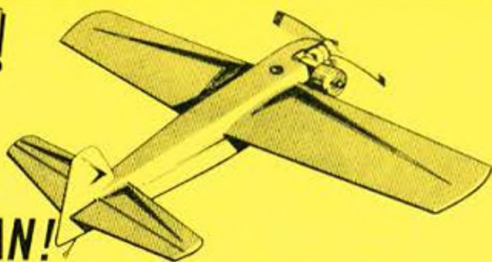


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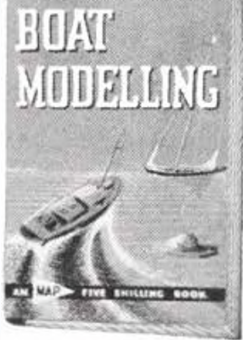
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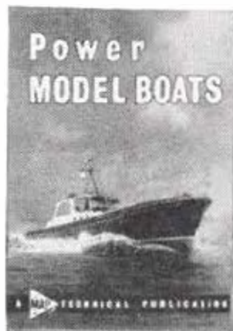
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AERO MODELLER

MAP HOBBY MAGAZINE

April 1965

VOLUME XXX No. 351

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cover

Monster model at the 1961 U.S. Nat's was this Lockheed Electra II by Earl Carpenter of Sepulveda, California. Powered by four Super Titans the model is to 1/35th scale with a span of approximately 81 in. It made its first flights during the contest and due to the heavy weight Mr. Carpenter deemed it advisable to use a leather wrist strap attached to the control-linr handle for safety. The model was extraordinarily impressive in flight as can be fully appreciated from study of this fine colour photo by Gordon Muddison.

next month . . .

Leader in the British Power Team Trials was Joe Savini of Liverpool and his Faical Mark III design. As we go to press, it seems unlikely that Joe will be able to travel to Finland in July, but anyway readers will be able to enjoy his A.P.S. Plan. We shall also have full details of the leading Czechoslovakian Team Racer as flown by Trnka for designer Milan Drazek into 2nd place at the 1964 World Championships, Budapest. Their "Orion" has many unusual design features. Full details of our Coupe d'Hiver contests including the Anglo-French challenge in Paris, a pictorial report on the New Zealand Championships, and further news of new kits and accessories revealed at the Trade Shows will combine with many other interesting features for your enjoyment. Extra to the issue will be a 16 page pull-out booklet on "Choosing your Engine". This detailed catalogue of British engines will be fully illustrated and presents for the first time, a comprehensive survey of the wide variety of power units available from British manufacturers.

other modelling angles . . .

April issue of **Model Cars** features the amazing Japanese Honda racing car with first drawings to 1/32nd scale plus photos. Other cars in detail are the Corvair Monza G.T. and the Cooper Zerex in two versions. Track reports, racing car show guide, Toy Fair news, latest trends, plus a 16 page booklet on building model cars with body shells make it a fine issue.

In April **R.C.M. & E.** a 16 page booklet is included for a simple trouble free and interference rejecting single channel receiver. This design by Derek Olley will be widely used by the club men. Review of the Orbit Propo outfit with flight experience report and circuits, latest trade news, and conversion of the Monogram Jaguar "E" Type to R.C. complete a fine edition.

In April **Model Maker** a scale model of the Ford Class naval craft with a length of 19½ in, beam of 3½ in, has plenty of scope for miniaturised radio control and appears full sized. Other April articles include two Japanese tanks; more on vane steering; casting and painting of model soldiers; the last German "A" championship; together with continuations of last month's off-shore power boat racer; metal construction, plastics, etc. Drawings include a Tilbury ferry, the liner Winchester Castle and a Roman corn ship.

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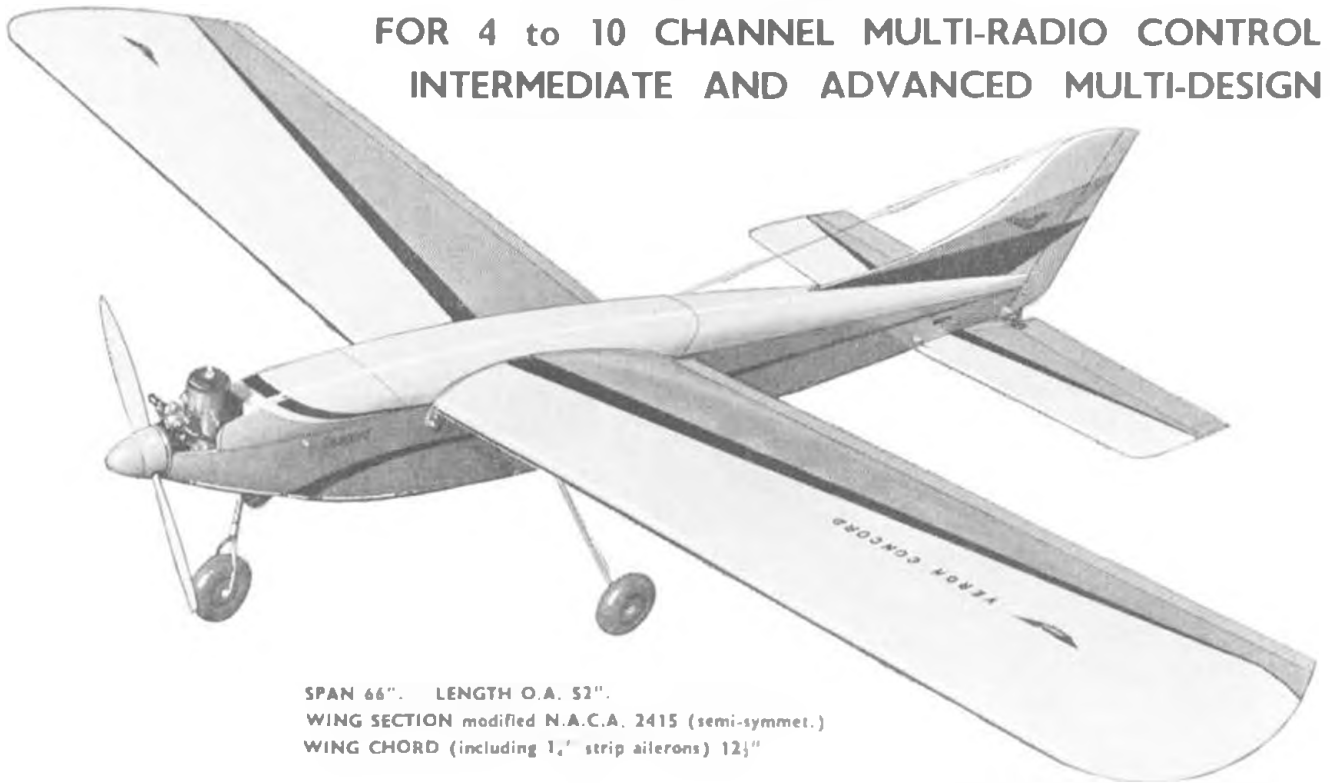
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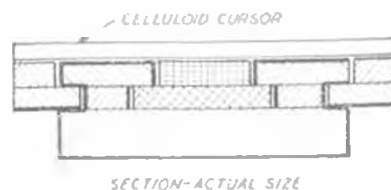
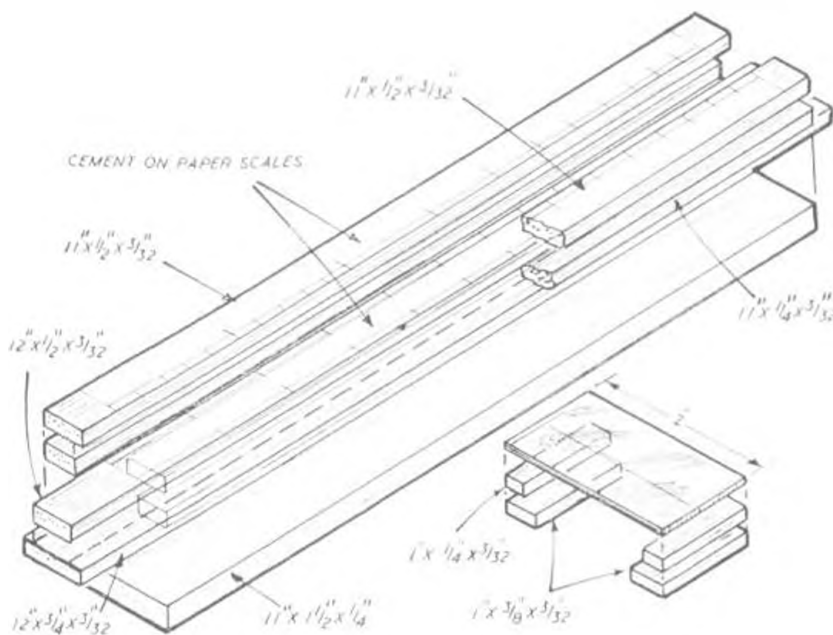
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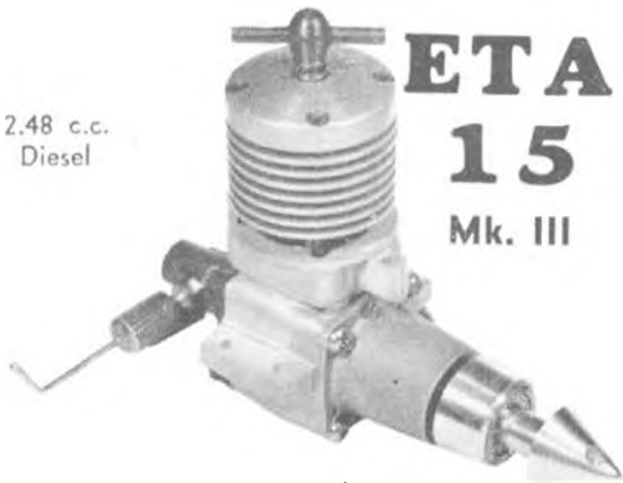
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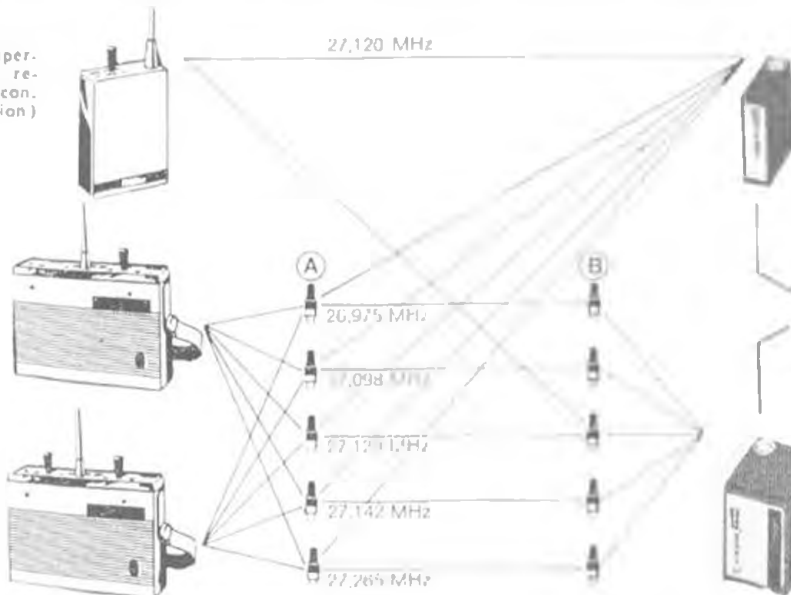
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A French jet Helicopter was used to film the aerial races in scenes for the 20th Century Fox film "Those Magnificent Men in their Flying Machines" and in this picture we see how it was done. Note the mechanic who failed to let go of the Roe Triplane. Animated by model type rubber motor drive in his limbs the dummy produces one of many hilarious incidents. Full details of the locations of model contests for aircraft used in the film will be announced next month, meanwhile lists of data packs to help entrants are available from the editorial offices. Contributor Francis G. Boreham already had his own Demoiselle model while the film was being made and is seen at right comparing his miniature version with one of the replicas made by Personal Plane Services of White Waltham, Berks.



Heard at the HANGAR DOORS

Coupe d'Hiver Challenge

Second of the British team visits to Paris for the annual Coupe d'Hiver rubber-driven model contest organized by our contemporary *Le Modele Reduit d'Avion* proved to be yet another wonderful occasion from all aspects. We shall be reporting in detail next month. Leading British places among the 155 entries were J. O'Donnell—4th (22 secs.), Dave Hipperson—7th (313.9), Geoff Dallimer—15th (291.5).

The event was won for the second year by Alain Landeau from Paris with the only perfect score. Moreover Alain placed 2nd, 10th and 37th with his three other models. A truly champion performance which established him as a leader in Coupe d'Hiver.

February 28th proved to be one of the finest flying days of the winter, very calm in England and France so that high times have been recorded in the *Aeromodeller* postal international event, results of which will be published next month. 128 entries were registered from Germany, the United States, Aden and Great Britain in our contest. Dave "Rolling Stone" White was top scorer with 360 = 48 secs.

York Tragedy

At a York inquest on a 14 year old boy who was electrocuted (as reported last month) when his diesel-powered model came in contact with high voltage overhead conductors the youth's elder brother said he had never seen warnings about the dangers of flying near overhead cables in model flying literature.

