public relations will have to be explored before we can compete for the use of facilities on the same level as other organisations. I don't profess to know the answer to this problem but I feel there must be some way of breaking the image barrier.

Perhaps with a little patience and willingness to see both the point of view of the public and also of ourselves we may overcome the problem—some day.

Rochester.

Karl M. Webster.

Glue tips

Dear Sir,

Working for a synthetic resin manufacturer who makes epoxides and PVA among other glues, I would like to add two comments to your article on adhesives in the May Issue.

Epoxides. I think it is misleading to suggest that an epoxy bond to metal is as strong as the metal itself. When a metal to metal epoxy bond is tested to destruction. The glue line, or its adhesion to the metal, always fails, not the metal surface itself.

In bonding metal with epoxy, two points should be borne in mind: Firstly bond strength in tension and shear is good but peel strength is poor: Secondly in addition to ensuring freedom from grease (wipe with solvent e.g. dope, thinners and allow to dry). The bond is greatly improved by roughening the surface to be joined.

P.V.A. I have found P.V.A. watered down to a thin brushable consistency is excellent for sticking tissue. It combines the neatness of dope with the ease of application of dextrin paste with its longer working time. It is also strong enough to hold tissue firmly in contact with undercambered ribs.

Rochdale, Lancs.

M. C. Reeves.

Validity

Dear Sir,

I and my competition minded clubmates have noticed and probably many others too, that when we enter a competition which is not run by the Society (SMAE Ltd) we are quite often not asked to prove that we are insured.

In the last eight competitions I have entered I have only once been asked about insurance. This was not very well done either, as my other clubmates and myself were only asked to give our Society numbers. Surely this is not the way a competition should be run?

I would like to suggest that when a competition is organised, the organisers should ask to see every competitor's membership card and also see that it is valid for that competition. If his card is not valid he should be disqualified unless he can produce some proof that he is otherwise insured.

I would also like to see the organisers check that a model is properly silenced by a reasonably effective silencer. I know some do but an awful lot don't.

Spenny Moor, Co. Durham.

K. Linsley,

Sec. Spenny Moor M.A.C.

A matter of trim

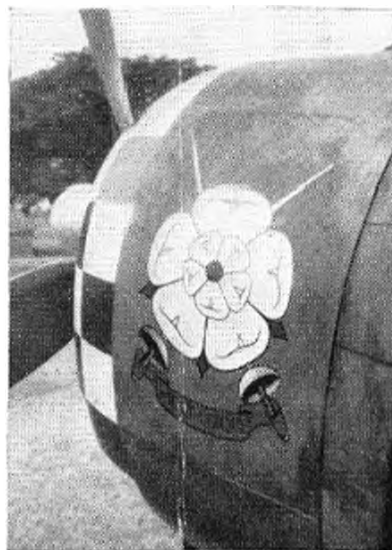
Dear Sir,

About 2 years ago I bought a Wen-Mac A-24 Attack Bomber, I flew it but it was not a stable flyer, and, after a few unsuccessful flights I took it home and it was left in a corner for 2 years. About a week ago I hadn't anything to do so I took the A-24 out and flew it again and I realised what the trouble was, the elevator is hinged in the middle and any air current hitting the elevator would either keep it up or down, and there is no medium between the two.

So I cut the front of the elevator off, the result—a very stable flier.

Sherbourne, Dorset.

S. T. Purcell.



Thunderbolts

Dear Sir,

Mr. Capewells of (Neston Cheshire) wrote a letter on P-47 Thunderbolts which was very interesting and I think I can give him the answer to the unknown Squadron. Looking through my father's photographs taken when in the R.A.F. (Far East) I found the enclosed photographs of some P-47's the squadron being 258, stationed at one period at RAMREE (Burma) 1944 the markings were chequered engine cowlings and emblems also on some cowlings, paintings of an English Rose & Desperate Dan astride a bomb, and many pilots' personal gimmicks. I enclose photos of P-47 showing 258 squadron marking ZT-D. Colours are green and earth, with light blue underneath.

Leicester.

*Stephen Searle
(aged 12)*

Two of Master Searle's father's photos are reproduced here, a photo of ZT-D shows small letters in line with the small roundel which in turn is in line with the intercooler vent (i.e. lower than WK-L on inside back cover.)



TOPICAL TWISTS

by 'Pylonius'

illustrated by 'Sherry'

Pile-in Racers

Rather like those gentlemanly University scientists who tinkered with the atom splitting experiments under the dreaming spires, and landed us with the H Bomb, so those pioneer hobbyists who heaved their six skeined rubber machines into the safe and soundless air over Wimbledon Common could not have suspected that their friendly old machines were the precursors of that ultimate flying field horror, the Pylon Racer.

Now, I admit the only pylon racing I have indulged in is to get in a few flights on the local common before the Electricity Board moved in, but I do admire those intrepid modellers who can face up to these unmanning missiles without turning a hair. It takes pints of courage. Come to think of it, the tensed up follicle, cringing on the twitching scalp, can possibly do a smarter job of turning than the way out Racer, which just goes to show that we still have a lot to learn about the art of course racing.

One aspect of the sport which is well up to the mark, however, concerns that Bond which unites the cult crazed masses. It's bad enough people thinking that the Quantum Theory has something to do with the short skirt craze, but to imagine that nothing is complete or fulfilled without the introduction of those mythical numbers, '007' is going too far. In a recent Pylon event, we are told, the racing numbers were given a two zero prefix in order to give one of the in-types a coveted Bond identity. It's enough to make you cry 'Uncle'.

Uncultivated Types

In case you think that vandals spend all their time wrecking telephone kiosks, I am asked to remind you that the tribal versatility knows no bounds, not even the distant farmland fences, where the infiltrators, heavily disguised as model flyers, strike deep into the cabbagey heart of the countryside.

Not unnaturally, this complaint of a fifth column in our midst comes from a farming type, himself a model flyer. Apparently, he sneaks out for a quick flip or two between raids, picking his way carefully through the squashed turnips, mashed potatoes and suspiring livestock, contemplating the while the possibility of erecting a few diversionary kiosks along the hedgerows.

But, seriously, this business of model flying hooligans is something that the movement can do very little about. Before you could possibly identify and discipline the miscreants they have gone to fresh pastures in other guises, and their next appearance on the delinquent scene might be as gun toting sportsmen or ten course picnickers.

No doubt, though, we have in our midst crop bashers of veteran experience, who have, in a long and extinguishing career, devastated huge tracts of life-giving fodder, broken countless fences and fed many a hapless ruminant a fatal dose of polythene wrapping. But, fortunately, such beings are rare, or so we like to think; usually, the farmer's enemy is a one-season man, who takes up the healthy sport of model flying as a means of recuperating from long spells of wrecking duty in cramped and stuffy kiosks.



"Old Bloggs believes in winning"

Bon Viveur

A FEW words apropos to cannibalism, inspired appropriately enough by a plasticator who wrote to the Air Britain Digest. But before you get any gory ideas about feasting out of tins of real Chappie, let me point out that the cannibalism, or rather cannibalisation, refers to the very unchewable contents of plastic kits, and the ran-sacking of same for those choice bits and pieces that will build your basic two bob outlay into a coveted 'special'.

A harmless enough pursuit, but one which can quickly get out of hand and become a feverish addiction, with the advanced re-creator mating up all sorts of improbable oddments. He may start off, innocently enough, boggling the unsuspecting eye with a Messerschmitt 110 empennage grafted onto a Mark I Spitfire, but as the mania takes hold he casts a deviationist eye towards the plastic 'Monster' shelf. Yippee, he says, as the full significance of a Frankenstein Bomber/Fighter begins to formulate in his plasticated pre-conscious. Or what about a Henry Mark VIII? And a Dracula Jet opens up all sorts of exciting possibilities, with a re-heat blood transfuser and inverted landing gear.

In quieter vein he could bring about some marvellous transformations with Santa Marias and Cutty Sark coming to terms with old Farman and Bleriot Monoplanes. Fortunately, before he gets to the plastic Adam shelf to ponder the airworthy scope offered by the assortment of human innards, he is flat broke.

Well, that's how the chap who wrote the letter to Air Britain tells us he finished up, although it would seem that his experience has given him a missionary urge. There are constant references in his letter to such Congo sounding places as Gloomsville and Crisisville. Let us hope, though, that the cannibals don't catch up with him and make him a 'Kookie'.

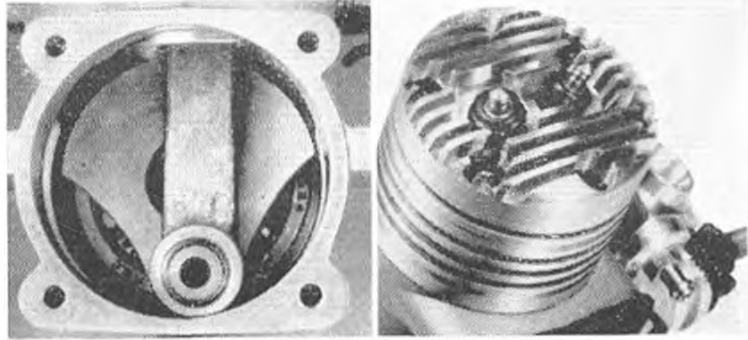
Everything Under Control

You could say that, now a free flight model has been controlled by Radio, we have lost the last freedom. But not to worry, the only reason a free flight model is called such is to distinguish it from the various types of acrobatic specimens which thresh about the sky, either on a loop of wire or the live end of a radio pulse.

As a matter of fact, the idea of a Wakefield or glider doing its stuff within the confines of the airfield has a strong appeal to those lacking the vigour and agility to negotiate that assault course known as the English countryside. One chastening thought, though. If we do manage, by the magic of electronics, to contain ourselves in the airfield environs, what a waste of all these strategically concealed ditches and defensive barriers of barbed wire.

Peter Chinn's Latest Engine News

At left, Merco .61 R/C Mk 2 details, honed bronze bushes are now fitted to both ends of connecting-rod, and right the twin standard plug head that replaces the shielded single plug head.



Merco Mark Two

THE number of new or improved engines that have been announced lately has been quite large; more, in fact, than we can hope to cover adequately in the "Latest Engine News" series. A sizeable proportion of these engines, however, are R/C units and, in order to make room for those motors of greater interest to our free-flight and control-line modeller readership, detailed descriptions of R/C engines—particularly the specialised "multi" type power-plants—are being switched to our companion journal, *"Radio Control Models & Electronics"*.

However, particularly in view of the fact that, nowadays, new British engines appear somewhat less frequently than new imported ones, we are starting this month's L.E.N. with a brief description—pending a full report when a test engine becomes available—of the Merco 61 R/C Mark 2.

When the Merco 49 R/C appeared a little over four years ago, it rapidly became accepted as the Number One R/C multi engine in the U.K. and also enjoyed a quite considerable reputation overseas. The same can be said for the 61 model that became available in 1963-64 and we have no doubt that the new Mark 2 will continue to uphold British prestige, despite what may prove to be strong opposition from new foreign products.

The Merco's most impressive successes have actually been in American hands, namely Ralph Brooke's 1965 World Championship win and Maynard Hill's world records in the duration and distance categories. Some of the modifications made to the latest Merco have, in fact, resulted from suggestions from modellers in the U.S.A., including Maynard Hill, who contributed the idea of using bronze bushes, with oilways, in both ends of the connecting-rod.

The piston is also now fitted with bronze bushes in the gudgeon-pin bosses to reduce wear. A slightly smaller diameter gudgeon-pin has been adopted to enable the bushes to be accommodated in the piston and the pin now has bronze end pads.

Externally, the most obvious change is the adoption of a new cylinder head having twin glow plugs. It is necessary to energise only one plug to start the engine, of course, and the plugs used are standard type since it was found that, with the twin plug head, no advantage was gained by using idle-bar or shielded types.

The Mark 2 has been under development for the past eighteen months or so, during which time Dennis Allen and production man Ron Ward have made innumerable flight tests. Experimental engines were also used by the entire British team at the 1965 World R/C Championships. The power of the Mark 2 is said to be slightly increased, but the major advantage of the new model is in its improved idling reliability and greater tolerance to variations in the tank position.

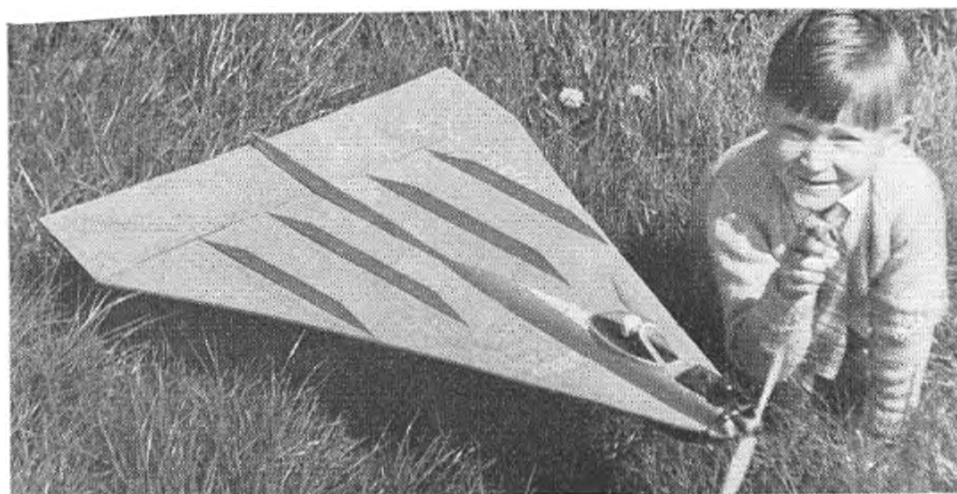
Moki S-3

In International 2.5 c.c. C/L speed events during the past few years, four makes of engines have headed the results and the Hungarian Moki has had its fair share of places. These started with first and second in the 1958 Criterium (Moki S-1) and went on to include 1st and 3rd in the 1962 World Championships (S-3) and 1st and 2nd at last year's Criterium (S-3 again).

(Continued on page 400)

Parts of the Moki S-3 compared with those of the K&B 15R and Super-Tigre G.20/15. From top left photo, clockwise, the shaft assembly, main casting and rotary-valve assembly are shown with those of the K&B 15R Series 64. In the final photo, the Moki piston and cylinder parts are compared with those of the G.20/15. Moki parts are on the left in each photo.





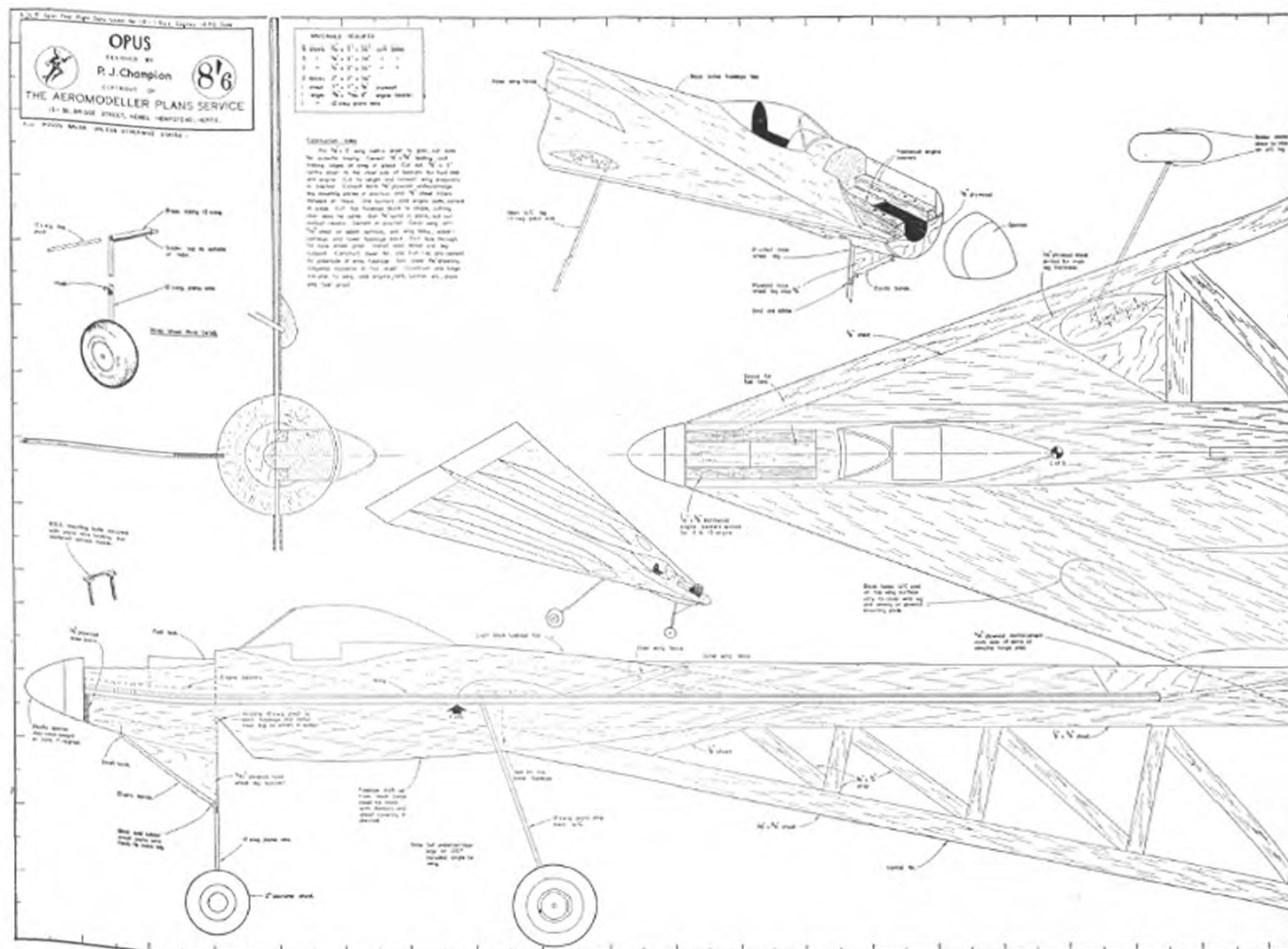
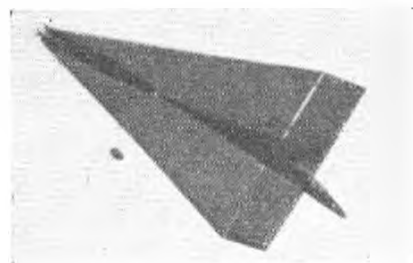
OPUS

Designed by
P. J. Champion

Sports free flight delta for 1-1 5c.c. engines

CONSTRUCTED as number four in a series of free flight delta style sport models *Opus* was made during 1964. Previous models showed a single dorsal fin to be satisfactory under power, but ineffective during the glide—the model gliding away at high speed in whatever direction it happened to be heading at the time the engine stopped!

