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WORKMASTER
R/C DESIGN
•
GLASS FIBRE
MODELLING**



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*This is your page.
Among the many thousands
of Quickstart enthusiasts
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there must be a fund of
experiences like those below.
Why not send us yours—
and get into print!*

Dear Sir . . .

'I am very pleased with my DC Bantam which I bought recently. Although my experience is limited I found no difficulty whatsoever in starting. Because it starts usually at about first or second flick I hardly had to use the "Quickstart" device. As this engine is capable of running inverted without trouble it enabled me to do my first wing-overs and loops in my stunt plane. I can expect this engine to serve well for long. Again thank you very much for a fine workmanship you have put in my DC Bantam.'

*from Mr. N. Ohno,
London, W.8.*

Dear Sir . . .

'This week I purchased my first Davies-Charlton engine—a Spitfire. Having "run it in" I mounted it in my own "special" a flying wing. I was truly amazed at its performance and so I have written to tell you how pleased I am with it. I am enclosing my guarantee form with this letter but I think that I shall never have to use it. I shall always recommend your engines to my friends as I consider them to be the best value for money on the market.'

*from Mr. R. N. Hollenshead,
Coventry, Warws.*

Dear Sir . . .

'I own a small engine and I have tried various fuels in it. Recently, however, I tried Quickstart glo-fuel and the easy starting and high performance amazed me. I shall certainly recommend it to all my fellow aeromodellers.'

*from Mr. J. C. Wilson,
Salisbury, Wilts.*

Dear Sir . . .

'Very many thanks for sending the Bambi spray bar. It is not often one receives such courteous service. We have four DC engines, including the Bambi, and have nothing but praise for them. I am an aircraft engineer, at present used to diesel engines and pistons around 10 to 18 ins. dia. I have now rebored a Merlin and the Bambi which, I must confess, nearly beat me; my colleagues and myself are amazed that you could produce them commercially considering the close limits required . . .'

*from Mr. S. Butterworth,
Woolston, Southampton.*

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AERO MODELLER

MAP HOBBY MAGAZINE

July 1962

VOLUME XXVII No. 318

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cover

This magnificent model, made in soft soldered brass and covered with the same type of silk as we use for flying models but appropriately colour doped, is the work of Mastermodels Ltd., Feltham. It was made to special order for the Air Museum section of a well established overseas museum and was prepared from drawings of the Etrich Taube which are reproduced in this issue on pages 346-7-8. A further picture of this will be found on page 324.

next month...

The British National Championships held over Whitsun will be the main feature of the August edition. Look out for full photo coverage with details of all the winning models and an explicit report on every event. Solid scale modellers and those who closely follow full size aircraft will appreciate the detailed drawings of the Lockheed F104G Super Starfighter and CF-104, which will also be illustrated in full natural colour on the cover. This Fighter will be standard equipment for several European Nations in NATO and is remarkable for its many unusual characteristics. Model jet engines are always fascinating. An exclusive article on something which is quite different to the accepted pulse jet and has been applied as a thrust aid on a control-line model will be described with sketches of experiments. These, plus many other interesting features, will be found in the August issue on sale July 20th.

other modelling angles...

July issue of RADIO CONTROL MODELS and ELECTRONICS contains a novel radio controlled Hydroplane plan for those who feel that the wind has been too much for flying lately. It is airscrew driven and there is ample capacity for all types of radio gear. What's new in equipment? This is always a leading question and in July issue there will be quite a round up of new gear, mostly from across the Atlantic, sufficient to wet ones appetite and to inspire new thought, Aerial efficiency, Vibration advice, Gadgets and Gimmickry, Radio Controlled vehicles and full gen on the first stage (single channel) of an advanced filter receiver design for later adaption to multi channel and pulse work will be a main highlight.

Next issue of MODEL MAKER and MODEL CARS will be featuring the Triumph TR4 in Prototype Parade, together with the M type MG Midget for slot racing and the Model T Ford and other articles on car, track, and scenic detail construction. A 30 in. fast electric cabin cruiser, A.W. B. Prowse on what makes planing boats porpoise, a 57½ in. modern coaster, reports on the first of the season's regattas, and many other features will add up to another good month's reading. Both magazines are the same price... 2/- per copy. If your hobby shop or newsagent does not carry a stock send 2/4 for return delivery to address below.

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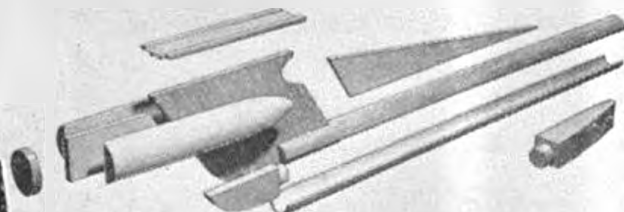
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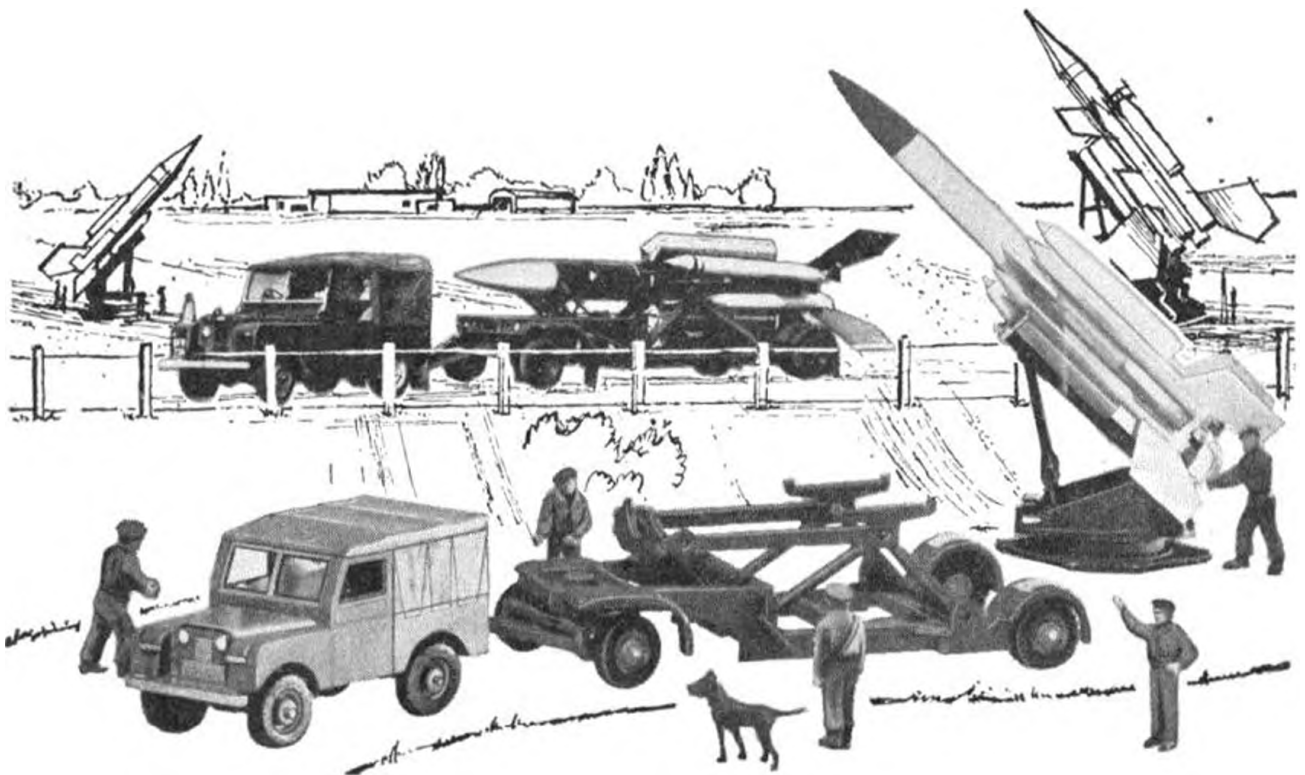
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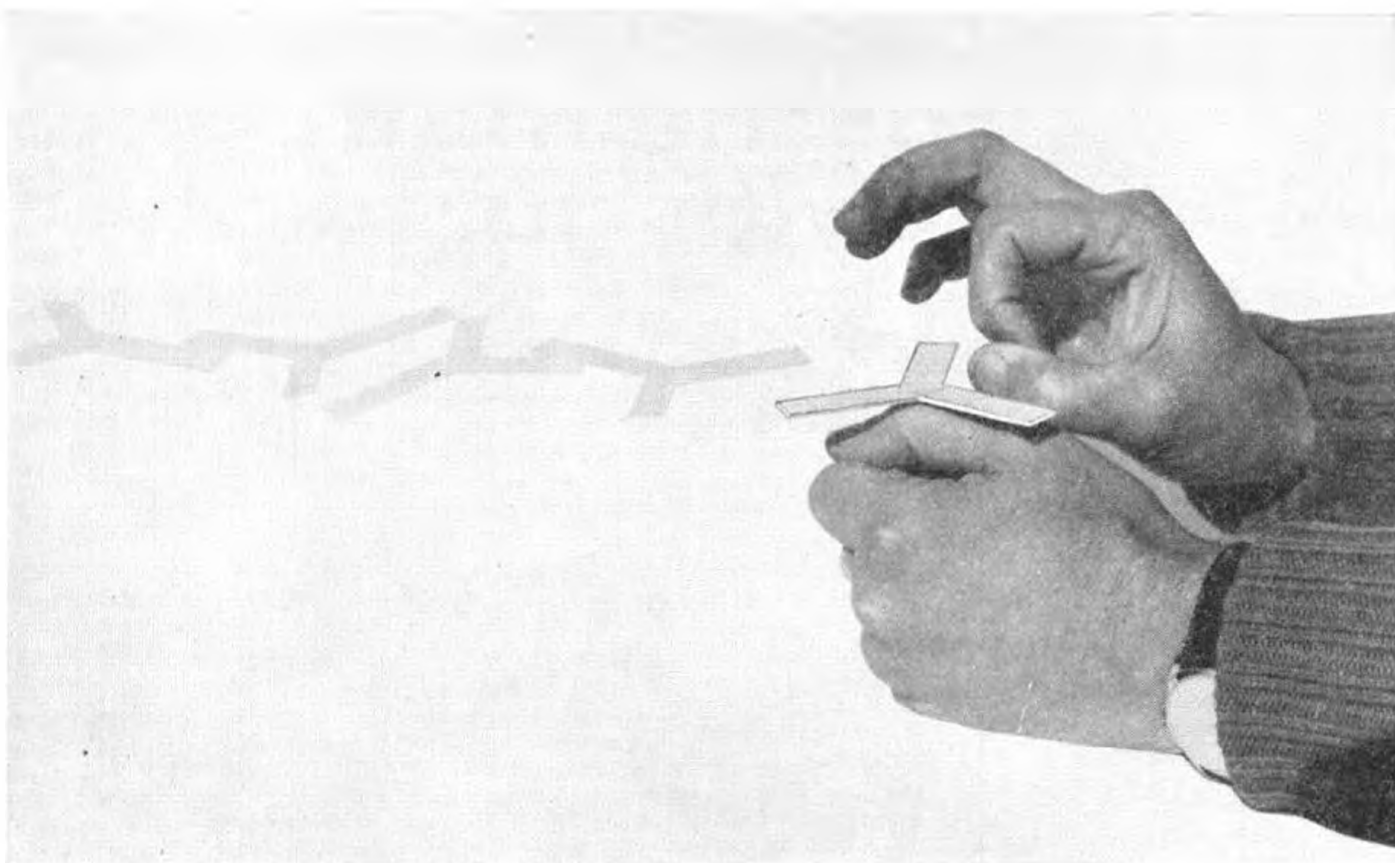
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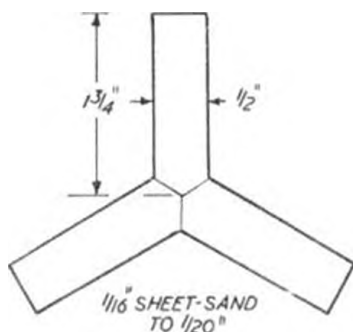
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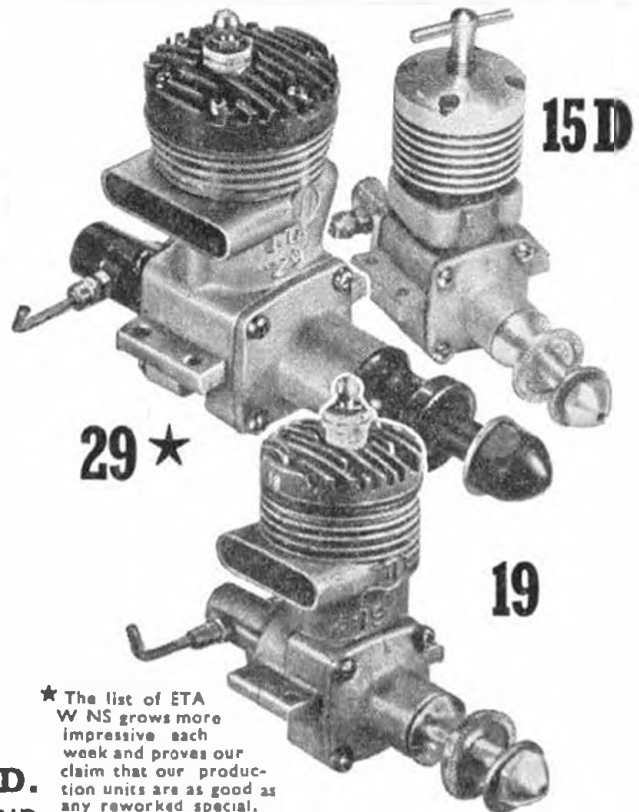
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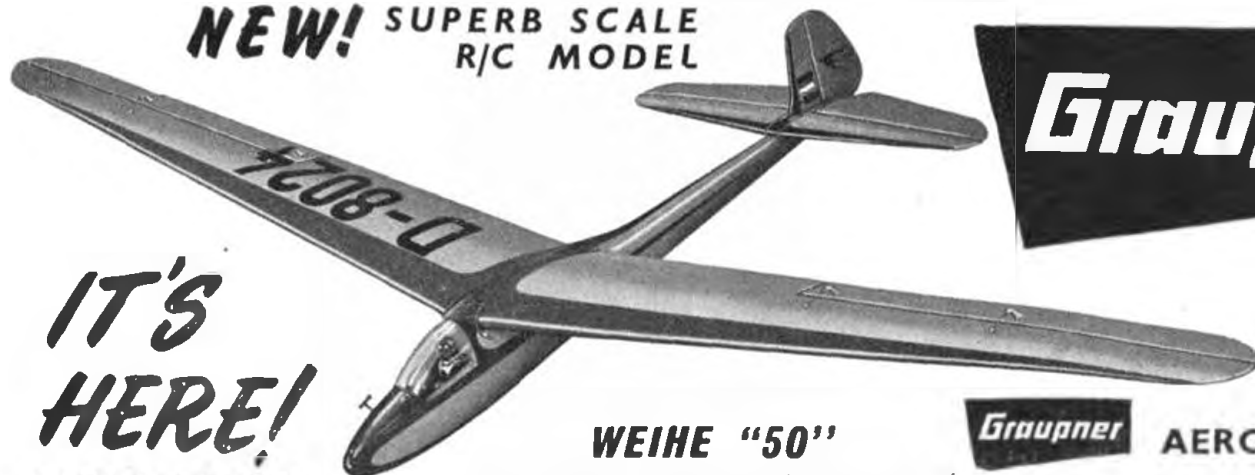
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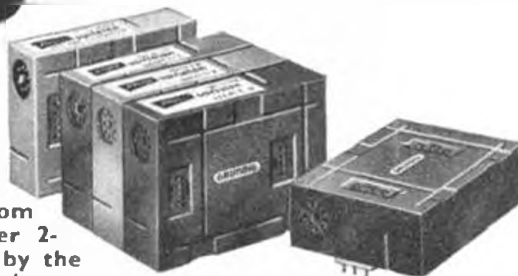
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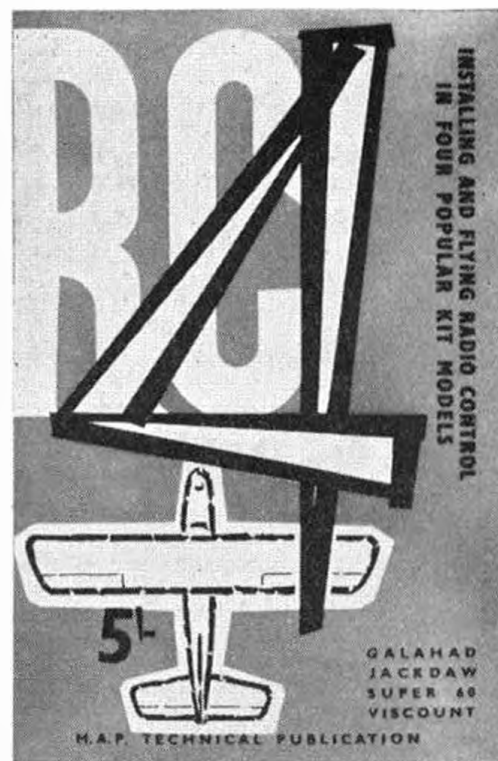
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SOMETHING NEW IN R/C !

RADIO CONTROL BIG FOUR is a new departure in model technical journalism that will fill a real need amongst newcomers to r/c flying. It caters for the man who has just bought, or is thinking of buying his first r/c kit in which to install and fly his first equipment. We approached the manufacturers and designers of the four British kits now on the market and invited them to tell us all about them. The result is a book which amplifies the building instructions supplied with the kits, tells why the designers did what they did, what equipment they installed and how, snags they met and overcame, and how they flew the models,

tips on better building — in fact it is nearly as good as having these expert designers and flyers standing with you as you progress. The kits covered are MERCURY GALAHAD; FROG JACKDAW; KEILKRAFT SUPER SIXTY; VERON VISCOUNT.

Sixty-four pages, size 8½ x 5½ ins. with two colour card cover. Copiously illustrated with plans, drawings, photos, and text by Tommy Ives, Frank Knowles, Stewart Uwins, Ernie Webster, Phil Smith, Tony Dowdeswell. Price 5/-



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R.C. PRIMER FROM U.S.A.

We have some copies of Howard McEntee's book for beginners dealing with use and application of equipment on U.S. market (much available in G.B.). Mainly for aero-modellers, but some on boats. 11½ ins. x 8 ins., 64 pages, 73 photo/illustrations, 72 line drawings. Semi-stiff glossy cover. Price 15/-

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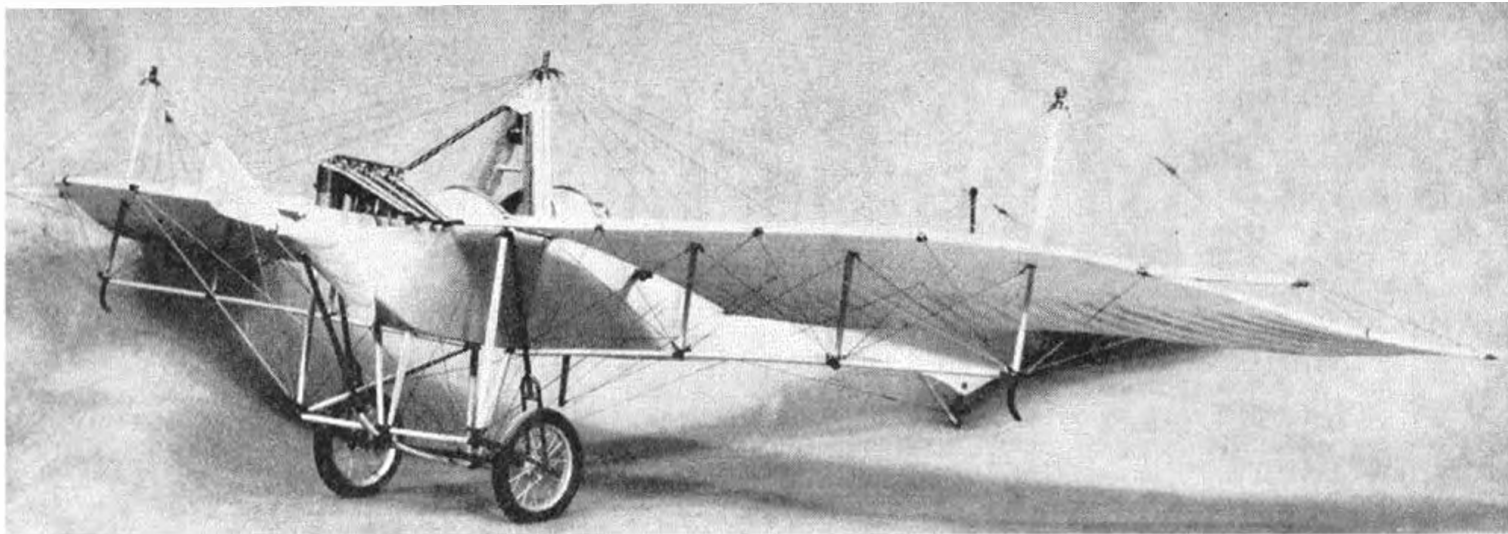
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Heard at the Hangar Doors

A Master Model

The photograph above gives a little impression of the detailed work involved in this 1/24th scale Etrich Taube, which is also featured in colour on our cover this month. It is part of a collection of models made by Mastermodels Ltd. of Feltham for an Aviation Museum, which is part of an overseas National Museum. Other interesting "early birds" made at the same time for the collection were the Antoinette, Avro 504K, Bleriot XI, Maurice Farman and the famous Wright Brothers Flyer. Models of other, later aircraft, are also being made for the Museum.

Because of the wide humidity range to which the models are subjected when on display, the specification called for construction in a medium that would not shrink or be temperature sensitive. This eliminates normal materials of wood or Perspex and calls for construction in glass fibre or metal. In fact all of the "early birds" collection, including the Taube, were made in soft soldered brass with silk covering. Wheels have rubber tyres on turned rims and the spokes are 33 s.w.g. piano wire.

AEROMODELLER Plans Service is frequently called upon by Mastermodels to provide drawings for such contracts and it was particularly fortunate that we were able to assist with advance information on the scale plans appearing in this issue for the Taube.

Plans Service Break

Staff holidays in the third and fourth weeks of June (17th—30th) for AEROMODELLER Plans Department will mean that only urgent items will be dealt with by a skeleton staff. Please note that orders submitted within this period are likely to be subject to a brief delay so we must apologise in advance for not being able to offer our usual by return of post plans service.

A Model Recovery

Although we receive a regular supply of S.M.A.E. Area newsletters, we do not ordinarily quote their domestic information but feel that the following, taken from the North Western Area circular of May is too good an opportunity to miss . . .

"The meeting had been in progress for an hour or so when it was realized that two characters were removing items from the back of Ray Musgrove's car, parked opposite the Y.M.C.A. Never have 20+ people evacuated a building so quickly! The two offenders were found around the corner sitting in a car with the loot, a tin of coffee and a mac, in the boot. When they handed the things back they decided to make a break for it, one on foot and the other in the car. However, all was not lost, and the great pursuit started. An extremely well trimmed John O'Donnell pursued the man on foot through the

streets of Liverpool and eventually ran him to earth half a mile away. Meanwhile the man in the car was being hotly followed by car and scooter, but the chase was discontinued when it became too dangerous. The Aintree race meeting and a ban the bomb demonstration had caused a shortage of Police and after half an hour one had to be fetched off point duty. Gradually law and order was restored and the meeting restarted after an hour's adjournment."

Are You Licensed?

Statement from the Radio Services Department, Headquarters Building, St. Martin's-le-Grand, London, E.C.1. tells us that the Post Office has recently issued the 5000th licence for radio control of model vehicles, vessels and aircraft.

Model control licences were introduced on 1st June, 1954 to cover the use of frequencies in the bands 26.96 to 27.28 Mc/s and 464 to 465 Mc/s. On and after 1st June 1963 the higher frequency band will be altered to 458.5 to 459.5 Mc/s.