The question was put to him by Mr. C. W. Robinson, for the Yorkshire Electricity Board, who also told the York City Coroner, Mr. James N. Ware, that the Board had a great deal of correspondence with local education authorities in its area, drawing attention to the dangers and had sent out warning notices

for display in schools.

The Coroner, returning a verdict of "Accidental Death", said he understood that as far as possible attention was drawn to the danger of flying model aeroplanes near high voltage cables. "This, I am afraid, is a very vital example of not complying with the warnings that have been given and can only act as a further warning."

The dead boy was Peter Charles Brown, Church View, Appleton Roebuck, near York. He went with his elder brother, John Albert Brown, tyre fitter, with whom he had lived, to fly model aeroplanes in a field where they had been before.

The brother said he had never thought about the danger, and told the Coroner he had not seen the notice on the poles bearing the cable which said "Danger, live wires". He said normally the models flew at about 5 or 6 ft. above the ground but, possibly because something was wrong with it, Peter's flew straight up into the air and the wire came in contact with the cable.

Since the inquest we have been in touch with the Yorkshire Electricity Board and have seen their leaflet on "Electricity supply and safety to children". The specific warnings which concern model aeroplanes are absolutely clear, although not pictorially emphasised. These leaflets were distributed to schools for teaching staff to verbally instruct children and may not have sufficient prolonged impact.

It seems to us that here is a clear cut case for the Electricity Council to consider the issue of a display poster perhaps on the lines of one already in circulation in Canada.

FLY WITH CARE, AVOID POWER LINES

Chobham Bisection?

Plans have been announced for construction of a motorway connecting Popham and Sunbury Cross which will effectively cut the vast area of Chobham common, Surrey into two parts.

The highway will of course speed traffic flow from London to the South but at the same time it will undoubtedly severely restrict the amount of aeromodelling currently enjoyed in these parts.

Two 36 ft. carriageways will sweep across the common for high speed motoring and their path will cross the area adjacent to that used as a car park for the aeromodellers. Such motorways prohibit pedestrian access and indeed the very hazard of crossing an unlimited speed motorway should be sufficient to deter even the most foolhardy modelling retriever.

Is Chobham doomed? The date for appeals is now passed and it remains to be seen as to exactly how long it would take for financial allocations to be made to complete the project.

Noise International

Circulation of a comprehensive enquiry by the Academy of Model Aeronautics (U.S.A.) to all aero clubs and engine manufacturers in the world indicates the concern of the Academy for a realistic approach to the noise problem.

A Muller Committee headed by John K. Ross is currently studying the situation and its terms of reference is that it is to recommend where mufflers are unnecessary as well as where they can be applied to great advantage.

Gen Sheets

We have just compiled our 1965 listing of international Aeromodelling magazines including those which deal with full-scale aviation matters, and include occasional aeromodelling features. Forty magazines are listed and appended to this list are 10 useful organizations for those with aeromodelling interests, including the various historical societies, experimental aircraft groups and the Plastic Modellers Society.

In addition to this list we have also compiled our 1964-65 register of 77 club news letters as received from 10 countries. Those interested in obtaining copies of these information sheets will be supplied on receipt of a postal order value 1-6d. together with a stamped addressed envelope for prompt return. Inevitably, no sooner do we duplicate such details than additional information comes to light. Latest of the news letters is *Internationalist* a well-printed information sheet issued by Mike Segrave, 6440 Decarie Boulevard, Montreal, P.Q., Canada for an annual subscription rate of \$2. It deals exclusively with I.A.F. Free Flight matters carrying information on airfoils and latest designs.

A worthy Society which we must add to our lists is *The Shuttleworth Veteran Aeroplane Society* of Old Warden Aerodrome, Biggleswade, Bedfordshire. Membership of the Society allows one to have free access to the renowned museum of historic aeroplanes, to use the library by appointment and to obtain advice and information as well as to receive regular editions of a newsheet. There are four classes of subscription costs according to the benefits required, beginning at one guinea per year. Application forms for membership are available from the above address.

We hope to be able to arrange a competition for scale models of the *Magnificent Men in Their Flying*

Machines subjects at Old Warden Aerodrome during the summer and for it, the Shuttleworth Collection has generously offered a special prize of five guineas for the highest scoring model of a Shuttleworth aeroplane which implies the Blackburn 1912 Monoplane and the Deperdussin.

Open days for the Shuttleworth Collection this year are to be May 22nd, June 19th, July 17th and August 14th. Subject to weather, aircraft in the collection are spiritedly flown. The Bristol Fighter and Avro 504 impart a memorable impression on these occasions and we thoroughly recommend all scale minded readers to make a note in their diaries not to miss the opportunity of seeing these marvellous machines in the air.

Magnificent Flying Machines

Response to the announcement last month of a scale model contest in connection with the 20th Century Fox's *"Magnificent Men in Their Flying Machines"* has been much more than encouraging. The interest displayed in these veteran machines gives rise to expectation of an impressive entry at the following competitions. The first is to be incorporated within the S.M.A.F. all scale meeting at R.A.F. Hemswell, Lincolnshire on May 9th. Others are to follow, including one at Old Warden as announced in the previous news item. A complete list of our data packs for each of the 12 eligible aircraft subjects is available on application from the editorial offices. They range from the strange Rhomboidal at 1-6d. for a two-view plan, to 8- for extensive detail on the Bleriot and variants. The competitions are to be arranged for Radio Controlled, Free Flight, Control line and Static replicas of machines used in the film.

Nats Innovations

The British National Championships to be held over Whitsun at R.A.F. Ouston, Newcastle upon Tyne will introduce two notable types of award.

The Nationals will have, for the first time, individual champions in the junior (up to 16) and senior classes. These are to be awarded the A. F. Houlberg Memorial Junior and Senior Trophies. The competition will be based upon a points system similar to that used in other National Championships overseas.

For those who do not aspire to top contest success at the nationals, an *Instant Merit Certificate* system for all classes of modelling is to be worked on a trial basis at the suggestion of Mrs. Freda Shirt, secretary of the North Sheffield Club. Details have yet to be forthcoming but in brief if you make three qualifying flights superior to the minimum performance required for the certificate, you will be able to claim instant issue of a merit certificate on the airfield. This will be a handsome trophy to return home with, and to establish your qualifications as an experienced owner.

French Pioneer Passes

With the death of Marcel Lanot (age 59) at the end of February, France lost one of her most influential and original model designers. Marcel and his son Gerard were control-line pioneers in Europe as well as being most proficient in other classes of aeromodelling. The model making establishment of Lanot was much respected and the loss of this personality will be felt by all French speaking aeromodellers.



OLD TIMERS FLY AGAIN



AUSTRALIA : Far left, 23 year old flying boat designed by Jim Fullarton made a 1 min. 17 sec. flight off water and won a Victorian Old Timer event in novel manner. First flown with a Baby Cyclone it now has a modern O.S. 15 as its fifth engine having been flying on and off since it was first initiated in Sydney harbour. Span 66 in., weight 2 1/2 lb. Andrew Fullarton stands by in calm water. Other model is Ford Lloyd's "Answer" another 1940 design originated by Scotty Murray and here flown with an O.S. Pet.

REMINISCENCE always has its pleasant moments and there is a very fine way of turning thought into practice with aeromodelling by construction of an early model design.

What constitutes an Old Timer? In the U.S.A. it is often a model designed or marketed as a kit before 1942. One could well call them "Vintage". British clubs have chosen younger designs, for example, the St. Albans M.A.C. contest earlier this year specified that designs should be pre 1951.

In either case the result reflects the current enthusiasm which has become international.

In the words of one American contest organiser, "The interest in Old Timer models is unbelievable. Words cannot describe the enthusiasm shown towards this type of competition. The models fly slower than present day free flight types and the fact that such a contest is not a rat-race may be another reason for the popularity. Contestants have a leisurely attitude and walk around looking over other models built and flown by other competitors".

This attitude is typical, we find. The charm of the early model with its complete contrast in flight attitudes to its modern counterparts gives the operator extreme pleasure. To some it is a challenge to return to early days and even to locate and use the spark ignition engines so fondly handled many years ago. But the contests are by no means restricted to power and in the rubber classes, we find such famous types as the "Dick Korda Wakeheld" placing first at the 3rd Annual Chicago Aeronauts Old Timer contest 1944 where the photographs at left were taken. At this meeting, the power classes were divided into engine capacity

U.S.A.: Two gents intently studying a "So Long" are Milt Burley the builder and Bill Engelhardt, the designer of this 1940 model which won the U.S. Nats in that year and is still capable of grand performance. Elliptical winged pylon about to be launched is a "Playboy Senior" built by Tom Stone with a McCoy 35 engine. The model just released is a "Comet Clipper" flown by Al Tratta with K & B 23 engine; one of the most attractive cabin designs but here lacking a nose cowling. Bottom and inset is Willard B. Smits's "A-Frame" twin pusher rubber model which was built as long ago as 1937 to win a Junior Birdman in that year. Same model still flies well despite its age and appears to be very well preserved.

sections of up to .20 cu. in., then from .201 to .30 (5 c.c.) and from that class upwards sufficiently to include the largest model engine sold - the Forster 99.

It is interesting to note that 16 entries (41 per cent) were with ignition type engines and they did not seem to have too much disadvantage as a long engine run was permitted. Outstanding incidents occurred when, for example, Ken Lilloy's "Buzzard Bombshell" flew off with a four minute engine run and though the dethermaliser popped at the three minute stage, the model was still descending with its engine running for the other minute. Tom Stone's "Play-boy" (see picture) had critical tail tip angle and when dethermalised, came down in a tight spiral only to be seen to rise again several times!

The picture of the 1937 A-Frame

twin pusher in the U.S.A. and the 1938 "Club Contest" design on this page show the variety of types one can use.

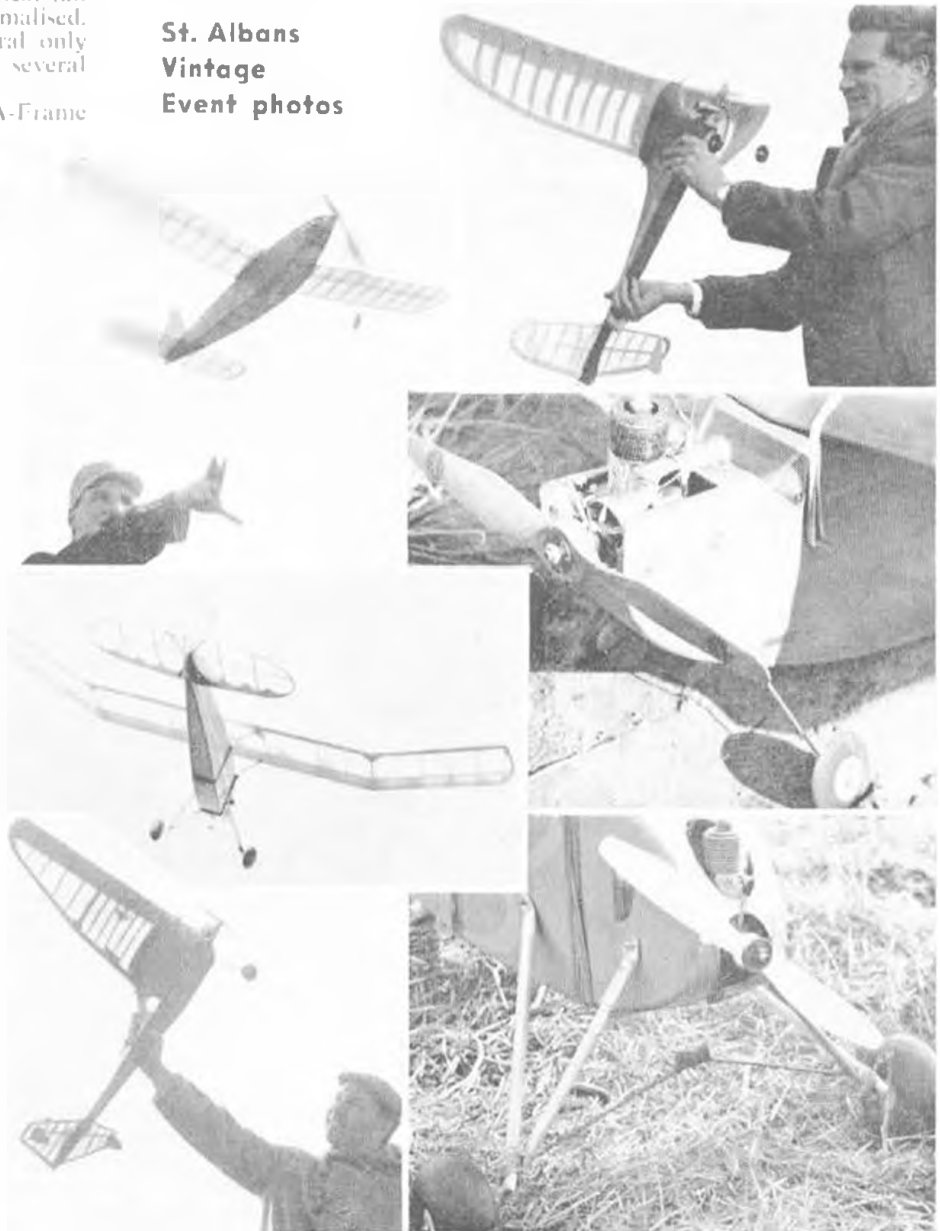
Although the large range of designs in the Aeromodeller Plans Handbook includes many of "Vintage" date, we do of course rotate our plans so that latest models replace those of earlier years. Modellers who wish to build any of the early designs can take advantage of our "X-list". This is obtainable from the editorial offices price 6d. and gives the initial date of publication together with general details of all the designs which are not included in our Handbook but which can be

supplied to special order on slightly deferred delivery as distinct from our normal 48 hour service.

