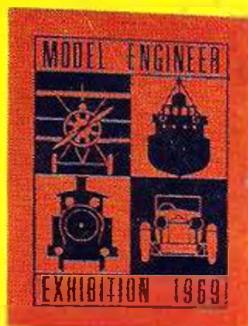


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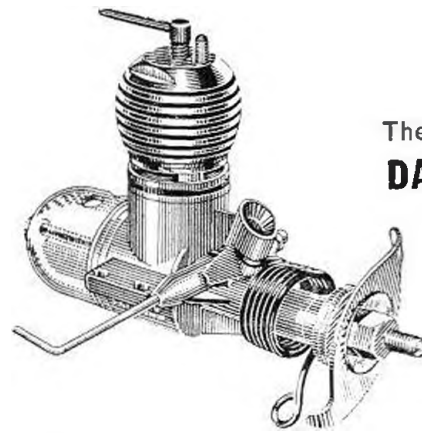
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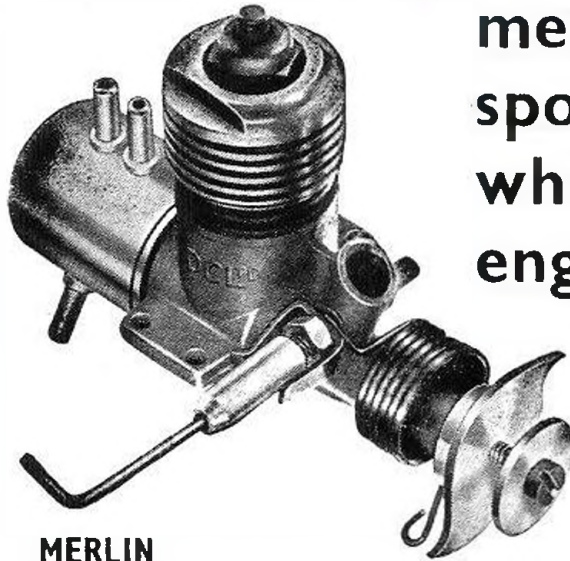
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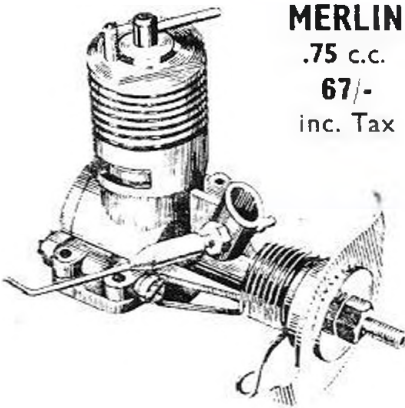
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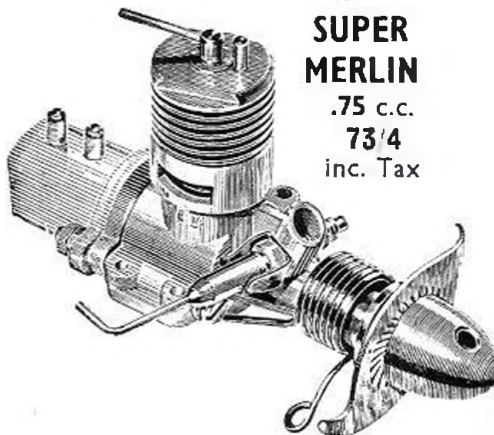


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January 1969

VOLUME XXXIV No. 396

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Editorial Director D. J. LAIDLAW-DICKSON

EDITOR R. G. MOULTON

Advertisement Manager ROLAND SUTTON

COMMENT

The month of November 1968 will not be easily forgotten by many aeromodellers, especially those with a sensitive attachment to tradition. Changes in the S.M.A.E., indicate an unhealthy tail-wagging-the-dog situation of membership reversing management decision. Introduction of the Import Deposit scheme imposes a heavy burden on the small trader. Increase of Purchase Tax, and changes of model rules in the F.A.I. will all have their effect. Discarding monoline may yet throw open control-line speed to a wider following, and adoption of the old S.M.A.E. system of semi-finals in F.A.I. team racing will give an encouraging 'second chance' for the not-quite-so-fast. We hope that the retardants established by the Government will be compensated by influx of new names in the competition classes through these moves to make waning events more popular. But nothing can compensate for loss of life. We mourn two stalwarts who left us in November. Tommy Newell first won the Wakefield Trophy forty years ago in 1928, and Eddie Keil introduced model flying into more British homes than any other person. Their memory will live forever.

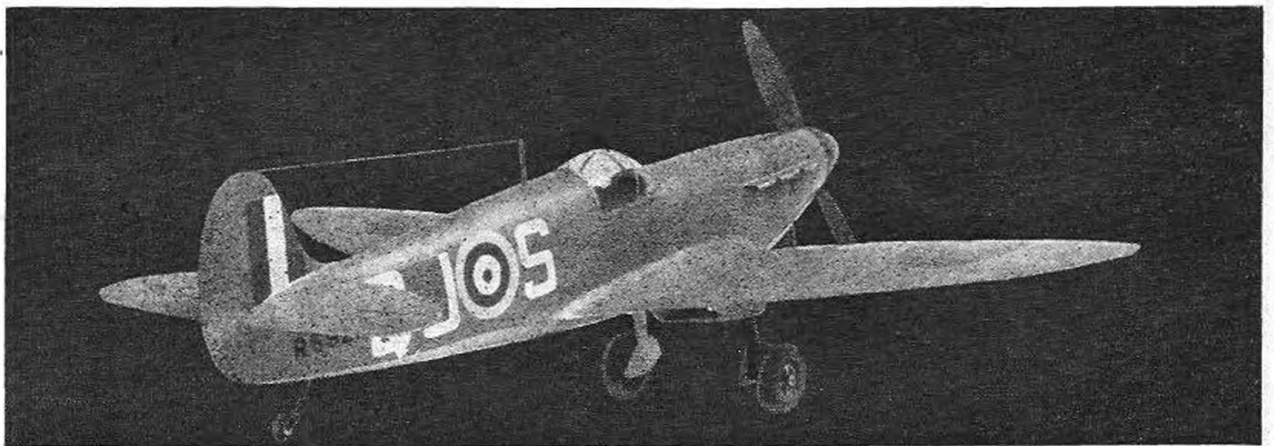
on the cover

Clive Hall of Cambridge with his 1/6th scale control-line Great Lakes Special as rebuilt by the U.S. Aerobatic pilot Harold Krier. Powered by Merco 49. Clive's model placed third at the closely fought British Nationals, R.N.A.S. Yeovilton 1968.

next month

Part two of Elton Drew's account of F.A.I. Glider development super scale drawings of the **Curtiss P-40 Kittyhawk**, Engine Test of the **Super Tigre G.23**, First part of a make-it-yourself **.375 cc. engine** as a workshop exercise plus plans and all regular features, on sale January 17th.

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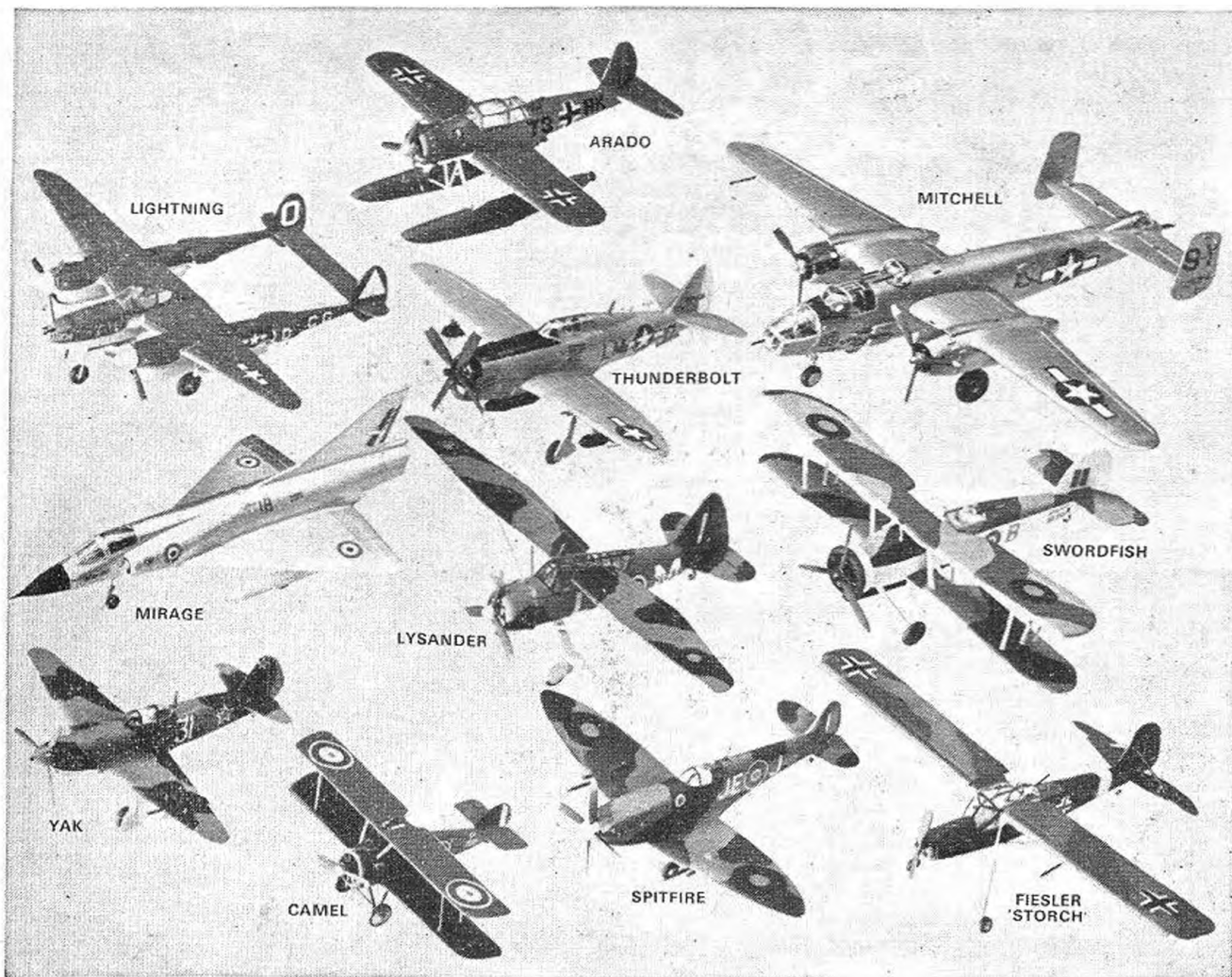
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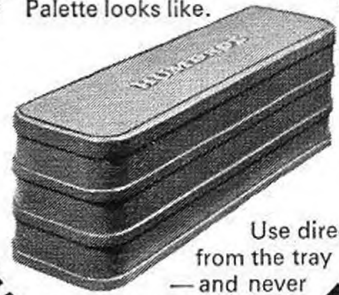


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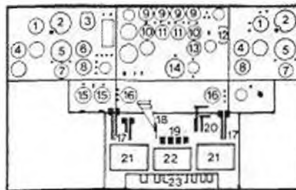
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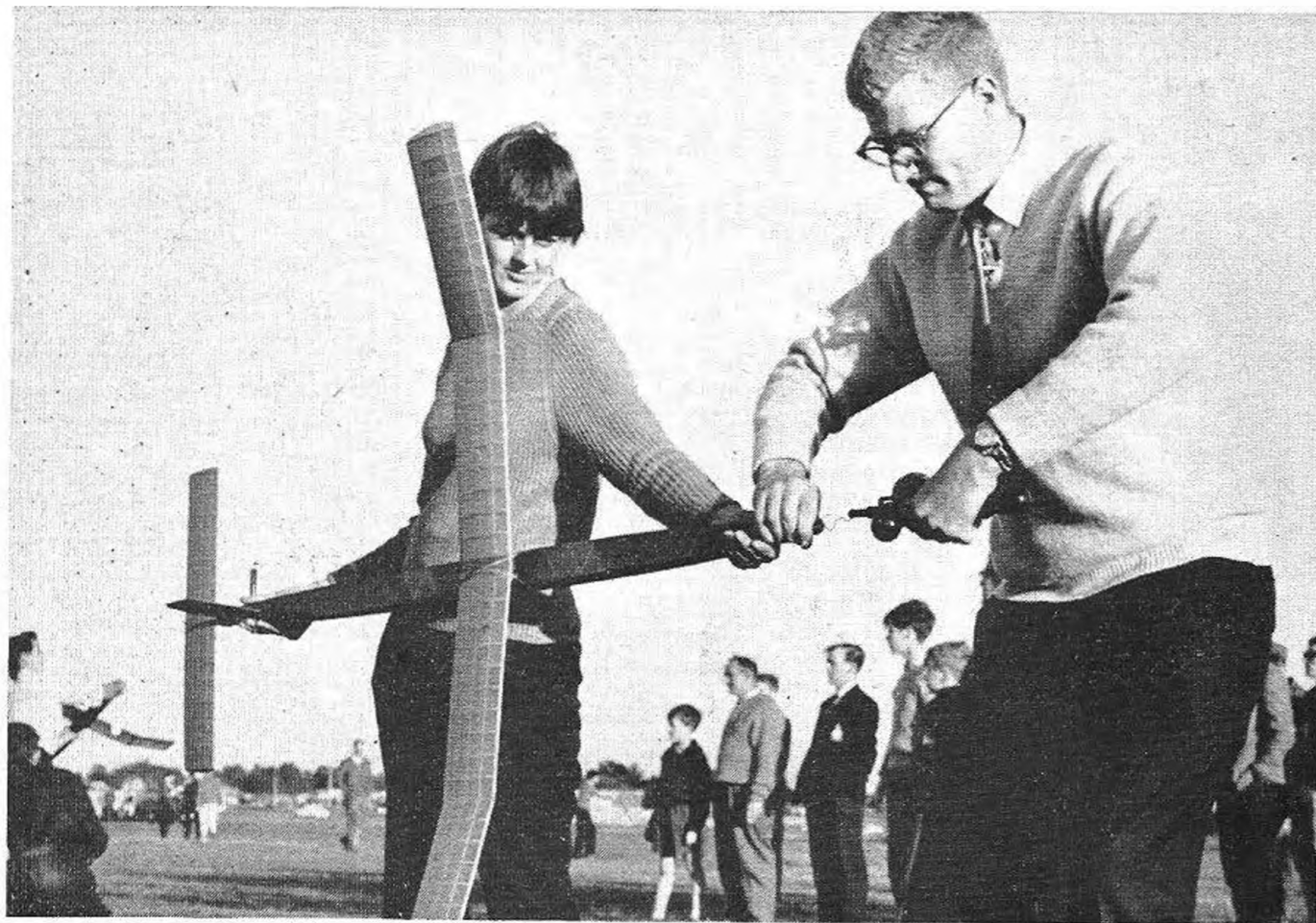
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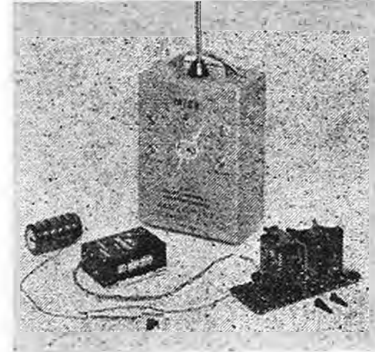
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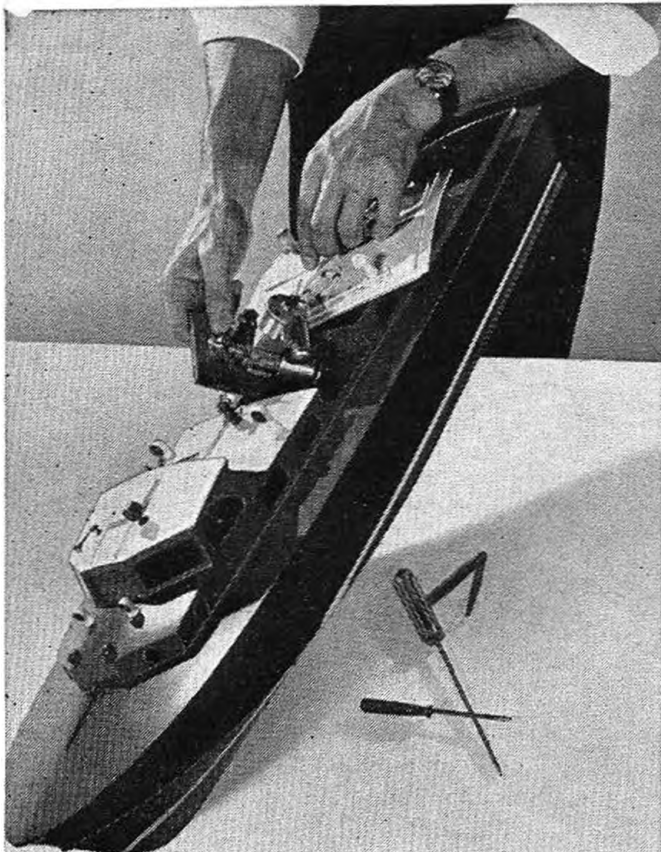
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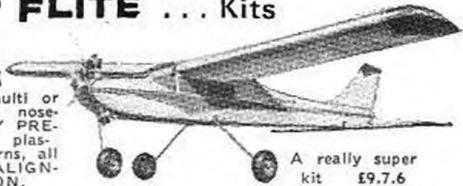
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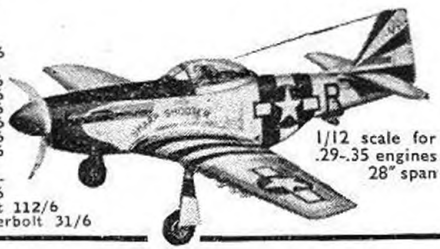
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38th MODEL ENGINEER EXHIBITION

Seymour Hall, London, W.1.

31st DECEMBER 11 JANUARY 1969

(Excluding Sunday) 31st December open to the Public 2.30 p.m. to 9 p.m. Thereafter daily 10 a.m. to 9 p.m. until Saturday, 11th January, closes 7.30 p.m.

SEE AND ENJOY

There will be a magnificent collection of models of all sorts shapes and sizes covering locomotives, traction engines, steam rollers, ships, yachts, cars, aircraft, in fact anything which can be modelled. These entries will be competing for a wide selection of trophies, cups and other awards as individual entries, in addition this year the emphasis will be very much on the club aspect and not only the governing bodies but some of the larger individual clubs have come together to give a composite exhibit of their efforts.

Meccano will be displayed, both working models sponsored by some of the specialist Meccano Societies and an actual contest for Meccano model entries.



SOUVENIR GUIDE

A very special Christmas Extra issue of Model Engineer will be coming out on 10th December. This will be the Exhibition Souvenir Handbook and Guide. It will contain Exhibition Entries, details of Stands, plus articles by experts on all aspects of modelling. Some special articles include, Clockmaking by Claude Reeve, Small Gauge Railway, Sixty Years of Model Flying, Radio Control Aircraft in Films, Approach to Model Car Collecting, Pairs Racing Model Boats, Hovercraft in Model Form, Meccano as Engineering. The Guide will be 72 pages, our usual magazine size

2/6

On sale everywhere and at the Show.



MODEL BOATS

In the January 1969 issue is a simple-built two cylinder steam engine - the original was made entirely without a lathe, except for the flywheel - and associated boiler, etc., a requested article on Yorkshire cobs, one of the most fascinating of small boats, and an American Civil War blockade-runner, the Alabama.

Also requested has been a boat design for the Fiji 2.5 c.c. outboard engine, and we have one for inboard installation as well. Plus the normal warship and merchantmen drawings, boating for beginners, radio in a plastic destroyer, readers' models, tested items, etc.

4th FRIDAY MONTHLY 2/6



RADIO CONTROL MODELS

February R.C.M. & E. features this fine scale Fokker DVIII. Spanning 46½ inches, it has been designed specifically for single channel R/C equipment, but it is also capable of carrying the latest lightweight multi equipment. Also featured will be Part 3 of the R.C.M. & E. Digital series, dealing with 6 channel transmitter conversion and receiver. Other special interest features include the full F.A.I. Judges Guide, plus "Wave Lengths" for R/C boat enthusiasts.

nd FRIDAY MONTHLY 2/6

Heard at the HANGAR DOORS

MODEL AVIA, one of the most highly respected modelling journals in the world, ceases publication with its December issue. For eleven years this high quality production has been the non-professional, spare time effort of Pierre Delfeld whose keen eye and skilful pen have established the magazine as a leader in the French language. All is not completely lost, Pierre is now elected Chairman of the F.A.I. control-line sub-committee so that his long experience will be well employed.

MODELLING HOLIDAYS are offered by our old pal Harry Stillings at a beautifully situated airfield in N. Devon. Accommodation is luxury caravans. Full facilities including a workshop, and location within easy reach of the sea or Dartmoor National Park make it sound like that haven many modellers dream about. We'll forward enquiries.

CHUCK GLIDER INTERNATS by post! The Thermikschnuffler Club, e.V., D-6901 Altenbach near Heidelberg, Abtsweg 26, W. Germany invites entries from anyone flying best six of ten chucks with one min. max. on any day in February. Entries, photos, field and weather data to the organisers by March 15th please. Flyers making 6 max's continue with max's increasing in 15 sec. increments.

SCOTTISH R/C SYMPOSIUM takes place at Castle Hotel, Greenlaw, Berwicks March 29/30th and is already almost fully booked for accommodation! It promises to be quite a trade show, enquiries to Jim Scott, West High Street, Earlston, Berwicks.

RADIO SCALE International with huge cash prizes is planned at Metz, France for June 14/16th and due to its position, will attract a large European entry. Details from 'Les Ailes Mosellanes' B.P. 701 (57) Metz France.

SCALE INFLUENCE? at Shuttleworth, namely the success of the meetings we have organised there (next on June 22nd) has led to formation of a Model Aircraft section of the Shuttleworth Trust. Open only to full members of the Trust, the few section will have the enviable advantage of being able to use the airfield for model flying subject to full size movements. Applicants queue by post to Shuttleworth Collection, The Aerodrome, Old Warden, Biggleswade, Beds.

Radio and T.V. personality David Nixon gave the new E. Law & Son model shop at Sutton a fine send-off on opening day, seen here enjoying the occasion between directors Barry Cussens and Ian Davies.



WINNERS of the generous cash prizes offered by the R.A.F. Central Flying School at Little Rissington for its Museum model competition were Mr. Vandersteen with his superb 1/24th scale 'Shorthorn' and in the junior class, Master Brett with the aerobic 'Tutor. to 1/72nd scale. More details next month, also of the I.P.M.S. finals on the same day, November 30th where Harry Woodman's 'Voisin' took the honours (see page 18).

S.M.A.E. Elections, and Annual General Meeting drew greater response than for many years. New Chairman is Laurie Barr, free flight exponent, leader of the 1969 Wakefield team, and a very successful professional model maker. Vice-Chairman is Norman Couling, known for his organisation in the S. East and at the Nats. Stan Wade is once more Records Officer, Syd Lawton the Secretary / Treasurer, George Lynn the Comp. Secretary while Ian Peacock becomes co-opted P.R.O. and Ron Moulton is F.A.I. Delegate. Henry J. Nicholls was presented with a pair of engraved gold cufflinks as a mark of appreciation for his 21 years of service on the S.M.A.E. Council in many capacities, not the least of which has been his invaluable work as F.A.I. Delegate.

MEMBERSHIP fees for the S.M.A.E. soared and fell like a yo-yo at the A.G.M. and after almost even division of opinion, a small majority discarded the long and most carefully considered advice of the Council to load the members who get the advantage, and passed an amendment that fees be increased all round by 25 per cent. Thus Associates are now 15s. 6d., Juniors up to 16, and Ladies 15s. 6d., Intermediates up to 21 are 25s. and Seniors 50s.

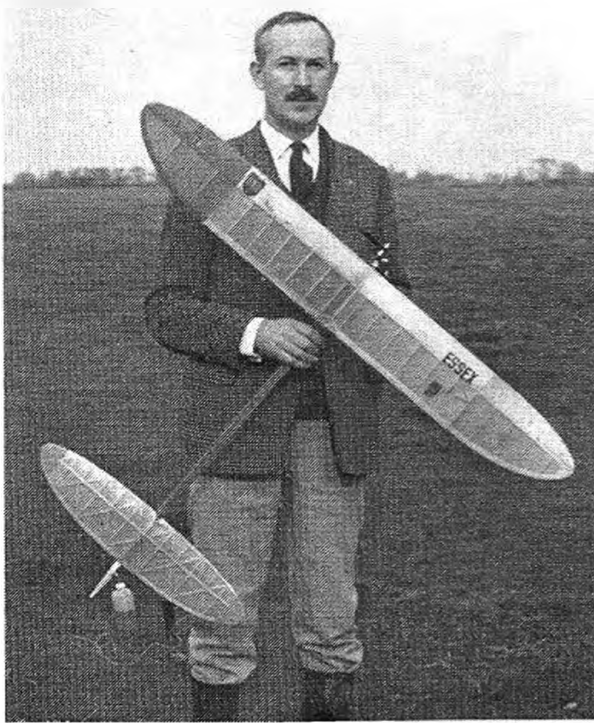
PRIZEGIVING, where hundreds of plaques were prepared for award to less than a quarter of the winners who attended, was by vote of the membership, conducted in a buffet

bar at minimal expense. We hope that the experiment will not be repeated by the S.M.A.E.