This figure of 5000 sets us thinking. Could it be that every radio operator has quite a collection of radio sets? Have the dealers been selling to the same people over and over again? Are *You* licenced? Application to the above address will provide the proper form, the charge is £1 for five years of operation.

Taipan Engine Report

We owe apologies to Gordon Burford, manufacturer of the Taipan 2.5 BR which we reviewed in the May issue, Engine Analysis No. 95. Somehow or other our dimensions became jumbled and the quotation of 10 thou. ovality on the crankpin was most inaccurate. The figure that should have been quoted was .0012 thou. ovality, which is not an unreasonable acceptance for an engine after it has received the strenuous treatment involved in test analysis. Gordon Burford products are distributed in England by Performance Kits.

History Repeated

R. L. Goddard, Chairman of Cleethorpes & District M.A.C., during a break in the recent International Team Trials at R.A.F. Barkston Heath, was reminiscing on earlier times when power modelling was just beginning to get under way. He has since sent us a cutting from *Newnes Practical Mechanic* of June 1936, in which a report is given of a petrol engined model which smashed into a nursery window half a mile from its launching point. The late F. J. Camm, editor of the magazine drew attention to the danger of uncontrolled models weighing several pounds and suggested that modellers fit automatic time control as well as automatic aileron or rudder control, so that direction and duration of flight could

be predetermined within reasonable limits. Sounds like the very beginning of timers. We wonder what the readers of 1936 would have thought of a suggestion that for International power duration, the motor should only be permitted 10 seconds running time. In those days, of course, one could fly with unlimited engine run and thermal flyaways were virtually unknown.

Indoor Information

The first of the indoor meetings, organised at R.A.F. Cardington on April 14/15th, was frustrated due to interior redecoration of the airship hangar and a lot of open windows letting in the gale force winds. However, the newly painted interior ensures a bright welcome for the World Championship meeting to be held there on September 22nd/23rd.

There is a great keenness in the U.S.A. for indoor flying. Local eliminators have already taken place in Chicago, Kansas City, Dallas, Detroit, Los Angeles, Moffet Field, and Lakehurst. Quarter finals took place during May, then top men go to the semi finals at the Moffet Hanagar; the State Fair Coliseum Detroit; and to a location on the East coast. This carefully selective plan will undoubtedly produce a very strong team from the U.S.A. We understand that at the Moffet field quarter finals on May 6th, Bill Atwood, the renowned engine designer, was leader with 39 minutes, closely followed by veteran flyer Frank Cummings with 37 minutes on a flight which could have been over 40 minutes, but for somebody opening a door at the wrong time. Times in the local eliminators elsewhere ranged, according to the facilities available, from 15 minutes in New York to 32 in Dallas. Competition is keen and stimulated by the excellent newsletter issued by the "National Indoor Model Airplane Society" (N.I.M.A.S.). Enthusiasts for indoor flying who would like to be put in touch with this organisation for receipt of their most informative regular monthly newsletter should write to Bud Tenny, Box 545, Richardson, Texas, U.S.A.

Scale at the Nats.

It is no secret that a number of the multi channel enthusiasts felt like jilted debutantes when they learned that there was to be no pure aerobatic multi channel R/C event at the British National Championships and the replacing event was to be flying scale radio control. As we go to press we are pleasantly surprised by the enthusiasm for the new event. From all parts we learn of most interesting models which we hope will have materialised at R.A.F. Barkston Heath over Whitsun. Three models are shown on this page. We reproduce their pictures as an inspiration to others to "have a go" for these are original designs, as distinct from the usual run of kit and plan models. We must especially congratulate the Bromley club members D. Bryant and W. Lowe on their 1/7th scale Spitfire Mark II and Hurricane Mark I 10 channel models, each of which is to near perfect scale. They also have a Hawker Fury and a Messerschmitt Me 109 in the offing.

Lost Model?

Have you lost a model in spite of it having a name and address label? We have, and from the state of models which have been recovered, after several weeks of exposure, we know the reason why. It is because name and address labels inevitably fade even if protected by an overlay of varnish or clear acetate. Recently we have been trying a *permanent* name and address label measuring $\frac{3}{4} \times 1\frac{1}{2}$ ins. made from table surfacing Formica, white in colour and deeply engraved to show the owner's name and address, telephone number and "if found

please inform" notice in black. Cost is 1s. each with the telephone number included. D. S. George of Liskeard, Cornwall, will gladly provide this service in units of three labels at a time, and we would be glad to forward enquiries.

World C/L Championships

Official invitations have been issued by the U.S.S.R. for the World Championships to be held at Kiev from September 1st—7th this year. This will be the first ever meeting of this type held in the Soviet Union and many Nations are currently preparing eliminations to select their representative teams.

However, there remains a very real problem in the question of travel and expense for a full team of 13 people from each Nation and this includes Great Britain, for the cost per entrant is likely to exceed £100. for London-Kiev return alone. On top of this, entry fees inclusive of accommodation during the period of the contest amounting to approximately £130 also have to be paid. Faced with such costs the S.M.A.E. will be hard pressed to support a team. What we need is a good fairy with thirteen seats to spare!

Elegant 1/7th scale Spitfire Mark II seen below, weighs 7 lbs. with Orbit 10 Relayless Receiver, 5 Transmite Servos and K & B 45, designed and built by D. Bryant of Bromley Radio Control M.A.C. using "Aeromodeller" 1/72nd scale drawings

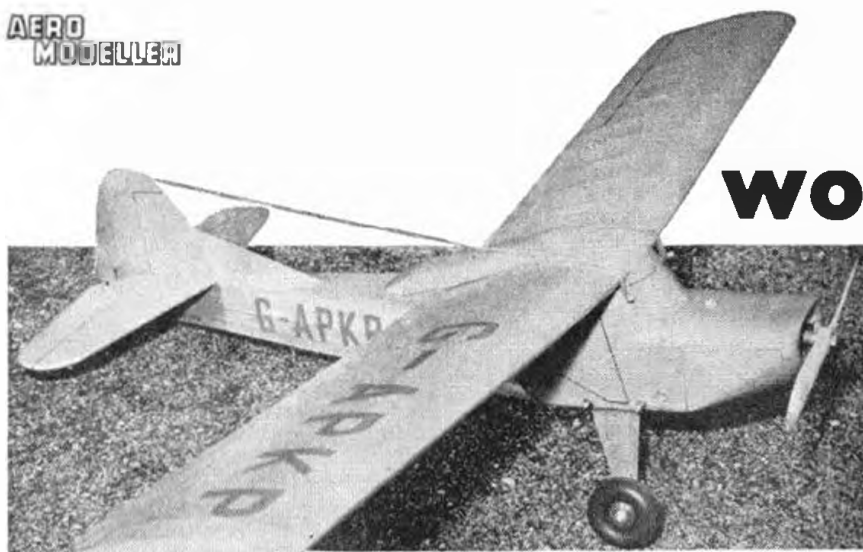


Hurricane Mark I also to 1/7th scale, is a stable-mate for the Spitfire above and weighs 7½ lbs. with Orbit 10 Relayless Receiver, Transmites and Super Tigre 56. Designed and built by W. Lowe of Bromley, scaled up from "Aeromodeller" 1/72nd scale drawings



Cyril Needham's Avro Tutor from Bristol, which he scaled up from manufacturer's drawings for the Cox Sportsman 15. Uses R.E.P. Tritone and is decorated blue and yellow, radio gear in front cockpit





WORKMASTER

48 inch wing span
semi-scale model
for single channel
radio control or
sport flying 1-1.5 cc

By Ron Moulton

THIS MODEL IS no stranger to the locals. The airframe was built in August 1958 to a specification laid down at that time for a model to fill an enormous gap in the plans and kits available on the British market.

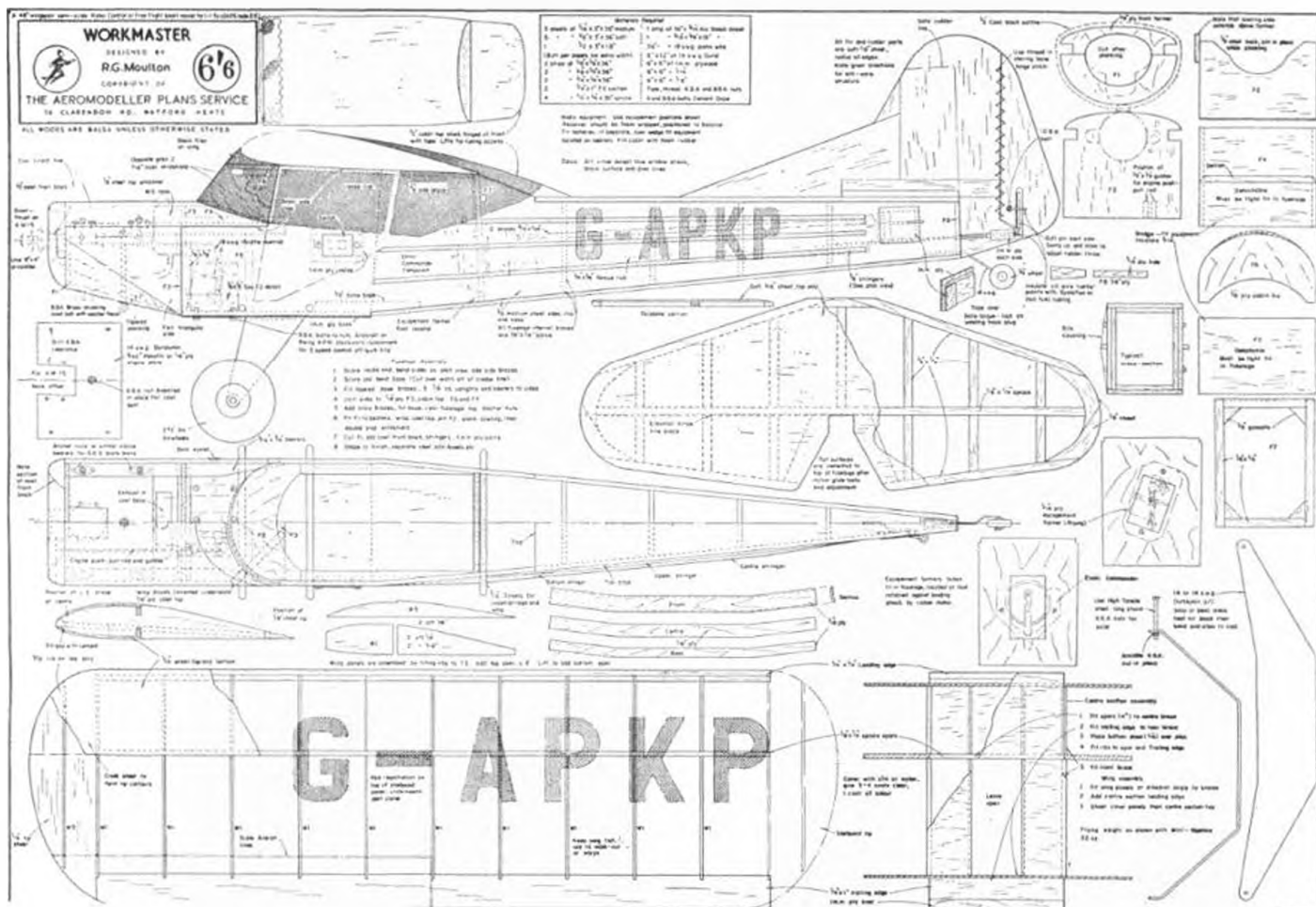
The specification was as follows:— The model should be of a size to suit most pockets, 1-1.5 c.c. engines; it must look right and fly right; it must have a specialized structure for its purpose of single channel radio control. It should be a weight carrier; have a voluminous interior and be adaptable to a wide range of equipment and engines; it must be repairable without risk of affecting trim; tough, up to date and practical.

For appearance sake, the near scale approach so well explored by deBolt kits has greatest attractions. Coincidentally, Austers had just announced in 1958 their hybrid airframe for agricultural purposes with large

tail surfaces, stronger undercarriage and big wheels . . . plus a broad cowling for a horizontally opposed engine. This, then, was to be the inspiration, and *Workmaster* is in most aspects a true 1/9th scale model except for enlargement of the tailplane, solid windows, simplified undercarriage and lack of struts.

Completely new thought was inspired in fuselage structure. All sheet construction with single creases in sides and base, one bulkhead and one former make for the easiest possible form of assembly. The volume within the fuselage under the wing is sufficient to take the most bulky of equipment. Bearers fitted to the fuselage sides, braced by a ply-former at the front and the replaceable engine mounting plate form ideal vibration dampeners. The double laminate windshield adds rigidity where wanted and the dowels are so

FULL SIZE COPIES OF THIS 1/6th SCALE REPRODUCTION ARE AVAILABLE THROUGH A.P.S. AS RC 821 PRICE 7/- INC. POSTAGE.



arranged that in a really serious prang, the wing slides straight off.

Tail surfaces with anti-warp features are fixed after the initial glide tests. Slight adjustment made on the prototype is incorporated in the design.

The wing is made to work. That is to say, airfoil is NACA 4415 sheet surfaced over the working area where it matters, with the result that the Workmaster will lift a loading of up to 20 oz./sq. ft. without difficulty. The normal operating loading is about 12-14 oz./sq. ft. Spruce spars and three dihedral braces have kept the wing together after innumerable cartwheel landings. Over the centre section, the dummy cabin top lifts to reveal a space sufficient to allow access for tuning.

The dural undercarriage is simple but in case of difficulty of supply could be replaced by a built-up 12 s.w.g. wire frame with sheet filling. Despite many ups and downs, the only damage suffered to the prototype has been shock tears in the silk covered wing panels, which will give an idea of the strength of the structure. The cabin top has ripped off, and once, when a wing tip caught a fence, the impact as the fuselage swung round was sufficient to break away a large area of the rear fuselage (see pictures for repair detail).

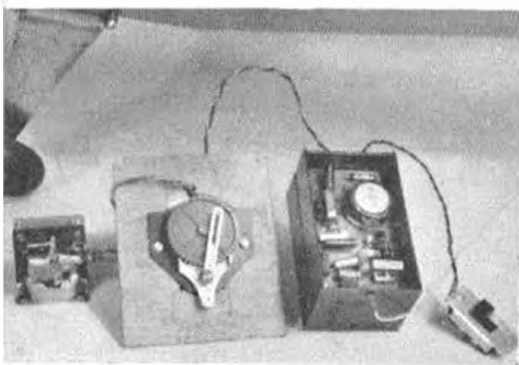
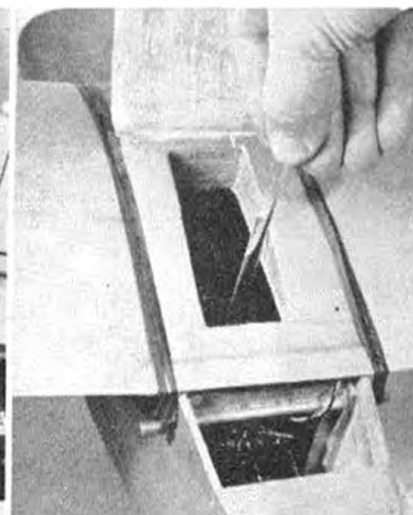
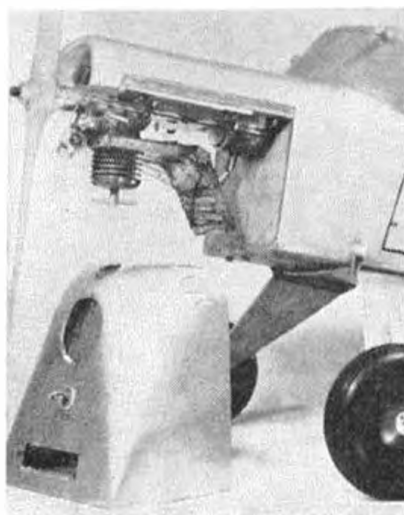
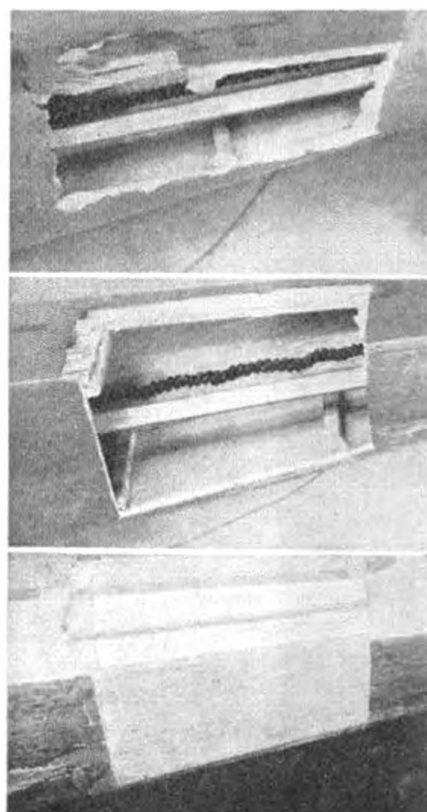
In every respect the Workmaster has more than lived up to its name and met every aspect of its original specification. It has been subject to all the trials and tribulations of working out best installation for new equipment and its current gear is still the original Mini-Reptone, Elmic Commander Compound and F. Rising 4 position clockwork escapement for engine speed. The AM.15 is most responsive on a 9 x 4 propeller.

Every effort should be made to insulate mechanical rattles. Connections from push rods to escapements should be covered with Systoflex or thin fuel tubing. Battery supply to the receiver should be regularly checked. The editor uses 4 DEAC 225 cells to provide 4.8 volts instead of the normal 3 U7 dry batteries. Those who intend to use the same set-up are strongly advised to study data sheet 12 issued with *Radio Control Models & Electronics* for September 1961, which covered just about all the possibilities and condensed most valuable information on the Mini Reptone. Full building instructions are quoted on the plan and should be sufficient for the relative novice.

Flying the Workmaster is by no means nerve racking. It performs admirably without radio control, and will hold a reasonable course although it is no competition model.



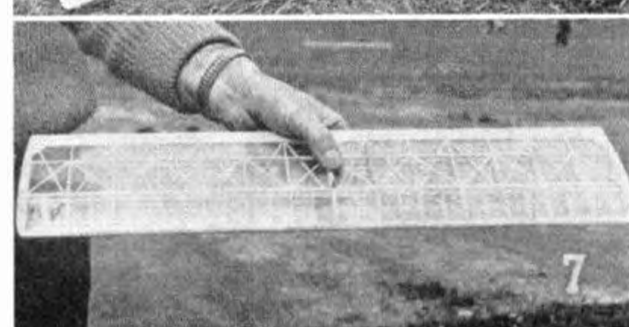
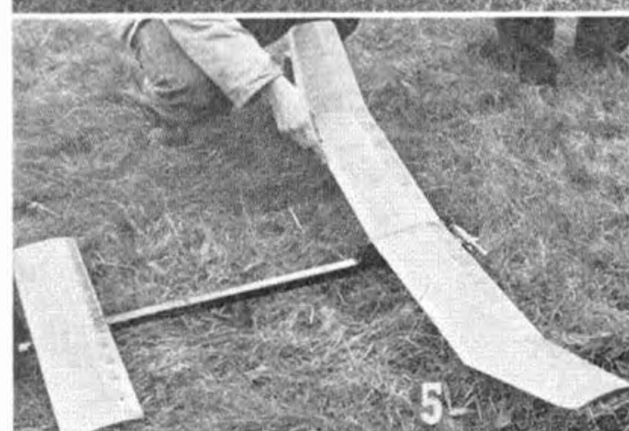
Red registration of original Auster Workmaster and blue painted cabin, KK 2.5 x .75 air-wheels, make for semi-scale realism in what is a simple design. At right, 3 stages in repair show first, impact damage on side and bottom (note, model still flyable!) next, cleaning the wound, next, new sheet and stringers, repaired in one hour. Below, left, the complete detachable rudder/engine control gear (8 ounces with DEACs). Centre, cowl detached showing MS tank, throttle rod and Araldited exhaust box on AM.15. Right, access under cabin top for tuning. Wing hole will take Unimatic MK1. Quick blip motor speed control and an Aristocraft Code-a-matic selector box on Tx give absolute sport flying satisfaction.





"STOCKPORT ADVERTISER" RALLY

1. Helper starts John Turner's A/2 from Chorlton, in the breeze. 2. Cheerful 1/4A team race winner was R. Place of Hemswell. 3. From A.P.S. drawings, a Douglas DC 3 Dakota, by Mr. Brown of Long Eaton M.A.C., powered by a mixture of Frog and Elfin 149's, with Derby Airways decoration, registered G-ANTD. 4. Southern Californian influence by Craig Cusik is evident in Mr. Culpin's Holland Hornet powered, high thrust line, 1/4A power entry. 5. Winning model in the 1/4A event was Tom Stoker's lightweight with Cox Tee-Dee .049 from Baildon. Unfortunately model was returned after third flight with engine missing. 6. Geoff Franklin of Leicester attends to his nose wheel assembly on enlarged Stormer, known as "Force-9". 7. Jim McCann from Redcar had this Terylene plastic covered tailplane, which may yet revolutionise model covering, eliminating dope. 8. Up from Cambridge M.A.C., Dusty Miller took first prize in Open Power, seen collecting the hardware, from Miss A. Clancy



RALLY REPORTS

Events at Esher and Manchester

SUNDAY, MAY 20TH, was a blustery, cold day throughout the length and breadth of the country. At the A.V. Roe Aerodrome, Woodford, Cheshire, over 9,000 people attended the best ever and probably the last of the *Stockport Advertiser* sponsored rallies on this aerodrome. Although the attendance made new records, thus disputing any claims that aeromodelling is on the wane, the unfortunate wind direction (South West) made it impossible to do three minutes within the airfield. Free flight events this year required three flights of three minutes. This led to complaints from the local farmers and some modellers, who had the unfortunate experience of finding their power models torn apart by engine thieves.

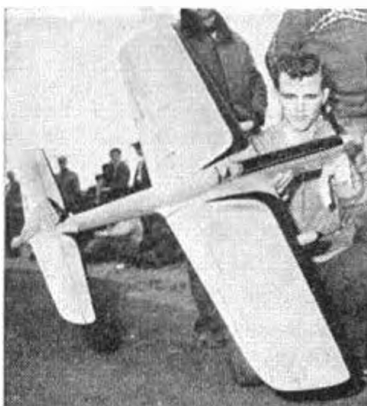
In the open event, triple max's were scored by Leppard (Croydon), Pool (Halifax) and J. O'Donnell (Whitefield). Only the first two flew off, Leppard winning by a clear minute. Perfect scores were returned by Dusty Miller from Cambridge to win open power and Tom Stoker in 1A. Yet once more John O'Donnell was senior champion with an over 23-minute aggregate for the three F/F events. Team racing and combat attracted a large and interested audience, the Long/Davy team from Wharfedale winning class A, and R. Place of Hemswell 1A with a beautifully finished model having a novel spatted monowheel. Mike Kendrick of West Bromwich added another combat win to his long list.

Entries in the E. J. Riding Memorial Trophy for scale were disappointingly low but standard was high. John Simmance's (now Wharfedale) *Sopwith Snipe* was the winner, but only one other entrant attempted to fly in the wind, which also deterred many of the single channel radio competitors from completing the course. Only about three managed to get around.

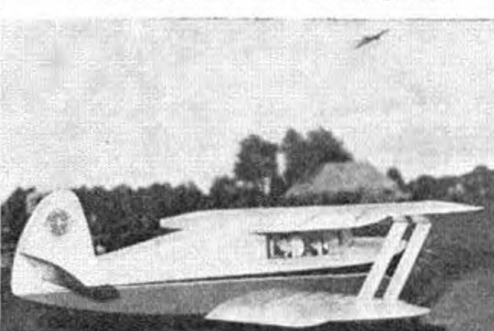
On the other hand there has never been such a high standard of multi channel radio on display in the North. Top place was a tussle between Ed. Johnson, eventual winner over Paul Rogers, each flying with McCoy 60 power in comparatively lightly loaded models. Climax of the meeting was undoubtedly the triple simultaneous take-off of three Orbit Superhet equipped models, flown by Ed. Johnson, John Singleton and P. T. Waters, which drew terrific applause from the crowd who were then entertained with a three-ring circus of aerobatics.