Full size copies of this 1/4th scale reproduction are available through Aeromodeller Plans Service, Plan U910. Price 8/6 plus 6d. post. Border scale represents 1 inch.



To cure this situation, *Opus* was given a long ventral fin to overcome the power-to-glide transition problem. Although it was thought the ventral fin would be rather vulnerable in this position it has withstood some very hard landings and achieved its objective in giving directional stability, even if it makes the model resemble a paper dart in the air.

The centre of gravity can be varied over a large range of movement with little effect on flight providing the elevator is also trimmed to suit. The balance point shown on the plan should give everyone satisfactory results, and different positions can be tried for experiment once flying experience has been logged.

With an A.M.15, *Opus* may seem a little underpowered to some enthusiasts, but due to its fast glide characteristics it would seem unwise to increase the speed any more. The original *Opus* terminated its lease of life in a high speed argument with a equally high tension electricity cable, but in general its shape allows it to survive most collisions.

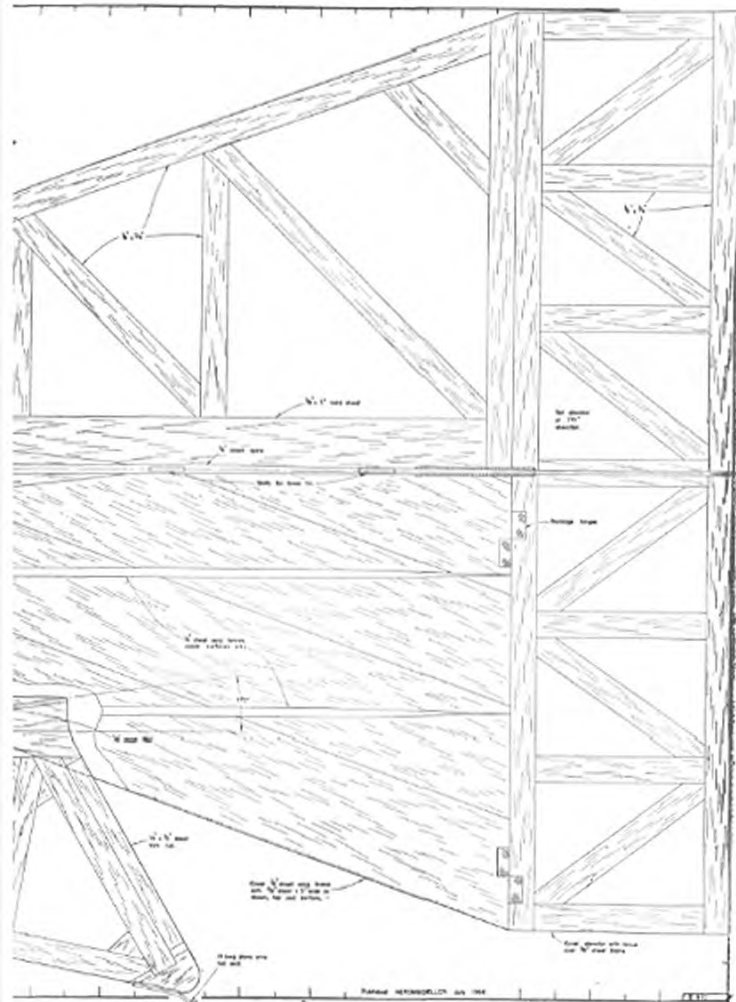
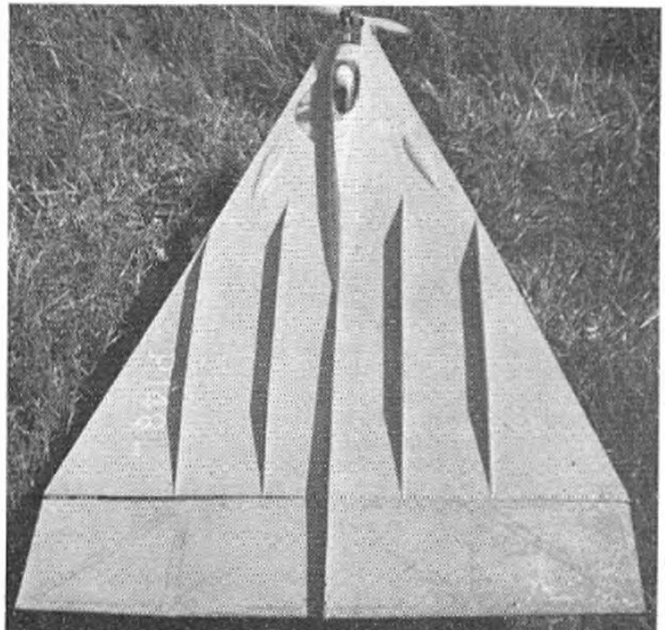
Commence construction by laying wing/fuselage $\frac{1}{2} \times 3$ in. centre sheet over the plan cutting slots for fin, and cutting out for engine bearers. Then pin down $\frac{1}{2} \times \frac{1}{2}$ in. wing edges. (not the elevator trailing edge). Note that one half of the plan only shows internal structure. Next fill in the $\frac{1}{2} \times \frac{1}{2}$ in. wing diagonals and the two $\frac{1}{2}$ in. plywood undercarriage leg support plates, add $\frac{1}{2}$ in. sheeting forward of the plywood triangles then drill undercarriage mounting holes. Prepare engine bearers with engine bolt holes and solder piano wire across both heads as shown in sketch, ready to add to the carved and sandpapered upper fuselage (with cut-outs for spine and cockpit area). Add bearers. Cut $\frac{1}{2}$ in. sheet spine making sure that the elevator seating angle is $7\frac{1}{2}$ degrees as indicated on plan. Cement

upper fuselage and sheet spine to wing, then add bandage elevator hinges on trailing edge, and cover upper wing surface with $\frac{1}{8}$ in. sheet diagonally as shown, leaving areas for undercarriage mounting pods. Add wing fences then remove structure from plan.

Bend 12 s.w.g. piano wire undercarriage legs to shape, then bind and cement to plywood plates in wing. Carve and sandpaper lower block balsa fuselage to shape making a cut-out for nose wheel plywood web, and pivoted nose wheel. Cut slot for ventral fin in the rear end, and drill a hole through fuselage to take nose wheel piano wire pivot. Bend nose wheel leg to shape, making sure the last $\frac{1}{2}$ in. is bent at a right angle and solder this $\frac{1}{2}$ in. length to the outside of $\frac{3}{4}$ in. length of brass tubing with a 12 s.w.g. inside diameter. Now slide the 12 s.w.g. piano wire axle through one side of the fuselage, slip the nose leg pivot tube over the pivot and then push the pivot right through, sealing the ends with Araldite, ensuring the nose leg moves smoothly fore and aft. Cement the nose leg gusset into lower fuselage and add elastic band retaining hook. Solder the second hook to the nose wheel leg near to web base, placing elastic bands in position to hold leg firm. Now cement lower block balsa fuselage in place. Lay the $\frac{1}{2} \times \frac{1}{2}$ in. ventral fin outside shape over the plan and fill in $\frac{1}{2} \times \frac{1}{2}$ in. diagonal strips. Add $\frac{1}{2} \times \frac{1}{2}$ in. trim tab, hinging it with thin alloy strip (Later bent 10 degrees to starboard). Remove ventral fin from plan and slot into wing, ensuring the fin is at a true right angle to the wing. Now cover the lower wing surface with $\frac{1}{8}$ in. sheet in a diagonally opposite direction to that of the top sheeting. Cover main undercarriage mounting points with block balsa pods, colour dope cockpit area, and cement canopy in place.

Construct the elevator over the plan, cover, dope then cement to trailing edge hinges and fuel proof. Cover remainder of model with tissue, dope all over and finally fuel proof. If a spinner is used as shown on the plan the screw on nose cap can be employed as a ballast compartment if needed, but be careful, as an out of balance weight of this nature can quickly ruin the bearing of a small diesel engine.

The sight of *Opus* in the air is enough to turn any head—stand by for sightseers whenever you aviate this one because it will soon draw a crowd.





AIRCRAFT DESCRIBED Number 152

HAWKER TYPHOON

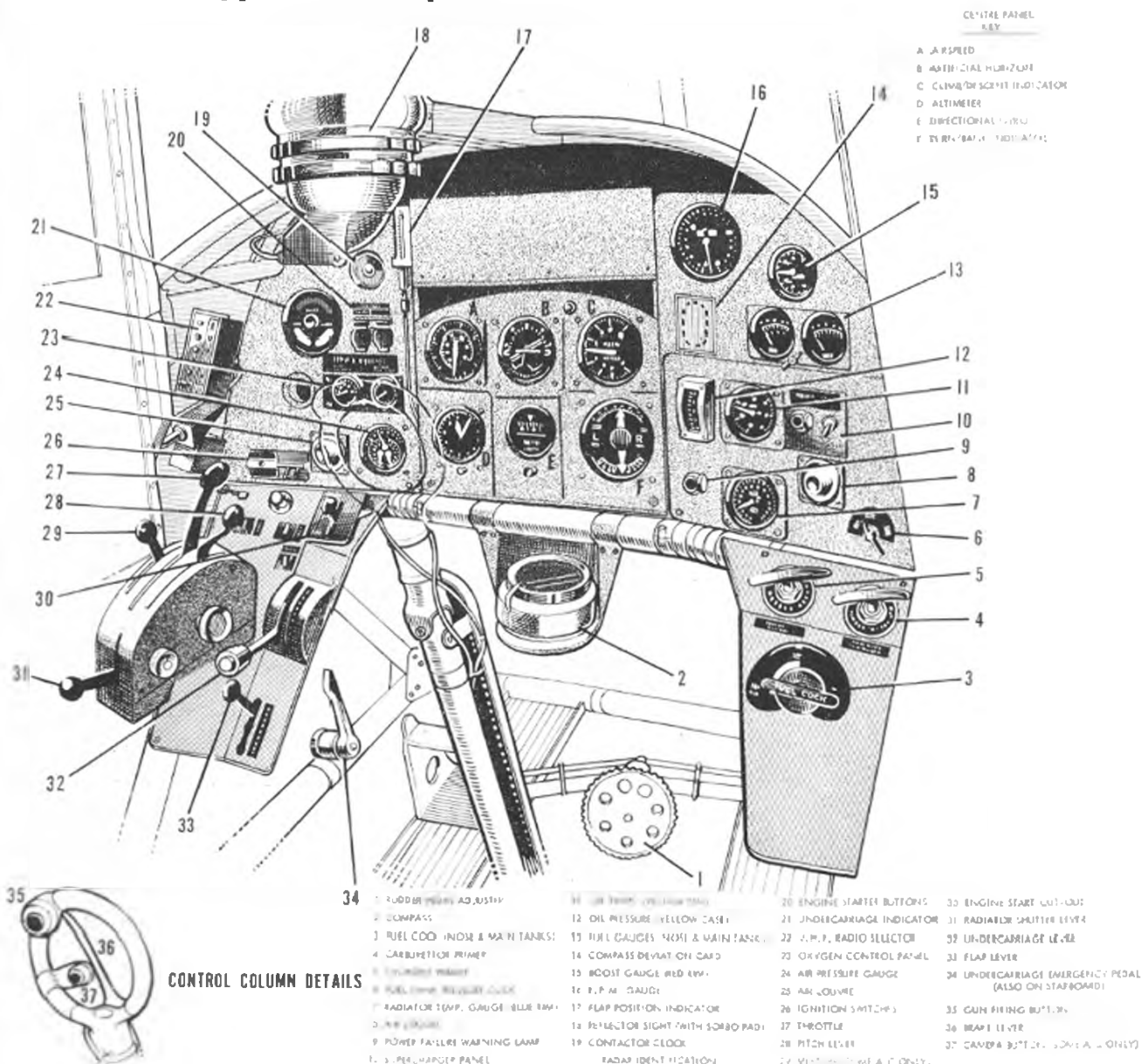
by G. R. DUVAL

evolved around the new 2,000 h.p. Rolls-Royce Vulture and Napier Sabre aero-engines, currently under development. Of the four machines, two were to be Vulture-powered as the Type R, and two fitted with the Sabre as the Type N.

The Type Rs, named Tornado, first flew in the winter of 1939 but were abandoned due to difficulties with the Vulture engine. The first Type N, named Typhoon and serialled P 5212, made its maiden flight on February 24th, 1940, piloted by Philip Lucas, who shortly afterwards

ON August 30th, 1938, the Hawker Aircraft Company received an order for four prototypes of an interceptor fighter designed by the late (Sir) Sidney Camm as an eventual replacement for the Hurricane, and submitted to fulfil A.M. Specification F.18/37, which was

the Typhoon cockpit



Opposite, interesting close-up of factory test machine without centre section stripes. Note extended foot step, steel plate on wheel cover doors cannon recoil spring shrouds and all black spinner and extension of yellow leading edge to inner cannon. Right, 56 Sqn a/c. another view of which is shown below. (Both photographs by "Aeroplane")



received the George Medal for landing it from a test flight with a structural failure in the fuselage.

Other troubles came to light, notable among which was a tendency for the machine to catch fire on starting up. Both these faults were to persist, with serious results. P 5212 was eventually armed with six .303 in. Browning machine guns in each wing, due to delay in the production of the proposed armament of four 20 mm. cannon, and a further brake on progress was applied in May, 1940, when Typhoon priority was cancelled in favour of the vital Hurricane programme. In October, 1940, priority was reinstated, and the bulk of production placed in the hands of the Gloster Aircraft Company at Hucclecote, Glos. Although the second prototype, P 5216, flew on May 3rd, 1941, the main weight of tests and trials fell upon P 5212, during which, although it attained speeds in excess of 400 m.p.h. The Service pilots concerned formed grave doubts as to its potentialities as an interceptor fighter, the doubts being heightened by snags in the Chatellerault belt feed mechanism for the 20 mm. guns now fitted to both machines, and by the low speed handling, which revealed a violent swing on take-off and a high stalling speed. Another feature was carbon monoxide penetrating the cockpit, requiring oxygen to be breathed at all times, and contemporary handling notes state that "... men cannot breathe in the slipstream."* For the moment, the Typhoon's future hung in the balance, and then the Luftwaffe introduced the Focke Wulf Fw 190, outclassing all R.A.F. fighters and damaging public morale by fast low-flying attacks on the South Coast. As a direct result, development of the Typhoon was accelerated, and Duxford was selected as a base for the working up of a Typhoon Wing, the founder of which was No. 56 Squadron who received initial deliveries of Typhoon Mk.Ia aircraft during the second week of September, 1941. In March, 1942, No. 266 Squadron re-equipped with Mk.Ia Typhoons at Duxford, and in the same month No. 609 Squadron's Typhoons arrived.

All these machines were a motley collection of variants, some with .303 in. guns and faired-in cockpit aft of the doors, others with perspex rear fairing, and some, officially Mk.Ibs, armed with 20 mm. cannon. Standardisation was achieved later, by modification, to perspex rear fairing and cannon armament for all machines, also introduction of V.H.F. radio. The Wing encountered technical trouble in abundance, with engine fires on the ground, engine failures in the air, and worst of all structural failure of the tail assembly, which caused many accidents. Through all this, civilian and Service personnel toiled unceasingly to eliminate the faults, and among all the other work the tail sections were strengthened by the simple yet effective method of riveting fishplates all round the tail joint.