F.A.I. CHANGES require T/R mechanics to wear a safety helmet, and to refuel at 19.6m. radius, and the three semi-final system will be used. Mono-line is out, and two 0.30 mm. lines are to be used in speed. Three models can be used in F/F, where seven rounds are ratified. Radio multi will be over best 3 of 4 flights at '69 World Champs and scale is likely to go to World status in '70. Austria will run '69 F/F on condition that she runs R/C in '71, previously earmarked for Britain. Support for charter to a U.S.A. based World Champs was lukewarm, in fact disheartening. A full report of the C.I.A.M. and F.A.I. General Conference is available to S.M.A.E. members.

† **THOMAS HENRY NEWELL**, a Fellow of the S.M.A.E. died on Friday, November 15th 1968. He joined the Society in 1924, serving as a Council Member from 1926 to 1932, and in 1929 was a Founder Member of The Model Aircraft Club. Tommy was a fine sportsman and competitor who won many of the major trophies and held the endurance records for fuselage models, hand-launch and R.O.G., in 1927, 1928 and 1929. His outstanding success was as the first winner of the Wakefield International Cup in 1928, an achievement resulting from diligent experiment, and development of the geared fuselage model. To his widow, Mrs. Gladys Newell, the Society and his many aeromodelling friends extend their deepest sympathy and condolence.

Price Changes. Recent increase in purchase tax means that many model goods will be subject to an immediate increase in price. This will amount to approximately 5d. in the pound extra. Advertised prices in this issue may not necessarily have been adjusted to include this increase. There will be further effect from the Import Deposit regulation, mainly in connection with kits.



Ancestry is obvious, it's a miniature of the famous 'Night-Train'.

THE ORIGINAL '1/2 A-Train' was designed and built early in 1962 as a simplified, scaled down derivative of my 'Night-Train' F.A.I. power models, hence the odd name.

After having spent several years on unsuccessful F.A.I. power models I struck lucky in 1960-61 with the Night-Train design, so a similar layout for my first own design 1/2 A model was an automatic choice.

However, unlike the F.A.I. model concept, simplicity of construction, lightness and ease of handling were primary considerations, hence no gadgets, not even an auto-rudder. Neither was an under-cambered wing-section considered necessary, since with a wing area of 250 sq. in. and an anticipated total weight of 6 oz. or less the wing loading should be quite low enough to enable an 8-9 per cent flat-bottomed wing airfoil to produce a slow floating glide, apart from the low climb-drag advantage and ease of construction of the flat bottomed wing.

The original model, ready to fly, weighed under 6 oz. with a Cox Tee Dee .049 and K.K. 3-bladed nylon prop. After an increase in fin area suggested by F.A.I. expert Dr. Michael Gaster to cure a flattening tendency in the early stages of the climb pattern, it proved to be quite docile, a real 'fun' model.

Most gratifying was the discovery that it behaved so much like its big brother in flight pattern, and being a lightweight, out-performed them.

Several other '1/2 A-Trains' have been built by friends, including two built by juniors. These have performed on a par with my original model which I suppose suggests that the model is not too difficult to build or handle.

I cannot remember ever having pranged my model, despite trimming mistakes causing wayward flight patterns.

An auto-rudder instead of tailplane-tilt for glide circle would probably improve power-to-glide transition which has been inconsistent with this model, but I have never considered the occasional height-loss caused serious enough to justify the complication of such an addition.

Take a tip from an expert
and build this outstanding
.049 (0.8 cc.) contest power design

1/2 A TRAIN

BY GEORGE FRENCH

I have kept no record of this model's competition career, but a 'Southern Area Gala' cup stands on my desk, inscribed '1st, 1/2 A Power' and alongside is a 3rd place *Quickstart Trophy* plaque (1965). I will admit to remembering that it has placed first or second on a few occasions during its seven-year active life, including a win in a Chobham 1/2 A fly-off; memorable because this flight was followed, after a hectic high speed recovery, by the same model placing second to John West's 'Dixielander' in the Open Power fly-off!

The original model, now almost seven years old and much battle-scarred, is still in flying condition having outlasted two Tee Dee .049's.

If you decide to go ahead and build, please give yourself the advantage of the very best quality wood available, aiming at lightness combined with strength. The tailplane should weigh less than 1/2 oz; with careful wood selection and accurate construction it will be quite rigid and strong enough at this weight. The wing sheeting must be very light.

If you are a newcomer to F/F competition modelling, then go ahead, bearing in mind what veteran F/F aeromodellers have learned through experience; namely that building a lightweight competition model starts with careful wood selection, and this, combined with diligent, accurate building, will produce a lightweight structure of greater strength than a hastily-built, heavier model.

Needless to say, such a model will certainly out-perform, and probably outlast, the carelessly-built heavy-weight.

Construction should present no problems if you have built a power model before. What follows is not intended to be step instruction, rather, advice on method and sequence.

Wing

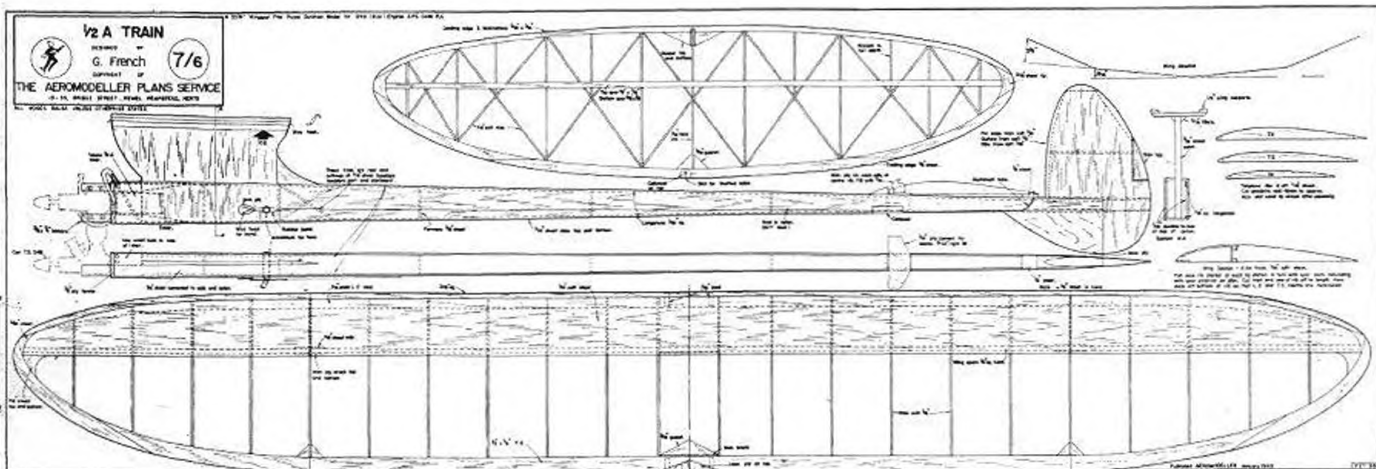
Build flat on plan in four sections, leaving out the centre and dihedral ribs, and top sheeting. Spars in main panels should be hard, medium in tips - taper tip spars to 1/8 x 1/16 at extreme tip. Note that centre and dihedral ribs are 3-32 in. sheet medium balsa.

Pre-cement all dihedral joints. Join tip panels to main panels at correct dihedral angles still without dihedral ribs, placing a piece of 1/8 in. scrap beneath T.E. at centre of starboard main panel to give wash-in.

Join halves at centre with port wing flat on plan and starboard main panel raised 2 1/8 in. at T.E. and 2 1/2 in. at L.E. to give wash-in. Add ply braces, pre-cementing. Thread dihedral ribs through spars to rotate and fit.

Pre-shape slightly oversize very light 1/16 balsa top sheeting by fitting 'dry'. Remove and dope underside of this sheeting. When dope is dry, shrinkage will have caused sheet to take up approximate curve of airfoil. Pin down each panel separately while adding top sheeting, not forgetting pushing under T.E. at centre for wash-in on starboard wing. Add webs and gussets and sand-paper tips to a fine edge.

Build Tailplane flat on Plan. Do not cut spar slots in ribs initially. Slot chordwise ribs into T.E. and add tip before pre-formed laminated L.E.



Full size copies of this 1/8th reproduction are available through A.P.S. as Plan PET994, price 8s. inc. post.

Centre rib (with ply hooks) should be hard balsa. Fit geodetic ribs and riblets slightly oversize, approximate shapes. Mark top spar position on all ribs with straight edge and cut slots to suit top main spar. A smooth curving taper down towards tips will determine depth of geodetic ribs and riblets. When dry remove from plan, mark lower spar slots, add spar dry, and replace flat on plan to cement in position. Remove and sand geodetic ribs to shape by eye. Sand tips fine.

Fuselage

Make up nose unit of pylon, engine bearers, tank (soldered Cocoa-tin) and formers. Cut fuselage sides from a single piece of 1/16 sheet medium balsa. Try cutting these, and bottom, oversize and leaving overnight. Re-cut to size next day, after curvature has set in.

Glue bottom 1/16 sq. in. longerons and formers to fuselage bottom. Glue top longerons to sides.

Build fuselage dry to check fits of formers, etc. Glue pylon unit to bottom. When set, add sides with bottom located flat and straight on building board. Add top sheet.

Build symmetrical section fin from soft 1/16 sheet and glue to fuselage, adding forward section of underfin afterwards.

Cover entire model with lightweight coloured Modelspan, or Jap tissue.

Fuel-proof dope is strongly recommended to avoid the use of fuel proofer in flying surfaces.

Beware of overtightening wing, and especially tailplane, with shrinking dope or warps will result. Water shrinking with Modelspan should be unnecessary unless it is very slack after covering.

Flying

Check for warps after wings and tailplane have matured. Do not worry if wing wash-in (starboard) is slightly more than 1/8 in. Tips will probably have washed out about 1/16. This is right. Fin tab should be slightly right, especially if wash-in is over 1/8 in.

Tailplane should tilt with Starboard tip about 1/8 in. above centre line to give open R.H. glide circle.

Recommended prop with Tee Dee .049 is Cox nylon 2-blade 5 in. x 3 in.

Check C.G. position. Tolerance is from 1/8 in. forward, to 3/8 in. rearward of point shown on plan.

Test glide to get approx. glide trim, packing L.E. or T.E. of Tailplane and altering tilt for R.H. turn.

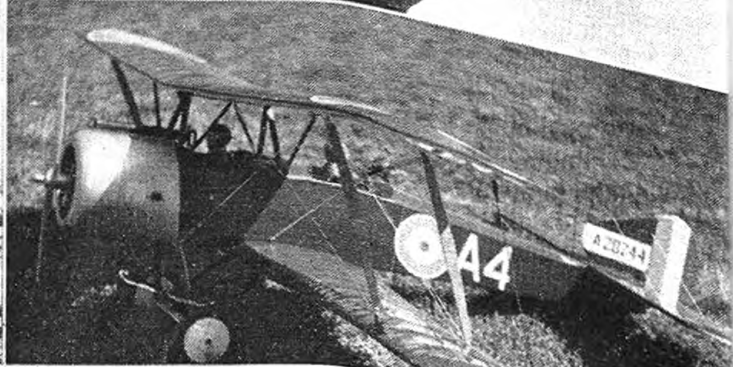
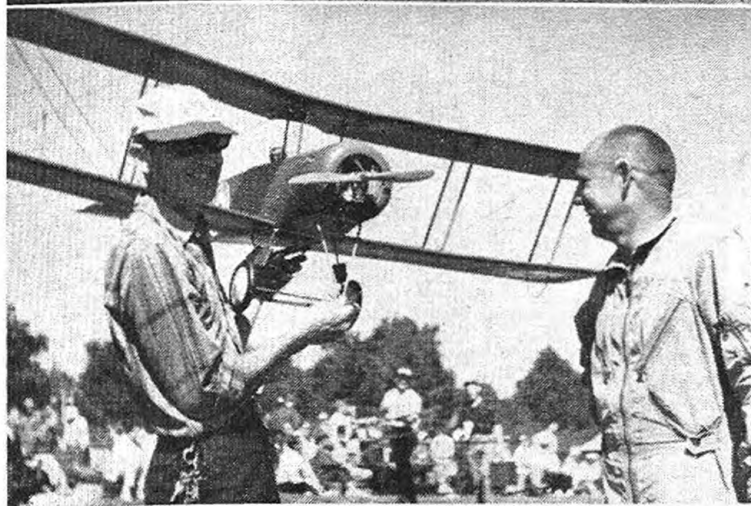
Try first power flights with prop on right way round, with engine run 3-4 secs. maximum, running slightly rich.

Launch at about 45 deg. to vertical with right bank. If model leans right and climbs, increase motor runs gradually. Use rudder tab to correct turns. If rudder is ineffective in correcting excessive right, or any left turn, use tailplane incidence in addition to rudder-tab as follows: pack under L.E. of tailplane to give left-hand tendency and pack under T.E. of tailplane to give right-hand tendency. Make small adjustments where necessary until a steep R.H. climb is achieved, with about 14 turns in 9 1/2 secs. When climb is trimmed in this way, any glide adjustments required will have to be effected by altering C.G. and/or tailplane tilt.

I hope your '1/2 A-train' gives you as much pleasure as mine has during the last seven years.

George demonstrates his launch technique





SCALE WORLD

PICTORIAL ROUND-UP ILLUSTRATES A FEW FINE EXAMPLES OF THE WORLD-WIDE BOOM IN FLYING SCALE MODELLING

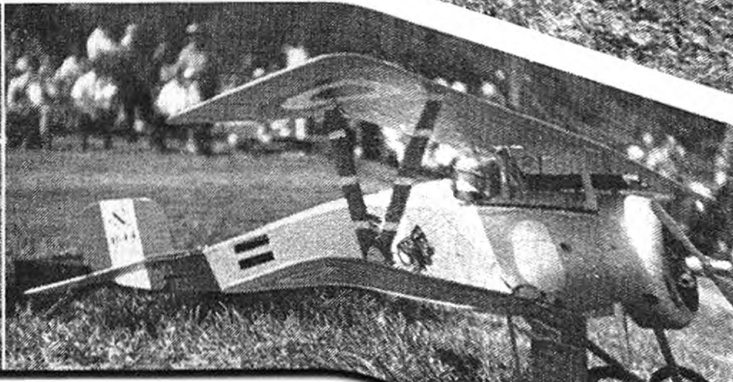
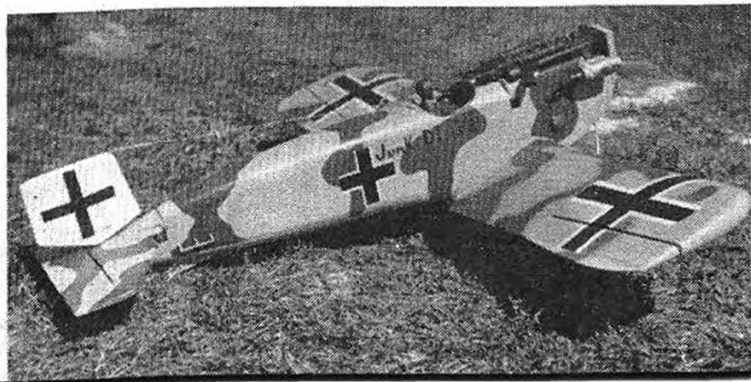
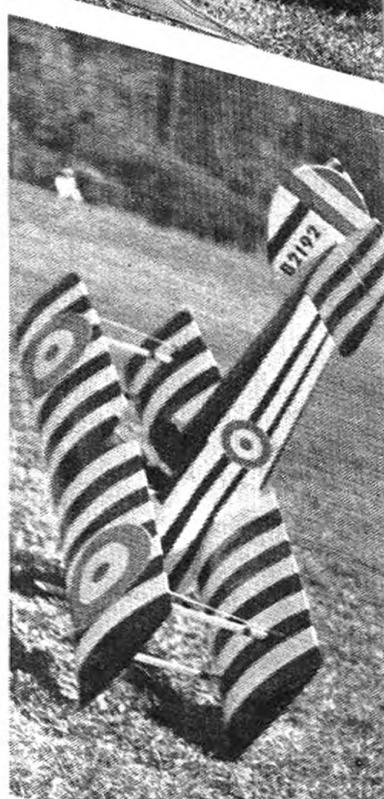
ALMOST 90 ardent scale entrants produced the finest ever turnout of flying scale models at the Flightmasters Annual, in faraway California. Seven classes covering Junior, Peanut (max span 13 in.) to full multi R/C produced subjects ranging from the Barrel shaped Caproni-Stipa to an eight foot monster Pfalz D.III. On the opposite coast, at Cole Palen's famous reproduction of a World War One airfield at Rhinebeck N.Y. forty three entries were made in an event restricted to subjects prior to 1919 Vintage! Such enthusiasm typifies the rapid expansion of the Scale movement. Events at Rhinebeck included straight scale, a manoeuvre contest, a 'mission' (balloon bursting, bomb drop etc.) and staged combat. Bill Wischer and his Sopwith 1½ Strutter had the crowd spellbound as he 'fought' with Dick Allen's Camel. After this exciting meeting, Dick King and Cole Palen flew their 12 in. equals 1 ft. scale Pup and Spad. What a finale! Across the Pacific in Japan, scale has the same degree of interest. Twins are popular. A Dornier 28 for single channel(!) and a P-38 Lightning in multi were outstanding at the 7th All-Japan Contest, Narashino. These photographs convey just a little of the skills involved, and the satisfaction to be derived from scale modelling.

Top: Dan Lutz's Piper Cub for R/C and Vince Constanto's contrasting Folkerts Racer at Flightmasters' meeting. Folkerts weighs one-third ounce, rubber motor is wound in tube outside fuselage. Lower left is G. Gallagher with Fox 59 8 lb. Avro 504 with Cole Palen at Rhinebeck. To right is Bill Wischer's Sopwith 1½ Strutter, Super Tigre 56, Controlaire R/C weighs 6½ lb.

Left: Jap aces, Fukada's twin Enya 45, Sankyo R/C, Lockheed P-38 Champs winner and Tsukada's Zero with Enya 60, Microavionics R/C at Narashino.

OUCH! Leon Schulman's brightly painted Sopwith Pup tumbles over, a procedure not unknown for real machines at Rhinebeck! Has Merco 61 and Citizenship R/C

BELOW: More Rhinebeck beauties, at left, a Junkers D.I., odd in shape and suddenly popular was described in June '68 A/M. Right is Vern Krehbiel's Nieuport 17 from his own VK Kit, uses ST 56 and Logictrol R/C weighs 5½ lb. Vern also introduced a new Camel Kit at same meeting.



† Eddie Keil

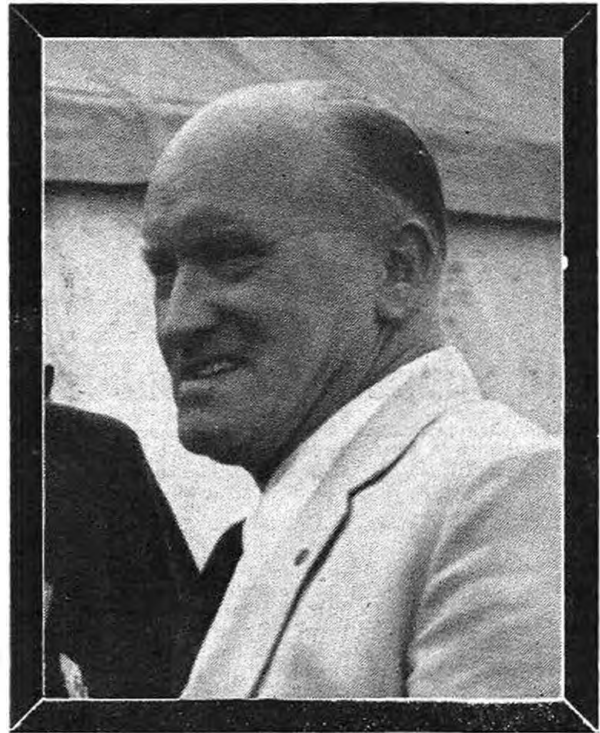
THE AEROMODELLING trade lost its founder on November 13th. So much has been built up, around and upon the stout shoulders of Eddie Keil in the last thirty years that he became their well-loved doyen.

Eddie was 68. The son of a furniture maker, it was natural that he should be interested in model making as a youth, and his additional flair for machinery attracted him to the petrol driven models of the '30s. He had already made his own motorcycle so a power driven model aircraft was a simple affair to him. Skilled in operation of woodworking machines, it was not long before he was cutting balsa for the model shops. He participated in contests and became a keen Internationalist, regularly attending the famous meetings at Flers and hosting visitors. Alvie Dague of Tulsa left a lasting impression upon him. This dynamic young American, over for the Wakefield in Paris was always in his reminiscences and must surely, along with Frank Zaic, have influenced his consideration to produce kits.

A local specialist in small models, Albert Hatfull created his first designs in the flying scale range, and for the now immortal *Ajax* and *Achilles*. It is to their everlasting credit that all of these kits, albeit updated and re-boxed are still in the Keil-Kraft range today. The story of how Eddie managed to produce balsa kits throughout all of the War period will never be told now; it belongs to this born fighter of many parts who maintained supplies of balsa throughout the most difficult period in all our history, both for the industry and his hobby-business.

After the war Eddie expanded his range of kits rapidly. He had to have the first of everything. How well we recall the arrival of the first Arden .09. It had to be mounted and run *immediately* and that meant in dear Rose's front room ('under the piano where the spots won't show'). Tests of the *Phantom* were made in Eddie's old school playground, the short frame in shirt and braces so excited over this 'new' approach to modelling on one's doorstep that Sunday lunch was nearly always at 4 p.m. This was also the great era of Fairlop. The *Slickers* were born. First for the Mills 1.3, then a whole family including Eddie's own special, the 'X' with Arden .19. A kit for a Wakefield

As so many Londoners will remember him... in the heyday of Fairlop, any Sunday, with the huge *Falcon* on his shoulder, an admiring crowd parting their ranks to let Ernie through to the runway.



became the *Gipsy* as Eddie's own way of pulling Bill Dean's leg for his long hair and sandals. The *Falcon* was ever his favourite and he'd never admit, that like the *Junior 60* it had American parentage; but one must allow Eddie that, for he was the most gracious, the kindest and the fairest man of all. He was intently pro-British and would justly claim to be able to stock any shop from floor to ceiling with his own produce. After making his bold move from Hackney Road to Wickford, his business expanded impressively to the stage where it became undisputably the biggest in the land. Generous with his support for the smaller man, and always ready to lend a sympathetic ear for any cause, Eddie had the gift of being both at the peak of his trade and yet still a modeller with an eye to values and standards. He could thus understand the most minor of complaints or enquiries. He must have been counsellor to thousands, and they will all miss his guiding hand. His name remains, a monument to his cockney frame which stood no nonsense and became the hallmark of honesty and quality.

The world of modelling will be with us in offering our deepest sympathy to his widow Rose, his brother and his sisters in their great loss.

The Editor has received the following letter from Mr. Ronnie Keil:

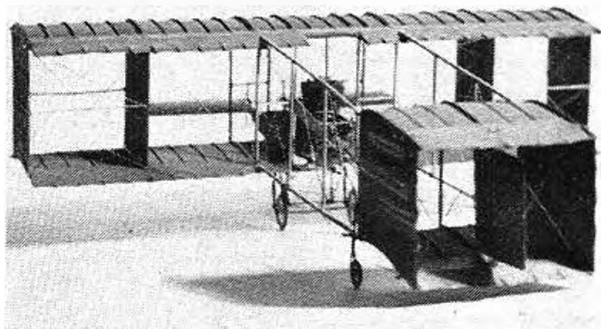
Dear Sir,

I would like to express the sincere thanks of the family of the late Mr. E. H. Keil, and those of the Staff of E. Keil & Co. Ltd., to our many friends in the Trade who have sent us letters of condolence and floral tributes.

The numbers involved are extremely large and it would be greatly appreciated if, in the circumstances, those concerned would kindly excuse us from replying to each one individually.

Yours sincerely,

R. KEIL



Full Support for "Solids"

Not for many years has one single letter provided so much correspondence in support as that by H. J. Boyd in appeal for the neglected solid scale modellers. We have selected just one of the many replies as typical and constructive... over to Mr. Woodman.

Dear Sir,

In his letter published in the November *Aeromodeller*, Mr. H. J. Boyd more or less asks readers to admire his model Pfalz. It certainly appears to be good but as the photograph is reproduced so small, and the scale of the model is not given it is not really possible to judge.

Mr. Boyd wonders how many people still make models in the old way, by which he probably means making the models from solid wood block and sheet. I would guess that there are many more than most people imagine but Mr. Boyd seems to be a little out of touch with modern trends.