AT THE ESHER CIRCUIT

Scene at the first invitational meeting on the Esher M.A.C. permanent control line circle, at left, stunt winner J. P. Newman, serving with the U.S.A.F.E. at South Ruislip and a member of Kenton M.A.C., with his well finished Aires (Fox 35). Model weighs 45 ozs., is finished in black



and flame. Below is Alan Cardash's novel red and yellow Fox 40 powered Biplane which, thanks to powerful flaps on 42 x 9 wings, put up an astounding display of small diameter loops. Right, second place in team race, S. Munro of Esher D.M.F.C. with Oliver Tiger, twin boom, 23 oz. racer, finished in British Racing Green.



By inviting a restricted entry in Class A team race and aerobatic contests at their hard won circuit at Fairmile Common on May 20th, Esher and D.M.F.C. opened the eyes of several visitors. We must say that they have achieved a magnificent "first" in establishing this circuit on open heath land, sufficiently far distant from habitation so as to avoid complaints, but close enough to the main A3 road for easy access and car parking. With co-operation of the youth centre, full catering and shelter facilities were available to competitors and the 25 teams, plus 10 stunt entrants, who were first to apply, enjoyed a good day. It is certain that as with this first meeting, all future invitationals will be over subscribed, but in order to conserve time on the single circuit for the future, aerobatics will probably be replaced by 1A team racing. Congratulations Esher and D.M.F.C. on a job well done and to the G. Yeldham/J. Hall team for winning team race (5:20) and to American Serviceman J. Newman, for his stunt display.

Woodford Results

Open Rubber "Northern Challenge Trophy"

1. R. Leppard	...	Croydon	...	9:00 + 3:18
2. J. Pool	...	Halifax	...	9:00 + 2:44
3. J. O'Donnell	...	Whitefield	...	9:00

Open Power "Royal Aeronautical Society Cup"

1. D. Miller	...	Cambridge	...	9:00
2. J. West	...	Brighton	...	8:11
3. S. Savini	...	Liverpool	...	7:22

Open Glider "Elite Trophy"

1. J. M. Fletcher	...	Whitefield	...	7:56
2. J. O'Donnell	...	Whitefield	...	7:47
3. D. B. Spencer	...	Chester	...	7:31

1A Power

1. T. Stoker	...	Baildon	...	9:00
2. T. Ellison	...	A.V. Roe	...	8:52
3. W. A. Lee	...	Chester	...	4:13

Flying Scale "E. J. Riding Memorial Trophy"

1. J. Simmance	...	Wharfedale	...	<i>Snipe</i> 100 pts.
2. J. Clifton	...	Doncaster	...	<i>Vigilant</i> 82 pts.

Radio Control "Rudder Class"

1. A. L. Whittaker	...	L.A.R.C.A.S.	...	385 pts.
2. R. Askew	...	Kersal	...	258 pts.

Radio Control "Multi Control"

1. E. Johnson	...	A.R.C.C.	...	2110 pts.
2. P. Rogers	...	High Wycombe	...	2044 pts.

Team Race "F.A.I."

1. Long Davy	...	Wharfedale	...	4:53
2. R. Wallace	...	Novocastria	...	5:36
3. A. Crofts	...	Derby	...	—

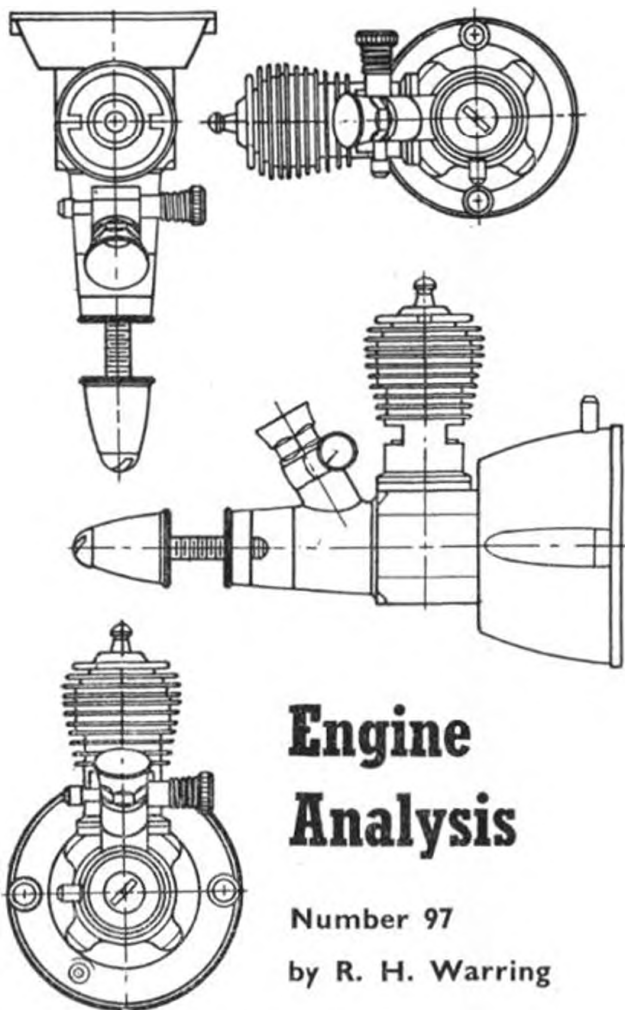
Team Race "1A"

1. R. Place	...	Hemswell	...	9:59
2. L. Davy	...	Wharfedale	...	11:18
3. L. M. Bellamy	...	Wharfedale	...	12:47

Combat

1. M. Kendrick	...	W. Bromwich	...	—
2. A. Lee	...	Wharfedale	...	—





Engine Analysis

Number 97

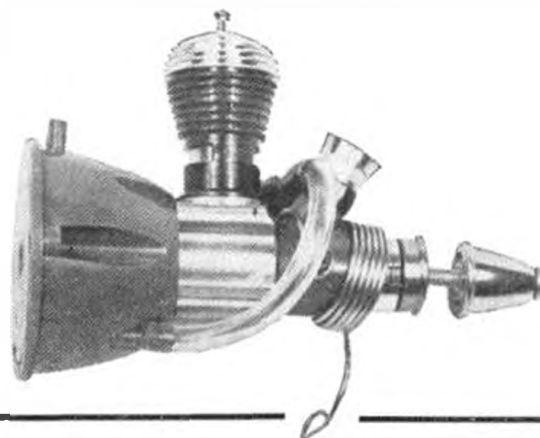
by R. H. Warring

cylinder after some running time, again imparting drag and detracting from performance. The recommended procedure for cleaning this is to "scour" the bore *lightly* with fine steel wool after about an hour's running time, which can remarkably improve performance on a subsequent run.

Cause of non-starting is usually simply—either the engine flooded or low battery for the glow plug (or both, the low battery not getting the element hot enough to fire the mixture anyway). The Cox element is definitely for 1.5 volts only and the life of even large 1.5 volt dry batteries can be unexpectedly low, especially under flying field conditions. Perhaps we do not make such good dry batteries in this country as America.

Starting tip

Even partial flooding *will* cool the element to the point where the mixture will not fire on a fresh 1.5 volt battery—and further flicking of the propeller from then on only makes things go from bad to worse. We found a "workbench" solution which worked very well. Using a 2 volt *accumulator* and a standard 2 volt glow plug *in series* in one lead to the Cox head, the element temperature was just right for normal starting.



BASICALLY THE COX TEE-DEE .020 (.327 c.c.) glow motor is geometrically scaled from the T-D .01 (see AEROMODELLER, October 1961) and is thus identical in general description. It is again a high-revving motor—but not to the same fantastic speeds achieved with its smaller brother—and requiring special sizes of propellers to operate at peak r.p.m.

If the instructions are followed explicitly, starting is perfectly straightforward and easy—needle 5 turns open, choke, prime through the exhaust with the port fully open, then flip or use the spring starter (the latter is recommended with the small sizes of propeller used). We did not find it fussy on nitromethane content of fuel either as regards starting or running, but a fuel with a fairly high nitro content is best for easy adjustment and smooth running.

Fuel residue

One possible trouble with different fuels, applicable to all very small motors in general (and the Cox Tee-Dee in particular, it seems) is gumminess or stickyness caused by residual fuel remaining in the engine after use. When it comes to starting the engine again after a few days idleness it feels "horrible" and reluctant to flip over—a condition which is not immediately relieved by flooding with fresh fuel.

Another thing these very small glow motors seem to develop is a lacquer-like coating over the inside of the

If flooded, (we were investigating how quickly these small engines flood and how they behaved as a consequence), temporarily shorting out the "resistance" glow plug produced enough heat to dry the engine element rapidly.

The main *causes* of flooding we found were (i) weak batteries (by far the most common cause); (ii) excessive finger choking instead of choking to fill the fuel line and then priming through the exhaust with the port *open*; (iii) trying to start the engine in an inverted position as fitted in a model (the remedy here being to turn the engine to an upright or horizontal position for starting).

For smoothest running we would prefer a fuel with a minimum 10 per cent. nitromethane content, although performance was comparable on Frog "Redglow". Cox's own fuel—now available in this country—seems excellent for the Tee-Dee engines and has a 15 per cent. nitromethane content. It seems a far "cleaner" fuel than many, with less tendency to "gum" or shellac formation. With no fuels tried, however, was needle valve adjustment critical, nor could consistency of running be faulted.

The only criticism we have with regard to the Tee-Dee .020 is in the manner of mounting via a moulded hard nylon tank. Designed for radial mounting the engine attaches to the tank moulding with four screws through the front of the tank, and the tank secures to the firewall of the model via two diametrically opposed mounting bolts. Possibly due to the fact that plastic is not a

DATA

PROPELLER—R.P.M. FIGURES

Propeller	R.P.M.
3½ x 2½ Cox three-blade plastic	21,000 plus
5½ x 3 TopFlite	11,200
5½ x 4 TopFlite	9,500
5 x 4 Keilkraft nylon	10,200

Fuel used: nominal 20 per cent. nitromethane, 25 per cent. castor, 55 per cent. Methanol.

NOTE: These propeller-r.p.m. figures are largely of academic interest. No standard commercial propellers available in this country are a "match" for the .020 other than the Cox 3½ in. dia. three-blade and Cox 4 x 2½ plastic (two-blade).

Displacement: .3266 c.c. (.0199 cu. in.)
Bore: .300 in.
Stroke: .282 in.
Bore/stroke ratio: 1.16
Bare weight: .85 ounces
Max. power: .0304 B.H.P. at 20,500 r.p.m.
Max. torque: 1.6 ounce-inches at 15-16,000 r.p.m.
Power rating: .093 B.H.P. per c.c.
Power/weight ratio: .036 B.H.P. per ounce
Material Specification:
Crankcase: machined from light alloy bar, "gold" finish overall
Crankshaft: hardened steel, 1/16 in. diameter steel screw propeller shaft
Piston: hardened steel Cylinder: soft steel

Connecting rod: machined from dural (ball-and-socket little end)
Intake body: moulded plastic, located by screwed dural collar
Venturi: turned aluminium
Spraybar housing: steel
Cylinder head: turned dural, integral 1.5 volt glow element.
Crankcase back cover: moulded plastic
Rear-cover tank: moulded plastic, with plastic end
Main bearing: plain
Manufacturers:
L. M. Cox Mfg. Co. Inc., Santa Ana, California, U.S.A.
British Importers:
A. A. Hales Ltd., 26 Station Close, Potters Bar, Middlesex.

completely rigid material this does seem to give undue flexibility to the mount. As a result the propeller must be meticulously balanced if excessive engine vibration is to be avoided.

The standard Cox 3½ in. diameter by 2½ in. pitch three bladed propeller particularly recommended for this engine is way out of balance, as moulded and, being three-bladed, is difficult to rework to exact dynamic

presence of vibration on the very high speed runs. However, .031 B.H.P. is still an exceptional figure for a .33 c.c. engine, which puts it in a class of its own. Peak power, as measured, was developed at 20,500 r.p.m. but the torque is fairly constant over quite a wide range down to the lower speeds. To use the Tee-Dee .020 properly, however, it needs small diameter propellers to let it rev. fast—nothing bigger than 4 in. diameter

The tremendously popular

COX Tee-Dee

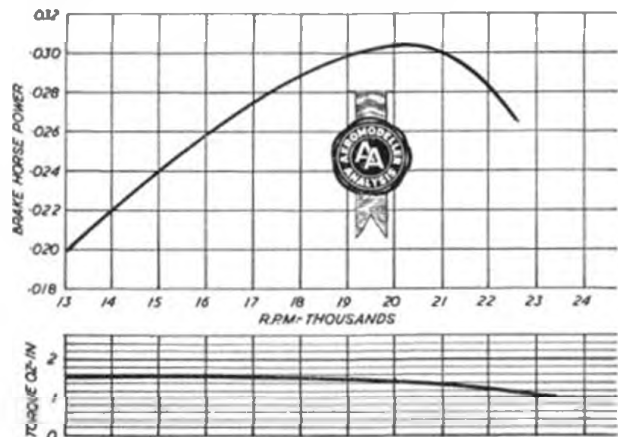
.020 (.327 c.c.)

Front rotary valve, glowplug engine

balance. Two-bladed propeller are better since they can be balanced closely without much trouble. But without a properly balanced propeller on the .020 you can lose an awful lot of power. First figures on the 3½ in. diameter propeller (unbalanced) were, for example, 15,000 r.p.m., as against the 22,750 r.p.m. figure quoted by the manufacturers. This we improved to 21,000 plus on reworking the propeller, during which the length of one blade, at least, was appreciably reduced.

In fairness to Cox, we must point out that they specifically state on their instruction sheet that the propeller to be used should first be trimmed and balanced.

Our test figures, we feel, may be a little unflattering to the true capabilities of the Tee-Dee .020 because of the



preferably. The engine gave consistent running on larger propeller sizes, but at such speeds was not doing a lot of work. It was, however, easier to hand start on larger propellers.

Workmanship

On the workmanship side we can only say that Cox engineering represents the highest standard in the model world today; and they combine this with first class styling and presentation. Their advertisement agent responsible for publicising Cox Tee-Dee must have an easy time of it. Merely to see one is to want to own it—and there is nothing to criticise on power performance either!



"Ed, you're wonderful!
most visitors
only bring
flowers"

OVER THE WAVES

Ed. Kazmirski's Taurus, described last month. Important features are full span strip ailerons, 19 per cent. thick wing section, trike undercarriage. Has Orbit 10 superhet relayless receiver and Transmite servos. Veco/Lee 45 engine. Superb finish. Has concluded 3 week tour of S. Rhodesia without even a scratch and no radio bothers.

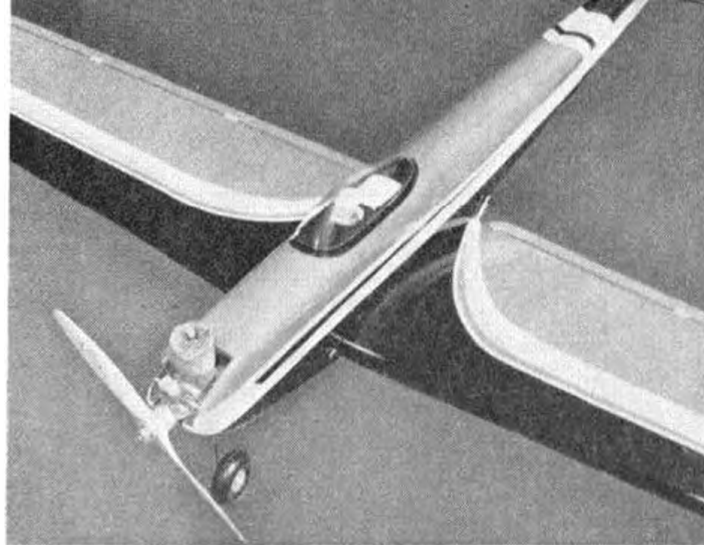
IN OUR POSITION it is understandable that we should be aware of trade trends. For instance we do know that a considerable amount of multi-channel radio equipment has been sold by dealers and is in the hands of enthusiasts throughout the country. The actual quantity is frankly quite staggering. It is obvious that many modellers are prepared to lay down a great deal of cash in pursuit of their hobby. Leading on from this comes a very big question. Just where does all this equipment go to? Indeed one rarely hear's of its existence, which can lead to the false impression of the popularity of multi-channel flying given by the same nucleus of two dozen faces we have seen in multi contests over the past 2 years. After purchase, most of these expensive sets seem to disappear into the hands of "Mr. Average Modeller", the activities of whom rarely come to light and it would be intriguing to know just *how* these many people have their fun.

This also leads to a problem for the R/C'er in that one can never tell just where the other chap will turn up flying and woe betide anyone falling foul of an unknown's signals while flying. A case in point happened just a few weeks ago when one staff member and fellow modellers lost their flying field, because the farmer was setting the field aside for hay. Without a flying site they had to hunt around and it was by a chance visit to a model shop that one member met a lone hand multi-flyer. It transpired that he flew regularly from a field no more than 2 miles from where the club had previously operated for over a year! This, of course goes to illustrate that the radio control waveband is becoming more crowded. How nice it would be to know just what the "hermits" are up to.

On Runways and Things

Several numerically strong Radio Control Model Clubs have sprung up in the past year or two, and it is quite likely that a few more will spring into being in the future. Club members may, in moments of meditation, have hankered after a club take-off strip from which to operate. April edition of the *Montreal Aeronautical Radio Specialists* (M.A.R.S.) Newsletter details a proposed paved runway, for which enthusiastic members have obtained a quote from a builder to lay down an asphalt landing/take-off strip over crushed rock. What interested us more than the actual fact of proposal, was the shape the strip would be. The runway would be triangular, the base of the triangle facing the prevailing wind. Size to be approximately 150 ft. by 100 ft. with an apex angle of 40 degrees. Many will naturally question the need for a paved runway since they operate successfully from mown and rolled grass fields. Across the American Continent to Vancouver, the same subject arises in the V.G.M.C. *Hot Head* bulletin. To quote from their editorial of April:—"Human nature being what it is of course we all want to get something out of club membership, even if it's only meeting people with common interests, but the R/C boys appear to expect more material things. Get us a good flying

Near Right: Five channel Telecont receiver (E.3) with servo and power plugs in top of case, component wiring can just be seen, including one Kaco relay. Far Right: The Dee Bee servo reveals Mighty Midget motor, double gearing and ingenious double coil "TT" centering springs in foreground



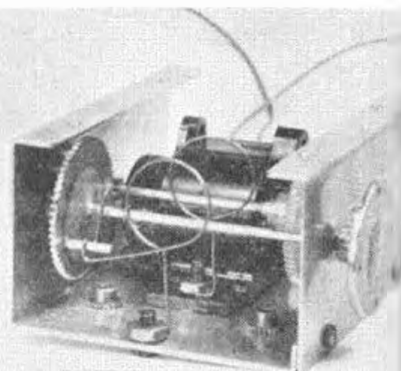
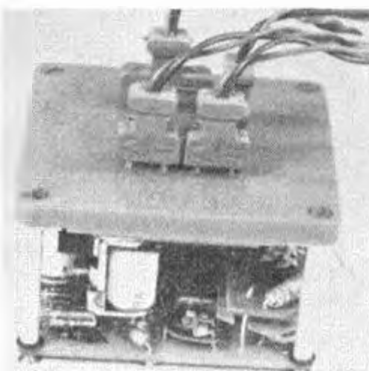
site and put in a strip and then contact us, we just might decide to join. This is the old riddle, which came first, the chicken or the egg? V.G.M.C. feels that it should have a site with a strip for R/C flying and are trying to procure one.

Proportional Servo

Now supplied by Roland Scott is a new U.S. product, the Dee Bee "TT" Proportional servo. This is designed for use with *Two Tone Pulse Width* proportional radio system originated by Dr. Walter Good, and used by Don Brown (Servo designer) to gain a place in the U.S. R/C team for the 1962 World R/C Champs. A drawing of Brown's model appeared in *AEROMODELLER* November 1961. Enclosed in an orange coloured metal box, size 2 1/8 in x 2 1/8 in. x 1 1/8 in., the unit weighs 3 1/2 ozs. is basically a double geared Mighty Midget with bushed shafts and a nylon gear to eliminate interference. It is spring centred, the spring cleverly applied to provide more tension near neutral than at extreme position, thus utilising greatest proportion of power to actuate the control surface. Push-pull travel to control surface via a rotary take-off disc is 1/8 in. either side of neutral, and power available is more than adequate. In addition to its primary function as a T.T.P.W. servo, the Dee Bee servo can be used as a rudder-only proportional unit for single channel work, and will follow fast pulsing rates. For what it is, bearing in mind its simplicity, £6 10s. 0d. seems a great deal to pay, but one must remember that proportional flying holds the interests of only a small percentage of the radio flying public and cannot therefore rely upon the mass sales associated with conventional single and multi-channel actuators. A detailed report will appear in *Radio Control Models & Electronics* August issue.

New from Germany

A new range of German multi gear known as *Telecont* is now available in this country, distributed by the British representative of Robbe (W. Germany). These are tone filter 3,5 and 9 channel sets, which permit the flier to gain multi experience with the simple three



function unit and then progress in stages to 5 and then 9 channels by means of "add on" channel packs.

The basic set has three functions. The E1 receiver is enclosed in non-rigid plastic and has three tone filters tuned between 4 and 7 Kc/s. There are three Kaco relays and it works off 6 volts being all transistor drawing 5 mA. when idling and 25 mA on signal. It will work any three single channel servo or one multi servo and a single channel type that require no more than three circuit wires. This limits it to the mechanical self neutralising type of multi servos. Powersupply and servos are simply wired to the plastic bodied plugs provided and connected into the top of the receiver case. By adding to the circuit, the receiver may be brought up to five channel standard (E.3) working off the same power supply with the same current drain. It has five tone filters between 4 and 12 Kc/s and five Kaco relays. A feature of Telecont sets is that all transmitters and receivers match so that returning is not necessary and the E.3 receiver permits simultaneous operation of two channels from the nine channel transmitter S.2.

The nine channel receiver E.2. is achieved by addition of another four channels with filter frequencies between 2 and 12 Kc/s and again works off 6 volts. It is however triple simultaneous.

Turning to the transmitters, the three channel type is the basic unit, houses in a cast metal case with a leather cover, not unlike a camera. All the fully transistorised circuitry is housed inside on an etched circuit board, power supply being a 12 v. pack of DEAC cells, built in and charged by plugging the appropriate charger into the case. Signal keying is by means of a two position "stick" with micro switch action, very light to the touch and a button micro switch. The stick folds back against the face of the case when the transmitter is put away. The Five channel transmitter S.3. is in the same case and is generally similar in circuit and power supply. It has a four position stick and the button micro for the fifth channel. The most complex is the nine channel transmitter, which is triple simultaneous. This same case is retained and one wonders just how the manufacturers put all the components inside the room for two four position sticks and a button key. Since it is triple simultaneous there are three modulators, each one providing three tones, that is 1, 2, 3.—4, 5, 6.—7, 8, 9 any three signals, (one from each modulator) trans.

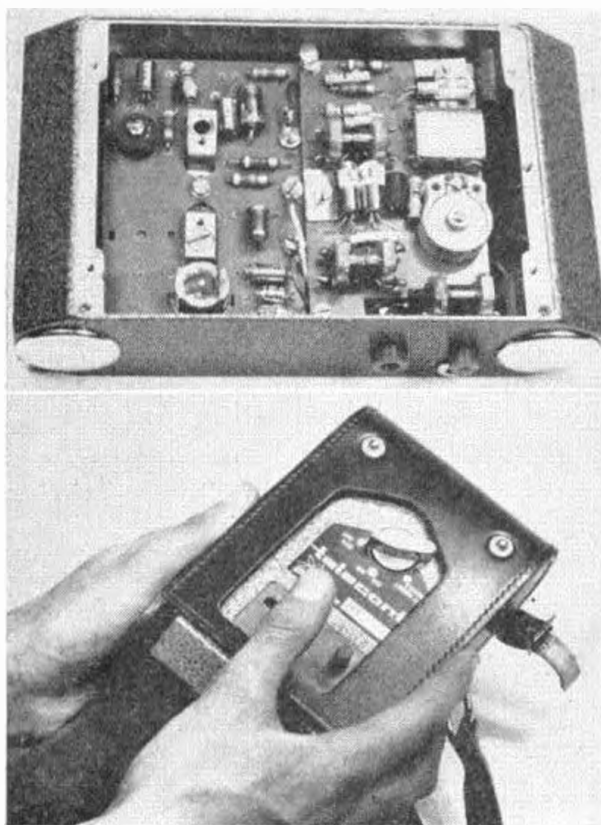
A special charger is provided for the Transmitter and receiver power supplies, working from 220 v. mains.

