

# Aero Modeller

October 1971

15p

(USA & Canada 75c.)

INCORPORATING  
MODEL AIRCRAFT



HOBBY MAGAZINE

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Sportster

Nats Combat  
Winner







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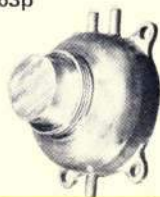
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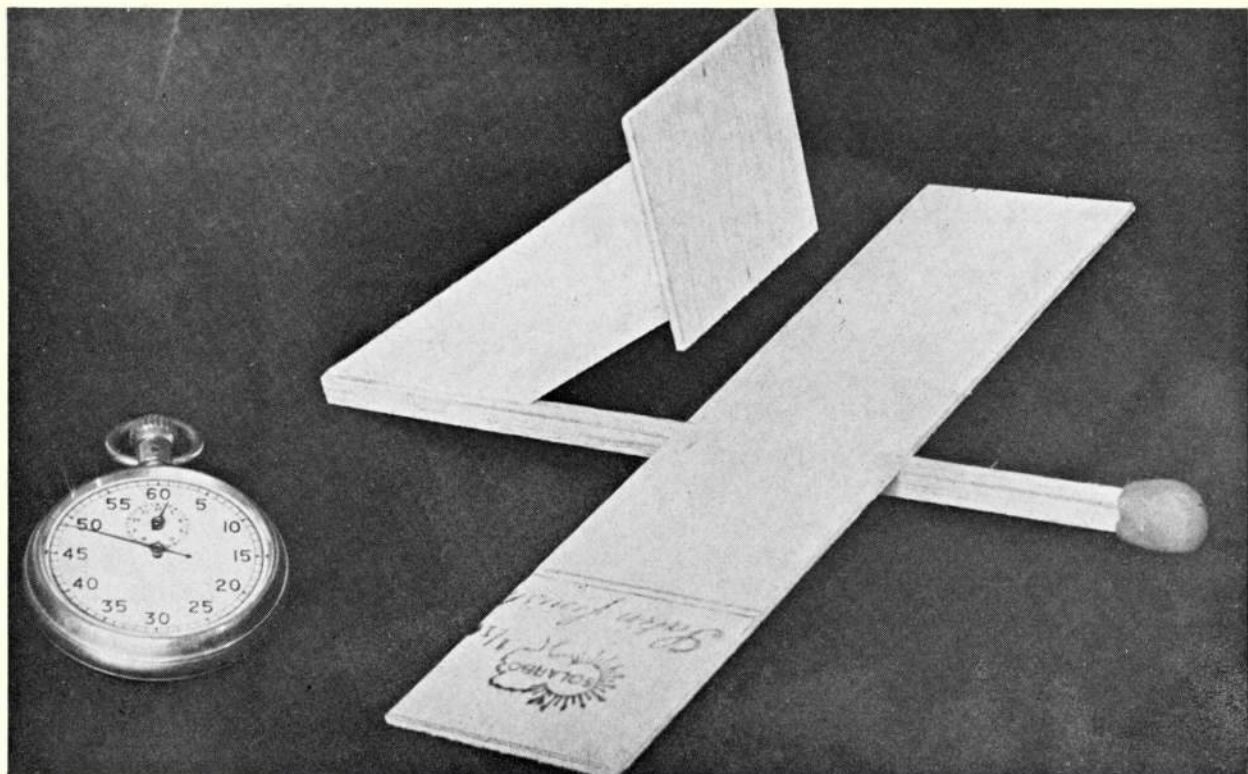
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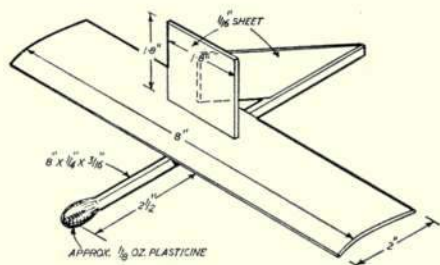




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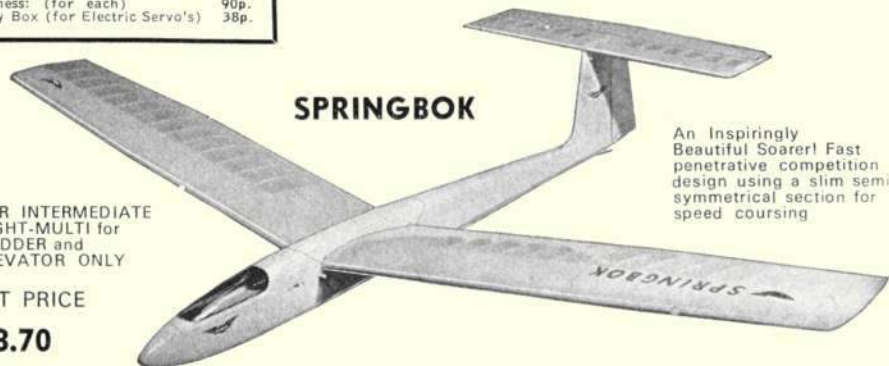
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# Aero Modeller

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MODEL AIRCRAFT

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Managing Editor **R. G. MOULTON**  
EDITOR **P. S. RICHARDSON**  
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October 1971

Volume XXXVI No. 429

## CONTENTS

HANGAR DOORS	549
'ORCRIST'	550
FREE FLIGHT TECHNICALITIES	553
GOLDEN WINGS CLUB	557
FLYING SCALE MODELS - Part VIII	558
TRADE NOTES	561
AIRCRAFT DESCRIBED - D.H. Hornet Moth 87A & B	563
TOPICAL TWISTS	567
'REACTION'	568
LATEST ENGINE NEWS	570
U.S. FREE FLIGHT NATIONALS	573
READERS LETTERS	575
CONTROL LINE DEVELOPMENTS	576
CLUB NEWS	580
CONTEST CALENDAR	581



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## COMMENT

A majority vote in the S.M.A.E. Council resulted in a 'split' National Championships for 1972. Radio Control and Control Line events are to take place over the Spring holiday and Free Flight during the Summer holiday. The decision was not reached easily. Many Council officers regretted breaking up the traditional Jamboree but found themselves obliged to support a move that would help patch the factions and give free-flighters a larger, clear field, most likely in the Northern sector of the Nation. Crop problems were the decisive factor in determining which of the 'Split' Nats was to come first in the year. One is left to wonder whether the experiment will really work. It is a simple matter to forecast extensions of the idea. Separation of the interests may well be logical but they will not command the interest or generate the atmosphere which has made the Nats a number one attraction for twenty-four years.

## on the cover

Winner of Control-line Scale at the 1971 British National Championships, Horace G. Venables of Wolverhampton M.F.C. with his Fokker DVIII. The model is  $\frac{3}{4}$  in. to the ft. scale, weighs 68 ozs., has a glass fibre cowling and hand-painted camouflage on the sheeted fuselage.

## next month

Harvey Mace's fabulous, all-elliptical 'Good-year' racer, which shattered everyone when it first appeared on the U.S. scene, is the subject of the detailed aircraft drawing. Plans for 'Sundowner', a rather different free-flight sports model with a vintage flavour. Technicalities of A/2 glider and Wakefield models flown at the World Champs revealed. How to make that cowling for a scale model is explained by Eric Coates. All these plus regular features, on sale October 15th.



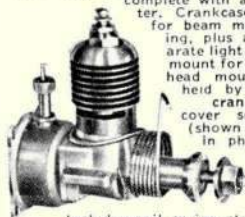
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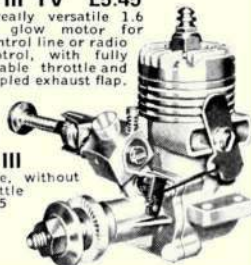
A superb little sports glow motor with rear rotary valve induction complete with air filter. Crankcase lugs for beam mounting, plus a separate light alloy mount for bulkhead mounting held by rear crankcase cover screws (shown fitted in photo).



Includes coil spring starter

### 09 III TV £5.45

A really versatile 1.6 c.c. glow motor for control line or radio control, with fully variable throttle and coupled exhaust flap.



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### 19 TV £8.45

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### 19 (without throttle) £6.75

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### 35 III TV (with throttle) £10.50

### 35 BB III TV

Specially developed as a long-lasting radio control engine with twin ball race main bearings and fully flexible throttle control. £11.90

Develops well over 0.5 b.h.p.



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ENYA 09.III	Bronze	0.512 x 0.480	0.099(1.62cc)	3.4	4.1 7.5:1	0.20	8,000-16,000	2,000-13,000	7-8 x 6-4
ENYA 15.III	Bronze	0.590 x 0.551	0.15(2.47cc)	4.8	5.2 7.5:1	0.33	8,000-16,000	2,000-13,000	8 x 6-5
ENYA 19.V	Bronze	0.654 x 0.590	0.198(3.25cc)	5.3	5.7 7.5:1	0.42	8,000-16,000	2,000-13,000	8-9 x 6-5
ENYA 35.III	Bronze	0.803 x 0.704	0.357(5.85cc)	7.7	8.6 low7.5:1 high9.0:1	0.80	8,000-16,000	2,000-13,000	10 x 6
ENYA 35.III	Bronze	0.803 x 0.704	0.357(5.85cc)	7.7	8.6 low7.5:1 high9.0:1	0.80	8,000-16,000	2,000-13,000	10 x 6
ENYA 35.III	2 ball bearings	0.803 x 0.704	0.357(5.85cc)	8.6	9.1 low7.5:1 high9.5:1	0.85	6,65 10,000-17,000	2,000-13,000	10 x 6
ENYA 45 BB	2 ball bearings	0.878 x 0.756	0.457(7.5cc)	9.1	10.0 8.0:1	0.90	8,000-15,000	2,000-13,000	11 x 6
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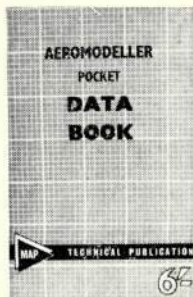
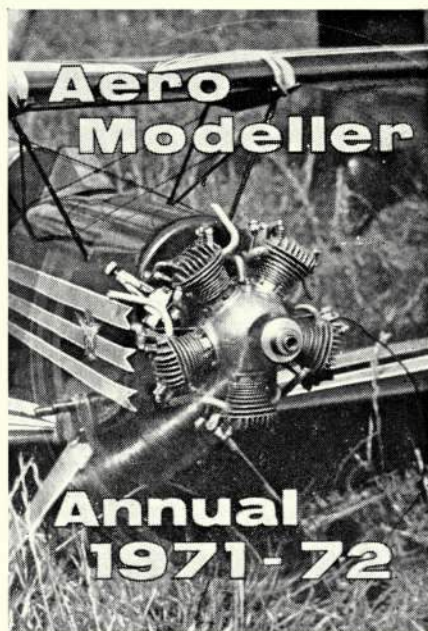
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128 pages, size 8½ x 5½ in. Coloured cover (photo) bound boards.

**75p**



**3 AEROMODELLER POCKET DATA BOOK**

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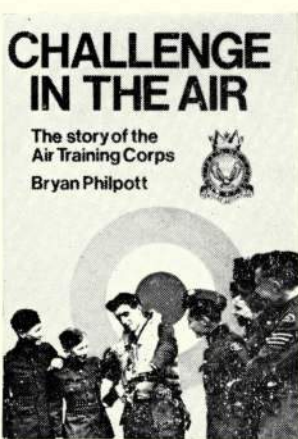
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**8 FLYING SCALE MODELS**

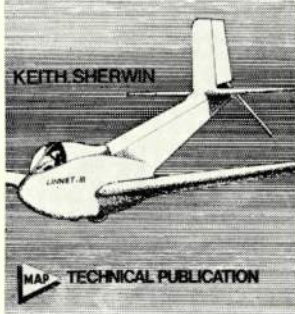


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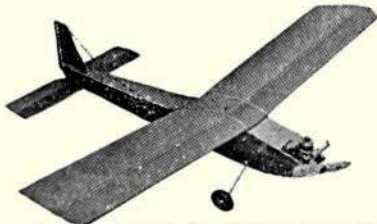
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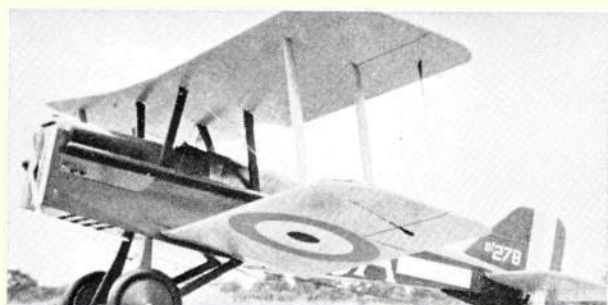
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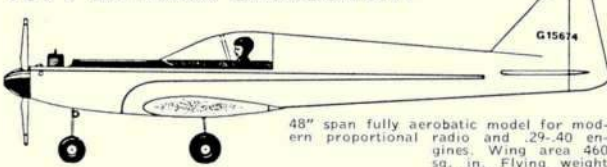
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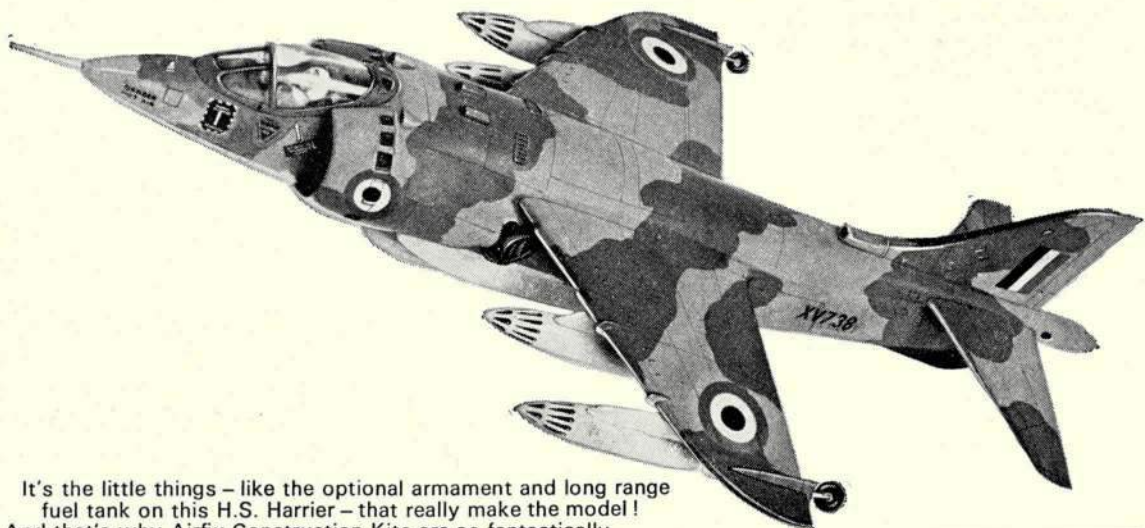
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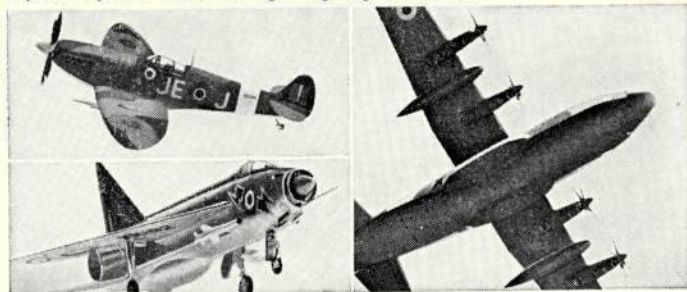


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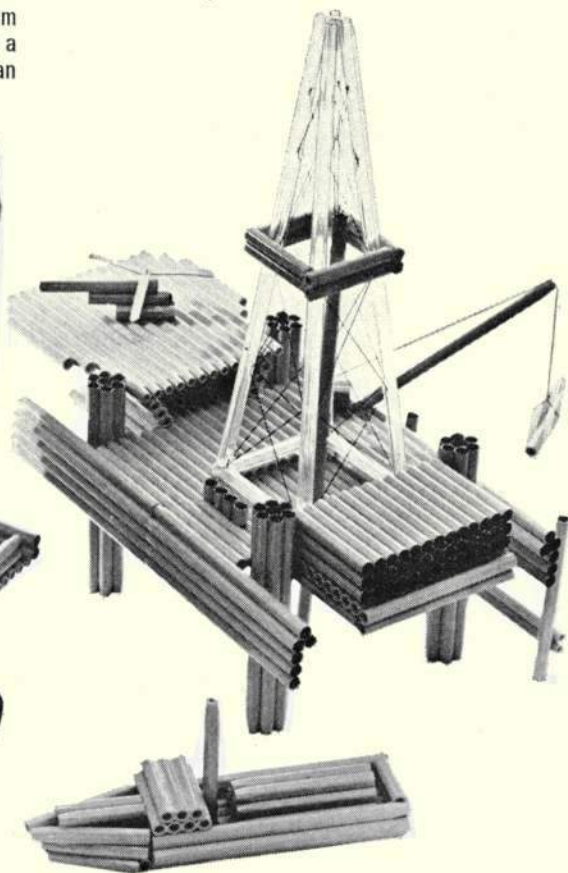
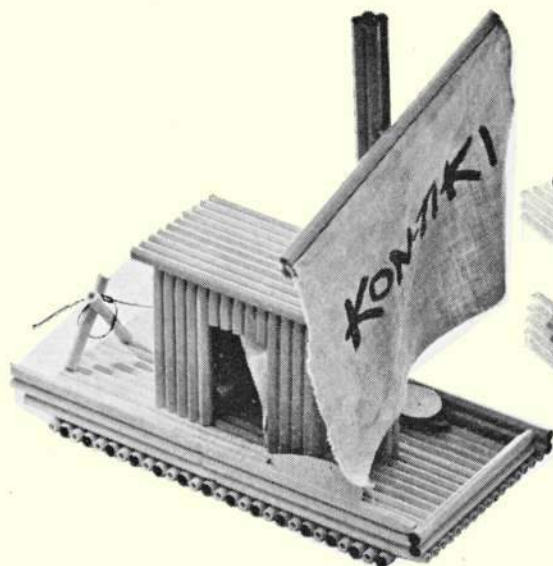
you expect in your own home. In offices and factories you should find them by the hundred.

### All you have to do . . .

. . . is to start collecting used Bic Crystal medium and fine ballpens now so that you may complete a suitable model and enter the competition.

There will be cash prizes for the best models every three months, both senior and junior and finally the best modeller overall at the end of the year will be awarded a further cash prize of £250 and the handsome Bic championship trophy.

Take your time, read the rules overleaf, then send your model with coupon.



the pen they model on





## Model Making Competition

Start collecting your pens now but—  
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or Fine Point ballpens carrying the BIC Registered  
Trade Mark because only these are eligible

### RULES

- The participants of the BIC Model Making Competition will be judged on their originality and technical model-making expertise.
- The competition will be divided into two parts:  
**Junior:** Participants, either sex, under the age of 16 at time of entry. Within this group no heat or flame technique for moulding may be used, but any other form of adhesion may be utilized.  
**Senior:** Participants, either sex, over 16. Within this group, any form of adhesion is accepted. Heat to bend or shape the pens may be used.
- Entries for the competition must be accompanied by the official entry form below.
- Any number of BIC Ballpen barrels may be used. All models must be constructed utilising any part of BIC Crystal Fine (Yellow) and Medium (Transparent) ballpens.
- BIC Crystal barrels may be cut to shape or size, but each barrel must clearly show the Registered trade name BIC (as imprinted on the barrel). Where models are moulded by heat, there must be at least 10 parts where the BIC Registered trade mark is clearly shown.
- Accessories other than BIC parts may be used *only* to make the model functional or to infer final design, i.e., wheels, transfers, cotton, string, paper, etc.

### PRIZES

- Prizes will be awarded to competitors who, in the opinion of the panel of judges, produce the most creative, unusual or skillful entry for each quarterly competition.
  - Quarterly prizes will be awarded as follows:  
**Senior section—first prize £25,  
second prize £15,  
third prize £10.**  
**10 consolation prizes of £5 each.**  
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second prize £10,  
third prize £5.**  
**10 consolation prizes of £2 each.**
  - Models winning any of the three prizes in either Junior or Senior levels of any of the quarterly competitions will automatically be entered in the BIC National Championship Competition and the individual competitor whose model is selected by the judges to be of greatest merit will receive an additional cash prize of £250 together with the 1971 BIC Model-Making Trophy.
  - Entrants should send their models to:  
**The BIC Model-Making Competition,  
c/o Montague House, 23 Woodside Road,  
Amersham, Bucks.**  
Should a model be considered delicate for conventional postage, then a photograph (colour or black and white) may be despatched beforehand. This will be used for preliminary judgement. Entry forms should be clearly attached to each model or photograph entered.
  - No responsibility can be taken for the damage in transportation of any model received. Judges will, however, take into account such unfortunate circumstances and the model will still be eligible for participation within the content.
  - Should participants require a model returned, then return postage must be included by way of enclosing the appropriate stamps.
- RESULTS**
- The 1971 competition will be held during 3-monthly periods and results will be announced during August 1971, November 1971, February 1972.
  - Participants should ensure that their models are despatched to arrive by 1st June (for August judging), 1st September (for November judging) and 1st December (for February judging).
  - Any model received after this date will not be eligible for the relevant Quarter but will qualify for the next Quarter's competition.
  - Any prize winning model will become the property of Biro-Bic Ltd. and may be used in any way they think fit.
  - Employees, relatives or direct associates of Biro-Bic Ltd., Model and Allied Publications Ltd., as well as their advertising agents will not be eligible for this competition.
  - The decision of the Judges is final and no correspondence can be entered into in relation to prizes awarded or decisions made.

I understand and abide by the Rules

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## Heard at the HANGAR DOORS

FIFTEEN Canadians from the Toronto Club went to compete with the thousand or more modelers from the U.S.A. at the 'Nats'. They returned with 1st and 2nd in Wakefield, 3rd in Open Rubber, 1st in F.A.I. Team Race and the Competition Sportsmanship award. Good show from the Cannucks—many of them, of course, ex-British Clubsters, including Bill Henderson, making a come-back with Jetex models.

**JACK MORTON'S** obituary would have been here: but for the proficiency of a Royal Air Force Rescue helicopter and a lot of luck. Flying the well-known silver Tiger Moth, G-AHRC back to England after a 'Barnstormers' display in Eire, a combination of bad weather, low ceiling and course diversion led to Jack hitting the sea with considerable velocity. While the formation orbited, a Mayday call to R.A.F. Valley alerted a rescue crew. Six minutes after the impact an unconscious 'Fearless' Jack was being winched aboard for speedy hospital attention at R.A.F. Valley. In that time Jack had ensured that his passenger was clear of the wrecked aircraft, before he passed out. The aircraft sank within 90 seconds. Jack's injuries included a fractured ankle, hairline fracture of the spine, fractured nose and

One of several giant free-flight scale models seen at the U.S. Nationals was this Art Chester 'Jeep' by Gene Lapansie. Power is supplied by a Brown Junior spark ignition engine.



cheekbone, lacerations to head and severe bruising. The winchman reckoned Jack was on his way down for the last time, with a deflated May West, when he grabbed the modeller we like so much. Now he's on the way to recovery in Bangor Hospital and we can all breathe again and bless the gallant men of the Rescue Services with special feeling.

**THIEVES BROKE INTO** Martin Dilly's mini-van, parked outside his hotel during the two-day free-flight meeting at Syerston and stole five brand-new MVVS engines (three 'works' tuned). Serial numbers are stamped on the lugs, and three of these are D7-243, 247 and 249. Also missing were a Smiths Tachometer, a pair of 7 x 50 'Clover' binoculars and a Leica camera, total value being around

£300. Anyone having a twinge of conscience, or offered such goods in a suspicious manner, should contact Martin at 20 Links Road, West Wickham, Kent.

**S.M.A.E.** Annual General Meeting takes place in the Cranwell Room of the Grand Hotel, Leicester, from 12 p.m. on Saturday, November 20th. After the formal business it is expected that the customary open discussion will produce exchange of viewpoints on future policy of the Society and all clubs are urged to send delegates. Following the AGM the annual prize-giving dinner/dance will be held at the same hotel. A lovely band has been engaged and the evening promises to be an excellent social occasion. Tickets, price £2 per person, are on sale from the Treasurer of the S.M.A.E.

## 1971 NATIONALS — A VISITOR'S VIEWPOINT

You often publish Nats stories of foreign countries. Perhaps it might be interesting to hear of your own Nats from the mouth of a continental European.

From *Aeromodeller* June 69, page 296. I had an excellent map and easily found the airfield. We were slightly surprised when we passed the gate without difficulties. In Germany you'd have to find your way through concentrated machine gun fire! Firstly, I looked for Mr. Lynn, whom I knew by correspondence concerning participation. Mr. Lynn told me that speed started on Sunday at 9.00. On Sunday I was at the flying site early in the morning. People told me that speed circle was just 'over there'. Over there was only a car with a speed model extending its tail above the back seat and the pilot sleeping on his seat. He told me that speed flying was to begin at about 9.00. At this time it was a quarter past 9.00. On my request when I had to fly he informed me that there would be hardly any organisation — 'if you're ready, come and fly!' I was ready half an hour later after three practice flights. I think I made the first two flights at the speed

circle. When I took a snapshot of the scoreboard at the end of the second day I reckoned that in Germany the whole affair wouldn't have lasted any longer than five hours — but you'd had no time to meet any flier!