* This note referred to the refusal to allow groundcrew to ballast the tail during an engine run by the usual system of four bodies laying over the tail plane. It was necessary instead to shackle the Tiffie by special harness to a link in the blast-bay floor.

EK183 of 56 Sqn with Sabre running shows overwing white stripe (also used on early Mustangs) and the early cockpit canopy with door side entrance and car type windows. This was the first of the Typhoon Squadrons, stationed at Duxford.

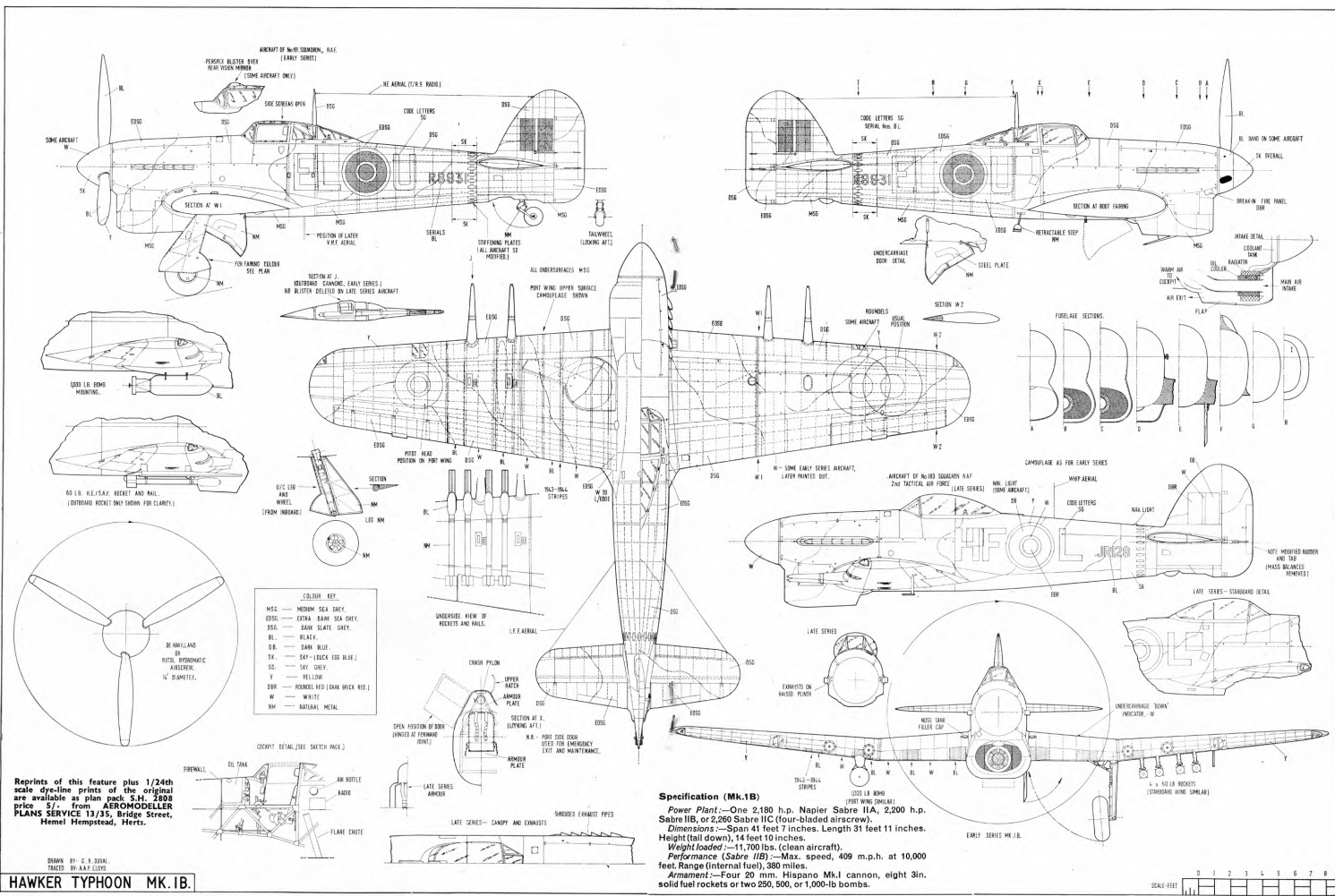


In November, 1942, the Wing moved South to Manston and Biggin Hill, and within a week, under the leadership of Sqn. Ldr. (later Wg. Cmdr.) R. P. Beaumont, No. 609 had caught and shot down four Fw 190s. It should be mentioned at this point that similarity in outline between the Typhoon and the Fw 190 was the reason for the black and white stripes adorning the R.A.F. machines, some of which had white noses, the latter noticeable during the Dieppe operation of 19th August, 1942. The Dieppe action also brought home the fact that at altitude the Typhoon became easy prey to the German fighters, a fact that soon caused the R.A.F. to concentrate the Typhoon Squadrons on the low level role, where, of all the aircraft employed by the Allied and Axis Powers, it became supreme. More and more Squadrons were formed, attacking enemy shipping and communications, and by the middle of 1943 as many as 150 locomotives were being destroyed each month.

Initially pioneered by No. 609 Squadron, which had developed a private and piratical offensive against the Germans, the Typhoons began to carry bombs (the first two were plastered with "Wings for Victory" stamps), which progressed through 250-pounders and 500-pounders to the eventual load of two 1,000-pound bombs, but the most important addition to the machine's armament came in 1943, when the Squadrons were withdrawn in rotation to be fitted with underwing rails for eight 3 in. rockets, carried as an alternative to the bombs. Using these weapons, tremendous havoc was wrought on both land and sea targets, for a salvo of rockets was similar in effect to the main armament of a naval cruiser.

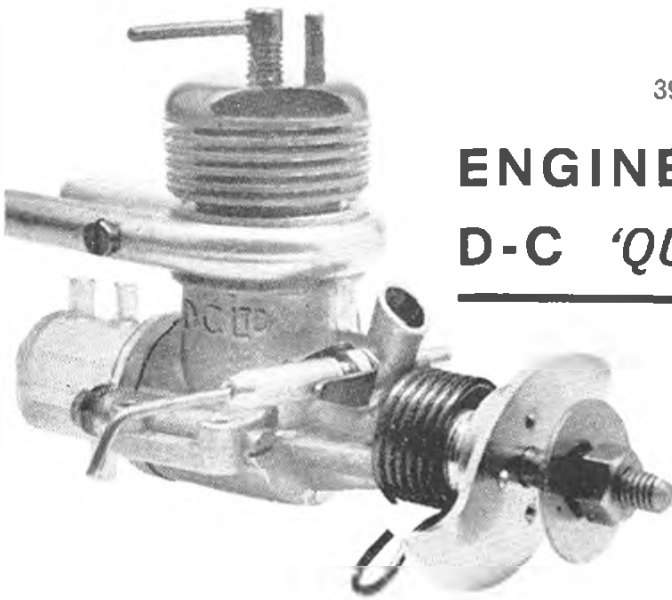
By 1944 the Typhoon's faults had been mastered, and with the Tempest coming into service, twenty-two Typhoon Squadrons were formed into the Second Tactical Air Force, the aircraft receiving a final major modification consisting of a clear-vision bubble canopy. From just prior to D-Day, when Typhoons destroyed the vital German radar installations, until the end of the war, this deadly support fighter roamed the European battlefield, and in one day alone they destroyed 135 enemy tanks. In July, 1944, General Rommel himself was wounded by 193 Squadron, and in October five Squadrons shattered the H.Q. of the German Fifteenth Army, the H.Q. of the 88th Corps suffering the same fate in February, 1945.

At the war's end, the Typhoon was speedily replaced by the Tempest, and nearly all machines were immediately scrapped. In all, a total of 3,330 were built, 254 of them being Mk.Ia, the majority of the latter being converted to Mk.Ib standard. A small number of experimental variants was developed, including a radar-equipped night fighter, a tropical version which underwent tropical clearance trials at Khartoum, and one machine with an annular radiator. A few Typhoons were fitted with three F.24 cameras in the port wing, being designated F.R.Ib.



ENGINE TEST by Peter Chinn

D-C 'QUICKSTART' SPITFIRE



IT is now thirteen years since the original Allbon Spitfire 1 c.c. diesel, designed by Alan Allbon and manufactured by Davies-Charlton Ltd., was introduced, and more than nine years since it was superseded by the entirely redesigned Spitfire Mk.II.

The present Spitfire is basically the same as the 1957 model, but incorporates a few small changes, plus the addition of a starter spring and, as an extra, a silencer unit. D-C were one of the first British manufacturers to offer silencers for their engines.

The D-C silencer is a very simple and modestly priced affair: just a U-shaped aluminium tube, suitably cut away at the centre, where it is wrapped around the upper part of the crankcase to cover the two exhaust outlets, and secured with a 6 BA screw and nut. The twin tailpipes thus formed are then packed with steel wool to form twin absorption type silencers.

When originally tested on the .8 c.c. Merlin and 1.5 c.c. Sabre, we found that this type of silencer could cause quite an appreciable reduction in power, but, as tested on the Spitfire, the power loss was quite modest. Prior to actual prop/r.p.m. and torque tests, we took the precaution of removing the old oil-soaked packing and lightly re-packing the tailpipes with fresh steel wool.

The general design of the Spitfire follows that of the 1.5 c.c. D-C Sabre model. The main casting comprises the crankcase and front bearing, including carburettor intake, plus a pair of very thick beam mounting lugs. These latter contain the long backplate mounting screws which also serve to retain the fuel tank or, if the tank is omitted can be used as an alternative means of mounting the engine—i.e. to the front bulkhead or firewall instead of to longitudinal beam mounts.

The crankcase extends upwards to just above the level of the exhaust ports, where it is widened so that the flange on the cylinder sleeve drops down inside until arrested by an annular seating in the casting. The finned cylinder jacket then drops over the cylinder sleeve and screws into the top of the crankcase so that its lower edge butts against the liner flange, thereby securing the complete cylinder assembly.

The cylinder ports are of the radial type. Three exhaust ports are located at 120 degree intervals through the flange and below them are three slit type transfer ports. As is usually the case with this type of porting, the exhaust has a very considerable timing lead on the transfer porting. In the case of the current Spitfire, the transfer ports are open for a modest 104 degrees of crank angle but the exhaust ports are open for nearly half a complete revolution—actually an unprecedented 178 degrees on our test engine, which is about 40 degrees more than one normally encounters with, for example, a loop-scavenged glow engine.

The measured rotary-valve timing was also somewhat unorthodox. The valve closed at 45 degrees after top dead centre which is quite normal, but did not open until the crank was 85 degrees past B.D.C. A circular crankshaft port of 5/32 in. dia. is used and this registers with a circular port in the main bearings. The crankshaft runs direct in the crankcase material and employs a plain non-counterbalanced disc web.

The Spitfire is equipped with Davies-Charlton's "Quickstart" spring starter assembly. This consists of six coils of 17 s.w.g. spring steel wire, surrounding the crankcase nose and anchored by the left hand crankcase screw. The free end of the spring is formed in a loop to engage a dural cam behind the prop.

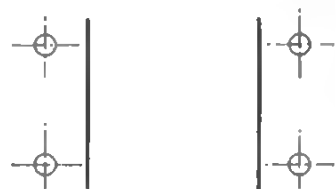
A stop-pin is fitted to the Spitfire cylinder-head to limit the compression lever movement to one complete turn. This is a useful addition to a beginner's engine for two reasons. Firstly, it reduces the extent to which the beginner can get muddled in finding the correct compression setting, especially if he, or someone else, has, as often happens, previously fiddled with the compression screw and disturbed the factory setting. Secondly, it minimises the risk of damage to the connecting-rod, gudgeon-pin or crankpin, through attempts to start the engine on too high a compression setting.

A compression stop has only one disadvantage. This is its tendency to limit the extent to which the engine can be controlled on the largest and smallest props that it is capable of turning. In the case of a beginner's engine, this is not important, as the prop sizes generally used will hold the operational speed range within fairly close limits. Actually, on the Spitfire, we found the range of available compression adjustment more than adequate. When a stop-pin is fitted to a diesel, we have sometimes found it necessary to remove the pin to enable the ignition timing



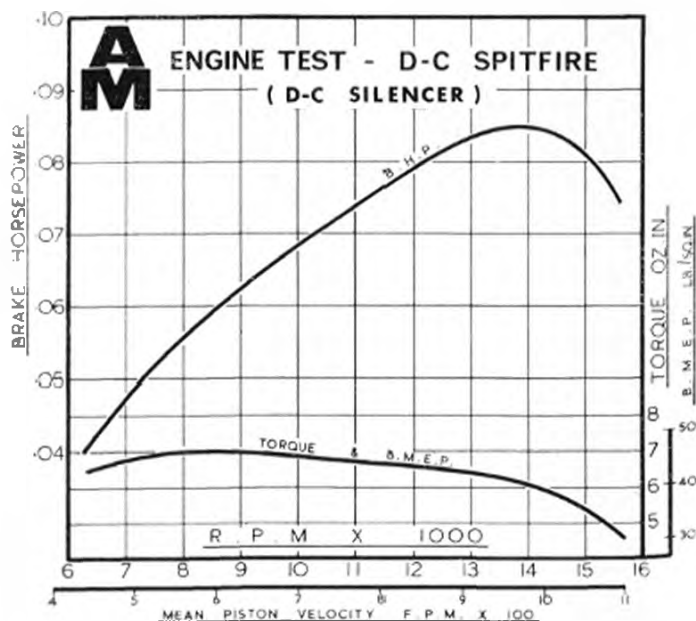
Robust, well finished parts of the Spitfire. Detachable fuel tank and spring starter unit are included and, with the low-priced silencer unit, combine to make this a very economically priced power package for the beginner.

Actual
Size



(compression setting) to be adjusted to the highest and/or lowest speeds and thus allow the engine to be tested over its full r.p.m. range to determine torque and power curves. On our test model Spitfire, however, the stop-pin position permitted operation on props ranging from 9 x 4 down to 6 x 3 covering a static speed range of 5,300 to 15,200 r.p.m.

Starting was good. Priming through the exhaust port was not necessary and the use of the silencer did not, therefore, complicate starting procedure. Beginners may find the Spitfire easier to start using the starter spring, but experienced modellers will find it just as easy by the conventional method of flicking the prop. It should be noted that, unlike the starters on some glow engines, the spring should be wound back only about half a turn. A very



SPECIFICATION

Type: Single cylinder, air-cooled, reverse-flow scavenged two-stroke cycle, compression ignition. Crankshaft type rotary-valve induction. Plain bearings.

Bore: 0.425 in. **Stroke:** 0.420 in.

Swept Volume: 0.0596 cu.in. = 0.976 c.c.

Stroke/Bore Ratio: 0.988 : 1

Weight: 3.4 oz. less silencer
3.6 oz. with silencer

General Structural Data

Pressure diecast aluminium alloy crankcase and un-bushed main bearing unit, with detachable rear cover. Hardened steel crankshaft with disc web, 0.312 in. dia. journal, 0.156 in. dia. crankpin and 0.140 in. bore gas passage. Hardened steel cylinder liner, flanged at exhaust belt and located by annular sealing in crankcase. Machined aluminium alloy finned cooling jacket, colour anodised blue, screwed into crankcase to secure cylinder assembly. Lapped cast-iron piston with conical crown and pressed-in 0.125 in. dia. solid gudgeon-pin. Forged aluminium connecting rod. Machined aluminium alloy prop-driver fitted to taper on crankshaft. Brass spraybar assembly. Combined beam and two-point bulkhead mounting lugs. Detachable transparent fuel tank. Optional absorption type silencer unit.

TEST CONDITIONS

Running time prior to test: 2 hours.

Fuel used: Keilkraft Diesel.

Atmospheric Temperature: 50 deg.F.

Barometer: 30.00 in. Hg.

Silencer Type: D-C Quickstart as recommended.

strong spring is used and half a turn is quite sufficient to spin the engine vigorously on release. The beginner is warned not to let the prop blade slip when winding the prop back against the spring: this can result in a painful rap on the fingers. The idea of a separate dural plate behind the prop, instead of using the prop blade, itself, to engage the starter spring, is a good one, especially with the strong spring necessary on a diesel, which tends to scar a wooden prop.

Most of our tests, including torque tests, were carried out with the silencer fitted. We also checked the Spitfire with the silencer removed and found that the greatest power loss came, surprisingly, not at the highest speeds but in the middle range, around 10,000–11,000 r.p.m., with a loss of about 5 per cent. Loaded for a speed of 8,000 r.p.m., removal of the silencer raised speed by only 150 r.p.m. and at 13,500 the loss was only 250 r.p.m. The actual peak output of the Spitfire, just under .085 b.h.p. at approximately 13,800 r.p.m. was, therefore, little affected by the removal of the silencer. The peaking speed was higher than had been anticipated and resulted in a slightly greater maximum output than we obtained with the earlier Spitfire Mk.II tested without silencer some eight years ago, despite the fact that the older engine started off by developing higher maximum torque.