Escapement Winder

The Elmic "90" *Sidewinder* is a simple winder for rubber escapement motors. The mechanism transmits the winding motion through 90 degrees so that the rubber motor can be wound from a crank arm in the side of the model fuselage. Basically the unit can be likened to a 90 degree angle bracket similar to an elevator horn with gussets in the corner. On one arm is a bush supported winder and on the other a wire motor hook connected by a spring coil like a short length of curtain rod to transmit the torque action from the crank arm to the motor hook. Two mounting holes in the winder arm of the right angle permit the whole to be bolted to the fuselage side (best supported with $\frac{1}{8}$ in. ply), to allow the escapement motor to be wound without unhooking and attaching to a drill brace. It measures just $1\frac{1}{2}$ in. x 1 in. x $\frac{3}{8}$ in. and weighs only $\frac{1}{6}$ oz. Costs only 4s. 11d. The idea is not without precedent, appearing in the first edition of our book "Simple Radio Control" back in 1955. However it is nice to see these little helpful ideas available over the counter to us all and we hope Dennis Elmes has more up his sleeve.



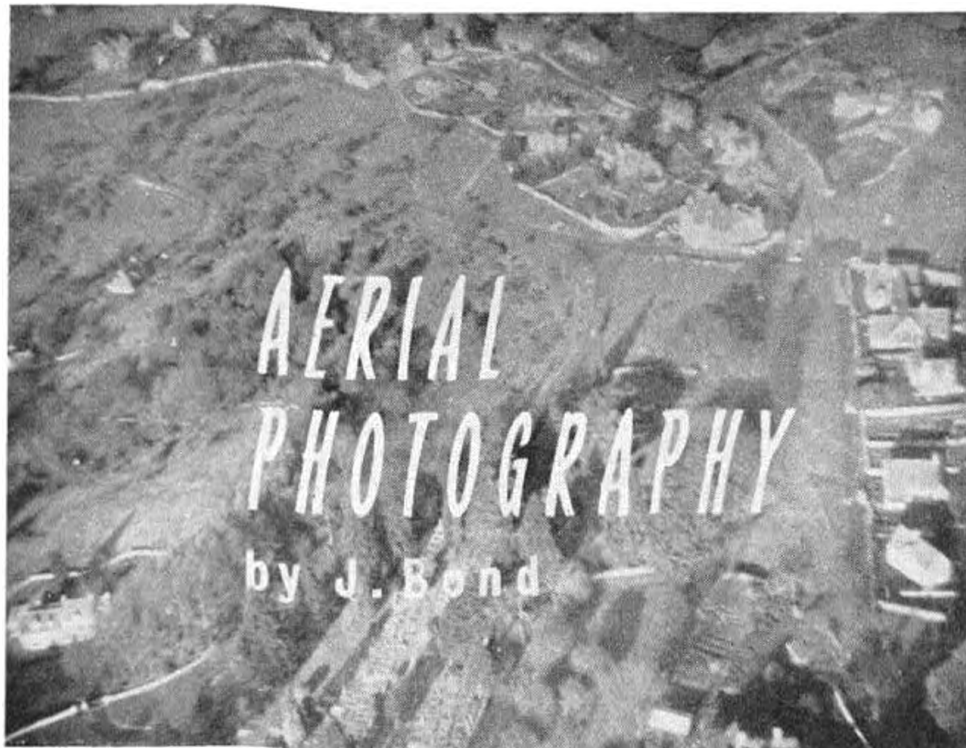
Most impressive model at Central Provinces R/C Rally, N.Z. in March was this A.P.S. Gee-String (one of several) for Octone, Duramite servos and Merco 35 engine by "Fluff" Hartley. Three channel Telecont Tx (S.1) below shows component layout in tough metal case. Bottom shows face of unit with leather jacket and strap. Two position stick is obscured by thumb though button is visible



SPORT FLYER LOOKING FOR A NOVEL ACTIVITY?

John Bond's
successful
experiments
should offer
inspiration

View of Amberley from our estimate of 500 ft. (at right) illustrates the fascinating possibilities of photographing your own locality, using a radio controlled model. John Bond's 8-ft. span enlarged Keilkraft Junior 60 is seen below, resting on its 6-in. diameter M.S. airwheels. R.E.P. Octone receiver is being used on five channels only. 14 x 6 Stant prop provides ample thrust from the 10 c.c. Hastings engine.



"SNAPPED FROM PILOTLESS PLANE—Oakridge Amateur's Success". These headlines in the *Stroud News and Journal* (Gloucester) of January this year registered local reaction to John Bond's achievements with photography from his radio controlled model.

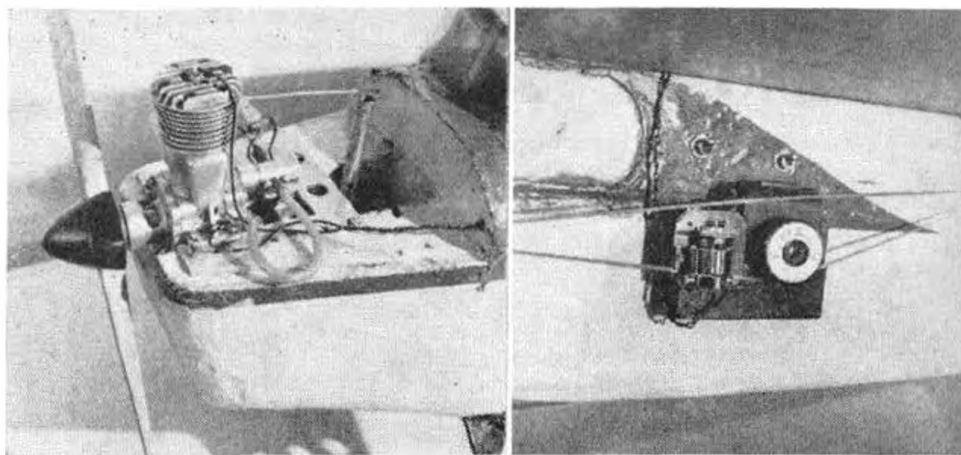
After flying Keilkraft Junior 60's for many years (he sent us a photo of 5 in a line-up), John felt the need for a larger model capable of carrying heavy payload. Thus the camera carrier became a 1½ times Junior 60 in which he installed a 1066 *Conqueror* (Hastings) 10 c.c. racing petrol engine converted to Glowplug. A Woolworth's 7s. 6d. camera was operated by clockwork actuator, altered from an E.D. Timer and set to run for 50 seconds before triggering the shutter. Mr. Bond then positioned the model so that at the end of the 50 seconds period after launching, it was over the object to be photo-

graphed. This proved to be far more difficult than expected and resulted in a large number of tree-top and horizon views. The amount of wasted film made it evident that this was not worthwhile.

Next step was to radio control the camera, employing a Mighty Midget to trigger the shutter and thus one could position the model at leisure and take accurate photographs. Snag was that one had to return to land in order to re-set the shutter. Latest development is an automatic wind-on everytime the shutter is operated, which works well on the ground but has yet to be proved in the air.

A 1½ times A.P.S. *Waveguide* with two engines is in an advanced state of construction to carry a cine camera in the nose, which should produce the most interesting film of all. We must congratulate Mr. Bond on his efforts, one of which is seen above. Several other modellers are also undertaking aerial photography and details of other experiments will appear in our companion magazine "*Radio Control Models & Electronics*."

At right, details of the 1066 products engine, originally produced for racing purposes. Extreme right shows the fuselage mounted Woolworth's camera with exposed Mighty Midget servo motor to its left for triggering the shutter under radio control.





How to run a (160 member) Club

described by
**H. S. Fletcher
and J. Marsh**

THE ORGANISATION of a model aero club must be considered on the same basis as a business. Many clubs rise, only to disappear due to lack of purpose and method. The aeromodeller who wishes to become a member is a customer and you cannot afford to turn customers away! Hence you must be prepared to accept all types of modellers if you are to operate as a successful club. It must be recognised that for every member who is prepared to give a hand with the club organisation, at least six members will join merely for what they can get out of it—but these are the people who, while they are attracted only by what you have to offer, will help you, by their subscriptions, to increase the scope of the club. The scope of a club is controlled by its size and much more can be done by a coherent group of 30 or 40 members than three or four splinter groups of a dozen or so.

Now what should your club offer to attract modellers into its ranks? First and foremost, you must provide a flying site. Much has been said and written recently on this subject, but the present purpose of this article is not to tell you how to do this. Suffice it to say, that a lone hand usually has little difficulty in finding somewhere to fly, but to obtain written permission from an owner or lessee for a site for the use of a group is very much more difficult. In addition to the flying ground, members will expect some or all of the following (not in order of priority):—

1. Clubroom.
2. Competitive events with prizes and trophies.
3. Social events.
4. Circular news sheet.
5. Equipment—use of stop-watches, etc.
6. Insurance cover.
7. Copies of club rules and information on how the club functions.
8. Extras such as transfers, badges, ties, etc.

Let us now consider how an organisation providing these things can be built up.

The broad principles of the objects and operation must be incorporated in a set of rules or constitution. Primary ground to be covered will be a statement which gives the following listed items:—

1. The objects of the club—should be worded to include all of the above services in general terms.
2. Categories of members and subscriptions payable.
3. A list of officers and method of election.
4. Provision for and approximate date of the A.G.M.
5. Provision for election of Committee members and regular Committee Meetings.
6. A fixed date for the start of the financial year.

These points are now considered in detail so that an idea can be obtained of the way the club will operate.

Objects

Initially it may be thought sufficient to state the objects as "the promotion and encouragement of building and flying model aircraft," but it will later be necessary to include other named objects which are conducive to the attainment of further ends. These can include the promotion or joint promotion of meetings, contests and exhibitions, the acquisition of property, or the raising investing or borrowing of money. It must be emphasised that the objects of the club should not exclude any particular type of model or restrict the members in any way unless dictated by restrictions of size or location of flying sites. The average town or city just does not produce sufficient prospective members to allow a group to restrict itself and at the same time to prosper.

Member categories, Subscriptions and Finance

The greater part of the club will be a subscription paying body and it is convenient to accept the S.M.A.E. division of juniors and seniors divided at the age of sixteen. The President and Vice-President are normally honorary members, but may of course, be voluntary donors. The club should also make provision for appointment of honorary members, membership being given as a token of appreciation for services rendered, or about to be rendered.

The matter of subscription rates is perhaps the most difficult of all to settle, the amount of money required to run the club depending purely on the scope of operations intended and the way the membership increases. First it is obvious that the junior members will require a lower rate than the seniors and it may be necessary to fix senior subscriptions at a level which adequately subsidises the juniors. Second, a most important factor affecting the subscription rate is the policy of the club with regard to the S.M.A.E. and its Insurance cover. Full Insurance cover is available by becoming a full member at £1 0s. 0d. per annum (juniors 7s. 6d.) and part cover, now restricted to sport flying only by becoming an associate member at 5s. per annum. As an alternative, group Insurance cover can be obtained through an Insurance Broker, who may be able to quote a more favourable rate than the S.M.A.E., which will also enable members to enter open contests if they wish.

S.M.A.E. Membership should therefore, be considered only as an extra for those who wish to enter national competitions. Your club can prosper entirely without contact with the S.M.A.E., but if you insist that all members pay full Society membership, your numbers will decrease until only a small contest group remains. This statement will no doubt bring forth howls of rage from ardent S.M.A.E. contest supporters, but make no mistake about this, the average person who wants to join a model aero club is not, repeat not, interested in contests and just does not want anything to do with them. He is moreover not prepared to pay to support them.

Continued overleaf





Social events are climaxed by the annual prize-giving. Here, John Randall collects his Senior Championship Trophy from Mr. and Mrs. G. Dunmore at the 1961 Leicester function.

How to run a model aero club (continued)

Experience has shown that a senior subscription of between 15s. and £1 0s. 0d. per annum is acceptable to most modellers and will produce an income large enough to provide a satisfactory range of services and still allow a slow but steady increase in the bank balance. Junior subscriptions should be about half of the senior rates and it may be a good idea to have some form of easy payments scheme. Whatever you do however, avoid saddling your poor treasurer with the job of collecting 3d. per week from everybody. You will have enough to do without this. In any case, with this method you never know who is or is not a member at any given moment.

It is recommended that all subscriptions should become due on one date, preferably somewhere near the start of the summer competition season, a period of about a month being allowed as grace for renewal of subscriptions. To encourage members to be prompt with their subscriptions it is a good plan to allow renewal at a reduced rate during this month of grace, after which renewal is only allowed at the standard rate.

Changes in subscription rates may be required from time to time and obviously must be agreed by a general meeting. The rules of the club should be arranged so that it is not possible for a member to rise at such a meeting and propose a change without the prior agreement and sanction of the committee. At least once a year the Treasurer should try to assess the total of known major items of expenditure for the next twelve months and check that the anticipated income will be sufficient to meet the requirements. Any rising or falling of membership should be taken into account in this calculation, which although necessarily rough, may be sufficient, especially if a loss was shown on the balance sheet (more of which later) for the previous year, to alert the Committee to the need for a rise in subscriptions.

Club Officers

The day to day management of the club is carried out by the executive officers, who will normally comprise:—

1. Chairman.
2. General Secretary.
3. Treasurer.
4. Competition Secretary.

These four are the bare minimum and any reduction here may be detrimental to the wellbeing of the club. A particular warning is given regarding the temptation to make one person Secretary/Treasurer. Far too much control becomes vested in the person concerned, and if the individual's interest should wane, the dissolution of the club could follow.

It may be thought desirable to appoint a Vice-chairman and if you have over 30 members, or if you issue a regular news sheet, a Publicity Secretary should be appointed to deal with the extra work involved.

It has been assumed from the start that all officers will work on an honorary *i.e.*, unpaid basis and quite usually

will be expected to pay normal subscriptions as any other member, but since the amount of work increases with the larger clubs, it is only fair to award honorary membership to the Secretary and Treasurer, who normally do the bulk of the work.

In addition to the executive officers, the non-executive officers must be chosen *i.e.* the President and Vice-Presidents, usually being people of some local standing who take an interest in the club either financially or by providing amenities and facilities which would otherwise not have been available.

All club officers should retire each year at the A.G.M. being of course eligible for re-election. The officers are elected or re-elected by ballot at the meeting after being nominated as follows:—

1. A form should be sent or given to every member about six weeks before the meeting, asking for nominations which should be returned to the Secretary within fourteen days.
2. The complete list of nominees should be circulated to all members at the same time as the formal notice of the A.G.M. not less than fourteen days before the date fixed for the meeting.

Members who make nominations must make sure that their nominees are willing to stand and in their own interests be equally sure that the nominee is personally capable of doing the job and sufficiently interested to make the effort. Club members are also warned that keen competition fliers may accept nomination with the very best intentions but may neglect their duties when a spell of good flying weather arrives. It is generally not easy to find people who will act as Secretary or Treasurer but if there is any chance of a choice, the person to elect is one who has an interest in the hobby but is prepared to undertake the duties for their own sake.

Although officers are elected on an annual basis the club will benefit from the added stability and continuity brought about by persuading them to continue in their office for several years.

The Annual General Meeting

The A.G.M. is the most important business meeting of the club and should be attended by every member worth his salt. Fourteen days notice of the meeting should be given to every member together with an Agenda and list of nominees for officers and committee men. It should also be possible to send out a copy of the balance sheet at the same time. The Agenda will normally be as follows:—

1. Minutes of previous A.G.M.
2. Reports of Officers including presentation of the accounts and balance sheet.
3. Election of Officers.
4. Any other business.

After the reading and acceptance of the minutes the executive officers make brief reports on the year's working and a general summary of the financial position is given by the Treasurer. Copies of the balance sheet and accounts, a typical specimen being included with this article, should be available for any member who wishes to refer to one. After answering any matters arising and the subsequent acceptance of the reports the new officers are elected by ballot.

The only items of any other business which should be discussed are those which have been submitted to the Secretary in writing and duly circulated with the notice of the meeting. Only major items of policy should be dealt with in this way and it is not fair to members who do not attend if items are discussed which have not been notified, hence any member who wishes to introduce further items should be firmly ruled out of order.

Committee Members and Meetings

The executive Committee of the Club comprises the executive officers plus a number of Committee members.

For the type of club we are considering three, four or five Committee men will be required in order to bring the full Committee up to about nine. It is convenient to have an odd number here to avoid the necessity for the Chairman to use the extra vote which is normally allowed in the event of equal votes being cast for a motion.

The Committee men are nominated and elected in the same way and serve for the same duration as the officers.

Committee meetings should be held regularly, once monthly usually being sufficient, an extra meeting being called if any urgent business arises. The importance of regularity of Committee meetings cannot be stressed too strongly as the whole well-being of the club depends on its business being dealt with and discussed in a regular and orderly fashion.

The Financial Year

About two months before the A.G.M. the accounts for the year should be closed and a complete check of



A good club flies together—stays together. This typical summer session on the field with Tony Summerfield about to launch his scale "Seagull" emphasises the club spirit.

all stock, equipment, and assets taken. From this the balance sheet is drawn up and presented to the Auditors for checking. As an example, the Leicester M.A.C. Annual Accounts are shown here.

Annual Accounts 1st October, 1960—30th September 1961

Stock account

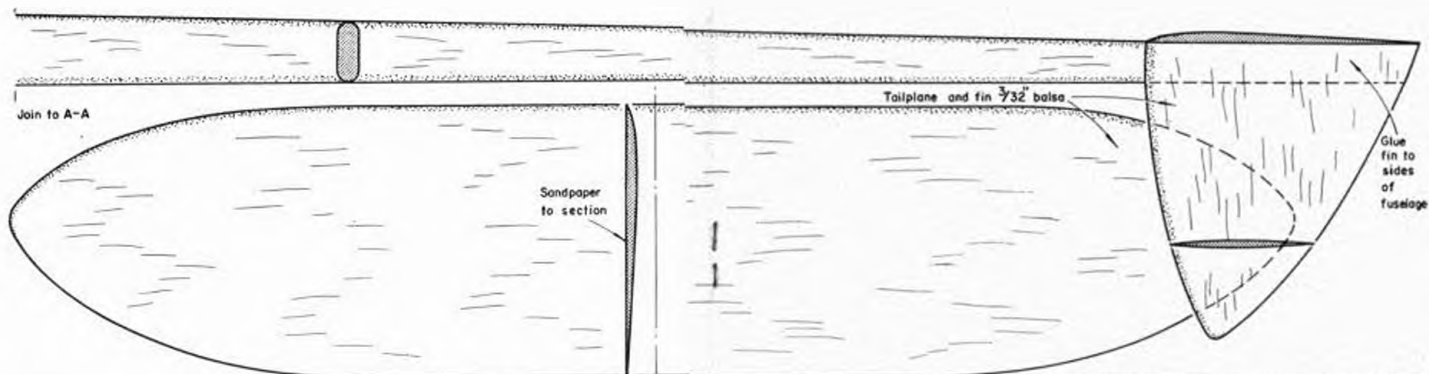
PURCHASES		1960—61	1959—60	SALES		1960—61	1959—60
		£ s. d.	£ s. d.			£ s. d.	£ s. d.
Value of Stock—October 1st, 1960		7 7 6	16 4 4	Sale of Transfers (new type) ...		1 12 3	
Purchase of Badges ...		27 18 0		.. (old type) ...		1 11 8	1 13 4
.. Transfers ...		6 3 5		.. Badges ...		15 3 0	5 10 0
.. Address Labels ...		1 0 0	1 0 0	.. Address Labels ...		16 2	10 6
S.M.A.E. Transfers ...			3 0	.. Club Ties ...		1 5 0	2 5 0
Profit on Stock ...		6 1 0	1 0	S.M.A.E. Badge ...			2 0
				Value of Stock as on Sept. 30th, 1961:			
				Club Badges ...	12 15 0		
				.. Transfers (old) ...	1 4		2 0 2
				.. Transfers (new) ...	9 19 0		
				Reg. Nos. ...	6 11		6 11
				S.M.A.E. Badges ...	8 0		8 0
				Address Labels ...	1 18 7		14 5
				S.M.A.E. Transfers ...	3 0		3 0
				Club Ties ...	2 10 0		3 15 0
						28 1 10	
		£48 9 11	£17 8 4			£48 9 11	£17 8 4

Revenue account

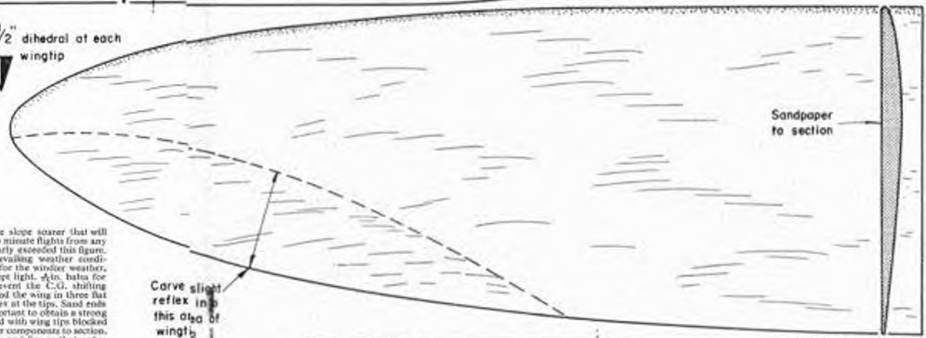
EXPENDITURE		1960—61	1959—60	INCOME		1960—61	1959—60
		£ s. d.	£ s. d.			£ s. d.	£ s. d.
Printing and Stationery ...		9 2 4	12 1 9	Subscriptions:			
Postage ...		17 6 0	13 19 8	Senior (85) ...	75 4 0		52 7 6
Insurance and Legal Fees ...		20 15 0	8 9 0	Junior (74) ...	41 7 0		31 0 0
Competition Prizes ...		9 11 4	8 17 0			116 11 0	83 7 6
Bank Charges ...		7 6	14 0	Donations ...		2 3 6	2 13 0
Room Hire ...		1 12 0	2 15 0	Interest—L.T.S.B. ...		1 11 0	1 10 0
Badges, etc. for New Members ...		12 1 5	6 1 0	Sundry Receipts ...		12 11	10 7
Engraving Cups ...		1 5 6	17 0	Profit on Stock ...		6 1 0	1 0
Repair ...		8 6		.. Film Show ...			19 2
Depreciation of Equipment ...		9 1 0	9 10 0	.. C/L Demonstrations ...			4 18 3
Loss on Annual Dinner ...		1 16 9	10 0 4				
Loss on Social ...		8 6	7 9				
Loss on Car Rally ...			2 0				
Loss on Stapleford Rally ...			3 6 10				
Sundry Expenses ...		5 4 7	10 0				
Excess Income over Expenditure ...		37 16 7	16 8 2				
		£126 19 5	£93 19 6			£126 19 5	£93 19 6

Balance sheet

LIABILITIES		1960—61	1959—60	ASSETS		1960—61	1959—60
		£ s. d.	£ s. d.			£ s. d.	£ s. d.
Balance from 1959-60 Brought forward		219 18 6	203 10 4	Equipment:			
				Balance ...	85 10 0		83 9 10
				Plus Addition ...	5 1 0		12 10 2
				Less Sale ...			1 0 0
				Less Depreciation ...	9 1 0		9 10 0
						81 10 0	85 10 0
				Stock—as at Sept. 30th, 1961	28 1 10		7 7 6
				Investment A/C—L.T.S.B. ...	63 16 1		62 5 1
				Current A/C—Westminster Bank	81 1 2		62 16 4
				Cash in Hand ...	3 6 0		1 9 7
Plus Excess Income over Expenditure		37 16 7	16 8 2				
		£257 15 1	£219 18 6			£257 15 1	£219 18 6



$3\frac{1}{2}^{\circ}$ dihedral at each wingtip

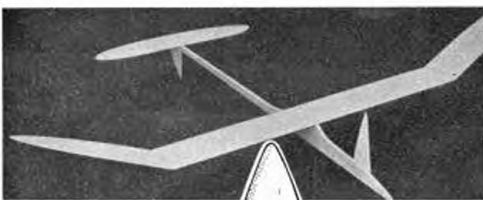


Full wing plan showing flat centre panel of $\frac{3}{16}^{\circ} \times 3^{\circ} \times 19^{\circ}$ between tips

Balance Point

Shape to section

Fuselage shaped from $\frac{3}{16}^{\circ}$ Obeco or hard Balsa



SLOPE RHINO a 36" span glider for hand launch flight by I. Anderson

Add Plasticine to
nose for balance

HERE'S AN easy-to-build "solid" style slope soarer that will surprise you with its ability to reel off two minute flights from any reasonable slope. Prototypes have regularly exceeded this figure. Wood hardness depends on your prevailing weather conditions at the flying site, use harder wood for the winter weather. The tailplane wood should always be kept light - also, balsa for the wings must be even grained to prevent the C.G. shifting towards one wing tip. First carve and sand the wing in three flat pieces to section shown, with a slight reflex at the tips. Sand ends to the right angle, pre-cut sand other components to section. Add tailplane, to fuselage, then the wing and fin in that order. Reinforce leading edge of wing with thread. Fill grain with three or four coats of sanding sealer, sanding well with fine grade wet and dry paper between each, then give a final coat of dope or balsa oil. Balance nose with modelling clay to bring C.G. to 60 per cent, chord approx. Fin is set straight initially; directional trim can be altered later by warping the fin. When launched from the hill the model should keep pointing directly into the wind, go out into the lift and stay there, gaining height with each gust. If the model gets blown backwards and is obviously too light for the wind, add ballast under the C.G. until penetration is right. You'll find the Rhino is quite a pleasant beast.