Old Timer contests are not necessarily for sheer duration. Beauty or Concours d'Elegance events are also incorporated and this allows scope for the intricate colour schemes which were typical of the period. When all is considered, there is a very great deal to be said for the early model design which although in its day was rated as a contest type, is much closer to the "Sports" category of the present age and can be regulated to cruise around for fun or to fly for best possible duration as the flier wishes.

St. Albans Vintage Event photos

GREAT BRITAIN: At the St. Albans vintage event for pre-1951 models, many entries were considerably earlier in design date. Top right is a John Gorham "Thoroughbred" built by John Mayes of Bristol fitted with an Elfin 1.8 c.c. diesel. Immediately below, is a close-up of the 1938 Ohlsson 60 and 14 x 6 in. prop in Alan Mussell's "Gizmoe" originally designed by Gerry Brofman. The model had a fine climb and glide but suffered a hard fate when it glided through high tension power cables. Top left is G. Pink launching a "Club Contest" which was originally kitted in 1938 by Bristol Model Airport. Below is a fine flying shot of Noel Barker's "Mis Philadelphia" elegantly finished in blue and yellow scallops. A close-up of the nose with robust undercarriage and dwarfed Brown Junior engine is at bottom right. Winner of the St. Albans event was J. Leitch with a Shulman "Banshee" seen at bottom left. In this case also the engine was true vintage being an Arden .199 fitted with silencer.



IDEAL FOR THE 'MAG: MEN' CONTEST

1/8th scale — 44 inch wing span

BLERIOT MONOPLANE

Rubber power version

by J. M. GREENLAND

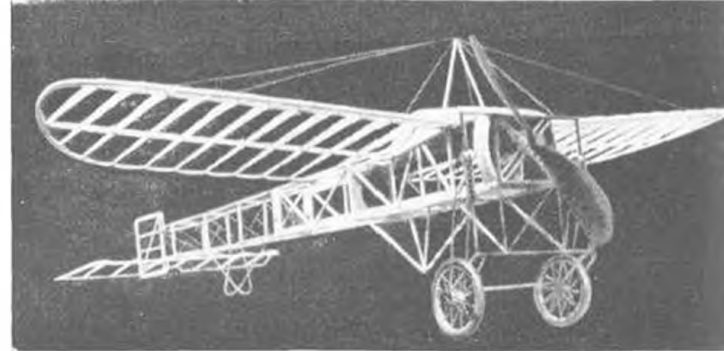
FOR THE TRUE LOVER of flying scale models, here in the Bleriot Monoplane is a machine that will offer endless pleasure. It is fascinating in flight, so slow that one can walk alongside it, and in every respect is the perfect replica of the famous machine it portrays. The basic design is for rubber power with the patented Moore Diaphragm, but for those who want to convert to power, the additional conversion sheet will be most helpful.

If the selected wood is lightly stained with Ronuk oak wood dye, then sanded to remove raised grain before any contraction begins, a weathered appearance will be built into the model.

Fuselage is a normal slab-sided construction, using 1/8 in. sq. balsa sanded down to 1/16 in. sq. Due to the open construction on most of the fuselage, care should be taken in wood selection, and building. For the power version the plan is followed with exception that the 1/8 in. sheeting is extended to the rubber motor peg.

If difficulty is found in shaping the last two bays, an alternative is to finish short on the bays containing the skid, and the final two bays are made by laminating 1/8 in. x 1/8 in. strip with P.V.A. then rear bays are completed. They are joined to the main fuselage by tapering the longerons so as to fit flush with aft section, then pegged and glued with 1/8 in. dowel placed parallel with the grain of the wood.

The uncovered rear part of the fuselage is braced with thread. Use Seccotine or any fish glue to stick the thread in place since it tends to pull out of



cement if it gets a hard knock. The thread should be varnished to prevent it from contracting.

For the rubber version note the angle that the thrust line makes with the datum line; it is therefore important to see that the nose former and the diaphragm are at right angles to the thrust line and not to the datum line. It is also important to see that the propeller shaft, the centre of the diaphragm plug, the motor peg are in a straight line.

The Moore Diaphragm

The centre of gravity on this model is at 50 per cent of the chord, and being of an extremely short nosed type it is necessary to keep the weight well forward. A Moore diaphragm with a plug in it is placed half way between each motor hook, the motor is not divided equally in halves but into two-thirds and one-third, the shorter piece going behind the plug and the longer piece going in front. The plug has a flange on it which prevents the short piece from pulling the long piece backwards. The motor then has two-thirds of its weight in front of the diaphragm and one-third behind, whereas with a normal motor, the weight would be evenly distributed either side.

Undercarriage

The horizontal cross members are cut from 1/4 in. three-ply and sanded to a stream-line section. The vertical members are of birch dowel.

This method of springing the undercarriage is exactly the same as that employed on the real machine, it is very efficient and never once has the undercarriage been broken although the model has hit the ground at a variety of angles!

Power version alteration is that the 1/4 in. birch dowel is completely sleeved with brass tube and fixed with Araldite. This also gives more efficiently sprung shock absorbers.



Heading shows the original by designer J. M. Greenland, using rubber driven with large diameter propeller. Framework view emphasises the structure. At left and below are two views of W. Kitching's version which appeared at the '63 Nats destined for radio control with all controls operating in the cockpit. We seem to recall that the engine was a Veco 19.



Construction of the wings and tailplane is perfectly simple except that the mainspars cannot be pinned to the plan on account of the undercamber. The angle of incidence of the tailplane is adjustable, but make sure that it cannot possibly slip or alter itself in flight as this leads to disastrous results. Extra spars are added to the power version for both strength and scale effect.

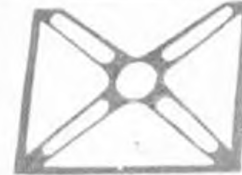
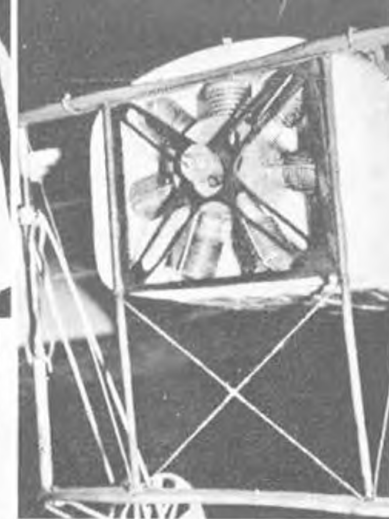
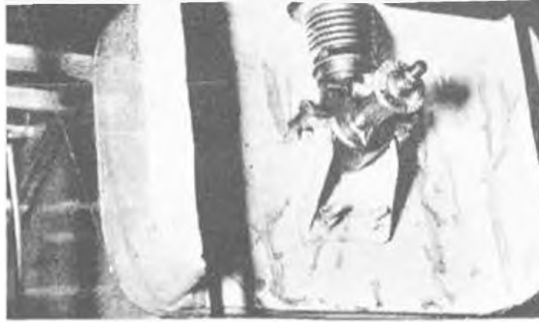
Power Nose Section

Motor former is from 1 in ply. No 1 former from 1/2 in balsa with cut out for access to bolts for aluminium motor mount. Mock cylinders and block are held in place by the needle being extended through to the side of the fuselage. The compression screw is replaced by a slotted screw so that it can be adjusted with a screwdriver, so avoiding an unsightly projection.

Finish

Clean up fuselage structure then apply two coats of dope taking care not to clog the rigging. Cover fuselage where balsa sheeted with yellow light weight tissue then dope lightly.

To give canvas and varnished wood effect, thin down some cream enamel paint adding a slight drop of black to "dirty" it, then apply a second coat from

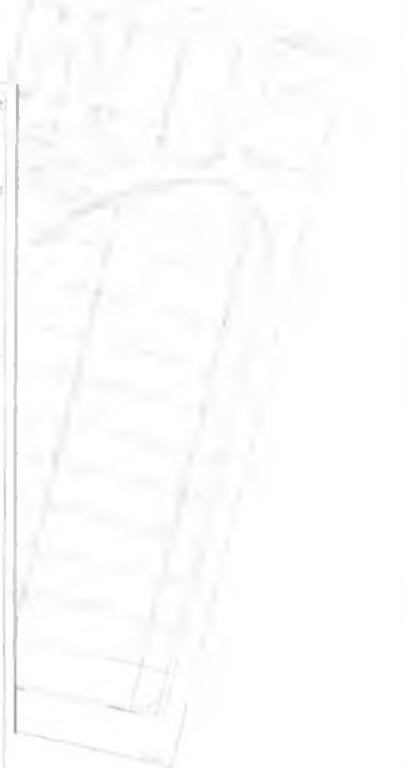
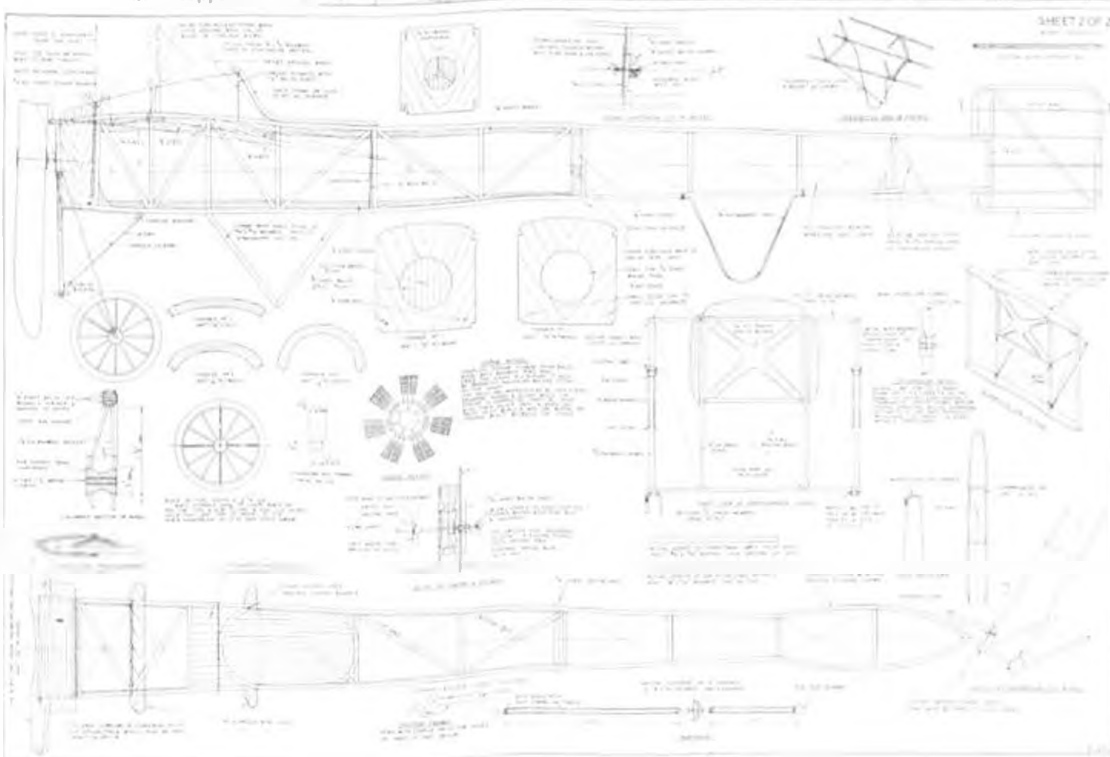


nose up to mid-section of cockpit. Wings and tail surfaces are covered with light-weight yellow tissue with two coats of dope on wings and one each on tailplane and rudder ensuring that the dope is thinned, otherwise there will be a risk of warping. Then a single coat of "dirty" thin cream enamel is applied. A few drops of turpentine applied at random (then allowed to run) with a slight touch of black paint added, which again is allowed to run, gives the effect of oil thrown from rotary engine on the nose area.

Illustrated instructions for building the rubber driven model are issued with every copy of the full size plan which is available through Aeromodeller plans service as ESP 275, price 7 including post. A specially prepared extra third sheet carrying power conversion details as designed by W. Forrester is available at an additional 2/6d.