Prop/r.p.m. checks included the following: 7,200 r.p.m. on an 8 x 4 Tornado nylon, 8,100 on an 8 x 3½ Top-Flite wood, 8,100 on a 7 x 5 P.A.W., 9,300 on a 7 x 4 Top-Flite nylon, 11,000 on a 7 x 3 P.A.W., 12,600 on a 6 x 4 Power-Prop and 13,400 on a 6 x 4 Top-Flite wood.

One of the best, and certainly the most complete, of instruction leaflets, accompanies each D-C engine. This is packed with useful information for the newcomer to power models and, added to the easy handling qualities and robust construction of the engine, helps to make the Spitfire an excellent choice as a beginner's first engine.

Power/Weight Ratio (as tested complete with silencer):

0.37 b.h.p./lb.

Specific Output (as tested complete with silencer):

86 b.h.p./litre.

drag of the wing at this high incidence, and shows that when the silencer is working properly the exhaust gases coming out of the upper surface give the effect of a "blown flap" and so *reduces* the actual drag of the silencer.

So for a given wing silencer the better it is sealed the better will be the speed increase *and* the noise reduction.

The arrangement in D.B.1 was exaggerated to test whether the theories would work. For possibly even better results the silencer can:—

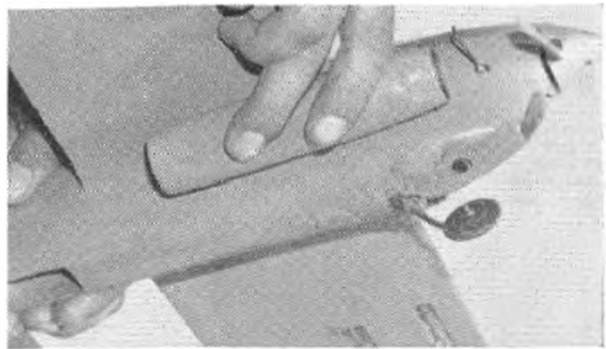
- 1) Be set at a lower incidence to reduce the drag.
- 2) Have the holes drilled even further forward to use the absolute maximum suction developed (peak suction on a symmetrical wing set at 5° is at about 1% back from the L.E.)
- 3) Have more and possibly slightly larger holes drilled in the upper surface. If the silencer is then too noisy, wire wool may be added to the expansion chamber. If still too noisy it is a simple job to block off some of the holes again. It is advised not to drill holes of more than $\frac{1}{16}$ in. dia, and not to exceed a total exhaust area of more than $\frac{1}{2}$ the collector ring outlet or exhaust port area.

As far as application goes, any condition where the upper surface of the wing silencer can become the lower surface, is naturally out. This will occur on any R/C or C/L model that has an upright motor and can be made to fly inverted. Models with sidemounted motors will be alright if the upright mounted wing silencer does not introduce any odd trim effects. For a combat model this arrangement is ideal, for the wing will substantially increase the line tension but the unit does become a little vulnerable in a crash. For speed and team race models which only fly one way round, no trouble at all is expected.

So far no actual mention of size has been made. This is deliberate because each application must be considered on its own merit. For best results a fairly large wing area with low thickness/chord ratio is required. D.B.1. and D.B.2. were both 2 in. span, 3 in. chord and $\frac{1}{2}$ in. thick with a symmetrical section. However these sizes were dictated by mounting them in combat models to clear tanks and give adequate prop clearance. The thickness was such as to allow the exhaust ports in, with sufficient built in incidence. If a flat bottomed section is being used, the thickness can be reduced slightly as the non-symmetrical section has effective built in incidence. The wing span was cut down from that desired to give minimum overhang to reduce crash damage.

The D.B.1 and D.B.2 silencers were welded assemblies of aluminium sheet. Unfortunately this method of construction is not available to everyone. However almost any sheet metal can be used instead and the silencer can be assembled with "Araldite". The ordinary 2 tube pack "Araldite" is quite good but a special one, available direct from the manufacturers is much better for aluminium. This is Araldite AT1 which is solid. Melt this at the joint at 80°C or so then cure it at 180°C for 1 hour. One could also use AU1 which is AT1 filled with metal powder—better for conducting away heat.

Some people may be asking why not use the available lifting surface (the normal wing). This may seem the logical solution. However there are a number of limitations. To obtain any degree of silencing with minimum power loss we need an expansion chamber in the system. If this is to be in the wing itself we must naturally have a fairly thick wing ($\frac{1}{2}$ in. thick or more). Unfortunately most models that have thick wings are designed to fly inverted at one time or another, which then ruins the system. For models with thin wings, and using a separate expansion chamber, the problem will be in getting an adequate gas passage in the wing leading to



Glass fibre moulded, venturi extractor silencer on Dave Balch's Oliver Tiger F.A.I. team racer, note large size.

the suction holes near the leading-edge, which will not in anyway restrict the gas flow.

However the real shortcoming of using the main wing is that most models (except small C/L speed and trainer models), when travelling under power are operating at a very low angle of incidence. As a result the peak suction is quite small, and so the system is operating at a much lower efficiency than it would do when using its own separate wing silencer set at a higher incidence.

If ultimate power is not required then the main wing can be used as it will make a quiet and convenient arrangement.

Venturi Silencers

Another way of obtaining a suction is with the help of a venturi. The general lay-out of the venturi is as given last month. This type of silencer is employed in the commercially available ETA unit, and by a number of Team Race fliers notably Brian Turner.

However they usually employ a shallow inlet angle and sharper outlet angle. The arrangement which is likely to give the least drag is that shown in the sketch published last month.

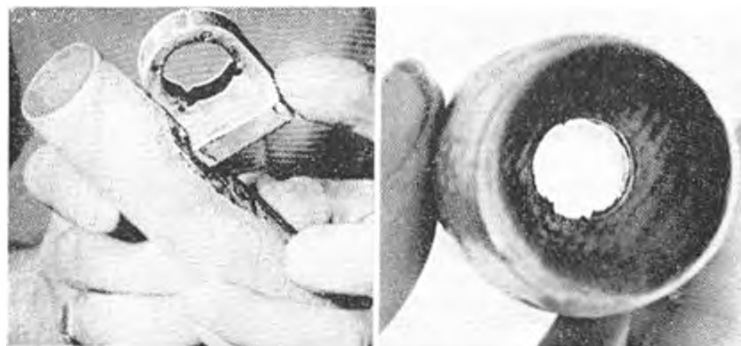
Construction of the venturi silencers is somewhat easier than the wing silencers. Almost any sheet material can be used, even balsa if suitably fuel and heat proofed. However for a more durable result, metal sheet welded or Araldited together is preferred. However, if tests on sizes are planned, then a few quick balsa silencers could give you an idea of the general effect before the ultimate metal one is made.

The sequence of construction is to make the two inner cones and the throat tube, join them together and drill the exhaust holes. Slide them into the outer fairing, packing with wire wool as thought necessary. Then arrange a method of mounting the silencer onto the engine exhaust, (direct or via a collector ring) and finally seal every joint thoroughly. Like the wing silencers, venturi silencers will work at their best only when all odd

Brian Turner's moulded glass fibre venturi extractor, semi buried in fuselage to lessen drag, has won many contests.



At left glass fibre extractor venturi silencer with brass manifold for Oliver Tiger. Exhaust is fed from ring manifold to expansion box at rear and then into settling chamber in venturi. Right a head-on view of the venturi shows relationship of D to d . (Refer to diagram p 345 June issue.)



leaks have been eliminated, for then all suction is applied to the exhaust gases and not lost.

An alternative construction method is to use fibreglass. Here we again construct the centre ducting first. One way of doing this is to shape the venturi out of wax, lay on the fibreglass, then when hard, heat until the wax melts and runs out. However if more than one silencer of the set size is required that shape can be turned from wood, then cut across the throat area and pinned with a dowel, back together again. After preparing the surface and applying the releasing agent the fibreglass is added. Then when hard, the wooden mould can (we hope) be pulled out from each end.

The three main variables in the venturi silencers are the two diameters D and d , and the number of exhaust holes of diameter $0.1d$. D/d governs the amount of suction generated at the venturi throat. The number of exhaust holes is governed by the engine size and noise level acceptable.

D/d is the first variable to consider. The higher D/d is, the greater will be the suction at the throat, but if the ratio is more than 3 to 1 then considerable drag will also result because compressibility of the air is present.

When considering D we must consider the motor to be

used. If the motor is large and D is small, then although sufficient suction may be generated at the throat, the flow of exhaust gases may be sufficient to more than fill the suction, and so a back pressure may exist. So obviously for a large motor, D must be suitably large. Conversely for a large D and small motor the suction might be such as to extract the exhaust gases too effectively and so increase the fuel consumption.

The ideal size for your own motor can only be found by experiment, but a good starting size can be $D = 1\frac{1}{2}$ in. for 0.29–0.35 cu. in. glow motors, 1 in. for 2.5cc diesels.

Tied in with the diameters are the number of exhaust holes to use. The best number can only be found from experiment, but as with the wing silencers it would be advisable not to have a venturi exhaust area more than half the true engine exhaust area.

In a side exhaust stack motor the true exhaust area is not the area of the exhaust stack but the area of the opening in the cylinder wall.

If a low value of D/d is used (say $1\frac{1}{2}$ to 1) then noise may still be a problem. This can be minimised by using an expansion chamber between the motor and the venturi, and by packing everything with wire wool.

Latest Engine News

Continued from page 381

The forthcoming World Control-Line Championships at Swinderby may well produce a new Moki engine but, in the meantime, some details of last year's model may be of interest. A very small number of these engines are now in use outside Hungary and a few months ago, speed flier Gordon Farnsworth was kind enough to let us have a look at his own example.

As our photographs show, the engine bears a distinct resemblance to the K&B 15R in many respects, except for the cylinder porting which is quite obviously Super-Tigre inspired. It is also surprisingly "production-job" in appearance—in the complimentary sense, that is.

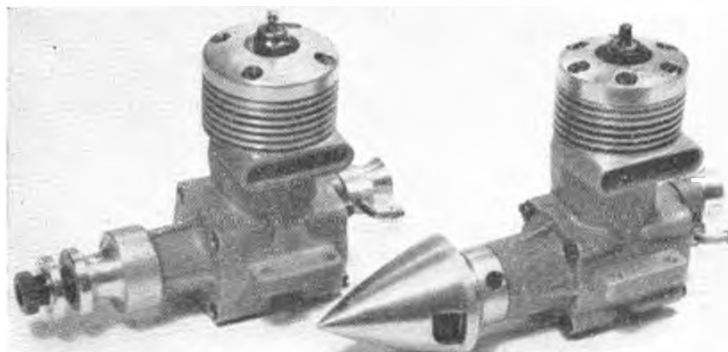
The similarity to the K&B is particularly noticeable externally and also in the main casting, the shaft and the rotary-valve design. The crankshaft uses the Wisniewski "hidden counterbalancing" system, in which the cutaway portions of the crank disc are sealed off by a shrunk-on aluminium rim so as to reduce effective crankcase volume to the minimum. The shaft has a 7 mm. dia. journal and a 5 mm. crankpin and is carried in twin ball bearings in a stout front housing. The backplate carries a valve rotor of Tufnol type material mounted on a stationary pin. It is timed to open at 40 deg. ABDC and remains open for 190 degrees of crank angle.

The cylinder liner is virtually identical with that of the G.20/15 mod.1 Super-Tigre. However, designer Gyula Krizsma has elected to retain a short exhaust lead to the timing, respective periods being 136 degrees exhaust

and 130 degrees transfer. The piston follows the Super-Tigre in having no baffle, but is a trifle lighter than the pistons of both the Tigre and the K&B. There is an annular stiffening rib immediately below the 4 mm. gudgeon-pin. The machined dural con-rod is slightly longer, between centres, than the Super-Tigre. The cylinder head gives a shallow cone-shaped combustion chamber and is entirely without squish area.

The engine has the usual Continental bore and stroke combination of 15 x 14 mm., weighs 5.4 oz and is very well made throughout. Performance is considered to be comparable with a reasonably good G.15.

The resemblance of the Moki S-3 (left) to the K&B 15R is readily seen in this photo.





Left, J. Connacher's multi channel R/C design with swept wing and "Constellation" propo equipment (See RCM&E for R/C Nats).

South African Nats. By Basil Moore

The 1966 S. A. Nationals will be remembered for some perfect flying weather, some good organisation and some terrific thermals. It will be remembered too as a Nationals where the "big names" in S. A. Aeromodelling had to fight all the way for their successes and the appearance on the scene of a new "star" in W. Pretorius of Rand Model Aircraft Club. Entrants came from Rhodesia, East London, Port Elizabeth and Cape Town, Pieter Maritzburg and Durban to the field at Johannesburg.

Flying got underway at 0700 hours on 8th April, 1966 with WAKEFIELD (14 entries). Air was damp and no wind or drift. An ingenious adaptation of the Kauhava "Bubble Bottle" worked by means of a fan and a battery showed that thermal activity was present even though it was light. By 07.35 no modellers had dared to risk flying "damp tished" models and it was left to John Cowlin a junior of Western Province to lead the way with a beautiful max. By the end of the third flights Cowlin had registered 444 secs. Next closest was Brian Partridge (365 secs.) and E. Burroughs (358 secs.), both of Rand Model Aircraft Club. Lift was now alternating with downdraft and the picture changed rapidly, but with Cowlin showing the seniors the way. Partridge and Burroughs faded to be replaced by Calefatto and Rowe (both of Western Province) and Forbes and Kittel of Rand M.A.C.

Final Placings were:—
1st. J. COWLIN (West Prov.) 735 secs.
2nd J. CALEFATTO " 670 secs.
3rd J. SWALLOW (Rand Mac.) 562 secs.
Cowlin flew his modified "Long John" by J. Calefatto beautifully and showed the designer just how the model should be flown.

4 A POWER with 24 entries was next. The weather seemed to have settled down and a slight breeze was responsible for a small amount of drift. In the 1st round four maxs were recorded Becker (Rand) Calefatto (Slowworm) and Rowe (W. Prov) and G. Wellsted (Jnr) East London MAC. By the third round downdraft was more prevalent than thermals and it was the "good flyers" who made the grade. Young G. Wellsted was giving a good account of himself at this his very first Nationals.

Final placings were:—
1st J. CALEFATTO (W. Prov.) 789 secs
2nd G. WELLSTED (East Lond) 746 secs
3rd E. BECKER (Rand Mac) 684 secs
There were 19 entries for F.A.I. POWER and Vikings and Ultimeters dominated the scene with one Diesel engine (J. Swallow). Lift was patchy but the breeze had increased and this seemed to help these "heavyweights" overcome the "watered" fuel position.

Final placings were:—
1st J. SWALLOW (RMAC) 659 secs
2nd D. COMINS (RMAC) 624 secs
3rd S. McCULLAGH (West Prov) 605 secs
OPEN GLIDER with 23 entries followed next, under an overcast sky with scattered lift. John Swallow (RMAC) entered a beautiful O.D. job with "egg box" construction in the wings and stabilizer. Wings were held down by concealed rubber bands while the Auto Rudder was enclosed in a beautifully finished fuselage. The plane did not however live up to its looks and did not place.

Final placings were:—
1st R. ROWE (West Prov) 678 secs
2nd E. NISSEN (Rand Mac) 676 secs
3rd G. KITTEL (Rand Mac) 581 secs
44 entries (a record) for A/2 opened the 9th

April flying day with beautiful weather—but minimum lift. John Swallow's "Thermal Hunter" design was in evidence and there was a sprinkling of *Inchworms*, *Continental*s and an *APS Rolling Stone*. W. Pretorius (Rand Mac) was going well with 4 maxs in a row and was unlucky to have the wind do a complete "VOLTE FACE" and due to inexperience was not able to bring his ship around and launched downwind for a paltry 25 secs! A beautiful builder, this boy. Vic Hoxley (Port Elizabeth MAC) with an O.D. was "battling it out" as a one man team. Roy Fraser (Rand Mac) with a *Rolling Stone* and W. Garrard (Maritzburg Mac) tied with 775 secs for the first ever fly off in this event in S.A. Roy towed steadily into a beautiful thermal and Garrard followed him but towed almost through the "hubble" before launching. Fraser got his 210 secs whilst Garrard was down for 90+ secs.

1st ROY FRASER (Rand Mac) 775+210 secs
2nd W. GARRARD (Maritzburg Mac) 775+90 secs
3rd W. PRETORIUS (Rand Mac) 745 secs
OPEN RUBBER attracted 11 entries and the thermals were now becoming express lifts. Wind was in evidence and made retrieving a long business. 6 max's were recorded in the 1st Round. Competitors were being rushed for time and excitement was in tense with entrants trying to put their last flights in. Final placings:—
1st J. SWALLOW (Rand Mac) 830 secs
2nd R. ROWE (West Prov) 701 secs
3rd T. TYRER (Rand Mac) 680 secs (4 flights)

HAND LAUNCH GLIDER produced the usual record number of entrants (it would seem that this is one way to let off the tenseness of competition flying) 5 juniors flew.