AEROMODELLING IN OTHER COUNTRIES....

ARGENTINA

Interesting
information
on how they
organise the
hobby in
S. America

AEROMODELLERS ARE A rather small community in Argentina, although long established over the past 30 years.

At present there are 35 clubs affiliated to the *Federacion Argentina de Aeromodelismo*, which quite recently has been directly affiliated to the F.A.I.

The Government supports aeromodelling in two ways:

Directly, with small but helpful cash grants to those clubs which maintain modelling courses, on a "new-modeller-made-per-year" basis. Also by giving the funds to run annual National Championships, including the transportation tickets of the modellers from all over the country to the site of the competition.

Indirectly, by exempting of importing taxes all aeromodelling materials; these taxes are as high as 300 per cent. original value. The tax relief allows importers and retailers to sell at fair prices, retaining good profits, which is the only way to keep them interested despite the small market.

The F.A.A. Board is formed exclusively by honorary members elected by the affiliated clubs in a General Meeting held annually on the last day of each National Championships. The Board has no connection with the Government offices; this means that it can act free of restriction, since the State has no more control over it than it has over any other sporting institution.

Through the initiative of the F.A.A. the *Confederacion Sudamericana de Aeromodelismo* was formed with representatives from Brazil, Chile, Uruguay and Venezuela. These Nations take part in the South American Championships held under F.A.I. rules, with awards for individual and national team classification on each category. The 1962 Championships will be held at Sao Paulo, Brazil, during July.

Most popular category in Argentina is Nordic A/2, with the best men following closely the styles of the world's leading experts. In Wakefield they have always had very good standards (Scotto of Argentina tied for first place in the 1953 World Championships). Any Argentine Wakefield team could give a good show in any World Championship. Free Flight Power standards are not so good; maybe this year things will improve

with use of modern engines and designs. Team Racing is growing steadily in performance; 5:30 is consistently returned by some teams. Stunt is in the doldrums; the best pilots are much too busy flying real gliders, and the new ones are yet too green. Speed is fairly good; they have the fastest times in South America; with the old rules they reached 194 k.p.h., and now they are around 155 k.p.h.

Radio Control activity started some twelve years ago with a team formed by Jose M. Garcia and E. Arance. From then on, there were never more than ten or twelve radio controllers, but flying was always improving. The exhibition visit made by Bob Palmer and Dale Nutter (see May 1961 *AEROMODELLER*) inspired fresh enthusiasm. Nutter test-flew the first multi job made in Argentina (Dr. Federico Deis, Astro Hog 8 ch.) in January '61. At present there are fifteen multi models ranging from a 6 channel *White Cloud* to a ten channel fully equipped *Stormer*.

1962 National Championships were held at Buenos Aires from 14th to 22nd of April. 263 competitors flew with 363 entries in the many free flight, control-line and radio classes.

Simultaneously with the Nats, special flights are made in Speed, Team Racing, Stunt, Nordic A/2, Free Flight Power, Wakefield and R/C Single (all F.A.I.). Performance in the Nats and the special contest are added and the three best men on each category will form the National Team to represent Argentina in the next South American Championships.

At right, Waldemar Coffey. He is the most serious and studious Nordic A/2 enthusiast in Buenos Aires area (and maybe all Argentina)

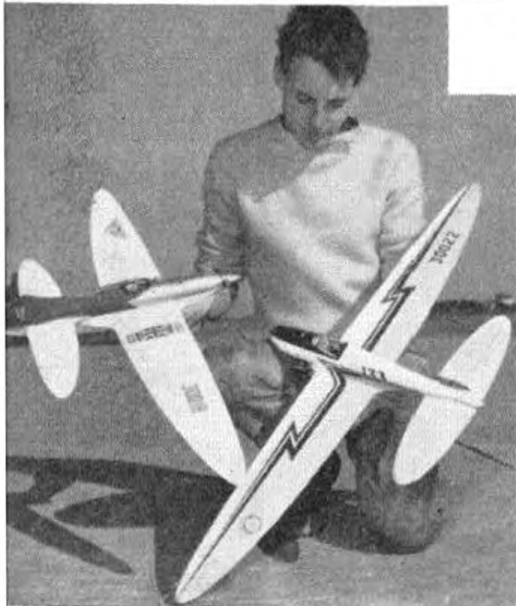
Gilberto Riega (F.A.A.'s President) speaking at the closing of the last South American Championships. Background trophies are perpetual; the souvenir plates with S. America silhouette engraved are awards for the winning team members; in foreground are individual awards

Below right, building in background is a four-wheel trailer, built and owned by the F.A.A. It has accommodation for the contest directors, desks, scales, P.A. system provides shade and shelter, refreshments, etc., for the people who work for the fun of others, including F.A.I. power flier in foreground





Team Trials

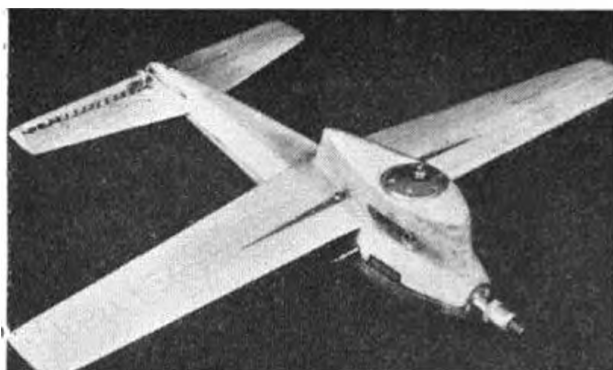


TEAM SELECTION TRIALS held at R.A.F. Barkston Heath, near Grantham, on April 29th and May 27th provided an insight into several new trends in radio control line aeromodelling.

Some of the outstanding models which caught our eye were those pictured above. At top left is Frank Van den Berg's renowned *Sweeper*, a fast Merco 49 powered bat-like aeroplane in its latest form with end plates and surface spoilers near the leading edges of the outer wing. Opposite is the far more conventional *Gee-String*, which did not place but was nevertheless admired as being one of the best finished of the radio control models present at the trials. Built by Ken Marsh of West Essex Aeromodellers, with a Super Tigre 51, Orbit 10 and Duramites. Ken has modified the fuselage slightly to accommodate more bulky gear and to gain tank accessibility. It also has a detachable tail unit. Seen with the pair of Eta 15 powered *Tigress* team racers is Les Davy of the Wharfedale team who has qualified with very fast times, rarely exceeding 4:50 with either model. Partnered by Ken Long, Les has alternated as pilot and mechanic, but under F.A.I. rules this pair of well known modellers must now consolidate as one firm

team, making only one entry. In the centre is Frank Warburton with his very latest, a semi-scale of the Japanese *Hien* (Tony) fighter. It is one of the most attractive stunts we have ever seen and although Frank claimed it to be a fair weather model, it certainly handled the Barkston breeze. Like the other leaders in the C/L stunt trials, Frank was using a Merco 35. To the right is Dick Edmonds, fastest in the trials with *Long Dog*, having no less than 47 in. span. This is Dick's new approach to team racing now that aspect ratio regulations have been relaxed and it certainly produces the results. The model is Oliver Tiger powered and pilot is Mike Smith, both aeromodellers from High Wycombe.

Bottom left is Jack Morton's (Winchester) all white *Mustang* made from the Sterling kit, for Orbit 10 gear and Super Tigre 51 engine. Model put up a pleasantly surprising performance against the specialized designs and will certainly be the forerunner of many similar aeroplanes. Lastly, Peter Drewell's red and natural finished F.A.I. speed model, with the Fred Carter special C.C.S. engine, resting in its dolly after a 120.4 m.p.h. flight. It uses a short metal pan, two line controls, and rather unusually broad propeller blades.



Modelling with Glass Fibre PART TWO

By Kevin Lindsey

.....
Last month, moulding methods were discussed, now we cover various Glass Fibre applications in this concluding feature

NOTE...
Silicone furniture wax polishes used as a release agent are liable to react with polyester (resin), leaving a sticky surface. Simonize pure wax car polish (yellow and red tin) is advised, preferably topped with a coat of P.V.A. release agent.

The use of G.F. mouldings in T/R and R/C fuselages is well-known; but why not use G.F. for combat and stunt fuselage? Applications which also suggest themselves are engine cowlings, model pilots, power props, F/F power pylon reinforcing, glider nose reinforcing, model skids, fuel tanks, wing leading-edge reinforcing and even complete wings.

As some combat clubs practically mass-produce models during hectic (and smashing) contest seasons, it would be very advantageous to the club as a whole if one produced some moulds for production combat fuselages. Using 5 per cent. catalyst in the resin to set the mouldings quickly, up to three fuselages could be produced per evening. Hardwood bearers could be incorporated during moulding.

The fuel-proof properties of the resin (100 per cent. fuel-proof even to pure nitro methane) can be utilised by finishing the whole model with it instead of the usual process of grain-filling, undercoats, top coats and fuel-proofing. The models in the photos are examples of resin-finishing. The resin is grain-filling; two coats are brushed on, rubbing down between coats and finishing with fine wet or dry then metal polish. This results in a high-gloss, hard, tough resin skin, about two thou. thick



Fig.1

if the resin was brushed on about as thickly as colour dope usually is.

If you colour your models, pigments are available for resin-colouring. Up to 4 per cent. pigment is mixed with resin and catalyst before application to model or moulding. Colour density though is not as good as with colour dope, so resin skins below two thou. thick will be translucent or patchy. If you think resin-finishing results in heavy models, note the weights of the models illustrated.

Do *not* try to apply a resin skin to a colour-doped model; it doesn't work!

In C/L speed model construction, flexibility of G.F.

At left, the author's Dooling 29 class 2 speed model, weight 12½ oz., using a sandwich speedpan and upper fuselage shell, another example of perfect resin impregnation of cloth on fuselage. Wings and tailplane are finished with 2 coats of Bondaglass resin. Below is a fibre glass F.A.I. Team Racer, 17½ oz. all-up weight with a "Works" Rivers Silver Streak 2.5 c.c. diesel

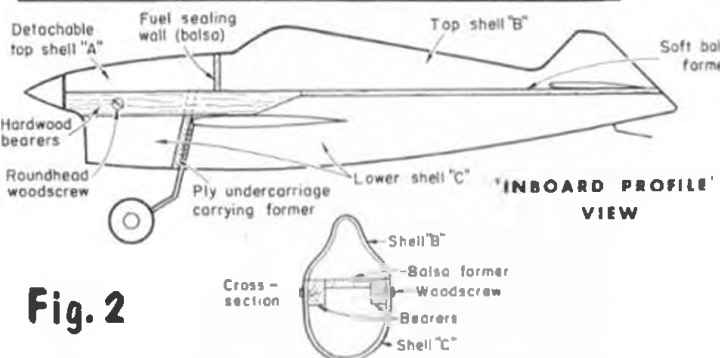


Fig.2

presents a serious problem. Speedpans moulded in the normal way were just not stiff enough unless prohibitively thick and heavy. Alternatively, if pans were made thin, resulting vibration means loss of power and speed.

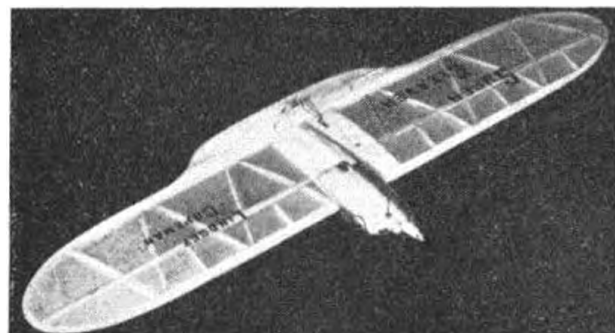
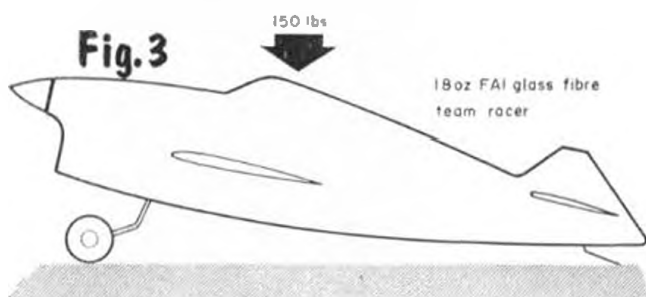
The solution lies in the well-known I-spar principle. Look at Fig. 1, then read on. Ignoring the strength of the light spacing material, the resistance of bending of the sandwich is proportional to D^3 , that is proportional to the square of the thickness of the sandwich (almost). So if we make a sandwich speedpan by first carving a pan out of very soft balsa (6 lbs./cu. ft.) then add G.F. to the inside and outside, the resulting sandwich pan is very much stiffer than its equivalent weight-for-weight normal all G.F. pan. The G.F. and balsa thicknesses listed in Table 1 give pans up to 10 times as stiff as normal G.F. pans. Also included in the table are final pan weights and approximate costs.

Some speed enthusiasts disagree with use of G.F. for pans. They say that only metal pans can dissipate engine heat fast enough. If this is so, motors in wood and/or G.F. pans

should overheat and slow down in the air. The stopwatch indicates that this very rarely happens, and anyway, why do many speedmen deliberately "cook" engines on the ground before each flight?

Going onto T/R model construction. *Fig. 2* gives the general layout of fuselages. The upper and lower shells are joined with Araldite and a horizontal cross-grained sheet balsa former, the front of which is glued to the engine bearers. No vertical formers are necessary except for undercarriage and fuel-sealing. *Table II* gives shell thicknesses, approximate finished weights and costs for the three T/R classes.

Araldite is the only suitable adhesive for sticking G.F. apart from resin and reinforcing cloth strip. As well as sticking bearers to the G.F. fuselage shell, it is advisable to add roundhead woodscrews (No. 2 or No. 3). One Team Racer shook its bearers loose (faulty gluing) but this does not happen now woodscrews are used as well as Araldite (*Fig. 4*).



Do not try to mount an engine on G.F. bearers. Vibration and heat from the engine cause local softening, resulting in the motor vibrating loose. The strength of a G.F. resin-finished team-racer is illustrated in *Fig. 3*, the author stood on an F.A.I. team racer (150 lbs. passenger load!) without the model suffering any damage whatsoever.

General

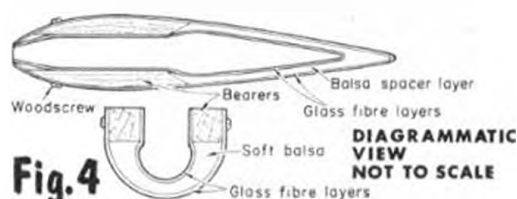
Unset G.F. sticks very well to balsa, fairly well to hardwood and very badly to metal.

G.F. can be filed, ground, drilled and turned, but it does not tap satisfactorily, that is, the tapped hole has little physical strength. An aeromodeller should never need to use a grinder on a G.F. moulding, the moulding shouldn't be that rough.

Sandpaper is not very useful on G.F. due to the hardness which is somewhere between that of ply and aluminium.

If *Table I* is used as a guide though, the finished model should be as light or a little lighter than its all-wood counterpart.

GENERAL SANDWICH SPEED PAN LAYOUT



The author considers that glass fibre and the Polyurethane foam plastics now under development, will be the modelling materials for the future and he longs for the day when complete models are produced and marketed in these materials. In the U.S.A. these ideas are proving commercially practicable and profitable.

One can make a start in G.F. work for about 12s. There is a 5-oz. Resin size at 5s. 6d. retail. 10-oz. Bonda-glass Resin and Catalyst will cost 8s. 6d., three square feet of 9-thou. cloth costs 3s. 6d. These materials work out cheaper if bought in larger quantities—why not give the material a chance to help you?

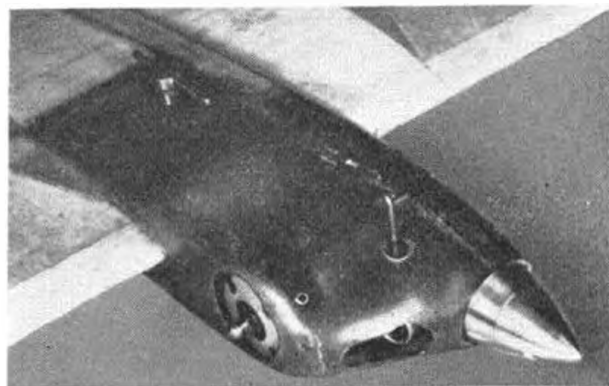
TABLE I

Type of Moulding	No. of layers of 9 thou' cloth	Final Moulding Thickness (thous. of an inch)	Approx. Finished Weight (ounces)	Approx. cost
SPEED PANS				
F.A.I.	2 outside			
	1/4" soft balsa + 1 inside	160	1.6—2.0	3/6
CLASS I ¹ (5 c.c.)	3 outside			
	1/4" soft balsa + 1 inside	240	2.2—2.6	6/-
CLASS III (10 c.c.)	4 outside			
	1/4" soft balsa + 2 inside	320	3.7—4.4	9/-

TABLE II

T/R FUSELAGE SHELLS				
I A	Shell A	1	12	0.2—0.3
	Shell B	1	12	0.4—0.7
	Shell C	1	12	1.0—1.2
F.A.I.	Shell A	2	24	0.3—0.5
	Shell B	1	12	0.6—1.0
	Shell C	2	24	2.0—2.5
B	Shell A	2	24	0.4—0.6
	Shell B	1	12	0.8—1.3
	Shell C	3	36	3.0—3.5

Close-up of the fibre glass moulded cowl on the MK2 Super Cleaver. As seen in picture above, left. Male mould. 2 layers .010 in. glass cloth total time to make balsa mould plus one F.G. moulding:—4 1/2 hours. A perfect moulding should be almost transparent





World News



EGYPTIAN NATIONALS were held at Embaba Airport, near Cairo, last November and news has just filtered through. 42 competitors took part and, as may be expected, strong thermals effected the results. F. Monir had a D/T failure on his second A/2 flight, which was 15 minutes o.o.s. He was the eventual winner, followed by Farouk Fouad who had to fly in following rainy conditions. A girl entrant, Fatin Tawfik placed second in Jetex to Mohsen (aviation is quite an occupation with the fair sex in Egypt). In free flight power and rubber, there were many flights out of the field area and power overruns. M. El Shazly won both the events with A. Bassouni second in each case. Then the wind blew up to affect stunt and we are told that there was a lot of argument among the judges! Bassouni from Cairo and M. El Shazly from Alexandria tied in the championship points and thus share the trophy for the next year.

First announcement is made by the model group at Marcinelle and Charleroi, **Belgium**, for a grand rally of modelling to take place in June 1963 at Charleroi, covering all events and to be International. Similar invitation for free flight radio and control line has reached us far too late from Cambrai, **France**, to take place June 30th to July 1st 1962. Anyone passing that way could call on us for further information. No doubt if we had received earlier notice, a number of holiday making aeromodellers would have liked to take part.

New Zealand modellers are very much after the same enthusiasms as we enjoy in Britain and this, of course, includes team racing. Being so far away they have the

disadvantage of not always being up to the mark with latest developments and are naturally proud of John Crombie's new class B team race record. Piloted by Tony Bretherton, the model made the record time of 7:37.4 at Trentham on February 11th. It should be explained that N.Z. class B is run over 160 laps on 60 ft. lines, making a 11.4 mile course. When re-adjusted to the course used by most other countries, the time works out at 6:41—which is going some! Model flies for 37 laps at 117 m.p.h.

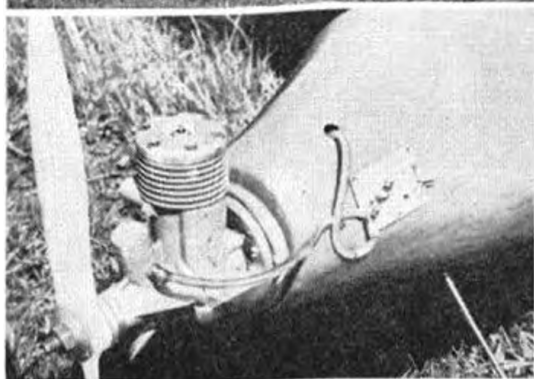
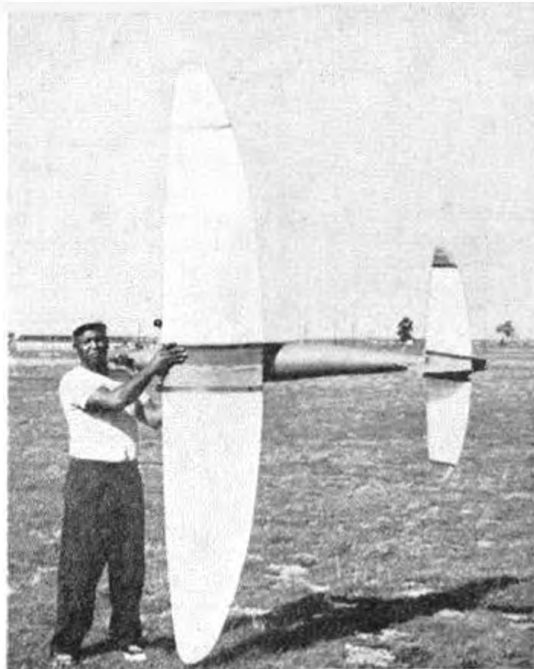
First news is contained in the Upper Hutt aero-modellers news bulletin of the new Les Wright lightweight radio control gear. It seems like it weighs 4 ozs. complete in the model and has already been thoroughly air tested. Bearing in mind the very advanced design and absolute reliability of Les Wright's earlier relayless gear, the new lightweight set should be popular.

International Postal Contests are at long last becoming more popular. Next one in early July will be between Belfast M.F.C. (Northern Ireland), "Modellflugjugend" Munchen (West Germany) and Auckland M.A.C. (New Zealand).