It is obvious that he missed reading the June '68 feature by my friend Bill Hearne on building models from plastic sheet and other materials. Writing as an aeromodeller of some 35 years' standing, during which time I have been through the paper, cardboard, hardwood and balsa wood stages, I would advise Mr. Boyd that *the* method now is the polycard technique. Polystyrene sheet is without doubt the most useful material ever to have been made available to the aeromodeller. In the space allowed, Bill Hearne could only touch upon the subject for the possibilities are endless. Models are built up from 'raw material' all parts being made by

the modellers, but the effort, compared with the old wooden models, is less and the result far superior. To anyone who has had experience in the old style, the techniques are even simpler for rough wooden moulds must be carved for double curvature parts although many models can be made without moulding at all.

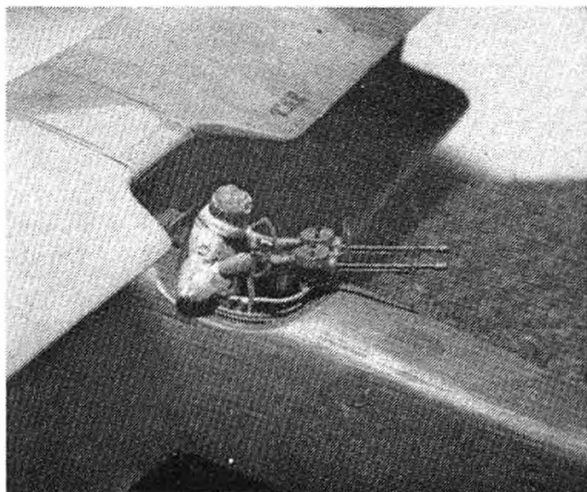
I have been experimenting with polycard for several years and have learnt so much about it that I am currently writing a book. The words 'break through' have become somewhat hackneyed in recent years but it would be quite true to describe polycard modelling as such. I enclose some photographs of models which I have made which are all 1/48th scale. The photography is, I regret to say, somewhat makeshift but they do show what can be done. If you will excuse the tongue in the cheek, I have posed these so that they can be seen to be models and not the real thing.

I thought that the time had long passed when the old timers dismissed plastic kits as child's play. True, a child of ten with average intelligence could put together *some* of the plastic kits on the market and they eventually look like the things one sees hanging up in Woolworths. However, if Mr. Boyd had seen some of the finished kit models that I have

Made to 1/48th scale, and almost entirely in polycard, Harry Woodman's models of J. T. C. Moore Brabazon's Voisin 'The Bird of Passage' and the De H 88 Comet 'Grosvenor House' illustrate the potential of polystyrene card modelling. The engine in the Voisin has spark plugs, leads and valve gear.

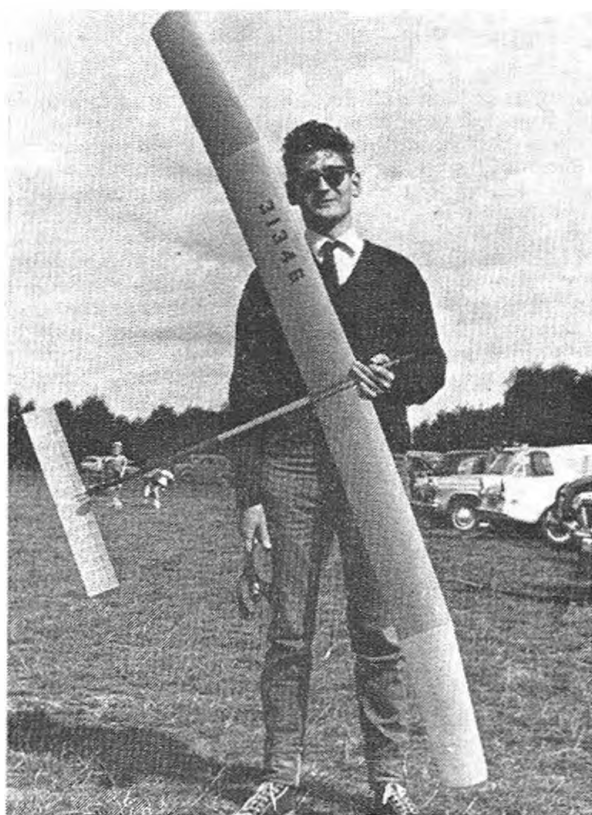
seen he might change his mind. There is sometimes as much work and modelling knowhow required to correct and refine a plastic kit model as there is to make an old fashioned 'solid'. The plastic kit has given the modelling world an enormous boost, and has given pleasure to many thousands of people who never even thought of modelling before.

I would wholeheartedly concur with Mr. Boyd when he remarks that the static modeller only gets a small percentage of space in your magazine. I have been buying *Aeromodeller* since about 1938 and I remember when we were treated better than we are now. However, the plastic, solid and polycard men are just as much 'Aeromodellers' as the flying fraternity. Indeed, having seen some of the motorized planks whizzing around on wires, bearing little resemblance to aircraft past, present or future, I feel that we are in some cases, more entitled to use the appellation. London W.2. H. Woodman



Bill Hearne's superb model of the Salmson 2A2 has fully equipped cockpit, complete with figures, shutters on the engine cowl, everything in fact to make clear that polycard technique is advancing the art of scale modelling at a fast pace.





F.A.I. Glider development

by Elton Drew

Member, British team for
1969 Free Flight World Champs

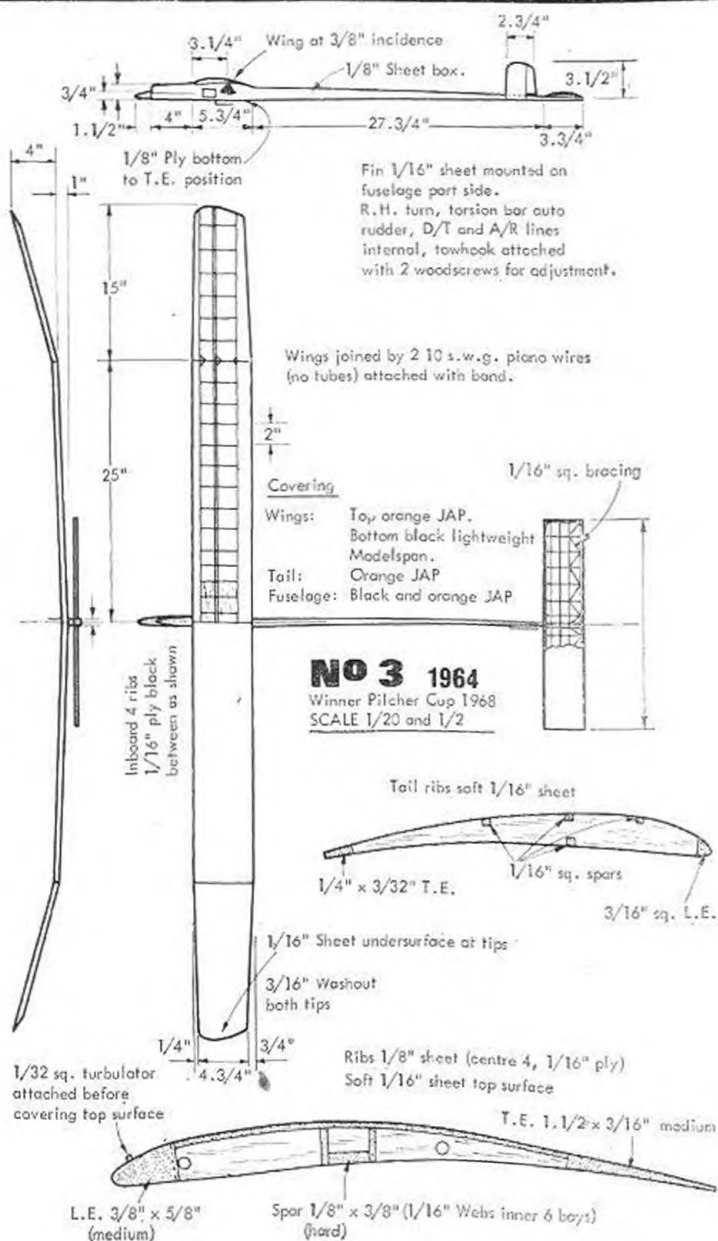
Left, Number 3 in the series, created in 1964 and photographed here at Chobham in 1965 was used by Elton to win the Pilcher Cup at the S.M.A.E. Southern Gala, R.A.F. Odiham in 1968. Top surface is 1/16 in. sheet.

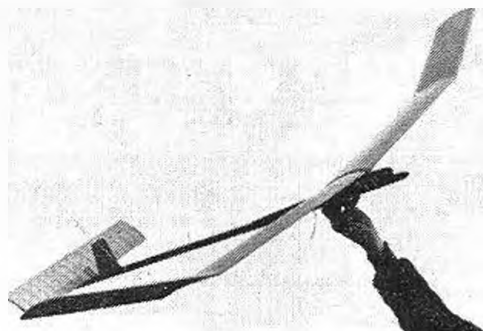
THE DRAWINGS presented here represent a loosely connected series of models I have used since 1964 in the elusive search for a really potent contest machine. Whilst superficially the range illustrated is rather varied in shape, layout, structures, etc., there has been some attempt at continuity throughout. Each design has been an attempted improvement on its predecessors but various features have been maintained to achieve interchangeability of components to a degree and the designs shown, whilst representative of the most widely used models, do not show all the combinations and variations employed.

The forerunner of this series, published in May 1963 *Northern Area News* was largely based on a Ray Monks' design. This and a follow-up model of similar layout, but different structurally, achieved limited contest success during 1961 to 1963.

Two features that have been retained throughout the series are the wing section (basically) and the tailplane dimensions. The wing section was originally scaled from the *Frank Zaic Year Book* drawing of Monk's model and has been thickened and thinned etc., all, one must confess, by eye. Whilst this may horrify some, it is the basic form of the section which is felt important and this section, whose parentage might be described as loosely 'Benedek' has certainly proved reliable, whether fat or thin, with various aspect ratios and with and without turbulators. It will probably be used for some time.

A third feature used throughout has been the wing joining and attachments method - namely 10 s.w.g. piano wire dowels bearing in 1/16 ply ribs without tubes and with 1/8 in. sheet (or block) let in between the ply ribs, the wing being held on with bands. Whilst this is not as clean or neat as some methods one can have a basic distrust of the tongue and box type and braced systems and this method is entirely reliable. It has a built-in





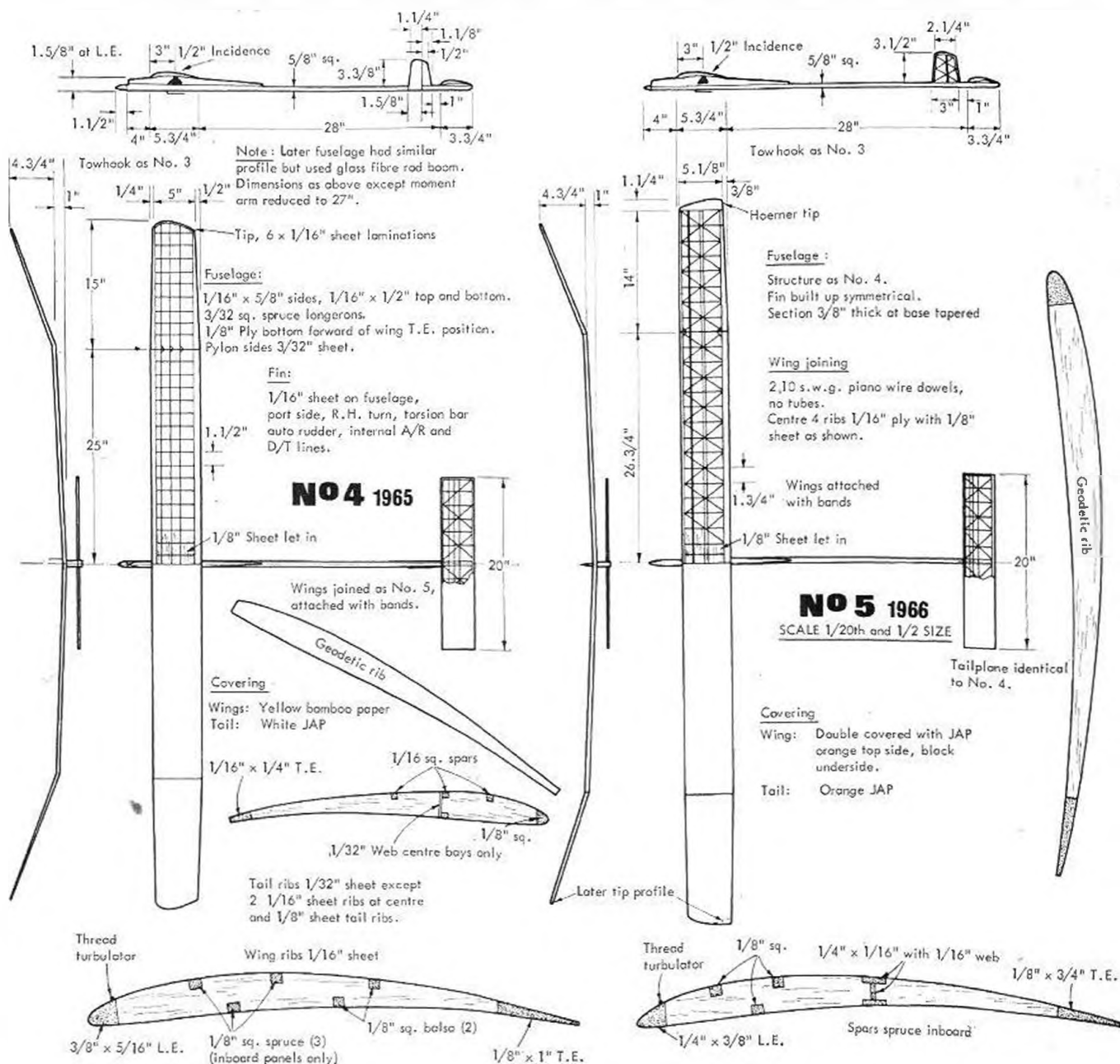
flexibility and shock-absorbing capacity, the latter feature being particularly useful when D/T'ing, whilst the flexibility is probably an asset when towing. There has been a temptation to do away with rubber bands, passing the dowels straight through the fuselage, but

Number 4 at left, with pylon wing mount and lightweight wing structure used in fly-offs but yellow wing covering proved disadvantageous.

thoughts of such a model flying into a post etc. have so far dissuaded the designer.

The first model drawn, No. 3, was to some extent influenced by *Wishbone*. Its fuselage nose portion was of somewhat novel appearance and though later models were changed to a low pylon format, has set a trend used on most of the designs.

This model has proved immensely rugged and has survived two long spells in the open following D/T failures. The wing, in fact, probably has an over-strong structure and its flight pattern sometimes indicates that its inertia is high but it is nevertheless quite happy in turbulent conditions and is now mainly used as a rough weather model. It is not entirely suitable for such conditions, but its good towing qualities are an asset. The model started its contest career very promisingly, doing six maxs to reach two fly-offs in the 1964 South Coast



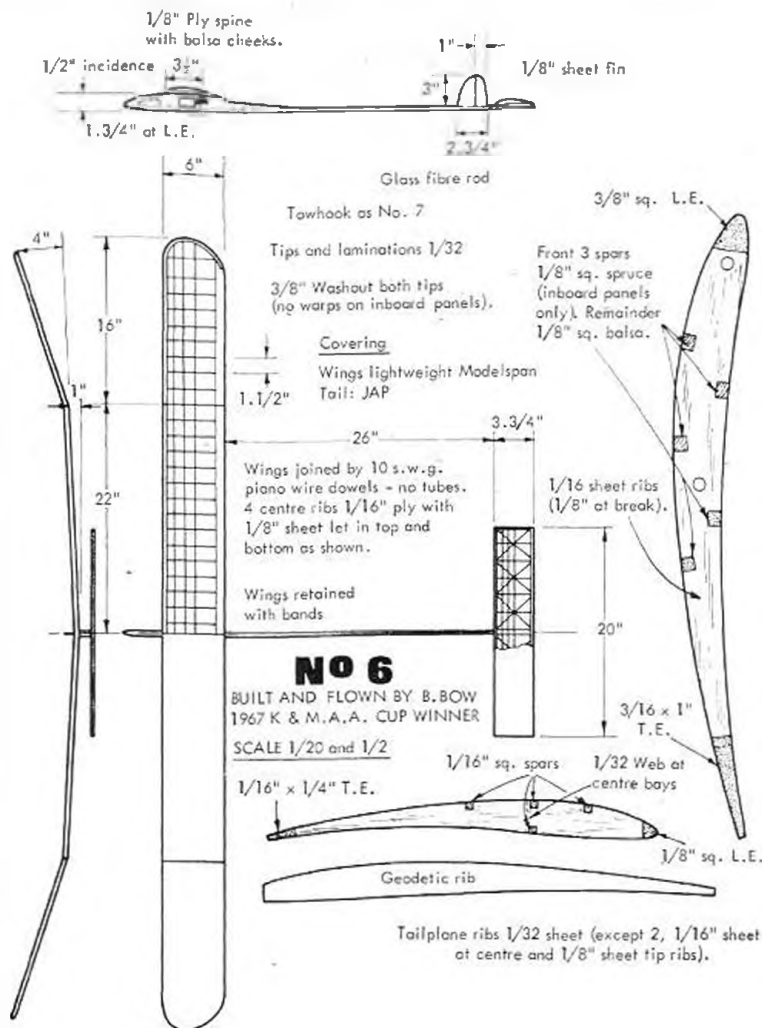
Gala in perfect weather and going on to win the *All-in F.A.I.* fly-off beating several Power jobs. It has subsequently done a few treble maxs and achieved some minor successes over the years, and was, in fact, used to win this year's Pilcher Cup at the Southern Gala in far from calm conditions. Its 'still air' time is lower than we would like and its rather high inertias detract from its potential as a contest machine.

The next model, No. 4, was built basically to the same layout as No. 3 but an effort was made to reduce inertias and increase the 'still air' time. To these ends a much lighter wing structure was adopted and a real effort made to reduce tip weight. Aspect ratio was increased and the section slimmed. The result was a much better contest machine all round, it was one of my most used models for contest flying. It seemed particularly good in thermals and only on one occasion did it obviously come out of lift. Needless to say, on a vital third flight! A variety of fuselages were used throughout its life and undoubtedly the best combination was a fibre-glass rod job which unfortunately was soon lost on a pre-contest test at Beaulieu with D/T failure. The model was originally flown without turbulator but a series of tests indicated a marginally better stall recovery with a thread turbulator 3/8 in. aft of the L.E. and, since the performance appeared unaltered otherwise, this was adopted.

This model did suffer from visibility problems, - the yellow flying surfaces being particularly difficult to see at a distance and a rather flat turn did not help. It was used on the celebrated 1966 Nats giant-sized fly-off and recorded 5:27 whilst D/T'ing at about 9 minutes. A fortnight later it was used to win the fly-off at the Croydon Gala in somewhat windier conditions to score 2:47 'down'. In fact, on several occasions it went O.O.S. in conditions when 3:00 max's should have been just about visible with an A/2. So, no more all yellow wings! Incidentally, it was once lost for several hours in a huge field of buttercups!

Number 5 is perhaps the black sheep of the family. Intended to have a better still air time than previous models, it didn't! The Aspect Ratio was the highest used to date and Höerner tips were employed on the wings. These were suspected of interfering with the tow on occasions and were removed (rather reluctantly as they had taken a lot of carving!) No noticeable difference in tow or performance was evident.

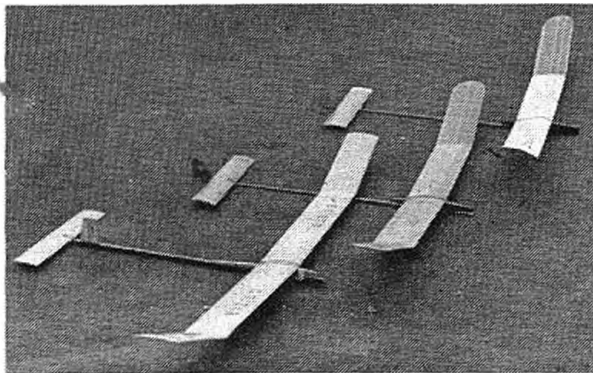
The wings employed 'Union Jack' structure to prevent warps and thus maintain trim consistency. However, trim warps built in could not be readily changed and the model needs excessive amounts of offset on the auto rudder for tow, gliding with the rudder virtually straight. Whilst this set-up appears reasonably satisfactory on the glide, I am never very happy with the towing characteristics at the top of the line, the model veering rapidly with changes in wind speed. Towhook position is also rather critical. I also suspect that the model has a tendency to work its way out of thermals. Several flights in obvious lift have terminated earlier than expected, and a couple of timer failures, when in thermals, have not resulted in fly aways. A version built by Brian Bow exhibited very similar characteristics but it did show promise as a slope soarer, in which role it was soon lost. Since then, the author has been to work on his own model with steam to try some more reasonable warps, in particular equalising the wash-out on each tip. This transformed the model. It now tows very well and the glide is definitely much more 'lively', In fact, providing the new warps can be maintained satis-

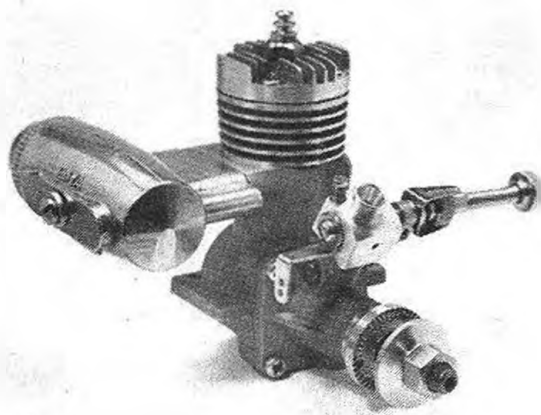


factorily it should prove a useful machine.

No. 6 was built by Brian Bow and incorporates his preference for a different layout to the fuselage nose profile. This model was intended for general use but in particular to be suitable for rough conditions. To this end the aspect ratio was lowered and the section thickened. The 'still air' time did not suffer unduly and it certainly went well in rough weather, winning the 1967 K. & M.A.A. Cup in very strong winds with a total of 9:25. It is a straightforward job with few frills, the structure was kept simple as an aid to quick production and this model, in a rather short life before being lost, indicated that it was a very practical competition machine. Brian has a very similar replacement under way at present. This will revert to the pylon format. *To be cont.*

Line up of Numbers 5, 6 and 7 (with rear fins), the last to be detailed in next month's instalment of this feature.





ENGINE TEST

by Peter Chinn

ENYA 19-IV TV

THE ENYA Metal Products Company Ltd of Tokyo now have a bigger model engine range than any other manufacturer. Including marine and R/C variations, plus several small glow and diesel units sold mainly on the Japanese home market, Enya list nearly fifty models. That we have dealt with only two of these in the A.M. Engine Test series in the past three years, is mainly due to the fact that the U.K. importers, Keilkraft, have been unable to obtain adequate deliveries. At the present time, almost the entire production of Enya motors is being absorbed by the American and Japanese markets but it is hoped that, in the not too distant future, Enya's steadily expanding production will meet the considerable demand that exists for these engines and enable regular deliveries to be resumed to the U.K. and Europe.

The 19-IV TV (.19 cu. in., fourth series, throttle-valve equipped) model, which is the subject of our report this month, actually went into production sometime before the present shortage and a fair number of these, plus the similar, earlier series models, are in use in the U.K. Our test unit came direct from the Enya factory, by courtesy of Saburo Enya, one of the four model-enthusiast brothers who, this year, will complete 20 years in the model engine manufacturing business.

It was with a .19 engine, in fact, that the Enya factory began quantity production of model engines and, as a result of Enya's policy of steadily developing a successful design, the basic layout of the original 19 is still evident

in the present model. None of the parts of the early models are to be found in the current engine but it remains a shaft induction motor of 16 x 16 mm. bore and stroke, with one-piece crankcase/cylinder casting and detachable front end carrying a plain bronze-bushed main bearing.

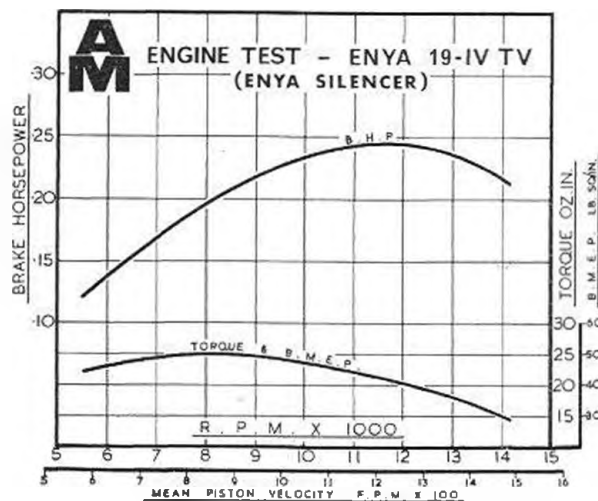
The throttle type carburettor used by the current 19-IV TV is an improvement on the simpler type used on the 19-III TV model. It is of an orthodox barrel throttle pattern with adjustable airbled and idling stop screws. The throttle arm position on the barrel can also be altered, which can be helpful when making adjustments to the servo linkage. No coupled exhaust restrictor is fitted – but this is no disadvantage to the average U.K. user since it would normally be discarded in favour of a silencer, anyway.