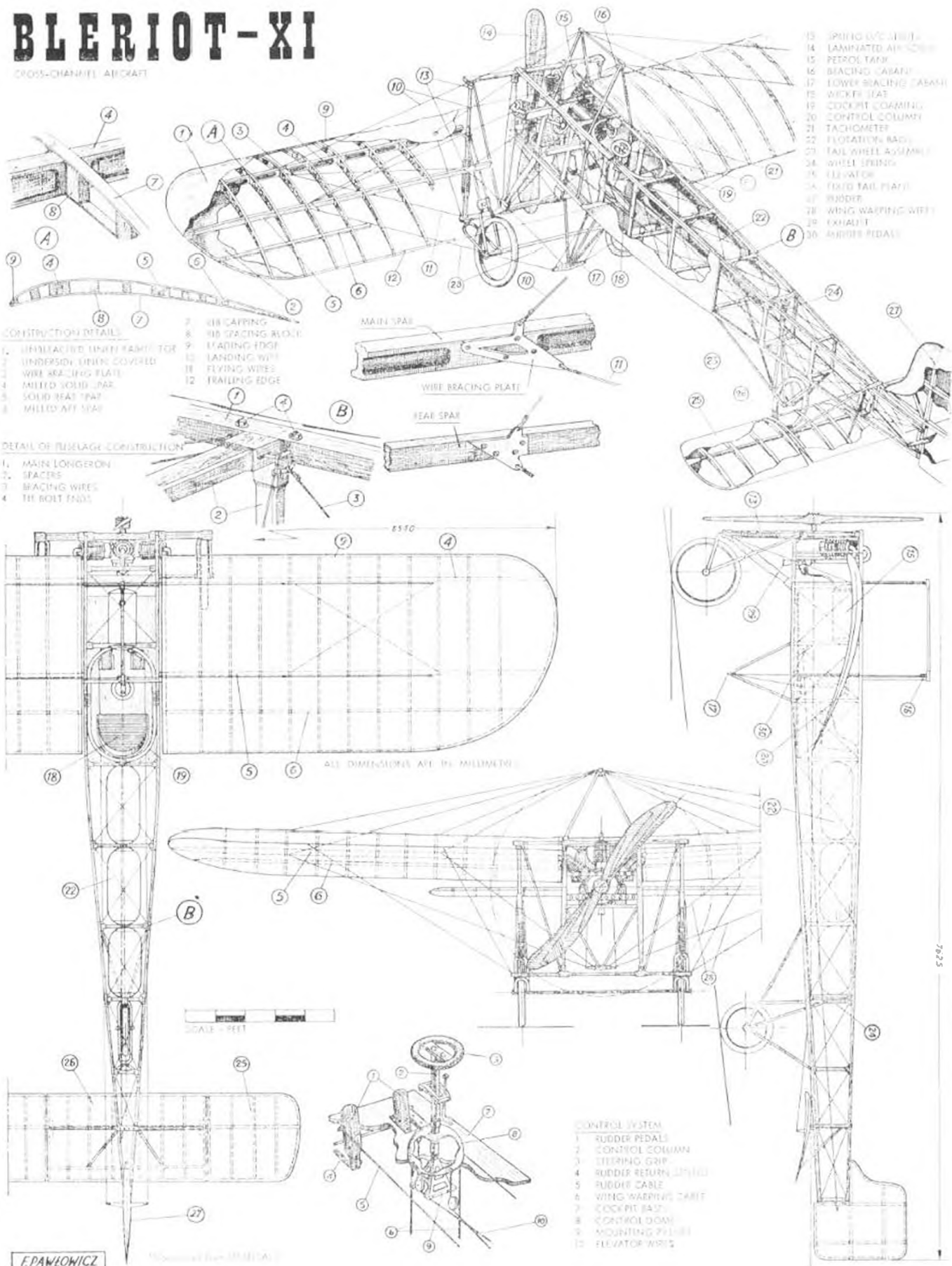
These 1/4th scale reproductions of the full-size plans illustrate the rubber power version. 3rd sheet now prepared carries details of free-flight power conversion. Price for rubber power plan ESP 275 is 7 inc post. Extra power sheet 2/6d illus. instructions are supplied.

Details of W. Forrester's model are seen above. His E.D. 46 Diesel is mounted on an aluminium sheet bearer (note oil stain effect) and then covered with dummy Gnome engine with front supporting plate added to give true scale effect as at top right.



BLERIOT-XI

CROSS-CHANNEL AIRCRAFT

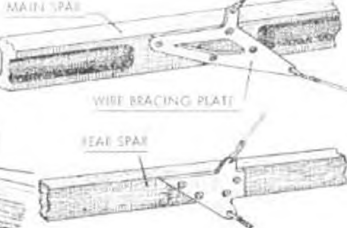


- 13 SPRING (V/C AIR)
- 14 LAMINATED AIR COVER
- 15 PETROL TANK
- 16 BRACING CABANE
- 17 LOWER BRACING CABANE
- 18 WICKER SEAT
- 19 COCKPIT COAMING
- 20 CONTROL COLUMN
- 21 TACHOMETER
- 22 FLOTATION RACK
- 23 TAIL WHEEL ASSEMBLY
- 24 WHEEL SPRING
- 25 ELEVATOR
- 26 TAIL FAN PLATE
- 27 RUDDER
- 28 WING WARPING WREATH
- 29 EXHAUST
- 30 RUDDER PEDALS

CONSTRUCTION DETAILS

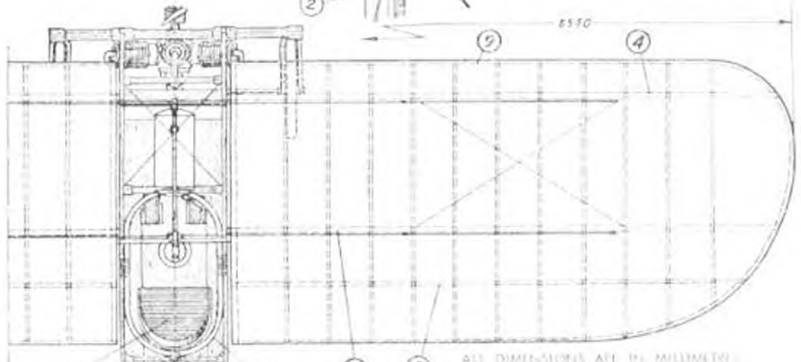
- 1 UNPERFORATED LINEN FRAME TOP
- 2 UNPERFORATED LINEN COVERED
- 3 WIRE BRACING PLATE
- 4 MILLED SOLID SPAR
- 5 SOLID SEAT TAP
- 6 MILLED OFF SPAR

- 7 WIRE CAPPING
- 8 WIRE SPACING BOLT
- 9 LEADING EDGE
- 10 LANDING WIRE
- 11 FLYING WIRE
- 12 TRAILING EDGE



DETAIL OF FUSELAGE CONSTRUCTION

- 1 MAIN LONGERON
- 2 SPACERS
- 3 BRACING WIRES
- 4 THE BOLT HEADS



ALL DIMENSIONS ARE IN MILLIMETRES



CONTROL SYSTEM

- 1 RUDDER PEDALS
- 2 CONTROL COLUMN
- 3 STEERING GRIP
- 4 RUDDER RETURN SPRING
- 5 RUDDER CABLE
- 6 WING WARPING CARB
- 7 COCKPIT SEAT
- 8 CONTROL DOWN
- 9 MOUNTING PULLEY
- 10 ELEVATOR WIRE

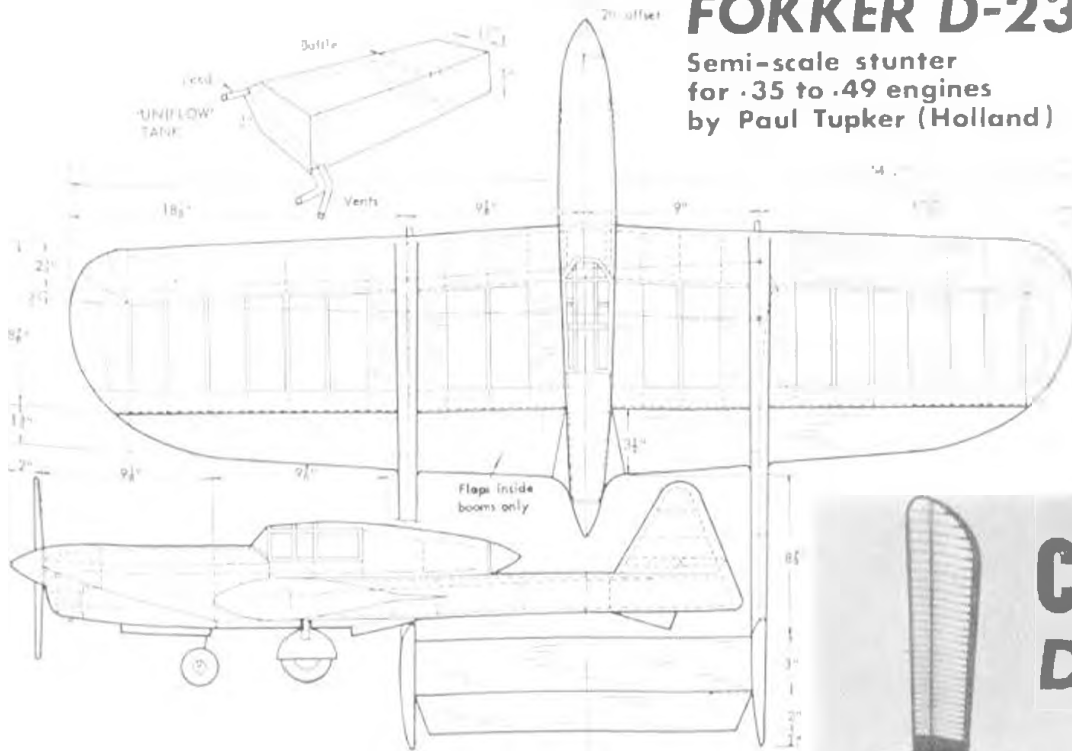
EPAWLOWICZ

Reproduced to 1/60th scale, this most famous of all the Blériot types is eligible for the scale model contests beginning in May, 1965, for subjects in the 20th Century Fox film "Those Magnificent Men in their Flying Machines".

FOKKER D-23

168

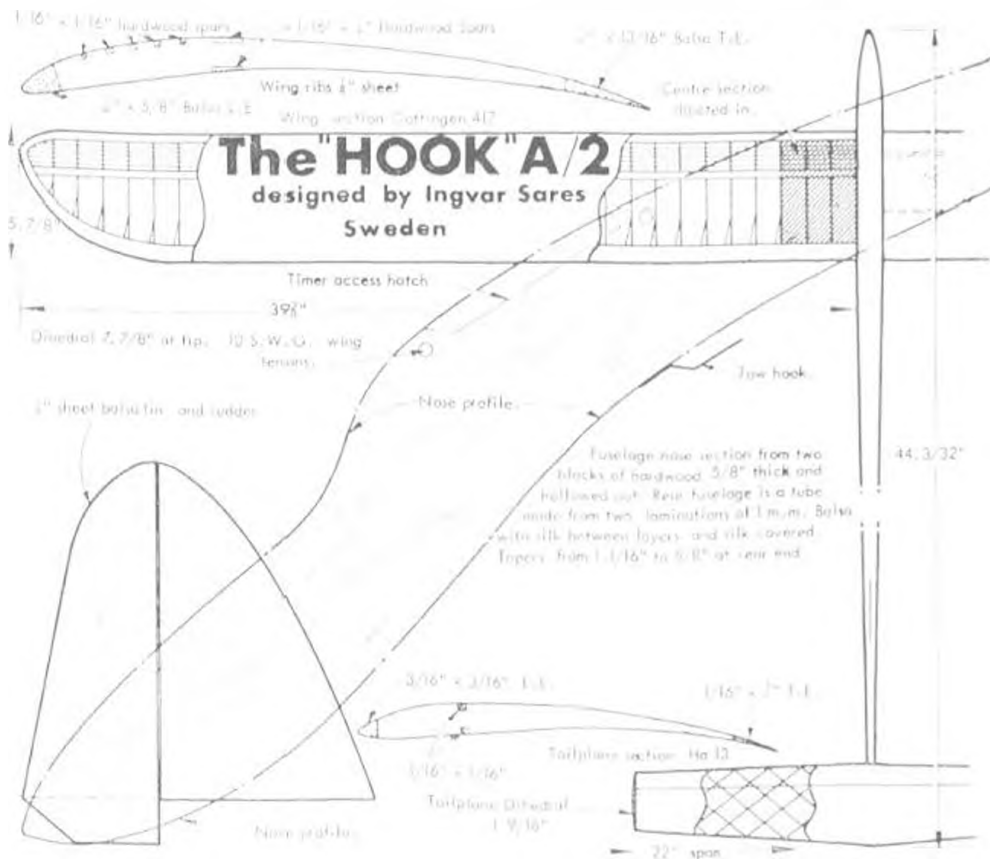
Semi-scale stunter
for .35 to .49 engines
by Paul Tupker (Holland)



POWERED by a 1/4 x 35 stunt engine. Paul Tupker's original Fokker D-23 model has a 50 per cent thick wing airfoil and restricts the flap area to the space between booms only. Note the liftline section this twin engine version would have to carry ballast in the nose to obtain a correct centre of gravity position.