1st W. PRETORIUS (Rand Mac) 313 secs
2nd J. SWALLOW (Rand Mac) 308 secs
3rd S. McCULLAGH (West Prov) 295 secs
1st Junior H/L was G. Swallow
OPEN POWER with 16 entries, followed in windy conditions and many planes were lost after being seen to D.T. and still going up. Fortunes swung one way and another and the final placings were:—
1st G. BOUWER (Rand Mac) 721 secs
2nd J. SWALLOW (Rand Mac) 656 secs
3rd M. SILKSTONE (West Prov) 608 secs

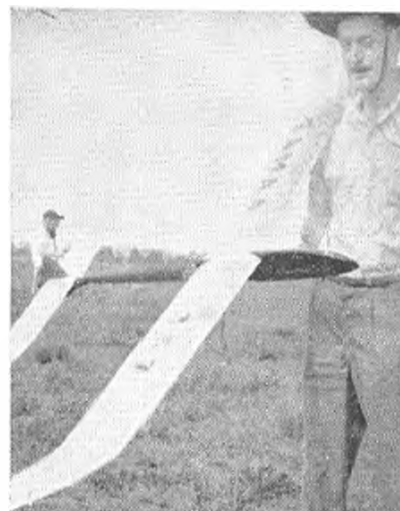
A/I GLIDER ended the day with 24 entries in wild and windy conditions. Wings were folding with monotonous regularity. *Aiglets* predominated.

1st ROY FRASER (Rand Mac) 429 secs
2nd W. PRETORIUS (Rand Mac) 413 secs
3rd B. GUNNELL (East Lond) 408 secs
The first of two days set aside for Control I line dawned clear and crisp. 12 entries were received for F.A.I. T/Race with O.D.'s predominating. Final placings were:—
1st F. TURNER (Topliners) 5 min 8.6 secs

2nd B. MENGES (Topliners) 5 min 48.8 secs
3rd H. MATHEWS (Topliners) 6 min 10 secs

STUNT produced 7 entries with O.D.'s predominating. Flying was good and manoeuvres were executed smoothly. Final placings:—
1st W. PRETORIUS (Rand Mac) 1100 pts O.D.

2nd L. MARNEWEKE (Rand Mac) 1024 pts O.D.
3rd E. BECKER (Rand Mac) 902 pts O.D.



John Swallow and "Dinosoarer" open glider.

B. TEAM RACE produced 7 entries with no surprises in the event the results of which were as follows:—

1st F. TURNER (Topliners) 7 min 42 sec
2nd E. BECKER (Rand Mac) 10 min 31.6 sec
3rd A. v. BREDA (Rhodesia) 15 min 0.8 sec.

OPEN COMBAT proved to be a crowd pleaser and one of the best flights was produced by Herb Newton (West Prov) and E. Nevin (R Mac).

1st E. BELL (Rhodesia) 90 pts
2nd E. BECKER (Rand Mac) 76 pts
3rd H. NEWTON (West Prov) 71 pts
On 11th April SAT/R attracted 6 entries and final placings were:—

1st F. TURNER (Topliners) 10 min 13.8 secs
2nd A. v. BREDA (Rhodesia) 10 min 24.5 secs
3rd H. MATHEWS (Topliners)

Quite a turn-up for Mr. Turner! He seems to have won all that was going in team racing-Ed.

F.A.I. COMBAT results were:—
1st B. MENGES (Topliners)
2nd E. NISSEN (Rand Mac)
3rd E. BECKER (Rand Mac)

A smashing dinner-dance at the Club House of the Transvaal Aero Club brought the Nats to a happy close. All voted it one of the best and a big "thank you" was voted Mrs. VAL SWALLOW for her hard work as Recorder and one of the organisers.

A band of "FETCHERMITES" (young AFRICAN boys) well trained in carrying and spotting made retrieving easy for a small fee.

Main criticism was that it was "too hot" Ah! well modellers are never happier unless they are grousing.

Only scale entry was this Beechcraft D17 by Roger Stern from Rhodesia.





Colin Cox, Winner of F.A.I. Power using a time proven model well trimmed and precisely flown.

F.A.I. TEAM RACE

F.A.I. Team Race with 22 entries was the most popular class of team racing, but as with the other classes, race times were rather low. Perhaps the altitude of Canberra had something to do with this; many competitors found their machinery going slower than usual at home, although at the same time some had found increases in lappage.

The three finalists were Ron Wilson—Gordon James, Brian Eather—Ian Roach and Garry George—Trevor Hughes.

Garry George was unlucky to break a crankshaft in his ETA just before the final and without time to get his model going properly again his chances of a win looked pretty remote. Ron Wilson's model used an Oliver Tiger mounted in a short Pomadi pan. Brian Eather's model's design was strongly influenced by Dick Place's successful *Super Nova*, but with more functional and simplified features than the Place machine.

At the drop of the flag Wilson was away first, followed by Eather then George with a very sick motor. Eather was travelling at just on 90 mph and expecting 50 plus laps, while Wilson only had about 78 mph with lappage in the forties. On his second tankful Eather's motor overheated badly and slowed right back to 72 mph. At the same time Wilson's speed had improved to 80 mph and he passed Eather several times. At the second stop Roach backed off the compression on Eather's motor and from then on the two models were pretty even for speed, both circulating at about 86 mph. George had retired by this time. As the race wore on it was noticeable that pitstops were taking longer as motors got hotter. Eather made stops at 52, 125 and 196 laps and came in the winner with 200 laps in 10:36. Wilson's stops were quicker than Roach's but there were more of them and they took 11:02 to complete the race.

JUNIOR 1A TEAM RACE

It was immediately apparent that the high winds and inability of tiny models to land properly on the reasonably good grass surface would not make for very clean racing. Nevertheless most of the Juniors did a very creditable job.

The finalists were Greg Fahey—David Arthur, John Toyer—Roger Whyte and Bill East.

Fahey and Arthur were left at the start and did not get going until well into the race. Toyer and Whyte were unlucky to lose the cowl off their model while going well, bringing about their disqualification, leaving Billy East to run out winner using an Oliver Cub in a Pomadi cast pan. His was the only model to finish 180 laps within the allowed 15 minutes.



Australian Nationals

held at Canberra, reports by Brian Horrocks

OPEN 1A TEAM RACE

The four finalists were Bill East, Mal Pring, Sean O'Connor and Geoff Lawson, all of whom were using Oliver Cubs. About half way through the race Geoff Lawson's model was blown into the centre of the circle causing it to wing over with such force that the control handle was ripped out of Geoff's hand.

The model crashed into the crowd of spectators, but luckily no one was hit. This left the race to be battled out between Bill East and Mal Pring as Sean O'Connor was unable to finish the race. The finish was the closest of all the team races, with Mal Pring being beaten by one lap.

SPEED

Phil McGee's Rossi 60 powered class III speed model hurtled off into the junior combat circle, confusing the judges as to where this gyrating third model had come from. Sorry Phil, you lost 100 points for going in without a streamer!

Len Buck's model lived up to its owner's name as it screamed off into the wild grey yonder and "bucked" over the safety fence. Dave Hayles came out of the dolly and into a wing-over which terminated several inches underground. With all this crashery by the big models only two competitors recorded official times in class III, the best being a record shattering 161 mph by Ivan Vodopivec's Rossi 60. Despite his prang, Len Buck notched second place with 152 mph with his McCoy 60.

Ray Finneran was the winner in F.A.I. speed with 123 mph. Second was Laurie Cantwell with 120 mph and Len Buck third with 117 mph. All three were using Super Tigre 15's.

Nine competitors returned times in Class II speed and heading the list was Len Buck who turned in 143 mph with his Rattler. Phil McGee was close behind with 142 mph from his Super Tigre 29 RR and Andy Kerr was close behind despite having troubles with his K & B.

Monoline control once again proved its worth, fine demonstrations being given by Ivan Vodopivec, Len Buck, John Morgan, Stewart Cobcroft and Andy Kerr.

PROTO SPEED

This event saw some real fireworks and ended up with the setting of a new Australian record which compares more than favourably with the best yet done overseas.

Previous record holder Andy Kerr was flying his usual lightweight blunt elliptical winged K & B powered monoline model to reel off 126 mph for the standing mile which looked for a while as though it might win. At this stage John Morgan had 115 mph and Ivan Vodopivec was flying at about 113—120 mph. Ivan's Super Tigre had been swinging a full 8 x 8 Rev up prop and was not sounding particularly fast so for his last flight the prop was cut down a bit and a new fuel tried, a combination which resulted in a run of 138 mph! Ivan's 138 mph had undoubtedly won the contest, but it would not be counted as an official Australian record because he had not used the anti whip pylon for that run. Preparations were immediately made for a special record attempt. This time Ivan made a frantic dash to get into the pylon as soon as the model was released and his little blue model screamed around at a top speed of 152 mph to give an average over the standing mile of 136 mph, a new record.

CONTROL LINE SCALE

Control line scale event had only a few entries, but these were nevertheless very

Left, Les Fahey with his winning A/2 model. Right, The Cockpit of Prosser's Pawnee complete with pre-flight check list on top of instrument panel.

impressive and drew a bigger crowd of spectators than most other events. First was Ross Woodcock with a *Cessna 336*, Barry Bowerman's *Piper Tri-Pacer* was awarded second place, followed by the *Southern Cross* of A. Edwards.

RADIO

The radio events were very poorly supported with only one entry from Victoria, two from Western Australia, with the remaining entrants all from N.S.W.

The Multi channel event was the best supported. Tom Prosser won once again, using a modified *Sultan* (Merco '61 and Silvertone Gear) Second was Basil Healey with a *Sultan* (Merco '49 and O. S. Gear) and third Mike Pettigrew with a *Pegasus* (Veco '45 and Silvertone gear) The standard of flying was not high.

Tom Prosser also won Intermediate with an O.D. Model, K & B and Silvertone gear, with Mike Pettigrew second with an *Aristocrat* (Merco '49 and Silvertone) and Ken Millard third, also with an *Aristocrat* (Merco '49 and Silvertone gear).

Scale was won by—guess who?—Tom Prosser yet again with his magnificent *Piper Pawnee* (Merco '49 and Silvertone gear.)

FREE FLIGHT

The free flight events were by far the best supported events. The field however, was far from satisfactory, being close to houses with the prevailing wind in the direction of the houses. Many models were lost. The standard of flying in all events was extremely high. The weather was hot—calm early in the morning with wind increasing during the day.

POWER DURATION CLASS I

This was one of the best supported events. Cox Tee—Dec, '049s and '051s were almost universally used. Winner was R. Brennan with a *Dynamo*. Second C. Cox with a *Mini-Weaver* and third was K. Murray with a *Dynamo*. All used Cox T.D. '051s. (and our plans—Ed!).

F.A.I. POWER

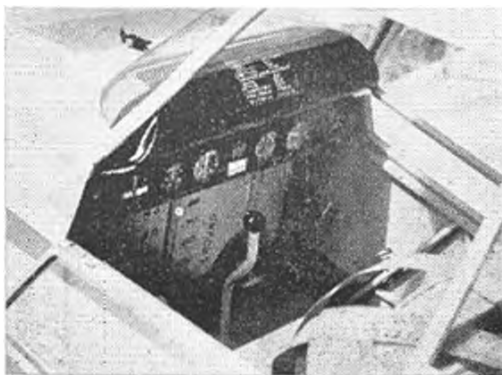
This was again a well supported event, with approximately 20 entries. The most popular motor was the square-port Super Tigre 15 but the winner, Colin Cox used a Cox Special '15 in a modified *Pulteri*. Second was Ford Lloyd and third R. Greaves, both using the Australian designed Eclipse with Super Tigre '15s on pressure. Doug Murray had the highest climbing model—a *Viking* powered by a Cox Special '15, but struck "downers" on two flights.

OPEN POWER DURATION

This was a new event based on 5 flights with a total engine run of 35 seconds. Maximum flight time was 3 minutes. The event was popular and will be used instead of the old power ratio events at future Nationals. Winner was K. Murray using a *Dixielander* with Cox Special '15, second was F. Lloyd using an O.D. model with Cox '09 and third was A. Butler.

SENIOR A/1 SAILPLANE

Winner of this event, F. Lloyd, was going to withdraw from this event until friends





Left, Bob Greenhill with his perennial Gloucester Gladiator. Always a great crowd pleaser. Right, Australia's No. 1 Speed flyer Ivan Vodopivec with his winning class III model.

persuaded him to continue. Ford used an Aiglet. Second was C. Cox and third T. Prosser flying a "Telstar".

A/2 SAILPLANE

A competitor finally achieved a 900 second total in this event at the Nats. Les Fahey flew 5 maximums, with his modified "Migrator". Second was L. O'Reilly flying his O.D. Heavyweight (19.5 ozs.) and third S. O'Connor flying his O.D. model.

L. O'Reilly tried for the Australian sailplane record on his last flight, but only achieved 13 mins. 12 seconds after D.T.-ing. Les Fahey set a new looping record when his model looped 87 times after D.T.-ing on one flight. Quite spectacular.

FLYING SCALE

First was D. Marshall flying a Sopwith Triplane and second J. Marshall flying a Fokker Triplane. Both models flew well.

WAKEFIELD

A. Butler won this event with his old patched, but very consistent model. Second was R. Greenhill with a well constructed model of his own design. There were a number of new faces in this event, which augurs well for the future.

JUNIOR COMBAT

The first round and recharge eliminated the weakest of the 18 starters. The eventual winner Bill East lost his heat and won the recharge. After the second round eight remained. White, Ikin, May, Turrall, Willing, East, Chapman and Arthur. In the third round White flying an Enya 15D powered "Vishus" flying wing defeated Ikin after a "Vishus" collision. Turrall defeated May in a hard fought heat during which Turrall stacked and May lost half a wing. Bill East defeated the tiny Warren Willing after both had stacked due to a line tangle and Willing pranged his reserve. David Arthur flying an ETA 15 powered wing scored a win over Glen Chapman.

Then to the semi-finals. Turrall won his duel with White. East won his semi-final with a good cut against Arthur. In the final East won with a cut against Turrall who was forced to fly a model which was lacking half a wing. In the fly-off between White and Arthur to decide third place, models were up and down all over the place with the result that Arthur won on air time.

F.A.I. COMBAT

Despite perfect conditions (except for heat, dust and flies) the standard of flying was not good. The contrast between the few really good fliers and everybody else was not a joke. Whilst wings and derivations thereof dominated numerically a 36 in. span light-

weight stunt layout which towed a streamer at 75 mph carried home the bacon. Andy Kerr the eventual winner had only one model with him and it is to his credit that he flew right through to first place without pranging it.

The outstanding engine though was the Super Tigre 15 glow, a good number of contestants used them including the winner, who has his swinging a clipped down 8x4 Tornado Nylon prop. To quote Andy "I think that F.A.I. combat is a good version of slow combat which costs much the same as Open Combat and leaves the beginner who does not know how to use his motor to its limits out in the cold".

CLASS II TEAM RACE

Class II team race with 20 entries rivalled F.A.I. for popularity. The finalists were S. Young, Enya 29 3B in a Pomadi pan., R. Wilson OS Max H29R in Pomadi pan, G. May Super Tigre 29 no pan, and M. Caux's Super Tigre 29 in Pomadi pan.

At the start Wilson was first away, but Young broke a prop on take-off and lost a lot of time. May too, lost time at the start. Wilson's model powered with an OS 29 speed motor fitted with intake restrictor, was fastest with 100 mph for 34 laps and quick pitstops, whereas Caux's model was slower but getting over 70 laps. In the end it was Wilson first in the time of 7 : 17, Caux second with 8 : 36 and Young third in 9 : 10. May did not finish.

ADVERTISER TROPHY FOR CLASS II TEAM RACE

The line up for the Advertiser trophy consisted of only S. Young, Victoria; G. May, New South Wales and I. Bristow, South Australia as there were no entries from Queensland, Western Australia or Tasmania. Simon Young made no mistakes in this race and won in a time of 8 : 3 with May second and Bristow third.

JUNIOR AND SENIOR STUNT

The first round started in calm, sunny weather. Ross Murphy was one of the lucky ones who flew before the wind started to blow, and he came up with the highest score of the round. The wind built up to such strength after lunch that several competitors withdrew from the round rather than risk smashing their models. Defending champion Ken Taylor flew in the wind and flew well but missed out on a couple of stunts at the end of the pattern for a mediocre score.

Ken Taylor flew his big Fox 59 powered stunter in fine fashion and top scored in round two. Darryl Hartshorne, Ross Murphy and John Hughes lost ground in this round. John Tressler had two good flights on board, and stood a good chance of winning Junior unless Johnny Hughes had a good third round and the Senior section was still wide open.

In round 3 Ken Taylor flew well and again topped the round. Daryl Hartshorne with his Angelique also flew well and obtained a score big enough when added to his first round score to beat Taylor's best two scores. Ross Murphy's nerves were getting the better of him by this time, but he flew his Shark well enough to ensure at least third placing. John Hughes turned in a magnificent flight for a junior with his own design Rebel which was a bit too good for John Tressler. Glen Chapman knocked up a decent score in the last round to place third in the Junior section.

Left, Brian Eather, winner of F.A.I. Team Race likes his planes like he likes his cars, Fast! (Lotus Elan). Right, Sean O'Connor putting turns on his immaculate Wakefield model.