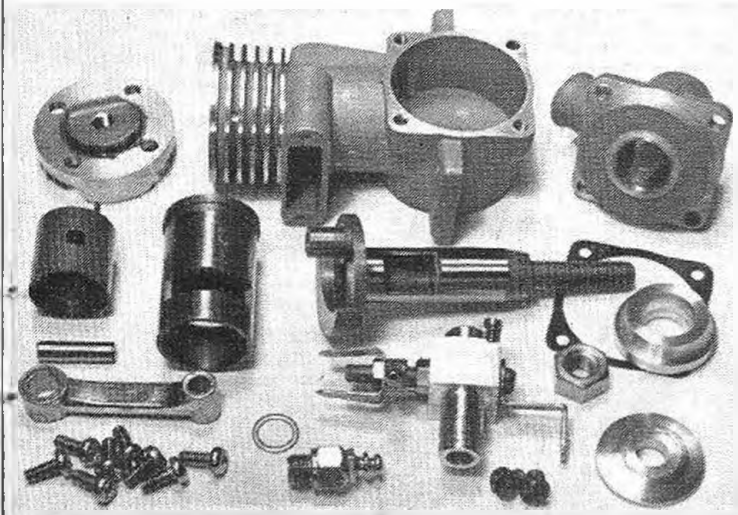
The standard Enya small (15/19 size) silencer fits this engine. It can be attached either by clamping it to the cylinder with the steel strap and two screws provided or, for a neater installation (see heading photo), the ends of the engine exhaust duct (which are centre-popped for the purpose) can be drilled and tapped for two internal attachment screws. Screwdriver access for fitting these screws is via a swivelling plate on the side of the silencer which uncovers two holes opposite the internal attachment screw heads.

Performance

Most, if not all, of the numerous Enya engines (including an earlier type 19) that we have handled during the past few years have been very good starters. It was, therefore, surprising to find that, in this respect, the 19-IV was not quite up to usual Enya standards. When new, the piston of our test model was rather tight at the top of the stroke, which did not help matters. As the engine freed off, cold starting became much easier but hot restarting was a trifle indefinite, particularly when using the silencer. In general, we found it best to close the throttle and/or open up the needle-valve and *not* to suck-in to obtain a warm restart. When quite cold, however, the 19 responded best to the usual preliminary of an exhaust prime. This is greatly aided, when the engine is fitted with the silencer, by the latter's swivelling side plate.

Typical prop r.p.m. obtained, with the silencer installed, after an accumulated running time of approximately 1 hour, included the following: 7,200 r.p.m. on 11 x 5 Top-Flite wood, 7,800 r.p.m. on 11 x 4 Power-Prop wood, 8,000 on 10 x 6 Tornado nylon, 8,100 on 10 x 5 Top-Flite wood, 9,400 on 10 x 3½ Top-Flite nylon, 8,550 on 9 x 6 Top-Flite wood, 10,100 on 9 x 5 Top-Flite wood, 10,600 on 9 x 6 Top-Flite nylon and 11,00 r.p.m. on 8 x 6 Top-Flite nylon.





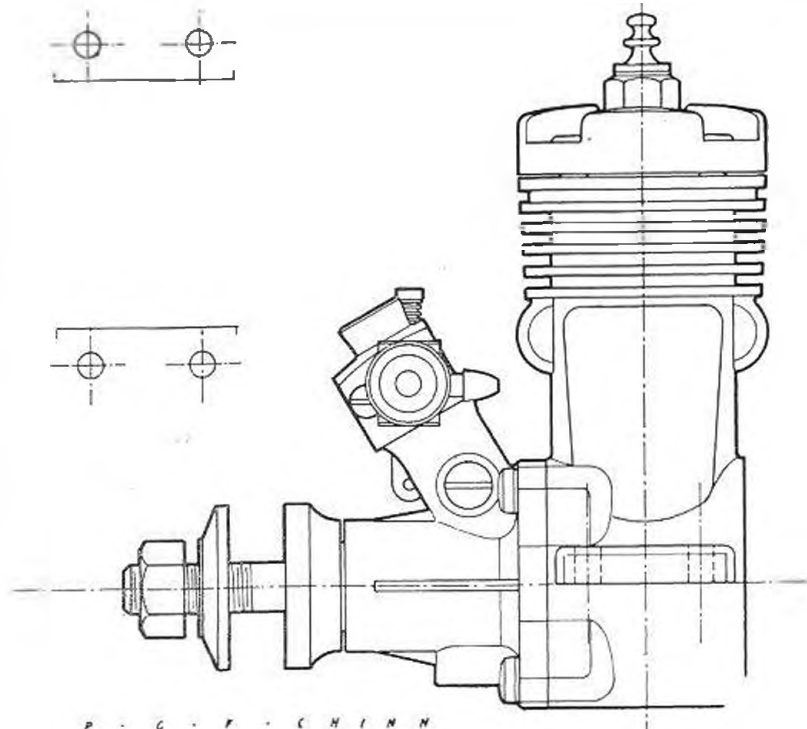
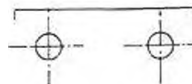
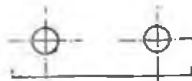
Parts of the Enya .19 display the hallmark of quality for which this company is renowned. Note the large shaft bore. Photo opposite shows the Enya silencer fitted.

The throttle worked well, especially after the engine had become adequately run in. Safe idling speeds of between 2,500 and 3,000 r.p.m., according to prop size, were then obtained. On the prop sizes best suited to the engine for R/C use (e.g. 10 x 5, 10 x 4, 9 x 6, 9 x 5, 9 x 4) idling speeds were in the 2,700-2,800 r.p.m. bracket.

A maximum power output of just over 0.24 b.h.p. at between 11,500 and 12,000 r.p.m. was recorded on test, using our standard 5 per cent nitromethane test fuel and with the silencer in place. Removal of the silencer resulted in the peak b.h.p. being raised by approximately 12 per cent at about 700 more revolutions per minute, but maximum torque (reached at approximately 8,000 r.p.m.) was not measurably increased. The power loss due to the silencer, in fact, only began to show when the engine was propped for speeds over 10,000 and was only really significant when load speeds exceeded 11,000 r.p.m.

Apart from the slightly slow warm restarting already mentioned, the general handling and running qualities of the Enya 19-IV TV were good. The engine showed no tendency towards viciousness when started on small props and running was free from excessive vibration.

To sum up, the Enya is not the most powerful nor the smallest, lightest or easiest starting 19 R/C engine on the market but, having been in production in this and earlier versions since 1953, it is a thoroughly proven product. It is well made, is known to have better than average resistance to wear, has good throttle performance and a power output well up to expected levels for engines of this size and type.



P - G - F - C H I N N

SPECIFICATION

Type: Single cylinder, aircooled glowplug ignition two-stroke with crankshaft type rotary-valve and bushed main bearing.

Bore: 16.0 mm. (0.6299 in.). **Stroke:** 16 mm. (0.6299 in.).

Swept Volume: 3.216 cc. (0.1962 cu. in.).

Stroke/Bore Ratio: 1.00 : 1.

Weight: 167.6 grammes = 5.91 oz. (less silencer).

210.7 grammes = 7.43 oz. (with silencer and external fitting).

General Structural Data

Pressure diecast aluminium alloy *crankcase/cylinder casing* with drop-in steel *cylinder-liner*. Pressure diecast aluminium alloy detachable *front housing* with cast-in phosphor-bronze *main bearing* and secured to crankcase with four screws. Hardened, counterbalanced *crankshaft* with 11 mm. dia. journal, 8 mm. bore gas passage and 6 mm. dia. crankpin. Lapped cast-iron *piston* with fence type baffle and fully floating 4 mm. dia. hardened tubular gudgeon-pin with brass pads. Pressure diecast aluminium alloy *connecting-rod* with cast-in bronze big-end bush. Pressure diecast aluminium-alloy *cylinder-head* with machined joint face and cast-in brass thread insert for glowplug and secured to cylinder casing with four screws. No cylinder head gasket. Machined aluminium alloy prop driver fitted to matching taper on crankshaft. Machined aluminium alloy *carburettor body*. Ground steel *throttle barrel*. Separate idling and air-bleed adjustment screws. Plated brass jet assembly. Flexible needle-valve extension. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: 2 hours.

Fuel used: 5 per cent pure nitromethane, 25 per cent Duck-ham's racing castor-oil, 70 per cent ICI methanol.

Glowplug used: Enya No. 3, medium reach, platinum-rhodium filament.

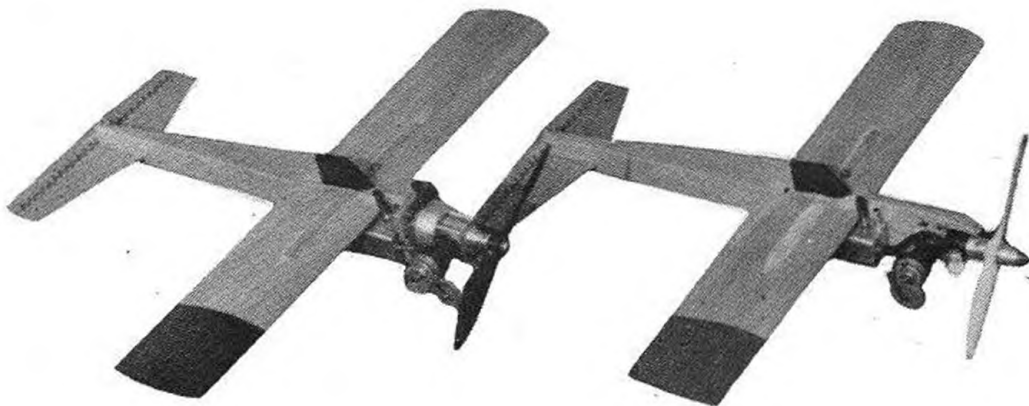
Air temperature: 44 deg.F.

Barometer: 29.45 in.Hg.

Silencer: Enya 15/19 size, expansion chamber type.

Power/Weight Ratio (with silencer): 0.52 b.h.p./lb.

Specific Output (with silencer as tested): 76 b.h.p./litre.



**FULL SIZE
PLANS ON
CENTRE
PAGES FOR
THIS ULTRA
SIMPLE C/L
DESIGN**

Tom Jolley's 'BURP' Mouse Racer for .049's (.8 c.c.)

CONSTRUCTION, in the main, has been kept simple. The only dodgy step is the drilling of the fuselage for the undercarriage leg. Unfortunately, despite much dandruff disturbance, it's the best idea we can come up with.

Balsa cement was not used on the originals at any point because of the ply parts. Araldite, now available in small quantities, is recommended for the joints that you can leave for a number of hours. Those requiring speedier treatment were fixed with Holts Cataloy paste - useable time about four minutes, and workable after 20-30 minutes.

Now, to the bench, kitchen table, grand piano lid or what-have-you. We always suggest, but never do it - chop out all the parts after you have decided what engine to use. Ensure that the tail slot in the ply fuselage is parallel to the top edge. Cut out the spar slot in the wing and glue the spar in place. Carefully round off all the edges of the tailplane and elevator with very fine glass paper, which should be wrapped around a 6 in. length of planed 2 in. x 1 in. hardwood to give much better control. Finish all edges and surfaces (except wing at this stage) with grade 400 wet or dry paper, used dry.

Hack the wing to the closest approximation that you can manage to the shape shown on the plan. Again finish with glass paper and 400 Wet or Dry paper.

Drill the ply section of the fuselage and having bent the upper part of the leg, push it down through the fuselage. Trim underneath of the wing to seat correctly on the ply.

Sticking time - Attach wing and tailplane to plywood half of fuselage. Check that they align perfectly to each other both in plan, side, and end views. Attach engine former if using radial mounted motor (no offsets necessary). Glue balsa top to fuselage.

Two choices now remain: start a second model or go to bed.

If using beam mounting, shape bearers and attach to fuselage. If using radial mounting, groove mount for tank feed pipe and add top and bottom fillet pieces. Drill rear of fuselage and glue tailskid in place. Attach outboard wing tip skid and inboard wing line guide. Attach horn to elevator - securely. Add adhesive fillets anywhere that

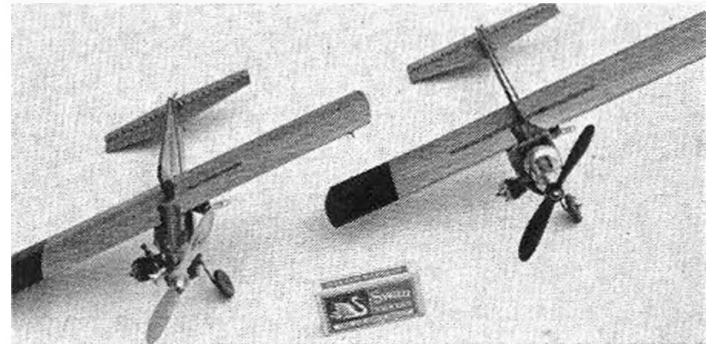
you fancy - wing/fuselage, tailplane/fuselage, engine mountings etc., and that's it.

Continue with second model, watch T.V., or go to bed again.

A great many words have been published on the subject of finishing, but most can be ignored for this brain-storm. After a most careful finishing sanding with 600 W/D paper, used dry (well-used 400 or two pieces of new 400 scrubbed face to face will suffice) apply one coat of clear dope, straight from the bottle. You can, to advantage, add half a dozen drops of castor oil to each ounce of shrinking dope - stir extremely well before use. This will reduce the tendency to curl the wing trailing edge and tail parts. Lightly dry sand all over with the 600 again, paying particular attention to corners and end grain. Add any trim that your psychedelic fantasies dictate. Apply one or two coats of clear polyurethane to the whole thing. As you will be using nitromethane fuels in glow motors, it is recommended that you use a two pack polyurethane - the only type that has a true chemical hardening process.

Using either a fine twist drill (No. 50) or a pin, carefully make the holes for the carpet thread stitched hinging, which connects the elevator to the tailplane.

The prowess of the girl friend or wife - but not both together - could now be tested. Ensure that ultimately the horn is on the top - this will mean that for 'up' elevator the pushrod is pulled giving a positive reaction at the elevator, instead of a bending pushrod when overtaking. You *will* be overtaking, won't you? Drill the wing and bolt the bellcrank in place complete with paper clips (for tiny models ONLY) and over-length pushrod.



Paired views of the twin Burps, Class I for Tee Dee 049 and Class II with Cox Babe Bee radially mounted are sized for comparison with matchbox. Could anything be simpler? Last year's Nats showed how these tiddlers can rotate like the best and yet can be made overnight. Build today, race tomorrow should be the motto.

Right, Top to base. Nose detail of Class I with Cox Tee Dee on beam mounts. Detail of bellcrank with paper clip connectors, and pushrod trapped by wing as does the elevator horn and fuselage. Drilled Babe Bee tank also has needle valve upside down for crash protection, hard to see; but it points upwards. Base view shows the bare facts, minus flippers, ready for finish and proofing, one for each class.

Temporarily lock the bellcrank at the *almost* full DOWN position and, holding the elevator at neutral bend the pushrod to fit the elevator horn. Remove the bellcrank/pushrod assembly, feed the pushrod through the elevator horn and gently fiddle the rod and the bellcrank back to their correct location. Drill the motor mounting for the 8 BA bolts (No. 44) and bolt motor in place. On radial mounting version screw lower outboard bolt FORWARDS to ensure clearance for tank.

Now glue tank in place, making sure that tank and local area are grease-free. Install 5 in. diameter prop. on motor and bend undercarriage leg so as to give $\frac{1}{4}$ in. to $\frac{1}{2}$ in. prop tip clearance when flying from hard surfaces or $\frac{1}{2}$ in to $\frac{3}{4}$ in. for very short grass. For long grass just don't bother with an undercarriage at all. Bend for wheel must turn inwards, not outwards, so that wheel is inboard of the C.G.

Flying presents no problems—it can be used as a trainer—even in strong winds, believe it or not. After connecting the lines, double check that a comfortable handle neutral gives neutral elevator. Be critical. Rectify any errors by adding/subtracting/bending supplementary paper clips at the handle. Use a handle with a small line gap (about 2 in.) to reduce sensitivity. At the moment of release the pilot should step back and to the left to ensure line tension as the model lifts off.

Original equipment used has been: K.K. red card 33 s.w.g. steel lines; K.K. plastic handle; K.K. 15 c.c. rectangular team race tank; Tornado or Cox 5x4 nylon props; and Super Nitrex fuel (15 per cent nitro).

The use of a two-volt wet accumulator should seriously be considered, using a long thin lead to end up with about 1.7 volts at the plug. This voltage is high enough to burn off any excess fuel during a flooded start, but not high enough to burn the element or cause excessive back-firing. A *small* polythene bottle should be used as a filler/primer, because a normal sized one will waste as much fuel as is used, being almost uncontrollable during pit stops.

Lines should be carefully stored on a reel around 2-3 in. diameter—a suitable one can be made from $\frac{1}{4}$ in. Balsa core and 1/16 ply flanges of $\frac{3}{4}$ in. bigger diameter than the core.

See you at the next event?

Rules

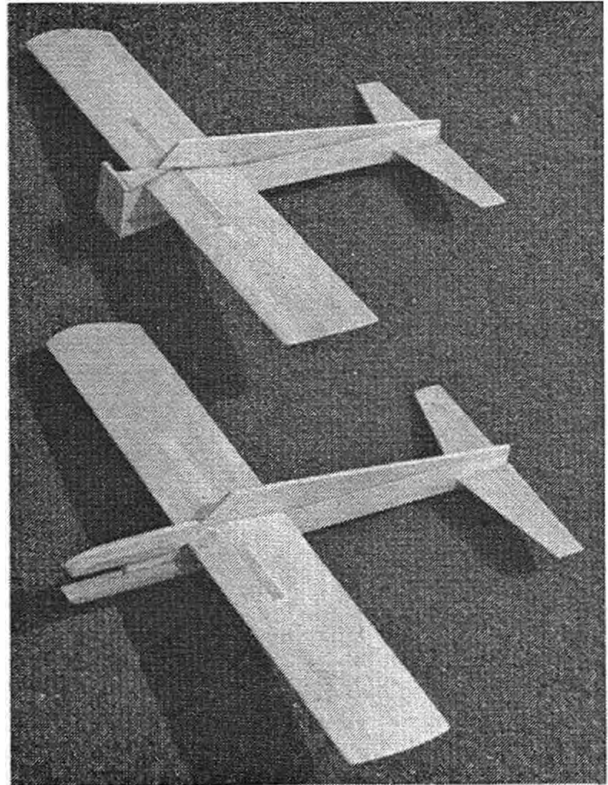
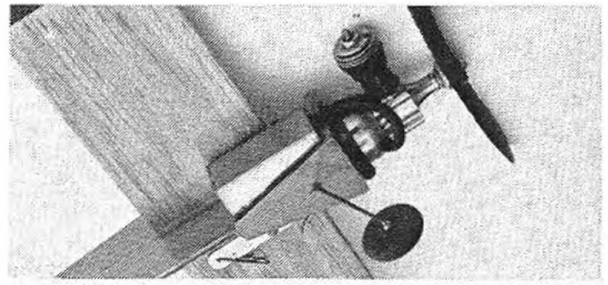
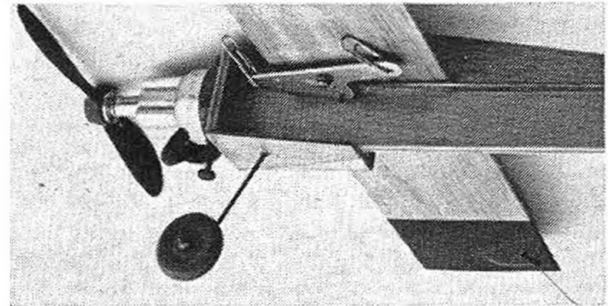
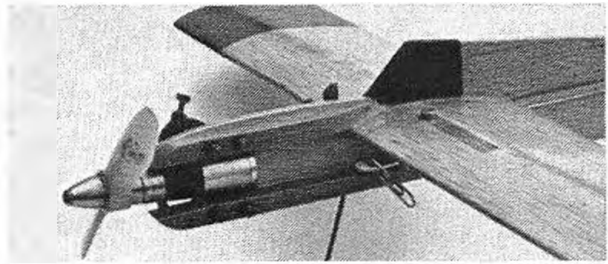
Class I Motors costing more than £4.

Class II Motors costing less than £4.

Modifications and interchange of parts is allowed in each class as long as the original style of induction is utilised.

General

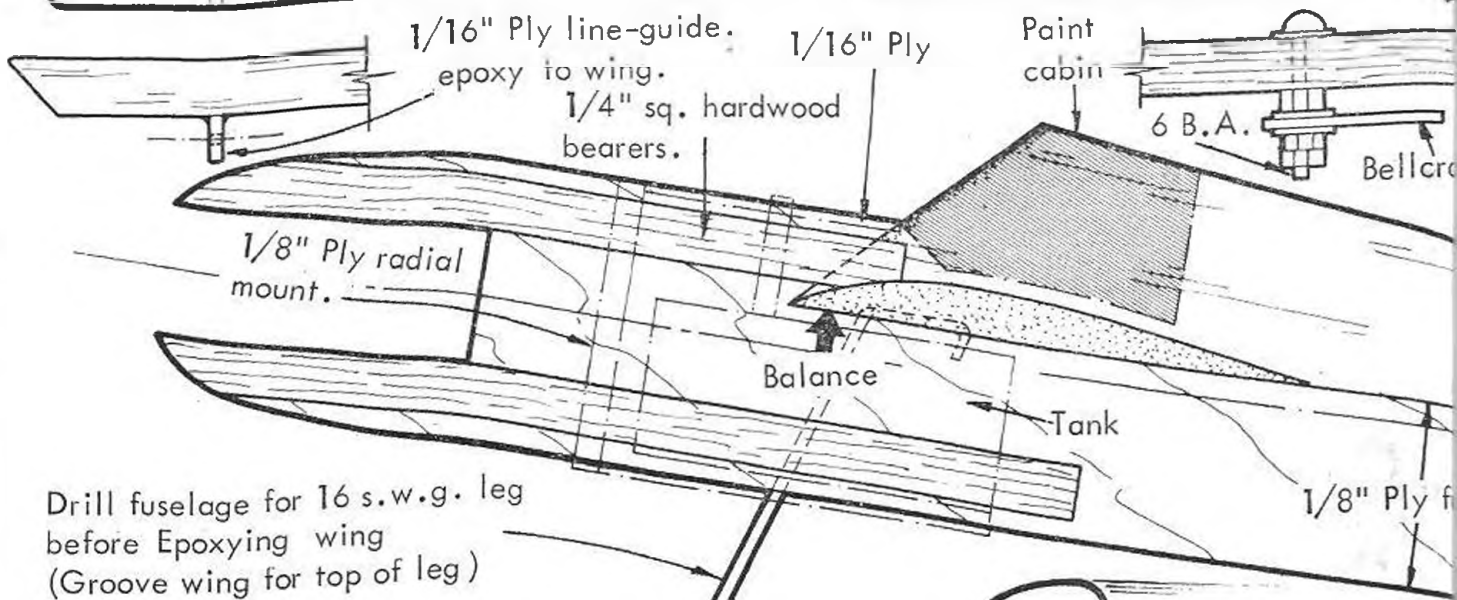
Handle to model line length	35ft.
Minimum line diameter	0.010 in.
Maximum number of team members	Three
Maximum number of teams per race	Three
Minimum number of teams per race	Two
Heats: 72 laps with minimum of one stop	
Final: 144 laps with minimum of two stops	
Flight circle markings:	
10 ft. diameter	
20 ft. diameter	
90 ft. diameter	
Maximum heat time allowable	7 mins. 0 sec.
General S.M.A.E. Rat Race rules shall apply.	



Drill 1/16" holes at
1/4" pitch for lines.

Start with these holes,
adjust for best performance.

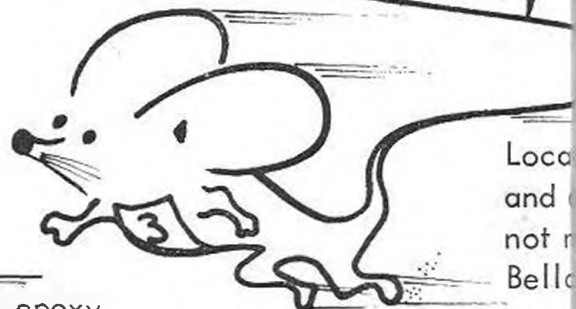
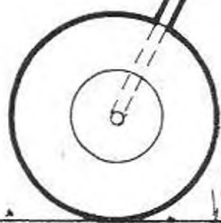
Bolt bellcrank through spar.
Use small paper clips on
bellcrank for lines. Use K.K.
aluminium bellcrank.