Kokkola, 270 miles NNW of Helsinki, was the site for the second championships in Finland for free flight. A 38 m.p.h. wind spoiled the event but 70 contestants flew and standard was high. Leader was Pentti Aalto with 842 seconds in Wakefield, but R. Hyvarinen still holds the leading gross time. Sandy Pimcnoff was power leader with 781 and Tahkapaa in A/2 with 810. Seems like you cannot keep a good champion down!



All 7 team racers in heading picture, all to the same **Bold Knight** design, belong to members of the Strathmoor model club of Detroit, U.S.A. This F.A.I. design by Nick Risl uses metal pan on glass fibre lower fuselage. Standing left to right M. Pemberthy, N. Risl, D. Elsey and kneeling left to right R. Sweet, H. Saincome, D. Kade, A. Jerome. Nick Risl is soon returning to England. Next is a fine example of Wakefield workmanship in Ernest Colombo's Viking F.A.I. rubber design from ARGENTINA. See also article on page 340 on activities in this country. At left, are scenes at the Egyptian National Championships. Mohsen who was winner at Jetex event, starts up his German stunt design with anxious audience surrounding the engine. At right is J. Rageb with his Keilkraft Skystreak and 5 c.c. K & B 29 glowplug engine



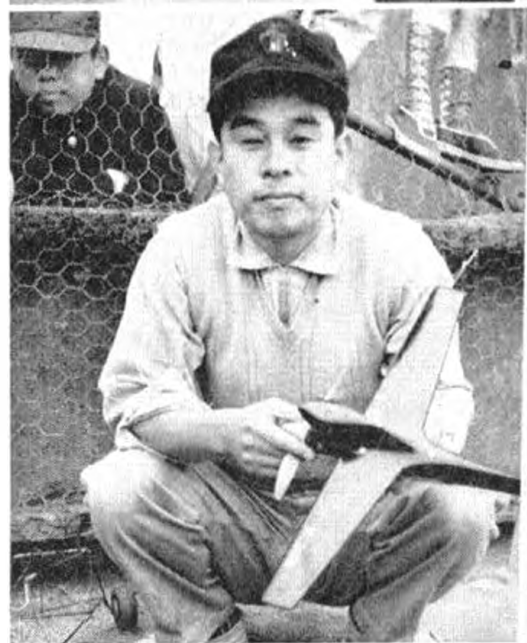
What is Stuntathon? This is the latest creation by the Vancouver modellers in Canada and is simply a 5 round stunt contest with total pointage to count. Pity the poor judges after working through that lot and adding up all those totals!

Following a nation-wide grouping of officials in the M.A.A.C., several important decisions have been made to influence the future of Canadian modelling. Free flight team members will be selected through 7 eliminators, 5 of which will count, the first 5 taking place this year and 2 in 1963. Canadian Nationals are to be decentralized with the exception of radio, which takes place in Calgary, Alberta during July. Rat Racing will be an official Nationals event and progressive fly-offs in free flight dropped in favour of a fourth unlimited flight for the setting of records. Most important in our view is that the M.A.A.C. is to endeavour to have modelling supplies re-classified as sporting items for entry into Canada. At the moment the Canadians have to pay about 50 per cent. over advertised U.S. prices.

In Italy Ugo Rossi made an absolutely clean sweep of all four speed classes in the *Giornate Aeromodellistiche Ambrosiane*, his brother placing second in two events.

Issue of qualifying trials details by the A.M.A. makes a point of correcting the F.A.I. Sporting Code specification for free flight rubber (Wakefield). The Sporting Code and the latest issue of the S.M.A.E. rule book (*Wakey Wakey Free Flight Committee!*) are wrong in stating that the maximum permitted area is 304.5 sq. ins. The figure should be 294.5 sq. ins. Other important A.M.A. announcement is the "Ready-to-Fly" trainer programme for minors up to 14 years of age. Rules have been set for a balloon bursting event on 42 ft. lines so that standardised contests can be sponsored by the manufacturers as an encouragement to increase the potential of the modelling movement.

Big models in California, U.S.A. Top left Sam Belcher with his replica of Carl Goldberg's 1938 *Valkyrie* and below it, a close up of the nose showing installation of the Super Tigre 56. Top right are members of the Southern California team of A/2 flyers in the International Post Contest of March 18th, left to right Bob Van Nest, Dick Gildersleeve and Don Hutchinson. Below them is a huge *Space Rod 1400* with Stan Reeves starting up the McCoy 60 which has a balloon pressure feed system

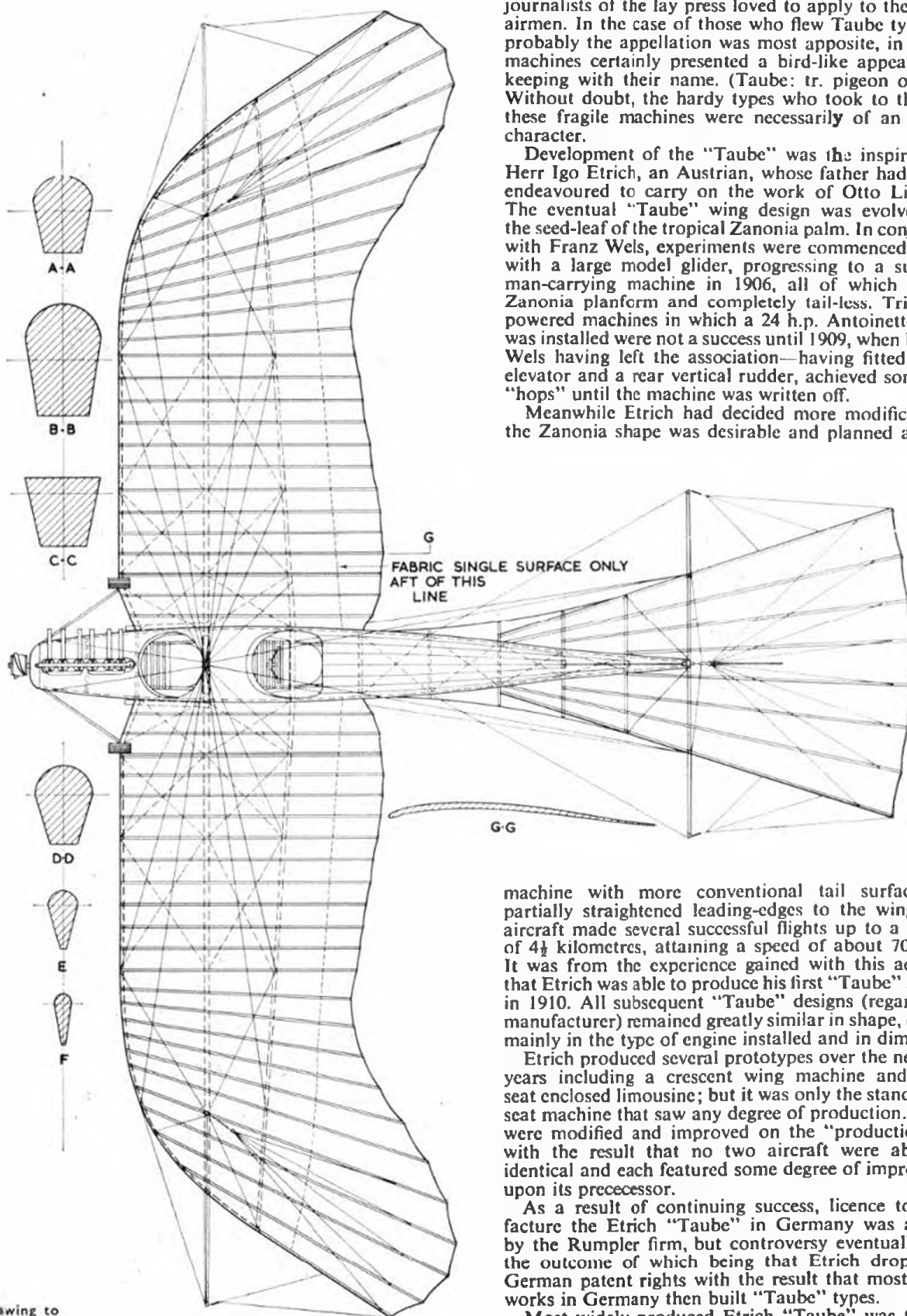


Unusual scale glider from CZECHOSLOVAKIA is this primary trainer (Zlin VI), built by J. Vlach. Gent with the speed model is Kikuo Tackechi, a shop foreman in the O.S. engine factory at Osaka, who is current Japanese class B speed champion with best effort of 136 m.p.h. (O.S. Max-III, 29X)

"INTREPID BIRDMEN"—such was the description journalists of the lay press loved to apply to the pioneer airmen. In the case of those who flew Taube types then probably the appellation was most apposite, in that the machines certainly presented a bird-like appearance in keeping with their name. (Taube: tr. pigeon or dove). Without doubt, the hardy types who took to the air in these fragile machines were necessarily of an intrepid character.

Development of the "Taube" was the inspiration of Herr Igo Etrich, an Austrian, whose father had in 1898 endeavoured to carry on the work of Otto Lilienthal. The eventual "Taube" wing design was evolved from the seed-leaf of the tropical Zanonía palm. In conjunction with Franz Wels, experiments were commenced in 1904 with a large model glider, progressing to a successful man-carrying machine in 1906, all of which were of Zanonía planform and completely tail-less. Trials with powered machines in which a 24 h.p. Antoinette engine was installed were not a success until 1909, when Etrich—Wels having left the association—having fitted a front elevator and a rear vertical rudder, achieved some good "hops" until the machine was written off.

Meanwhile Etrich had decided more modification of the Zanonía shape was desirable and planned a tractor



Drawing to
1/72nd scale

machine with more conventional tail surfaces and partially straightened leading-edges to the wings. This aircraft made several successful flights up to a distance of 4½ kilometres, attaining a speed of about 70 km/hr. It was from the experience gained with this aeroplane that Etrich was able to produce his first "Taube" machine in 1910. All subsequent "Taube" designs (regardless of manufacturer) remained greatly similar in shape, differing mainly in the type of engine installed and in dimensions.

Etrich produced several prototypes over the next three years including a crescent wing machine and a four seat enclosed limousine; but it was only the standard two seat machine that saw any degree of production. Models were modified and improved on the "production line" with the result that no two aircraft were absolutely identical and each featured some degree of improvement upon its predecessor.

As a result of continuing success, licence to manufacture the Etrich "Taube" in Germany was acquired by the Rumpler firm, but controversy eventually arose, the outcome of which being that Etrich dropped the German patent rights with the result that most aircraft works in Germany then built "Taube" types.

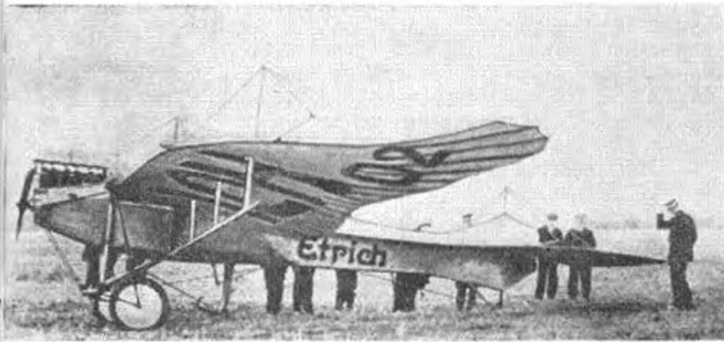
Most widely produced Etrich "Taube" was the 1913 two-seat military monoplane shown in the drawing,

AIRCRAFT DESCRIBED

Number 115

By P. L. GRAY

Etrich Taube



Rare photograph of the second machine illustrates use of manufacturers' name to identify the aircraft as distinct from modern registration requirements. (G. Haddow picture).

which was used on reconnaissance duties. The fuselage was a spruce braced box-girder frame with the forward decking and sides of the nose of aluminium sheet, the remainder being fabric covered. In section the forward fuselage was trapezoidal and tapered to a triangular section aft. Of the cruciform tail surfaces the horizontal member was of wire and spruce lath with warping of the extremity for elevator control. Vertical surfaces were of tubular framing with hinged rudders both above and below the tailplane.

Wings were of the characteristic "Taube" profile. Two converging spars were mounted well forward to allow the trailing edge to flex in flight, thereby achieving a degree of inherent stability. The wing tip portions were braced from additional king posts, which also afforded the necessary fulcrum for the control cables to the warping tips. The whole of the wing structure was braced to inverted vee pylons both above and below the fuselage, also an additional girder member ran below the main spar to give extra strength and rigidity to the bracing.

A point that should be highlighted in connection with the fabric covering of the wings, is that the lower surface fabric extended only approximately three quarters of the chord as indicated in the plan. The trailing portion had, therefore, only a single surface.

The undercarriage was a complex arrangement of struts and forks supported with vee struts springing from the lower longerons and anchored to elastic cord shock absorbers in the leading-edge of the wing. The wheels were mounted in a twin forked structure and the whole chassis was much akin to that of the contemporary—and probably more familiar to modellers—Bleriot monoplanes.

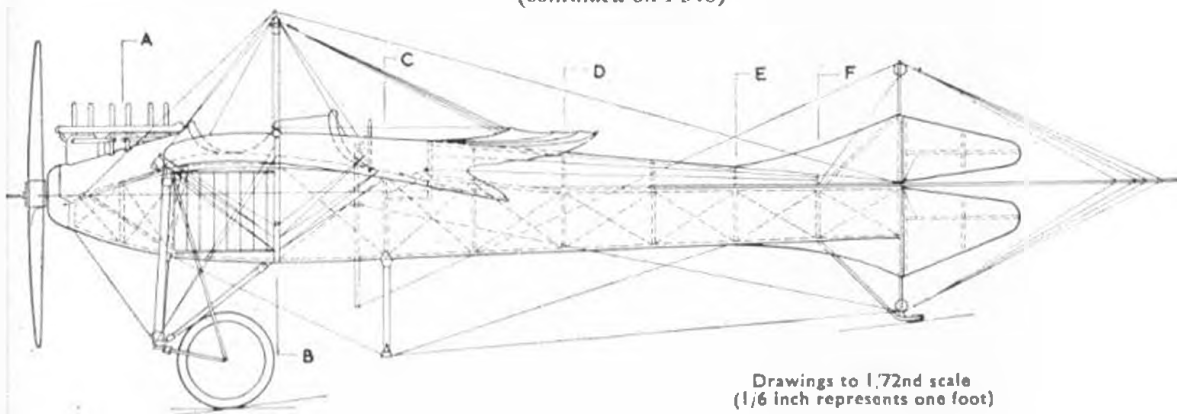
Controls were located in the rear cockpit with a large wheel for "elevator" and lateral control. Rudder control

(continued on P348)

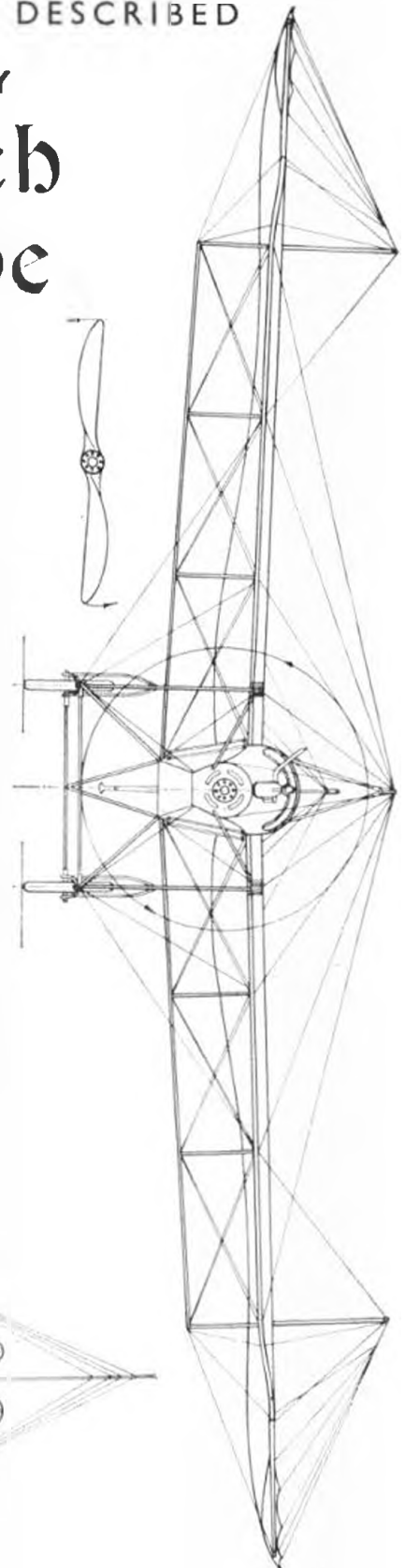
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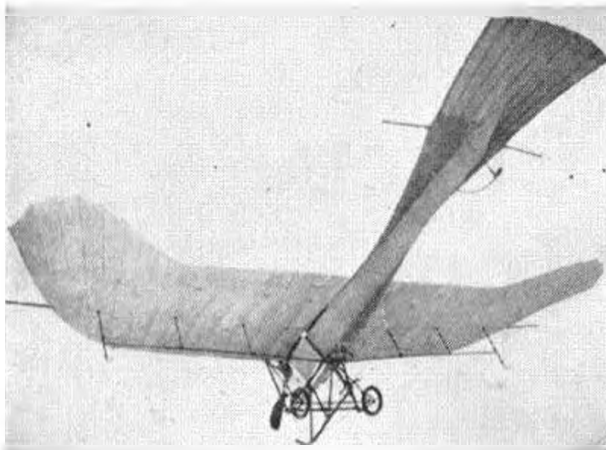
Span: 14.34 m. (47 ft. 0½ in.).
Chord rib 3: 2.88 m. (9 ft. 5½ in.).
Length: 9.85 m. (32 ft. 3¼ in.).
Chord—max: 3.68 m. (12 ft. 0½ in.).
Weight (approx.): 870 kg. (1,914 lb.).
Speed: 90-100 km./hr. Climb: 800 m. in 15 min.
Engine: 100/120 h.p. Mercedes six cylinder, in line, water cooled.

The finish of all the "Taube" machines was in natural linen, doped and varnished; presenting a varying degree of cream shade, according to age and/or cleanliness. Decking panels were usually metal and were either left bright or painted grey. Some of the machines entering operational service on the outbreak of hostilities were painted over a dark colour (probably green, possibly grey or brown) on the top and side surfaces, they also carried the palce crosses above and below both wing tips, on the fuselage sides and vertical rudder, those on dark surfaces being painted on a white square background.



Drawings to 1/72nd scale
(1/6 inch represents one foot)





Full-size replica of the Etrich Taube constructed by students and suspended beneath the ceiling of the aviation section of the museum at Munich, Germany. This view clearly illustrates the bird-like plan form and the horizontal lift bar beneath the thin wings, but does not convey the birdcage of rigging wires

was by foot pedals mounted on the slatted floor. A 100/120 h.p. Mercedes engine was fitted and radiators were mounted on the fuselage sides in strip sections, slightly staggered outwards from each other to receive greater advantage from the slipstream. These sections could be augmented or reduced according to climatic conditions. The main fuel tank was positioned on the C/G and by fashioning it to a seat contour it served a dual purpose by providing a seat for the observer in the front cockpit.

"Taube" types were used operationally on reconnaissance duties during the opening phase of the war, but did not remain long on active service on the Western Front after the Spring of 1915. The types that did see service largely had a simplified wing bracing with the lift bar under the wing, and all its attendant wires, dispensed with.

Some remarkable exploits on a "Taube" were put up by Lt. Gunther Pluschow during the siege of the port of Tsingtao. To establish a foothold in China, Germany had leased 117 square miles in the Shantung peninsular and established a Naval station at Tsingtao. Having transferred to the naval branch of the Air Service, Pluschow was appointed to Tsingtao in April 1914; his "Taube" travelling by the sea route did not arrive until July.

Operating in gusty conditions from the racecourse "acrodrome" was a constant hazard and eventually the "Taube" was wrecked. As the engine was undamaged an attempt to re-build the machine with spares that had travelled with it, was made, but these were so seriously

affected by the climatic conditions that an extremely dicey patch up resulted. A new "home made" propeller was fashioned from laminations of local oak but the Chinese glue did not stand up to the centrifugal stresses with the result that the airscrew had to be taken off and re-glued and clamped after every flight.

With the outbreak of the European conflict the Tsingtao garrison at first thought it would be left in peaceful isolation, however, on 15th August 1914 an ultimatum was issued by the Imperial Japanese Government demanding immediate evacuation of the German forces. The garrison did not intend to capitulate and Pluschow flew reconnaissance eventually sighting the Japanese fleet on August 24th. The next day he was able to pinpoint the landing places of the Japanese forces and a few days later returned with bullet holes in his wings after flying low over the enemy infantry. Each day this gallant officer was able to assist his artillery by locating the Japanese batteries, but inevitably his countrymen were forced to retreat upon Tsingtao. Lt. Pluschow operated in grim conditions, it was impossible to carry an observer due to weight considerations, and all observations were personally recorded while under fire from the Japanese. Although under orders to avoid contact with his opposite numbers, he was on one occasion caught unawares by a Japanese machine but attacked by firing at it with his pistol and was rewarded by seeing it go down.

Ultimately the garrison was nearly out of ammunition and on November 5th, 1914 Pluschow was ordered to fly with the final despatches to the German Consulate in neutral China. He took off in a hail of Japanese gunfire flying north to Haichow. When out of fuel he landed in a rice paddy, his valiant "Taube" nosing over in the soft ground. He was "rescued" by an American missionary and eventually arrived in the U.S.A. His further attempt to reach his Fatherland with a forged passport was frustrated by his capture at Gibraltar.

Rare picture of a military Taube of a later type having a conventional Vee type undercarriage and dispensing with the lift bar beneath the wings. It is unusual with its dark colouring and patee crosses on vertical tail surfaces and wings in white squares. The serial of the aircraft is A.172 followed by a small 14 (A. Imrie photo)



RAT RACING RULES

F.A.S.T.E. Club regulations
for the guidance of other groups

OBJECTIVE. It is the purpose of the following rules and regulations to give modellers a simplified form of team racing; therefore rules are kept to a minimum.

GENERAL. All S.M.A.E. regulations covering the flyer, the model, and the flight, shall be applicable, except as specified below.

AGE CLASSIFICATION

JUNIOR—Contestants of 18 years of age and under. All members of the R.R. Team, (pilot and 2 pit crew members) will be 18 years of age and under.

OPEN—Contestants of 19 years of age and over.

MODEL CLASSIFICATIONS

CLASS I

Engine displacement .000—201 cu. in. (or to 3.293 c.c.).

Line Length. From centre line of handle to centre line of model—52 ft. 2 ins.

Line Diameter. .012 in. minimum.

Pull Test. 15 lbs. min.

CLASS II

Engine Displacement—.000—40 cu. in. (00—6.55 c.c.).

Line Length—60 ft. plus or minus 6 in.

Line Diameter—.014 in. minimum. Pull Test—30 lbs. min.

R.F.C. SQUADRON MARKINGS

PART
NINE

Described by Leslie A. Rogers

Drawn to to 1/72nd scale

by K. McDonough

MORE GEN ON A

1½ STRUTTER SQUADRON

**No. 5 Squadron R.N.A.S.
later No. 205 R.A.F.**

This Squadron used Sopwith 1½ Strutters from about May 1916 until they were replaced by D.H.4's in August, 1917.

Using Sopwith 1½ Strutters the Flight and Individual markings were:—

"A" Flight

All aircraft in the Flight marked "A" in white, behind the roundel on the fuselage side. Individual marking was numerals in white, painted aft of the Flight letter.

"B" Flight

were as "A" Flight, but using the letter "B".