On the second day I knew I was to fly at 10.20. After some practice flights we were at the team race circle punctually at 10.20. I must apologise for this: we should have been there earlier. When I asked Brian Turner 'we are the team Maikis/Springer. When do we fly?' he said 'are you ready? right now!'. In Germany the anger of the C.D. would have smashed you. Mr. Turner had the sharpest eyes I ever experienced. It was the first time I got two warnings for whipping. Afterwards he told me 'you can take full advantage of the rules'. Thank you, Brian!

It was not our day; but that of my friends. When Schwarz/Kaul flew the final, there was an honest applause several times. Apparently patriotic feelings were strange to these people. To see a combat flyer just practice was a manifestation. I have no words to des-

cribe my impression of the flights — but I'll burn my combat model.

I always had the feeling that the contest ran very smoothly and all flyers voluntarily tried to help their opponents to win. No wonder there's no translation to the English word 'fair'.

We never felt as strangers. Mr. Spooner (I knew him from his time at Stuttgart) managed the connection to free flight. Neil Billington gave me permission to fly. John Penton loaned his engine starter to me. Brian Turner explained to me how to hold the handle. Les Davy warned me of bad pilots. Richard King helped me — despite his dialect — to find Holloway 308 and last but not least Joe Devenish and Norman . . . (I don't even know his name, he flies FAI and B team race) were of great help to experience British way of life (and eating. Hmmm! Remember Stanbridge Hotel, Joe?).

Just to name a few. I don't know all your names, comrades. But if I ever have a few pennies left, I'll come to see you again.

Claus Maikis





Top notch combat  
design, winner of  
the 1971 British  
Nationals . . .

# ORCRIST

by Steve Jones

*ORCRIST* was not really designed – it just sort of happened in late 1969! I was greatly impressed by the handling qualities of the *Ruteress* design but was less enthusiastic about its strength; accordingly I merely grafted a tailplane onto a normal *Liquidator* type wing and produced the prototype *Orcrist*. This model is still in existence and was used to win the finals at Cranfield and the Nationals. Since this time various wing sections, ranging from  $\frac{7}{8}$  in. flat to  $1\frac{1}{4}$  in. 'full stunt' have been tried but the original has not been improved in any way!

But why the name *Orcrist* (pronounced as orc-ris-t with short 'o' and 'i')? Readers of *The Hobbit* by J. R. R. Tolkien will recognise this as the name of the Elven sword used by Thorin Oakenshield, the dwarf, in an important contest (the battle of the Five Armies) to overcome his enemies – the Warlords! Rather appropriate don't you think? Actually, although *Orcrist* had some magical properties, it was never claimed to fly . . . and its final fate was to be buried under the soil, so do not get too carried away with your fantasies!

As for construction, care must be exercised in selecting wood in order to produce a light, strong model. The grades indicated on the plan will produce a model weight of 15-16 oz. which I consider to be the best compromise. If you really want the performance you can use lighter grades but don't blame me if it falls apart!

The construction is conventional combat practice and will be familiar to many. P.V.A. glue should be used for leading and trailing edge laminations, and epoxy for the

engine pod; otherwise good quality balsa glue is adequate and shortens construction time.

Commence by laminating leading and trailing edges, taking care to eliminate warps by use of straightwood and clamping during drying. Cut out the ribs using two templates in the 'sandwich' method, and glue to the leading edge on a building board. Insert the trailing edge from the rear, and check carefully for warps. Add the tips and gussets, and build up the composite centre-section rib and bellcrank mount assembly. Laminate the tailplane assembly and assemble onto the wing along with the fins, taking care to line it up exactly with the centreline of the wing; any discrepancy here will have disastrous effects. The leading and trailing edges may now be shaped, (remember to leave the leading edge square for the pod!) taking care that the sections are as shown on the plan, and constant along the length of the span. Add the controls and tank, and sheet over the centre section.

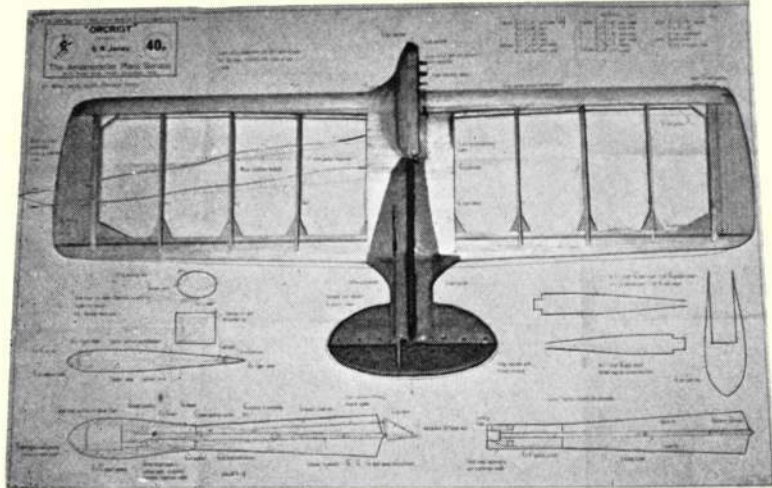
Construct the engine pod using epoxy adhesive throughout – a fast setting adhesive such as *Devcon* 'five minute epoxy' speeds this process considerably. When set, shape roughly and epoxy to the wing, adding the  $\frac{1}{2}$  in. gusset. Drill through the bearers and insert the bellcrank mount retaining dowel then finally shape the pod and smooth into the wing contour.

Sand the whole model smooth, and apply one coat of full strength dope to the framework. Sand smooth again, and nylon cover the engine pod and tailplane assembly. Cement the horn to the elevator and sew to

Distinctive shape with its separate tail plane, makes for ready identification at the combat circles. Construction is light but strong, using spruce strip reinforcement in both leading and trailing edges.

FULL SIZE COPIES OF THE 1/6th SCALE REPRODUCTION OPPOSITE ARE AVAILABLE AS PLAN NO. CL1134. PRICE 40p (8/-) PLUS 5p POSTAGE, FROM AEROMODELLER PLANS SERVICE, 13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS.

Yet another replica on the building board! Note bandage reinforcement around nose and heavyweight tissue applied to tail and fuselage.





Steve with his Nationals winner. Rubber extension tube over the Oliver's intake keeps dirt out of the carburetor if a vertical 'forced landing' is made over soggy ground.

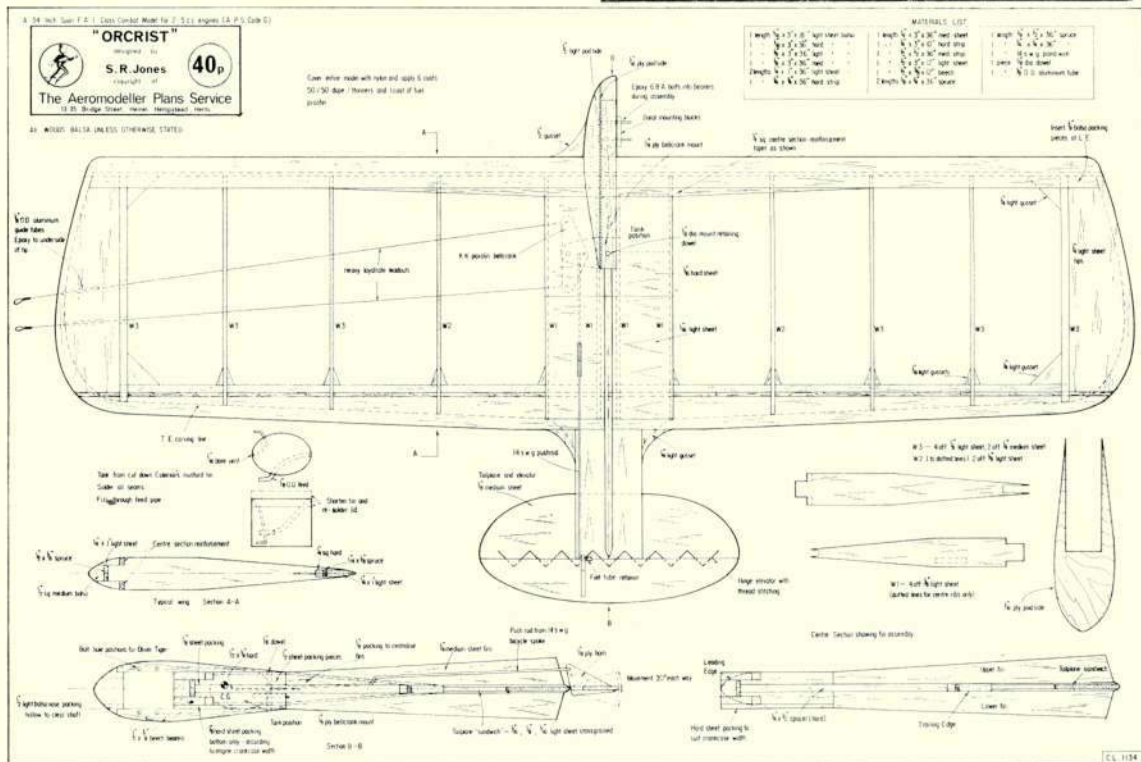
the tailplane. Rub wax onto those parts of the leading edge and tips to which the nylon must not adhere - this helps to produce a nice smooth section. Cover the framework with medium grade nylon pulled as tight as possible and apply six coats of 50/50 dope and thinners. Skimping on the dope does not save weight as fuel seepage can have an alarming effect - also a really tight covering seems to produce improved performance. Decorate to taste and apply one coat of fuel proofer.

Mount the motor and check the C of G position - ballast should be applied if necessary as this is vital. Final adjustments can only be made by flying the model - the C of G and/or elevator movement should be adjusted to permit tight manoeuvres without over-elevating. If it is possible to over-control the model you are certain to manage to do this in a combat heat!

Combat is perhaps the contest class in which the greatest emphasis is placed on piloting skill rather than model performance; however as the latter is still very important I will first make a few general comments on combat equipment.

**Models**

*Orcrest* fulfills the necessary conditions for a good combat model; so do many other designs, some of which are already in the A.P.S. range. The main requirement is for a strong light model - say 16 oz. with motor. The critical points seem to be to obtain a good leading edge section, really firm engine pod and mountings, and tight covering - plus of course, a properly 'trimmed' model with the right C of G and elevator movement. In short, it doesn't matter what you fly so long as it's at least as fast and manoeuvrable as the opposition!





## Motors

As any observer of the combat scene will notice, the motor which has dominated the event is the Copeman Special Oliver Tiger. The reason for this is the utter reliability of the Oliver, and its ability to run evenly on suction feed through the most violent manoeuvres. Certainly other motors can provide more power, for example G.15 glow motors and M.V.V.S. diesels, have been tried by various people, but the reliability has been poor.

The cost of a new Copeman Special Oliver may seem high – but with proper care it can be made to last almost indefinitely due to the excellent reboring service available. It follows that Olivers can be picked up second-hand in quite good condition, in fact one of my best motors was acquired in this way.

If you buy a new motor the most crucial phase is the running in – if you do this badly you will have a slow motor at least until the next rebore. The correct procedure is to use a fuel containing 30 per cent castor oil and 2 per cent Redex; *never* run the motor on a large propeller as this only harms the bearings. Start off using a 8 x 4 prop, and give the motor 15 minutes ground running in 1-2 minute bursts, allowing it to cool between each. Start with a very rich mixture and work down to flat-out running; never over-compress the motor. At this stage the motor may be flown, preferably on an 8in. x 6in. prop cut down to 7½in. diameter. Leave the mixture just a shade rich and again take care not to over-compress; fly wide manoeuvres with as much whipping as possible to keep the engine lightly loaded. After 30 minutes in this fashion you should have a pretty quick motor – keep to 30 per cent oil for a while though.

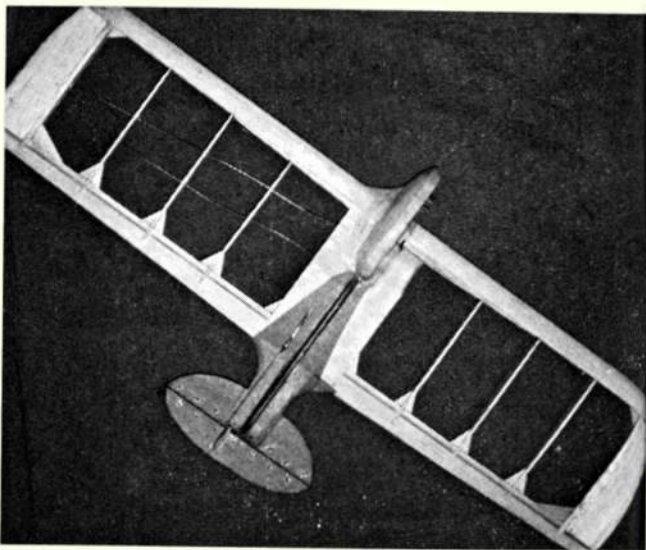
My fuel mix is 25 per cent castor oil, 2 per cent Redex, 35 per cent ether, 35 per cent paraffin and 3 per cent MPH ignition additive (or amyl nitrate etc.). Nothing is gained by reducing the oil except more rapid engine wear; for a new motor reduce the nitrate content to 2 per cent.

## Flying tactics

In order to fly combat well you must be in complete command of your model. As a minimum requirement you should be able to fly continuous manoeuvres by 'feel' without looking at the model, as in a heat you will be kept busy by watching your opponent.

For the newcomer there is no substitute for practice; in order to learn combat flying you really need to have three people who are all keen enough to go out regularly and just fly combat for fun – this need not be a very destructive process, and in any case you will learn far more than by keeping your models for a contest and then getting knocked out in the first round. As a combat trainer for this purpose, the APS *Dominator* (plan no. CL1093, price 20p) is just about ideal, since although the performance is not quite up to modern contest standards, it is very easy to build and fly, and is very strong.

Once you have learnt the basics you are ready to 'have a go' in a contest. Organisation on the ground is very important – your pit crew must know their job as they will be responsible for ensuring your engine run is good as well as starting the engine and handling emergencies. In A.C.E. we are fortunate in having several outstanding pitmen. For my Nationals success I am much indebted to Lenny Smith, Jim Woodside and 'Gypsy' Melrose who did a fine job. Our normal technique is to have a spare model ready with lines attached and motor warm. If anything happens to the first model, the spare is used and in the meantime the first model is made operational if possible. With practice it should be possible to change models in about fifteen seconds, so long as each pitman has a specific job to do and sticks to it.



As pilot, your job is to get behind your opponent's model and stay there; this is relatively straightforward if you have the better model, difficult if you don't. Once you are there you can take cuts – the biggest mistake you can make is to remove all the streamer in one cut.

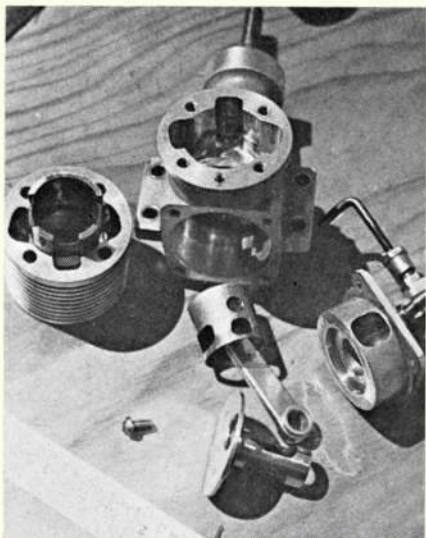
To take small cuts you must judge your position accurately and cut the streamer with your propeller, since it is impossible to knock off small pieces with your wing or lines. This entails holding your handle along-side your opponent's or just slightly outside it; provided the line lengths are right you should be in position. It is no good standing behind your opponent and trying to take cuts, as you will fly inside his streamer every time.

Never attempt head-on attacks unless you are really desperate, as the chances of taking a cut are only equal with your opponents, and you are extremely likely to write off both models. Furthermore, a head-on collision is the only way known to modern science of damaging a Mk.IV Oliver! If you have a poorer model than your opponent, all you can do is to whip hard and try to anticipate his moves. The best way of 'losing' somebody from your tail is to perform manoeuvres which only just miss the ground; if he doesn't chicken out there's a fair chance of his crashing. Needless to say, you must have confidence in your own ability before trying this!

A last word on line tangles. These are almost certain to happen in a heat, but they need not be disastrous. The gentlemanly way out is to keep standing close to your opponent and fly out of the tangle – if you run apart one or both of you is bound to lose control. This fact is often used by the unscrupulous, when it is known as a 'line job' – I must confess to having done one to two in my time, but only in retaliation. If you do crash, keep hold of the handle and untangle the lines while your opponent is flying – throwing the handle away is dangerous as the lines will probably remain tangled and the handle will whip round in a frightening fashion.

I hope these hints are of use to newcomers to combat – it is not a difficult class to become proficient in, and 'new blood' is always welcome in any contest class. The best way of learning, after practice, is to watch the people who are winning – there are no 'secrets' in combat, and people are usually only too pleased to explain why their model goes better than yours.





Verbitsky's rear exhaust free-flight motor appears to have quite a few things in common with the 'Start' speed engine (see this month's *Latest Engine News*) designed by Natalenko. Cylinder construction and porting is very similar although Verbitsky motor uses windows in piston instead of cutaway skirt. Like the Start, it also has a reversed drum type rotary valve in a separate rear housing. Note the well-packed crankcase and high placed gudgeon-pin, aids to high crankcase compression without the penalty of excessive conrod angularity and piston side-loading.

## FREE FLIGHT CHAMPIONSHIP TECHNICALITIES

explained by John O'Donnell

Part I: Power, Class F.1C

WORLD CHAMPIONSHIP MEETINGS have grown in size considerably since the first post-war Wakefield Contest attracted around 30 participants. This year there were 223 individual scores in the three events that formed the championships at Sävje, Sweden. Furthermore, each entrant is now eligible to present three models for processing and possible use in the contest. One of the minor results of this expansion can be seen in the detailed reporting that is possible. In 1948 *Aeromodeller* was able to publish a 'Wakefield Album' illustrating every model flown. Nowadays such a feature would be well-nigh impossible—even in serial form! All that I propose to attempt is the outlining of a few apparent trends, and a brief mention of a few of the more interesting models and/or gadgets that I encountered.

There should be no doubt in anyone's mind that the F.A.I. Power event is very much a 'power race'. This is inevitable when performance is curtailed by model restrictions related to engine size. There is then an immediate advantage in extracting more horse power from the specified size of engine. Rule changes involving the use of standard fuel and the prohibition of tuned pipes have merely changed the emphasis from one aspect of 'tuning' to another. Developments in engine design and modifications have out-stripped the legislation in that more power is now generally available than ever before.

With sheer power being a prime requisite it was hardly surprising that there were plenty of very fast motors at Sävje. Whilst there were occasional instances of exceptionally good 'stock' motors, most were tuned or modified in one way or another. The current favourite would seem to be the tuned Rossi R15. These were used by several well-placed competitors including Rolf Hagel and Thomas Koster. There were still plenty of Super Tigre G15s to be seen, of course—but it is no longer the automatic choice for this event.

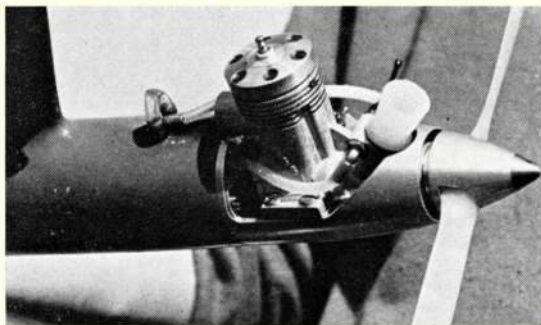
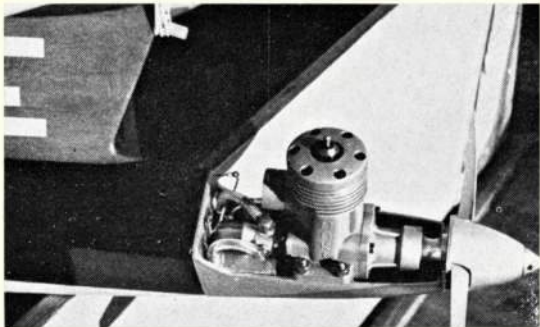
It is also noteworthy that propellers seem to be getting Gyula Simon of Hungary used a Moki S6T in his *Medium* model. The engine cants at 45° from the vertical on the diamond sectioned fuselage to keep exhaust residue off the timers.

some attention at last—often in the shape of home-made (or custom made) glass-fibre reinforced resin examples. Of the British Team, Bob Bailey and Ray Monks made their g/f propellers, whilst Pete Buskell still prefers to *carve* his own from 'Tufnol'. It is convenient to discuss engines and propellers together.

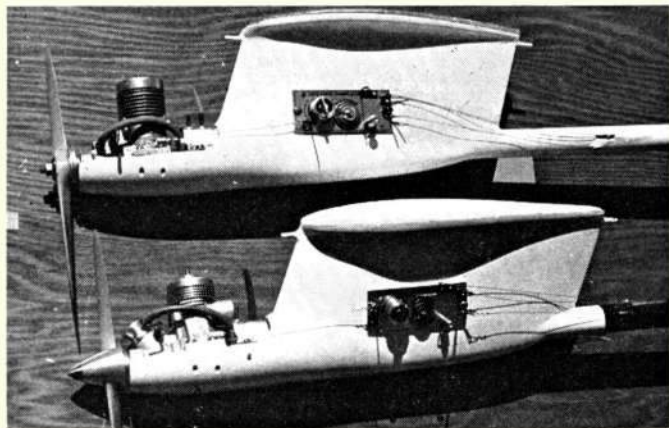
The winning motor was self tuned by Hagel, as described last month, and swung a glass-fibre 7in. x 3½in. prop (made by Ake Qvarnström, and based on the Cox plastic prop except for having slightly wider blades) at 24-25,000 r.p.m. Koster's Rossi was Miebach tuned and obviously a good one. It was used in conjunction with the German g/f prop. made by Meissner. Dave Sugden, who at one time made his own 'Sudgen Special' engines, naturally enough did his own engine work. He also made his own 7in. x 3½in. g/f props. These were designed as 7½in. x 3½in. using 'modified' Theodorsen theory, and then cropped to 7in. diameter. Horst Mildner had a different, and obvious, alteration to his Rossi in the shape of a 'Delrin' plastic tube fitted into the venturi. This had no effect on engine power but made the motor less critical to adjust. He used a 75 x 100 mm. (6.9in. x 3.9in.) prop that is made in small numbers by Peter Kretschmer.

There were plenty of alternatives to the Rossi of course, and quite a fair range of exotic machinery was in evidence. The Americans had an interesting selection and the enterprise to obtain a prop to suit them. Having found that the Cox grey plastic 7in. x 3½in. prop (intended for the .09 engine) was ideal except for shedding blades, they persuaded Bartel to make them copies in glass-fibre. The US team were the only ones with these props at the Championships but they are being produced by Bartel for general sale. They are made from Ciba epoxy resin with continuous strands of glass from tip to tip (unlike some other brands which are merely resin filled with short

Mildner of West Germany used Delrin tube venturi insert to make the Rossi less critical, at the expense of a slight r.p.m. drop. Spinner fares nicely to the cast alloy pan.







lengths of chopped glass fibres). Bartel is confident that his props are safe at *double* present day speeds! Using this prop, Jim Taylor and 'Buzz' Averill were claiming 25,000 r.p.m. from their Rossis. 'Buzz' also had a TWA racing motor that was almost as fast. Their third member Tom Kerr used K&B Torpedo - at least in the model he flew in the contest.

Other countries had their own National preferences. The Czechs had examples of both old and new MVVS diesels. Jaroslav Sediak used a wooden 190 x 90 mm. (7.5in. x 3.5in.) prop on both varieties, whilst Vladimir Hajek preferred a Graupner 7in. x 4in. nylon for his new MVVS. The Hungarian team had a varied selection of Moki engines. Andras Meczner was using a Moki diesel, whilst his countrymen had glow motors - Ferenc Csizmarek using the SV version and Gyula Simar the very latest S6T. The sole Rumanian, Popa Emilian-Cringu, was also very up-to-date with a S6T. His propellers were made (by Csizmarek as I understand it) from multiple layers of wood veneer impregnated with resin and laminated under pressure. Workmanship and finish could only be described as beautiful. Size was 190 x 90 mm., and the Moki turned them at 21-22,000 r.p.m. They certainly brought back memories of 'Hydulignum', though that had thicker layers.

The Russians had a variety of motors. Grekin was using a glow motor that I didn't recognise, despite a TMA designation. Victor Onoufrienko did have a Super Tigre in one model - but in the contest both he and Eugen Verbitsky used motors that Eugen had made himself. That these were very competitive was demonstrated both in the contest itself, and at an impromptu gathering on the sportsground in the middle of the 'Wakefield day'.

This informal meeting began with an r.p.m. contest. Using the same propellers swapped backwards and forwards between the engines some interesting and direct comparisons were made. The Americans were pleased that they could 'out-turn' Verbitsky - but it was Paul Lagan who 'stole the show'. His Rossi took the needle of the tach. hard against the stop at 25,000 r.p.m. The motor eventually was shown to be capable of 25,800. This exceptional performance came from an engine that had been tuned *twice*. Following its receipt from Miebach, the motor was subsequently re-tuned by Murray Stringer in New Zealand. The actual figures that I noted are given in the table below - and are not quite the same as given in 'Free Flight News' 71/7 or the A.M.A.

Left, front ends of Paul Lagan's two new power models top one for a G.15, other for his very fast Rossi. Both have glass fibre rod fuselages. At right, Nygren used aluminium tube front end with built-up box rear.