OPEN COMBAT

This event with 31 entries was the last control line event of the Nationals. There were some fiery heats. One of the best was between Adrian de Vos and Sandy Stowe, in which Adrian took three cuts off Sandy's streamer and most of her string, forcing her model to the ground and finally came down intact when Sandy threatened to get her reserve model out. John Hughes had an F.A.I. Combat model, John Satan, going rather fast with OS Max III 35 and fought through to the final. The May boys had big Foxes going well too, but were eliminated somewhere along the line.

The Combat finals are usually the most disappointing of any of the rounds, as by the time they have battered their way this far, most of the models are in no fit condition to fly. Last year's winner, Stewart Sherlock, was matched with John Hughes in the final, but Stewart's plane was a complete wreck; the Super Tigre 40 was about the only part functioning normally. The wreck obviously would not fly so Hughes won on air time.

CHAMPIONS

Tom Prosser deservedly became Senior Champion of Champions and Carl Ingelfinger Junior Champion of Champions. The "Aeromodeller" shield for the state winning the most points was won by N.S.W.

Nationals always bring forth criticisms both founded and unfounded, and this Nats was no exception, however, as long as the true spirit of Aeromodelling and its camaraderie prevail, these complaints are eventually lost in the smell of dope and fuel. Doug Murray and John Lewis drove almost non-stop from Perth to attend the Nats.—round trip distance of 4,400 miles. Many modellers travelled over 1,500 miles to attend. Everyone had a good time and will be back next year for more in Sunny South Australia. (with yet more APS designs?—Ed.)



Basic Aero Modelling

PART SIX (Concluded)

Rubber Motors

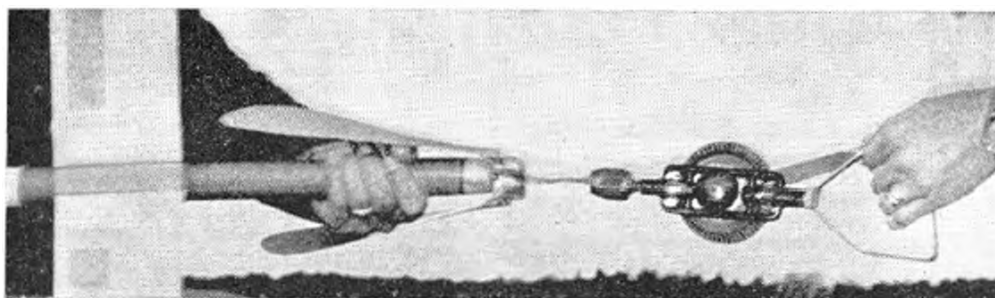
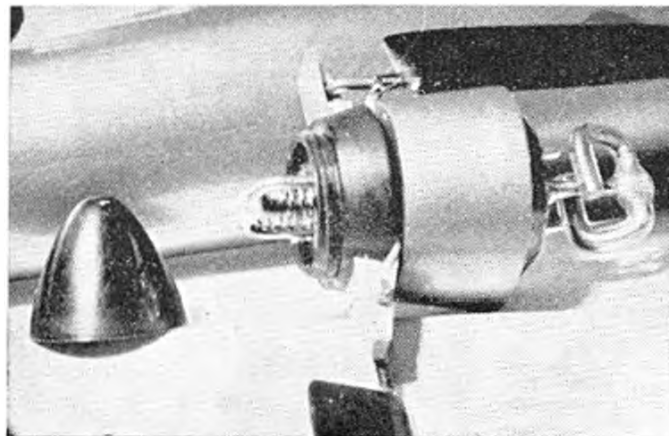
'Breaking in' is something that is very necessary with new rubberas, initially, it will not take anything like maximum turns without braking. Thus a new motor needs winding to about half maximum turns and then allowing to unwind; repeating winding and unwinding at about 60, 70 and 80 per cent maximum turns. The motor will then be reasonably 'broken in' and can be wound to approaching maximum turns from then on. During the process of breaking in it will also have stretched about 10 per cent in length, taking up what is known as the 'permanent set'.

For sports flying, motors should never be wound to more than 80 to 85 per cent maximum turns, when a consistent performance should be obtained over a reasonably long period. For contest work, however, it may be necessary to approach maximum turns on each winding. In such cases the 'maximum turns' figure (Table XXIII June Issue) can be taken only as a rough guide. The actual breaking turns can only be established by testing a specimen motor of that size (and rubber type) to destruction.

There is also the point that when a motor is wound to near maximum turns it will suffer a marked loss in performance after only a few windings. Some contest flyers may even change a rubber motor for each flight, although good rubber should stand up to at least three 'maximum turn' windings without loss of performance. It will not be suitable as a 'contest' motor afterwards, however.

Winding itself demands a special technique. Besides being quicker it is also a more efficient way of winding to use a winder, the usual type being a hand drill with a hook inserted in the chuck. The hook should be so shaped

Detail of Frenchman Jacques Valery's conversion of plastic spinner for power models on a Wakefield design also showing his non-bunch hook with plastic tube covering. Prop hub is fabricated from wire.



The traditional hand drill is an indispensable tool for winding rubber motors. Here, Swedish Lennart Flodstrom is about to stretch wind his Wakefield motor prior to coming 4th in the '65 World Champs.

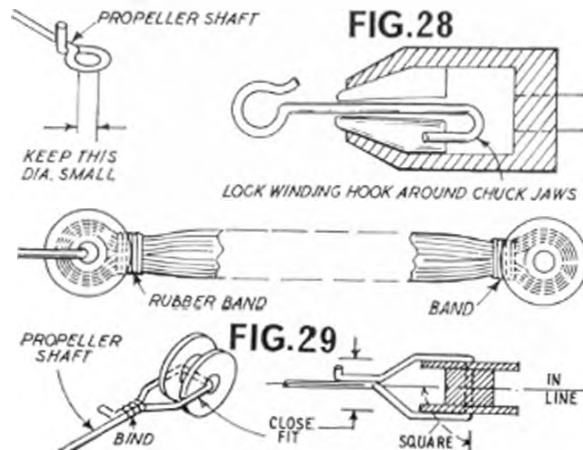
that it cannot pull out of the chuck, in addition to the chuck being tightened as hard as possible. Another useful tip is that the diameter of the winding hook should be of an easy shape to disengage from the propeller shaft and the propeller shaft loop of small diameter very little larger in size than the wire diameter of the winder hook. Fig. 28.

This will stop the propeller loop trying to climb around the winder hook when winding. A rubber motor is always stressed less if stretch wound—and for putting on about 70 per cent maximum turns or more, stretch winding is essential. The technique is quite simple. After engaging the winder move backwards to stretch the motor to about three times its normal length. About one half to two thirds turns can be applied in this position, advancing towards the model as the remaining turns are applied. Judge the rate at which you take off the stretch so that you have advanced right up to the nose of the fuselage as the last turns are applied.

The initial 'stretch' is a little easier—and there is less strain on the rear anchorage—if turns are applied when moving out to the stretch position. This is particularly true if more than the '3 times' stretch is attempted. Some modellers use a 5 or even 6 times stretch when winding as they feel they can get more turns on this way. This is only for contest flying, and not always necessary then. It is largely a matter of individual technique, and the amount of stretch you feel happiest with.

A major problem with long motors is 'bunching'. There is also the ever-present problem with all rubber motors of the ends trying to climb around any conventional hook shape to which they are attached. The real answer is to avoid hook shapes as anchorages, and it was for this purpose the bobbin was devised.

Basically, a bobbin is simply a spool (preferably in plastic) over which each end of the motor is looped and the motor then bound close up to the bobbin with a rubber



band—Fig. 29. The rear end of the motor is then anchored by a dowel through the centre of the bobbin. At the front end the propeller shaft has to be bent into a suitable shape to retain the bobbin. This shape is *important* for the bends must fit the bobbin snugly and accurately. If the bend is too wide, for example, the bobbin may be able to climb around the side of the hook. This possibility is aggravated by the fact that the centre hole of the bobbin is invariably much larger than the shaft wire diameter. It may pay, therefore, to plug the hole of the front bobbin to fit the shaft snugly—e.g. with a short length of split Rawlplug.

Bobbins are an ideal rear anchorage fitting; but with small motors they can be omitted and the dowel simply passed through the rubber loops. They are also a good anti-bunch fitting at the propeller end, but not always desirable. It is sometimes desirable, or even necessary, to use a hook.

No bent wire hook shape—circular, diamond and similar variations—is proof against bunching, with one exception. This is the 'S' hook, shown in Fig. 30. This is difficult to bend neatly and accurately, especially in 16 swg wire, but it is positively bunch proof *provided it is bent the right way*. The motor will then automatically align itself centrally with the hook under its own twisting action. If the 'S' hook is bent the wrong way the rubber motor will simply climb off the ends of the hook almost as soon as you start winding.

Where wire hooks are used in contact with rubber they should always be covered with sleeving. Bicycle valve rubber tubing used to be the standard 'sleeving' material, slid onto the hook. Plastic fuel tubing of suitable small diameter is even better and more durable. It may, however, need to be warmed to soften before it can be slid over a small 'S' hook.

Finally, whatever type of wire hook is used to anchor a rubber motor, make sure that this cannot straighten out under the pull of the rubber when wound, or during winding. The best method of preventing this is to bind the 'open' end of the propeller shaft fitting or hook with fuse wire, as shown in Figs. 29 and 30. This is more reliable than binding with a rubber band, as sometimes recommended, and easier to do.

This does not apply at the rear end of the motor since the anchorage here is usually a dowel pushed through the fuselage sides—but do use a strong enough material for

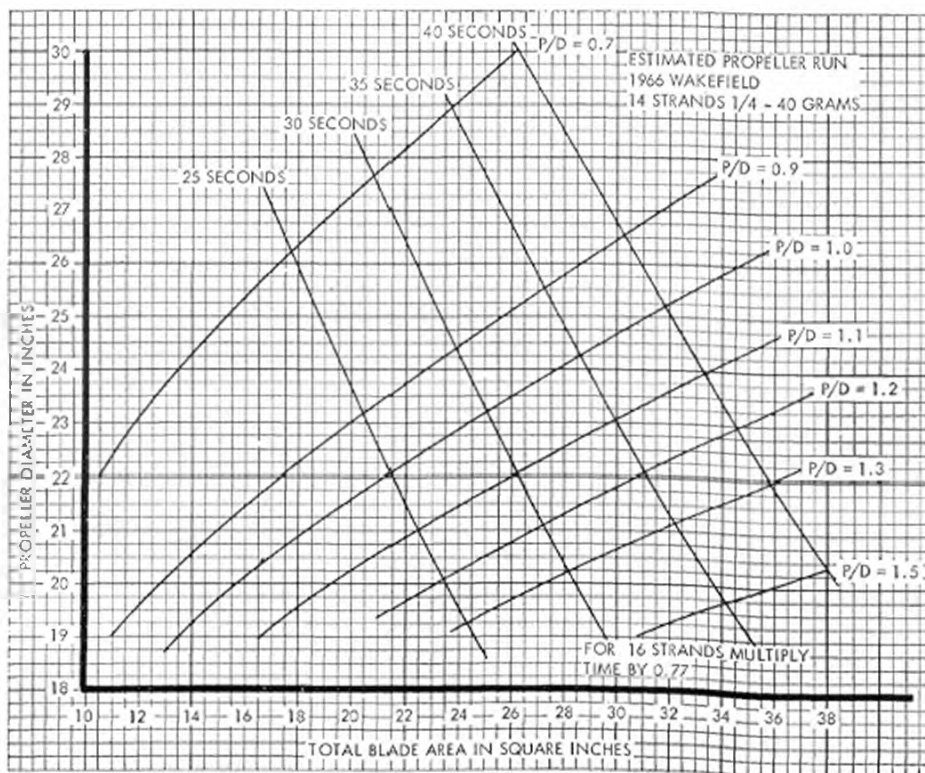


the dowel, preferably really tough bamboo rather than an ordinary hardwood dowel.

Proper fixings—bobbins or 'S' hooks—prevent bunching at the ends of the motor, but bunching can still occur in the middle and upset trim, especially with long motors. This can be caused by poor winding technique—putting on too many turns when stretch winding and then having to come in too rapidly. Bunching can also develop in a long motor when it is *unwinding*, and again can upset trim. This type of bunching will eventually clear itself as the motor continues to unwind, but the flight performance may be spoilt as a consequence. If a really bad bunch develops in a small section fuselage the rubber may become so jammed in the fuselage that it just cannot clear itself. This sort of fault is only likely to be produced by poor winding technique. The usual cause is over stretching and prolonging the 'stretch' too long; but it can also occur attempting near maximum turns without stretching enough.

Care of a made-up rubber motor is fairly logical and straightforward. Keep it clean and well lubricated (but not excessively lubricated). If it is dropped on the ground it needs washing, drying and re-lubricating before it is used again, as it will almost certainly have picked up grit. Keep all rubber out of direct sunlight or excessive heat as this will cause deterioration. Rubber, and made-up motors, are best stored in a cool, dark place.

Contrary to popular belief, made-up rubber motors do not want the lubricant washing off and storing 'dry' when not in use. Just keep them as they are in a suitable container. You can even leave them 'corded' without harm, although if they are to stand idle for more than two or three weeks it is advisable to uncord them first and re-cord again when you need them. If not, the strip may develop a sort of 'ripple' pressure pattern, although in fact this does not appear to have any harmful effect.



MOTOR RUN RECKONER FOR 40 GRAM MOTORS

by J. Grant

The graph presents a cross plot of propeller diameter, blade area and pitch diameter ratios against motor run for 14 strands of 6 x 1 weighing 40 grams. It is reproduced by permission of 'Internationalist', Canada. Note that changes in blade area will vary the times only slightly. For example, assuming a 22 in. diameter, P/D of 1.0 and a blade area of 21.5 sq. ins. an estimated run of 25 seconds is indicated. Increasing the area to 30 sq. ins. will only alter the run time of

$$25 \times 3 \sqrt{\frac{30}{21.5}} = 25 \times 1.12 = 28 \text{ seconds}$$

Winding to the absolute maximum could also increase the run up to say, 10%. Although the plot is theoretical, quite a number of propellers have been checked out and agree with the findings.

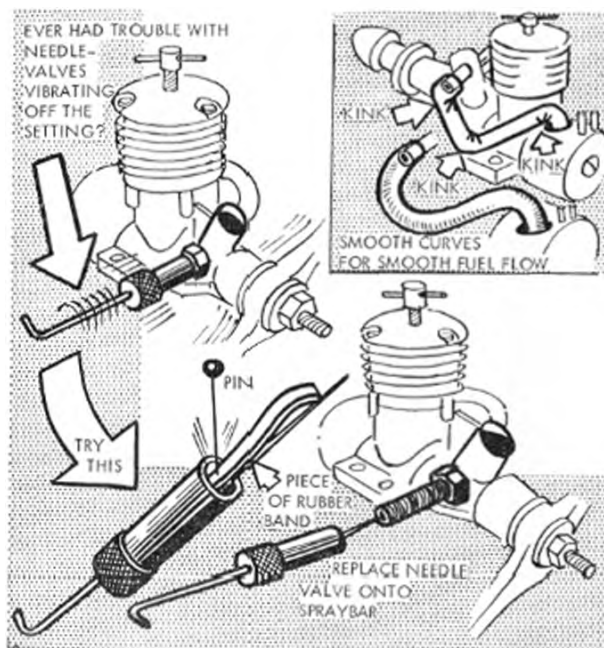
GOLDEN WINGS CLUB PAGE

To join, fill in the handy membership coupon and send with a postal order/money order, or cheque to the value of 2/6d. made payable to "Aeromodeller". Post to Golden Wings Club, Aeromodeller, 13-35, Bridge Street, Hemel Hempstead, Herts. Each member

will receive his own badge—depicting 'GoldenWings', a membership card, and two transfers to decorate his model or model box, and will make him a member of the largest modelling club of all time.

John Bridge

TIP OF THE MONTH



Dear John Bridge,

I am between 10 and 16 years of age and would like to become a member of the "Golden Wings Club". With this application I enclose postal order. (International Money Order) for 2/6d. to cover cost of the badge, transfers and membership card.

NAME IN FULL

ADDRESS

YEAR OF BIRTH.....SCHOOL.....

NAME OF ANY OTHER CLUB OR CLUBS TO

WHICH I BELONG (if any)

SEND TO: GOLDEN WINGS CLUB AEROMODELLER, 13-35, BRIDGE STREET, HEDEL HEMPSTEAD, HERTS.

We have all had needle valves vibrating loose or moving off their correct setting at some time or another. This month Colin Simpson, of Reading, Berkshire, comes up with a tip for curing this problem. With the help of a pin, push a length of rubber band into the needle valve body. Then screw the needle valve back into the spraybar assembly, this should lock it and keep it fixed in the position you set it too. Another quick tip, keep the fuel line free from kinks as this can often stop the supply of fuel to the engine, also avoid taking the fuel line too near the cylinder head as this can melt the neoprene and also stop the engine running.