Drill fuselage for 16 s.w.g. leg
before Epoxying wing
(Groove wing for top of leg)

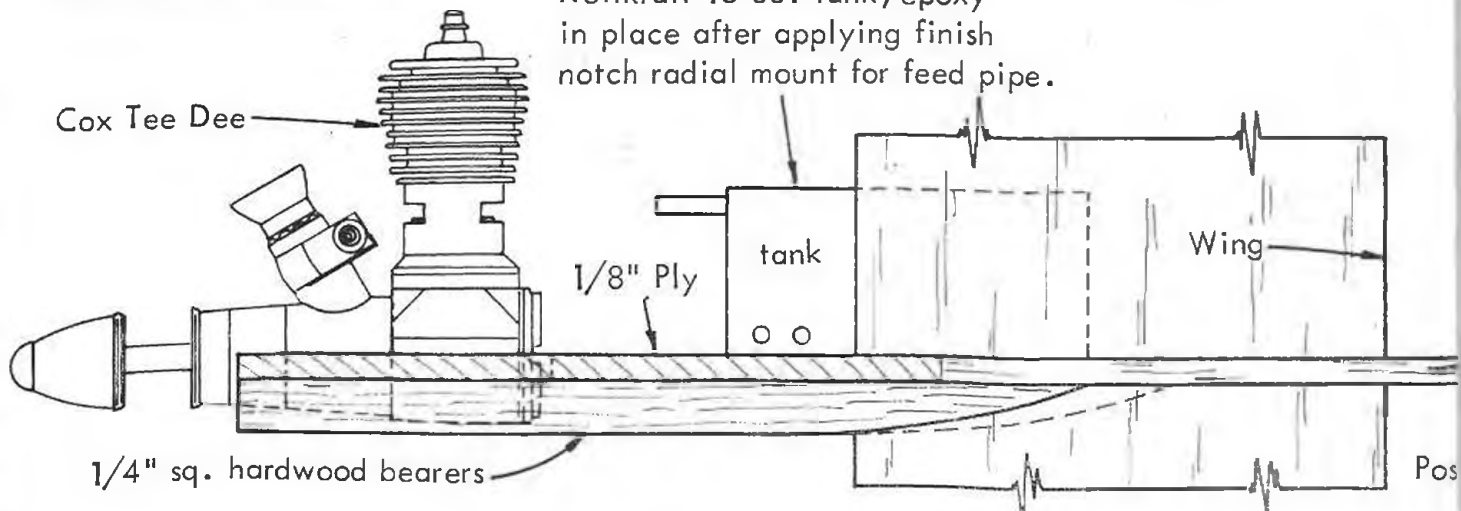
Tom Jolley's BURP

049 (.8 cc.) MOUSE RACER



Loco
and
not r
Belle

Keilcraft 15 cc. tank, epoxy
in place after applying finish
notch radial mount for feed pipe.



1/4" sq. hardwood bearers

Pos

1/4" sq. hardwood,
Britfix epoxy into wing.

No tipweight

Wing 1/4" sheet balsa

22 s.w.g. tip skid.
Britfix epoxy to wing.

Elevator

Tailplane
1/16" sheet hard.

Sewn thread hinges
on original

16 s.w.g. tail skid.
Drill fuselage for
skid, after Epoxying tail.

Pushrod
16 s.w.g.

fuselage

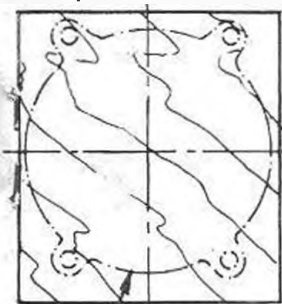
1/8" sheet

crank

locate pushrod parallel to fuselage
and about 1/8" away from it. Washers
are needed for retaining. This will locate
crank pivot hole and horn.

Radial mount shown for Babe Bee or
QZ.049. Adjust position for Golden Bee.
B.B. or Q.Z. side mounted with needle
valve on top. Drill tank wall for fuel
line if using external tank as shown.

Use suitable horn
to achieve approx.
35° up and 5° down.



position of engine

1/8" Ply radial
mount

Cox Babe Bee

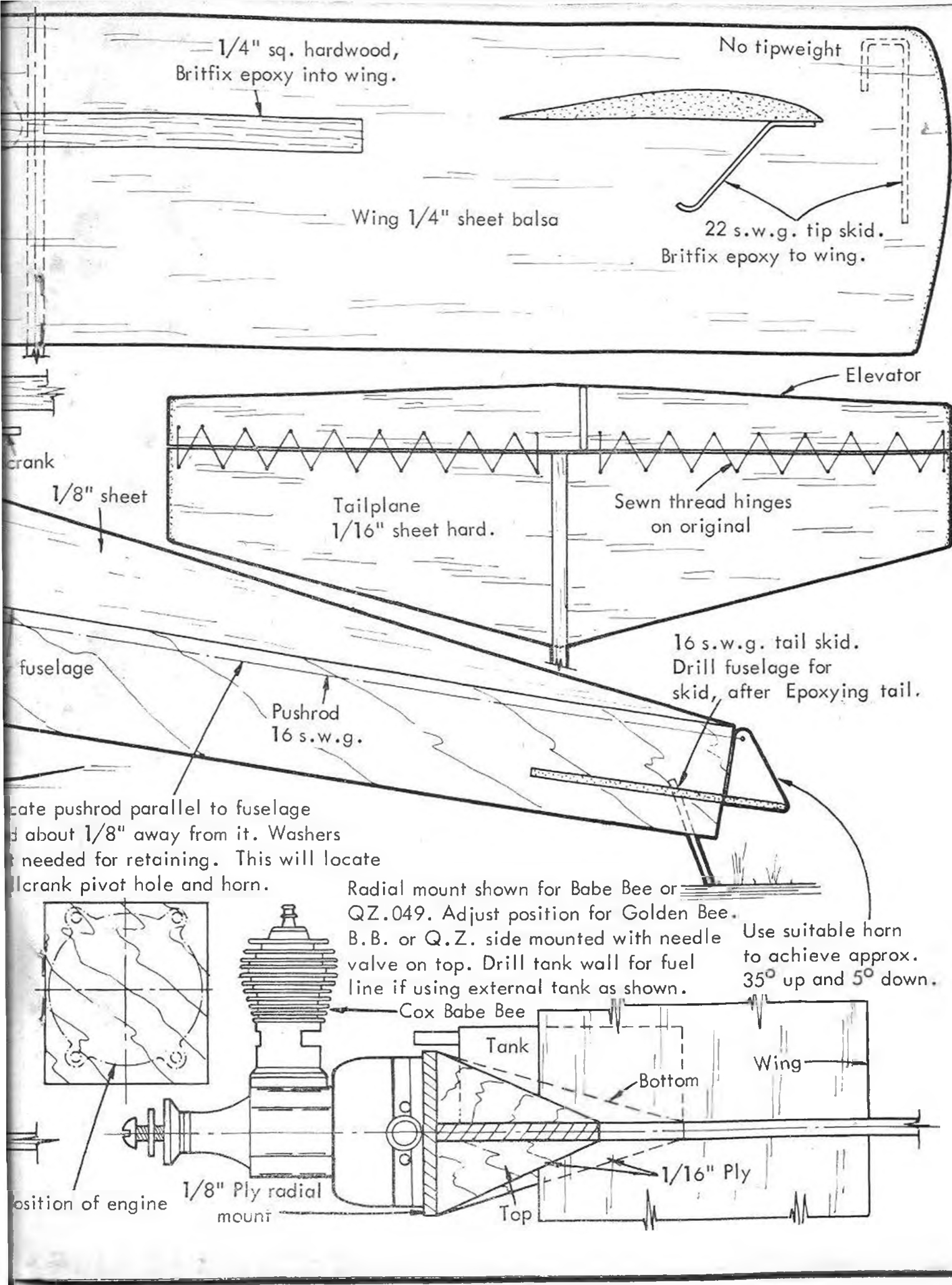
Tank

Bottom

Wing

1/16" Ply

Top



Strictly Simple

Timely advice
for the novice
radio flyer from

**DAVID
BODDINGTON**

ONE OF THE MANY frustrations of our hobby is the lack of flying fields of any description. Most of us are only too thankful to be able to fly from any rough patch on which the local council or a friendly farmer have been good enough to give their blessing. Admittedly our hobby must seem a rather odd pursuit, to say the least, to the average layman; but surely we deserve as much consideration for our flying facilities as other minority sports and hobbies. However, the fact remains that few R/C modellers are lucky enough to fly from a field with short grass, not to mention an area of hardstanding. This being the case, it makes the possibility of carrying out successful take-offs virtually impossible and practically all landings finish with the model doing a somersault or



Author's brother Charles, one of Britain's leading aerobatic pilots, shows how to launch the 'Mighty Super' a capacious development from the well established Super 60 layout, in turn derived from the Junior 60.

cartwheel after touch-down. I find it particularly galling after doing a reasonable circuit and approach to see the model touch down in the correct altitude, and at the correct speed, only to see the model tripped over by a long tuft of grass. In view of the lack of success in achieving satisfactory take-offs and landings – and these can be one of the most rewarding parts of the flight, is there really any point in having an undercarriage at all? The conclusion that I have reached is that, providing you are bound to fly from a normal grass field, one might as well dispense with a conventional undercarriage on all but the larger models. On a plane of the size and type of a 'Super Sixty' with large balloon wheels fitted, it is at least possible to carry out a reasonable landing on pasture land. One modification worth considering in this respect is to move the undercarriage (on other than tricycle u/c arrangements) further forward than normal, nearer to the position used on the original Junior 60. For small models without undercarriages, it is advisable to strengthen the underside of the front half of the fuselage to take the additional knocks. This can be done by sheeting the underside with sheet obechi or spruce instead of balsa or to cover the balsa with 1 mm. plywood. An added advantage of dispensing with the undercarriage is an overall reduction in weight and of drag when the model is flying.

My latest galloping ghost model is without wheels – and flies very well – but what happens, within a couple of weeks of completing the model our flying group managed to obtain the use of an airfield! Such is Murphy's law; why not try it yourself?

Britain appears to be about the only country to continue to produce a large number of diesel engines for model aircraft. Indeed, few of the other nations ever seemed to take to the diesel engine as we have. The reasons for this are many and varied but the important consideration remains as to whether the glo engine or diesel is most suitable for R/C models. Having used both types, and having a strong nostalgia for the diesel resulting from early acquaintances with the Frog 100 and Mills 1.3 engines, I feel that both types have their uses.

D. North enjoys lunch hour flying at Enfield with an 'Obogo' from data in July 1968 Aeromodeller. Powered by O.S. 10 R/C with R.C.S. Guidance System it is very lively and responds well. Mr. North has mounted the tail surfaces to the bottom of the fuselage to make elevator controls easier to fit, otherwise it's a standard Obogo.

For a small model with rudder only control a diesel engine will do the job well enough, it does not, of course require a booster battery and is therefore more simple to operate. Diesels up to 1.5 cc. capacity are generally easy to operate and, and this is most important, do not cause too much vibration. Larger diesels can sometimes suffer from excessive vibration, this is not common to all engines but is a characteristic that is more noticeable with diesels than glo's. Quite frequently, too, larger engines and models are associated with engine control in addition to rudder control. Diesels fitted with throttle control often suffer from a limited range of r.p.m. control, a figure of 50% of the maximum r.p.m. for low speed position being a normal figure. In addition to this there is sometimes an occurrence of 'under-compressing' which, in practical terms, results in the engine failing to pick up to full revs. after a prolonged period at low speed. Needless to say this can prove embarrassing at times when one is relying on immediate response of the throttle. Modern examples of Glow engines have excellent throttling characteristics, many rivalling the high speed/low speed ratios of the larger engines.

Before irate owners of diesel or glow engines start putting pen to paper to explain that their particular engine is the best (or, for that matter, the worst) engine available, let me reassure them that the foregoing remarks are only generalisations and there are bound to be exceptions. For more detailed reports of specific engines you will have to refer to the engine test reports. One point here, as far as these tests are concerned, there is rarely sufficient information in them regarding levels of vibration. I do not know whether there is any method of measuring levels of vibration but it would be most useful if some form of indication of the expected vibration could be included in the reports. Without doubt excessive vibration can cause more radio troubles than pretty well any other cause.

Having decided upon, built and, we hope, successfully flown your first R/C model the choice of the second and subsequent models can be equally as difficult as the first. Too many modellers seem to make an arbitrary selection of models after their initiation into R/C flying only to regret it later. There are a number of factors that should reflect on the eventual choice of design whether it be a kit or a model built from a plan. Providing you weigh up the following factors *before* deciding which model to build you are more likely to be satisfied with the final result.

If you are the owner of some of the older type of radio equipment, both bulky and heavy, there is no point in considering a model of small dimensions. Even if you manage to cram all of the airborne equipment into the fuselage the model will probably finish up overweight and, as a result, have poorer flying characteristics.

Multi channel equipment will obviously allow a wider choice of model design and the latest miniature proportional systems cover the greatest possible range of models. These systems, because of their light weight and compact dimensions can be installed in designs varying from .10 cu. in. engine powered pylon racers with wing spans of less than 36 in. to the high-powered stunt models used in competition events. Unfortunately the cost of this type of equipment is prohibitive to most modellers and, therefore, model dimensions and types are dictated by the equipment available. Allowing for this limitation it

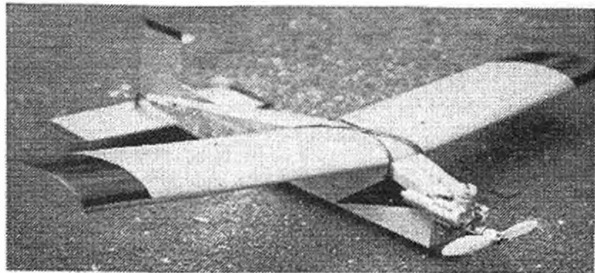
Of course if you want simplicity how about Tom Lampitt's wheel-less 41 inch 'Royal Coachman', complete, no less, with Super Tigre G.23 and Sprengbrock proportional control! Weighs 3 lbs. ready to fly, lands on a ply skid and can take a lot of knocks. Apart from the expense of the equipment it appears to be the quickest approach to multi control in more senses than one!

is then up to the modeller to decide how much he is prepared to experiment with the equipment and model design to obtain the utmost from them.

Assuming that your proposed model is to be powered by an existing engine this will also limit your selection of aircraft designs. Remember though, that it is always possible to reduce the efficiency of an engine that is theoretically too powerful for the design. It is more difficult to get that extra bit of urge from a motor that is under capacity, using high performance fuel and careful propeller selection may help but, an under powered model can be a problem to fly and even dangerous. Reducing power on an oversize engine can be accomplished by throttling down (if it is an R/C type motor) or by fitting the propeller on to the engine backwards. Diesel engines can be undercompressed to reduce the r.p.m. but there is always a danger that, as the engine warms up, the engine will increase in power. Similarly a Glow-engined model sent off running rich may peak out for the last few seconds of its fuel run with, possibly, dire results.

Restricted flying sites pose a problem as to the most suitable model to fly in these areas. Lightly loaded stable models tend to be 'floaty' on the glide and, with high obstructions around the site, difficult to land within a restricted boundary. A heavier wing loaded model will fly faster but may also have a more rapid rate of descent allowing it to clear an obstacle and still land within the perimeter of flying area. Engine control is obviously an advantage in flying from small sites, full power can be used initially until a safe height is reached and the engine then throttled down for normal flying followed by further throttling down or cut off the approach and landing. In such circumstances it is essential that the motor control should function with complete reliability indeed, it is essential when flying in the confined areas to have foolproof operation of all radio equipment with a reasonable degree of model manoeuvrability. There is a special method of flying from 'cabbage patch' fields and I will try to deal with this in a future article.

Most modellers have a preference for certain types of models, e.g. fast flying stunt models, sports easy to fly designs or scale, and this will be their chief guide. We sometimes tend to get into a rut and fail to try out different types that can offer just as much challenge and enjoyment as our first loves. Have you got any large hills near you? Then why not a try at slope soaring. Or what about that large lake just a mile or two from your home! Flying boats and seaplanes are a fascinating, and relatively untried, branch of our hobby. If you will excuse the cliché, the sky is the limit as far as suitable designs - provided you keep within the practical limitations. When you hear anyone state that he has *done it all* as far as R/C flying is concerned and there is no future challenge, you can be sure that he must have lost interest in life!



AIRCRAFT DESCRIBED NO. 178

Another ideal flying scale subject,
Germany's aerobatic trainer

Focke-Wulf Fw44

"Stieglitz"

drawn by Bjorn Karlstrom

described by Bo Widfeldt

THE 'STIEGLITZ' was created by Kurt Tank at Focke-Wulf Flugzeugbau GmbH in 1932. It was originally constructed as a successor to the S.24 'Kiebitz' at the request of the famous German aviators Gerd Achgelis, Emil Kropf and Ernst Udet. They needed a new aircraft suitable for advanced flying and D-2409 was extensively demonstrated. The Fw 44 proved to be an excellent aircraft and Achgelis promptly ordered another for his personal use. Production versions were to have a revised fin and rudder.

Achgelis flew the Fw 44 on many occasions, among them the 1934 National Air Races at Cleveland and the 1934 World Aerobatic Championships at Vincennes in France. In the ensuing years the 'Stieglitz' was a frequent visitor to England, Herr Gerbrecht came 2nd in 1938 in the Manx Air Derby.

The first prototype flown in 1932 was equipped with a 150 h.p. Siemens Sh 14a radial engine. The Fw 44C had a 135 h.p. Argus As 8 in-line engine and few were built.

The B and C versions were slightly modified and built in larger numbers designated Fw 44D (with Sh 14a) and Fw 44E (with As 8). 100 of these D and C versions were ordered for DLH in 1938. The Fw 44J was designed for export. This aircraft was the same as Fw 44D with some minor changes. A large number of 'Stieglitz' were sold to Bolivia, Bulgaria, Chile, China, Finland, Hungary, Sweden, Rumania, Turkey and Slovakia. The type was also built under licence in Sweden, Argentina, Turkey and Brazil. It was to become a standard basic trainer for the Luftwaffe and in 1944, over 700 were in use though only a couple remain in Germany today.

In the beginning of 1936 the Swedish Air Force consisted of about 80 weakly-armed and old aircraft. Sweden also lacked a powerful aircraft industry with enough capacity to support an Air Force. The basic flight training centre was Flightschool F5 at Ljungbyhed and the expanding Swedish Air Force looked in 1936 for a replacement of the antiquated basic trainers type Sk 9 (DH 60T Moth Trainer) and Sk 10 (Swedish built RK 26 Tiger-Schwalbe).

In 1935 a Fw 44 demonstrator registered D-EKRO was shown at Ljungbyhed and on February 7th 1936, two Fw 44J were ordered in Germany. The two aircraft were ready for delivery from Focke-Wulf Flugzeugbau GmbH in Bremen in the beginning of March and they were accepted by the Swedish Air Force on April 17th, 1936. The two aircraft were designated P 2 which indicated that they were intended for evaluation (P=prov, testing). The P 2's were flown at the Swedish Air Force test centre at Malmen (FC) and of course with the F5 at Ljungbyhed. The type proved to be extremely manoeuvrable and a series of 14 aircraft were ordered in Germany



Wide gap between high aspect ratio wings, large ailerons with coarse movement, big rudder and generous elevators make the 'Stieglitz' a perfect scale subject for R/C aerobatics - if you like a biplane!

Serial 1305 on the fin and nose cowl of NM-AM in service through to 1945 as a trainer, with similarly uncamouflaged gliders seen in rear.



in 1936. These were delivered to the F5 Flightschool from January to July 1937 with the designation Sk 12 (Sk=skol, training). The designation of the two P2 was also changed to Sk 12.

On September 29th, 1936, a contract for licence production was signed by the Swedish Air Force and Focke-

1935 regulation Swedish AF markings on an SK 12 with F5 wing at Ljungbyhed. Rudder stripes were yellow and blue.

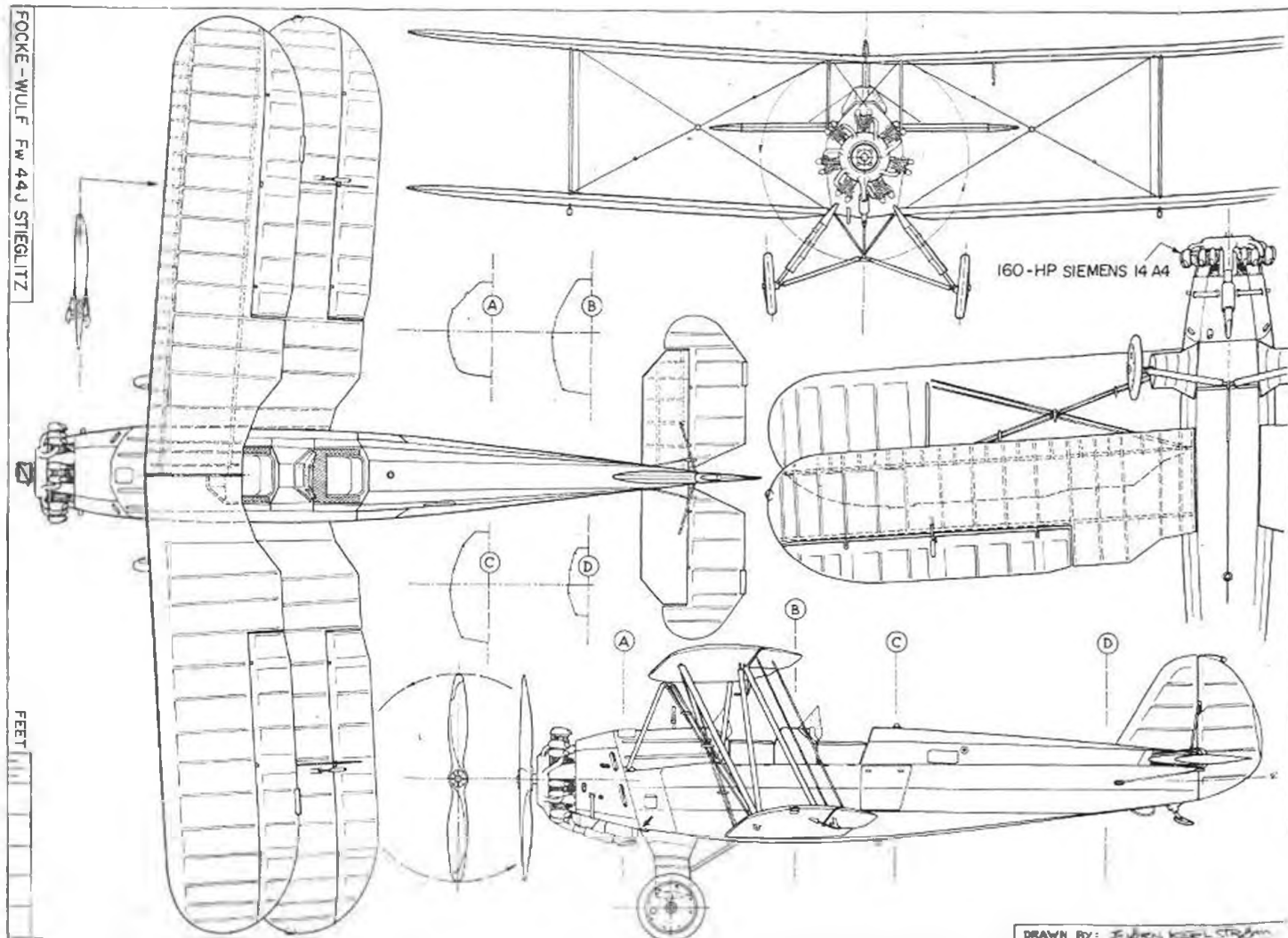


Wulf GmbH. This contract was followed by an order to the ASJA factory in Linköping (later SAAB AB) for 20 Fw 44J. The conditions for ASJA were very tough. The aircraft had to be delivered as quickly as if the order had been placed in Germany. However, the first ten Swedish-built Sk 12 were delivered during the autumn of 1937 and the last ten were actually delivered by SAAB from April to August 1938.

A final order for 12 Focke-Wulf Fw 44J was placed in Germany in 1940. These aircraft were built by Flugzeugwerke CKD in Prague and delivered to Sweden in March 1940.

Ljungbyhed. The Sk12 were later successively replaced by the Sk25 Bucker Bu 181, but the last example was not retired until 1967 when it was flown to the Military Air Historic Collection at Linköping. When most of the Sk12 were written off around 1950 they were civil registered in Sweden serving with the different flying clubs as trainers and glider tugs. Due to lack of spares many civil Fw 44s have to be scrapped and by 1967/68 only three were still civil registered, SE-BWO, SE-BWZ and SE-EGT of which the last still has a valid C of A.

Upper and lower wings were of wooden construction, identical size and shape, inter-connected by N-struts



Reprints of this 1/72nd scale drawing, with dye-line prints of the 1/36th scale original are available as plan pack JF 2883 price 3s. incl. post from Aeromodeller Plans Service.