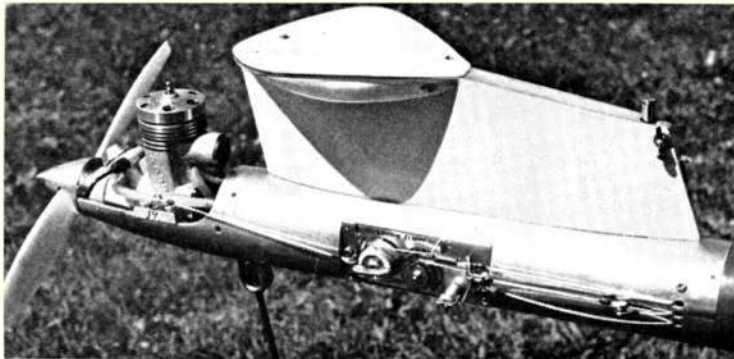
Competition newsletter! It was pointed out that the Rossi is supposed to peak at 23,500 - presumably in standard form.

Prop: Bartell 7in. x 3 1/2 in. Cox type

Lagan	N.Z.	25,800	Tuned Rossi
Sudgen	Canada	25,000	Tuned Rossi
Taylor/Averill	U.S.A.	24,500	Tuned Rossi
Verbitsky	Russia	23,800	own.

Subsequently the Americans, Verbitsky and Sudgen dismantled their motors so as to compare their different approaches. The discussion became very technical despite a certain amount of language problems. Smoothness and 'fits' were obviously most important if some people's reactions were any guide. The most that I could get from this discussion was the opportunity to take close-up photographs of the 'innards' of Verbitsky's motor.

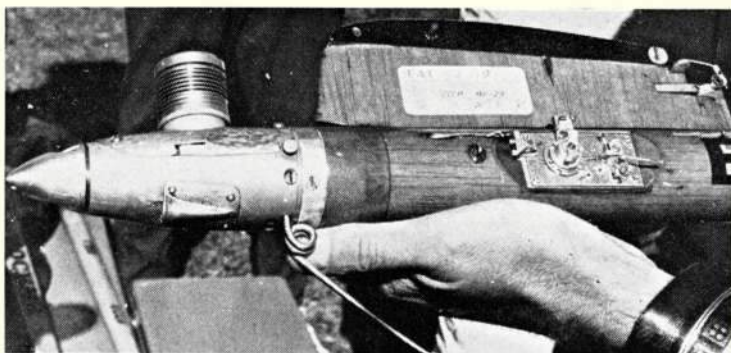
As will be apparent from the photographs, most motors were mounted in cast aluminium half-pans. These provide a neat and convenient mount - but do have inherent drawbacks. Breakages can be embarrassing as the British team found out. (I should mention that the mount that Monks broke was *not* the Culpin type as reported in error last month.) If long enough to include a tank, the half-pan can have considerable 'overhang' from the front bulkhead and hence needs a properly 'engineered' attachment. Their use, however, has encouraged the appearance of tubular, or at least circular section, fuselages. A few models were seen with aluminium tube forward fuselages - Taylor, Averill and Fiegl come to mind, as examples. There was also the novel combination employed by Urban Nygren on his first model.



Aluminium tube front-end used on Jim Taylor's Rossi 15-powered flapped model, which was not used in the contest. Mechanism for moving the flaps is very neatly enclosed, and simplified by using a straight dihedral wing. Note complexity of the Seelig timer operation.



One of Verbitsky's models featuring home built motor with top cowling over crankcase. Note air scoop on underside of pan and variable incidence wing to provide a lighter rear end. Seelig-influenced timer used.



Below right, a close-up of the variable incidence wing mechanism used on this model. Differential incidence on each wing panel is provided for power, but not for the glide.

This had an aluminium tube front, and a built-up (longerons and warren-girder spacers) tail boom.

The overhang and attachment problems were overcome by Frenchman Michel Jean who used a complete 'speed' pan that fitted under the fuselage proper. Another approach, reminiscent of that used by Frigyes, was that of metal bearers bolted to the fuselage sides of Robert Guilloteau's model.

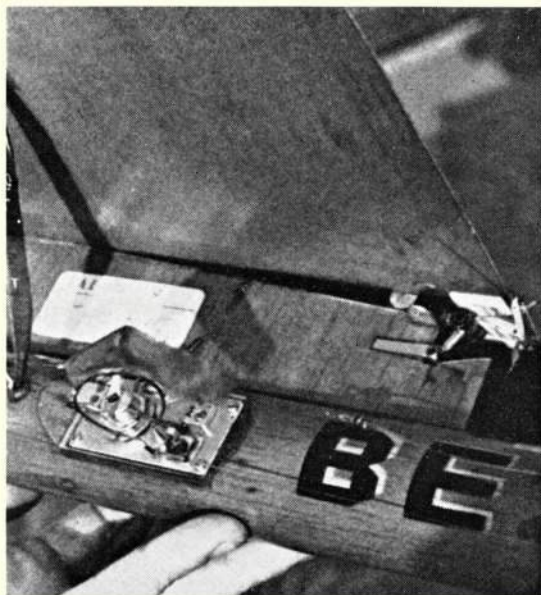
Several engines were seen mounted at 45° to the vertical, and usually for quite a practical reason. With an upright motor fitted with a rear exhaust (like the Rossi, MVVS, Moki etc) a good percentage of the 'used' fuel is blown back onto the timer and its accoutrements. By tipping the motor through 45° the exhaust gasses pass along the starboard side of the pylon (and fuselage, and hence miss the timing mechanism on the other side).

Surprisingly the motor on Rolf Hagel's model was angled the opposite way as may be apparent in last month's photos. An obvious alternative to inclining the motor is to fit an exhaust deflector of some form and these were seen on several models. Present-day rules require such deflectors to be attached to the airframe with some, if slight, clearance from the motor. The Americans had to modify their models to suit—as illustrated last month.

The standard engine and 'systems' timer was the Seelig—visible in many photos. Even home-made conversions, maybe using camera timer works, often showed Seelig influence in having spiral-type fittings for the D/T operation. The Russians' timers came into this category.

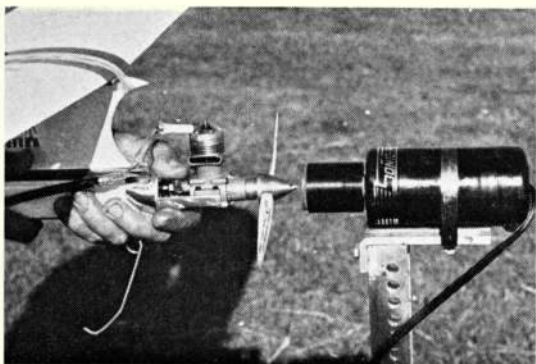
There should be something gained by 'cleaning up' the front of most power models. Improvement in propeller efficiency, or increase in useful thrust, is likely to contribute more than straightforward drag reduction through streamlining. The popular half-pan engine mount is a step in the right direction especially when the mount shrouds the crankshaft (in the manner of the Seelig/World Engines style) and is used in conjunction with a spinner. Only a handful of fliers have taken the next step however—and cowed the top of the engine. Those who did enclose the crankcase etc, leaving only the cylinder exposed, included Pete Buskell and Verbitsky (on the model to be mentioned later). A full 'speed cowl', made of metal, was used by Hagel. A couple of the Finns, Seppa Haapalainen and Matti Pyykko also had fully cowed motors.

Unquestionably, the outstanding technical innovation on the model side was the flapped power design flown to second place by Thomas Koster. The requirements of fast climb, and slow sinking speed thereafter, are difficult to



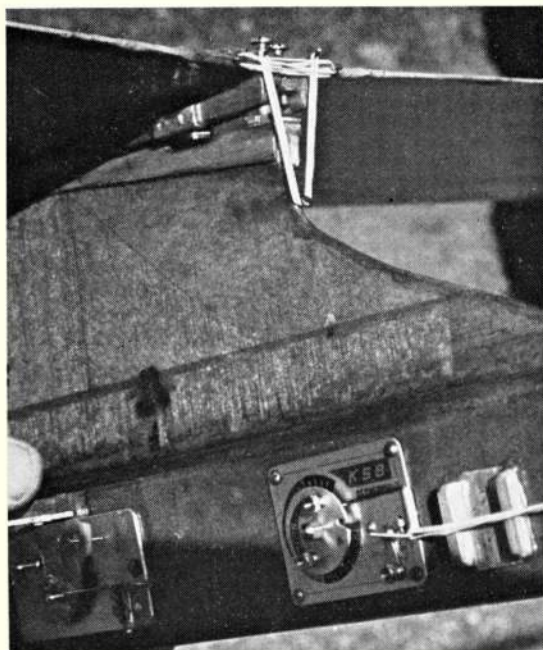
reconcile. The use of flaps to produce a variable-camber wing (possessing first low drag at or near the zero lift angle applicable on climb, and then high lift on glide) is hardly a new idea. Bill and Annie Gieskieng have used the approach with some success in the USA over the past two or three years. Zaic's '59-'51 Year Book contains the drawings of Anderton's flapped design, and earlier examples could not fail to exist. What Koster has done is to develop the idea to the stage where it can present a serious 'contest threat' at World Championship level—and to demonstrate this in public.

Certainly his pair of *Andromeda* models (presumably different to his first *Flapped Cream*) were the most discussed design at the Championships—and must have given many people much food for thought. From Koster's performance, the potential for duration is very high and the mechanical problems are hardly insurmountable. The *Andromeda* has completely sheeted straight dihedral wings of moderate taper. The rear half (or thereabouts) is hinged, so the section is flat bottomed (or slightly biconvex) under power and under-cambered for glide. Movement is around 3/8in. at the trailing edge. The change in wing section on transition necessitates V.I.T. movement in the reverse direction to normal. The hinges consist of four short lengths of 'Mylar' polyester film per side. The 'Mylar' is only 0.005in. thick, including a coating of thermosetting adhesive on each side, and is sandwiched between pieces of ply which in turn are attached to the wing and flap upper surfaces. This



Tom Kerr of the U.S.A. team uses relatively elderly K9B Torpedo 15. Electric starters, mounted in a similar fashion to this were popular. Almost essential wear for tactical flying when a quick start is essential, and useful for saving finger wear on these high revving motors!





might sound flimsy – but it is free-moving and lightweight, yet strong enough for flight and D/T loads.

With this type of hinge the flaps are unlikely to contribute much to the stiffness of the complete wing. This means that the front portion will tend to bend or flex as a very high A.R. wing, with the flaps merely trailing behind. This might be part of the explanation for Koster's model being somewhat inconsistent despite continuous test-flying. The problem was not helped by a straight vertical climb, without roll, and a tendency to wing-over rather than spiral. How much of this behaviour was due to the use of straight dihedral (to simplify the flap mechanics) is a matter for speculation. It is relevant to report that Bill Gieskieng has gone over to polyhedral for his latest 'flapper' despite the complications involved.

Koster's model was interesting in other ways. It had screwed-on wings (as did Taylor and Averill) kept on anti-warp jigs between outings – and was the only power model I noticed with internal timers mounted behind a hinged hatch.

There was another flapped model present – but not flown in the contest. This was by American Jim Taylor, who considered it too new to use. Its similarity to Koster's design, both in layout and detail suggests that there had been prior collaboration – and this, in fact, was the case.

Flaps are surely 'here to stay', and I would expect to



Another variable-incidence wing user was Hajek – again each panel moves independently. MVVS motor turning 7 in. x 4 in. Graupner prop. Wing section is 6 per cent thick with 2 per cent camber, i.e. bi-converse.

see much more of them at future F.A.I. power events. Those who are deterred by the thoughts of such complexities should be thankful that an even more radical approach is now disallowed by the F.A.I. (who now only permit flying surfaces to change camber or incidence during flight). The Canadians were telling me about Jack McGillivray's work on a *folding wing* layout. He has produced quite a practical model, on which the tips panels are hinged at the dihedral break so as to 'tuck under' the inner panels. This permits something rather like an A/2 glider to climb as a 3ft span symmetrical section projectile – said to be surprisingly stable. This discussion prompted Eugen Verbitsky to produce photographs (unfortunately 'unsuitable for reproduction') of his version of the *same* concept! Those with long memories will recall Gerry Ritz trying the same idea not years ago. (Editorial experience with catapult launched 'Chuck' gliders on the same theory have resulted in loss of models O.O.S. – Ed.)

Verbitsky's 'orthodox' models were interesting enough – even apart from his home-made motors already mentioned. As with all the Russian power models, his designs had two piece strut braced wings, – but they also had two piece fuselages. The model flown in the contest had a very fast, safe-looking spiral type climb – and used auto-aileron. The model drawn in *Free Flight News* 71/7 was the one with a top cowl on the motor – and had variable incidence wings. These fitted on a short stub dowel in line with the wing struts, and had a strong spring fitting to pull down the T.E. and guarantee positive movement and positioning. Apart from saving weight at the rear of the model, and the need for line connections, this arrangement also allows the wings to be set at different angles (one relative to the other) on power but not on glide. This effectively provided 'warp' to suit the spiral climb, without its drag to spoil the glide. The whole system was an 'engineering' job – even to having ball-races on the stops bearing against the wings. Section was 7.5 to 8 per cent thick and slightly biconvex – better for climb than glide.

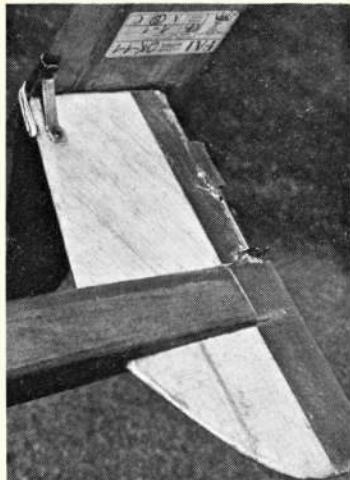
Vladimir Hajek also had a variable incidence wing – perhaps because the model also had a 'T' tail. This was the only one that I saw in the power event!

Apart from the models already mentioned, the vast majority of the power entries were conventional in design i.e. low pylon, polyhedral, V.I.T. etc. etc. West German influence was evident in the number of models with all sheeted surfaces. This construction was even seen on models with 'elliptical' tip panels. One novel combination was evident on all three of Robert Guilloteau's models – sheeted inner panels and built up tips. One even had 'eggbox' construction tips. He also had an interesting flying technique in using a *Heathkit* 'ThumbTac' to check his engine revs before release.

Next month we shall deal with Glider and Wakefield.

On page 490 of the September issue, a photograph was captioned as being Li Sung Chan of North Korea. In fact this should have read Mohamed Fathy A. Amer of Egypt, who was shown with his balsaboom, fuse D/T equipped A/2 glider. Apologies to all concerned, including J.O.D. for being the result of mistaking a negative reference number – Ed.

Michel Jean (France) who came as reserve and replaced Zimmer at eleventh hour, used Rossi mounted in full length 'speed' pan.



Hajek was the only user of a T-tail in the power event, which was no doubt the reason for his variable-incidence wing! Large fin area employed.





Are you between 10 and 16 years of age? Then don't delay, join today

Dear John,

I have just finished building a Frog Talisman. It is a 20 in. wingspan stunter for a 1 to 1.5 c.c. motor. I have put a 1.5 c.c. motor in it and could you possibly tell me what speed it flies at? It is a AM.15, which I understand is now out of production.

I have been having a very difficult time with fuel tanks. A month ago I bought a Kielkraft stunt tank, and when I used it on my friend's Gazelle it constantly dripped fuel from the vent tube. Thinking it was a 'dud', I had it replaced with another of the same type, which dripped even more! The thing was that neither of these fuel tanks ever stopped dripping. Could you give me a reason for this?

Lance Peerman,

Cornwall.

It is rather difficult to tell you at what speed will be obtained without knowing the details of propeller, line length and type etc., but 45-50 m.p.h. would not be unlikely. As for your fuel problems, it may just be fuel siphoning; we suggest you try bending the vent forward a little so that the air forces the fuel to remain in the tank.

Dear John,

Is there any way in which you can colour nylon props without painting them, as paint soon flakes off. Also, is there a way to colour silk or nylon material, as the colours I would like to use are not available.

S. Thompson,

Teignmouth, Devon.

You can kill two birds with one stone here. Dylon dyes, which are available from most ironmongers, Woolworths etc. will dye both props and covering materials. In fact, it is a good idea to boil nylon props anyway to relieve the stresses which occur in the moulding. Immerse in hot water for at least 15 minutes and cool naturally. Dylon can supply a very large range of colours.

Dear John,

I have bought my first control line aircraft, and as I do not know much about them I would be very grateful indeed if you would write back and tell me the basic drill for a control line plane and the maintenance of the plane; for I have a desire one day to enter a Competition. I enjoy reading Aero Modeller.

Graham Ferre,

Havant, Hants.

This answer is a complete subject in itself and I recommend you purchase our Control Line Manual, which covers all topics and is an invaluable reference book. Price is 90p, and it is available directly from ourselves, or from your model shop.

Dear John,

I use a small disposable plastic syringe (3p from Boots) for filling my tanks. It is unaffected by diesel fuel. Another idea is to remove the plunger and use the remaining part for an eye-

dropper tank, as used for Little Deer. I have just begun a Fokker D7 from your plans range, and am getting on well with it. Also, could you please bring back 'Tip of the Month', as it used to help me immensely.

C. Butler,

Derby.

Thank you for your tip. We would bring back 'Tip of the Month', if more people like you send in tips! We urge members to send in any ideas, however small, for publication. Even if you think your idea is obvious there are always new members who need advice and help through the early stages of our hobby.

Dear John,

I am building the APS Luton Minor for free-flight. Can you please tell me how I can make the instrument dials for this model? I have tried to hand paint them, but they don't look very good.

J. Band,

London, S.W.1.

Ripmax of London are distributing I.M. Products, a Japanese firm who manufacture R/C materials; they do a good range of various instrument panels which look very realistic and can be recommended for the realism they add. See the Trade Notes section in this issue for further details.

Dear John,

Having just completed Doug McHard's excellent model of the Fokker DVII, I am trying to work out an attractive colour scheme for it. Could you tell me an easy way to paint the hexagon shaped camouflage used on these planes, or any alternative schemes.

J. Sandy,

Portsmouth, Hants.

The Fokker DVII, in common with other German aircraft of this war, were covered in Lozenge shaped camouflage patterns and colours. Both styles appeared in December 1969 Scale Models.

The easiest way to apply it is to trace it on your silk/tissue covering with a soft pencil before applying to the framework. When covered and doped, paint carefully 'by numbers'. When dry, apply a coat of fuel proofer.

Further colour schemes appear in Profile Publication No. 25, price 20p, obtainable from most model shops.

Dear John,

I wish to convert the A.P.S. Heinkel Hansa to single channel radio control using the Staveley Tone Lock R/C and an M.E. Heron motor. Could you please tell me if this is feasible. I have already started the construction of the fuselage and wings.

S. L. Beazley,

Solihull, Warwicks.

Low wing model subjects such as the Heinkel you mention are notoriously difficult to trim for single channel radio. If you want a simple radio model I suggest you try one of our high wing sports jobs, such as BANDBOY, RC/777; SHOULDER STRAP RC/977; and PLANE SIMPLE RC/986. All these models are noted for their ease of construction and pleasant flying characteristics. These models are ideal if you wish to fly consistently every weekend. I suggest you finish your Heinkel as the free flight model it was designed to be.

Dear John,

Could you please tell me which is the best fuel proofer to use over transfers? I have been told that some fuel proofers will attack and ruin decals.

Frank Warring (12).

Luton, Beds.

Most of the problems regarding fuel proofer causing transfers to disintegrate is not the fault of the proofer, but the modeller himself who has not allowed the transfer to dry out thoroughly. The time this takes obviously depends on the transfer itself, but always leave at least 24 hours before applying the fuel proofer. If trouble still persists, then use an enamel type of proofer, such as Humbrol, a synthetic finish such as RipMax Tufoke or even a coat of clear polyurethane varnish.

Dear John Bridge,

I am between 10 & 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 25p (5/-) to cover cost of the enamel club badge, two coloured 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, HEMEL HEMPSTEAD, HERTS.

10/771 25p in the £7 Rebate plan purchase coupon for Golden Wing Members G.W. No. ....





Rather a contrast to Eric's approach is Andy MacIsaac's  $\frac{1}{2}$  in. : 1 ft. *Hawker Fury*. Has scale rib spacing, scale tail surfaces and landing gear, slightly increased dihedral. Cowling and wheels are vacuum-formed plastic. Gained top scale points in *Indoor Scale* for the second year at the 1971 U.S. Nationals.

## Part VIII Applying the Finish

# FLYING SCALE MODELS

RIB TAPES are only worthwhile, in my opinion, on larger machines; above about 36 in. span. Their purpose on the full sized machine is to cover up the lacing of the fabric to the ribs. More fastidious radio scale modellers are now simulating stitching beneath the tapes as well, but it is hardly practical on the scales we are working at. Baby ribbon is the standard material for rib tapes on large radio models, although unfortunately I have not been able to obtain narrow enough tape for a free flight model as  $\frac{1}{4}$  in. to  $\frac{3}{16}$  in. width is what we are interested in. I always cut my own from heavyweight Modelspan and am fortunate in having access to a drawing office shear for this purpose, which soon reduces a sheet of paper literally to shreds. The long way to do it is to use a steel straight edge and razor blade. The tapes are doped on top, and beneath, each rib and riblet. When colour is applied to the wing the effect is well worthwhile as can be judged from the photograph of the upper surfaces of my B.E.12b wings. Continuing the rib line to the absolute trailing edge of the wing masks the necessary heavy spar at that point.

Control horns are best made from 20 or 22 s.w.g.

light alloy (not soft aluminium)—I have made them from plywood in the past and sometimes still do for the tail surfaces if I am critical on weight at the back end. Aileron horns in ply are hopeless as the lower ones get ground away due to wing tips scraping the concrete and the upper ones break during nose overs. Do not attach the control wires to the horns until after painting.

If metal panels are to be added to the fuselage, which are to be painted, they should be done now. If the panels are to be left in their natural state then they are best fitted later.

One last thing before applying the colour. Draw in the outer circles (or crosses if it belongs to the other side) of the insignia with a soft pencil and paint up to the line. There is nothing worse than trying to paint white over camouflage green especially when the green starts to leach through.

Now a word about paints. I personally always use cellulose, well thinned and brushed on with a good quality camel or sable haired brush; about  $\frac{1}{4}$  in. wide. You will have to pay the topside of £1 for a good one so look after it by washing it in thinners immediately

Terry Manley's Armstrong FK8 (which won the Super Scale Trophy at the 1971 Nationals) uses a chemically etched aluminium cowling—rather beyond the average enthusiasts resources though! Etched finish imparts a nice sheen to the aluminium.

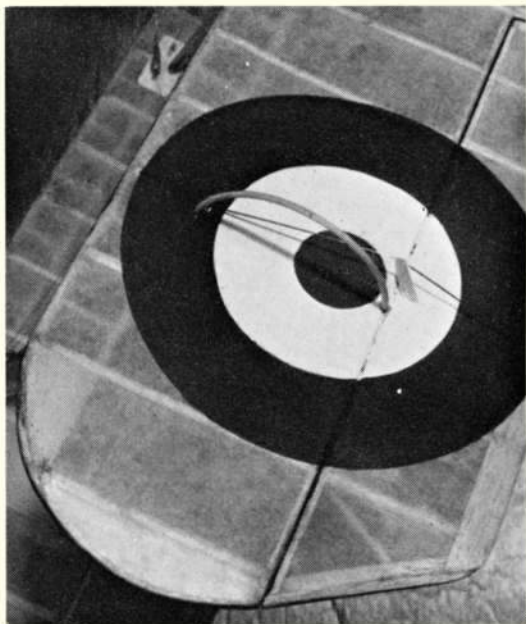




after use. Whilst on the subject of brushes you will also want a No. 5 for general paint work and a No. 0 for lettering. These are best bought at an artists' shop. The average brush sold for a few pence at model shops is useless for our purpose unless of course you admire hairs laid all over your models. Good brushes will last for years with proper care - I have had my main doping mop for at least 15 years. To get back to paint, I find nothing superior to cellulose for either a matt or a gloss finish. As we are not using 'hot' fuels a fuel proofer is not necessary. Matt cellulose is getting very difficult to obtain these days, although I believe H. Marcel Guest Ltd. of Collyhurst, Manchester, still look after our needs. A word of warning here regarding plastic enamel, which is freely available. Matt plastic enamel is not diesel fuel proof, and over a long period it goes sticky with a horrible mess ensuing. The gloss enamel seems proof enough but it takes an age to dry between coats if you want to rub down. If one is compelled to use a glow-motor as the radio boys are, then matt polyurethane varnish over cellulose produces a semi-matt finish which is reasonably fuel proof, but I would recommend something harder in the region of the engine bay though. Another alternative is provided by Humbrol Ltd., who produce a matt fuel proofer especially for the scale modeller, packed in their familiar and convenient tins, or even in a 'spray pack'.

Our silk covered surface is still pretty porous so that two thinned coats of matt khaki dope effectively covers a typical W.W.I job. These machines were invariably left clear doped underneath and after much experimentation I have come to the conclusion this is best reproduced in a similar manner on a model, i.e. leave it alone. Perhaps a few streaks from a brush dipped in dirty thinners adds to the realism. Certainly cream dope, which so many people apply, looks completely wrong; many aeroplanes stored in museums have gone that way due to the varnish yellowing with age, but they never look like cream paint!

If the prototype was left in natural fabric all over then I am afraid clear doped silk looks far too 'stark'. Recently both Terry Manley, on his Vimy, and myself, on my Blackburn White Falcon, have been experimenting with a coat of Magnolia emulsion paint, on top of the Modelspan, before applying the silk. Although they look better than with undoped silk, I am afraid they are still not quite right. The best advice I can offer is to avoid unpainted prototypes - they get terribly dirty and look shabby very quickly anyway!