Dear Sir,

As I am a beginner to control line flying I would like to know what aircraft would be most suitable for me. I wish to buy a 1 c.c. diesel and I would like to know which engine to buy. I want to use this engine for a second aircraft. Hilton, Aberdeen. Michael Deans.

Our most suitable control line trainer for 1cc engines is Bouncer, plan CL1808 price 3/6d. With 24 in. wingspan its handy size takes 1-1.5 cc. engines, diesel or glow plug. Full instructions are included on the plan for construction, and details of Rigidist are included. This is a control line handle that keeps the forearm rigid and teaches correct pilot technique. This is easy to construct and should set you onto the path of successful control line flying. All of the following engines are suitable for Bouncer—AM 10, Frog 100, M. E. Heron, FOK 10, and D.C. Quickstart Spitfire, these are all diesels and readily available at your local model shop.



Pen Pals Wanted

P. Curran, Oldleighlin, Carlow, Eire, age 14, would like to correspond with a pen pal in England. P. Simek, Nadrazni 220, Svetla nad Sazavou, okr. Havlickuv Brod, CSR, Czechoslovakia, would like to exchange magazines and books dealing with all forms of flying with an English model flier. H. Cuypers, Bouwsestuw 50, Herenthout, Antwerpen, Belgium, would like to correspond on free flight and control line. J. B. Gorse, 31, Thornley St., Wolverhampton, Staffs, would like a pen pal in the U.S.A. or Canada, aged 15, who would correspond on aviation matters.

Dear Sir,

I enclose a picture of my KellKraft "Snipe", which is powered by a Cox "Babe Bee". As yet this model is unflown. I hope to fly this model at R.A.F. Lindholmo, where my father flies the Varsity T1. for Bomber Command. He also used to be an aeromodeller many years ago.

Dunsville, Yorkshire.

N. Brooke.

Snipe photo at left

Dear Sir,

At the moment I am building my first model, a Mamba. I am now at the finishing stage. The plan tells me to put an

ounce of lead on the starboard wing. when I did this I found that the starboard Wing was too heavy when I put my finger on the balancing point. Should I add just enough lead to make the wings level or should I put the ounce of lead on the wing tip? Glasgow, S.4.

A. Davidson.

The ballast weight specified is correct. It should be sufficient to balance the weight of the lines and additionally helps to keep the lines in tension during flight by centrifugal effect. It will have the same value whether the model is upright or inverted and should not be reduced to less than that advised on the drawing.

Dear Sir,

Recently I have lost two of my free flight models by using an oversize tank that gave a long engine run. Can you tell me the best way of getting the models back. Stockport, Cheshire.

F.A.T. Day.

Well the answer is to use a smaller tank then you won't lose the models, alternatively you can use a fuel supply cut-out. To locate your lost model visit all the local police stations in the area leaving your name and address with a description of the model. Also you can place a small advertisement in your local newspaper.



Dan Poole (B'ham) releases Open Rubber model at Haddenham where visiting "Sky-scraper" Bob Hatschek won pewter tankard in Chuck Glider at Right.



John O'Donnell

covers the
contest scene
and offers
his viewpoint
on Free Flight

THE contest season is now well under way and even I cannot manage to attend everything—much as I would like. One event that I missed was the **Southern Area's free-flight gala** at Beaulieu on 24th April. Dave Welch sent me a report, results and photos. The weather was hardly inspiring with a gusty wind and occasional drizzle. This resulted in a rather low entry with main interest being in the two glider events. Despite the use of a 21 minutes max. only open glider needed a flyoff. Al Wisher and Dave Glue flew off first in sink, leaving Jim Baguley to follow with a four minute O.O.S. flight. Jim appears to have reverted to his stick fuselage type of design—but now featuring sheet top wings.

A 1 glider and open power were won by local liars Bert Turner and 12 years old Ed. Warwick. Rubber was very badly supported with Barry Hyde (late of Sharston, Manchester and now with Torbay) winning through persevering with a reserve model. Jack Allen flew his Coupe d' Hlyer model in open rubber and thereby illustrated just how low were scores.

The **Airtech M.F.C. rally**, held on their firm's private airfield at Haddenham, just one week later had very different weather and hence lots of entries. Brilliant sun and little wind in the morning seemed too good to last—but the sun shone all day and the breeze never became very strong. Lift was peltiful and maxes commonplace. In short, an ideal day for high scores.

Rubber had around a dozen trebles and was flown off in lift. This rather made it a timekeeper contest especially as only one per flier was employed. As the flyoff is the really important flight it is the one where the second timer is most necessary. Top places (Bob Walls, Bob Bailey and Ray Monks) seemed to have been won through using relatively short D/Ts. Certainly duration and/or distance travelled bore no resemblance to the flyoff score. Lou Burrows was probably the most unfortunate with a time of 4 : 45 and a very long walk due to using a 10 minute D.T. I went even further—but at least there was a rumour that someone had seen my model for 10 minutes. This was a new model with every visibility aid: large black fuselage, fluorescent wing tip panels, and "Melinex" reflectors.

The glider enthusiasts were well satisfied when they discovered that there were two glider events scheduled. Airtech have acquired a "Challenge Shield" to be rotated round the 1/1 events, commencing this year with glider—and flown as a

separate event. Pete Trenchard distinguished himself by recording a treble in each glider event, and then going on to win one flyoff. Bruce Edwards won the other with almost the same score. I cannot say much about the glider flyoffs as they were held after the rubber one and I was "downwind". From the scores it is quite obvious that no-one found a fourth thermal.

Perhaps surprisingly the power event was a N.W. Area clean-up, with Russell Pears recording the only treble flying an Enya 19 powered version of my "Pendleton Fault" design. I managed second place with the same design but with Veco 19 power. Thermal spotting helped compensate for an unexpectedly tight power pattern, presumably due to heat warps. Joe Savini filled third place with an FAI model, just ahead of George French and his "Ramrod 750".

Chuck glider (or should I call it "Outdoor Hand Launch Glider" in view of the result?) was won by American visitor Bob Hatschek with a model borrowed from Reg Lennox, who promptly lost it himself when he got it back. Bob was in England for a brief business trip and practically everyone he met told him how untypical was the weather!

The third of the season's **area-centralised meetings** was held on 15th May and if the rest of the country had the same weather as the north scores should be high. It was dead calm at the N.W. venue (Chetwynd) and there was talk of 20 minute test flights landing in the field. Few trebles were scored, even though there were area open events staged.

I flew with the Northern Area at Topcliffe where it was sunny all day although a little breezy in the afternoon. The Weston Cup was the first real tryout for most people, including myself, with 40 gram Wakefields. Practically all those seen were old 50 gram models with the motor pegs moved forward.

Whatever may be said about the rubber reduction it has certainly reduced the models capabilities to below the max. My model was doing 2:40 late the Thursday eve before the contest—just 80% of what I used to expect from it on 50 grams. But even this meant absolute max turns!

Tactical flying, or at least a definite attempt to launch into lift will become standard practice just as it is with glider, but without the latter's advantage of positive feel on the line before release. Results are liable to be very good or very poor. There were certainly plenty of maxes recorded at Topcliffe and also plenty of 80-90 second scores. Top scores there were in the 124 minute region, best being Tom Stoker.

Although Topcliffe power scores were low (i.e. below trebles) results were better in the N.A. open events, where George Tidswell recorded a 9:20 rubber flyoff—D/T'd in sight to land only two fields outside the 'drome. There was also a very useful 4:27 flyoff recorded in the Frog Junior by Pete Whitehead who prefers Graham Freeston's "Ganymede 2" design to the usual York club layout.

Mentions of area contests would be incomplete without comment on scores absent from recent results. Mention was made last month of Southern area scores missing from the 27th March results. Now the results from the April meeting have appeared "sans" the Northern Area's contributions. The straightforward and obvious explanation is unfortunately correct—the results were sent in late (due to their comp. Secretary getting someone else to post his mail).

There has been much argument and one resignation since. Although the rules are clear enough and the necessity for

12-years-old Ed. Warwick, of Lee Bees, open power winner at Chobham Easter Meeting, and "double chance" Pete Trenchard with gliders that made 6 maxes at Haddenham.



NORDIC FREE FLIGHT CHAMPIONSHIP by H. Dahl



Above, Wakefield winner Skjulstad (Norway) retrieves on skis. Victorious Swedish power team, Hagel, Wall & Nygren on the frozen lake below—what a superb flying areal Nice to look at in mid summer!

AS in 1962 when Norway were hosts for the Nordic Champs, this contest was held at Lillestrom some 20 miles east of Oslo on March 13.

Finland and Sweden each fielded full teams, Denmark were short of one A/2 man and two power flyers and Norway missed one power flyer.

The temperature was about 15 degrees centigrade below zero, and wind caused quite turbulent air. (At least to Norwegian standards.—The Danes called it almost dead calm!)

In Glider the first round saw only two maxes. One each for Westin (Sweden) and Skard (Norway). In the second round, Westin still held the lead, but Skard dropped to 7th with only 88 sec. After the third round the Finns Hietanen and Tahkapaa were in top places. Hietanen dropped to 6th in the fourth round making a place for Kongstedt, (Denmark) in second position behind Tahkapaa. In the last round Tahkapaa dropped to 6th with 116 seconds making Kongstedt the winner. Last year's winner Wahlund and Westin secured second and third places for Sweden and also the best team score.

Rubber was to be a game of avoiding downdraughts. It seemed that most of the models were capable of a maximum in still air. The Swedes with "Termik-Johan" (Rune Johansson) from the victorious team at Kauhava, Anders Hakanson (Nordic Champ 1964, 1965) and Ragner Ahman who had the most beautiful Wakefields on the field, all missed the fly-off. Thus one each of Finland,

Above right the famous Swedish Wakefield specialist "Thermik" Johansson with his latest and most beautiful model, was unluckily down-draughted—shows it can happen to the best!



Denmark, and Norway had a man with a perfect score after the 5th round.

The 4 min. round still left young Skjulstad of Norway and long time specialist Nienstaedt of Denmark in the running. The Dane used his 'Ville' with short motor run and a very rapid climb, while Skjulstad had a longer and more docile motor-run. In the 7th round they launched simultaneously the Dane having an edge in the climb, which however was more than made up by the Norwegian models better glide. Denmark made the best score as a team.

In Power maxes were also the order of the day. Bulukin (Norway) had lost his best model earlier in the winter and crashed his better model early in round 1. Sverdrup (Norway) and Raulio (Finland) also crashed. Highest climbers were Urban Nygren (Sweden) with a very big model and Mikko Sulkala (Finland) with a quite small design. The Super Tigre G-15 was the usual power plant although 2nd man Steen Agner (Denmark) used Cox Special. In the fly-off Nygren made 4 min. with ease. Unfortunately Sulkala had an overrun to ruin his chances.

Altogether the Swedes made the best score to take home the beautiful silver cup.



Results:- GLIDER, 1. K. Hansen (Denmark) 848; 2. A. Wahlund (Sweden) 833; 3. B. Westin (Sweden) 831; 4. K. Bentzen (Norway) 800; 5. A. Hietanen (Finland) 793; 6. M. Tahkapaa (Finland) 786. **TEAM RESULTS,** 1. Sweden, 2. Finland, 3. Norway, 4. Denmark. **RUBBER,** 1. P. T. Skjulstad (Norway) 900+240+223; 2. E. Nienstaedt (Denmark) 900+240+201; 3. P. Ella (Finland) 900+249; 4. P. Rasmussen (Denmark) 894; 5. E. Jorgensen (Norway) 885; 6. A. Hakanson (Sweden) 877. **TEAM RESULTS,** 1. Denmark, 2. Sweden, 3. Finland, 4. Norway. **POWER,** 1. U. Nygren (Sweden) 900+240; 2. S. Agner (Denmark) 900+231; 3. S. Haapalainen (Finland) 900+168; 4. M. Sulkala (Finland) 900; 5. R. Hagel (Sweden) 890; 6. B. Wall (Sweden) 887. **TEAM RESULTS,** 1. Sweden, 2. Finland, 3. Norway, 4. Denmark. **TOTAL SCORE:** 1. Sweden, 2. Finland, 3. Norway, 4. Denmark.

Hall-Rossey Speed Meeting

Held on May 15th at the Hayes Control Line Circle, this event was for 4 classes of speed and 3 team races. The sprint (where the pit men raced from the centre of the circle out to the models at the start of the 10 lap race) was held for JA, F.A.I. and B team racers. Whipping was allowed and this seemed to be adding up to 10 m.p.h. to airspeeds. JA with 8 entries had the fastest heat go to Smith/Brown (Feltham) at 30.9 secs. with the eventual victor being Batch/King (Feltham/Hayes) at 34 secs. A. Pollard, from the same club, came second with 38.2 secs. and G. Hartnett (Chingford) third with 40.4. F.A.I. sprint had 9 entries and Ray Gibbs (Southend) flew a glow Carter 15 powered model which, though fastest in the air was a poor starter. F. Bradley recorded the fastest heat with 32 secs. In the close final Bradley (Feltham/Hayes) with 32.6 secs. only just beat R. Gibbs (33 secs.), for first place. B. Langworth (West Essex) placed third with 34.2. Class B only had 4 entries, so the final was the whole event. Batch/King won with 39.2 secs. followed by M. Atwell (Chingford) with 44.7. Alan Dell (Feltham/Hayes) placed third with 46.5 secs. The speed contest attracted less support and speeds, and were slow in all classes except 10 cc. where Ivor Rolley (Brixton) made 162.1 m.p.h., and this with a shattered propeller for three of the recorded laps after "bouncing" it and not damaging the Carter Dooling .61. B. Fairbank (Sheffield)

won the 5 cc. with an Fta .29 by recording 124.9 m.p.h. Ray Gibbs (Southend), with a Carter, won the open 2.5 cc. at 111.8 m.p.h., and Bill Bessant (Southampton) 1.5 cc. at 94.5 m.p.h.

Free Flight Comment from P.407

results to be collated quickly following the event is self-apparent, there is one very important factor. Disallowing these results means that entrants (including those with highest scores) are being disqualified for something that not only is not their responsibility but that they are not allowed to do.

The final outcome may be in doubt—especially as precedent is of no help. Late results have been allowed (event after initial rejection) in the past, and they have also been refused. When it happened in the N.W. years ago the then Area Comp. Sec. found he had cost himself a National contest. This certainly appeased the rest of the entry!

Another complication is the fact that some of these scores count towards the National Championship and Plugge Cup. Logically the Championships are contests with closing dates just the same as the separate events. But I'm rather glad I don't have to decide this question—logic and sentiment never mix well!

SECOND BURTONWOOD CONTROL LINE CRITERIUM

This, the second N.Western Area 'Criterium' for control line models only, was as usual a well run affair but lacked support from the London clubs who had a rival control line attraction on their doorstep at Imperial College, duplicating several events. *Stunt* was won by Jim Mannall (Lincoln) followed by Tom Jolley (Whitefield). *Novice Stunt* was topped by C. W. Draper (Gee Dee) and P. Simmonds (Wolves) topped the *Scale* with a 1912 Blackburn Monoplane. *A Team Race* was flown 'in a hanger' to avoid the wet weather. This made engine settings practically impossible to establish with so much noise reflection from the walls. The final saw Royal/Salmon (Shrewsbury) win at 9.45 over Davy/Hudson (Wharfedale) at 10.3 with Place/Hayworth (Wharfedale) coming third. *F.A.I. Team Race* in general had slow heat times and a fated final that required three starts! (the judge was heard to ask for more co-operation from the pilots as he wanted to go home!). All flying Eta powered racers, the finalists were Booth/Taylor (Rolls Royce), Place/Haworth (Wharfedale) and Franklin/Ives (Wanstead). After a good start, at the first stop Place had to hold off landing to miss Booth taking off. Franklin then took off and found Place's model sitting on top of his for a few segments. Start again, this time Booth raised his model at a pit stop and Franklin's model went underneath it tangling all the lines up. Start yet again, this time things went smoothly with Place and Franklin at equal speeds but Franklin a few laps down in range forcing him to make a stop in the late 190 laps. Place won with 9.45, Franklin next at 9.53, and Booth retired at 163 laps. *Rat Racing* was rather noisy to say the least and Tom Jolley with team-mate D. Day had a comfortable win at 8.25 whilst both of the other finalists retired. *B Team Race* was also won by Wharfedale Davy/Hudson with a very vintage 1000 lap race model that had seen better days. Heaton/Ross placed second with Laurie/Wallace retiring for third place. *Handicap Speed* where all the classes are flown as one and the winner is established by the highest percentage score of the National record for the class of model flown, was won by Ivor Roffey (Brixton) 10 cc. at 158.7 m.p.h. (94.2 per cent), followed by J. Hall (West Essex) 5 cc. at 131.6 m.p.h. (85.6 per cent). Third were Parker/Allard

(N. Sheffield) 1.5 cc. at 82.2 m.p.h. (83.6 per cent). D. Sewell (Whitefield) won the *A Combat* after a reflight caused by a detached streamer and J. Fotheringham the larger engine capacity *Class B Combat*. In all a good rally marred slightly by the early wet weather conditions.