HERE is a twin boom stunt model with a difference. It is semi-scale, based on the Dutch twin engine fighter and can be flown with either single or twin engines. Designer Paul Tupker sent us photos of his camouflage decorated original which looks most realistic and includes a pilot in the cockpit. Paul says that it is a most satisfactory model with better flying characteristics than he ever expected. He prefers it to the conventional Girondal designs he flew in the Netherlands team at the last World Championships.

contest DESIGNS

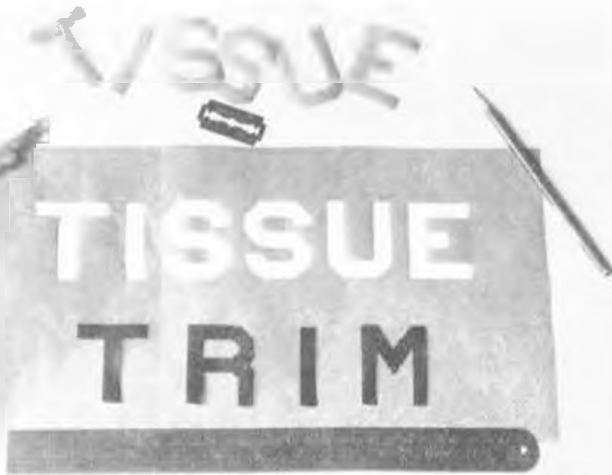


THIS SWEDISH A/2 Glider with appropriate name to describe its forward fuselage profile is by Ingvar Sares from Dalecarlia, Sweden. He was a member of the Swedish national A/2 Glider team at the World Championship in 1961, held at Leutkirch, W. Germany.

The wing is covered with light silk and has extensive use of surface spars to maintain the airfoil section in the vital first 35 per cent chord. The spars are said to give sufficient turbulator effect and the thread turbulator which is barely discernible in the photograph of the designer and his model above was found unnecessary. Tailplane structure is of the fashion we expect more from Italy with criss-cross ribs and has Japanese tissue covering.

An internal Latone clockwork timer works in conjunction with a fail-safe fuse to give de-thimeriser action by tipping the tail. (See page 185)

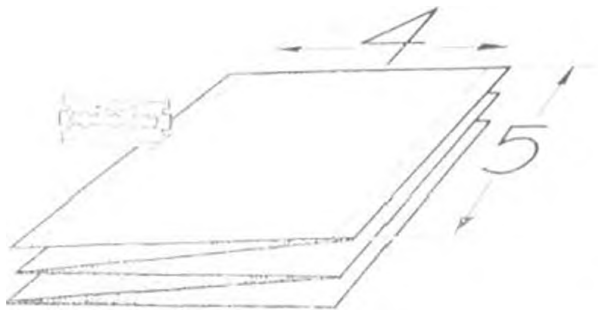
By Martin Dilly



DO YOU HAVE TROUBLE with S.M.A.I. numbers and lettering on your models? Do your results look scruffy and ragged or have that rustic look? If so read on. Even without any typographical training, your lettering can look neat, competent, and at least legible. And, in case you'd forgotten, the S.M.A.I. competition rules *require* that the contestant's number should appear in figures at least $\frac{1}{8}$ in. high on the upper surface of the wing and on radio transmitters. While it is quite in order to scrawl numbers grudgingly on your model with a suitable felt-tipped pen, one might feel a little out of place on some Central European airfield with those pretty Hungarian models all over the place (and they win the contests too, sickening!).

There are three main methods of lettering in general use, transfers, letters painted directly on to the surface of the model, and tissue letters doped on. These all have their applications, but so far people don't seem to have taken to tissue letters as much as their simplicity deserves.

For a colour doped model, transfers or hand-painted letters are to be preferred. Unless you are something of an artist, ornate, Gothic or other types of script are best avoided, as it's awfully easy to destroy legibility and ruin the general look of a model by using lettering you're not familiar with. A simple block or script lettering, apart from being far more legible, is a lot simpler to apply, and free from distracting wiggles and curves, in fact the simple and readable form shown is completely curveless and yet is quite attractive.



Fold tissue in the ratio of 4 to 5, then cut into rectangles for letter cutting. The 4 to 5 ratio copes with the widest letters and offers most economic use of this tissue.

The first thing to do is to decide on the height of the letters or figures to be used and the number you need; as a rough guide to proportion, the width of an average block letter plus its adjacent gap should equal its height.

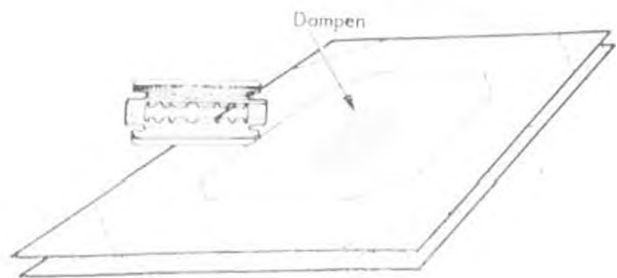
The next step is to find a sharp, preferably new razor blade or pointed modelling knife and cut a strip of wrinkle free tissue the same height as your letters; fold this zig-zagwise so there are a few more folds than letters, to allow for mistakes, and cut the vertical edges to give a pile of rectangles about 4.5 ratio. This ratio can be varied, of course, but should be somewhere near this figure for a reasonably balanced looking figure.

You should now have a small heap of tissue rectangles. If a letter is to occur more than once, pile the requisite number of rectangles together and dampen a spot in the middle to prevent them slipping while being cut out.

Now sketch the letters on to the tissue with a 2B pencil, either by means of a stencil, or by eye, using a straight edge. Then cut along the lines, being careful to cut right into all the corners, even going beyond the line a little helps to avoid stray wisps of tissue hanging on. It simplifies matters at this stage to cut all parallel lines at the same time, instead of following round the outline of a design.

For items like S.M.A.F. numbers and club names, that are frequently used, it's quite an idea to cut a stencil from heavy cartridge paper; this saves the labour of laying out the letters and figures each time they're needed. Don't forget that several figures are others upside-down or reversed, 6 and 9, 2 and 5, or with pieces missing, a 3 can be a modified 8, a P a carved-up R, a C an opened up O, an I two-thirds of an L. This also makes for uniformity of lettering. It helps during the layout stage to use a sheet of graph-paper under tracing-paper, as a guide. The tracing can be placed straight on top of the cartridge-paper and cut through, using a sharp-pointed modelling-knife and a steel straight-edge. Don't use a plastic rule or set-square, as it's only too easy for the blade to nick the edge, and the resulting blood spoils the letters.

The above method works fine if you're using a sharp blade, but there is a variation which helps if your blade is dragging at all; this consists of sandwiching the tissue between layers of newspaper.



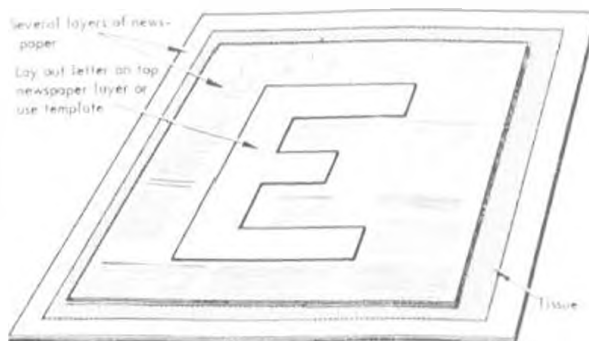
When cutting several layers of tissue at once, dampen in the centre to avoid them slipping under the pressure from the razor blade.

If your tastes run along more exotic lines, try Woolworths or a do-it-yourself store, you may find their metal or plastic house-numbering figures suitable. One way of using these is to dope several layers of tissue on to the figures and then cut around the edges with garnet-paper. This produces a neater result than a razor-blade. Then float the tissue figures off in thinners and lay them out to dry between sheets of glass, to prevent curling.

Magazine and newspaper adverts and titles also sometimes have suitable lettering that can be traced and used, and the layout diagrams in John Barker's article in the July 1964 *AEROMODELLER* are most helpful.

Another effective and simple method is the folded strip or Origami letter; here a narrow tissue strip is cut and folded as shown to produce a figure. This can usually be done most conveniently actually on the model, using the dope-brush on the folds as they are made, using a convenient spar or rib as a guideline.

By cutting pairs of figures out of contrasting colours of tissue, you can produce various shaded effects. A light-coloured letter on a dark background on such parts as fins and sheet surfaces can be produced by covering the surface first with the light tissue and then applying the darker over it, after cutting the design out of the darker before doping



on. If you have a long word or S.M.A.I. number and a small space to put it in, overlapping the figures gives quite an attractive result and still retains legibility.

Points to watch during doping: line up one edge of the figure first and, using fairly thin dope, start there and dope through the tissue. It's not very easy to alter the position of a design once it's doped through, so get the first edge on and the rest will fall into place.



1



2



3



4



5



6

Sketch on left shows how to sandwich the tissue between layers of newspaper if the blade drags. The newspaper helps to stiffen up the flimsy tissue and results in a cleaner cut.

At right, are 1 in. letters and numerals ready for tracing into tissue decoration for your model identification.

Various stages at left for differing methods of cutting letters or numerals from tissue are as follows: (1) The rectangles of tissue are piled up and the top one has the number or letter drawn on it (7 in this case) with a 2B or softer pencil and straight edge. (2) Cut the letters out when drawn by using a sharp blade and steel straight edge. Note that many letters will result from just this one cut. (3) For letters and numbers that are frequently used, draft the true shape on to cartridge paper and cut around this shape when laid over the tissue. This saves having to draw it each time direct on the tissue. (4) A simple method of cutting a strip of tissue and folding it over to form the letter when doping it on. This angular "Origami" style can be made to look most attractive. (5) A shadow or 3-D effect can be gained by cutting the number from two contrasting shades and mounting one opposite to the other. (6) Door numbers and sign letters make excellent templates for those who prefer a more curvaceous shape and dislike the task of having to draw them. Text describes an easy method of doping tissue to figures then sandpapering to cut shapes.



Brass or aluminium
lead out tubes

18 s.w.g. piano wire lead outs or heavy
weight Laystrate

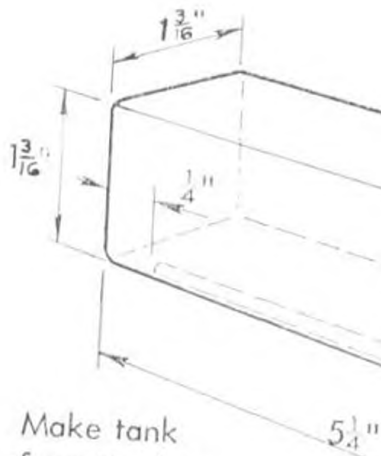
$\frac{1}{8}$ " hard balsa sheet
tailplane and
elevator

16 s.w.g.
elevator horn
rod

W5

W4

Eye dropper bottle top filling valve,
note slit in base.



Tube size depends
on diameter of
eye dropper
make a tight
fit.

Small
bore
pressure
line

$\frac{1}{8}$ " O.D.
feed pipe

Join line of $\frac{1}{8}$ "
sheet sides

16 s.w.g. p
tailskid, bot
plywood forr

**king
go rat**

**FULL
SIZE
PLAN**

King Rat



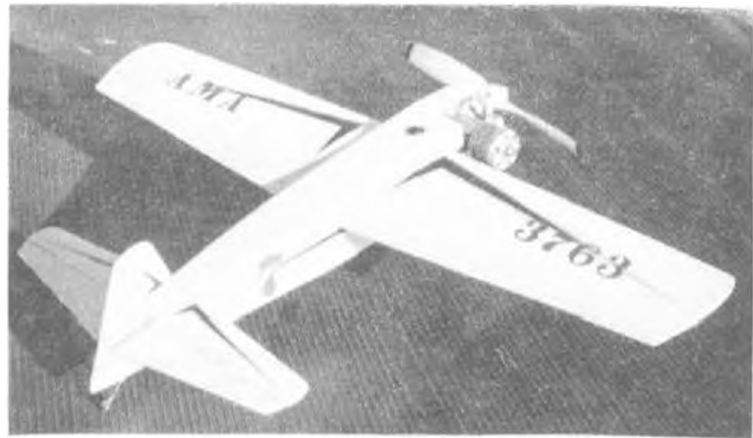
ALTHOUGH not as yet an official event in Great Britain, Rat Racing is becoming increasingly popular for club contests. Main requirement is a reliable .35 to .40 glow plug motor and simple rugged airframe that will absorb a lot of punishment and can be flown over grass. "King Rat" meets these specifications admirably in all respects. Nearly 36 have been built by the author and his clubmates starting way back in 1957, and to date "King Rat" has won or placed in the first three in all the contests entered, collecting almost 60 trophies.

As engine flooding is troublesome with upright mounted engines and inverted engines susceptible to damage in hard landings the sidewinder method was used for protection and the advantageous intake angle. The intake should just hold enough fuel from a prime with any excess running out, so eliminating flooding. Undercarriages take a real beating in Rat Racing, so make sure this is strong.

Construction is easy, provided that details shown on the plan are closely followed. Start with the wing by drawing the outline onto $\frac{1}{8}$ in. hard sheet. Glue into place $\frac{1}{8}$ in. plywood bellerank doubler, wing ribs and leading edge. Bevel the trailing edge then install bellerank, lead out tips and tip weight. The 16 s.w.g. piano wire push rod is now fitted and the top of the wing covered with $\frac{1}{8}$ in. hard balsa. When dry, sandpaper to the airfoil shown.