Close-up of the lower wing tip of the author's B.E. 12b shows the 'natural finish' of silk applied over lightweight tissue, as discussed in Part VII, and the hand painted roundel - none of your super-glossy transfers here! Note also aluminium aileron horn and the effects of the rib tapes.

After khaki, silver is the next most popular colour, being almost universal for between-wars military aircraft. Thin the silver dope and keep it well stirred up as the metallic particles soon settle out. Three or four thinned coats are usually adequate.

That leaves us with the gloss colours used on civilian machines. Here a case can certainly be made out for spraying and anyone who has access to professional spraying equipment would be well advised to use it. Unfortunately I have not a contact in the spraying business and so continue with the back of the camel, which I find infinitely superior to the cheap little hand sprayers. Some colours go on better than others. Blues, greens and reds are O.K. but yellow and white can be tricky. They must be used very thin and up to eight coats may be necessary to get a good depth of colour. Wet rubbing down, over sheet sur-



The most fascinating part of Eric's modelling is the amount of 'character' which exudes from his subjects. Here the chipped paint over metal panelling generates a really worn 'in-service' look.





The latest Manley creation is most ambitious, a Vickers Vimy Atlantic, utilising two Mills .75 c.c. engines, and to approximately 1/16th scale. Model painted overall with magnolia emulsion paint, while the cowlings are once more chemically etched aluminium. Twin engined free flight scale models are not for the inexperienced or weak-in-heart!

faces, is recommended between coats.

The next job is to apply the decorations – my term for roundels, squadron markings, serial numbers, registration letters, etc. Forget transfers, they look crude and come off in time.

Roundels are easy. Use a pair of ink compasses loaded with the correct coloured dope. Use a brush to load the pen, never dip it in the jar. Keep the dope well thinned and keep washing the pen in thinners. Tape a piece of card to the wing at the centre of the roundel for the compass point to bear on, then draw inner and outer circles of each colour and fill in with the No. 5 brush. Always start with the white.

Mask as much of the rest of the decorations as possible: the diamonds on the upper surfaces of my *Nimrod* being a typical masking job. With regard to the serial numbers I am afraid there is no alternative to painstaking signwriting. I always draw the outlines of the figures on to the surface first with a very soft pencil, a 4B being ideal. I then fill in, with dope, using the No. 0 brush. When the dope is dry, a soft rubber removes the pencil marks but make sure it is dry though! For very small lettering of the 'lift here' variety I think it is best to revert to *Letraset*.

Finally this month I wish to deal with simulated metal panelling. For deep compound curves, such as to be found on noses of in-line engine fighters, I am afraid there is no option but to beat the panels, cowlings, etc., out of soft aluminium if we want a natural metallic finish and I will cover 'metal bashing' in my next article. A simple alternative is to select a painted prototype and carve the difficult curves from balsa wood, although admittedly silver painted wood is no substitute for polished metal for anything but the smallest areas. For areas which have only mild compound curves, and this is usually the major part, I can recommend *Metalskin*. This is sold at most shops which specialise in the more exotic plastic models – the ones which run radio outfits a close second in

price! It costs about 25p per square foot but is worth it compared with *Baco-foil* because it is self adhesive when you peel away the backing paper. This is a great boon because I find it extremely difficult to get an impact adhesive to lie smoothly under foil. Double curvature is applied by 'spooning' on the reverse side before removing the backing while rivets can be simulated by embossing from the reverse side. Each individual panel should be cut and shaped prior to attachment to the model. Even on completely flat areas do not try and cover in one large sheet and score out the panels later.

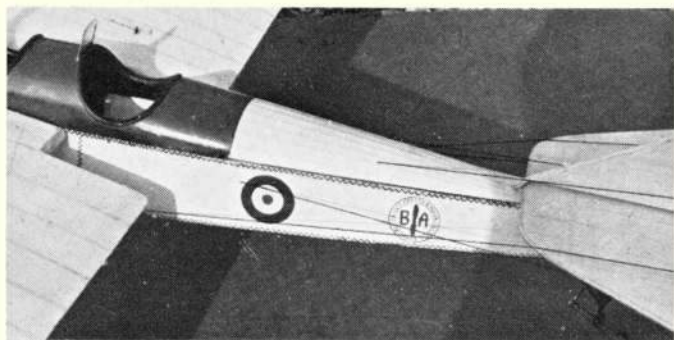
For flat areas it is cheaper to use metal stencil plates. These are bonded to paper making the adhesion job very much easier; P.V.A. or an impact adhesive being ideal. Of course, thin sheet aluminium can be also used but this is very rarely available thin enough without a big weight penalty. Terry Manley specialises in this form of plating; as can be seen from the close up of the F.K.8. However, he has access to a chemical etching plant which reduces his aluminium down to a few 'thou'. It also imparts a nice scale satin sheen to the surface.

Even if it is intended to paint the model all over I think it is worth panelling in metal as it adds to the realism enormously especially if one scratches the paint away a bit, here and there, particularly at the edges and corners, with fine wet and dry paper. The B.E.12b is so 'treated' and it looks very nice and 'battle worn'.

One final point on natural metal finishes. Always apply two coats of clear dope over the *Metalskin*, etc., to seal the edges and cracks, otherwise fuel will creep under and attack the adhesive allowing the panel to lift.

*Next month's article deals with adding the detail points, such as propellers, dummy, engines and the manufacturing of cowlings – a common stumbling block for the tyro.*

The Blackburn White Falcon is also finished with the magnolia emulsion technique described in the text. Model was built this year by the author, to 1/12th scale, and powered by a faithful Mills .75 c.c. Incidentally, before we receive any more requests for address of people undertaking a re-boring service, regret that no such facility appears to be offered at present. Now for the good news – the M.E. Heron and Snipe (1 and 1.5 c.c. diesel engines) are now back in production 'under new management'. More details shortly.







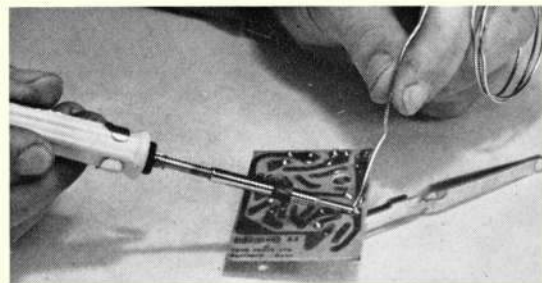
A SOLDERING IRON of some description is an absolute 'must' for virtually every aeromodeller (when did you last complete a model without using one?) and there are of course several irons made to suit many specific purposes.

Two such 'speciality' soldering irons have just been sent to us for review by **Antex Ltd.** and have proved to be well made, well presented items of great usefulness.

Firstly, intended for delicate electrical work, rather than for applications where greater heat is required, is the Antex 15 watt iron, which is sold in a 'soldering kit'—and a most complete one at that. The iron itself is very light and slim and is supplied with three alternative bits (of approx. 3/32 in., 5/32 in. and 3/16 in. dia.) which simply slip into position—the smallest diameter would be particularly useful for soldering components to tightly packed printed circuit boards. Also included in the kit is a heat sink to protect vulnerable components, multicore solder, a booklet on soldering, and even a 1 amp fuse. Altogether a very complete and reasonably priced outfit for £2.40.

Having more of a 'general purpose' role is the same company's Model MES 12, 12 volt battery

# TRADE NOTES



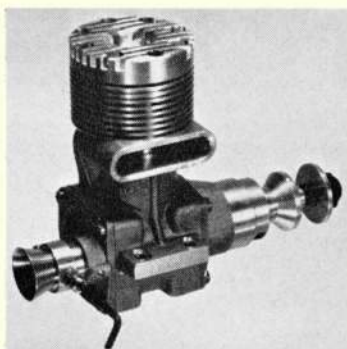
Top left, the very useful 12 volt battery-operated soldering iron by Antex—ideal for keeping in the car boot for emergency repairs of all kinds. Above, the Antex 15 watt iron seen in use. Note heat sink employed gripping components on underside of printed circuit board. Narrow tip ideal for soldering close 'lands'.

operated iron. As its name suggests, it is intended for use from a source such as a car battery for which purpose the commendably long (15 ft.) lead is fitted with crocodile clips. Obviously, this item is ideal to slip into the model box for on the spot field repairs, where it could cope with jobs ranging from wheel retaining washers to soldering needle valves together, as well of course as giving 'first aid' to R/C equipment. Complete with a durable plastic wallet, the cost is just £1.95.

A particularly nice feature of both these irons, especially in these 'replace-don't-repair' days, is the availability of all the spare parts—even if you manage to break the mounting hook, a new one can be supplied. A wide variety of different tips are also available to suit any contingency and should be available from most hardware shops.

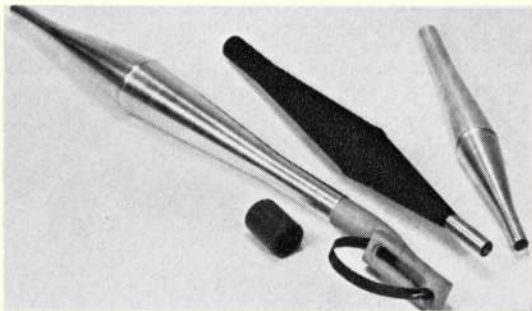
The **Eclipse Magnetic Rubber Strip 888** is a rather novel item, which could well interest the hobbyist. It is in fact just what it calls itself!—a flexible strip some 1/8 in. wide and 1/8 in. thick with a self-adhesive backing, and is of course magnetic. The advantages are that this strip can thus be stuck to even fairly 'severe' curves—the manufacturers suggest that it could be affixed to the nozzle of a vacuum cleaner to pick up metallic objects—ideal for salvaging all those pins from amongst the balsa shavings! The strength of the magnet is not great—it could not retain items such as a pair of pliers—but for knife blades, pins, etc it's fine. A strip stuck to the edge of the building board would save much frustration that the absence of these items cause. Two 8 in. strips are retailed at 30p per pair, again available from the 'ironmongery' type of shop rather than your hobby dealer.

As was mentioned in a previous *Latest Engine News*, **Irvine Engines** are to distribute *Rossi* engines in this country, and stocks have now arrived from Italy. Although the range consists of only two engine sizes, 15s and 60s - nine engines are available. They consist of a

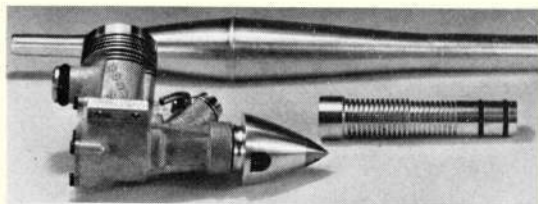


Left, the Rossi 60 'Speed' engine is beautifully produced, and one of the most powerful 60s currently produced. Marine and R/C versions also available.

Below, selection of Rossi pipes—the '60' size being shown with its lightweight manifold. In the centre is the pipe for the 5 c.c. motors (painted matt black) and at right is the '15' pipe.







speed' 60 (£28.90) plus an ABC version (Aluminium piston running in a Chromed Brass liner) timed for (and supplied with) a pipe, for £3.65, a throttle equipped version of each for R/C use, as well as marine versions.

The other engines are piped (£24.20) and non-piped (£19.55) versions of the new Rossi 15 - thus making them eminently suitable for C/L speed or F/F power flyers. The pipe for this engine is beautifully made, and being a metal spinning, is very light. The header tube is extremely well machined, and is fitted with oil seals to provide gas-tight joints to the motor and exhaust.

A lightweight cast aluminium manifold/elbow is available for the '60' engine to suit the resonant pipe-connection being via a silicon rubber joining piece. Total weight for the complete exhaust system is 2½ oz. very low for such an item. Manifold price is £3, the pipe itself £4.00. A pipe for a 5 c.c. engine is also made - this weighing just ½ oz. on its own, and costing £3.50. Diesel versions of the 15 are not yet available.

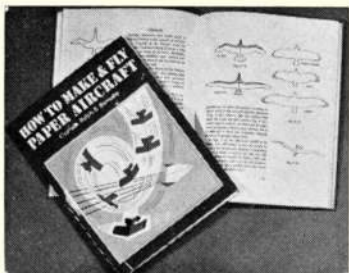
Also included in the Rossi range is their range of glow plugs, which come in six different grades, competitively priced, to suit virtually any engine - the 'F.A.I. fuel' grade should be particularly interesting to contest modellers. The addition of this range of plugs must make Irvine Engines the Glow Plug Kings of all time - they can now supply a combination of 21 makes/grades, and are even contemplating producing their own!

Another of the specialist items which this company can supply is an A.R.M. (American Racing Machine) team race engine mounting crutch, cast from magnesium and machined flat on both surfaces, and the rough-cast exterior would polish up with little effort. Extremely lightweight (1½ oz) these crutches can be supplied 'plain' or ready tapped to suit ETA or Super Tigre rear-induction motors, priced at £2.60 and £3.00 respectively.

#### HOW TO MAKE & FLY A PAPER AIRCRAFT

Published by John Murray £1.25, 70 pages, illustrated by the author.

Most of us have at one time or another folded and flown a paper dart and here we have an excellent book on the subject by a man who started flying paper planes when the Wright brothers were making their first public flights and who has been making and flying them ever since. (*We still treasure 'Gliders & Gliding' by L. & R. Barnaby, 1930, from the Ronald Press as a classic in our Library - Ed.*)



Left, turning the humble 'paper dart' into a 'respectable' craft is described by Captain Barnaby in his excellent little book.

Extremely lightweight ARM team-race crutch seen at right. Can be supplied ready tapped to suit Eta or Super Tigre rear induction motors.

At left, the answers to a power-hungry modeller's dream - the Rossi 15! Spun pipe is extremely light, and high quality is evident even down to the turned fins on the header pipe.



More than a catalogue, a most useful guide to aeromodelling - the KeilKraft Handbook. Available from all K.K. Stockists.

The book deals with all aspects of paper planes starting with the basics of aerodynamics including practical demonstrations of what is meant by the terms used.

The author then goes on to describe various forms of flying wings and darts, showing how he developed *The Barnaby*, the plane which took first prize in the aerobatics section at the International Paper Aircraft Competition sponsored by the *Scientific American*.

The plans of this plane are worth the cost of the book alone because the plane can be made to glide, make right, left, U and S turns, loops and even circle and return to the launcher's hand.

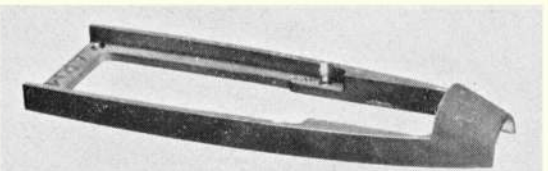
The only pieces of equipment needed are paper, paper-clips and Sellotape, although scissors, a stapler, cardboard and glue may be used for some of the designs, but these are not essential.

The author prefers to use 8½" x 11" board, as this was the stationery in his father's office in 1908, but we found that other types and sizes can be used providing they are in approximately the same proportions and not too weak or heavy.

Most of the models were made by the reviewer and they all flew well enough as may be expected with a high-performance plane such as the *Barnaby*. Some of the models flew a lot better than others, so do not despair if your first try does not come up to spec.

As previously mentioned the *Barnaby* is worth the £1.25 alone, but apart from this, the book will provide an interesting deviation for aeromodellers - and what's more it's cheaper!

An annual favourite, the *Keil Kraft Handbook* is now on sale in its 1971 form, and apart from being an illustrated catalogue of all the company's many different wares, also includes several useful articles on general building topics especially aimed at the newcomer to the hobby, which should prove most useful. A valuable addition to any modeller's bookshelf, retailing at just 17½p.







AIRCRAFT DESCRIBED NO. 207

# D.H. HORNET MOTH

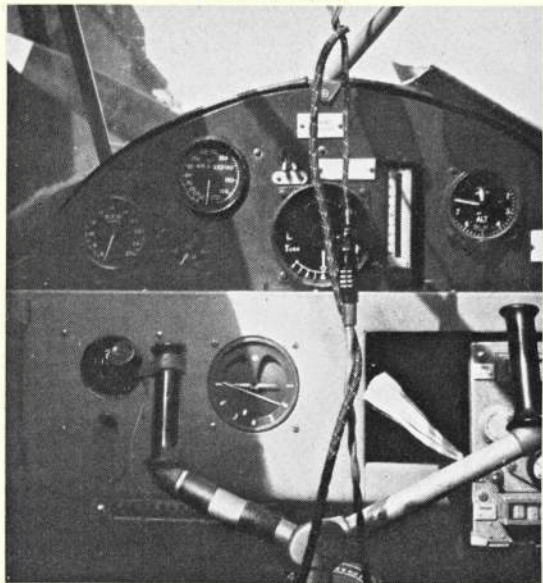
ON MAY 9th, 1934, Captain Geoffrey de Havilland made the maiden flight of the first Hornet Moth prototype, E6, from the company's airfield at Hatfield in Hertfordshire. It was rather a departure from 'normal' de Havilland practice in that it provided side-by-side seating for the pilot and thus paved the way for dual training. Intended as a cabin biplane replacement for the highly successful *Gipsy Moth*, it was to some degree a 'composite' aircraft – the general appearance was rather like that of a *Leopard Moth*, and indeed the same type of rear fuselage con-

struction was used, while the front fuselage was of welded steel tubing – *Puss Moth* fashion. *D.H.86* influence was seen in the manner by which the wings folded. Heading illustrates the original taperwing Hornet Moth. As text describes these wings were rapidly replaced by the broad tip panels (see photo page 566 for same aircraft after change). Below, view through the starboard door shows the compass on a bracket between the seats and radio panel added.

struction was used, while the front fuselage was of welded steel tubing – *Puss Moth* fashion. *D.H.86* influence was seen in the manner by which the wings folded.

This aircraft was then entered for the King's Cup Race held on July 13th of that year under the registration letters of G-ACTA, but was eliminated in the heats despite averaging 127 m.p.h. A pair more of prototypes were built, and the final development period was completed in just a year, having ironed out the minor snags

Pilots eye view of the instrumentation in G-ADUR. The asymmetric yoke for dual controls is necessary because the vertical stick is to left of the fuselage centre. Leads to headphones are clipped up to the cockpit roof. Also evident is the single diagonal bracing strut from the instrument panel top centre.

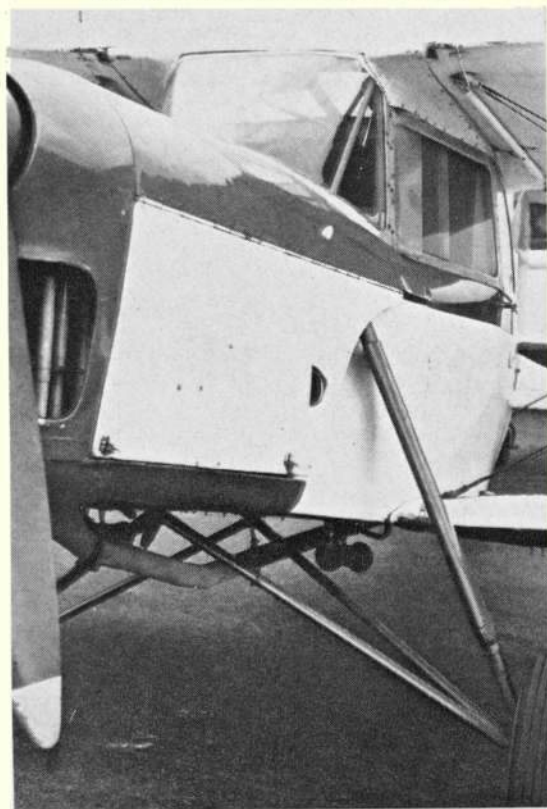






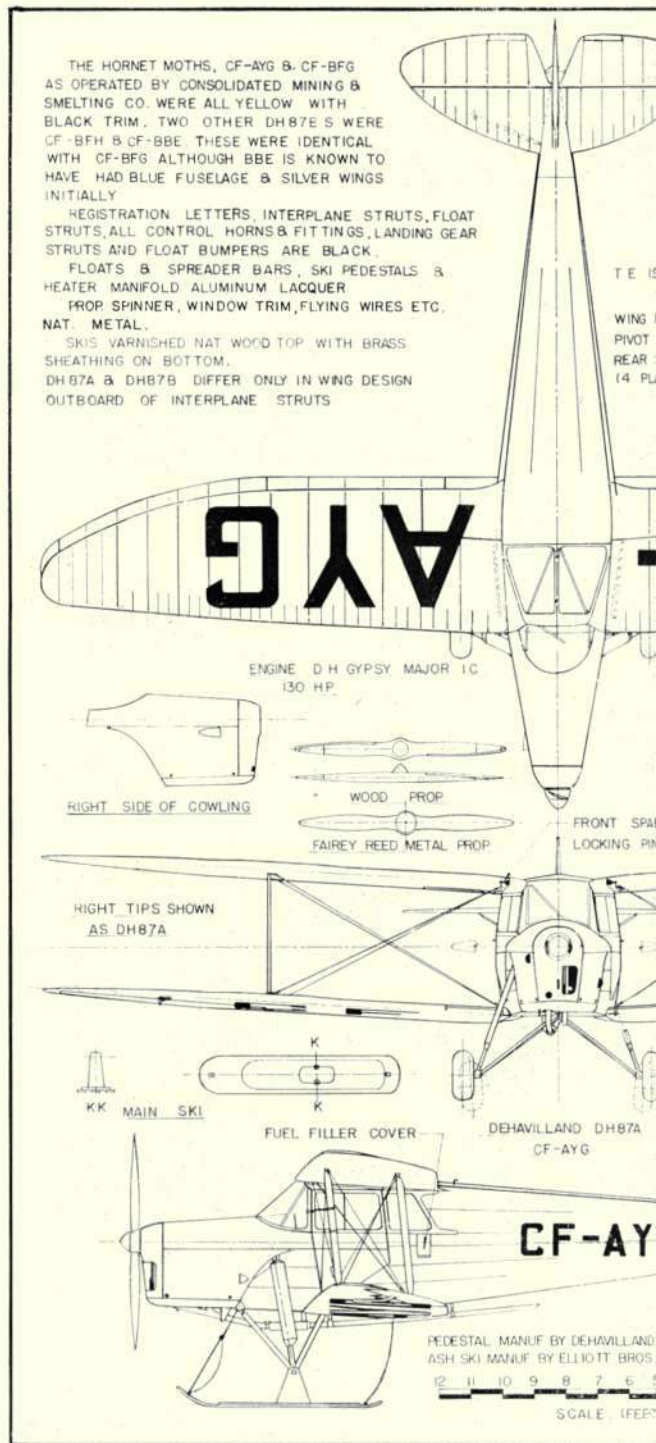
De Havilland monogram on the wheel cover should not be overlooked by modellers. The fairing over the undercarriage oleo strut can be turned through 90° to act as a surprisingly effective air brake, as will be appreciated by comparing this photograph showing the width of the fairing and the photo below which illustrates its thickness.

This angle of the Hornet Moth emphasises the taper on the fuselage which 'swells' around the passenger area - a feature common to other Moth types with side by side seating. Modellers should also note the long exhaust push rods exposed on the Gipsy Major engine seen through cooling intake. The Venturi for instrumentation under the fuselage, and the landing wire pick-up on the wing panel permits wings to be folded for storing in a garage.



which were discovered during the test programme.