Production continued in Sweden at the Central Workshop of the Air Force in Vasteras (CVV). The first order for 12 Sk12 was put in 1939 and the aircraft were delivered to Ljungbyhed from May to October 1939. The second order called for another 12 Sk12 and these were delivered from November 1940 to May 1941. The last order for 13 aircraft was delivered from February to June 1943.

A total of 85 Fw 44J were delivered to the Swedish Air Force 1936-43 and out of these, 57 were built in Sweden by ASJA and CVV. The Sk12 served as basic trainer together with the Sk11 (DH 82A Tiger Moth) at

and braced by dual wires. The fuselage of polygonal cross-section, with pronounced tumble-home in the top section for improved vision, was constructed of welded steel tube without wire bracing, fabric covered with the exception of the electron fairing and the fuselage front section.

Control surfaces were designed for effectiveness in all flight manoeuvres and were of metal construction. The divided landing gear was nicely faired and carried two 2 ft. x 4% Elektron wheels equipped with brakes.



LV-YZM visited Great Britain in 1955 and was used in the Lockheed International Aerobatic Trophy contest at Baginton. Colour is pale yellow overall with Argentinian light blue and white rudder markings. Cockpit view at right displays the angular cross section fuselage. Photos by G. A. Cull.

Technical Dimensions and Performance:

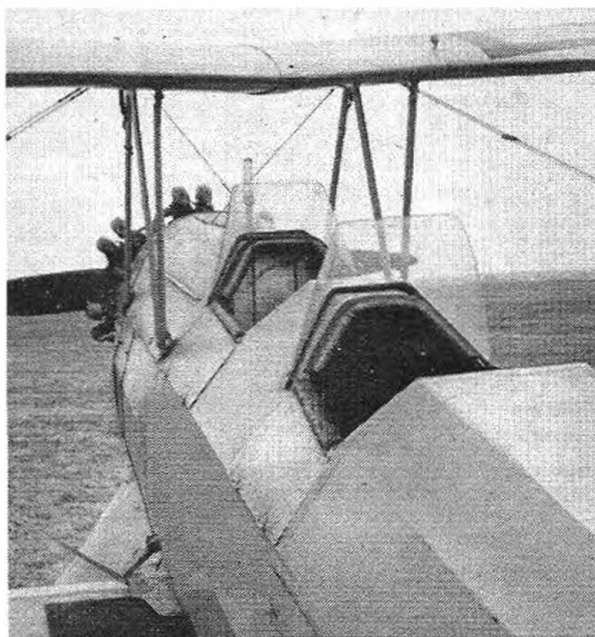
(English figures from Fw Brochure)

<i>Version:</i>	Fw 44E	Fw 44J (Sk 12)
<i>Engine type:</i>	Argus As-8	Bramo (Siemens) Sh 14a
<i>Power:</i>	135 h.p.	150 h.p.
<i>Span:</i>	9.01 m. (29.6')	9.01 m.
<i>Length:</i>	7.70 m. (24.3')	7.29 m.
<i>Height (tail up):</i>	2.70 m.	2.83 m.
<i>Track:</i>	1.82 m.	1.82 m.
<i>Wing area:</i>	19.8 m. ² (216 sq. ft.)	19.8m ² .
<i>Airscrew:</i>	Wood 1.72 m.	Wood 1.95 m.
<i>Fuel:</i>	135 l	135 l (internal elektron tanks)
<i>Weight empty:</i>	560 kg. (1105 lbs.)	565 kg. (Wheel) 585 kg. (skis)
<i>Normal flight weight:</i>	900 kg. (1765 lbs.)	875 kg.
<i>Maximum speed:</i>	185 km/hr. (118.5 m.p.h.)	168 km/hr.
<i>Climbing:</i>	1000 m/5, 2 min.	1000 m/6.5 min.
<i>Ceiling:</i>	3900 m. (14,450 ft.)	4400 m.
<i>Range:</i>	600 km. (336 miles)	540 km.

Swedish Air Force Sk 12

Type	Build by	Delivered	SAF-serial	No.	Notes
P 2	Focke Wulf GmbH	1936	801, 802	2	later Sk12
Sk 12	" "	1936	611, 612	2	former p2
Sk 12	" "	1937	613-626	14	
Sk 12	ASJA, Linköping	1937-38	627-646	20	
Sk 12	CVV, Vasteras	1939	647-658	20	
Sk 12	" "	1940-41	659-670	12	
Sk 12	Flugzeugwerke				
Sk 12	CKD, Prague	1940	5771-5782	12	
Sk 12	CVV, Vasteras	1943	5783-5795	13	

Covered cockpits on OH-VIJ at Kauhava, Finland, pale cream overall with white name on cowling. The canopy slides in one piece along special spine forming a dorsal fin. Right, is Swedish SK 12 serial 615 in 1940 regulation markings.



Notes on markings of Swedish Military Aircraft

1935 Regulation: The national insignia consisted of three black crowns on white circle on top of the upper outer wing, under the outer lower wing and on the fuselage sides. Two areas in yellow and blue (approximately same size) were painted on the rudder with the yellow area in front on both sides. A code number was painted in figures to the right of the national insignia on both sides of the fuselage. A figure indicating the Wing to which the aircraft belonged was placed to the left of the insignia. A small serial number was painted on both sides of the rear fuselage.

1937 Regulation: The national insignia was changed to three yellow crowns outlined in black placed on blue circle and situated according to the 1935 regulation. The blue/yellow areas on the tail fin disappeared. The individual code of the aircraft was placed on the fuselage in front of the wings and as before, to the right of the national insignia on both sides of the fuselage. The Wing-number was placed to the left of the national insignia. The serial number was positioned as before.

1940 Regulation: The national insignia was changed to three yellow crowns outlined in black and placed on a blue circle surface outlined with a yellow circle. The national insignia was placed on both fuselage sides and under the lower wing. The individual code number was placed in large figures on both sides of the fuselage in front of the wings and on the tailfin. The wing number was placed to the left of the national insignia on the fuselage. Serial number as before. (See photo below).

1944 Regulation: The national insignia as for the 1940 regulation; but now also placed on top of the upper wing (except for during war). The wing number was painted in yellow behind the national insignia on both fuselage sides.



TOPICAL TWISTS

by "Pylonius", illustrated by "Sherry"



They Also Serve . . .

It is a well-known but little publicised fact, that 90 per cent of the modelling fraternity does not build and fly model planes as you might reasonably expect them to do. They are content to merely watch the activated 10 per cent of the fraternity undertake this arduous and exacting business. Though not all. Some are too tired to do even this after laying down the democratic law at the club meeting.

I mention the club meeting because there is a strong movement afoot, the stirrings of which comes from the grass root club members, which aims at the democratisation of the hobby. Why should the model flyers, that insignificant 10 per cent minority, run the show? Decide when and where they should carry out their purely representational flying activities, and enjoy the dubious freedom of building the type of anti-social model they seem to favour? The non-flyers are demanding action. This hobby of ours is now a full participating one. Whereas, at one time, only the more zealous club member turned out to watch the model flying, the public at large now demand to share the spectacle, as they have every right to do. After all, telly and bingo are not the only things in life.

Already several purely spectating events have been held with great success. At the Nationals, for instance, there were ten spectators and five cars to one square inch of Modelspan, and at Woodford equally gratifying ratios were recorded. Again, at Little Old Warden the spectator came into his own, and if he couldn't see the Scale models fly it wasn't for the want of trying; treading on the odd wing or two in the process only demonstrated the extent of his enthusiasm.

But instead of being pleased at this belated recognition of our once 'toys for boys' hobby as something almost on a par with professional wrestling, the meagre 10 per cent model flyers are making undemocratic noises of dissent. Worse than that, they are even revolting against the giving of these most worthy public demonstrations. Yes, we know the beer tent was sited just where the Free Flight should have been held, but as bar takings greatly exceeded those of the comp. entry fees, this policy was completely vindicated. And, as for the scale modellers who complained that their take-off area was nothing but tall grass and bumps, what sort of 'Hell's Angels' attitude is that?

Sad to state, though, that John Citizen has taken the despised toy aeroplane to his heart, there are so few of them for him to go into raptures over. If the telly is becoming a bore to the man in the street it still seems to exercise sufficient compulsion over the average club member to keep him glued in front of it for the whole week, excepting, of course, on club night when he sallies forth to give his democratic views on what's wrong with the model movement.

A.R.P.

It was a bit like war-time over the common. There we were warily flying our purely peaceful rubber and glider models during a lull in the Radio attacks, when suddenly our lookout sighted a fully operational bazz-bomb. Before anyone had time to take cover the pilotless missile did three scarifying circuits and then plummeted into a dense centre of population. By this time everyone had taken cover, ready to emerge if the missile had been rendered non-operational. But no, it had turned out to be a dud crash, and within minutes the bazz-bomb was ready for another low-level sortie. A quick evacuation was decided upon, although one or two courageously stayed to await the 'All Clear'.

1984

Tactical flyers must be turning envious eyes towards the R/C arena, where soarers are now being fitted with built-in lift indicators. These electronic devices should prove more reliable than the lift indicators in use at present - the other blokes' models.

With these advances in the take-over of the human function by machine, it will not be long before our lives become controlled by computers. This means that the armchair critic would become an electronic component. Instead of writing nasty letters to the S.M.A.E., as he does now, he would send equally nasty programmes of a binary digital nature to the central computer.

Blurb

Usually the function of the club P.R.O. is limited to sending an occasional tentative letter to the local press, which, given luck, is squeezed between the Chrysanthemum Show and Tiny Tots Corner. One club, however, seems to have more high-powered ideas on the subject. In order to advertise a forthcoming rally, model aircraft were posed with girls in high altitude minis and framework revealing bikinis. Only thing lacking was Playmate of the month displaying proportional equipment.

Now we all know that high speed cars are sex symbols, as was so revealingly demonstrated at the Motor Show, but I for one am sorry to see the poor old model plane suffering the same mumbo jumbo fate. I have always regarded the model flying hobby as the last of the old-fashioned monastic pursuits. With Johnny either sticking his bits of balsa together in the attic or innocently chasing his model across the park, Mum felt him to be safe from the seamier things of life, like girls.

But can she any longer feel reassured? Who has Johnny got up in the attic besides his model? And is he not lingering rather too long in the long grass just to find his model plane?



Why not join this grand junior Aeromodelling Club?

Dear John,

I have been making model aeroplanes ten months. I have made about nine planes most of which are control-liners. My first control-liner was *Wee-Wun* by M. B. Ashby powered by a Cox 'Pee-Wee' 0.020 cu. in. engine. It has been flown over a hundred times and I have successfully wing-covered it. Although it has gone through many bad crashes, it has only needed a few patches on the wing.

I have just finished making *Sweetheap* by Ray Malmstrom. All I have to do now, is to apply two Golden Wings and it is complete. In most books it says that transfers should be protected by fuel proof, but I find that this shrivels them up. Is there a remedy for this?

Castleford, Yorks. **Terry Instone**
True! Some transfers are affected by fuel proofers. There is a special transfer varnish on the market but beware, it can take a long time to dry as it is oil based. Personally, we've always found transfers fuel proof themselves. Purpose of the varnish is to protect them from scratching or even washing away in the rain!

Dear John,

I have built two control line models and have decided to attempt a free flight model. I have chosen the Keil-Kraft Snipe. Do I need insurance for these types of models or is it advisable to have it. I am going to fly it at Chobham Common, and what does this insurance cover?

Sheerwater, Woking **J. Jennings**
Insurance is rarely compulsory: but always essential! If you join the Society of Model Aeronautical Engineers, 10A, Electric Avenue Brixton, S.W.9, you will, as an Associate at 15s. 6d. per year, have 3rd party cover while flying your models. The alternate schemes are Personal Accident Policies which can sometimes be provided by Traiff Companies for approx 10s., or the M.A.P. scheme as at the rear of this and every issue. The M.A.P. scheme is for regular

readers of M.A.P. magazines. You have to place a firm order and receive the magazine each month to validate your M.A.P. Scheme membership. 3rd party cover means, in brief that you would be protected from claims at Law for any damage caused by your model excluding the first £5 of any claim.

Dear John,

I have now been a member of the Golden Wings Club for a few weeks (No. 13610) and I would like some advice on aircraft with 'pusher' engines.

I recently bought the A.P.S. R/C P.1174 for .049 pusher motors - I plan to use the Cox QZ .049 which has a spring starter. On the plan, it illustrates a Cox Babe Bee .049 and says it will run in reverse. Does this mean that one merely flicks it clockwise instead of anti-clockwise in order to start it?

I would have thought it would have been better to have a special pusher airscrew.

Also could you tell me if there are any R/C clubs in the Woking area I might join or do I have to have a Superhet Receiver before I am eligible (I have RCS Guidance System)? Hoping you can oblige.

Ealing, London, W.13 **Neil Wilson**

Engines with reed valves are omnidirectional and have the advantage that they do not need special propellers when used on pushers. The Cox T.D. engine, for example, would only run in one direction (anti-clockwise) and must therefore be fitted with pusher propeller to obtain thrust when mounted at the rear of a model. There are only a limited number of pusher props available e.g. P.A.W. 7 x 4 so that the reed valve becomes advisable. You will find that the QZ 049 is a reed valve and able to run in either direction.

The Woking Club Secretary is A. J. Starkey, Pine Trees, The Ridgeway, Lightwater, Surrey.

This is a progressive club and would not therefore have the otherwise selfish requirement for you to use a Superhet Receiver.

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 2/6d. 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

TIPS OF THE MONTH

To fill up smallish cracks or gaps in sheet surfaces (at the joints) smear cement into the crack, and then sand around it before the cement dries. This will neatly fill the crack with dust and cement. Saves a lot of time lost when mixing up grain filler (I use French chalk, or blackboard chalk, plus dope). Word of warning: this (the cement and dust technique) will clog up the sandpaper slightly, so it is advisable to keep an oldish piece somewhere (under all the junk on the bench if yours is anything like mine).

R. G. Palmer.

A piece of tissue paper (I usually use toilet tissue!) should be placed over the part on the plan to be copied and then the outline is drawn on the tissue using a fairly free-flowing ball point pen.

When the outline has been drawn, the tissue is placed reverse side down (i.e. the inked side) on the balsa and then a finger is gently, but firmly rubbed on the outline on the tissue. When the paper is removed, an accurate print of the part on the plan will be seen on the wood. There is no limit to the shapes which can be copied, although with the larger shapes the ink may dry before the tissue is applied to the balsa, so that the outline may have to be drawn over a second time in order to keep the ink 'wet'.

This method does not spoil the plan as does the older type of 'pin pricking' the shapes onto the balsa. In addition the balsa sheet can be utilised to the maximum as the wood can be seen under the tissue. **S. F. Newman.**

Dear John,

Please send me some more transfers. I am making a *Mini Robot*. I used my transfers on the Veron *Tipsy Nipper* and one on my *Smoke Trail*. The *Smoke Trail* used to 'balloon' in the lightest of winds. Could you give me some idea how I can stop it from doing this?

Jersey C.I. **Richard Frances**

Many models have the characteristic of 'ballooning' when they turn into wind particularly those with fairly thick wing sections. The only sure way is to re-trim the model with less difference between the wing and tail angles, which in turn means that the centre of gravity must be moved aft slightly. Another cure is to employ downthrust on the engine.

Dear John,

I am too old to be a member of your club, but I feel that I may have a useful hint for any of your members who may be building *Pusher*, the plan of which was given in November *Aeromodeller*.

When they are shaping the propeller blades, they may find it simpler to use large headed pins to hold the blades on to the blank. Sufficient pressure being used to hold the blades on to the blank without crushing the wood. It is easier and quicker than using tape and when I built the blades (at the time of writing the plane is completed bar for the motor assembly) I found it easier and very successful.

Rotherham, Yorks.

E. Newton

1/69 plan purchase coupon for Golden Wing Members G.W. No. 2d in the 1/- Rebate

4th WORLD INDOOR MODEL CHAMPIONSHIPS

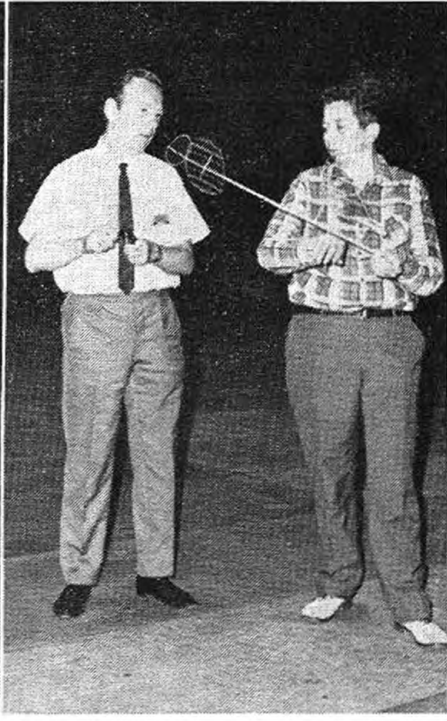
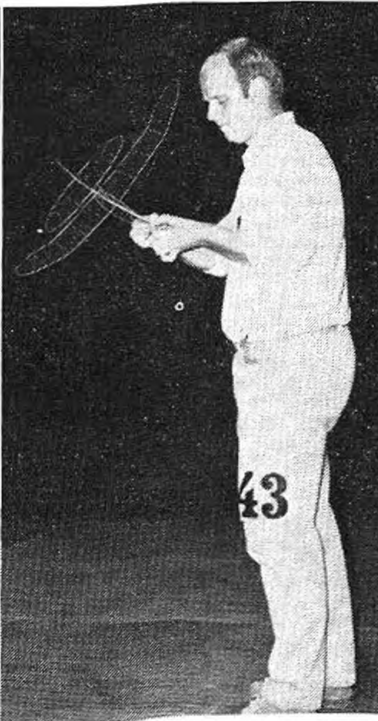
NINE nations participated in the best yet Indoor Championships, held in the Sports Palace built for the 1960 Olympics at Rome. The building is circular, with a main floor diameter of 164 ft. and a peak of 115 ft. Rounds were arranged to avoid disturbance during the heat of the day and started at 6 p.m. through till midnight on the first day, one hour earlier on the 2nd day and with a 7 a.m. start for the fifth round, and 5-8 p.m. concluding round on the third day. Hard work mainly by Tosaroni, Kannenwoff and Bovo ensured excellent organisation and in all respects the event was to be recognised as a Championships of memorable standards. Suspense kept all participants in tension through to the end. Kalina was leading, having suffered the worry of seeing his model hit the roof, tail slide, have its tail boom buckle and pop out again on his personal best effort of 34:46. Richmond pulled out a bigger rubber motor for his fifth flight, and ruined the model with a collapsed fuselage. So he assembled an older, stronger model and made 33:40, his best so far. In the final round, with the same older model and more powerful motor, Richmond needed a best yet 35:50 to tie with the Czech—and the special effort produced this with a 28 secs. margin for top time of the meeting. Outstanding were the efforts of Team Prize winning Czechs, and the new competitors (old stagers by name though!) from Yugoslavia and Italy. Next event will be in Poland.

Action below shows, L. to R. Corazza (Italy), Kalina (Czech) and at right, Maibaum and Beck (W. Germany).



Jim Richmond receives Trophy from Dr. R. Teti, President of Rome Aero Club, famous S.M:A.E. 'Dragonfly' Trophy not having been returned by covetous previous winner!

Place	Name	Nation	1	2	3	4	5	6	2 Best Flights
1	J. Richmond	U.S.A.	32:11	28:37	—	26:30	33:40	36:18	69:58
2	J. Kalina	Czechoslovakia	28:09	34:44	33:22	34:46	33:28	04:20	69:30
3	E. Chlubny	Czechoslovakia	09:38	31:46	33:51	30:32	22:10	33:28	67:19
4	K. Beck	W. Germany	03:21	32:42	—	29:58	28:32	33:32	66:14
5	M. Koller	Austria	30:06	30:13	23:54	33:06	12:10	13:19	63:19
6	C. Mather	U.S.A.	32:38	27:30	29:04	29:14	00:11	00:11	61:52
7	E. Corazza	Italy	32:01	26:30	29:02	26:38	23:33	24:39	61:03
8	V. Kmoch	Yugoslavia	06:16	30:00	23:10	30:01	28:58	07:13	60:01
9	J. Sitar	Czechoslovakia	26:21	11:39	—	00:10	25:04	32:43	59:04
10	W. Hach	Austria	27:58	28:59	—	26:42	25:17	29:43	58:42
11	Varszegi (proxy Ree)	Hungary	27:35	25:38	28:17	29:11	09:49	23:42	57:28
12	A. Egri	Hungary	11:43	26:40	28:18	28:47	28:34	27:20	57:21
13	K. Vogler	W. Germany	26:41	28:37	—	09:14	22:43	28:40	57:17
14	A. Rohrbaugh	U.S.A.	08:54	27:19	21:45	29:53	24:02	24:52	57:12
15	K. Erofejeff	Finland	21:29	25:24	17:59	26:32	26:42	28:18	55:00
16	C. Cocugno	Italy	14:11	08:13	00:04	26:38	15:35	27:54	54:32
17	T. Strasberger	Yugoslavia	26:36	21:37	22:42	26:05	25:10	26:53	53:29
18	W. Wetzel	W. Germany	26:15	09:08	19:35	27:12	24:33	16:07	53:27
19	E. Tirronen	Finland	26:48	00:52	—	04:54	21:50	26:36	53:24
20	L. Gabriel	Yugoslavia	17:59	00:12	20:36	24:46	22:49	24:31	49:17
21	O. Nordlund	Finland	00:12	00:28	18:46	23:31	22:43	10:39	46:14
22	G. Buzady	Hungary	20:01	01:36	19:23	17:16	17:25	15:50	39:24
23	G. Masciullo	Italy	12:53	06:11	17:49	18:14	12:20	17:32	36:03
24	G. Cognet	France	07:10	08:58	12:44	12:18	12:48	11:07	25:32



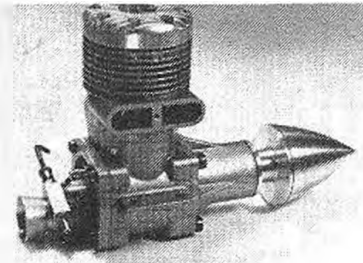
LATEST ENGINE NEWS

By Peter Chinn

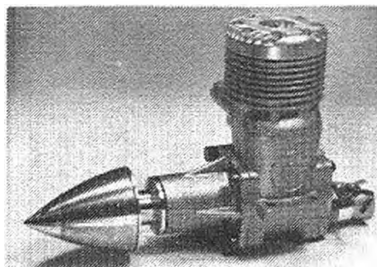
Super-Tigre G.60R

AT THE PRESENT MOMENT, the Super-Tigre G.60R is, perhaps, the most powerful model aircraft engine ever put into quantity production. In its original version, as announced nearly three years ago, it was claimed to develop (fuel unspecified) 2.15 brake horsepower at 20,500 r.p.m. Since that time, a number of improvements have been made to the engine and World Engines Ltd. of Watford, the U.K. distributors, have been kind enough to loan to us one of the very latest models for examination and comment in these columns.

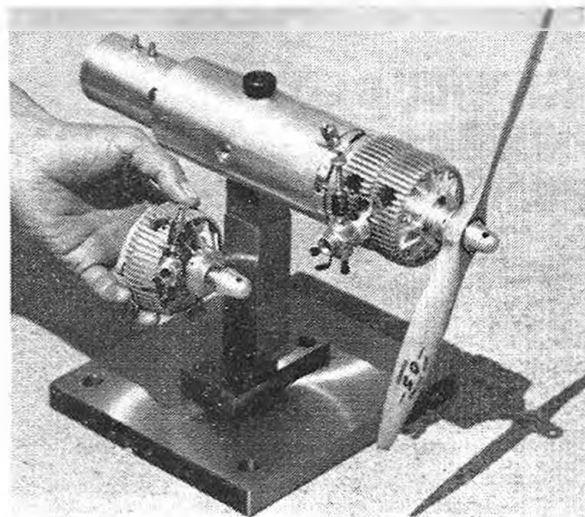
Before we describe the engine, we should explain that the motor we are talking about is the current 10 c.c. control-line speed engine that has also been designated in various advertisements as 'S.T.60 Racing', 'G.60 Racing RV' and 'S.T.60 Speed'. The legend that appears on the crankcase casting is 'Super-Tigre G.60' and on the maker's box 'G.60R' and we shall, therefore, henceforth regard this latter as its official title. Two other 10 c.c. engines share the same 'G.60'



Two views of the latest Super-Tigre G.60R. This 10 c.c. C/L speed engine, capable of delivering well over 2 horsepower at around 20,000 r.p.m. was used by Kaeseberg for his record R/C flight at over 198 m.p.h.