"C" Flight

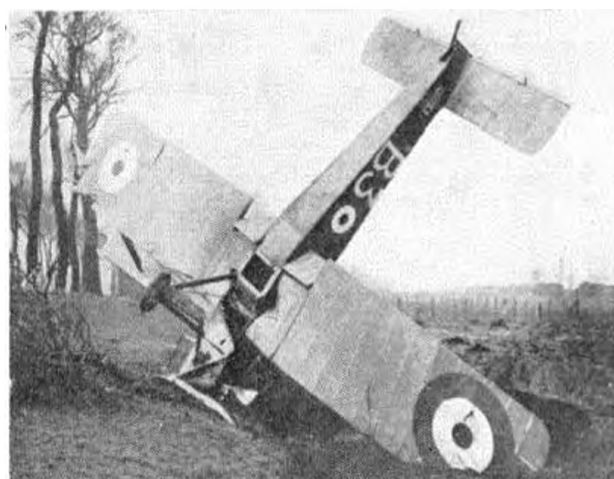
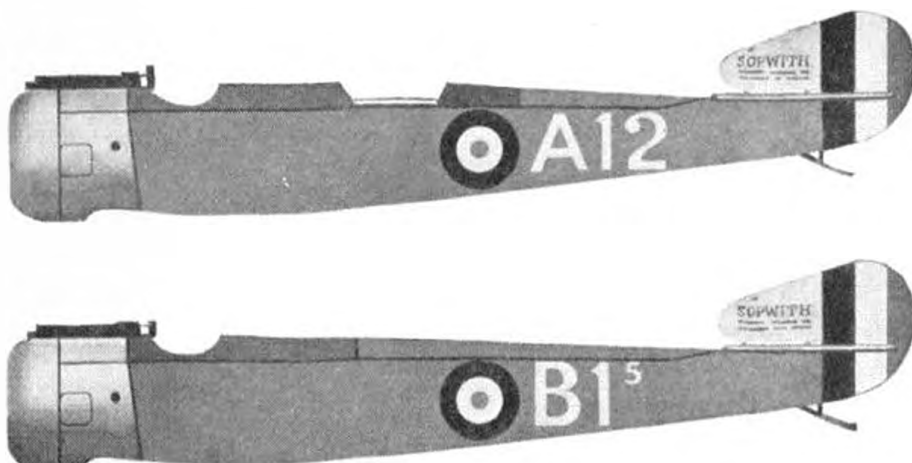
were as "A" Flight but using the letter "C".

In addition, many aircraft had a small "5" painted in conjunction with the other markings. This indicates that they were part of the 5th Naval Wing.

Using D.H.4's the method of marking was used as before. By this time the numbers used in the Flights most likely went from "1 to 6". Many of the D.H.4's had "private" markings of striped or coloured cowlings and wheel covers.

Drawings above show the 2-seater at top and the converted 1½ Strutter single seat bomber next with the variations in markings for "A" and "B" flights. A small number 5 indicates the 5th naval wing

At right, crashed Sopwith 1½ Strutter single seat bomber at Coudakerque clearly illustrates the individual and flight marking on aircraft serial N5114 (G. S. Lesley photo). Below right is a De Havilland 4. Note the built-up rear cockpit and propeller blade covers, also the similar individual and flight number marking behind the fuselage roundel as used on earlier Sopwiths (G. S. Lesley photo)



1. Models shall have a fixed two wheel, conventional undercarriage.
2. There shall be no restrictions placed on wing area, fuselage cross section or fuel tank capacity.
3. Models shall be arranged for counter clockwise flying.
4. Models shall pass a general safety inspection prior to each race or heat.
5. Team will consist of one pilot, two pit crew.

RACES

1. 70 Lap Heat—one refuelling stop is mandatory. Motor must be completely stopped for refuelling. Best times go forward.
2. 140 Lap Final—two refuelling stop mandatory.
3. Failure to make necessary pit stops will result in disqualification.

PROCEDURE

1. Teams will be called to the racing area 5 minutes prior to the start of the race.
2. Recommended number of aircraft constituting a race shall be four (4).
3. There shall be a minimum of 15 ft. separation between aircraft in starting position.
4. Two minutes warm-up time shall be allowed each team.
5. Mechanical starters will not be permitted.

6. The "Le Mans" start shall be used for all races.
7. Pit Crews must stand 5 feet away from the model at least 10 seconds before the starting signal.
8. Racing altitude will be maintained between 10 and 25 feet. Overtaking will be above other models.
9. No whipping is allowed.
10. Pilots must walk around within the 5 ft. radius circle when flying.
11. During pit stops, the pilot must move to 10 ft. radius circle, crouch, and ground his control handle and lines.
12. Pit crews and equipment will remain outside the 70 ft. safety circle in class II and the 62 ft. safety circle for class I.
13. Crew members may enter the racing zone at right angles to the flight path to retrieve models only.
14. If in the opinion of the judges, a contestant, with deliberate or malicious intent, conducts himself (or performs any flight manoeuvre) so as to endanger other pilots or team members, cause damage to other models, or to flagrantly disregard any of the aforementioned rules (either pilot or crew members) such action shall result in the disqualification of the team from the race.
15. FLY SAFE—BE SAFE.

Reader's Letters

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, must accompany letters.

Rat racing

DEAR SIR,

I have just returned from the first "open" Rat Race to be held in this country at Oakington. This was organised by the F.A.S.T.E. Club and a jolly good job they made of it too.

I feel this type of flying is the "shot in the arm" which control line flying so badly needs. Any model can enter and the variation in shapes and sizes had to be seen to be believed. I even saw a stunt model which was going well. I believe this type of flying to be a perfect way for the beginner to start contest flying. The atmosphere was quite free and easy and I saw none of the tantrums and nerve tension I have come to expect at a control line meeting.

The object of this is, of course, to give all and sundry a fair chance. After all, good engines are now easy to get, and it is only the vast experience of the named men which enables them to win repeatedly. Watford, Herts.

K. A. BEDFORD.

(See rules set by F.A.S.T.E. on pages 348/9 of this issue.)

Nut case

DEAR SIR,

Would it be possible for me to make a plea through your columns to the nut and bolt manufacturers? Could they put on the market a packet of nuts and bolts with lock nuts to save having to buy two packets every time and getting tins full of spare bolts? Perhaps an even better idea would be to have the slightly tapering self-locking nuts and do away with the old two nut system. I must however, congratulate one manufacturer, who now includes five bolts which leaves one over for the bellcrank in a control-liner, but it still needs an extra nut!

Sheffield 7.

J. S. PRESSLEY.

Brass is sold by weight hence 5 bolts (and nuts) for 6d.

Poppetry

DEAR SIR,

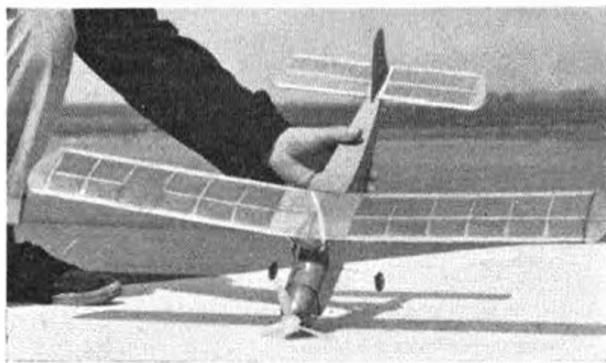
I've just built your Poppet using a Cox Pee Wee, and lost it first flight. After three days searching I recovered it from a farm 3 miles away. I would like to say how much I like the idea of publishing full-size plans in AEROMODELLER. Long may it continue.

JAMES GOUGH.

Weston Coyney, Stoke on Trent.

Glad to hear of your success—Poppet also makes a fine miniature radio control model too for the new 3 volt receivers. We shall continue to include full-size plans in every issue of AEROMODELLER and have many exciting new and popular projects in store for the future.

John Dumble's D-C Dart powered Poppet (below) weighs 12 ozs. with tricycle undercarriage, KK 5 x 3 prop, 1 oz. all transistor Rx., 3 pencils and Conquest escapement. Does "flip over" loops from a short spiral



Be tidy

DEAR SIR,

Probably the best place near London for flying model aircraft is Epsom Downs.

On a visit to the Downs last week I was disturbed by the amount of litter obviously left by aeromodellers.

Is this the next place for a ban?

P. A. VALENTINO.

Ealing, London, W.13.

The right retailers?

DEAR SIR,

We have all got used, these days, to shops selling everything in general and nothing in particular, but now it seems the trend has spread to aeromodelling.

While visiting a local ironmongers recently, I was very surprised and rather horrified to see a display of kits and aeromodelling materials on show. The kits were of a very well known make, and you will probably guess the firm concerned.

I do feel that protest should be made against this, as otherwise the trend will no doubt spread. One has, of course, seen plastic kits everywhere for some years, e.g. at Woolworth's, the sub-post offices, small toyshops etc., and this is bad enough, but, after all, these type of kits are not usually considered as being for serious modellers.

I feel sure that this sort of thing, if allowed to go unchecked, can do serious harm to our hobby. It is not fair to the beginner, as, having bought a kit from, say, the ironmongers, he cannot hope to get any sort of proper advice or attention from such unqualified people. Similarly, it is not fair to the established model shops, most of whom give good service and advice to modellers. The only way to prevent this sort of thing happening is for the leading kit manufacturers to supply only to recognised model shops, and not to any Tom, Dick or Harry who requires a dozen kits wholesale.

I do hope you will draw attention to this practice before it gets out of hand and damages the hobby.

K. C. SAUNDERS.

Allestree, Derby.

Light fingered gentry

DEAR SIR,

Would the gentleman (some gentleman!) who stole a P.A.W. 19 at the Wanstead and Dagenham Control Line Rally on April 15th, kindly return it to its rightful owner, Mr. P. Gillow, 21 Domic Drive, New Eltham, S.E.9.

Mottingham, London.

P. H. T. NOBLE, Hon. Sec.

DEAR SIR,

Following our Woking and D.M.A.C. gala on May 6th, there are one or two things that I feel should not go unsaid. Firstly, downwind engine thieves collected at least one engine, wrecking the model in the process. This was a P.A.W. 1.49 and timer, belonging to D. Hippason. Secondly, perhaps even more disappointing, A. Fathers of Abingdon, after prancing his open power model, placed front end of fuselage with T.D. 15 and autoknips timer in his bag and this part of model complete with motor and timer was missing by the end of the day. His model box and bag were in full view of many other competitors throughout the day. Thirdly, some stupid person saw fit to attempt to fly C.L. in the carpark with not more than 6ft. clearance on each side of circle, between cars. When politely asked to move, refused and could only be shifted by a F/F competitor threatening to jump on the model. It is people like this who cause insurance premiums to be raised; will they never learn?

Should you see fit to publish these comments, our club will gladly act as a clearing house for the missing motors if the persons who took them wish to return them. If not, they may rest assured that should further enquiries reveal their identity, full action will be taken. Woking, Surrey.

P. NEWELL, Comp. Sec.

Thoughts from 'down-under'

DEAR SIR,

I have been prompted to jot down a few thoughts on a subject which I feel must soon become the centre of a controversy again: namely, the F.A.I. free flight rules. The present regulations are considered by many to be unsatisfactory with a proportional loss of interest in that class.

A top line F.A.I. free-flighter today, requires an expensive, plug-burning, 2.5 c.c. super glow motor in a 26-30 oz. projectile, and a galaxy of accurate clockwork timers to operate tilted tailplanes, engine cut-outs and D.T. The resultant model is easily capable of exceeding current requirements, and as is fitting to a World Championship model, represents the peak of technical development. To my mind such a model, while presenting a definite challenge, lacks only one feature—enjoyment.

Harken for a moment back to 1953 and Dave Kneeland's *Vapour Trail*. When was a World Championship more enjoyed by the mass of aeromodellers. Those models, while requiring care and skill in construction and trimming, performed within the limitations of the then current regulations and certainly didn't require a marathon fly-off. The proportions of such models also encouraged a great deal of interest in the F.A.I. class and a lot more modellers tended to fly F.A.I. models in club events. Today, International models are for a select few only.

Before I am criticised on the point of inevitable development, I would say I fully understand the logical progress which has been made in the past nine years, particularly in engine output, and appreciate the fact that competition must improve the breed. But when model development exceeds the rules, then new rules are required, rules which would be valid for several years and not be subject to constant chopping and changing. The last rule alteration of engine run dropping from 15 to 10 seconds was, I feel, a stop gap only.

Therefore, might I suggest a completely new set of rules to govern free flighters, rules which would call for a model of *Vapour Trail*'s performance. The answer could lie in reduced engine capacity in the old F.A.I. models.

Now I know that engine manufacturers have spent vast sums and considerable research in developing the racing 2.5 to its present level, but production of these engines is strictly limited and offered as a specialist motor. The motor is therefore a highly priced item, purchased by only the keenest of free flight men. The gradual decline in sales of these engines (with the coming of new rules) coupled with the

increase in sales of a contest engine of about 1 c.c., probably would not upset the overall picture of manufacture.

I mention a possible class of 1 c.c. models, and will put forward my ideas on this. Imagine a 1953 *Vapour Trail* powered by an A.M. 10 say, or a Holland Hornet. We would no longer have a model with rocket like ascent its true, but by using an engine run of 20 seconds, or longer if necessary, to produce a maximum time of three minutes, we would have a true power free flight model, yet a model which still requires the most skilled of building and trimming.

Now let us look at some points for and against such a specification.

For:

1. The model is of convenient size for International transport; circa 50 ins. wingspan.
2. As performance of such models improved, engine run alone would need to be altered, and with such a long engine run in the first instance, this could be done without reducing the model to the catapult rocket category.
3. A 1 c.c. engine size would encompass a wide variety of currently produced engines, both European and the American .049's.
4. Because of model size, motors would have to be capable of swinging large props. Instead of today's trend, especially with .049's of running the motor above 20,000 r.p.m. on tiny props.
5. This in turn must slow down engine development and the need for manufacturers to constantly retol.
6. With engine output at a constant level, aerodynamic layout must improve, and this surely is the aim of free flight competition.
7. The world wide popularity of .049 free flight contests, proves that there is a definite interest in this class of model.

Against:

1. The reluctance of modellers to accept what at first sight appears to be an inferior class of model (Analogy: the 1.5 litre formula 1 racing car replacing the 2.5 litres).
2. Having reached such high states of development in 2.5 c.c. motors, the reluctance of factories to begin developing all over a breed of hot 1 c.c. engines.
3. The inferior performance of "World Championship" models to the much more spectacular open class 5 c.c. models, etc.

All pros and cons weighed, it looks to me as though something on the lines suggested will have to be done in the next two or three years. Don't take this letter as the disgruntled cry of one who can't trim today's models, or afford today's engines. I freely admit that whatever class of model was flown, I wouldn't be within miles (or minutes) of the experts of today. The above thoughts are merely intended as food for thought amongst those interested in free flight and will, I hope, arouse some discussion on the matter through the pages of *AFROMODELLER*.
New South Wales,
Australia.

G. FLOOD.

Diminishing returns?

DEAR SIR,

Regarding the Audio Tachometer in May '62 *AFROMODELLER*, I must point out, that you appear to have overlooked the fact that an engine running at say 10,000 r.p.m. but moving away from the observer (as a F/F power model in a climb) would not sound to be running at 10,000 r.p.m. but at a reduced speed, depending on the speed of the model.

This of course is due to the speed of sound being relative to the model and not the observer, and this I think would give a false reading.

J. R. BRIDGE.

Blackpool, Lancs.

The phenomena is known as the "Doppler effect".

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Letter u = 50 m.p.h.

Letter v = 750 m.p.h.

Letter f = 10,000 r.p.m.

$$\therefore f' = 10,000 \times \frac{750}{800} = 9,400 \text{ r.p.m.}$$

or an error of 6 per cent.

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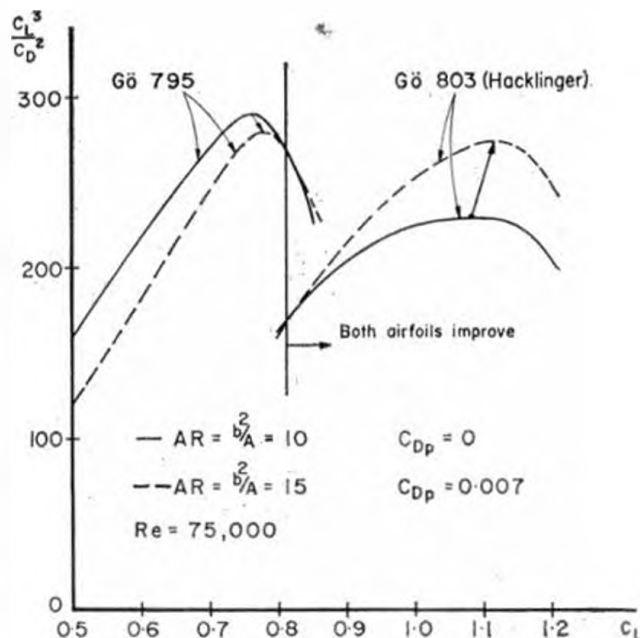
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However, the instrument is still sufficiently accurate for all but the most exacting work.

P. BRADLEY.

Churchover, Rugby.



Flat bottoms best?

DEAR SIR,

In his interesting article *Is undercamber necessary?* (*AFROMODELLER* February 1962) Werner Thies suggests that flat bottomed airfoils may give smaller sinking speeds than the usual undercambered ones. However, for gliders the comparison is slightly misleading due to two reasons. First, the low aspect ratio ($AR = 10$) used in the calculations favours airfoils with low drag at moderate lift (flat bottomed). Second, Mr. Thies neglects the parasitic drag C_{Dp} of the fuselage and the stabilizer. As C_{Dp} is fairly independent of the angle of attack, this favours the flat bottomed airfoil again.

In the figure, the two airfoils G6 795 and G6 803 are compared. The full lines are based on the assumptions used by Mr. Thies. As it is difficult to read the graphs, the results do not agree exactly. If a more realistic assumption is used (broken line in the figure), both airfoils are improved above $C_L + 0.812$. However, the G6 795 cannot use this gain, whereas the G6 803 can, as it can fly at high C_L . The intention with this example was to show the principle. Much more detailed calculations would be necessary to give definite results. The essential facts can be summed up as follows: for low AR and for extremely low C_{Dp} the G6 795 will give lower sinking speeds than the G6 803. If however a model with a high AR is built with the G6 803 this model will almost certainly be superior.

Werner Thies' article certainly stimulated considerable interest. More details and references can be found in:

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Sweden.

Proof in the box

DEAR SIR,

May I, as a fanatical sport R/C Multi Flyer, add a brief comment on the Soap box/Tea chest controversy.

(Chapter 1): I recently purchased a much heralded forty-nine engine of foreign manufacture. Unfortunately the prop driver broke, my dealer (in Leicester) immediately supplied a new one for me off the other engine that he had in stock. I also wrote to the foreign manufacturers and asked if there had been any mods., if so would they supply.

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Hurrah! for Mr. Soapbox.
Spordon, Derby.

R. HARGREAVES.

increase in sales of a contest engine of about 1 c.c., probably would not upset the overall picture of manufacture.

I mention a possible class of 1 c.c. models, and will put forward my ideas on this. Imagine a 1953 *Vapour Trail* powered by an A.M.10 say, or a Holland Hornet. We would no longer have a model with rocket like ascent its true, but by using an engine run of 20 seconds, or longer if necessary, to produce a maximum time of three minutes, we would have a true power free flight model, yet a model which still requires the most skilled of building and trimming.

Now let us look at some points for and against such a specification. For:

1. The model is of convenient size for International transport; circa 50 ins. wingspan.
2. As performance of such models improved, engine run alone would need to be altered, and with such a long engine run in the first instance, this could be done without reducing the model to the catapult rocket category.
3. A 1 c.c. engine size would encompass a wide variety of currently produced engines, both European and the American .049's.
4. Because of model size, motors would have to be capable of swinging large props, instead of today's trend, especially with .049's of running the motor above 20,000 r.p.m. on tiny props.
5. This in turn must slow down engine development and the need for manufacturers to constantly retool.
6. With engine output at a constant level, aerodynamic layout must improve, and this surely is the aim of free flight competition.
7. The world wide popularity of .049 free flight contests, proves that there is a definite interest in this class of model.

Against:

1. The reluctance of modellers to accept what at first sight appears to be an inferior class of model (Analogy: the 1.5 litre formula 1 racing car replacing the 2.5 litres).
2. Having reached such high states of development in 2.5 c.c. motors, the reluctance of factories to begin developing all over a breed of hot 1 c.c. engines.
3. The inferior performance of "World Championship" models to the much more spectacular open class 5 c.c. models, etc.

All pros and cons weighed, it looks to me as though something on the lines suggested will have to be done in the next two or three years. Don't take this letter as the disgruntled cry of one who can't trim today's models, or afford today's engines. I freely admit that whatever class of model was flown, I wouldn't be within miles (or minutes) of the experts of today. The above thoughts are merely intended as food for thought amongst those interested in free flight and will, I hope, arouse some discussion on the matter through the pages of AEROMODELLER.

New South Wales,
Australia.

G. FLOOD.

Diminishing returns?

DEAR SIR,

Regarding the Audio Tachometer in May '62 AEROMODELLER, I must point out, that you appear to have overlooked the fact that an engine running at say 10,000 r.p.m. but moving away from the observer (as a F/F power model in a climb) would not sound to be running at 10,000 r.p.m. but at a reduced speed, depending on the speed of the model.

This of course is due to the speed of sound being relative to the model and not the observer, and this I think would give a false reading.

J. R. BRIDGE.

Blackpool Lanes.

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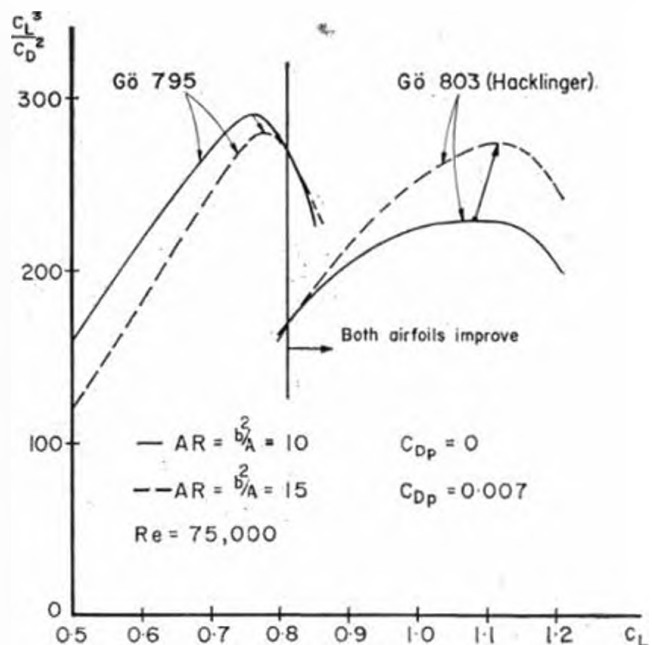
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The recently re-formed Bridlington and District Model Aircraft Club on the East Yorkshire coast has about thirty enrolled members and among their officers are a Headmaster, Superintendent of Police, Medical Officer of Health and a clergyman. Picture shows some of their activities

TO HOME COUNTIES rally-goers, perhaps the most popular fixture of the season is the **NORTHERN HEIGHTS GALA**, which though "in the balance" at one stage, is now firmly fixed for July 1st at R.A.F. Halton, Bucks, as usual. Competitions will be the same as previous years and the Queen's Cup will be the award for F.A.I. Rubber with prizes of £20, £10 and £5 for 1st, 2nd and 3rd places in that event. Slight changes have been made to the rules for Radio Control Spot Landing:— the flier must nominate his flight time before take-off and will be penalised on both flight time and distance from spot. (Well, we were wondering if there would be a N.H. this year.—Let's hope the weather is kinder than in 1961).

LONDON'S Dagenham & Wanstead Rally fell foul of high winds, but entrants came from further afield than in any previous year so the event must be gaining popularity (or maybe there are less rallies). "B" Combat (.35 cu. in.) and Rat Racing seem to have a following and Stunt was well supported, though the winds deterred some entrants from making more than one flight. High revving glow motors powered a fair proportion of "A" Combat entries but they lacked consistency to reach the final, a "three-up" tussle between *Oliver* diesel powered models. **Hayes & D.M.A.C.** have been pre-occupied with the first S.M.A.E. Control Line Trials at Barkston Heath, where George Copeman managed 2nd place in Speed at 110 m.p.h., he and others experienced difficulty with the F.A.I. Speed pylon due to lack of experience. Members attending the Wanstead Rally found the A.M.A. scoring system in "B" Combat rather disagreeable, because the rules call for "kills" in preference to "cuts", encouraging competitors to go for opposing models rather than streamers.