The first production models made in August 1935 and designated '87A' featured greater taper on the wing tips, and had the span increased by two feet to maintain the same wing loading. Front fuselage side panels were increased in size, while fuel capacity was increased from 26 to 36 gallons. During the next three years, 165 examples were made, nearly half for export. It was soon discovered that in inexperienced hands the *Hornet Moth* could be prone to tip stalling, so early in '36 new wings were introduced to eradicate this problem. These new wings featured very little taper and with 'squared off' tips

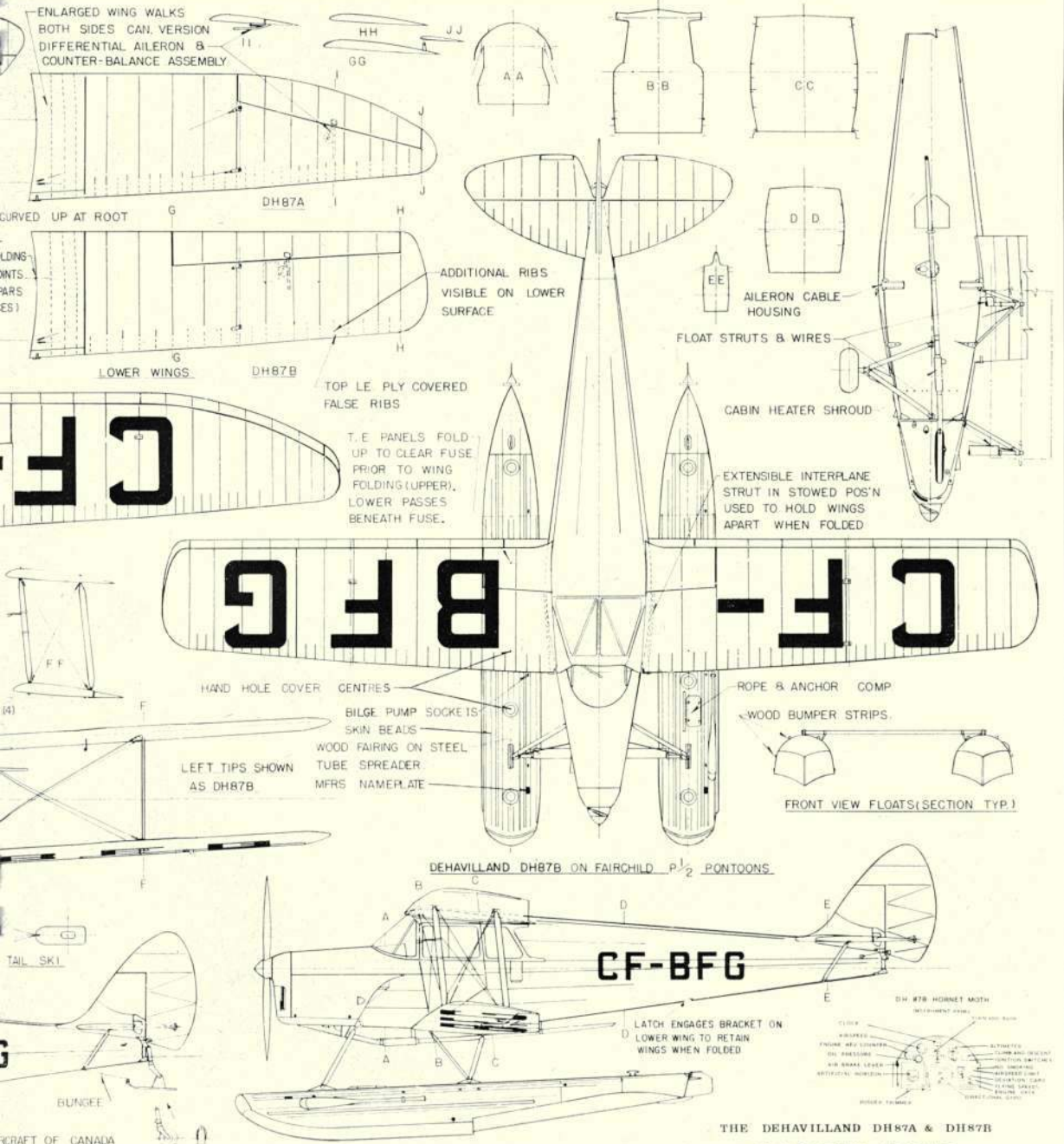




Distinctive feature on the Hornet Moth is the semi-span bracing of the wing panels with the interplane struts, the large ailerons on the lower wing, and the rudder cut-away to clear the sprung tail wheel.



PLANS NOTICE: REPRINTS OF THIS FEATURE WITH THE 1/72nd SCALE PLAN REPRODUCED BELOW AND DYELINE COPIES OF THE 1/16th SCALE ORIGINAL ARE AVAILABLE AS PLAN PACK 2930. PRICE 40p plus 5p postage FROM AEROMODELLER PLANS SERVICE, 13/35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTS, ENGLAND.



THE DEHAVILLAND DH87A & DH87B  
**HORNET MOTH**

DRAWN FOR THE CANADIAN AVIATION HISTORICAL SOCIETY  
BY D. E. ANDERSON JULY 24, 1966

ACKNOWLEDGEMENTS: CAPT J. K. POTTER (CPAL), ELLIOTT BROS., HALPH CLAYTON, D.H. AIRCRAFT CO., HATFIELD, J. A. SOLES.

AIRCRAFT OF CANADA  
LOOKOUT, ONT.  
4 3 2 1 0



Same aeroplane – two colour schemes. G-ADUR which is based at Elstree, Hertfordshire has appeared in many colours. The lower photograph shows it as it was in the early 60s, all silver with yellow registration picked out in black. It was subsequently refinished all white, with red rudder and trim. Regularly used by its appreciative owner, it is frequently seen in the Home Counties airfields.



formed a new type designation – 87B. These wings solved the problem, and customers of the 'A' series were invited to trade in their original sharply tapered wings for a set of 'blunt' ones. So many owners took advantage of this offer, that eventually only five 'A' series aircraft remained in this country; plus a few in the Dominions.

The *Hornet Moth* rapidly became popular with all types of aviators, ranging from club enthusiasts to executive level, both in this country and abroad. The De Havilland companies in the Dominions assembled *Hornet Moths* crated in Hatfield, and sold them to South Africa, Australia and India, while others were flown or shipped to Austria, Belgium, Denmark, Egypt, Eire, France, Greece, Hong Kong, Java, Kenya, Rhodesia, Singapore, Spain, Sweden and Switzerland.

D.H. Aircraft of Canada Ltd., designed an undercarriage unit enabling the *Hornet Moth* to be equipped with Fairchild floats, and four such aircraft were submitted to the British Air Ministry for evaluation as seaplane trainers. After extensive testing, they were despatched to Lee-on-Solent in June 1939.

With the onset of war, the majority of British Registered *Hornet Moths* were impressed into service, being snapped up rapidly by the R.A.F. for communication duties, as well as for calibrating early radar installations. Some 24 survived the war to be refurbished as civil aircraft, notably with the London Aeroplane Club at Panshanger.

As for the construction of these aircraft, the wings consisted of a single bay, braced biplane layout, with

built up wooden ribs, plywood covered leading edges and with fabric covering overall. Spars were spindled for lightness, the front ones being one piece while the rear spars were joined by fishplates. The wings were also braced internally by double steel wires with tubular steel compression members arranged in two bays out to the interplane struts. The method of folding the wings for 'garaging' was by fixing a jury strut, turning up the trailing edge flap and withdrawing a single horizontal pin from each front spar joint – an operation easily and quickly carried out by a single person.

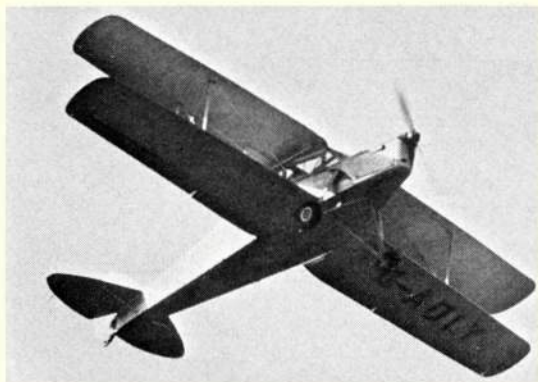
The fuselage was basically a simple wooden box structure with internal longerons and struts – external formers carrying stringers with fabric covering. Accommodation consisted of the previously mentioned two side-by-side seats, with approximately 14 cubic feet of storage space behind. The 130 h.p. Gipsy Moth gave the machine a maximum speed of 131 m.p.h. (124 m.p.h. for the 'B') with a cruising speed of 111 m.p.h. (105 m.p.h. 'B'). The Canadian float equipped version of the 87B used an up-rated 145 h.p. Gipsy Major, but the increased drag meant that the maximum was reduced to 115 m.p.h. with a cruising speed of 95 m.p.h. Consumption too was increased on this variant, dropping the range from 620 to 500 miles. An electric starter was available as an optional extra.

Fairings on the undercarriage legs could be turned through 90° to act as air brakes, while the tailwheel was fully castoring, sprung with a rubber-in-compression shock absorber.

The cantilever wooden fin was an integral part of the fuselage construction and sheeted with plywood. A fixed tailplane, supported with strut bracing, was also constructed from wood but with fabric covering. The incidence of this member could be adjusted on the ground.

Due to the popularity of the *Hornet Moths* as second-hand aircraft, and the length of service which many gave, colour schemes varied enormously – frequently one aircraft would be recovered and re-painted whilst still carrying its original registration marks, whilst others have been re-registered over the years. Many remain as economic vintage flyers in this country and abroad.

Same aircraft as illustrated in the heading of this feature G-ADLY with broad tip panels. The gap between lower wing rib and fuselage is evident here and permits the wing panels to be folded backwards, also seen is the Jury strut under the upper wing panel at the root, which is used to stabilise the wing panels when folded.

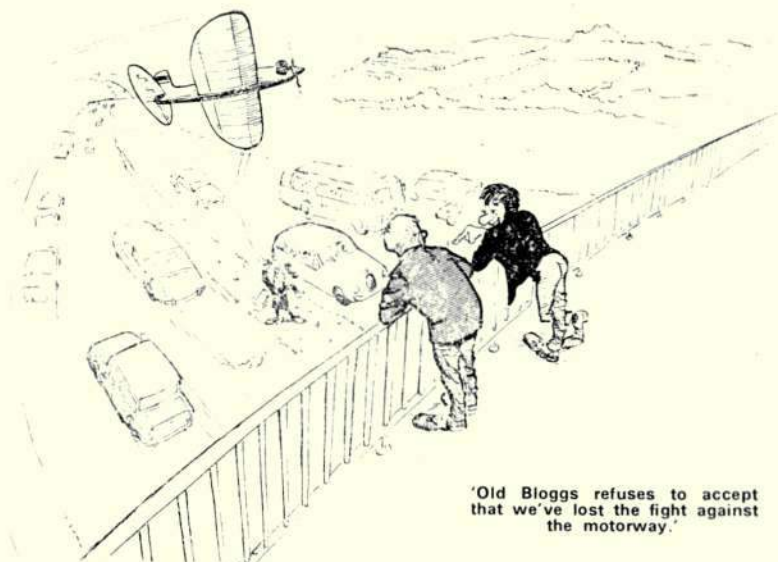




# topical twists

by 'Pylonius'

illustrated by 'Sherry'



'Old Bloggs refuses to accept that we've lost the fight against the motorway.'

## Made to Measure

Perhaps we are not so educationally advanced these days as we like to think. Back in the days when model aeronauting was still a hobby and not a blood sport you could not get a design published in a model mag unless you had the mathematics and aerodynamic theory to support it. I forget how many equations it took to prove which way you put on the wing, but it was significant that things like turbulators or variable incidence tailplanes were never thought of – considering the mathematics involved nobody would dare, not even Einstein.

When you think of all the mass of formulae that went into the design of a model which could only stagger a few feet over Wimbledon Common and compare it to today's scene where the multi flyer, who often does not know what an airfoil is, let alone plot one out, goes through his fantastic aerobic schedule, you can't help feeling sorry for the over serious modeller of yesteryear.

In these non-theory days you need a lot of academic authority for any departure from the well proven format of prop up front, tail behind and wing in between. For instance, we note that it takes a B.Eng., A.M.I.Mech.E., A.F.R.Ae.S. to fasten two rulers together, and so bring to the modern scene, along with instant coffee, the instant Boomerang. The Boomerang, you remember, was devised by the Aborigines in order to keep one jump ahead of the Kangaroo by bashing it on its billabong at long range. Trouble is that someone bashed the poor old Aborigine with something at even longer range, and now that he is almost extinct we revere him as the first man to operate a valid flying machine, and the boomerang has made something of a comeback in consequence.

## Hub-bub

What is all this brutal piloting we read about? Nothing to do with a 707 pilot looping his passengers, but what goes on in the inner team-race circle. Is this brutality symptomatic of the age we live in or is it just a few blokes having an old fashioned barney?

Personally, I can't see how anyone could be anything but brutal in this survival of the fittest situation. To keep a model under control while being squeezed by centripetal force into a sort of composite human blob is not a situation conducive to gentlemanly conduct. When someone's boot finds its way into your ear you are likely to react, quite instinctively, with a vigorously jabbing elbow; so what may seem brutal to the outsider is just a genuine human striving to survive.

## Chop 'em Common

Someone in a recent letter made the point that he would rather have Chobham in the wet than the torrid tropics or thereabouts in the dry. One slight oversight, though: they don't generally build motorways across the baking plains in order to get a lot of motorists to a place where the sun is reputed to shine but doesn't. Not that the poorer countries can afford to build motorways, anyway which is a blessing they don't perhaps appreciate.

I think all those people who have a bit of wilderness or desert to fly on should spare a thought for the poor old English modeller now that last citadel of free flight flying, Chobham, lies in pathetic ruin. The only thing that will now fly over that hallowed spot is a flyover.

## Flat Spin

As one who is unable to keep up with the accelerating rate of what is laughingly called 'progress', I am not always *au fait* with what is going on in the more advanced circles. I am aware that the decibel output of the prop flicker's 'ouch' has been going up year by year but now it seems that the index digit versus 20,000 r.p.m., is no longer a case of sit and suck but involves a hurried despatch to the casualty ward, where the staff are aghast at anyone doing something so blatantly self destructive. I am also embarrassingly aware that, whereas my primitive radio box is a skinny, one button affair, everyone else seems to sport fat ones full of levers. I feel rather like the skinny beach squatter who gets sand kicked in his face by the beefy bully, except that he was lucky in that he could afford to send away for a set of multi proportional muscles.

I cannot say that I know these other airfield users (fellow modellers back in the old days) all that well, particularly as there seems to be a complete change of personnel every week. You could say, I suppose, that I am on nodding terms with them – they fly and I duck. Lately, though, they do not seem to be all that thick on the ground, though the low flying types considerably so between the ears. It is, of course, quite pleasant to fly without risk of decapitation, but I couldn't help worrying over the absent flyers, if only for all that shiny new equipment you see in the adverts piling up on the shelves. But I need not have worried, for I now learn that the latest craze which is emptying the skies and leaving the boating lakes to the ducks is radio racing cars. This is much the same as multi flying (some have more wing area) except that instead of having to duck you do a nifty sidestep.





Designer Bob Walker holds his model while one of the club members fires up the PAW 1.49 – certainly the best way of avoiding cut fingers! With this engine the model flies fast even on 45 feet long lines of single strand control line wire.

# REACTION

a 30½ in. span control line  
stunter for 1.5 c.c. engines

by R. S. Walker

THE DESIGNER, a Senior Physics master, who runs a school model aircraft club, took a group of four boys down to the '70 Nationals at Hullavington to compete in the Junior Kit Contest. Their success was not great, due to a lack of experience in trimming free flight models, but they all enjoyed the principle of a juniors-only event. With the publication of the SMAE Junior Control Line Stunt rules for the following year's Nationals, their enthusiasm was renewed, but a suitable model was needed – the result was *Reaction*, a very manoeuvrable little aircraft, combining much 'big stuff' aerobatic practice. Indeed, if the model looks familiar, it is due to its heritage being largely based on Bill Morley's *Thunderbolt* design (APS No CL/587, 40p).

It was designed to be as crash-proof as possible, whilst retaining light weight construction for maximum performance, and to be good-looking. The structure incorporates many lessons learned from other designs, and throughout avoids abrupt changes in strength – a point which can cause damage in a minor 'incident'. Perhaps the construction is a little more involved than is normal for a model of this type, but care is repaid by a really aerobatic, long lasting model with a very tight turning radius, which is useful in getting out of trouble!

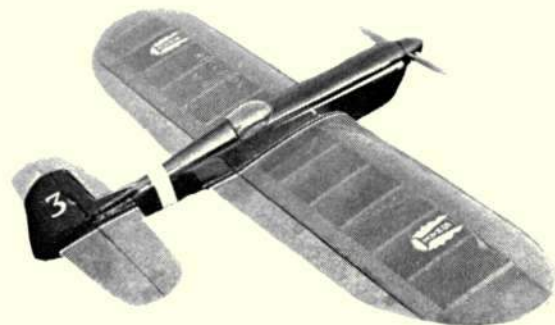
With this model, many of the members of this school club learnt to fly aerobatics, and some eight *Reactions* were flown at the '71 Nationals, where Andrew Gibson placed highest at fifth. Altogether very much a school-team effort, even some of the photographs on these pages were taken and processed by a member of the fourth form, S. Appleson.

Building starts with the wing. The spars are cut from a sheet of straight grain, medium 3/32 in. and the 1 mm. ply doublers glued on with P.V.A. taking care to get a 'top' and 'bottom' spar. Ribs are made by the sandwich method, port and starboard separately, remembering the lead out holes in the port set. The T.E. pieces and spar web are cut from medium hard quarter grain 1/8 in. sheet. The 1 mm. ply web reinforcement is glued on with P.V.A. The tips are made next; the inboard one from two layers of 3/32 in. with the lead-out tubes sandwiched in between and the outboard from hard 1/16 in. with tip weight sewn and glued on. The bottom mainspar is pinned down flat on the plan and also the bottom T.E. using the scrap packing shown on the plan. The basic wing ribs, with the exception of the two root ribs, are glued to the sparweb, after which they are glued to the bottom spar and T.E. The L.E. is added next on its scrap packing; then the outline is completed with the tips and

||  
YOUR

FREE

PLAN







Three more *Reactions* built by members of the Allerton Grange School model club. All the models have been constructed to a very high standard, which is well rewarded by the resulting high performance. Weight must be kept down so use coloured tissue for the wing coverings in lieu of a heavy paint scheme.

The tank and F1 go in together, trimming the crutch if necessary. The fuselage sides should be nearly cut through at the cowl joint and chamfered at the tail end before being glued into place. The fin fits between them and it should have no offset. The model is completed with planking and sheeting as shown on the plan. It is easiest to make the cowling as an integral part of the model blending it into the spinner which can be fitted to the motor. When the outside shape is correct, the cowling is parted off at the joint already nearly through and the inside strengthened and shaped as necessary; attachment is detailed on the plan.

Heavyweight tissue is used on the wing panels only; the rest should be covered with lightweight. Apply two coats of clear dope all over, sanding lightly between each coat. The wings and tailplane should have a further coat. Colour dope should be applied only to the fuselage and fin to keep the weight down. A thin coat of car primer-filler is applied and rubbed down when hard until the tissue just begins to show through. (400 grade wet and dry, used wet is suitable.) The surface should be like glass all over when it is ready. This is achieved by applying more coats and rubbing down nearly to the tissue each time. The finish is completed with up to three coats of thinned and filtered Humbrol enamel, rubbing down between coats with 600 grade used wet. Do not forget to fuel proof all areas not protected by the enamel.

Fly your model on 35 s.w.g. steel lines 35-55 feet long according to engine power and wind strength. If you cannot get single strand wire, you can use stranded wire but it is heavier and gives more drag.

Phillip Howell (15) on the left, and Andrew Gibson (16) both flew their PAW powered *Reactions* at the Nationals Junior Stunt contest, where they placed 16th and 5th respectively. Phillip's model has an 'open' cockpit, while Andrew uses the enclosed type.

shaped tip pieces. The T.E. reinforcement and root ribs are added next followed by the top spar which should be left flat at first. The flap hinges are put in before the top T.E. which needs to be very well glued all the way along. When the glue is hard, small clothes pegs are used to clamp the spars on to the tips from both sides at once. While this sets the L.E. sheet may be prepared. It should be wide enough to overlap the spar by about a  $\frac{1}{16}$  in. and have a slot in its front edge to take F2. We have used P.V.A. or a contact adhesive when attaching the sheeting. When all is set hard, the wing is removed from the board and the pushrod/bellcrank/lead out system installed. The alloy bellcrank has a piece approximately  $\frac{3}{8}$  in. square epoxied on at each side to locally thicken the pivot bolt region which is then drilled and tapped 6 B.A. If you have no means of tapping the bell crank, pack it on either side with suitable tubing to maintain its central position. Former F2 is installed and then the other L.E. sheet followed by F3; after which the remaining sheeting and cap strips are added. The flaps and their control system complete the wing.

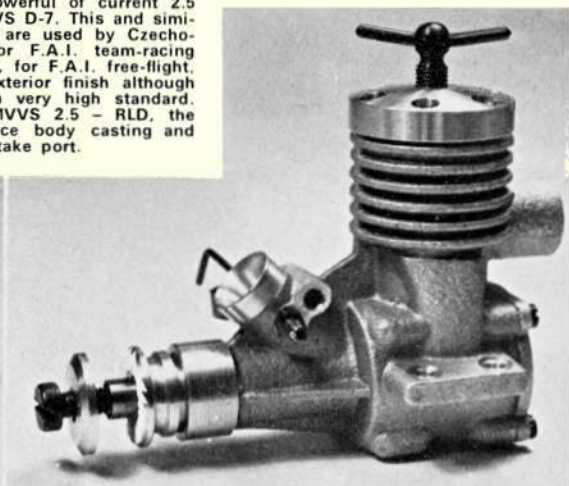
The crutch is built over the plan and the bearers are shaped and drilled. Wrap adhesive tape round the exhaust and intake of the motor and bolt the bearers to it, checking that they are true. Glue the crutch and the  $\frac{3}{16}$  in.  $\times$   $\frac{3}{32}$  in. packing pieces to the bearers. While this sets, cut out the formers, fuselage sides, fin, tailplane and elevators using the grades shown on the plan. 'Juggle' the crutch into position on F2 and F3. Check that the thrust line is parallel to the wing centre line, and at right angles to the L.E. Rectify if necessary then glue it firmly in place along with formers F4, F5 and F6. Make up the tailplane assembly with the pushrod and try it in position. The flaps and elevators should be at neutral together. Small inaccuracies can be corrected by moving the tailplane fore or aft; otherwise a new push rod is needed. When all is well and moving freely, retain the pushrods with washers soldered in place and glue the tailplane firmly to the crutch. The tank is made from any tin that has not got any paint on it - baked bean cans are ideal! When it is completed connect the filler and feed pipes with a short length of fuel tube, and immerse in hot water. Leaks are shown up by bubbles and a 'pop' should be heard when the fuel tube is removed and the pressure released. If you do not wish to make your own tank, use a pressure fed wedge type such as the small Mercury design.







One of the most powerful of current 2.5 c.c. diesels, the MVVS D-7. This and similar previous models are used by Czechoslovakian experts for F.A.I. team-racing and, to some extent, for F.A.I. free-flight. Rather rough cast exterior finish although construction is to a very high standard. Like the previous MVVS 2.5 - RLD, the D-7 uses a one-piece body casting and offset intake port.



## LATEST ENGINE NEWS

by Peter Chinn

HAVING DEALT, last month, with the three current Italian 2.5 c.c. speed engines (specifically the piped versions of the Kosmic K.15, Rossi R-15 and Super-Tigre G.20/15RV) we thought it would be interesting to follow up with two more 2.5 c.c. engines that have been seen in world championship and international contests, this time from Eastern Europe, namely the Czechoslovakian MVVS D-7 team-racing/free-flight diesel and the Russian Natalenko 'Start' speed motor.

### MVVS D-7

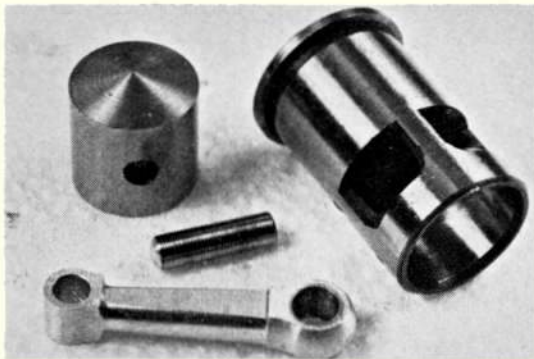
This engine has its origins in the MVVS 2.5-RL rear-exhaust engine that first appeared six or seven years ago, initially in glowplug form and then, designated the 2.5-RLD, as a diesel.

The present type is of very similar design, the main outward difference being that the main casting incorporates a circular section exhaust outlet in place of the rectangular stack of the earlier model. Inside, however, quite a number of modifications have been made.

Despite its use of a rear exhaust and side transfer passages, the MVVS is not a Schnuerle loop scavenged motor. Porting is of an open-loop or cross-scavenged pattern using very large inclined transfer ports in the Super-Tigre tradition. This type of porting was also used by the original 2.5-RL but, in the present model, the transfer ports are larger and more rectangular in shape. They are timed to open and close at 62 deg. of crank angle each side of BDC. The exhaust period is 64 deg. BBDC to 64 deg. ATDC.

The hardened steel cylinder has a wall thickness of 1.5 mm. and is a slip fit in the main casting. The cast-iron piston has a conical crown and weighs 6.5 grammes, or 7.4 grammes complete with its 4 mm. gudgeon-pin. The latter is fully floating with an aluminium pad at the front end and a brass eyelet type pad at the rear to facilitate extraction of the gudgeon-pin through the exhaust duct when the engine is dismantled. The connecting-rod is of machined aluminium alloy with a bronze bushed big end, plain small end and an oil hole at each end. It weighs 0.9 grammes.

The counterbalanced crankshaft has a 10 mm. dia. main journal, a 7 mm. bore gas passage and a 5 mm. dia. crankpin. It has a very long (16 mm.) valve port. This registers with a parallel sided port in the crankcase which is offset in the direction of rotation as on some of the Super-Tigre models although the offset is rather less than on the front-induction G.15. The induction period occupies some 205 degrees of crank rotation, beginning at 35 deg. ABDC and closing very late at 60 deg. ATDC. The shaft runs in a 7 x 14 mm. 8-ball steel caged ball-bearing of Swiss manufacture at the front. The rear bearing is 10 x 22 mm. brass-caged with 7 balls and on the particular engine under examination this was of Russian manufacture. An earlier example examined had a British Hoffmann bearing. Incidentally, the front bearing is protected by a two-piece



MVVS D-7 cylinder and piston assembly. Porting is development of open-loop system originated by Garofali, of Super Tigre fame, and not Schnuerle, despite its exterior appearance.



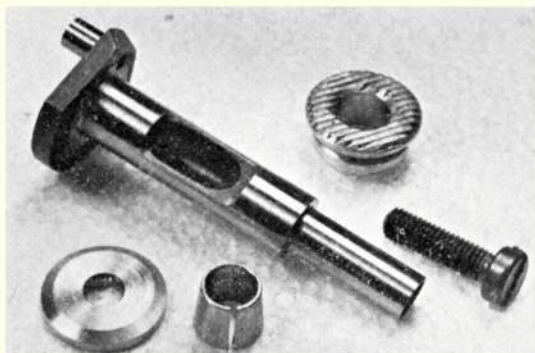
steel shield fitted into the front of the bearing housing. Beyond this, the machined aluminium prop driver is mounted on the shaft by means of a brass split tapered collet. The shaft end is drilled and tapped for a 5 mm. cheese-head prop retaining screw.