Radio Motor Commentary in January R.C.M.&E. gives data on the exciting O.S. twin-rotor Wankel type engine of 10 c.c. displacement, shown on stand. It is probably the world's first twin-rotor model rotary-piston engine. On left is what may be final prototype of production 5 c.c. unit.



casting, but these are easily distinguished by the fact that they are throttle-equipped radio-control engines. They are the disc-valve G.60 R/C (sometimes referred to as the 'G.60 RV R/C') and the shaft-valve 'G.60F R/C' (sometimes referred to as the 'G.60 FV R/C' or 'G.60 FI R/C') . . . (All of which is just about as confusing as government departmental nomenclature, so we hope that some effort will be made to stick to one simple designation for each engine in future).

It was with one of the latest G.60R Super-Tigres that Werner Kaeseberg set his world record R/C flight of over 198 m.p.h. at the Harsewinkel R/C speed trials in Germany earlier this year. Moreover, of the three Super-Tigre G.60R and five Rossi 60 powered models that recorded official flights at this meeting, the Super-Tigres finished 1st, 2nd and 3rd. In view of the fact that Rossi 60's have, over the past few years, been the most successful commercially produced 10 c.c. speed engine obtainable, this performance obviously speaks volumes for the new Super-Tigres.

Essentially, the G.60R is a disc-valve, twin ball-bearing engine with the now well-known Super-Tigre racing type porting system. Where the latest model really differs is in the piston and cylinder setup used.

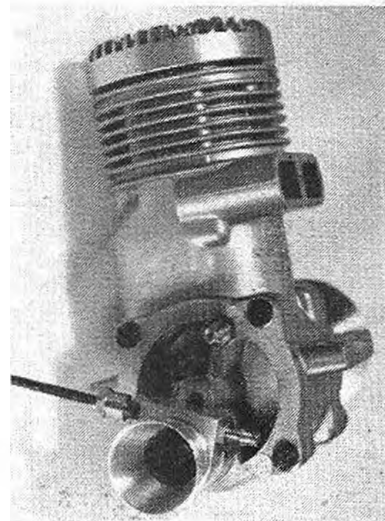
As marketed during 1966 and 1967, the G.60R was quite unorthodox in this respect. Instead of the usual arrangement of an aluminium piston with rings or (admittedly uncommon on a large engine) a lapped cast-iron piston, this engine had an aluminium piston without rings and fitted instead with a fixed hardened and lapped Meehanite band above the gudgeon-pin. For the latest model, however, Super-Tigre manufacturer Garofali has adopted an even more unconventional system. Code-named ABC (as described in last September's L.E.N.), this, as used in the production engine, comprises an aluminium piston *without* rings, running in a brass cylinder sleeve having a chromium plated bore.

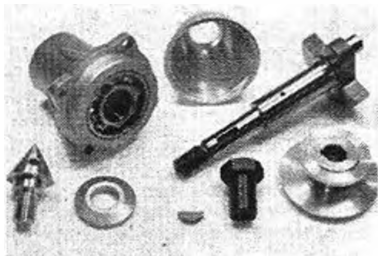
The piston is quite tightly fitted to the bore, especially at the top of the stroke, but we are assured by those who have used these engines that they show little sign of seizure during the running-in period. Apparently, despite the fact that the coefficient of expansion of brass is still lower than that of aluminium, a happy situation is achieved whereby a remarkably consistent piston/cylinder clearance balances adequate piston seal against freedom from excessive

frictional loss through the entire range of operating temperatures. The whole thing gives one food for considerable thought. Heat dissipation via the cylinder casing and cooling fins should be better since a greater area of the piston skirt is in intimate contact with the liner wall and, since the liner will expand more than a ferrous one, there should be, in turn, better transference to the surrounding casting. One important advantage is that an extremely light piston is possible. In fact, the G.60R piston, flat crowned without baffle like all racing Super-Tigres, weighs only 3/10ths of an ounce. This means less vibration and more power at the shaft.

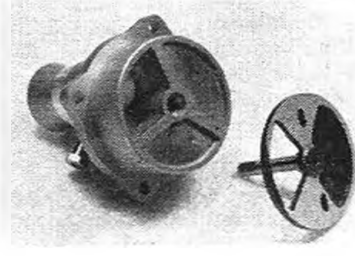
Another change that has been made in the G.60R has been the adoption of a new backplate and rotary-valve assembly. After a good deal of experiment (and some trouble) with nylon, reinforced nylon and various composite valve rotors, Garofali has now changed to a thin hardened steel disc. He has thereby reverted, more or less, to the type of valve used in some of the earliest

Massive intake of the G.60R has 12 mm. throat diameter, almost completely unrestricted (tangent mounted spraybar protrudes only very slightly). Pressure outlet in backplate, diametrically opposite intake, is rotary-valve timed for high-pressure delivery only.





Left: The shaft assembly of the G.60R. Right: Latest Super-Tigre rotary-valve, as seen on the G.60R, features thin, hardened steel valve disc, almost perfectly balanced and running on hardened steel pin. Below: Unique piston and cylinder assembly of G.60R includes aluminium piston without rings and a brass cylinder-liner with chromed bore. Note wide squish-band on head, used in conjunction with flat crown piston. Bottom: Main casting used by G.60R, also employed by several other large Super-Tigre engines, features very big transfer passage and is robustly proportioned.



disc valve model engines and pioneered by Edgar T. Westbury, the noted British model engine designer and technical consultant to *The Model Engineer* etc. (currently running a fine series of reminiscence articles in 'M.E.' - Ed.).

With most of the early steel and cast-iron valve discs, little or no attempt was made to balance them and this was one of the reasons for the subsequent adoption, in most production engines, of thicker but lighter valve discs of aluminium or non-metallic materials. These were, in most cases, partially counterbalanced by hollowing the rear face of the disc. The new hardened steel G.60 disc (it is fitted to the latest G.60 R/C as well as the G.60 R) is, however, both light and almost perfectly balanced. It is machined and ground to a thickness of .077 in. and, opposite the intake port it has a recessed sector .062 in. deep (i.e. leaving the disc only 15 thou. thick at this point) and large enough to balance the intake sector. The drive pick-up slot is balanced by another slot diametrically opposite which also serves to maintain the correct induction timing if it is desired to alter the carburettor location. The disc incorporates a boss to provide adequate bearing area and prevent wobble. It runs on a hardened steel 4 mm. dia. pin inserted through the backplate and locked by a set screw. The pin is internally drilled at the forward end in order to allow lubricant to reach the disc bearing.

The original G.60 had a 'Wisniewski' type internally counterbalanced crankshaft but the latest version reverts to an orthodox pattern with web flanks cut away each side of the crankpin. The shaft runs in a 12x28 mm. ball-bearing at the rear end and an 8x22 mm. bearing at the front. The alloy prop driver, of which the backplate of the excellent machined spinner unit is an integral part, is keyed to the shaft with a Woodruff key.



The connecting-rod is of machined aluminium alloy with a bronze bush and lubrication slit at the big end but plain eye at the small end. On all the G.60 series engines, the conrod is longer than usual for a motor of 22 mm. stroke. This reduces conrod angularity, and thus piston side-thrust, but at the expense of greater dead volume within

the crankcase. However, the ringless piston of the G.60R has enabled the gudgeon-pin holes to be placed higher so that the piston is lowered and (with the piston skirt slightly cut away fore and aft to clear the crankshaft counterbalance and backplate at B.D.C.) effective crankcase volume is slightly reduced and primary compression increased. This has, of course, required the lowering of the cylinder ports to restore correct timing. A new cylinder head, projecting farther into the bore, is also used in order to maintain the required compression ratio. The internal head contour is perfectly symmetrical and might best be described as being of a 'bowler hat' section, a wide (4.7 mm.) squish-band with a deep small diameter combustion chamber. An 0.2 mm. copper head gasket is used.

The porting follows the basic Super-Tigre racing pattern first seen in the 'Jubilee' model G.20 in 1960 - i.e. large parallelogram shaped transfer ports, a fairly moderate exhaust port area (5.5 mm. deep by 115 deg. of the cylinder circumference on the G.60R) and approximately equal exhaust and transfer periods. Checked timing of the G.60R examined was: exhaust period 135 degrees, transfer period 134 degrees. The rotary valve opened at 34 deg. A.B.D.C. and closed at 59 deg. A.T.D.C. Incidentally, the carburettor choke is some 12 mm. bore and, of course, requires a pressurised fuel supply. If desired, the crankcase pressure can be tapped for this purpose: the backplate is drilled for a rotary-valve timed high-pressure outlet and a screw-in nipple is supplied.

Modern racing .60's tend to be fairly heavy and the G.60R weighs 17.7 oz. - about 3 oz. more, for example, than the Series 20 McCoy 60. The engine is 6 1/2 in. long, including spinner, and just under 4 in. high. It fits a bearer spacing of 1 21/32 in. and has an overall width of 2 1/2 in. Construction throughout is to high standards.

F.A.I. events in Europe 1969

WORLD CHAMPIONSHIPS

RADIO CONTROL July 23-27 1969 - Lemwerder, Bremen, West Germany.
Plus International R/C Scale.
FREE FLIGHT August 12-17 1969 - Wiener Neustadt, Austria.

INTERNATIONAL EVENTS

February 16th F.A.I. Free Flight, Helsinki, Finland.
April 6/7th C/L Speed T/R Combat, Hradec Kralove, Czechoslovakia.
May 10/11th Amsterdam Cup F.A.I. Free Flight, Rosendaalse Heide, Netherlands.
May 25/26th Criterium du Nord F.A.I. Free Flight R/C Multi, Mauberge, France.
June 14/15th R/C Scale, Metz, France.

June 21/22nd
July 5/6th

July 5/6th

July 12/13th

July 12/13th

July 25/27th

August 2/3rd

August 23/24th

August 21/25th

September 14th

September 20/21st

September 25/28th

September 18th

R/C Slope Soaring, Rana, Czechoslovakia.
F.A.I. Free Flight, Munich, West Germany.

European Champs. Indoor, Brno, Czechoslovakia.

Pierre Trebod F.A.I. Free Flight, Marigny-Chatel, France.

Mecsek Cup C/L Speed, T/R, Pecs, Hungary.

Garcia Morato Cup F.A.I. Free Flight, Spain.

Hajdu Cup. Indoor, Oebrecen, Hungary. Magnet and F/F Glider, Kobling, Austria.

Criterium of Aces, Belgium. Alisca Cup F.A.I. Power, Debrecen, Hungary.

C/L Speed Stunt T/R, Bochum, West Germany.

R/C Multi, Lienz, Austria. Raba Cup Wakefield, Gyor, Hungary.



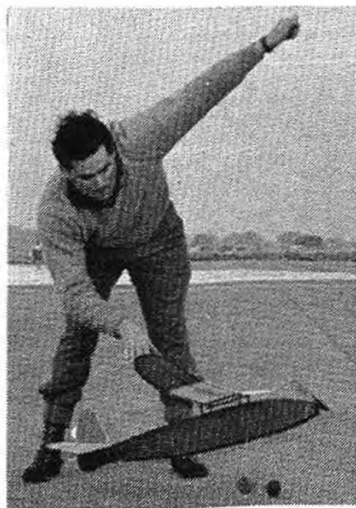
COMPARISONS are said to be odious – but are sometimes inevitable. A case in point is the **Northern Area F.A.I. Meeting**, held at Topcliffe on 20th October 1968, just a fortnight after the second F/F Trials – and certainly affected by such close proximity.

Even attendance suffered as most of the regular Southern contingent failed to appear this year. But even allowing for this, the meeting was not as well supported as in 1967. On the other hand the contest was blessed once again by good flying weather. Despite an unencouraging Saturday and an adverse forecast, the actual conditions were very acceptable – mostly overcast and generally with insufficient wind to take max. off the airfield. There was plenty of lift but it was weak, localised, and short-lived.

Despite, or because of, the example of the Trials tactical flying was far from universal. Many entrants, especially in Wakefield, elected to rely on their own judgment. Inevitably this produced more mistakes, and hence lower scores, than might otherwise have been 'achieved'. Even so, the general standard of flying was lower than I expected. This was most obvious in Power, but also showed in Wakefield.

The contest was flown in five rounds, the first of two hours duration, and the others of one hour. The only power entrant to record an all-max. score was Brian Martin. He had little difficulty with the sheet-surfaced, Miebach-tuned G15 powered model with which he just missed a Team place. This could hardly be said for the runners-up.

Dave Wiseman surprised himself with trim trouble, inconsistent flight patterns and two over-runs from the model with which he had just topped the Trials, and which had flown 'on rails' all season.



Heading photo, fifteen years old David Plews, Junior Champion of 1968 with one of his glass fibre fuselage A/2 Gliders. Dave has given the Seniors a run in the glider classes and well deserved his honour.

Gerry Tideswell r.o.g.'s his vintage 'Gutteridge Trophy Winner' which had a few bothers at the N.A. event.

Free Flight Comment

by John O'Donnell

Nevertheless he totalled 14:16. Even Ray Monks' model lacked its usual climb, and certainly hit poor air on one flight.

It was hardly my day. I dropped three seconds on my second power flight, then lost my HP 15D model in the next (and only windy) round. 'What! - with *that* motor' said the T/R exponents from whom I had obtained amyl nitrate to smooth out the rough running experienced the previous week at the South Coast Gala. The loss was only temporary however, and it appears that the model was picked up by a 'local inhabitant' as it landed.

Glider was rather tricky as thermals were usually only sufficient to enable models to hold height. The lift was also liable to 'die out' suddenly as I demonstrated on the final round with a 1:53 flight in what looked and felt like sufficient lift. This enabled Mike Reeves to win with four flights from his normal model and one from his new 'still-air' development. Both have short noses, *balsa* fuselages and under-fins. Runners-up were Henry Tubbs and Dave White, both with new, if conventional, models.

Dave ended a rather quiet (for him) season very well by also winning the Wakefield event. He picked poor air for the first flight, but must have dropped very little time thereafter. Wakefield exponents Ray Pavely and Bob Wells came second and third to bring Norwich's name into the results – although I find it difficult to think of them as other than Hornchurch.

The following Sunday saw my making another trip over the Pennines, for the **Pannett, Vintage**, etc., events held at Elvington. Having been to Topcliffe en route (to collect the F.A.I. model) I arrived rather late, but still in time to witness the first official flight.

Typically, this was made by Russell Peers flying his usual ETA 29 light-weight design, the surviving examples of which have V.I.T. As visibility was marginal due to a combination of mist and 10 m.p.h. drift, the flight was eagerly watched by all those still wondering whether to start. 'Rather difficult to see' was the general verdict on the max, and this set the scene for the rest of the day.

Contrary to expectations the mist did not clear, and this spoilt what was otherwise quite a nice day for flying (as distinct from competing). The power event for the Tony Pannett Memorial Trophy was most troubled by the visibility, with several good flights timed o.o.s. to the chagrin of Messrs. Monks, Baggott, Wiseman and maybe others. I had to struggle with an over-heating engine (not run enough yet) and a most erratic Seelig timer. After two over-runs in the Pannett and one at the Northern Gala, I may be unlucky in having a bad example. From what I have heard elsewhere these timers are not the *automatic* 'answer to the modeller's prayer' that they are often considered. Practical snags with the wire arms either jumping out or sticking down can be overcome once it is appreciated that they can occur. The susceptibility to water and/or rust is not so easily countered.

The Vintage event was reasonably well supported with a variety of models that aroused considerable 'spectator' interest. With 250 ft. towlines allowed for glider, the three basic categories would seem fairly evenly matched – but the top two places went to the only gliders participating. Jim Moseley won with a good score of 8:28 from his 'Lulu', whilst Henry Tubbs was second with a minute less flying a 'Mick Farthing Glider'.

Gerry Tideswell showed remarkable perseverance when a take-off crash, attempting his third flight, smashed the whole fuselage nose of his 'Gutteridge Trophy Winner'. He rebuilt it – but with

F.A.I. Meeting, Topcliffe, October 20th

F.A.I. Power. 1. B. Martin (Tynemouth) 15:00. 2. D. Wiseman (York) 14:15. 3. R. Monks (Birmingham) 13:37. 4. R. Baggott (Birmingham) 13:11. **A/2.** 1. M. Reeves (Whitefield) 14:58. 2. H. Tubbs (Baildon) 14:23. 3. D. White (York) 14:22. 4. J. O'Donnell (Whitefield) 13:53. **Wakefield.** 1. D. White (York) 13:41. 2. R. Pavely (Norwich) 13:31. 3. A. Wells (Norwich) 12:52. 4. D. Hipperston (Croydon) 12:42.

Elvington, October 27th

Pannett Memorial Trophy (Open Power). 1. R. Peers (Cogleton) 8:43. 2. J. O'Donnell (Whitefield) 8:37. 3. R. Monks (Birmingham) 8:36. 3. R. Howarth (Whitefield) 8:14. **Vintage Pre 1951.** 1. J. Moseley (Baildon) 8:28. 2. H. Tubbs (Baildon) 7:24. 3. G. Tideswell (Baildon) 6:57. 4. J. Turner (Teesside) 5:44. **Coupe d'Hiver.** 1. T. Medley (U.S.A.) proxy H. Tubbs 5:50. 2. J. O'Donnell (Whitefield) 4:52. 3. H. Tubbs (Baildon) 4:27. 4. R. Hoff (Sheffield). **3:36 A/1 Glider.** 1. J. Pool (York) 6:03. 2. R. Firth (Sheffield) 5:54. 3. M. Reeves (Whitefield) 5:06. 4. P. Oliver (Whitefield) 5:02.

little time to spare. The next r.o.g. was followed by a power stall, a momentary touch down, and a short flight thereafter. This was speedily retrieved, and immediately followed by a reasonable flight. As three attempts were involved, perhaps 1940 rules were invoked so as to award him third place. Nevertheless it was a fine demonstration of what can be field-repaired.

Jim Moseley proxy-flew John Mayes' 'Interceptor' to record the only power score in Vintage. Several other power models met their demise after a variety of unwanted manoeuvres.

Coupe d'Hiver certainly gave Tubbs a busy day due to use of Chavenay rules (one entry per model). He flew three times, including Tom Medley's 'Garter Knight' by proxy. His early flights with Tom's model were best with a very good score of only 10 seconds short of a 3 x 2.00 treble. The better of his own models was nearly 1½ minutes behind. I flew late, after finishing power, for second place with the same old model that I've flown for some years.

In A/1 glider, John Pool's 'Strolling Bone' just edged out Ron Firth's 'Syncoptor'. Mike Reeves might have been much closer to them had he not inadvertently bent an auto-rudder stop, and then unsuccessfully tried to tow the model down.

Prizes at both the Northern Area Meetings were plaques to third in all events, plus trophies for certain events and a certain amount of merchandise from some sections of the 'Trade'.

Warps by intent

WARPS are often considered to be one of the major headaches of modelling, and of which many enthusiasts have an almost illogical fear.

Generally, free-flight modellers of any experience seem to realise that warps are a factor to be considered (whilst C/L and R/C followers have been known to be all but unaware of the phenomenon). But appreciation, although necessary, is only a beginning.

Warps have their uses, even if to most people this extends no further than the ability of *washin* (more incidence) to hold up the inside wing on a circling model. Nevertheless warps are now occasionally quoted on plans, and even on three-views, although there have been whisperings about some designers suggesting standardised warps rather than those they use.

I get the impression that most 'plan-builders' merely incorporate such warps at the building or doping stages, and trim the model as best they can. If the warps change then they attempt to retrim to suit. As I personally regard warps as quite a critical trimming device, I prefer to ensure that the *intended* warps are what I *obtain and retain*.

Warp prevention starts with good basic structural design. This includes 'balancing' the structure so that it is not immediately and

Proxy flown by Henry Tubbs, this APS 'Garter Knight' made by U.S. Rod & Custom magazine publisher Tom Medley won its class at Elvington.



inevitably distorted by the covering, correctly fitting joints that avoid built-in stresses, and the use of geodetic ribs and other anti-warp devices.

The act of applying the covering can cause components to warp through uneven tension, and attempts to pull out wrinkles part way through covering. Despite often-published advice to the contrary, I *iron* any time that has been creased or folded. A heat setting as low as will smooth the tissue is used — and the tissue kept *rolled* thereafter.

I also water shrink *all* tissue before doping. Whilst not absolutely essential with 'Modelspan' it does mean that the covering need only be applied smoothly and not tightly. The water can be applied quite adequately by *brush*, and need *not* be sprayed as invariably recommended in all the textbooks.

Pinning down surfaces after doping is often advised, but is rather impractical with polyhedral wings. Personally I do not pin down components, but I do endeavour to dope both *sides* of a wing panel (between dihedral breaks) one after the other with as little time between as possible. Wings are stood on their L.E.'s as soon as the dope is dry enough not to flow. Incidentally my wings are *stored* in this fashion as it reduces the tendency to twist through their own weight.

Warps, of course, still appear — but can be removed. This is a topic that will be discussed at some length next month.

1969 SMAE Contest Programme

March 23	(PL) (S)	F.A.I. Glider (K.M.A.A. Cup)	Area Cent:
	(C) (J)	Open Power (Frog Senior)	
April 6	(X)	Open Rubber	
	(X)	R/C and C/L Meeting (Trials for Criterium)	Cent:
April 20	(PL) (S)	FAI Power (Halifax Trophy)	Area Cent:
	(C) (J)	Open Rubber (Gamage Cup)	
May 4	(C) (J)	Open Glider	
SOUTHERN GALA		Open Rubber (Flight Cup)	
		Open Glider (Pilcher)	
		Open Power (Short Cup)	
		½A Power (Quickstart Trophy)	
		Chuck Glider	
	(X)	R/C Multi Aerobatics (Aeromodeller Trophy)	
		½A Team Race	
		Rat Race (Provisional)	
		Combat	
		C/L Aerobatics —	
		Also R/C Scale Trials	
May 25/26	(S)	FAI Rubber (5 flights)	
BRITISH NATIONALS	(S)	FAI Glider (5 flights)	
R.N.A.S.	(S)	FAI Power (5 flights)	
YEOVILTON		Tailless (Lady Shelley)	
		Frog Junior	
		R/C Scale (Radio Modeller Trophy)	
	(X)	Multi R/C (S.M.A.E. Trophy)	
		C/L Aerobatics (Gold Trophy)	
		C/L Scale (Knokke No. 2 Trophy)	
		Rat Race	
		Handicap Speed	
		Combat	
		R/C Pylon Team Race	
		½A Team Race	
		(R.A.F.M.A.A. Trophy)	
		Mouse Race (Under 0.9 cc.)	
		Novelty Event	
		C/L Carrier	

NATS (cont.)

	(J)	Open Rubber (M.A. Cup)	
	(J)	Open Glider (Thurston Cup)	
	(J)	Open Power (Sir John Shelley)	
		½A Power	
		F.A.I. Team Race (Davies Trophy)	
		Women's Cup	
June 8	(X)	R/C and C/L Meeting	Cent:
June 15	(PL) (S)	FAI Rubber (Weston Cup)	Area Cent:
	(C) (J)	Open Power (White Cup)	
		Open Glider	
July 6	(PL)	Team Glider (M.E. Cup)	Area Cent:
	(C) (S)	FAI Power (Astral Trophy)	
	(J)	Coupe d'Hiver	
August 10	(PL)	Team Power (Keil Trophy)	Area Cent:
	(C) (S)	FAI Rubber (Gutteridge Trophy)	
August 31/September 1	(J)	A/1 Glider	Cent:
		FAI Rubber	
		FAI Glider (7 flights in ½ hour rounds)	
		FAI Power (Provisionally C/L and C/L & R/C R/C at same venue)	
September 7		Open Rubber (Caton Trophy)	
NORTHERN GALA		Open Glider (C.M.A. Cup)	
		Open Power (Hamley Trophy)	
		R/C Multi Aerobatics	
		FAI Team Race (Wharfedale Trophy)	
		½A Team Race (Budapest Trophy)	
		C/L Aerobatics	
		Rat Race	
		Combat	
September 14		C/L Team Trials for 1970 World Championships	Cent:
September 14	(PL)	Team Rubber (Farrow Shield)	Area Cent:
	(C) (S)	FAI Glider (S.M.A.E. Cup)	
	(J)	½A Power	

(S), (J)—Senior and Junior Champ. events; (PL)—Pluggo; (X)—R/C Individual Champ. Area Cent.—Held at S.M.A.E. Area Venues. Cent.—Held at one site only.



AT a recent meeting I was intrigued by the quite diverse design approaches of two leading model flyers, each of whom had that golden touch. Model one was streamlined and elegant, with all modern refinements. The other, in contrast, was square built and unadorned, as simple and basic as any sports model. But varied as they may have been in looks they each had that special something which made them outstanding. What they did have in common, though, was that they were both faultlessly constructed and perfectly finished, with scrupulous attention to the fine detail.

A report, or rather letter, which spells trouble for me comes from the **Heswall M.A.C.** They are incensed by our seeming inability to spell their seven-letter name with the rite seven letters. 'Spel us rite!' they demand from Deer Sur. Thus cowed we take the point. **Heswall** it will be in future, cum wot mai.