Pressure feed tanks are now being used almost exclusively in the U.S.A. so it is important to have a quick fill valve that is simple and inexpensive. To do this, obtain a neoprene eye dropper top and cut $\frac{1}{8}$ in. wide slit in the top. Araldite this upside down into the large filler tube as shown on the tank drawing. To fill the tank, fix a piece of $\frac{1}{8}$ in. dia. copper tube to the top of your fuel bottle making sure it is polished and free from burrs, then press it through the slit. When the tube is pushed through the slit it will open up a small area at each side to act as air vents, and self-seals when the tube is withdrawn. Naturally an engine with a large intake, running on pressure feed will use a lot of fuel so make your tank hold 2 to 4 oz. depending on which engine is to be used. It should be remembered that we only want to do 50-60 laps per tank fuel to get the required number of pit stops for 70 and 140 lap races. The author uses a large tank and only completely fills it when there is a two minute starting and warm up time, then at pit stops he only refuels for 55 laps.

The engine bearer assembly is the most important part of the construction and good fits are of great importance to strength. Cut the upper engine bearer



AMERICAN STYLE RAT RACER

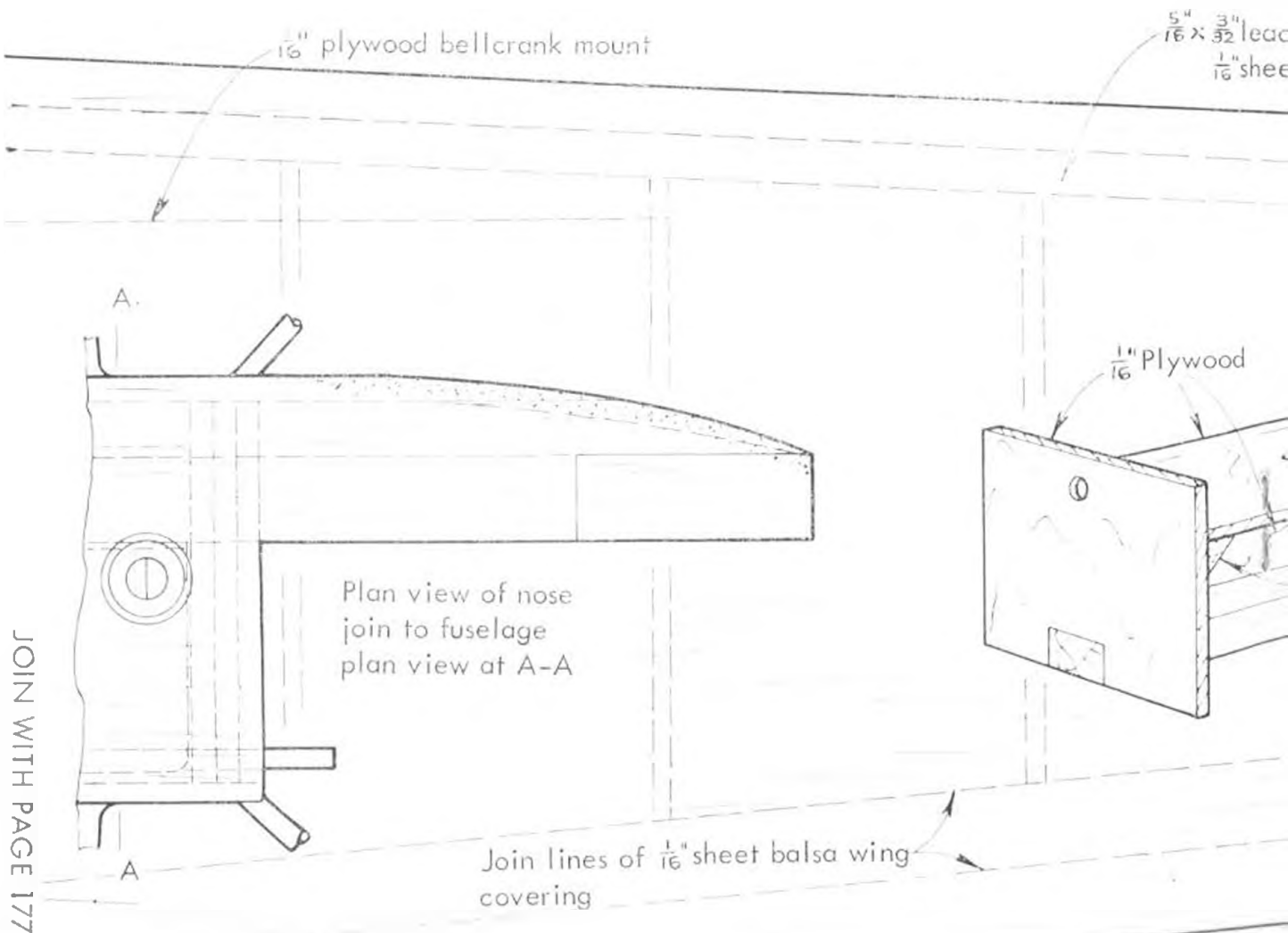
By THOMAS L. HAMBLET

to fit over the wing leading edge and glue the plywood U.C. sandwich in position. When set add $\frac{1}{8}$ in. plywood rear former and glue tank in position. Next add lower bearer and $\frac{1}{8}$ in. plywood stiffener plates. Make all bearer joints with P.A.A. Glue wing onto $\frac{1}{8}$ in. plywood stiffener plate and under top engine bearer. Cut $\frac{1}{8}$ in. sheet fuselage sides to shape and glue to bearer assembly. Make tailplane from $\frac{1}{8}$ in. sheet soldering mild steel elevator horn to 16 s.w.g. wire brace. Slide $\frac{1}{8}$ in. sheet fuselage former over pushrod then draw rear end of fuselage together and glue former in place. Connect elevator horn to pushrod and glue tailplane onto fuselage making sure it is square to the wing, and does not have any incidence. Bend 16 s.w.g. tailskid and sew to $\frac{1}{8}$ in. plywood former, then glue whole assembly inside fuselage. Next glue $\frac{1}{8}$ in. sheet fuselage top and bottom sheet in place and $\frac{1}{8}$ in. plywood fin. The fairing around the nose may now be glued into place and carved to shape. Sand the entire model and brush on one or two coats of dope. Lightly sand with fine sand-paper and cover the entire model with a good grade of silk or nylon. This is very important for strength. The connections for the "hot glove" are now epoxied into place if they are to be used. Mask the contacts and apply your favourite finish. It is worthwhile to remember that lighter and brighter colours are easier to see which aids in lap counting. Finished weight of the original model was approx. 20 oz. Version above has a Super Tigre .35.

The "hot glove" is an ordinary leather glove with two contacts sewn onto the tip of the thumb and index finger, these are connected by means of a wire running down the mechanic's arm to a battery in his pocket. When contacted with the pickups on the fuselage side (wired to the engine) the glow plug is activated. This of course means only one person is needed to service the model and help cut down pit stop time. "King Rat" is very stable and easy to fly and is virtually unaffected by wind. Take offs are easy in all conditions.

With a standard Johnson .35 King Rat should be capable of 100 m.p.h. using commercial fuel and an 8 x 8 nylon propeller. As the author flies some 7,000 ft. above sea level and gets this performance in the "rare air" most British modellers should achieve higher speeds.

By no means a design limited to hot racing, .35s "King Rat" has won some races using a .19 engine. Silencer position with the sidewinder engine is simplicity itself, since a downward facing exhaust places the silencer between the undercarriage legs.

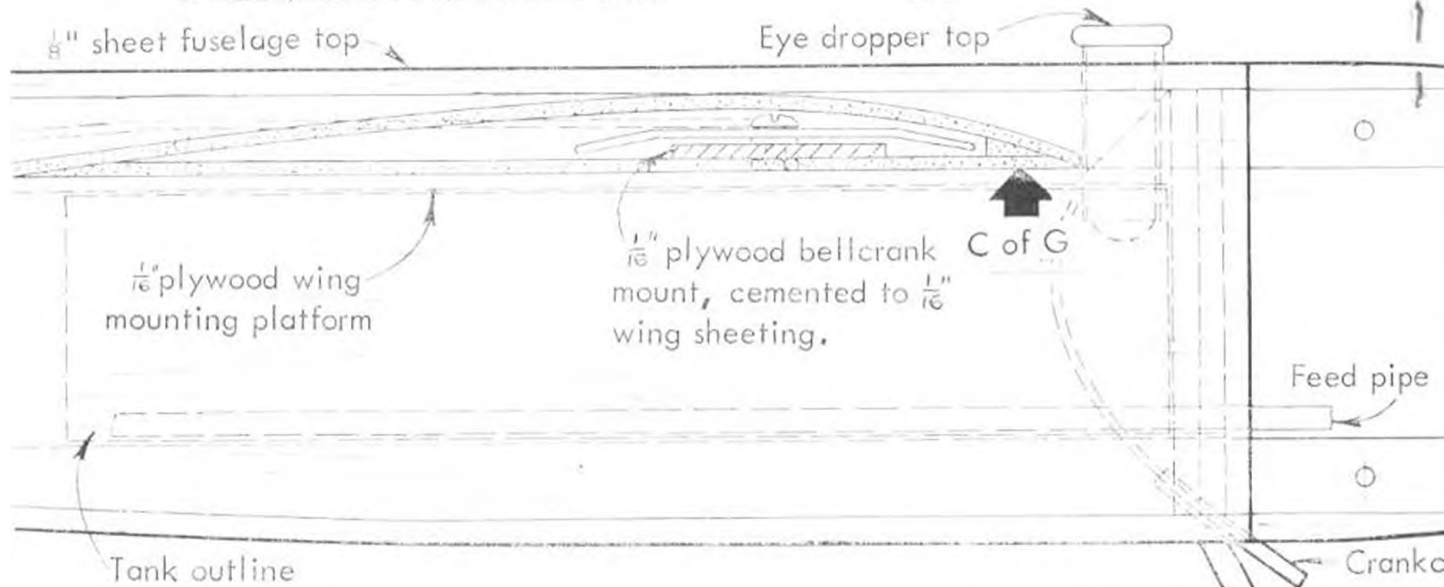


EXTRACTS FROM A.M.A. RACER RACING REGULATIONS IN U.S.A.

- A. Engine shall have a displacement of from .15 to .40 cu. in.
- B. Models shall have a fixed landing gear, and shall R.O.G.
- C. There shall be no restrictions placed on wing area, fuselage cross-section or fuel tank capacity.
- D. Engine spinners of any type shall not be allowed.

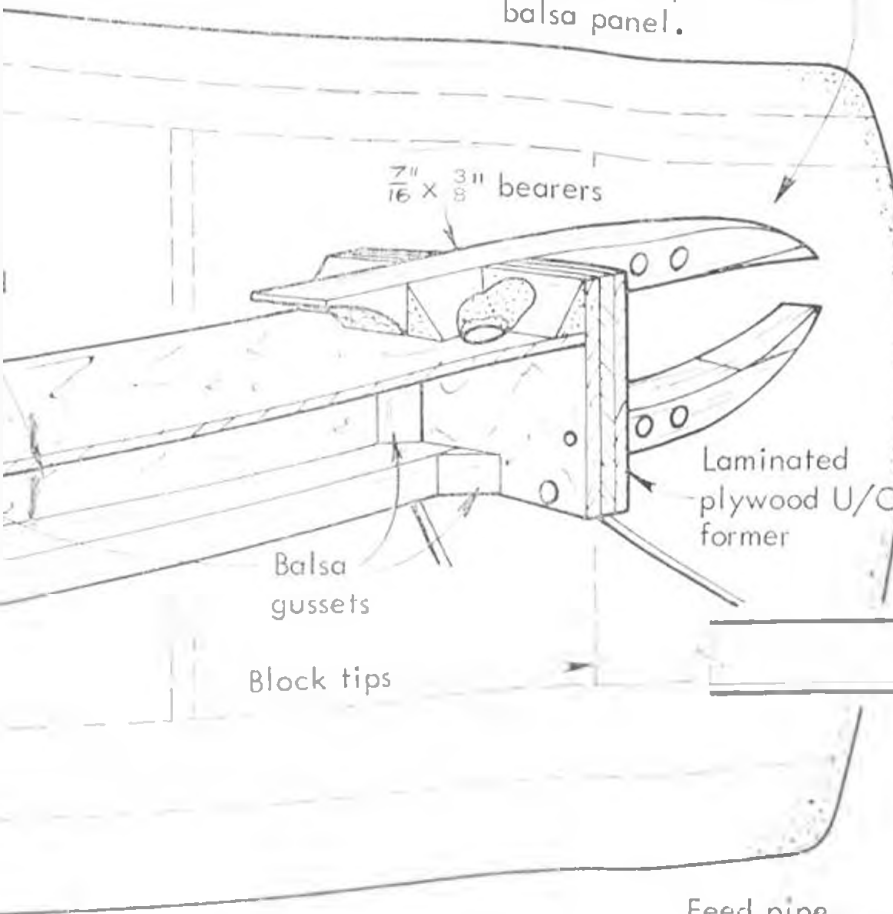
- E. Line length, measured from the centre line of the motor to the centre of the hand's, shall be 60 ft., plus or minus 6 in.
- F. Line diameters shall be:

000-200 cu. in.	010 in.
201-300 cu. in.	012 in.
301-400 cu. in.	014 in.
- G. Model control mechanisms from the handle to and including model shall withstand a 20 G. pull test prior to each heat.
- H. Pilots must stay within a 5 ft. radius circle. Pilots must not be in the area between the 5 and 10 ft. circle to land for re-charge.
- I. One (1) model shall receive and refuel models outside the 10 ft. circle.