The cylinder height of the engine is the same as for the glow version, thanks to the use of a very shallow contra-piston (only 4.5 mm deep). This has a cone shaped lower surface matching that of the piston crown. The machined cylinder head has cooling fins milled on the exhaust side only and is attached with six screws. The cast crankcase backplate is fixed with four screws and has provision for a low pressure fuel system.

The MVVS is supplied with two carburettor inserts. One, which has a bore of 6.5 mm. and is used in conjunction with a normal diametrical spraybar location, gives an effective choke area of 12 sq. mm. and is presumably intended for team racing where a high intake velocity is desirable in the interests of fuel economy and suction. The other, 8 mm. dia. and for use with the spraybar installed in the back wall of the intake, gives a very large choke area of no less than 50 sq. mm. for ultimate free-flight contest performance.

Quite a few MVVS engines have passed through our hands over the years. In general, they have been well made and this example is no exception. The D-7 has the usual 15 x 14 mm. bore and stroke (2.474 c.c. or 0.1510 cu. in.) and checked weight was just under 168 grammes (5.91 oz.) or 193 grammes (6.80 oz.) with MVVS silencer. The latter is a simple expansion chamber type, 24 mm. o.d. by 125 mm. long with a 6.5 mm. i.d. outlet.

MVVS D-7 crankshaft and prop drive assembly showing large valve port and replaceable prop screw, a useful device in 'heavy' landings.



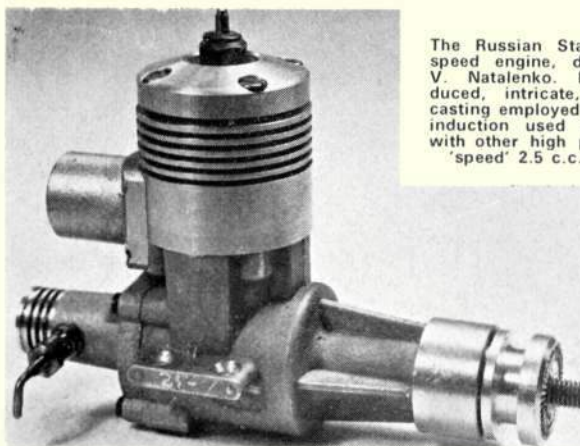
### Natalenko 'Start'

In the U.S.S.R., the average production motor falls well short of the standards of performance necessary for competition purposes and, as a result, the engines used by Russian contest flyers are either specially built or, in a few cases, imported. A typical 'special' is the 'Start' 2.5 c.c. piped speed engine designed by the well-known Russian speed flyer, Natalenko. Natalenko's best per-

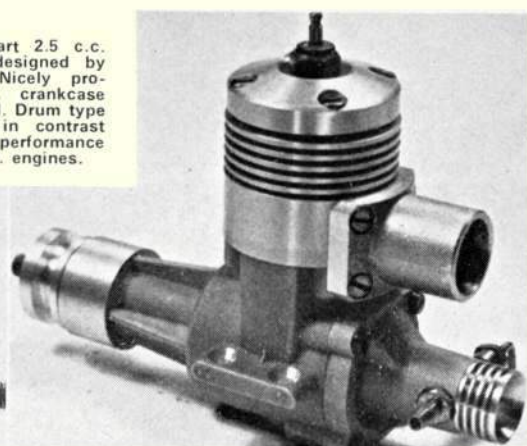
formance in a World Champs with one of these engines was in 1968 when he recorded 149.8 m.p.h. for sixth place.

It is interesting to compare the design and construction of this with current western 2.5 c.c. speed motors and, as a table of data was included in last month's L.E.N., on three of these, we will start off by listing the equivalent statistics for Natalenko's engine:

<i>Nominal Bore and Stroke:</i> 15 x 14 mm.		<i>Piston/Conrod Assembly</i>	
<i>Nominal Swept Volume:</i> 2.474 c.c. -		Total Weight:	7.4 gr.
<i>Stroke/Bore Ratio:</i> 0.933 : 1		Piston only:	4.9 gr.
<i>Checked Weight, less pipe:</i> 185 gr. - 6.52 oz.		Gudgeon-pin only:	0.9 gr.
<i>External Dimensions</i>		Connecting-rod only:	1.6 gr.
Length, prop driver to intake:	98.6 mm.	Gudgeon-pin dia.:	4 mm.
Overall Height (less plug):	67.5 mm.	<i>Porting</i>	
Crankcase width:	27.4 mm.	Scavenging System:	Schnuerle, rear exhaust
Width across mounting lugs:	41.5 mm.	Induction System:	
<i>Bearings</i>		Rear rotary drum valve	
Main (ball journal):	7 x 22 mm., 7-ball	Exhaust opens:	80 deg. BBDC
	5 x 16 mm., 6-ball	Exhaust closes:	80 deg. ABDC
Big end:	Plain, aluminium,	Transfer opens:	63 deg. BBDC
	1 oil-hole	Transfer closes:	63 deg. ABDC
Small end:	Plain, aluminium,	Third port opens:	65 deg. BBDC
	1 oil-hole	Third port closes:	65 deg. ABDC
Drum valve:	10 mm. dia. hardened steel running in plain aluminium.	Rotary-valve opens:	20 deg. ABDC
<i>Crankshaft</i>		Rotary-valve closes:	55 deg. ATDC
Main journal dia.:	7 mm.	Carburettor choke dia.:	8.0 mm.
Crankpin dia.:	5 mm.	Effective choke area:	34 sq. mm.



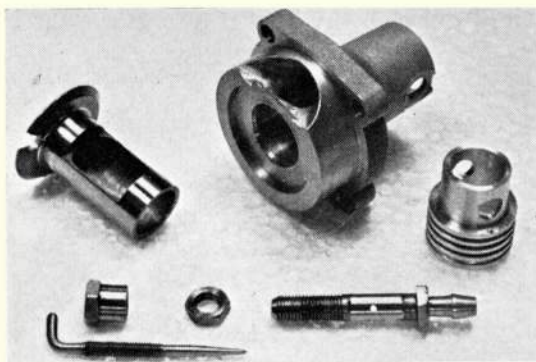
The Russian Start 2.5 c.c. speed engine, designed by V. Natalenko. Nicely produced, intricate, crankcase casting employed. Drum type induction used in contrast with other high performance 'speed' 2.5 c.c. engines.







'Start' shaft has peripheral counterbalance slots without sealing rim. Note extensively cutaway piston skirt. Con-rod shank is oval section.



Induction components of the 'Start' show the drum type rotor and housing, intake venturi and needle valve assembly.

Designwise, the Start is interesting and from the construction standpoint it is unquestionably the best Russian motor that we have seen to date. The quite intricate crankcase (probably an investment casting) is very neatly executed and all machining is to high standards. Particular attention has been paid to the cylinder ports and passages to smooth out directional changes and eliminate pockets. Tapered channels are formed in the outer wall of the cylinder-liner and these line up with the three transfer channels in the upper part of the crankcase and in the finned cylinder-jacket that is pressed on, or shrunk on, to the upper part of the liner. The ports are carefully shaped and angled to direct gas from the two main transfers across the piston and away from the exhaust port. The inclined third port, opening just before the main ports, deflects gas upward into the combustion chamber. As on the TWA 15 (to be dealt with shortly in L.E.N.) the piston skirt is cutaway at the front to aid gas flow to the third port.

In contrast to the disc-valve induction system of the TWA, Kosmic and G.15RV or the shaft-valve of the Rossi, the Start uses a drum type rear rotary-valve. The valve is of the 'reverse-drum' type (i.e. as on the rear-induction O.S. H.60) in which the mixture enters the open rear end of the drum and is released into the crankcase via a rectangular port in the drum surface, through a slot in the upper part of the drum valve housing. On the Start, the slot is offset slightly in the direction of rotation. The advantage of a reverse drum rotary-valve is that it is possible to use a larger bore gas passage than would be practicable without weakening the crankshaft of a shaft-valve engine. In addition, the incoming charge, being directed upward, should help to cool the piston. It also

offers greater crankcase packing (for increased primary compression) than does a shaft-valve layout. Admittedly, a drum valve causes extra drag but this is, to some extent, offset by the fact that a smaller crankshaft journal and smaller bearings can be used. (This latter point is not fully exploited with the Start, the larger of the two Russian-made bearings having a 22 mm. o.d.). On the other hand, many of the advantages claimed for the drum also apply to a well-designed disc valve system.

With a modern FAI speed engine, much depends, if ultimate performance is to be reached, on the cylinder-head: its shape, its fit within the cylinder-bore, combustion chamber shape, compression ratio and piston-to-squish-area clearance. Our example of the Start has a small diameter truncated cone-shaped combustion chamber with conventional glowplug and surrounded by a 2.7 mm. wide squish-band. Others may, of course, have different heads.

This particular engine was supplied without a pipe and its peak on-pipe performance is not known. This Natalenko design, does, however, appear to have been the basis of one or two other Russian specials, both speed and free-flight. For example,

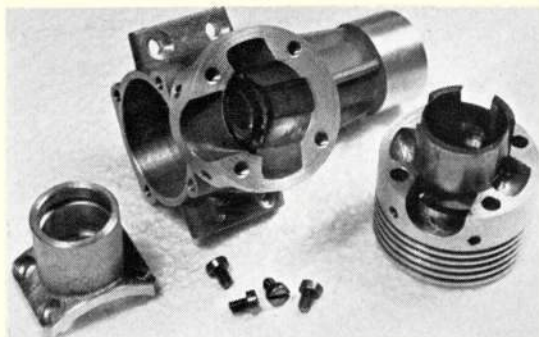
fourth place man in the recent World Free-Flight Power event, Eugeny Verbitsky, used an engine of very similar general design.

### New McCoy Stunt 40

We have just received two examples of the first of the new 'Series 21' McCoy engines. This is a .40 cu. in. motor intended primarily for control-line stunt use. Other engines scheduled for introduction under the 'Series 71' label include .19, .29 and .35 cu. in. standard models and R/C versions of all four.

There will be a fully illustrated description and test report on this new McCoy in *Aeromodeller* in due course. Meanwhile, we should point out that the 'Series 21' is a totally new model, quite different in design and construction from the McCoy's offered during the past decade or so. Distinguished by an unusual crankcase design of rectangular shape with horizontal finning, it has a ringed aluminium piston instead of a lapped iron one and a black anodised cylinder-head with hemispherical combustion chamber. Although the price is somewhat higher than for the previous 'Red Head Stunt' series, our guess is that this will prove to be a better engine all round.

Neatly executed Schnuerle type porting system of the Natalenko Start engine. Note bolt-on exhaust duct for tuned pipe.







One end of the 'work hangar'. Some came with kits, worked day and night assembling them to enter the competition later in the week - always a feature of these Nationals!

Bob Meuser,  
camera in  
hand, reports  
on free flight  
at the

## 1971 U.S. NATIONALS

CHICAGO IS IN THE HEART of the Midwest, but if the word 'West' evokes an image of wide open spaces and people running around in cowboy suits and ten-gallon hats (pardon, 38-litre hats) saying *Howdy, pardner* and *they went that-a-way* you are in for a shock. Actually, Chicago and its suburb, Glenview, site of the Nats, is about as far east as a Californian would care to go, and half as far from New York as from San Francisco. And it isn't called the 'windy city' without reason; winds from 15 to 20 m.p.h. in the morning, increasing to 25 in the afternoon were typical. Couple the strong winds with a one-half by one mile field with the wind usually blowing crosswise; difficult access to the surrounding area - only one gate was open, and that was usually in the wrong direction, and was closed and locked at 4.30 p.m. a half hour before flying ceased - and hostile surroundings consisting of residential areas, cornfields, and Lake Michigan (some models were returned by friendly yachtsmen). Now you have what free-flighters dream about - in their nightmares!

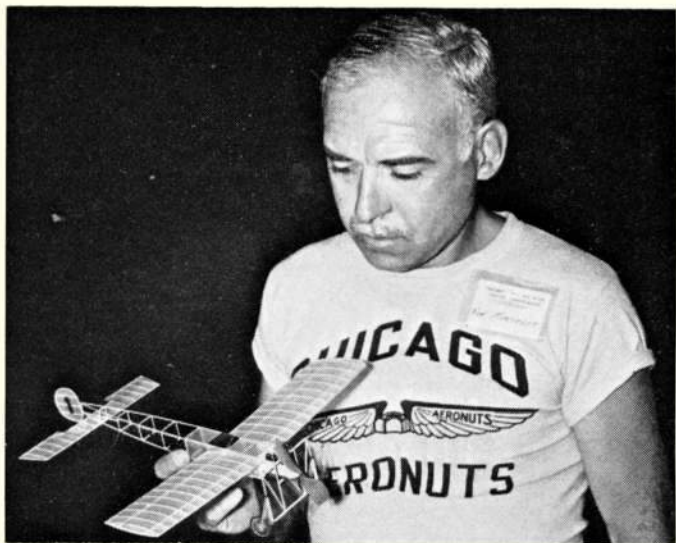
Without the Navy the Nats could not exist. They furnished the field, barracks and a camping area for the contestants, quarters for the officials, a hangar with workbenches, their mess facilities (that's Navy-talk for

Ron Martlet's tiny Peanut Scale 1911 Cessna. 'Peanuts' are limited to a 13 in. wingspan, fly for about a minute handlaunched, an 'unofficial' nats event.

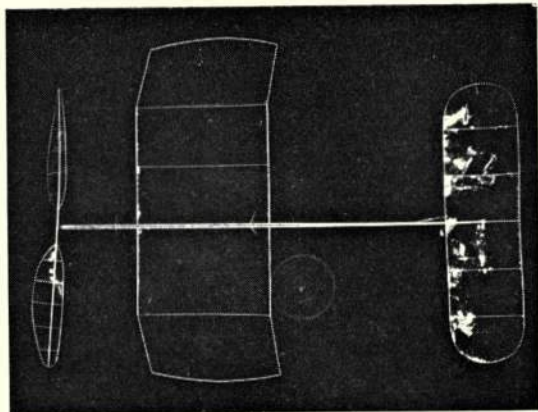
'cafeteria') the timers for the free-flight events, and a well equipped, enthusiastic and efficient Model Recovery Crew, to name a few. Why they could not have opened another gate, one more in line with the usual drift direction, is at the very least, somewhat obscure. *Because it has been welded shut* was the rumoured reason, but to prove a point, the gate was opened by 'vandals' at 3 a.m. one morning with their bare hands - and firmly re-welded shortly after daybreak by the Navy! The speed limit on the runways, accord-

ing to the Navy *gendarmarie*, but not posted, was 10 m.p.h. and you could expect a 'ticket' if you did much more - an exercise in frustration if your model is drifting away at 20 m.p.h. toward the welded-shut gate! But where would free-flight be without the luck element that permits even the least adept of us to take home a trophy occasionally?

In the Indoor events, much of it seemed like a re-play of the tape from last year: Jim Richmond won Paper Stick and Microfilm Stick with the same models as last year. Marty







Above, Jim Richmond's 1-gram F.A.I. model. Similar grotesque proportions have evolved in Pennyplane, which also has a span and minimum weight limitation. Interesting development for the new rules by a top 'indoor' expert.

At left, Mel Schmidt and helper keep their eyes peeled for thermal evidence or another model to piggyback. Took 2nd in Coup d'Hiver event.

Thompson again won Hand Launch Glider, but this time in the Senior age bracket, with a better two-flight total than made by Open winner Rudy Kluiber. Many broke the one-minute mark but none exceeded 1:05. Top indoor scale points were again taken by MacIsaac's Hawker Fury I, spearhead of Britain's air defence of the early thirties, but when it came to flying, where most of the points are made, the 1911 Cessnas had it all the way; Bucky Servaites got 3-min. out of one, which helped him win the Grand National Championship for the third time in a row. Five new national records were set,

California's Sal Taibi fires up his K&B 29 powered *Starduster 600*. Sal, a tool-maker, is now retired and has more time to devote to his kit-manufacturing business.

most of them in the Junior and Senior age categories, and the Open Cabin record changed hands five times before it was finally clinched by Ron Plotzke.

The outdoor power events saw a definite trend toward a smaller ratio of wing area to engine displacement, evolutionary reaction to the short motor run, short max rules that have been in effect at the Nats for three years, and which appear destined to become part of the general AMA rulebook, which itself is a reaction to the gradual loss of sites suitable for a five-minute max. A few new designs were seen such as Don Chancey's

Mike Hallum flew 480-sq. in. version of Mathis's *Rambunctious* in both B and C Gas. Sr. division using Super Tigre engines. Won in Class C.

recently kitted *Mini-Pearl* with which he won Open 1/4A. Mike Hallum's 480 sq. in. version of Mathis's *Rambunctious* which won Senior B-Gas, but for the most part, *Dusters*, *Galaxies* and *Witch Doctors* prevailed. Peter Allnutt failed to make it three in a row in Nordic, yielding to Frank Wolff, who also became Free Flight Champion, but made up for it by winning Wakefield. Unlimited Rubber saw a preponderance of big high-rubber-to-total-weight-ratio models, but even they came down in two minutes when they hit a 'hole'. Boo Siffleet was the winner with 7 maxes plus, a tribute

Charlie Sotich launches his *Fizz-Dip* Jetex-150 powered Rocket model. Despite the rather variable performance of these engines, Rocket is popular at the Nats, although seldom seen elsewhere.



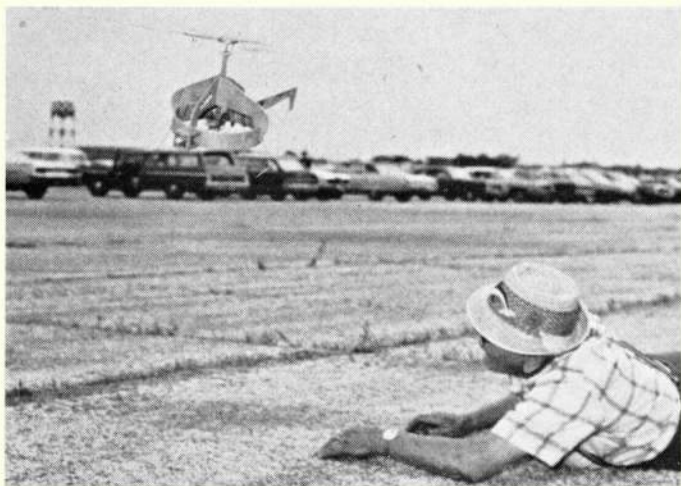




to his thermal hunting and retrieval skill.

You can read the dutifully encribed listing of who won which event at the Nats, perhaps even commit it to memory, and still not have the faintest idea of what the Nats or Free-Flight is all about. Maybe this will give you some idea. The Helicopter event is a standard event at the Nats, but only eight or so enter it, and fewer watch it. Since 1962, as far back as my records go, Glen Lee and Dr. Lee Taylor have had it all to themselves, but another name has appeared each year, somewhere between second and fourth place; that of William Ellerman. This year, Ellerman had more than his share of problems – each time his chopper landed something broke. But Ellerman, with the help of

**William Ellerman 'gets down to it' to launch his helicopter entry – note the 'fuselage' encircling propeller of this torque-reaction machine.**



Dave Linstrum's entry in the unofficial Pennyplane event. Weighing three grams, the weight of a U.S. penny, and limited to a span and length of 18 in., they have flown for 15 min. 44 entries!

the modellers he was competing against, got the thing epoxied and soldered together again for another flight – and another repair session. When the points were tallied up, Ellerman had won, and probably no one was happier about it than Glen Lee, who was one of those who had helped him with the repairs, although Glen was forced into second place after winning the three preceding years. Ellerman is 83 years old!

Unco-operative weather, retrieval problems, and lost models are indigenous to free-flight, and although we got more than our share this time, most will come back to do it again at the next Nats.

## READERS LETTERS . . . . .

Dear Sir,

I would like to pay my personal tribute to a very dear friend, Mr. H. T. Jackson, who passed peacefully away on Friday, the 20th August, 1971, aged 68 years, still engaged in modelling at the time of his collapse.

Many readers will remember him for his enthusiasm in all modelling spheres. He was one of the founder members of the S.M.A.E. connected with names like C. F. Bullock, C. E. Bowden, E. Riding, etc., in the pre-war days at Wimbledon Common.

In the past 25 years he was an active member of the Watford Model Aero Club, the Watford and District Model Boat Club. Also a very keen railway and model engineer, many will remember his exceptional 2½ in. gauge Royal Scot, and 3½ in. gauge G.W.R. Bulldog. He made many free flight World War I aircraft including the Avro 504 K, which won the Concours d'Elegance at the All Britain Rally at

Radlett in 1952 and his outstanding model of the River Dart Paddle Steamer, 'Compton Castle', was the winner of the Suzor Friendship Trophy 1969. In the subsequent year, 1970, he won the same trophy with his model of 'Kiloran', another Dart Steamer.

A great man, whose enthusiasm fired my imagination and many others to be more adventurous in the modelling field.

With many very happy memories of his friendship I have written this inadequate tribute to a very dear friend.

John Darnell.

Leavesden, Herts.

Though perhaps unknown to most aeromodellers, 'Herbie' Jackson was a great, very active personality. He alone could claim to have seen 56 Squadron depart Landen Colney in their SE5s for France, recall the colour schemes and yet make individual models of latest light planes for their owners whom he met each Sunday at Elstree. Herbie's

scale models are legendary. It seems such a pity his fame should come in an obituary but being a modest man, he never sought publicity.

Dear Sir,

Whatever happened on page 432 of the August issue? That is very much the Gee Bee Model Z, not the R-1. Since *Scale Models* had a flying scale drawing of the Model Z not so long ago and it's not too many years since you published the definitive drawing of the R-1 (*Aero Modeller*, April 1965), it would seem worthwhile to put the record straight on this one.

H. Robinson.

Greenford, Middlesex.

. . . and as the author and draughtsman of the very fine article in the *Aero Modeller*, who should know better than Harry!

Actually, our caption information came from the official Nationals results list – so which type was being judged?



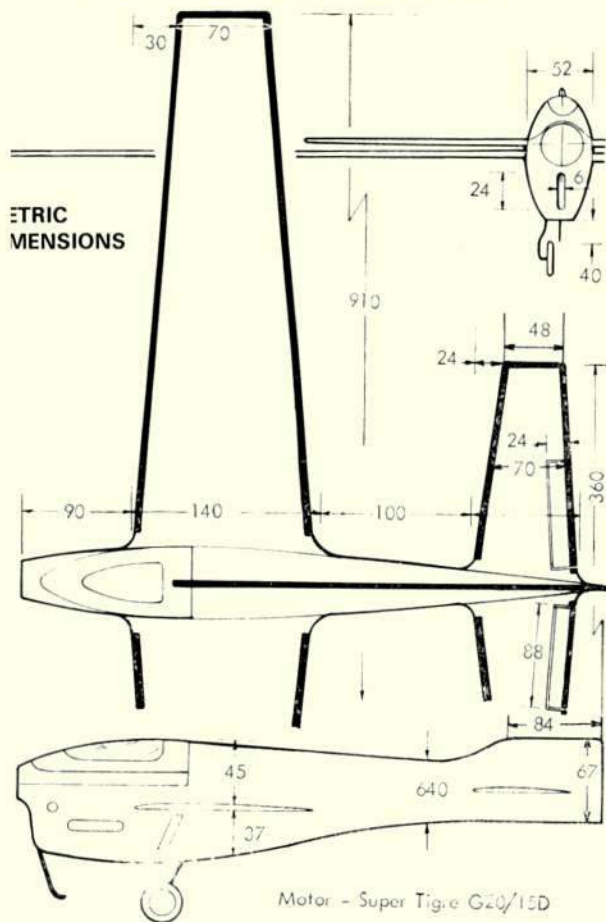
# CONTROL LINE DEVELOPMENTS

as seen at the

## CRITERIUM OF EUROPE

THE TOP ROSSI 15s in the speed circle were certainly pushing out plenty of power. Frohlich, for example, with his much modified version recorded 28,000 r.p.m. on a 6 in. x 3 1/4 in. glass fibre 'club' test prop, while Fontana achieved 29,000 r.p.m. with a standard Top Flite 7 in. x 3 in. wood. To see the rev counter needle jump from 26,500 to this higher figure, as the pipe came 'in' was quite a revelation. It also shows the value of such a power booster, and it is interesting that while the pipes seemed to be standard Rossi fittings, they worked so efficiently at this r.p.m. level—a look at the review of this motor by Peter Chinn in last month's *Latest Engine News* shows that the manufacturer suggests an operating r.p.m. of 26,000! They are certainly not as

### KARBUNKLE by Nore/Ekholm F.A.I. TEAM RACE WINNER



critical as some—no doubt the gentle taper of the cones accounts for this and contrasts with the Moki's 'peaky shape'. As a sad footnote, our team's piped T.W.A.s could hardly match the Rossi's *unpiped* speeds...

Frohlich has obviously tuned his motor to the limit, anticipating just two 'runs' per piston/cylinder, while Fontana's factory prepared version lasts for 30-35 flights. He runs his motor rich to preserve it, but says that the last five laps are usually over 240K/ hr, with 243 being the best recorded score. The motor now is to be saved for next year's World Championships.

Another price to pay for the hot performance is the high fuel consumption — Bilat's Rossi needing eight turns of the needle to operate, this being reflected in his enormous (40 cc) tank.