On April 9th Sidcup A.S. and Cosmo A.C. fought out between themselves what was intended to be a two-team Combat comp. with Northwood M.A.C. and Kenton M.A.C. who failed to turn up. (Surprised—never known the Northwood and Kenton boys to pass up the chance of a good scrap). After a fierce engagement, Sidcup emerged winners. There were no hard feelings, however, because three days later, they met again, this time for an indoor comp. of Free Flight, R.T.P. Speed, Duration and Team Race, all going to make a most enjoyable evening from which Sidcup again carried off the honours. **Croydon & D.M.A.C.** are jubilant that Al. Wisser's winter of glider practice paid off at the Woking Gala on May 6th, where he took first place in Glider, using a stark looking A.2 and further still the following week-end when he scored a full-house of maximum times in the C.M.A., unfortunately damaging his model in the process. Thus in the fly-off, he was forced to use a virtually untrimmed model losing the advantage. Ken Smith can really make those simple kit models go, for at Woking he scored a couple of max's and placed 4th in glider with a *Frog Ventura* A.1. Martin Dilly's 9 oz., high aspect ratio *JA* Free Flyer with *Holland Hornet* power took first place in that event at the same rally, obviously these boys know the way to handle contest models, so those who want to learn more should go along to Woodside School Morland Road, Croydon, on any Tuesday evening between 8 and 10 p.m. It's on the 197 bus route.

All sheet *JA* free flights are popular competition subjects with Mill Hill & D.M.A.C. You know the type of model... the fiendish all-sheet *Ebenzer* style that zoom all over the sky. The boys will be laying on a display at a local fete and are looking for other engagements as well as new members, invited to attend club evening at either Dollis Primary School, Purnsey Road, Mill Hill, or at Copthall Playing Fields alternately any time after 8 p.m. on Tuesdays. **Surbiton M.F.C.** wish to remind all friends (they have some) that their annual Gala takes place this year at Chobham Common on July 29th. As usual, entry fees will be divided up to provide competition prizes. One change is that instead of presenting that silly pot (they called it that, not us—Ed.) to the Gala Champion, that blue blooded zealous one will in future receive a very nice *Smiths Electric Wall Clock* that has been given to the club. (Did they pawn the Pot?). Only snag we can see is that we presume, whoever wins this will have to return it after one year. Thus after the clock has hung on a wall for a year a nice clean mark is bound to remain to show where it was! **Hornchurch M.A.C.** add a line to say that *Open Power* is now added to the list of contests for their Gala on September 2nd.

Easter Sunday was an enjoyable one in the **SOUTHERN AREA** for **Horsham M.F.C.** and **Worthing Bald Eagles**, who had a wonderful day at Beaulieu. The "down" line broke on Ron Smith's fast '19 powered *Peacemaker* and snatched the large E-Z-Just handle from his hand, the model looping and rolling upwards out of sight, to be recovered ½ mile down the road. Reigate's Frank Knowles caught

a dove of gremlins at the first R/C Trials, **Barkston Heath** on April 29th where his *Cannonball* suffered through radio failure spoiling his first flight. Between flights he also discovered part of the piston skirting missing from his engine. Further, he burnt out his last idle bar glow plug and was forced to use a ceramic type when risking a second flight so sacrificing throttle. He completed the schedule though and placed ninth, which gives him another chance at the second trials. **Portsmouth M.A.C.** were among those who had fun at the Woking

Gala, E. Yerrrell topping the "big boys" in Power with his aged but well trimmed *Elfin* 1.5 c.c. job which racked up 8:26. L. Larrimore smashed two models in that event but managed a third in Rubber to collect two tins of dope and a balsa knife. (He can now repair those power jobs).

Stand by for a useful modelling tip from **Horley M.F.C.** who find that blushing of dope on nylon and silk (or tissue for that matter) is completely stopped if one adds a little oil of Wintergreen (sold as methyl salicylate, 10d. per 2 oz. bottle) to the dope. Proportions are about half an ounce to the pint, say 9 or 10 drops to the pint or if you want to be real scientific, 1/300th part to the pint. Someone doped a complete nylon covered *Smog Hog* wing one rainy morning with their workshop doors open and a cold blast blowing through. Not a single bluish mark resulted. Thanks lads for reminding us of an old tip, its not unknown but we'll bet there are many modellers in the dark about it. One of the boys built the *Audio Tachometer* from **AEROMODELLER** June issue with very successful results, though it goes into the realms of ultrasonics at one end of the speed range. One of their R/C fliers swears it interferes with his receiver, but it cannot really be true.

Up in **EAST ANGLIA**, **Brentwood M.A.C.** are a small but active club, who travel to most of the contests within reasonable striking distance and having now purchased a goodly sized tent they are all set to go further afield. Up till recently their interests centred on free flight and radio control, though an influx of younger members has resulted in more control line activity. So if you are interested to get in on the fun, phone the secretary at Brentwood 5150.

From the **SOUTH MIDLAND AREA** comes news of another rally fixture. October 14th is the date of **Luton M.A.S.'s** Slope Soaring Rally to be held at the popular *Ivinghoe Beacon* site near Dunstable in the Chilterns. If your interests are R/C, Multi, Single, Free Flight, or Chuck Glider, they will all be catered for at 2s. 6d. entry for R/C and 1s. 6d. for Free Flight. Rules? Well, R/C target flight time will be 5 minutes nominated and the time counted will be the best of two. Free Flights from a hand launch will be judged on the best total duration of two flights. Pre-entry for R/C can be made to Mr. D. W. Bateman, 14 Ridgeway Drive, Dunstable, Beds. Please NO power models. The majority of **Watford Wayfarers M.A.C.** have elected to arrange their own insurance and break away from the S.M.A.E. With the contest season well under way, members are very active. A Chuck Glider event was won by secretary J. Trinder with 2:04 and junior D. Smith made an 11 minute flight with an *A.P.S. Yellow Bird* after the contest (popular these *Yellow Birds* y'know) and also won *JA* Power flying a *Cox T.D.* powered *Dynamo*. National competition results have also been good, Geoff Kent winning the British section of the Coupe d'Hiver contest flying a *Garter Knight*.

Up to the **MIDLANDS** now where, in the **Wolves Club** room, Dave Day flies a 6 ins. span rubber powered, scale *Whitman Tailwind*. It's rather fast and the torque effect of the propeller causes rolling tendencies but it is fun all the same. Their most reliable Rat Racer so far is Sam Skitt's, which tops the "ton" consistently. It has a *Fox* 40 power plant for its 132 sq. in. swept wing. The *Fox* runs with pressure tapped from the crankcase to the *Veco* fuel tank and uses a *Tornado* propeller. Its only vice, they say, it invariably covers too many laps with the tank filled.

Calling the **NORTHERN AREA**. **York M.A.S.** report the loss of their regular flying field, *Clifton Aerodrome*, now to be leased to a farmer as grazing land. Negotiations set up by their committee seem fruitless and the said agriculturalist shows no inclination to allow fliers on the aerodrome again. Hope you find somewhere else chaps. Remember the **Rotherham & D.M.F.C.** confusion detailed in *May Club News*. There were two clubs if you think back and we have now received clarification. There are in fact two clubs at Rotherham!

A new club in the **NORTH WESTERN AREA**. That's **Crew & D.M.F.C.**, re-juvenated after five years with some 30 members. So anybody in South Cheshire parts interested should contact P. Newman, 55, Eastern Road, Willaston, Nantwich, Cheshire.

North Western Area's Whitefield M.A.C. have been out enjoying themselves. When that mini-rat race detailed in last month's *Club News* eventually took place it afforded a most hilarious spectacle when an over enthusiastic pit mechanic overdid it a bit, with a really fast pit stop on a rival model! While mentioning no names, it was "Jolley" well appreciated. Oh Yezzz! Event was won by M. Entwistle using an *E.D. Super Fury* powered model he designed himself.

More Rat Racing in the **NORTH EASTERN AREA**, where Mr. W. Evens presented a cup to **Sunderland D.M.A.C.** to be awarded for

events in that category. First holder was G. Stephenson, who won a comp. on May 11th. This club invite new membership so attend every Friday 7 p.m. in the East End Community Centre (Number 9 Bus stops right outside the door). Good news from Novocastria M.A.S., who have obtained the use of Thornaby Aerodrome for this year's Rush Trophy Gala date on August 12th (contests will be Open Glider, Rubber, Power free flight and Control Line Team Racing to 1/4 A.F.I. and "B" specifications). Pre-entry fee is 2s. 6d. per event (double on the day) to T. W. Liddel, 58 Beatty Avenue, Jesmond, Newcastle-upon-Tyne.

Easter Sunday was the season opener for SCOTLAND's Glasgow Hornets M.A.C. whose Combat comp. attracted entries from Prestwick and Alloa clubs. The *Peacemaker* was popular, and eventually winner in the hands of Hornets' Ian Carson.

Several decisions were the result of MODEL AERONAUTICS COUNCIL OF IRELAND A.G.M. held in Dublin on April 7th. Affiliation fees for instance were reduced to 7s. 6d. in an effort to gain a larger membership. F.A.I. team selection procedure has been settled, the team to be picked on the results of eliminator trials only and overseas members will be invited to fill positions only in the event of lacking home talent. The latest S.M.A.E. 1/4 A Team Race rules have been adopted for 1962 though there are slight alterations. The Control Line Nationals will be held this year on August 19th and Free Flight Nats. on September 19th. English competitors are warmly invited and if early notification is received, accommodation could be arranged for the weekend. Could be worthwhile fitting in a holiday you know. Anyone interested should contact the new M.A.C.I. Secretary P. Brennan, c/o Royal Bank of Ireland Ltd., Dundalk, Co. Louth, Eire.

From the SERVICES, we hear that a new A.I. Glider record has been set up in the last R.A.F.M.A.A. Postal Contest. At Idris in Tripoli an A.I. went out of sight after a flight of 12:07. On the same day a K.K. Caprice flown at Changi, Singapore, by F.E.A.F. representative F/O Howlett was in sight after 32 mins. but the flight was not officially timed to its conclusion.

The Rat Race organised by F.A.S.T.E. and R.A.F. Halton Apprentices was flown off at Halton on May 6th. Senior event attracted ten entries topped by Swatek of F.A.S.T.E. with a time of 9:36. For the junior event there were 14 entries who were fast but some eliminated themselves in practice before the last race. However Dodds was not one of these, and won in 9:45.

Pen pals

For Julian Harris Jr., 1708 N. Davis St., Pensacola, Florida, U.S.A., who wished to write to a British model club. For Jaroslav Voreb, Halingradská 10, Teplice, Czechoslovakia, who wishes to exchange copies of Czechoslovakian magazine *Letecký Modelář* for AFROMODELLER. For Frank Gilchrist, 51 Marylee Park Avenue, Giffnock, Glasgow, age 16 and a keen control line flier, who wishes to exchange ideas with a French modeller. For R. Potter, 39 Victoria Embankment, Nottingham, who wishes to correspond with a modeller in the U.S.A. aged 25-35. Also is there any modeller interested in F.F. Power and Glider age about 15 who will write to Vimal Kumar Jhunjhwal, P.O. Motinagar, Faizabad, U.P., India, a very keen enthusiast? That's about all this month.

THE CLUBMAN.

S.M.A.E. Contests

June 24th	Gamage Cup (U/R Rubber)	} Decentralised
	Pilcher Cup (U/R Glider)	
July 8th	Area Championships	} Centralised
July 15th	Control Line Speed and Stunt	
	SCOTTISH GALA	
August 5th	K.L.M. Trophy (U/R Power)	} Abbotsinch
	C.M.D. Trophy (U/R Rubber)	
	(U/R Glider)	
	Taplin Trophy (R/C Mono control)	
	Team Racing (Classes A and B)	
August 5th	Control Line Speed and Stunt	Centralised

Other coming events

June 24th	Wharfedale C.I. Rally. 1/4 A, F.A.I., B.T.R. Combat (R.A.F. Marston Moor). All entries 2/6 to C. Secker, 36 Rookwood Ave., Leeds 9.
June 24th	Bristol R.C.M.A.C. Rally, including Mono-Scale, Scale and Multi, R.A.F. Hullavington, on A429 Road, between Malmesbury and Chippenham, Wilts.
July 1st	Northern Heights Gala. All Classes, R.C. spot landing. Queen's Cup for F.A.I. Rubber. R.A.F. Halton, Bucks.
July 1st	Drogheda M.F.C. Control Line Rally. 1/4 A, B, T.R. Combat Scale. Butlin Trophy Award. Butlin's Holiday Camp, Monsey. Entry forms from P. Hughes, 16 Mary Street, Drogheda, Eire.
July 8th	High Wycombe C.I. Rally. Combat, Stunt, 1/4 A, F.A.I. T.R. Restricted entry. No spectators. R.A.F. Booker. Pre-entry 2s. 6d. to 102 Suffield Road, High Wycombe.
July 8th	Sutton Coldfield R.C. Rally. Single, Multi, Scale. R.A.F. Wellesbourne. Details, 791 Chester Road, Erdington, Birmingham.

International Postal Contest

Three way contest held on March 18th between N.Z., U.S.A. & G.B. THIS CONTEST ORIGINATED with a challenge put out by Stevenage M.F.C. to a club in the U.S.A., well known as the South California Aero Team, and a club in New Zealand, Upper Hutt Aeromodellers. The rules called for each club to have three men teams in A/2, Wakefield, and Power, the contest to be flown to full F.A.I. rules just like the Championship Finals. Whilst it was not expected that the results would be directly comparable owing to the distances separating the teams, and the vastly different climatic conditions enjoyed (?) by each country, nevertheless this was a great opportunity for club members to fly as an F.A.I. team and gain valuable practice for the coming season.

Strangely enough the weather turned out to be remarkably the same in all three countries, that is to say that in every case it was bad! There was a strong wind to contend with in New Zealand, rain in California, and of course both rain and wind here in G.B. However in these conditions the teams put up commendable times, even though each now claims it can do better next time!

It is interesting to note that six of the fliers have represented their Country at World Championships.

Results:—A/2									
Bob Van Nest	S.C.A.T.	3.00	3.00	1.58	3.00	3.00	—13.58		
Geoff Dallimer	Stevenage	1.54	3.00	1.56	2.34	1.54	—11.18		
John Brookes	Stevenage	2.46	3.00	1.00	2.15	1.41	—10.42		
John Malkin	Upper Hutt	3.00	1.00	1.48	2.10	2.43	—10.41		
Bill Cook	Upper Hutt	3.00	3.00	0.48	3.00	0.33	—10.17		
Dick Gildersleeve	S.C.A.T.	1.48	3.00	1.20	1.06	2.53	—10.07		
Don Hutchinson	S.C.A.T.	2.24	3.00	2.24	0.32	1.14	—9.34		
Brian Dowling	Stevenage	1.52	3.00	1.08	2.28	1.05	—9.33		
Welly Choy	Upper Hutt	3.00	1.43	0.50	1.26	1.55	—8.54		
Wakefield									
Geoff Dallimer	Stevenage	3.00	2.55	3.00	3.00	3.00	—14.55		
Jim Patterson	S.C.A.T.	3.00	3.00	2.33	3.00	2.46	—14.19		
Bill Cook	Upper Hutt	3.00	2.00	3.00	3.00	2.04	—13.04		
Bob Wiehle	S.C.A.T.	2.57	2.20	3.00	1.58	2.41	—12.56		
Milt Harker	S.C.A.T.	2.53	3.00	3.00	1.42	1.37	—12.12		
John Malkin	Upper Hutt	1.18	2.08	2.20	3.00	3.00	—11.46		
Bernie Mack	Stevenage	2.17	2.38	1.35	1.53	1.07	—9.32		
Pete Giggle	Stevenage	1.14	0.56	1.23	1.05	1.53	—6.31		
Ted Malkin	Upper Hutt	0.45					—0.45		
Power									
Geoff Dallimer	Stevenage	3.00	2.44	3.00	2.45	2.39	—14.08		
Bernie Mack	Stevenage	2.10	2.46	3.00	2.43	2.54	—13.33		
Craig Cusick	S.C.A.T.	2.41	3.00	2.21	2.26	1.56	—12.24		
Bill Hartill	S.C.A.T.	2.57	2.22	2.22	2.25	2.08	—12.14		
Jim Trego	S.C.A.T.	1.48	2.12	3.00	1.58	2.13	—11.11		
John Crombie	Upper Hutt	1.46	1.52				—3.38		
Team totals									
S.C.A.T.							108.55		
Stevenage							90.12		
Upper Hutt							59.05		

Extracts from Club reports:
S.C.A.T. (See picture, page 345)

It was a strange day for South California contests. Rather cool (about 50 deg. F.) with a very light drift that constantly changed direction. The whole mess was covered with a thick layer of clouds, and light rain came and went throughout the flying. As the cloud cover got thicker and blacker by the minute, it was almost certain to come down really hard soon so we started flying about 8.30 and rushed through as fast as possible. We wrapped it up about 1.00 and luckily because shortly thereafter it started to rain in earnest. Most of the team members did not feel they were in top form (or perhaps this unusual weather caught them with their thermals down!) Upper Hutt

Weather was fine and sunny but with a fairly strong wind. In Wakefield Ted Malkin stalled all the way down and split his nose block and didn't have a reserve model. During the A/2 rounds the wind was taking the models 1200 yards on a max. All three of us broke parts of the models, but Welly Choy repaired his by gluing a piece of 1/4 by 1/4 along the L.E. of his stab and went off to score a max. His theory now is "sections don't matter, it's the thermals that count". The less said about Power the better. John Crombie's Saturn was partly trimmed, and although it showed promise, it obviously needed more trimming. On the third flight he launched crosswind and wrecked the lot, including the K.B.15. Even though we didn't have the best of days, we thoroughly enjoyed ourselves and would like to repeat the event, perhaps in late October.

Stevenage
The wind was light in the morning up to about 11.30 a.m. when it gradually rose to moderately strong. The temperature didn't rise above 40 deg. F. all day, we had a couple of light snow showers and a shower of rain during the afternoon, these were interspersed by bright periods when the sun broke through the cloud between the cold fronts, as someone remarked, "Typical British contest weather"! Unfortunately we had a further setback apart from the weather when Alan Payne drove his car over his Wakefield model! We started flying at 10.30 a.m. and finished at about 6.00 p.m. We all had our little troubles like broken prop blades, cracked wings etc., but needless to say that half our trouble was that we weren't properly prepared! But then we have had neither contests nor trimming weather for nearly six months now. Anyway it was a good start to the season and we are determined to do better next time, all the lads enjoyed it and look forward to the return!

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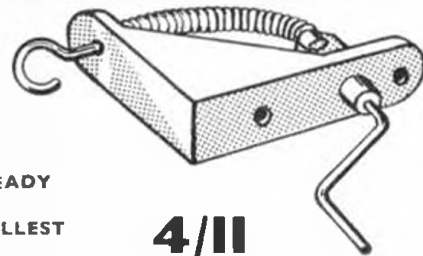
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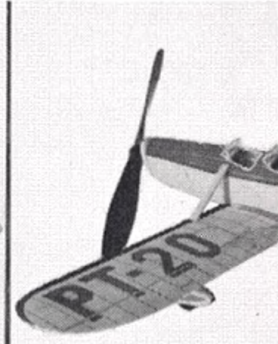
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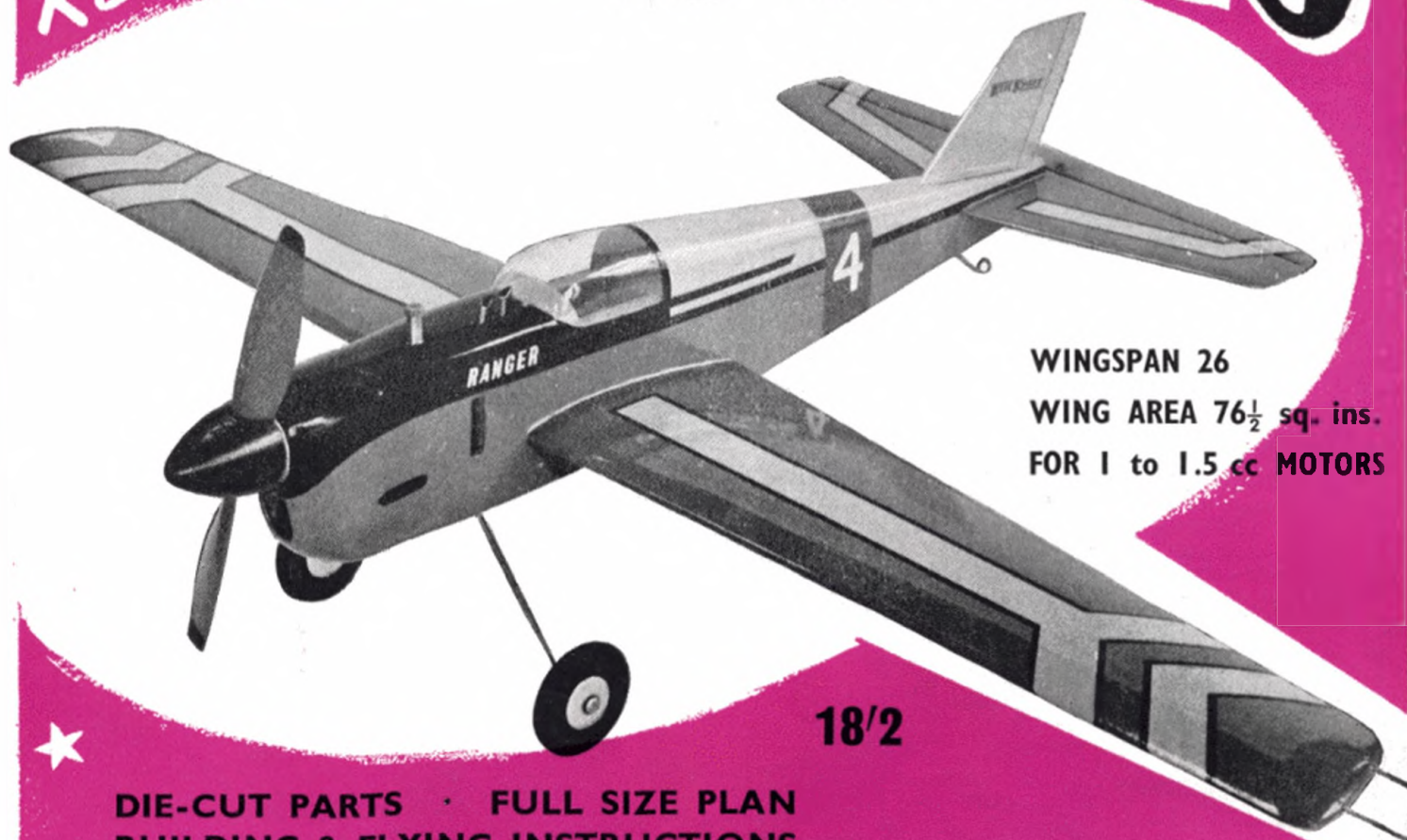
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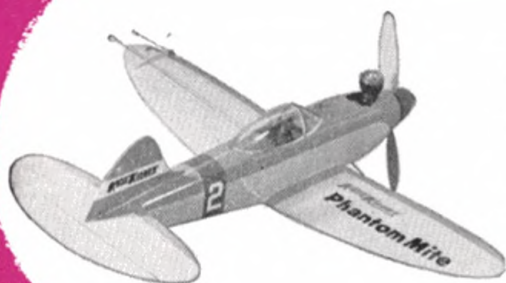


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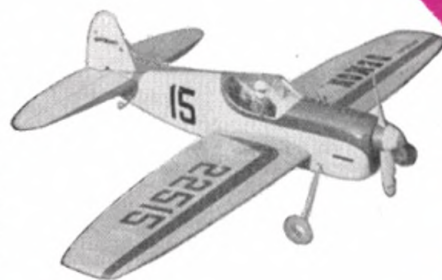


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