Leading edge inside sheering

Add 1/2 oz tip weight to this wing tip in block balsa panel.

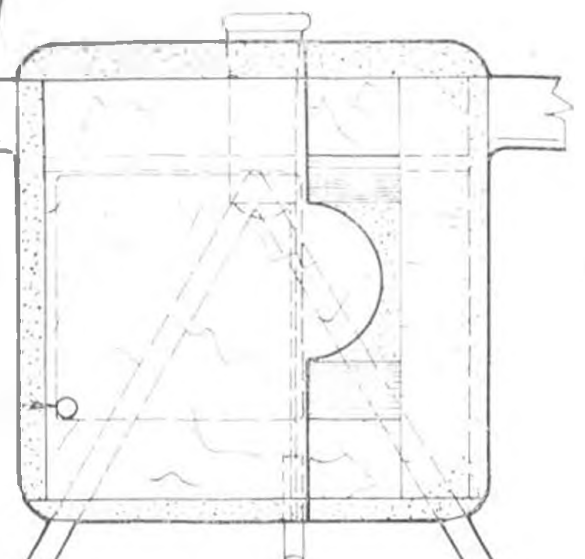


KING RAT SUCCESSES

SOME of the author's KING RAT contest successes: 1st New Mexico State Jan 1957-60; 1st, 2nd and 3rd La Paso, Texas, 1958-60; four 1sts, two 2nds and a 3rd La Cruces, New Mexico, 1961-64; twice 2nd Armed Forces Day, Albuquerque, New Mexico, 1961-62; two 1sts, 2nd and 3rd Southwest Regionals Phoenix, Arizona, 1958-61; 1st Denver, Colorado, 1964. In addition many other contests have been won by KING RAT flown by the author's clubmen.

MATERIALS LIST

SHEET BALSA: 1/2 in x 3 in x 36 in, 2 off, Medium; 1/2 in x 3 in x 18 in, 1 off, Hard; 1/2 in x 3 in x 8 in, 1 off, Medium; 1/2 in x 3 in x 36 in, 4 off, Medium
STRIP BALSA: 1/2 in x 3/8 in x 36 in, 1 off, Hard; 1/2 in x 3/8 in x 36 in, 1 off, Medium, **PLYWOOD:** one each 1/2 in x 2 1/2 in x 7 in., 1/2 in x 10 in. x 10 in.
ENGINE BEARER: 2 lengths 1/2 in x 3 in. x 12 in.
WIRE: one each 10, 16 and 18 s.w.g. piano wire
TAPE: 1/2 in. wide x 1/8 in. **INSULATOR:** 6 in. x 7 in. for tank
BRASS TUBING: 1/2 in ID x 10 in **MILD STEEL:** 1/8 s.w.g., 1 1/2 in x 2 in Eyedropper bottle top and large tube Engine mounting bolts, thread, cement and dope, etc



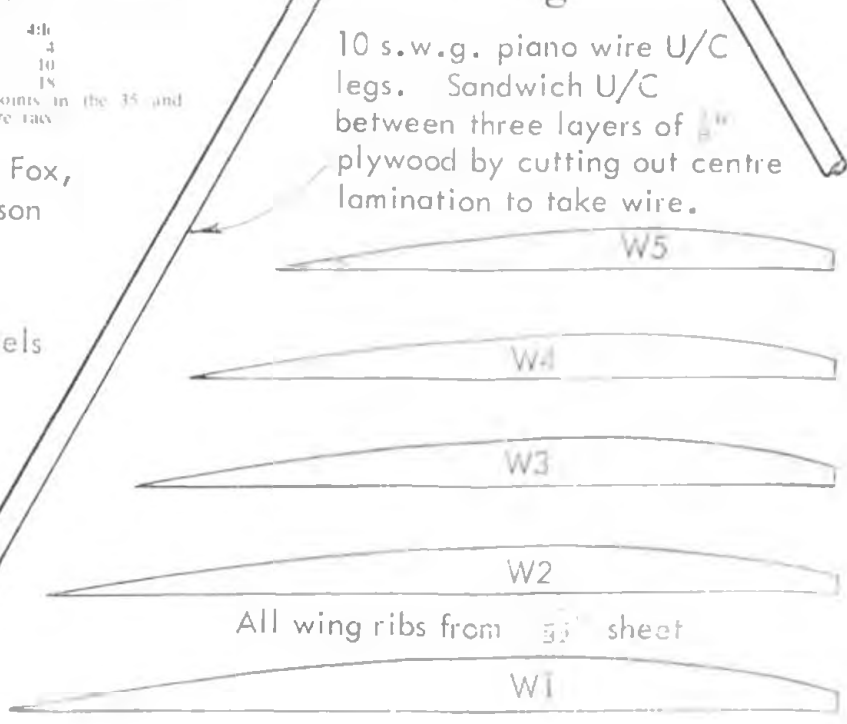
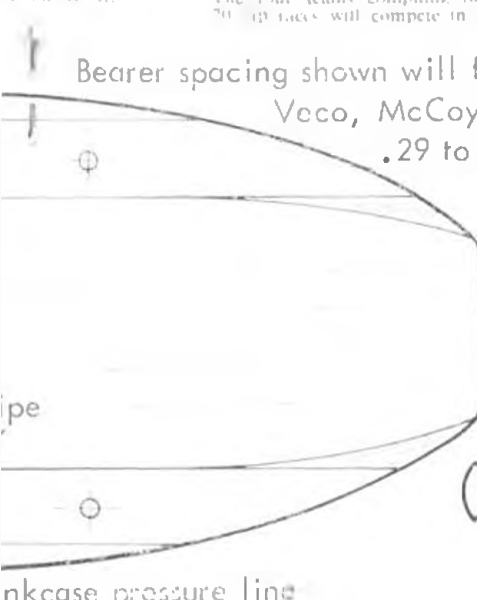
- 1 The team shall consist of one pilot and not more than two crew members.
- 2 Races shall consist of three heats, as follows:
 - 35 laps (2 1/2 miles) no refueling stop.
 - 70 laps (5 miles) one refueling stop mandatory.
 - 140 laps (10 miles) two refueling stops mandatory.
 Refueling stops must be made before the end of the lap section. Motors must be completely stopped for refueling.

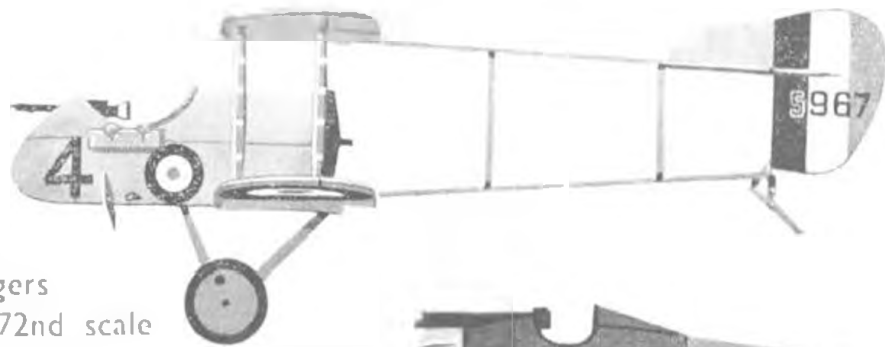
POINT SYSTEM

	1st	2nd	3rd	4th
35-lap	19	14	9	4
70-lap	28	22	16	10
140-lap	39	32	25	18

The four teams completing the highest total points in the 35 and 70 lap races will compete in the 140 lap feature race.

Bearer spacing shown will fit Merco, Fox, Veco, McCoy and Johnson .29 to .35





D.H.2 of "A" flight with white stripes on red struts and red wheel discs plus red numeral about the end of 1916. Below is typical D.H.5 marking June to December 17.

PART 22

Described by
Leslie A. Rogers
Drawn to 1/72nd scale
by K. McDonough

SQUADRON MARKINGS

No. 21 Squadron R.F.C.

Went to St. Omer on February 7th, 1916, equipped with 12 D.H.2s. The pushers were replaced by June, 1917, with D.H.5s which were in turn replaced by S.E.5As at the end of 1917.

Using the D.H.2. No Sqdn. marking was used as far as is known.

Flight and Individual Marking were as follows:
"A" Flight. Wheel covers and outboard Interplane Struts were painted red. Nos. 1 to 6 painted in red on the sides of the nacelle and on the upper wing. Corresponding with the number used were a number of white bands painted round the red painted struts.
"B" and "C" Flights used the same system as "A" Flight, but no details are known of the colours used. A reasonable guess would be blue and black, bearing in mind that the aircraft would be in clear dope finish.

Using D.H.5.

The Squadron marking (carried from May/June, 1917, to December, 1917) was a single vertical white band painted in front of the cockade on the fuselage sides.

Individual markings were by letters painted in white behind the cockade on the fuselage sides. The sequence of letters is uncertain but are believed to have run from "A" to "S", "I" being omitted. Before Sqdn. markings were adapted, the cowlings of the D.H.5s were left aluminium or painted white.

Using S.E.5As

The Squadron marking (carried from January to March, 1918) was a single vertical white band painted in front of the cockpit. This band went almost completely round the fuselage.

Flight and Individual Marking

"A" Flight—used the letters A, B, C, D, E, F, painted in white behind the cockade on the fuselage.

"B" Flight—probably used G, H, J, K, L, M.

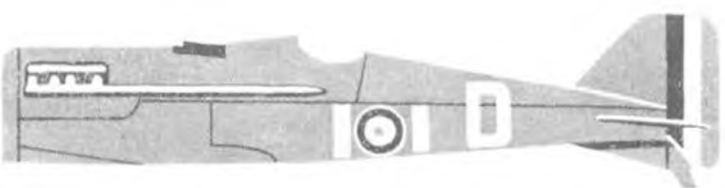
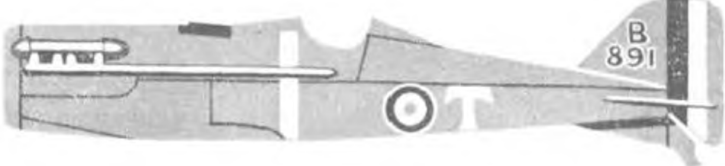
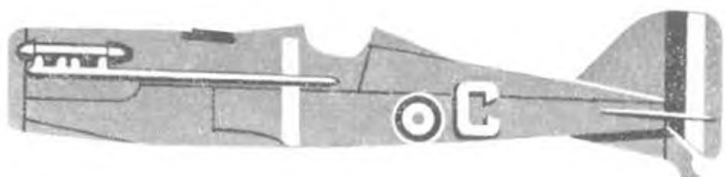
"C" Flight—used the letters N, O, P, Q, R, S, Y, painted in white behind the cockade on the fuselage. The "C" O is believed to have flown "T".

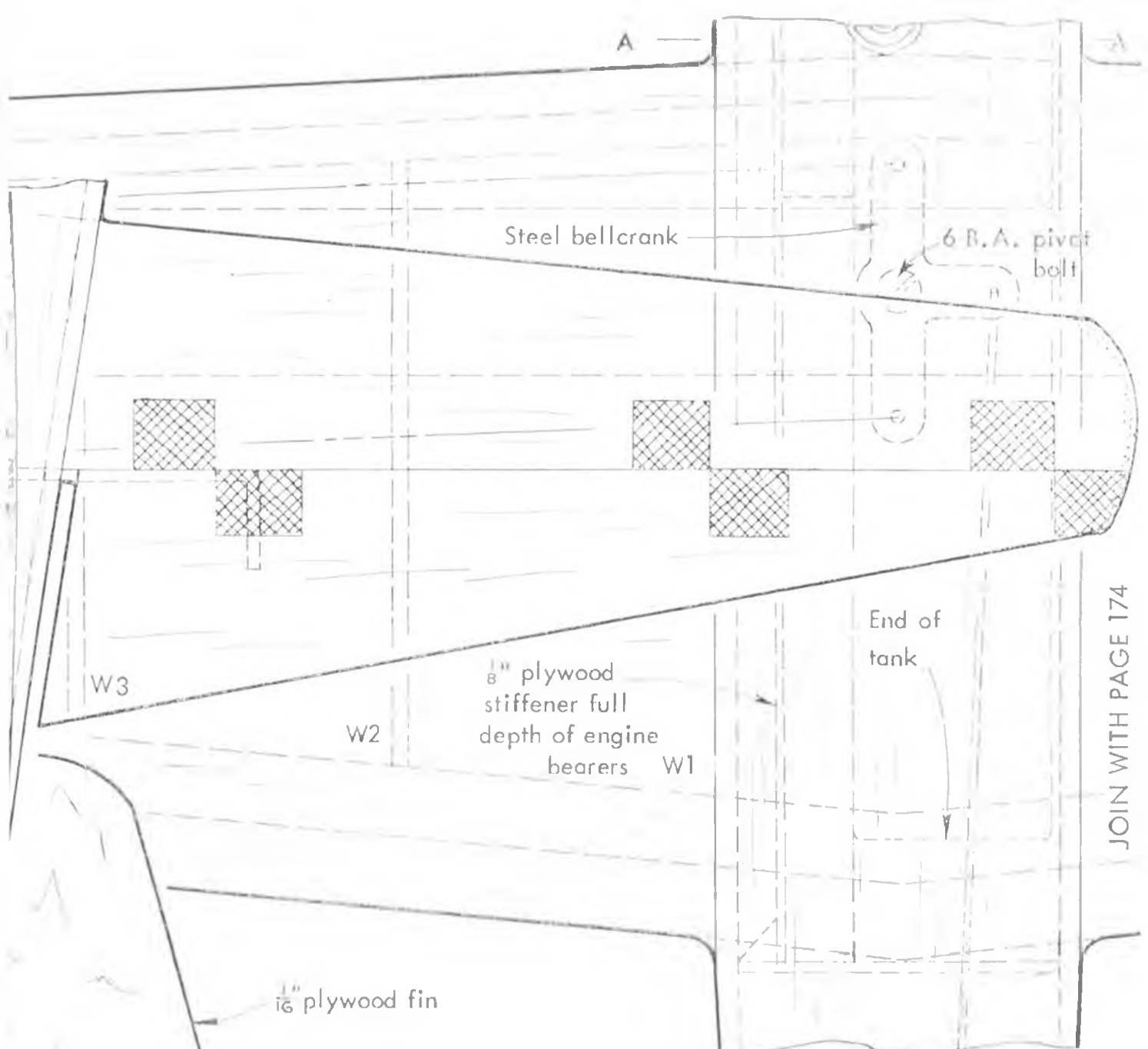
Squadron marking (carried from March 1918, to Armistice) Two white vertical bands, one on either side of the fuselage cockade.