Few modellers used sheet metal flying surfaces this year, balsa reinforced with spruce being considered adequately strong and lighter, apart from the added advantage of being easier to 'work'. Frohlich's model, while appearing to have metal wings, in fact had a balsa structure covered with silver Monokote — the only speed model seen to utilise this Mylar film. Both Dusi and Fontana had quickly detachable glass fibre helmet cowls providing easy access to the tank and dolly switch. Brian Jackson brought along an asymmetric *Pink Lady*, as used by Arnie Nelson at the '70 World Championships. Despite its supposed advantage of less drag (due to an extra 6 in. of lines being 'faired' in) it proved to be 3-4 m.p.h. slower than his normal model — possibly increased yaw was the culprit.

Ove Kjelberg, whose home built motor was illustrated in the September issue, used a novel approach

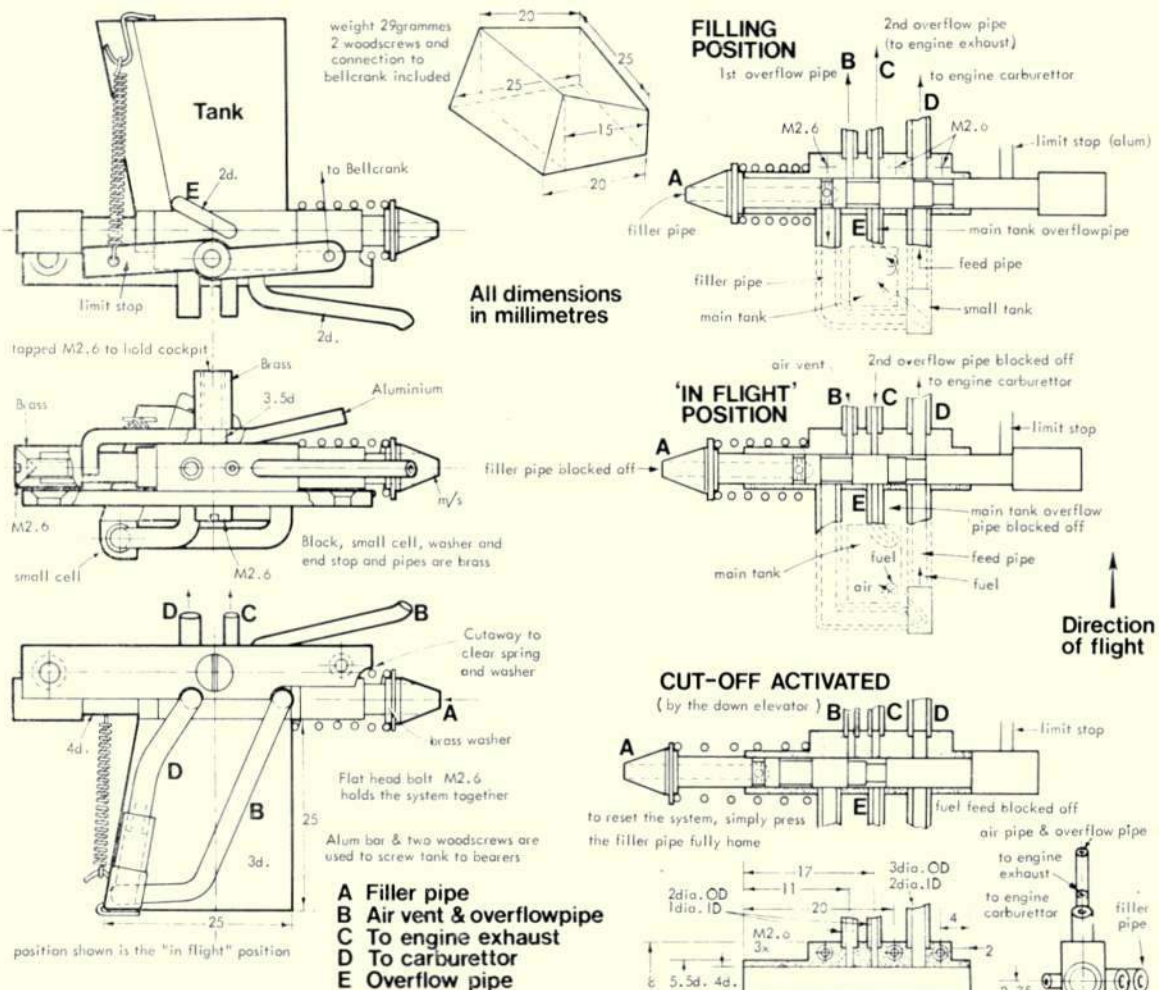
Louis Bilat needed this 40 c.c. un-flow tank (with the unusual addition of a pipe-pressure fitting) to achieve the necessary ten official, as well as the preliminary acceleration laps. Note the dolly operated fuel switch mounted on the rear of the Rossi 15.





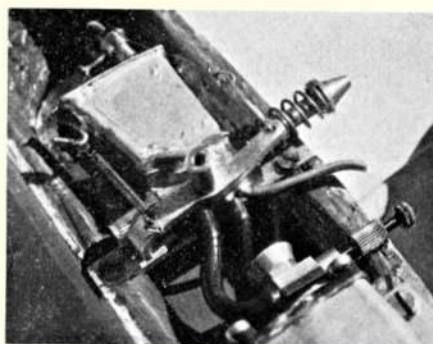
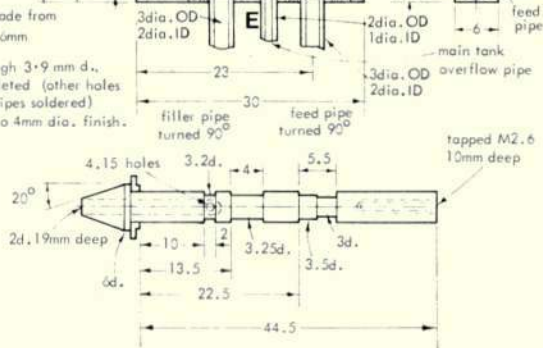
# Paul Schipper's chicken hopper team race tank

featuring combined fuel cut off reset button and pressure refueling valve, with automatic exhaust prime.



VALVE BLOCK made from  
BRASS: 32 x 8 x 6mm

hole drilled through 3.9mm d.,  
construction completed (other holes  
also drilled and pipes soldered)  
and then reamed to 4mm dia. finish.





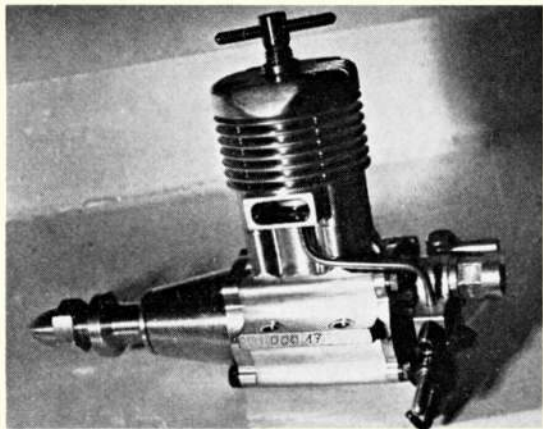


Neat installation of Hasling's HP15 motor in his team racer. Extensively lightened crutch mounting was made by his brother. Note circular bellcrank employed - also lightened. Complete model weighed just over 19 oz.

to his spraybar arrangement. He had a K & B type of annular ring carburettor, but with a narrow bore tube taking the fuel mixture to the centre of the choke bore for better fuel distribution and efficiency. In common with the Rossi's he used a Cox head insert - the designers of the Tee Dee range certainly seem to have hit upon the ideal head shape.

Although all the speed engines were engraved at the processing stage, no subsequent checks were made that the same motors were used throughout, and at least one team was suspected of passing the 'best' motor amongst themselves.

Paul Bugl's latest team-racing diesel - seen as a non-competing prototype at Pecs - is an impressive looking piece of work with some novel features including a fuel shut-off valve and exhaust priming device built on to the rear induction unit. Overall design shows a certain similarity to the earlier Bugl-designed HP 15 in the use of a large diameter drum or bell type induction valve, side-exhaust Schnuerle porting (but this time without a third port), long crankcase barrel with detachable front and rear components and a longish shaft. The cylinder casing is split horizontally just below port level to facilitate the machining of the transfer passages. A patented method of attaching the small end of the conrod to the piston is employed and the piston itself is of aluminium running in a hard-chromed liner. It is anticipated that about 200-300 of these engines will be produced annually.



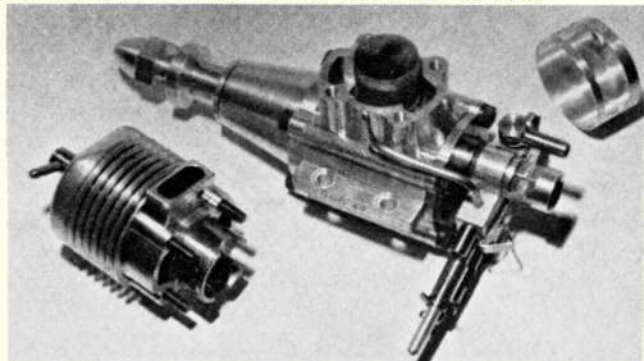
The Bugl which was used (by Fischer/Straniak and illustrated last month) was a special long-shafted version of the above mentioned prototype. This long shaft was not just a gimmick. The motor is designed for running at high r.p.m. (at least 3,000 higher than the original HP15D) and this necessitates a smaller diameter propeller, less efficient due to the large frontal area of the engine cowling immediately behind it. The long shaft enabled the nose section to be much smaller in cross-sectional area, thus restoring the prop's efficiency.

Another interesting team race motor was Rumpel's much modified G.15. This was a diesel converted version of the G.15 glow engine (preferred for its parallel, non-tapered bore) fitted with a copper cylinder head for better cooling, and equipped with a home-made Cox .049 type venturi in the interests of economy. An exhaust priming device from the tank overflow is also fitted, as was a very neat, simple, fuel cut-off, the whole mounted on a light-weight alloy pan. The pan was made by Brendel (who uses a similar motor, less the copper head) and this is available to enthusiasts for 10D.M., including the perspex canopy, but in an 'unfinished' state.

Hasling, one of the unluckiest competitors of the meeting, still uses an HP15D although he is desperately in need of spares (any offers of help will be forwarded). The motor is entirely standard except for the regulated exhaust auto-priming system, and will achieve 100 m.p.h. for 25 laps with the old MVVS style Bartels glass fibre prop. This pod and boom type model is covered entirely with two layers of 0.4 mm glass fibre cloth, with the exception of the starboard wing, which has three layers. Despite all this strengthening, the glass fibre adds just 3 oz. to the bare weight of 6½ oz., total ready-to-fly weight being 19½ oz. - quite an achievement. The model features plenty of crankcase cooling, which certainly paid off as his motor was unaffected by the conditions.

A protest was made concerning Molnar/Kuti's model which featured the cylinder head flush with the bottom of the cowling, hence clearly visible externally. However, the protest was over-ruled when it became known that the model had been processed, and accepted, for at least three previous International and World Championship events. How this came to be is hard to understand, rule 4.3.4. (i) of the F.A.I. Sporting Code reading 'The motor(s) must be entirely enclosed including the cylinder head and the body of the carburettor...'

The Bugl Prototype diesel, which may soon enter limited production and should prove to be most interesting. The fuel shut-off is an integral part of the engine. Note how the crankcase is split to ensure accurate machining of the ports.







## Aerobatic Observations

by Steve Blake

AT LAST the age-old battle for supremacy between the large and small stunters seems to have resolved itself in favour of the larger types. Only three 35s figured in the top ten places at Pecs, and since the MVVS 35s used by the Czechs are as powerful as most 40s this figure can be reduced to one (the writer's Fox 35). Personally, I maintain that a smaller model flies more accurately, particularly with respect to the radius of the 'square' corners. However, like it or not the big models are here to stay, and it is the *Nobler* sized models that are going to look out of place.

The majority of competitors used wooden props, but nine chose nylon types. Significantly, all of these were used in conjunction with large motors, and five were Tornado three-bladers. This confirms my own feelings on propeller materials—that nylon is only competitive in the large sizes.

Silencers were obligatory for the first time at this year's meeting. I went to Pecs expecting to see a collection of 'legalisers' rather than silencers, but surprisingly the vast majority had made a sincere attempt to produce 'quiet' silencers. In fact exactly half the competitors used home-made types. Without exception everyone used a conventional expansion chamber approach, and no attempts were made to install them inside fuselages. It seems unlikely that any significant changes in silencer technology will be forthcoming in the near future. Venturi type designs tend to give unpredictable burst of power, and are therefore useless for control-line stunt, where a smooth flow of power is far more important than the amount of power available. Neither does it seem likely that many people will attempt to fix their silencers inside the fuselage and will continue to take the easy way out. However, for those prepared to undertake some development in this field, there could be some useful benefits, such as a worthwhile reduction in drag, and a reduction in weight at the extreme forward fuselage.

With the increase in engine and model sizes, line lengths have also increased—most competitors used very close to the maximum length allowed. This is

The Italian aerobic team consisted of (l to r) Compostella, with his most attractive Macchi 202, Rossi, seen here with his reserve model used after an earlier prang, and Cani, with a slim fuselaged, semi-scale Hawker Typhoon.

a major reason against the use of a small model on short lines. Judges faced with a predominance of large models on maximum or near maximum length lines get used to the larger manoeuvres they generate. When they are faced with a smaller model they will have to work hard to compare it with the new norm.

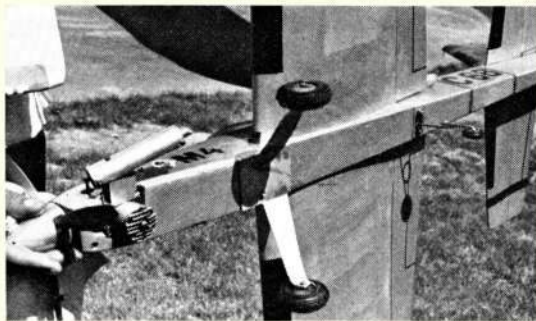
Detachable wings are slowly gaining in popularity, this year I counted five. Most people assume that easier transportation is the primary reason for them, but although this is true, I feel that their other advantages are much more important. On my own *Starmaker* the detachable wings are just one part of an overall concept. They simplify building by providing smaller pieces to work on, and simplify trimming as a screw adjustment is incorporated in the rear pushrod. In addition new developments can be tested by building a new fuselage or wing as required, maintenance and repairs are simplified too.

I now have two types of detachable wing models flying, both have proved entirely satisfactory and I would estimate the increase in model weight due to the wing fuselage at about 1 oz. (*Starmaker* weighs 43 oz. total).

One fascinating effect noticed was that almost everybody's models flew with their outer wings down, as though they had too much tip weight. Since this effect was seen on all the best models, which are normally perfectly trimmed, of course, I believe that the explanation must lie in the weather conditions, i.e. air pressure, or perhaps humidity, and this strengthens my opinion that as many parts of a stunter as possible should be trimmable.

Summarising, the fashion is a model of 650 to 800 sq. in. wing area, powered by a 40 or 45 engine driving a relatively small prop, and flown on 68 to 71 foot lines. Unfortunately there are problems for anyone wishing to follow this trend in Britain. Firstly S.M.A.E. rules require motors over .40 cu. in. to be flown on heavyweight lines, which makes them uncompetitive. Secondly, most competition flying sites are marginal in size even for smaller models. The circle at Pecs was in fact exact size, and did not allow for the extra line length of the pilot's arm. It is hoped therefore that the S.M.A.E. can be persuaded to fly control-line stunt entirely to F.A.I. rules. This change should be made before next season, as it is hoped that many international entries will attend our Nationals.

Bela Czetti used an unusual U/C arrangement with the 'tail' wheel mounted forward of the wing trailing edge, making his take-off and landings with the tail high at all times. Note also large silencer on the Moki 40 and three bladed nylon propeller.







# CLUB NEWS



PERHAPS IT IS A QUESTION of where you live, but it is surprising how many places there are where model planes can be flown, in spite of all the jeremiad stories we hear to the contrary. It is true that few of these open spaces are suitable for large scale events, but can suitably accommodate club and week end flying without undue restriction. Generally, you can say, there is still ample scope, even in our cramped little island, for model flying of all types, and that's something we should all be thankful for.

J. E. Glen, writing to us on behalf of the **Scottish A.A.**, gives news of the contest scene over the Border, and he sums it up in three dire words: *gale force winds*. The events he describes, however, were all held in the earlier, more turbulent part of the year, and we trust that our Scottish friends, too, have enjoyed a similar bright mid-summer to that which has kept the model boxes open down south. To give a quick run down on the Scottish events. Control line: Not much interest shown in team racing—only the F.A.I., class competed in, but Combat more lively, with a hectic battle between Glenrothes and Motherwell. Free flight: In the first event, for Open Glider, models were being borne away so rapidly on the rampant winds that even at the 2 min max the recovery teams would have earned a fortune on a sponsored walk. Won by M. McManus of Clyde Valley. Attempts to run the Caledonian Inter Club event were frustrated by a double onslaught of bad weather: wind plus rain on the first outing and gale driven sleet on the second. Battering winds again for the radio events. The *Caledonian Shield* Spot Landing comp was very much off the spot for most of the entrants; only three out of the eight entrants getting within the 30 metre qualifying distance. Winner: S. McAra of Clyde Valley. A fair day, though, if still somewhat breezy, for the Motherwell fly-in. Five events on the agenda: F/F Power, Chuck Glider, Combat and R/C Spot Landing and Limbo. A good day's flying, even if Radio did not get quite the hoped for support.

The last time I saw Chobham Common it was not a pretty sight. The motorway workings, scything right across the useable area of the common, didn't seem to leave much accessible ground to fly on. Perhaps, though, conditions were not so bad back in June when the **St. Albans M.A.C.**, held its Summer Gala. Gordon Hannah sends us a report and results of the meeting. The weather forecast was off-putting to say the least, and only the 'do or die' nucleus of F/F fanatics were expected. As things turned out the organisers were pleasantly surprised to find there were more fanatical fanatics in the London area than estimated; enough, in fact, to make the contest viable, and to keep the host club, which had laid on all those gorgeous trophies, out of the red. Case of toll for the brave, though, for not often, even on choppy Chobham, are conditions such that a 2 minute max is imposed. But with the wind gusting at 20/30 m.p.h., the limit was well justified; models reaching the dreaded tank factory fence at approx 2:20. By way of instilling a little regularity into the usual Chobham anarchy the events were flown in rounds, something rather unique in Open contesting. This gave opportunity to vary the max if necessary, and made for a little competitive drama

throughout the day, thanks to an up to the minute scoreboard.

Having had a model lodged tantalisingly in a dense clump of arboreal fungus recently, I can sympathise with those visiting modellers to the **Shuttleworth Veteran Aeroplane Society's** Model Section Open Day, who had to leave their models in the surrounding trees. Apart from this misfortune the day was a most successful one, not least from the weather point of view—a good old fashioned spot of near calm. Ideal conditions for free flight scale, as they can be exhibited slow flying, at close range. Let us hope that the tree bound models found their way back to their owners; a scale model is a lot of love's labour lost. Report from Mick Staples.

Unusual event featured on the **Nottingham M.A.C.'s** contest agenda was one for a 36in. formula glider contest. We are not given any formula details, but Bob Tebbutt, the club P.R.O., tells us that there was a good turn of o/d models. But it all boiled down to a question of experience, for the man with the eye to the right spots of lift was the wise old man of F/F, Ken Oliver. He put up the best set of times with R/C flyer, Kevin Gillings, coming a signal second. Ken Oliver also proved that he could wind 'em as well as pull 'em, for he also won the club open rubber contest, thus accruing many useful points towards the *Grain Trophy*, awarded for overall contest performance. The club C/L event, though flown in atrocious weather, was made colourful by the assortment of semi scale models which took the field, notably two *Kitty Hawks* and a *Mustang*. And it was a *Kitty Hawk*, Bill Draper's Merco 35 version, which won the day. Second was another stunt flyer of note, Barry Parkinson. He flew a *Crusader*. In the Combat event, however, Bill Draper had to concede victory to Grandad Dennis Orange, who gave him no quarter. Combat, we are told, is something that runs in the Orange family—the model variant, of course. In Class A Rat Race, Richard Wilson's Oliver powered machine beat Ted Hewitt's hurriedly prepared entry in an exciting final of a well supported event. He also won B Rat Race. Other news is of a whole succession of club demos. Streamer cutting by large stunt models seemed to go down well with the crowds.

A booklet issued by the **Leicester M.A.C.**, is entitled *Leicestershire Model Flying Site Trust*. It sets in suitably professional terms the factors involved in the club intention of acquiring eight to ten acres of land near Leicester for the purpose of controlled flying. The major part of the fund is to be obtained by loan notes. These payable after ten years, will give certain concessions to the holder, such as membership fee reduction and priority use of the site. May we wish the venture the best of luck.

From the **Speke M.A.C.'s** newsletter *Exhaust Fumes* it would seem that the club demo enthusiasm is about to reap its reward. By providing displays at public functions the club will become entitled to a quite liberal grant from the local authorities. Immediate reaction, quasi-serious, was for the purchase of Copeman Oliver's, but the grant being conditional on the expenditure going on articles connected with the displays thoughts are centering on such things as



R/C Monitors, three line control units, rev counters etc. Cannot help feeling that the ebullient character who writes up the newsletter comes down a shade too hard on anyone who makes a joke apart from himself.

The title **Vancouver Gas Model Club** sounds very pre-war transatlantic. Actually the title was changed to V.M.A.C., but nostalgia had its way, and back it went to the old title. A feverish title, too, for the club mag - *Hot Head* no less. But its not all gas and gaskets, for free flight and indoor flying seem to get quite a good coverage. A report on the 4th Western Canadian F/F Champs., indicates a well organised meeting to serve a somewhat modest entry of 30. Weather eminently flyable, and the standard of flying high, in spite of the sparse field.

Problem: what happens when high flying model meets low flying aircraft? The answer is too gruesome to contemplate. Anyway, the **Watford Wayfarers** feel that the light aircraft lane traversing the club field presents a definite hazard, small though it might be in terms of collision possibility, and members are warned to keep models well below the passing light planes. Perhaps a bigger hazard comes from the helicopters which scuttle across at quite low altitudes.

A letter from the **Chester-le-Street Radio Model Club** makes clear the name we failed to decipher in the club's last report. For the record then, our informant is Harry Pugh. He says he is grateful for the publicity given by the last report, and now sends us news of a model rally held in July at R.A.F. Ouston. The Chester-le-Street club organised the radio events, which were Intermediate and Schedule Aerobatics. Weather was excellent, and much lively flying was to be seen both in the comps and in the various sports and scale fringe activities. Marring an otherwise tranquil scene was the usual spectacular crash. The report deals with this rather lightly, but I feel strongly enough about such could-be-lethal occurrences at meetings to suggest an enquiry should be held into the circumstances by the organisers. Back to the rally, though. Winner of the Intermediate class was Mr. N. McFarland of the Sunderland Club, and Schedule winner was Bill Calcutt of Chester-le-Street. An eye catching sight at the rally was the graceful soaring flight of an A.P.S. *Leprechaun* glider fitted with a power pod, coming as a nice counterpoise to aerobatic wizardry.

Concern in the **Buckaneers Models Club** over the all too apparent dangers of radio flying. In *Scimitar* reference is made to an incident at Worcester Park, Surrey, where a man was seriously injured by a model plane as it was coming in to land. Members are reminded that their own families are vulnerable on the flying field, and children -

indeed all non-flying persons - should be kept well away from the flying area. Picnics are safer when held near parked cars or perhaps among bushes than on the open stretches of the flying field. Where an accident does occur flyers are reminded not to divulge whether or not they are insured, nor perhaps, to assume responsibility, for that is the function of the court of law, and I think I am right in saying that the law has certain reservations about spectator involvement. And don't forget, you are claimed against, to the full extent of your means, whether you are insured or not. Of other news in *Scimitar* there is mention of a disappointingly small, but well crammed stand, at the Bletchley Arts and Crafts Exhibition. The club has also put on C/L and radio displays in various good causes, such as a Hospital Fund fete at Newport Pagnall and an event at Kempston for the Bedford Friends of the Deaf. Hard luck on Jim Mannall in his gallant but unsuccessful attempt to get a three year hat trick hold on the Nationals Gold Trophy event but sterling work on the part of Jim and Steve Blake in taking 3rd or 4th place in the same event. The club, incidentally, is a model 'mix', mostly boats and planes - and works quite well.

Should the Nationals be split into two separate events now that Radio has grown into a self operating organism of its own? Opinion on the issue was evenly divided at the June North Western Area Meeting, according to the *Message*. There were those who were loth to lose the jamboree spirit of the present all-together set up, and with it the unity that it gives to the movement. On the other hand the separating of the breeds would make everything that much more manageable, and could well anticipate the advent of 'radio assistance' at free flight events. An amusing item in the newsletter, culled from *The Guardian*, concerns the managing director of an electronics firm who was charged at a Stockport Court with speeding. His plea, unique in legal history, that he had a model plane type frequency monitor switched on at the time, and this had the effect of boosting the reading on the police radar set. However, these technicalities seemed to have been lost on the magistrate: he was fined £8.00.