From the three-legged race in the land of the unfinished pussy cat comes notice of the formation of a new club, known as the **Manx M.A.C.** In order to get started on a regular footing they are asking for comp details, club registration (?) and insurances. We are hoping that the S.M.A.E., to whom we are passing on the request, will find the Isle of Man within its geographical scope. Anyway, the new club intends to hold summer contests as an attraction to tourists and as a lure to potential members. Possibly the sort of model that might well intrigue the tourists is the Graupner *Caravelle* which the report describes. It is fitted with a Merco 61 and multi-control. However, the finished product turned out to be so beautiful, and so expensive, that the owner/builder just hasn't the nerve to fly it.

It doesn't matter how countrified you are these days you just can't escape the encroachment of housing development. Thus the mid-Essex situated group, the **Witham M.A.C.**, finds its flying field threateningly nudged by the creeping concrete spread. Already the houses are too close for comfort, and free flight members particularly are on the look-out for a less encumbered site. Notwithstanding the urbanisation, 1968 was a quite successful year, featuring a number of club demos and two static displays. Members also enjoyed themselves at some of the big events such as the Nationals and Old Warden. No contest participation, but points have been watched and there are high hopes for the coming season. New members welcome to the club. Contact P. J. Simmons, Sec.: 19 Chelmers Road, Witham, Essex. Telephone Witham 2660.

Dreadful confession of the publisher of the **Whitefield M.A.C.** newsletter. He admits to his publishing duties having suffered as a result of a curious addiction to the building and flying of toy aeroplanes. 'Wherefore art thou, Roneo?' ask the members, but a new duplicator is now at hand and the mighty presses are rolling again. Problem for the club pundits is the utilisation of a number of club plaques left over from the ill-fated club rally, a notable casualty of that unlamented summer of '68. But if Spain isn't the only place to have rain on its plains at least the Whitefield planes in the Madrid, Spain Postal A/2 Comp did well enough to take second place. J. O'Donnell, P. Oliver and M. Reeves placing 1st, 5th and 20th in the individual lists. Maestro J. O' also featured in the top placings in the Gutteridge Trophy, the Woodford Rally, Cranfield etc. What a Rat Race the lads had at sober sounding Drinkwater (laps galore!). Only three entries but plenty of action. Winner: Len Morrell.

CLUB NEWS

Recently elected Chairman of the S.M.A.E. Laurie Barr (left) congratulates newly appointed 1969 Free Flight team manager Steve Bowles at the S.M.A.E. Prizegiving in Leicester. Steve was collecting his 1968 contest awards. Stalwart S.M.A.E. Officers Stan Wade, Norman Couling and George Lynn sort out the hundreds of Plaques in the background.

'Toll for the Brave'. Or rather not so much toll for the brave, as we hear from the **Buckaneers** Model Club newsletter that quite a number of doughty types got through the rain-swamped Cranfield gate in the guise of Buckaneer helpers. This is probably unfair to the gate minders as they were hardly likely to know whether the visitors were entering or were being blown in. Weather at Cranfield got the Navy Carrier off to a good waterborne launching. Seriously though, the fact that this event, like so many on that tempestuous day, was a near wash out, brought much heartache to all who were involved in the nurturing of the Carrier components: the collection, repairing, storing and delivering of same, not to mention the expense. Credit to the Buckaneers, though, for all the good work they put into the Cranfield meeting. In the newsletter the Club Sec. has a few pungent comments to make on Radio Control judging. As manoeuvres get more slick and complicated, so must the standard of judging be up to the quality of the flying. It requires then that the judges should be highly experienced men, with the sort of practised eye that is only acquired through much viewing of competition radio flying at club and area level. Trouble is that, as the standard of flying gets higher, there will be fewer and fewer judges capable of adjudicating at the required level of competence. Certainly what must be avoided is any thought of handing the chore to 'prestige' visitors of dubious ability.

Ups and downs in contest life; so, too, in the fate of clubs. **Dunfermline M.A.C.** was a swinging group a couple of years ago but came a slump in interest and the club dwindled to nothing. Now, lo and behold, a great revival is under way. Moving spirits are getting things going once again. A major effort has been put into the finding of a new clubroom, and the lads have turned up trumps with a whole four-room flat. No mention, though, of how long they had the club's name down on the housing list. Furnishing the flat presented quite a problem as the old clubroom gear was on its last shabby legs. Nothing daunted, the lads toured the local furniture shops equipped with nothing but a good, hard luck story. Result: a load of solid serviceable furniture, all for the price of a few brass necks. All that is needed now is the old time membership strength to fill the spacious accom. and its mod. cons. with the cheerful chat of mod. bods. If you are looking for a home from home, please contact the Secretary, M. C. Rouse, 41 Mid Beveridgewell, Dunfermline, Fife.

Like Rubber Power, C/L flying is a long time dying, although given a dismal prognosis. Report from the **Feltham D.M.A.C.**, cites 1968 as the best season ever. Perhaps a slight bias here, as Feltham has won most of the C/L events it has entered, particularly Rat Racing, where the club has appeared in the finals of every comp south of the Scottish border. The Pied Piper is just not in it. Fastest times recorded have been by Fred Lambert. He did five miles in 2 mins. 47 secs., whilst Dave Rudd did 10 miles in 5 mins. 46 secs. A proud club achievement is that of being the only club to have beaten the 3-minute barrier for five miles - and several times at that. In the sphere of controlled flight minus lines, Mike Birch, the 'Tough at the Top' boy, won both Nationals and Trials in Aerobatics. We all wish him the best of luck as a British team member next year. Now, I'm not sure what a baby pacifier tank is, but it is, no doubt, some nursery adaptation. Anyway, it has been doing sterling work on John Dixon's *Kooper's Kanible Kombat* job. Club claim is that Feltham is the London club, as it reaches out to such widely-spaced suburbs as Chingford, Croydon and Woking. So, as long as you have a toehold on the smoky metropolis you are welcome to weave your way to the Fairholme Primary School, Peacock Avenue, Bedford. Feltham, on a Tuesday evening. Meetings start at 8.15 p.m. Juniors especially welcome. No truth in the rumour that the membership fee is £15, or that it includes a free Rat Racer.

'*Turbulator*', the newsletter of the **Crawley** Club warns members that the school hall which they have recently acquired as a clubroom is for aeromodelling use only, and not to be used for staging mini-Olympics. It is therefore suggested that the exuberant members confine their athletic prowess to the 'Chuck the Glider' event. To give the right sort of encouragement the plan of an indoor chuck glider is featured in the newsletter. The model, a *Mini-Starmi*, by chuck family member, Tony Slater, is about 12 inches in span, with a short, six inch fuselage. Wing and tail 1/32nd sheet. We referred earlier to the survival qualities of 'radio-doomed' Control Line. This dead-but-won't-lie-down point is underlined by the high club

entry in the August Stunt contest; six, no less. Good flying in spite of the usual 1968 weather in uncomfortable attendance. Junior P. Davis took first place, with veteran all-rounder, Pete Cameron, second. Two questions raised in a retrospective look at a somewhat depleted Area flying season: was the lack of Crawley participation in F/F contests due to the 5s. entry fee? This must obviously deter those who enter for the hell of it anyway, and contesters who would normally enter more than one event are likely to fight shy of a double dip. Second question: has the seven flight rule had a putting off effect on all but the athletically inclined?

The revived *Northern Area News* certainly contains a whack of comment on the Free Flight scene, making compulsive reading for the aeronautically, as opposed to the mechanically-minded modeller. Included is an excellent article by Tom Chambers on Wakefield props - the sort of thing that separates the mag. flying men from the dabbling boys, which puts me, for one, right in the Junior class. Tactical flying comes in for some rather scathing comment, and John Pool, the Editor, certainly has a telling point when he suggests that those flyers equipped with pilot model launchers, pet time-keepers, and all the other appurtenances of tactical flying, would not, perhaps, be able to mount such a campaign on a foreign airfield. Thus, to allow someone to get a team place on the strength of tactics rather than flying ability would not be to the national advantage. Another good editorial point from John Pool. He warns that the N.A.N., columns will not be a healthy place for armchair critics. Get up and go types will, of course, get the usual sympathetic treatment. Good for him. I, for one, have had enough of some of the footing criticism we have had of late.

North Western Area's Message gives an insight into the sort of high finance involved in today's top rallies. At one time the attainment of a £120 profit would have caused a mass launching of hats, but this return from the Woodford Rally was regarded by Treasurer J. O'Donnell as a flop. In fact the rally was considered a success as a public spectacle but a failure as a money spinner. A bigger profit yield should have been realised in the indifferent, but flyable weather; thus to ensure against the sort of loss that could result if real disaster weather had struck. From the sublimely ridiculous to the mere preposterous. Derek Heaton was prevented from flying on Burtonwood Aerodrome by the duty Sergeant because of a Go-Kart meeting. He should have known that model aircraft don't fly that low. A run down on the Woodford Meeting highlights the high incidence of model losses by F/F/ modellers. Seems that much of this is due to pursuing flyers losing sight of their models as they detour via the drome exit.

From the **Eastcote Radio Control Club** comes a short report and a 'Country Member' newsletter. Country members, it seems have a regular flying field at Duxford. The club still retains the use of R.A.F. Bovingdon for weekends. A short-lived privilege, alas, as this drome is due to come under the axe within the next twelve months. The club claims to be very much S.M.A.E. minded, and is concerned that its democratic voice be heard in the councils thereof. I trust, though, that when the writer states that the S.M.A.E. must be run as we would like it to be run, he is speaking not parochially but for the greater mass of members. An unusual Trophy award among the four now available, is one for the most original design. There is also one for 'Limbo'. I forget what that means offhand, but sounds pretty purgatorial.

Most intriguing of the many postal comp. events which the **National Free Flight Society** (Massachusetts, U.S.A.) is running something called PUFF. Now while this term has certain unfortunate connotations this side of the pond, it is all a question of wind. In fact the PUFF initials stand for Penetration Up-wind Free Flight. Virtually an impossibility in this country, which is why the less athletic go in for Radio. The idea is to get your rubber powered model to do a two-minute max upwind of the launching point. Can't imagine how it could be done except in a back pedalling wind, but gives food for thought design-wise.

Further food for cerebral ingestion comes in the **Christchurch M.A.C.'s** (New Zealand) very ample *Torque* magazine. After much highly-gear'd multi chatter we are brought down to earth on page umpteen with the fluttering touch of an indoor job. The 'clubroom special' type members are asked to produce a squared up 18 in. span job, tissue covered for the initiate and microfilmed for the expert. Flight times around 20 seconds. A tongue in cheek letter to the editor purports to come from a perplexed spectator who describes how a chap with a model plane tried to destroy it by twisting it inside-out with a large rubber band, failing, and in disgust, setting light to the tail.

Something of the sting seems to have gone out of the **Glasgow Hornets M.A.C.**, if we are to judge by the gloomy tone of the latest newsheets. The editorial complains of a marked drop off in support, and the question is asked, 'Where do the Hornets go in

Contest Calender

December 26th	Boxing Day Gala, Open R/G/P. 2/6d. entry, 2/6d. pre-entry. At Chobham Common. Note: This contest is not organized by Woking as advertised last month.
January 5th	Bill White Day. Open Rubber (Bill White Cup) Open G/P all in F.A.I. Blackheath M.F.C. At Chobham Common.
February 9th	"Crookham Winter Gala" Open Rubber/Glider/Power ¼A Power, Venue Chobham Common.
May 11th	Eastbourne Slope Soaring Rally, "Long Man", Wilmington, Sussex.
June 22nd	AEROMODELLER/R C M & E. All-scale model Rally. Old Warden, Beds.
July 27th	South Coast R/C Rally, Golden Cross.
September 21st	South Midland Area Rally, Cranfield.
September 28th	South Coast Gala.

the summer?' The situation is so bad that the future of the club may well be in the balance. Clubs do, of course, go through these bad periods. We come to accept the old, familiar faces around us in the club room, then suddenly they are swallowed up by marital and other indescribable distractions. What is needed at this juncture is a vitalizing influx of keen, young prodigies, otherwise you can only wait in hope that the old ones may return to the fold, wiser.

More foreign news. This time from the newsletter of the **Western Province M.A.C.**, of Capetown. Nice to record that old members who like old soldiers, had just faded away, have 'sloped' back, as it were. For some reason, known only to geriatric science, the old ones are attracted to the idea of slope soaring. Odd, since there's nothing more strenuous than climbing.

I've always had a little giggle to myself whenever the name of the famous Bong Airfield is mentioned, but it was more good flying than bonging that went on at this Wisconsin venue when the U.S. F.A.I. Team selections were flown. Opinion has it that the U.S.A. teams which emerged are the best the country has ever had. The vast distances that must be traversed to reach such events is a tough test of enthusiasm. Many now do the trip by aircraft rather than by covered wagon, but even that mode of transport has its dangers. Imagine getting engine failure over the Grand Canyon! And that actually happened to one competitor. Did you know that, in America, model flying is making its contribution to marital bliss? More and more twin models are to be seen inscribed 'his' and 'hers'.

Finally, a couple of pen pals required, both for modellers in Czechoslovakia. First request is from Vladimír Pém, of Tylovo nábreží 367, Hradec Králové 1, Czechoslovakia. He is 15 years of age, builds F/F, C/L and Rocket models. The other request is from Jiri Kukulj, Schvarzova, Ul.40, Plzen-Bory, C.S.S.R. He is a F/F Glider flyer, and is interested in swapping the Czech 'Modelar' for the 'Aeromodeller' - a cracking magazine each, if I do say so myself! Keep those flying fields flying. THE CLUBMAN.

Recent Control-line Events

Northern Area S.M.A.E. F.A.I. Meeting, October 20th Rivers Trophy. (C/L Racing) 1. Laurie/Peart (Novocastria) 9:45. 2. Turner/Hughes (Wharfedale) 9:51. 3. Place/Haworth (Wharfedale) 10:59.

9th Rufforth '1000', November 3rd

Class B Race run by Wharfedale and D.A.C. At R.A.F. Rufforth, Yorks. 1. **Haworth/Place** (Wharfedale) 10:07 (200 L. heat) 49:41 (14 stops in 1000 laps).

1966 converted F.A.I. Model (also last year's winner) with Reggollow tank. Haworth Eta 15 + (bored out to 2.8 c.c.), chromed piston modified timing and 3 bearing shaft "Rev-up" 7x7½ prop (100 m.p.h. max.).

2. **Hampson/Yates** (Leigh) 109 laps (200 L. heat) 58:17 (19 stops in 1000 laps).

1962 Model with 2 cell tank (minus vents, lost in heat) Eta 19 (with Brand New piston and Liner) Glasslugal 8x8" Prop (105 m.p.h. max.).

2 other entries (Thurnscoe and Wharfedale) did not fly.

Haworth/Place were first away at the start and Hampson/Yates had a slight lead, due to their extra speed, before their first stop. But from here on the Wharfedale team took over and gradually pulled away for the rest of the race. The Leigh team were delayed by having to tighten the prop at their second stop and changing a plug at their fourth, but their main problem was re-fuelling a vent-less tank. Added to this were 4 bad catches to Wharfedale's one.

The extremely consistent run by Haworth/Place not only won them the race but set up a new record for the event, easily beating Horton/Humphries' 1964 time of 54:51. Don Haworth said *before* the start they anticipated going under 50 minutes with 13 stops if all went well. But they had 14 stops 1 49 minutes next year?

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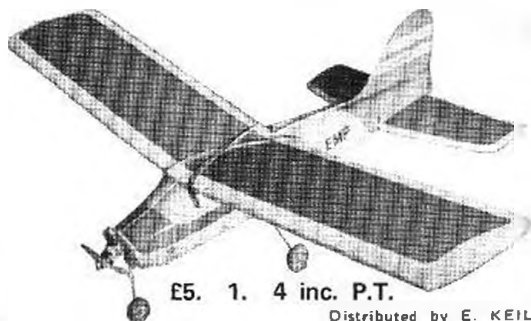
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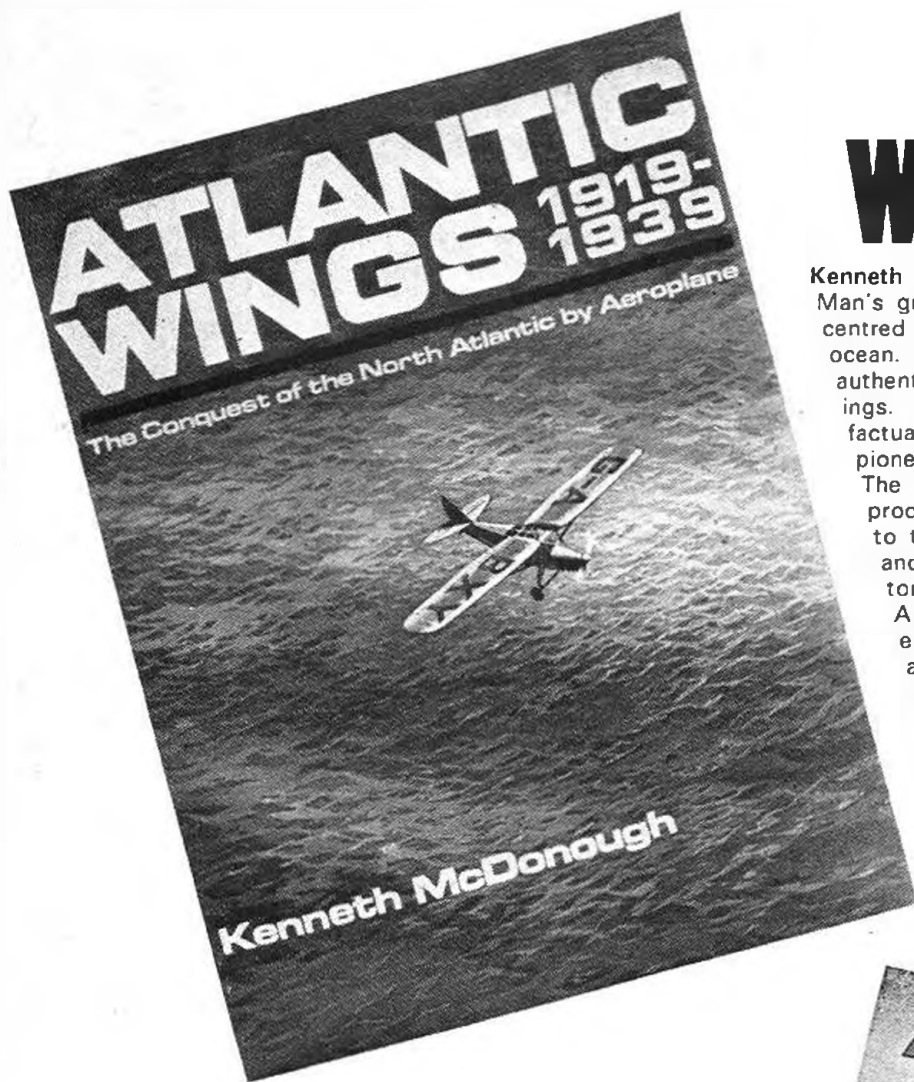
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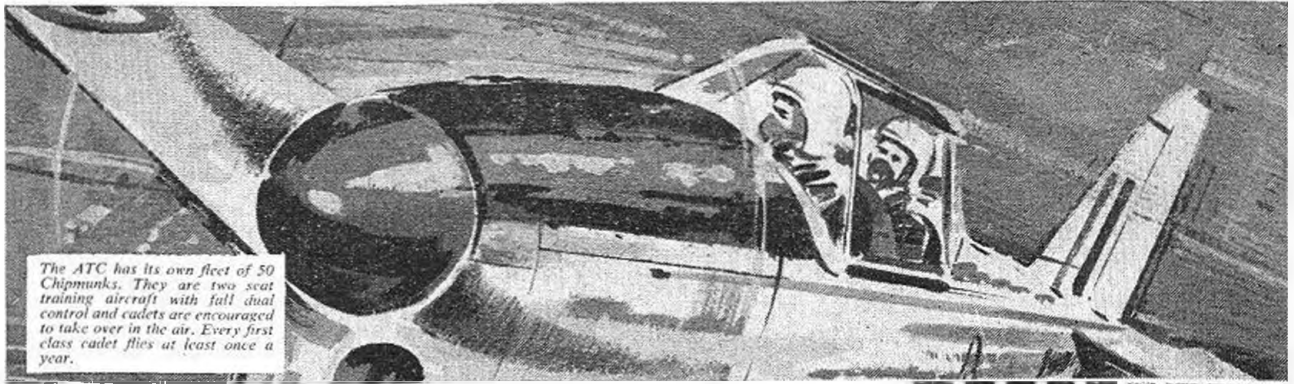
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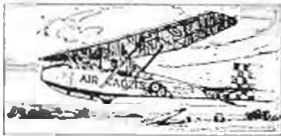
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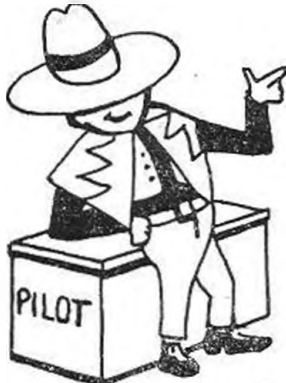
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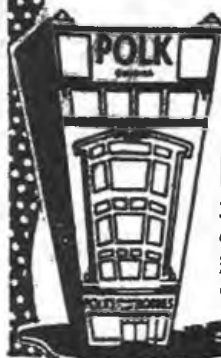
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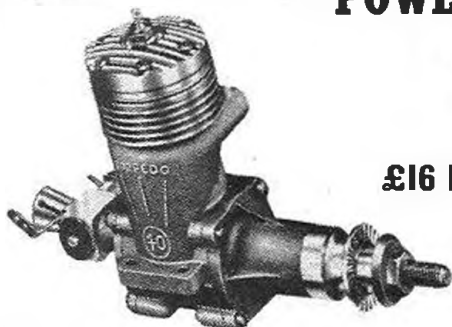
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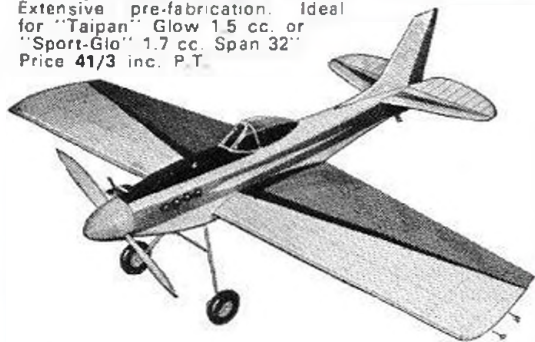
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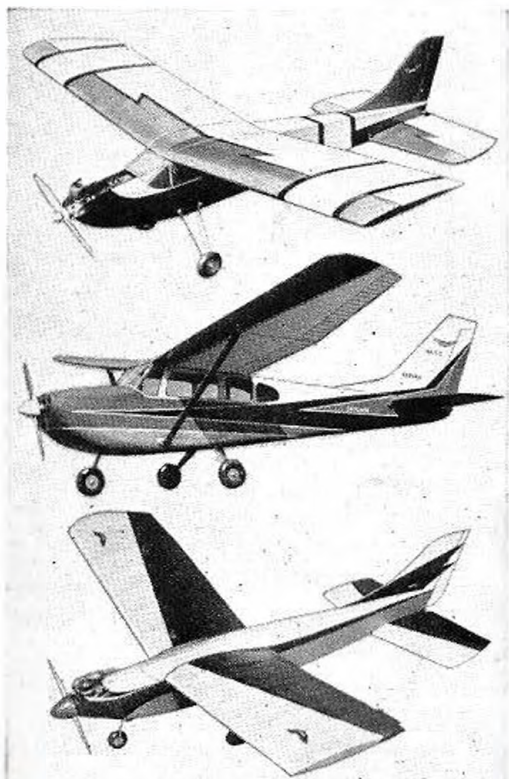
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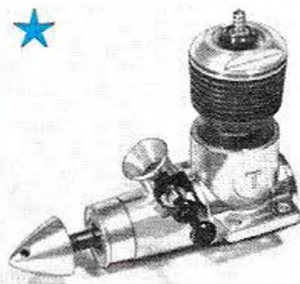
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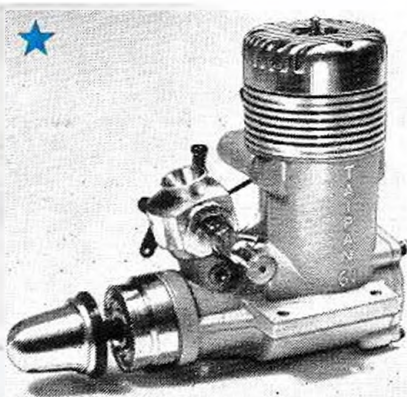
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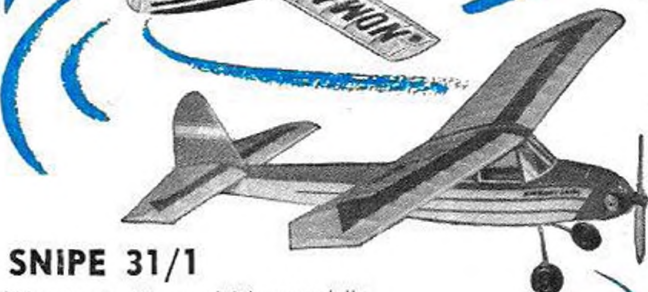


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