NOT ALL Team Racing

As contest modellers well know Wharfedale and D.M.A.C. excel themselves with their own speciality of winning team races and international team race events via Dick Place and Don Haworth. However, they do have many other club interests with radio control now the largest. Interest is split 50/50 with single channel and multi and two members have just completed home-made 'Digitrio' proportional sets. On May 1st a flying session was held with a Sheffield Club. With perfect weather an open spot landing contest was held with entries ranging from a single channel 'Half Tone' to a Kraft proportional equipped 'Taurus'. G. Kirk (Wharfedale) took top spot flying the 'Half Tone', with T. W. Kirk second. Sheffield made third with L. Fretwell flying the proportional 'Taurus'. The control line section has fixed the date for the marathon team race events, i.e. 1000 lap team races and these are Sept. 11th and Nov. 6th, for F.A.I. and Class B respectively.

Finchley Control Line Gala

The perfect weather conditions of May 1st attracted a large entry to the Finchley Control Line Gala, held at Glebe Lands with two classes of Stunt and Combat. Unfortunately the flying was not up to the best of standards in *Class A Combat*. Stoo Holand (Northwood) was going well but lost to Pete Smith (Outlaws) in the semi-final. Richard Wilkens (Sidcup) fought his way through the rounds and narrowly beat B. Mills (Maidenhead) in the semi-final. The final between Pete Smith and Richard Wilkens was an anti-climax with Smith beating Wilkens unconvincingly. *Class B Combat* attracted 22 entries and had more action than the 'A', with most of the entries from Feltham/Haves, so it's no wonder that J. Ledger and A. Dell from Feltham Hayes took first and second places respectively. *Senior Stunt* was topped by Jim Mannel (Lincoln) with Mick Reeves (Wanstead) coming second. *Junior Stunt* was topped by T. Lambert.

CLUB AND CONTEST NEWS

Leadout News

From the Hunts M.A.C. news-sheet "Leadout" we learn of some interesting team race developments. To most team race crews this will be quite a jolt, to quote:—"No oil in fuel could become a reality. Brian Turner—after seizing a couple of Eta shafts, tried a separate oil tank containing Redex and pressurised this from a backplate tapping into the front housing between the races. The oil being metered by a modified spraybar assembly. Brian used standard fuel but if one could lubricate the big and little end bearings in the same way then the whole 10cc's of fuel allowed in F.A.I. team racing could be power producing paraffin and ether". This system sounds feasible but it should be remembered that some oil will be needed in present team race diesels to give a good compression seal for quick starting. Also the F.A.I. definition of fuel tank and indeed the definition of fuel would have to be studied very carefully to make sure the present rules are not violated.

Feltham News

Mainly a control line club, with a very good record of turning junior members into competent contest fliers, Feltham D.M.A.C. also have glider and radio control interests. Some members have obtained the new 'Super Tigre 40' Rat Race engines with rear rotary valve induction and these are hoped to hold the club name at the top in Rat Racing. The team race bods are busy sorting out models and motors for the Nationals with some combat types trying Super Tigre G15's for Combat after the success of Richard Wilkens G20 powered model, it is hoped they will be seen at the Nationals, but other members still stand by their trusty Oliver Tigres. Club meetings are held on Tuesday evenings at Cardinal Road School, (Nr. the station), Feltham, starting at 7.30 p.m.

Below, F.A.I. Y/R cowlings is in fact the crankcase of engine! Solid block of alloy machined out to take Oliver Tiger parts, note stub exhaust tubes, by A. Kerswell (Novocastria) seen at Burtonwood. Extreme right, Ivor Roffey with mono line Carter Dooling 61 speed model prior to 162.1 m.p.h. flight at Hayes. Centre top, Dave Balch with winning 1A and B T/Racers at Hall-Roffey Meeting. Below, 1912 Blackburn Mono won Burtonwood scale for P. Simmonds with McCoy .19.



MODELS FOUND

20589941 Set. Baines, A.M.Q., R.A.F. Catterick, Yorks, reports the location of two lost models. Firstly a red 'Dixielander' type power model in the tree tops 6 miles N.W. of R.A.F. Topcliffe. Contact village policeman Kirklington, Nr Thirsk, Yorks. From Wales a red coloured power model approx 40" wingspan, with M. E. Snipe, letters A.A.O. on wings, contact Mrs. Holder, 13, King Street, Abergavenny, Monmouthshire.

ST. ALBANS CONTEST NEWS

The St. Albans M.A.C. have started this season with a promising contest record. At the East Grinstead Gala Bruce Rowe and Dave Tipper took first places in Open Rubber and Coupe d'Hiver with George Fuller and Brian Dyke third in power and open glider. A goodly selection of wins were also collected at the 'South of England Gala' through a mass club entry and Don Edwards won the *Halfax Trophy* for F.A.I. Power at the S.M.A.E. April 17th contest. Unfortunately no honours were won at *Haddenham* even though they were there in force, some of the junior members were doing just as well as the well known seniors in this event. For the summer the club hopes to hold Thursday night contests at *Nomansland Common* for club members, these are to include A/I, Chuck Glider, Coupe d'Hiver and a Scramble. Also don't forget the St. Albans Gala on June 26th, at Chobham Common, not June 5th as stated last month in 'Events This Month'.

FAIRLOP AGAIN

Things have been pretty active in the Wanstead area recently with plenty of contest flying and club meetings. Places have been gained in Scale, Team Racing, Stunt and Junior Stunt already this season. Dave Platt has well and truly test flown his 'T.28' Nationals scale entry with retracting undercarriage and at the other end of the scale, Roy Campbell is entering a single channel 'Luton Minor' against the full multi models for Nationals honours. Pete Ball is busy constructing a 'Boeing F4.B4' with a McCoy 60 and Bill Forrester a 'Bristol Fighter', both of these being for the Control Line Team Trials. S. Campbell should have had an 'Avro Lancaster' at the Nats and members can't wait to see the rest of the scale entrants. Mick Reeves is constructing another 'Mew Gull' stunter this time for a Merco 61 and the team racing teams are going quite well. Wanstead Flats are still being used for flying but, with a byelaw in the background all the time, to ban non control line power flying. All the crashes that happen to models flown from Wanstead Flats (and there are quite a few) have so far been caused by non-club members, and this does not help to keep a flying site. Of interest to older model fliers, they have received official permission to fly any type of model they like at Forest Lane playing fields, Barkingside, opposite the now closed Fairlop Aerodrome where developments took place in the early days that are now accepted as standard items in today's aeromodeling, so if the wind's in the right direction models will fly over Fairlop again after a lapse of many years—to the gravel diggers.

Television Demonstration

Border M.F.C. and Earlston Youth Club are arranging a model flying display to take place on Sunday July 10th at Huntshaw Farm, Fairstone. At present 22 models are available from model clubs in the area but more are needed, and the "Edinburgh News" has already given the organisers a good write up, and "Border T.V." are to televise the actual event. The organisers have also borrowed a three ton water filled roller to flatten the field into a condition suitable for model flying. Anyone who can help in this display should contact; Mr. J. Scott, West High Street, Earlston, Berwickshire.

EVENTS THIS MONTH

- June 19** Bath Festival Radio Control. R.A.F. Coleina, Nr. Bath, on A4 Scale and Concours d'Elegance F.A.I. Multi Aerobatics, Pylon Racing N.M.P.R.A. rules.
- June 19** S.M.A.E. Indoor Team Trials. R.A.F. Cardington, Beds.
- June 26** Northern Area Slope Soaring Meeting. Black Hambleton Hill, between Hawby, Thirsk and Northallerton. Free Flight hand launch, Magnet Steering hand launch and Single Channel Radio Control time Nomination/Spot contest. Details from: E. Coates, 37, Knedlington Road, Howden, Goole, Yorks.
- June 26** S.M.A.E. International Control Line Team Trials. R.A.F. Swindon, Official: pre-entries only. Team Racing, Speed, Aerobatics and Scale.
- June 26** Madmax Meeting, Pitreavie Nr. Dunfermline, Combat and Team Racing. Pre-entry to: J. Dunker, Kirklands Garage, Kinross, Kinross-shire.
- June 26** Devon Rally, Woodbury Common, Nr. Exmouth Open R/G/P and Chuck Glider entry 2/6d on field.
- June 26** St. Albans Gala. Chobham Common, Surrey. Open R/G/P, A/I Glider and Coupe d'Hiver.
- July 3** Esher Intermediate R/C Contest. Shuttleworth Collection Airfield Old Warden, Nr. Biggleswade Beds. 11 a.m. 5/- Pre-entry to: M. Everest "Hysel" Coldharbour Road, Pyrford, Woking, Surrey. By July 1st. Note admission 3/6d to Airfield, also includes car parking, access to museum and collection.
- July 3** S.M.A.E. Event. Area Venosa, Team Glider "Model Engineer Club" F.A.I. Power "Astral Trophy" and Open Rubber.
- July 3** 2nd Finchley and D.M.A.C. C/L Rally. Globe Lands, Summers Lane, Finchley, N.12, 1/4 A, A and B Combat. Pre-entry 3/- 10:— W. M. Baird 4, Belmont Close, Tottenham, London, N.20.
- July 3** Scottish Gale. Spango Valley, Gourock, R/G/P, 1/4 A, F.A.I. Team Race, Combat and Rel Race. Pre-entry FIF:—T. Preston, 53, North Gyle Terrace, Edinburgh 12. C/L:—I. Coultis, 12, Machan Road, Larkhall, Lanarkshire.
- July 10** Chwyd Slope Soaring Meeting. West slopes of Moel Fflamau Nr. Open A/I/R. Junior, R/C Single Surface.
- July 17** S.M.A.E. all Scale Meeting. R.A.F. Swindon, "Ripmax" Single Channel R/C, "Superscale" F and C/L Scale.
- July 17** 1986 Devon FIF Championships. Woodbury Common R/G/P. Only open to competitors normally resident in Devon. Details from D. G. Baudol, 80, Moorfield Road, Withycombe, Exmouth.
- July 17** East Midlands Speed and Combat Open Meeting. R.A.F. Barkston Heath. All classes speed, special prize for percentage of record flights Class "A" combat. Entry 3/- per class in speed Combat 3/- to G. Farnsworth 29 Balacava Road, Sheffield 8, by June 30th S.M.A.E. Insurance req'd.
- July 24** Ardrossan Control Line Contest. Auchenhavrie, Ardrossan, Ayrshire. Rel Race and Combat.
- July 24** South Coast Gala. R.A.F. Tangmere, Nr. Chichester, Sussex. FIF, C/L and Multi R/C.
- July 31** S.M.A.E. Indoor Meeting. R.A.F. Cardington, Beds.
- July 31** Woodford Rally. Avro Airfield Woodford, Cheshire. Open R/G/P combined 1/4 A/R/G/P, Chuck Glider, FIF Scale, Combined F.A.I. R/G/P. Class A Combat F.A.I. and 1/4 A Team Race. Rel Race C/L Scale, R/C Multi Stunt, R/C Goodyear Pylon Race.

COMING EVENTS

Additional to last Month's announcement.

- August 7** Usbridge D.M.A.C. Control Line Rally. Charville Lane, Hayes, Middlesex. S.M.A.E. "A" Combat "B" Rel Race (561. lines) Pre-Entry 3/- to:—R. Shelvey, 5A Station Parade, Denham, Bucks
- September 11** Wharfedale Team Race 1,000 lap race for F.A.I. racers (2.5cc.)
- November 8** Wharfedale Team Race 1,000 lap race for "class B" racers (5cc.)
- Change of Date** Canterbury Pilgrims Gala, October 9th, not October 2nd.
- Cancelled** St. Albans Gala, Chobham, June 26 not June 5th. Crawley Rally, Gt. Buckwood Farm September 25th cancelled.

CLUB DIARY

The response to our request for the dates of local club events, activities, etc., that may interest non club members in your area, has been poor, to say the very least. Club secretaries note, when you send this information to the Aero Modeller office, make sure it has the function's date and venue. Also we can only accept and print functions for the current month of issue. Typical example: St. Swanks, M.A.C.—Film Night—St. Peter's Church Hall, Brixton, London—June 30th.

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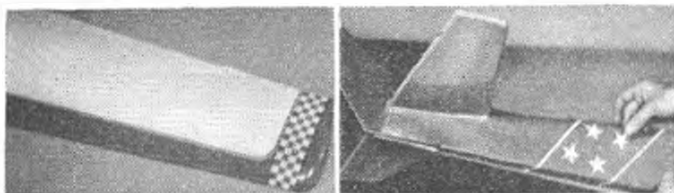
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Model Airplane News Plans Recent Additions

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Pink Fink III:- C/L tail racer, profile fuselage. 29.35 (1.6cc) 27 in.

Douglas 0-43A:- F/F scale observation plane .049 (.8cc) 40 in.

M.A.N. 54A

P-38:- C/L stunter based on W.W.2. fighter. 35 (8cc) 55 in.

JA Go-Go:- F/F contest pylon, simple construction 049 (.8cc) 47 in.

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All R/C models, Boat Crash Tender Frog 3.49, Hovercraft SRN-1 £3 x 30 McCoy 19, plane Jackdaw (partly built) need covering, Fox 35, R.C.S. 10 channels Tx and Rx, falaise, 3 new Ampedyne servos, magazines 1960-66, Books, worth £140 sell £95 P. Baxter, 1, Cadmus Court, Southey Road, Brixton, S.W.9.

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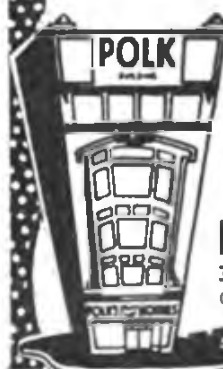
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Six variants drawn by Walter Wright



P47D.
SERIAL NO. 223038
'SONNY BOY'
73rd F.S., 318th F.G.
SAIPAN.
7th A.F., 1944.

(NOTE: White wing tip and white band top and bottom of tailplane, also white band round fuselage covers olive drab area only, not on undersides.)

P47D.
SERIAL NO. 28145.
'FIERY GINGER'
OF 343 SQDN.,
348th F.G.,
5th A.F. 1943.

(NOTE: All white tailplane and white wing leading edge.)



P47D.
SERIAL NO.
276055.
342nd F. SQDN.,
348th F.G.,
5th A.F., 1944.

P47D.
SERIAL NO.
224620.
61st SQDN.,
56th F.G., 8th
A. F. HALES-
WORTH 1943.

(NOTE: Large star insignia under wings, also white band round tailplane.)



THUNDERBOLT I.
HB975. WK-L.
ROYAL AIR
FORCE, S.E.A.C.
135 SQUADRON.
JUMCHAR AND
AKYAB, 1944-45.

(NOTE: Five white shells below and forward of cockpit, see separate detail of a shell outline.)



P47D-25-RE.
OF THE 1°
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AVIACAO DE
CACA, BRAZILIAN
AIR FORCE,
ITALY. 1942.



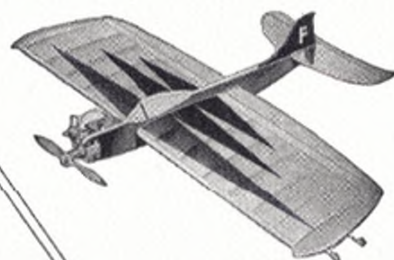
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21/3



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19/9



TALON

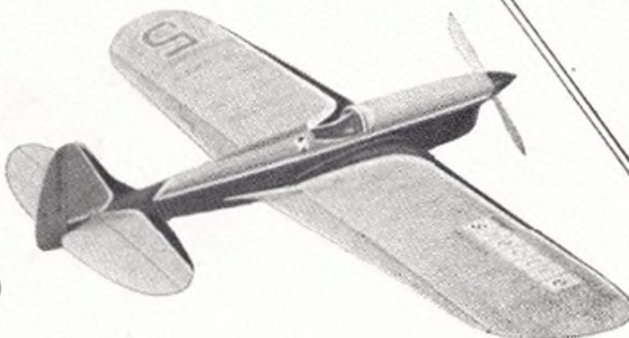
Combat design of considerable strength. Easy and quick to build. A fully aerobatic model that is great fun to fly. For 2.5 to 3.5 c.c. engines. Wingspan 32".

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SPECTRE

Outstanding stunt model featuring combined wing flap and elevator control. Wing ribs, formers, etc., die-cut in highest quality balsa. For 2.5 to 3.5 c.c. engines. Wingspan 41".

45/10



PHANTOM MITE

The Phantom Mite is just about the toughest model available to the newcomer to control line flying. Features all sheet construction with wings, tailplane, fin and fuselage sides ready to cut to shape. For .5 to .8 c.c. engines. Wingspan 16".

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DEMON

Class A team racer to the new S.M.A.E. specification. Kit contains die-cut parts. For engines up to 2.5 c.c. Wingspan 30".

36/3



MARQUIS

A very fine looking stunt model with attractive semi-scale lines, featuring tricycle undercarriage and extra large cockpit. For 1 to 1.5 c.c. engines. Wingspan 30".

40/-

IDEAL FOR
THE NOVICE



KEILKRAFT

FOR TOP PERFORMANCE