Question raised in the **Flying Druids'** newsletter. Why do all multi models continue to look so depressingly like model planes instead of real aeroplanes? Opinion here is that semi scale layouts should be mandatory for competition radio models as they are in C/L team racing. Real looking miniature planes, it is suggested, could well bring the spectators back to multi aerobatics. True that models can be too squarishly functional in design, but should not a model plane exist as a flying machine in its own right? But square, round or what have you, the plane member Ed Johnson lies

## CONTEST CALENDAR

September 19th	<b>SOUTH MIDLAND AREA RALLY.</b> F/F: Open R/G/P/, Tail-less, Helicopter, Chuck glider, Junior Kit, C/L: Combat, Stunt, 1/4 A T/R, F.A.I. T/R, Goodyear. Pre-entry (15p) essential, to G. Johnson, 37 Oxford Rd., Kirtlington, Oxon. R/C Single Channel, Multi aerobatics (R.O.Y.G. frequencies only). Pre-entry (15p) essential, to D. Giles, 'Berron', 64a Station Rd., Bow Brickhill, Bletchley, Bucks. R/C 'Eyeball' Scale (Brown and Blue freq. only). 15p pre-entry (essential), to R. Edmonds, 16 Telford Way, Bellfield, High Wycombe, Bucks. F/F entries 15p on field. Venue Cranfield, Bedfordshire.	October 3rd	<b>S.M.A.E. CENTRALISED MEETING.</b> Team Rubber, F.A.I. glider, 1/4 A Power. Area Venues.
September 26th	<b>LEEDS D.M.F.C. RALLY.</b> A/2, Open Power, Open Rubber, Chuck glider. Combined 1/4 A, A/1, C.d'H 'mine comp'. A/2 to 7 flights (not rounds) - £5 min. first prize. 9.30 a.m. start at R.A.F. Topcliffe - S.M.A.E. members only.	October 3rd	<b>STAFFORD HURRICANES R/C SCALE DAY.</b> John Bagnall Trophy at Hixon Airfield. Nr. Stafford. Field entry, 11 a.m. start. Details D. Martin, The Laurels, 58 Mount Road, Stone, Staffs. (Phone: Stone 3003.)
September 26th	<b>LONDON AREA F.A.I. GALA.</b> F.A.I. R/G/P/ in Rounds, Round 1 ends 12 noon. C.d'H, A/1, 1/4 A, HLG. No spectators. At R.A.F. Bassingbourn (on A.14, Nr. Royston, Herts.).	October 3rd	<b>THREE KINGS STUNT CONTEST</b> at Croydon Industrial Estate. Silencers essential. Park in Imperial Way. Field entry.
September 26th	<b>S.E. AREA THERMAL SOARING</b> at Golden Cross Lewes, Sussex.	October 3rd	<b>WESTERN AREA C/L RALLY.</b> 'A' race, F.A.I. T/R, Goodyear, Combat. Entry 15p by 12.00 p.m. Venue R.A.F. Fairford.
September 26th	<b>C/L TRIALS FOR '72 WORLD CHAMPS.</b> Stunt, T/R, Speed. Venue: R.A.F. Cottesmore, Rutland.	October 9th	<b>NORTHERN GALA.</b> Open R/G/P, Team racing classes 1/4 A, F.A.I., B, R/C Fly for Fun. Pre-entry 25p (or S.M.A.E. Comp. Licence) to K. Attiwell, 11B Cousin Lane, Halifax, Yorks. Venue R.A.F. Rufforth (3 miles from York on Wetherby road).
October 3rd	<b>S.E. ESSEX M.A.C.'s 'KEILKRAFT AJAX' CONTEST.</b> 'One Model' contest. Full details D. G. Rolfe, 106 Parkanaur Avenue, Thorpe Bav, Essex. (Southend 87633). Venue Leigh Marshes, 2.30 p.m.	October 10th	<b>3rd ANNUAL HARPOLE STUNT COMP.</b> The contest with the built-in lunch! 75p entry inclusive of food and drink. Entries to I. Peacock, 41 Carrs Way Harpole, Northants. NB: Closing date for entries: 20th Sept. (first post).
October 3rd	<b>S.M.A.E. ALL SCALE MEETING</b> at R.A.F. Little Rissington.	October 10th	<b>CROOKHAM F.A.I. RALLY.</b> F.A.I. R/G/P C.d'H. Entry 15p (Juniors 10p). Five rounds (Rd 1 10-12 noon). Remainder one hour each. Re-entry in Rd 1 only. Venue, Chobham Common.
October 3rd	<b>LONDON AREA C/L CHAMPS.</b> Stunt and Junior Stunt CANCELLED. F.A.I. T/R, 1/4 A and Combat at Hayes.	October 17th	<b>WHITEFIELD M.A.C. 'KNOCK OUT' GALA.</b> Open R/G/P to Whitefield K.O. rules. Chuck Glider (N.W. rules). Combat. S.M.A.E. Members only. Entry by 11 a.m. Trophy plus plaques all events. Details M. C. Reeves, 25 Ashmont Drive, Mizzy Road, Rochdale, Lancs.

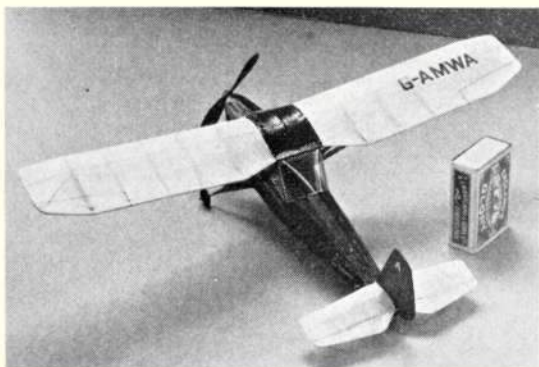


seems to have the right characteristics to win every club multi event this year, so that now he heads the score sheet to date by a clear 12 points. July, if you remember, brought in all that super flying weather. Not surprising, then, it was blue skies and zephyr breezes for the Army Fete at Carter Barracks. What a tempting Ack Ack target the models of the Flying Druids display team must have made as they ranged across the clear skies, and what a hit it would have been at a shilling a go. Finally, a snippet from the news-letter. Overheard on the flying field: 'It's been so long since I flew I've forgotten how to shake!'

The newsletter of the **Three Kings Aeromodellers** gives tidings of a big London Area jamboree to be held at R.A.F. Wyton, Hunts., on October 17th. Almost a mini Nationals judging by the flight programme. All classes in a wide variety of events. News, too, of a Navy Carrier event to be run by 3 K's sometime in September at Croydon Airport. The S.M.A.E. Carrier to be used if possible. And speaking of that carrier, a note here to remind us that Derek Bird won this event at the Nationals with his Grumman Guardian. And the model that came 5th in the Nationals Scale event was awarded the club Model of the Month Cup back in June: Wal Cordwell's *Gloster Gladiator*. Model is 48 in. span, nylon covered, with metal panels. Working flaps are driven by a servo operated from the handle. Lights go on when the flaps go down. Powered by a Merco .61 motor. It took further honours at the Shuttleworth Rally on 20th June with a first prize in the C/L section. At the same meeting Dave Morbin lost all his bottom teeth. Not his own but the shark gnashers on his model. Not to worry, for we are told there was plenty of jaw at the meeting.

This year free flight in the United States got quite a fillip from the success of the West Coast Nationals. Now renamed the U.S.F.F. Championships, it was held on an airfield that, even by larger than life American standards, is described as BIG. Entries were fabulous - over 500. News of this from the *San Valeers Satellite*, which goes on to say that competitors came from all over the States, some putting up in motels, but a vast field of them camping out on the site. Good T.V. coverage. Intriguing comment from the newsletter writer to the effect that the reduced engine run fly-off system 'stinks' - a hazard to free flight. Another item of news is that the San Valeers have given the thumbs down to remote control D/T action. Reason: transmitter control etc. would require extra organisation without increasing contest participation.

The Finchley & D.M.A.C. has sent along the results of its



Reader David Jane sent this photograph of his miniature version of the KeilKraft 'Pixie'. Span is just 12 in., length 8 in. and power is provided by a single loop of  $\frac{1}{8}$  in. flat rubber although a large paddle-bladed prop is really needed to make it fly properly.

Gala held on June 27th at Glebelands. There were 32 entries for A Combat and six for Stunt. Not bad, but where were all the Stunt flyers? Last year there were 13. Weather deteriorated during the afternoon when the wind got up and the sun went in. Had the good grace to calm down, though, for Jim Mannall's two flights. And gracious, too, the gesture of the Finchley club in giving Jim the Stunt trophy for keeps, having won it so many times.

The **Maidstone M.F.C.** now produce a newsletter under the editorship of Mr. M. V. Cook. He, incidentally, has been building his own R/C equipment - which is one way to overcome the money barrier. Outdoor flying in this club would seem to be mainly radio, but they also seem to do a spot of r.t.p. and other sheltered antics.

The July *Free Flight News* is mostly taken up with reports of the Free Flight World Champs. Some good illustrations of models and mechanisms.

Until next month.

Clubman.

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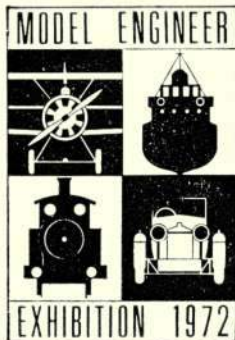
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BRYANSTON ROOM will be operating as the CLUBMEN'S CORNER with stands manned by the principal governing model bodies of the country, plus club units demonstrating, and offering combined club 'little exhibitions'. This hall will contain the TRACTION ENGINE entries.

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GALLERIES will provide sitting out space, spectator room and house additional club displays including our favourite BOYS' EXHIBITION.

## SOUVENIR GUIDE

Another CHRISTMAS EXTRA issue of Model Engineer will be coming out 2nd Friday in December.

\*Not Sunday

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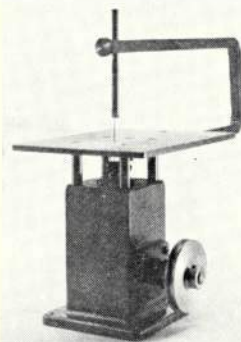
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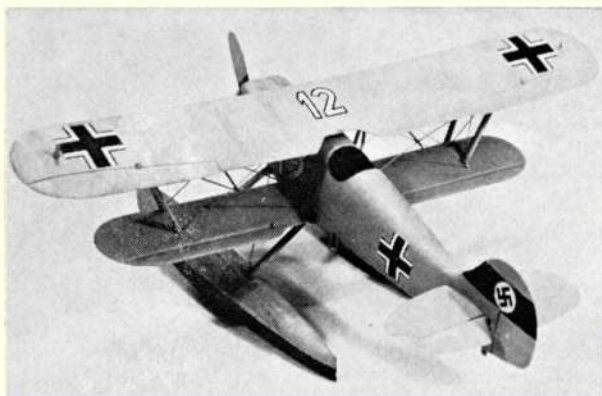
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To clear up the mysteries which appear to surround spray painting, a feature on airbrush finishing will undoubtedly open up new interests. That old favourite, the Ford Model 'T' is the subject of yet another conversion feature, and an entirely new shape in modelling, COLERAIN, the fire-fighting tug, is as fine a candidate for a radio-controlled ship subject as we have ever set eyes upon. Aircraft drawings include part two on Phantom markings, plus finest-ever drawings of the Heinkel He 51 biplane, a prewar classic with long-standing appeal.

Kit reviews include a seaplane version of the Heinkel, a Czech Avia biplane and the big 1/13th scale Alfa-Romeo Gran Sports Car. Book reviews are extensive, to cope with the increasing number of releases, and decals, too, are surveyed. In his Museum visit of the month, Terence Wise 'discovers' that Hull has five collections, so he deals with the Transport and Maritime departments, while Geoffrey Deason, the doyen of all card modellers, returns to print with his survey of the Wilhelmshaven 'Hamburg' class destroyer.

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Also featured are FULL-SIZE PLANS for SIGMA, a 54 in. span R/C Soarer, that can be packed away into a handy carrying case (plans also provided for easiest possible transport).

Other features in this new, king-sized format include the Soaring Scene with a report on the Sheffield Two-Day Soaring Meeting, Kit Review which examines the Avoncraft Chipmunk and Test Report which analyses the Kraft KP-2B system.

Regular favourites include Straight & Level by Peter Russell, David Boddington's Sport & Single column, plus Wave Lengths for R/C boats and the Radio Motor Commentary.

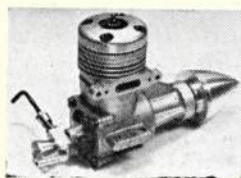
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PRESS DATE for November issue, 1971, 17th September, 1971.

Private rate 2p per word (minimum 20 words)

Trade rate 3p per word (minimum 20 words). Display box rate £2.50 per single column inch.

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Box replies to be sent care of Advertising Department, 13-35 Bridge Street, Hemel Hempstead, Herts., England. Copy received after first post on 17th September will be held over until the next issue, unless cancelled in writing before 15th of the following month. There are no reimbursements for cancellations.



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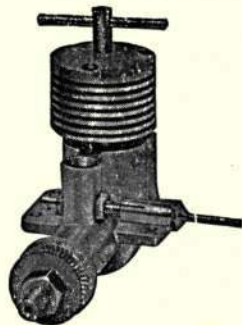
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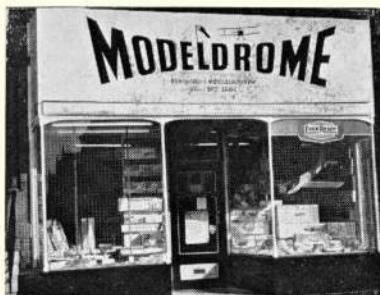
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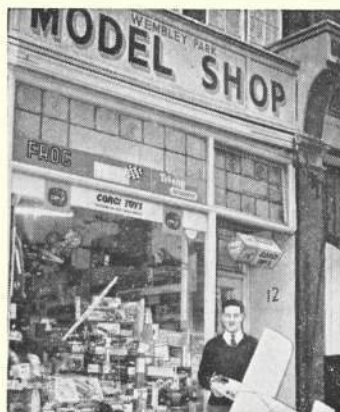
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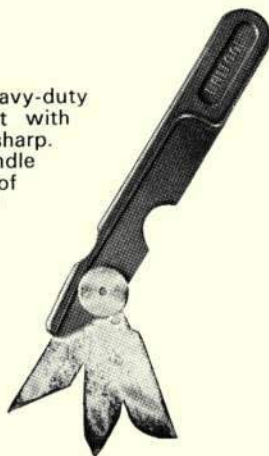


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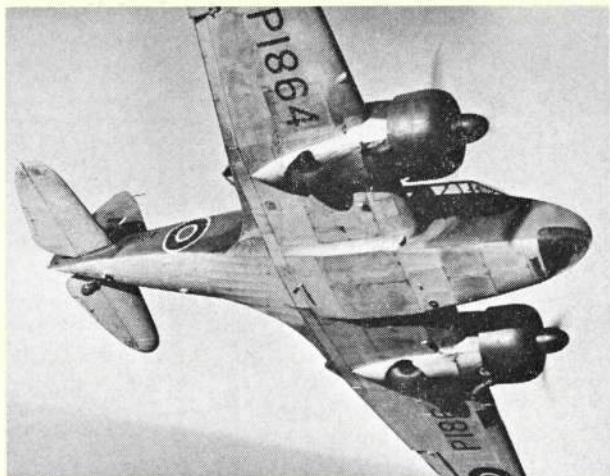
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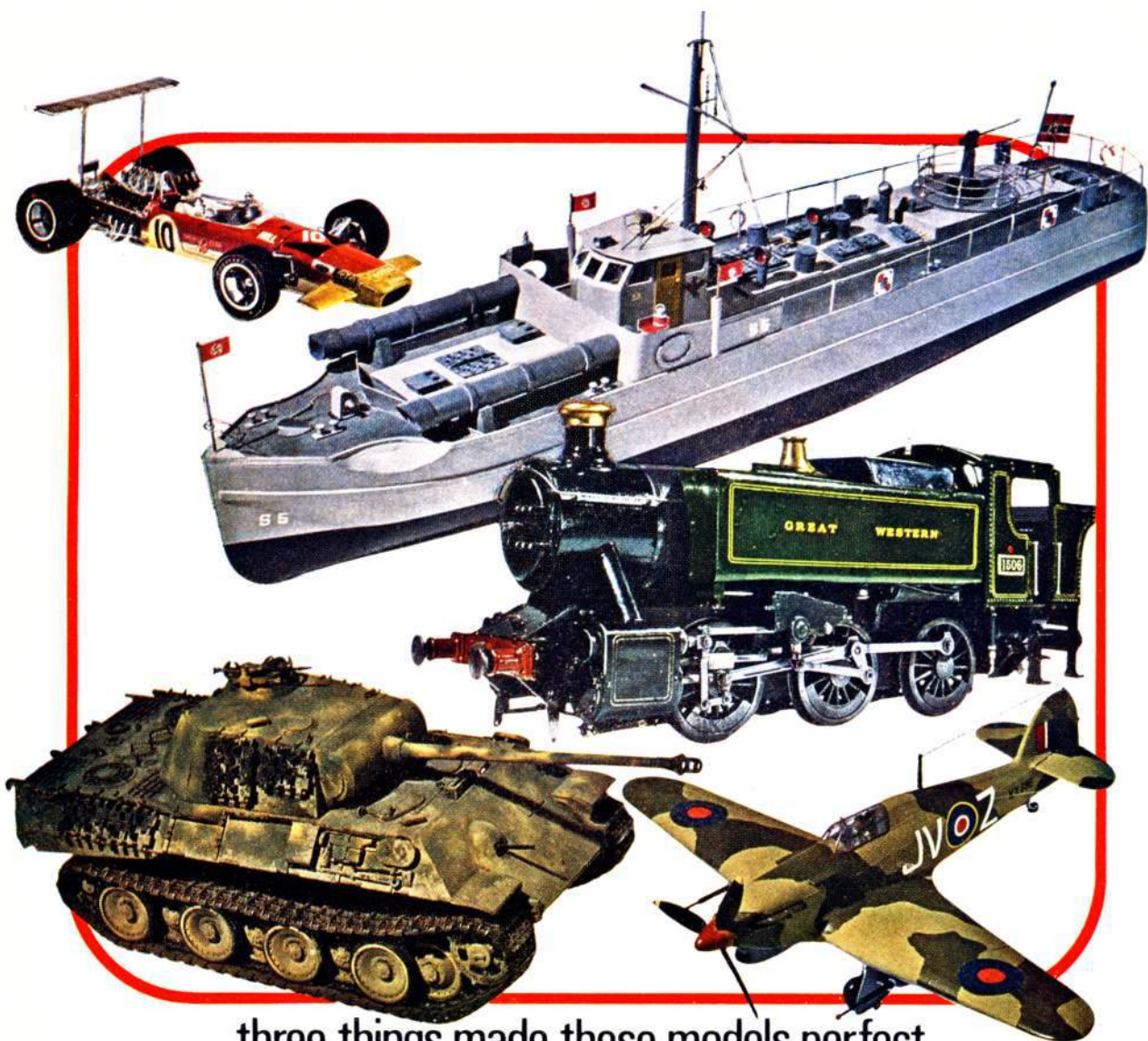
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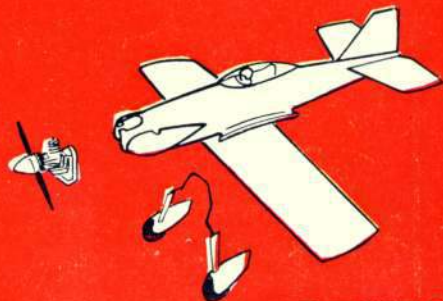
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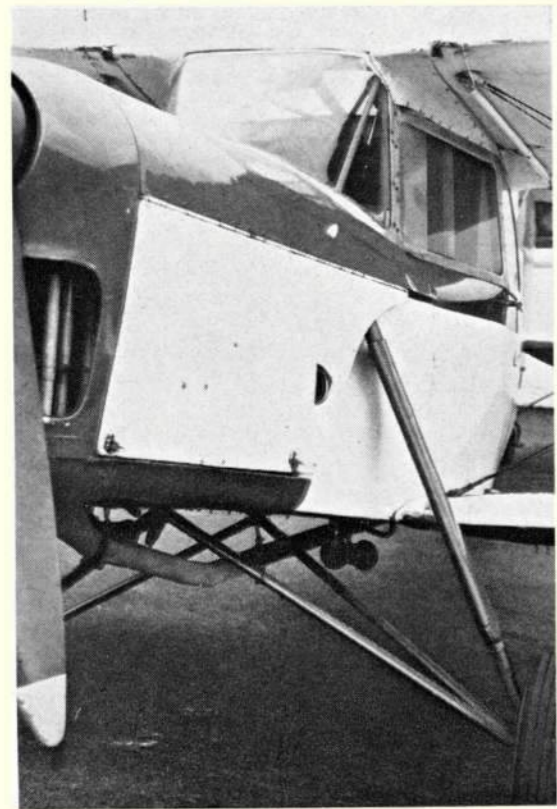
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De Havilland monogram on the wheel cover should not be overlooked by modellers. The fairing over the undercarriage oleo strut can be turned through 90° to act as a surprisingly effective air brake, as will be appreciated by comparing this photograph showing the width of the fairing and the photo below which illustrates its thickness.

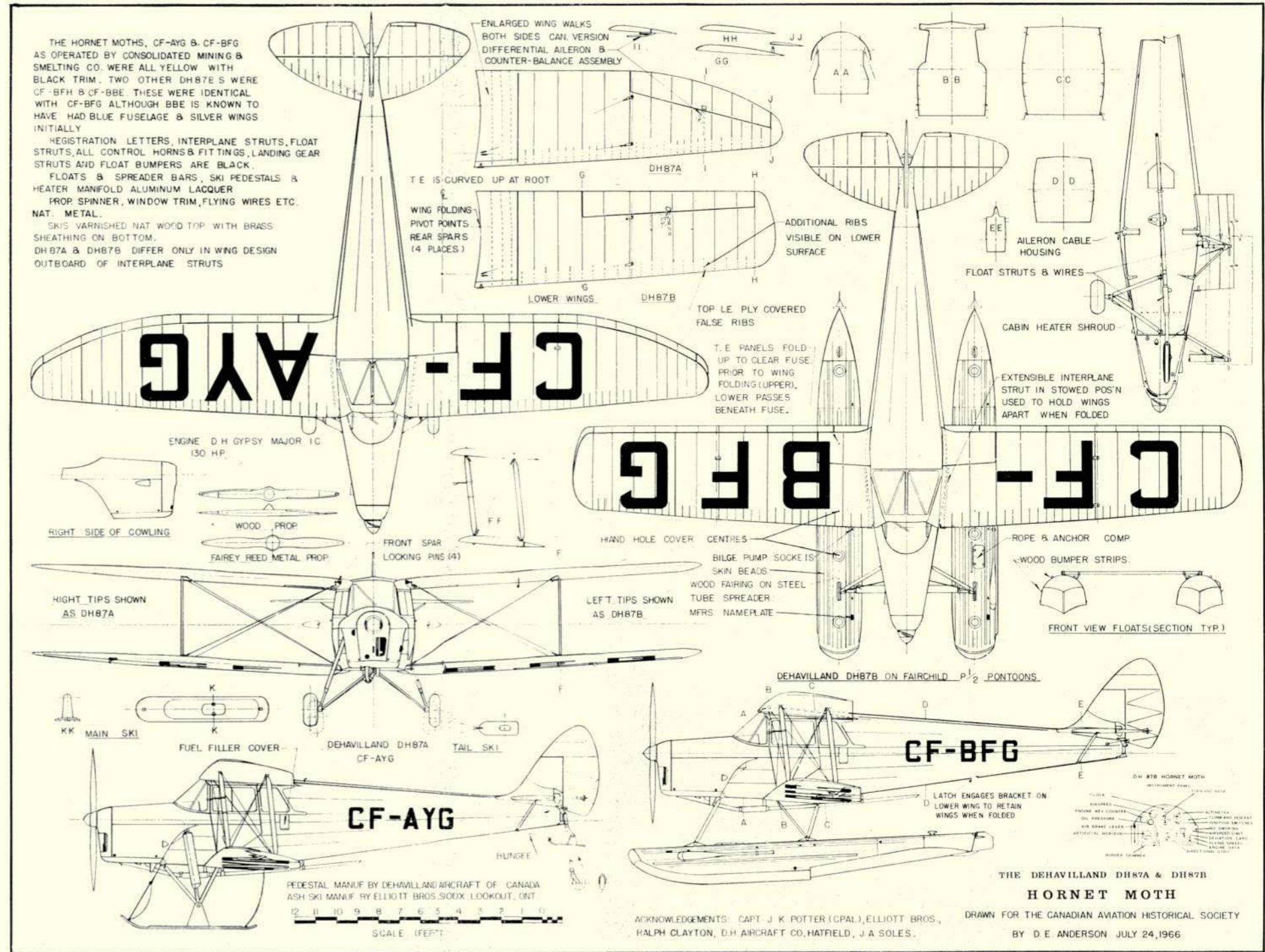
This angle of the Hornet Moth emphasises the taper on the fuselage which 'swells' around the passenger area - a feature common to other Moth types with side seating. Modellers should also note the long exhaust push rods exposed on the Gipsy Major engine seen through cooling intake. The Venturi for instrumentation under the fuselage, and the landing wire pick-up on the wing panel permits wings to be folded for storing in a garage.



which were discovered during the test programme. The first production models made in August 1935 and designated '87A' featured greater taper on the wing tips, and had the span increased by two feet to maintain the same wing loading. Front fuselage side panels were increased in size, while fuel capacity was increased from 26 to 36 gallons. During the next three years, 165 examples were made, nearly half for export. It was soon discovered that in inexperienced hands the *Hornet Moth* could be prone to tip stalling, so early in '36 new wings were introduced to eradicate this problem. These new wings featured very little taper and with 'squared off' tips

Distinctive feature on the Hornet Moth is the semi-span bracing of the wing panels with the interplane struts, the large ailerons on the lower wing, and the rudder cut-away to clear the sprung tail wheel.

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