Flight and Individual markings, were as for the earlier period of S.E.5A.

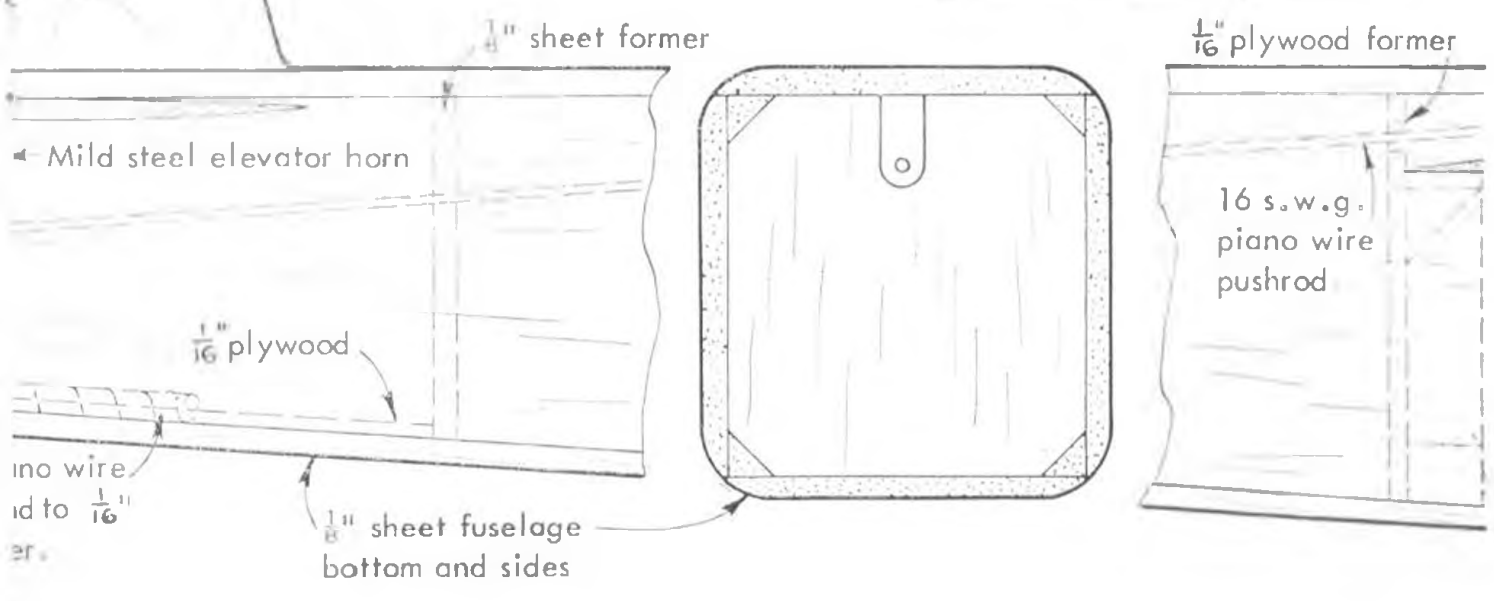
The aircraft used by No. 24 Sqdn. show a wide range of styles of lettering, obviously they were painted by many different hands.

Upper three S.E.5 profiles show styles from January to March '18 and fourth is of the next period on to Armistice. Top picture is from "C" flight (G. S. Leslie photo) and lower one of "A" flight at Cappy, France, in September 1918. (I.W.M. Photo Q 58113.)





JOIN WITH PAGE 174



AIRCRAFT DESCRIBED No. 141

Gee Bee R-1

described and drawn by
J. H. ROBINSON

For the 1932 National Air Races Granville Bros Aircraft constructed two essentially similar aircraft: R-1 with a 730 h.p. Pratt & Whitney Wasp engine for the Thompson Trophy and other unlimited races, and R-2 with the 550 h.p. Wasp Junior engine for the transcontinental Bendix Trophy Race. Construction of R-1 began by May, and drawings released on August 3rd caused considerable controversy. A large crowd at Springfield, Mass., Airport saw the new Gee Bee rolled out on August 12th. R-1 was of unorthodox proportions, with its 61 in diameter fuselage measuring barely 13 ft. 6 in. from engine mount to rudder post. This was some 12 in. wide and the rudder continued the streamlined form of the fuselage. There was no fin, but the upper profile aft of the cockpit continued to the rudder hinge, then curved downwards. This radical arrangement was arrived at after wind tunnel tests at New York University had satisfied the Granvilles that it would provide adequate stability and control.

Although Bob Hall had left the Granvilles by December 1931 the structure of R-1 was similar to earlier Gee Bees. The fuselage was of welded steel tube, with massive diagonals to spread landing and flying loads. The undercarriage followed normal Gee Bee practice, but extensive use of plywood covering and the lines of fuselage and engine cowling showed the influence of Howell Miller. The circular fuselage section progressed through a series of ellipses to the knife edge of the rudder. Plywood formers supported dural side panels and top decking, while spruce stringers carried fabric covering over the remainder, with plywood decking over the tailplane. The plywood covered rudder and sponge-rubber tailwheel moved together to aid ground manoeuvring, and could be unlocked for full castoring to facilitate hanging.

Centre of pressure travel of the M-6 airfoil used in the two-spar wing reduced flying loads on the rear spar and gave favourable trim characteristics throughout the speed range. Solid spruce spars connected by tubular steel compression members were reinforced by dural plates adjacent to bracing-wire fixings housed entirely within the wing. Plywood

Below left in its original version the Gee Bee R-1 had no fin but this was eventually modified to the version at right with increased height for the rudder post and addition of a small amount of fin area. Note bracing wire spacers which identify 1932 Thompson Trophy winner.



The ultimate Gee Bee R-1 of 1933 with extended chord rudder. The pilot is Russell Boardman.

ribs were cap-stripped with spruce between the spars, and torque tube operated ailerons with static balancing within the fuselage were mounted on a false spar. Plywood covering was finished with fabric and 14 coats of Titanine Dope.

The tailplane was of similar two-spar construction and adjustable in flight by means of a handwheel in front of the pilot's seat, but in practice no adjustment was necessary once trim was achieved. Seat height was adjustable for optimum visibility, and the cockpit was ventilated by a flexible airline running from the engine cowling. Throttle, propeller, and mixture controls mounted on the port side could be manipulated without releasing the control column. The starboard entry door could be jettisoned in flight with one movement, and the canopy was also jettisonable. A handhole with retractable cover set on either side of the windshield allowed cleaning in flight. Controls were light and sensitive, and the thick rudder in its final form proved extremely effective.

Russell Boardman, Chairman of Springfield Air Racing Association, made the first flight on August 13th. He reported a notable lack of directional stability, and a small offset fin was added and rudder height increased to suit. A fortnight before the Races Boardman was injured in a Gee Bee Sportster, and when "Jimmy" Doolittle damaged his Laird "Super Solution" Z D Granville arranged that he should fly R-1. Doolittle arrived at Springfield on August 28th, inspected the new Gee Bee and immediately flew it to Cleveland.

The Shell Speed Dashes at the Races were flown over a 3 km course acceptable for World Speed Records. On September 1st Doolittle averaged 293.19 m.p.h. unofficially before it was found that the engine cowling had pulled forward in flight, breaking and straining fixing lugs and splitting the cowling. Damage was repaired, cowling and fixings reinforced, and on September 3rd R-1 captured the

(Continued on page 181)

Reprints of the 1/72nd scale plan and aircraft description together with 1/24th scale drawings are available through Aeromodellers' Plans Section, pack JH 2789, price 2/6d. Ed. 1.80. Preparation of the drawings reproduced opposite, additional details have been discovered in particular concerning the rear fuselage and these are incorporated in all copies of the 1/24th scale plan.



RUBBER and glow flying has always been a great club-room activity, starting with rubber models, and then diesel and glow engine power when they became small enough to be flown in restricted spaces. Many clubs hold R.T.P. meetings but very few see electric motors being used, due mainly to the extensive modifications needed to increase their power to weight ratio if flights of more than 20 seconds are wanted and one does not want to keep changing the brushes to avoid the motor burning out. To improve power to weight ratio and prolong motor life, John Bridge makes the following modifications to his Mabuchi "35" or Ripmax Super Q" Orbit 305 electric motor as installed in a modified Keil Kraft Lairey Junior rubber power kit.

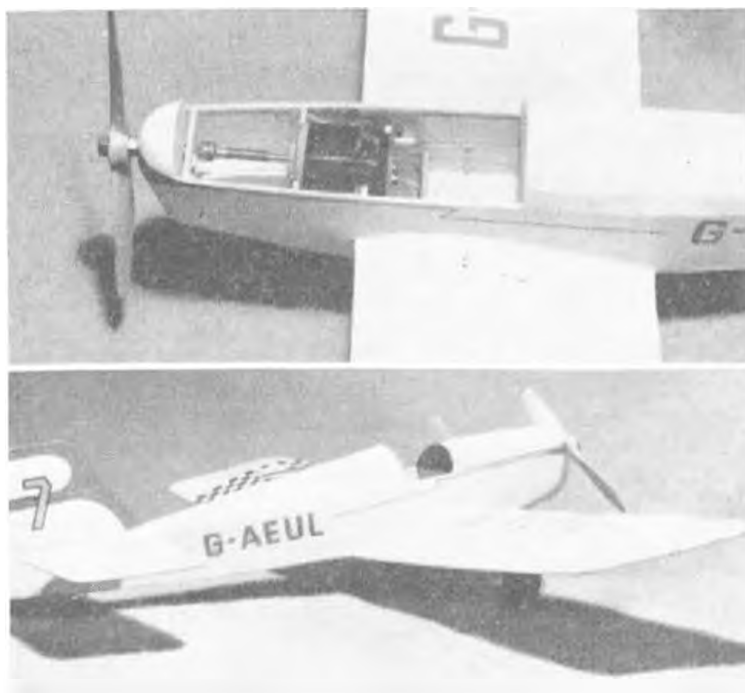
The brush gear is removed and a set of Philishave electric razor carbon brushes substituted to utilise the full commutator width. To fix these to the motor a pair of holders are made from slim brass and mounted onto the P.C. board bolted to the rear of the motor. The brush springs are made from C 1 wire and should be adjusted just tight enough to minimise arcing, not so tight that they bind on the commutator as this will set up frictioned heat. Cut two slots in the rear of motor and P.C. board for alteration of brush timing and to act as an air outlet, also in front of the motor for air inlets. Next, reduce the gap between the armature and field magnet by inserting a piece of paper or thin card. This improves the flux path and plays a big part in improving performance.

Even after these modifications it is still essential to cool the motor efficiently if it is not to burn out after a few minutes of flying. Intended for 3 volt operation, one *has* to put 10 volts through the motor if it is to fly. This means it will be drawing between 1 and 2 amps which is a great load for such a small motor. Providing the propeller is allowed to blow some air in through the cowling it will stand 3.5 amps in short bursts without damage. Matching the propeller size is most important and this should be hand carved from a piece of $\frac{1}{2}$ in. square spruce to $4\frac{1}{2}$ in. dia. with a fine pitch. Plastic propellers for rubber models are not suitable as the coarse pitch overloads the motor.

When choosing a model make sure it has a fairly large wing area in order to keep the loading as low as possible. It should be remembered that the motor is the heaviest component in the airframe. Fix to install it over the centre of gravity position by using a flexible shaft such as coil type curtain wire for an extension which must be carefully aligned.

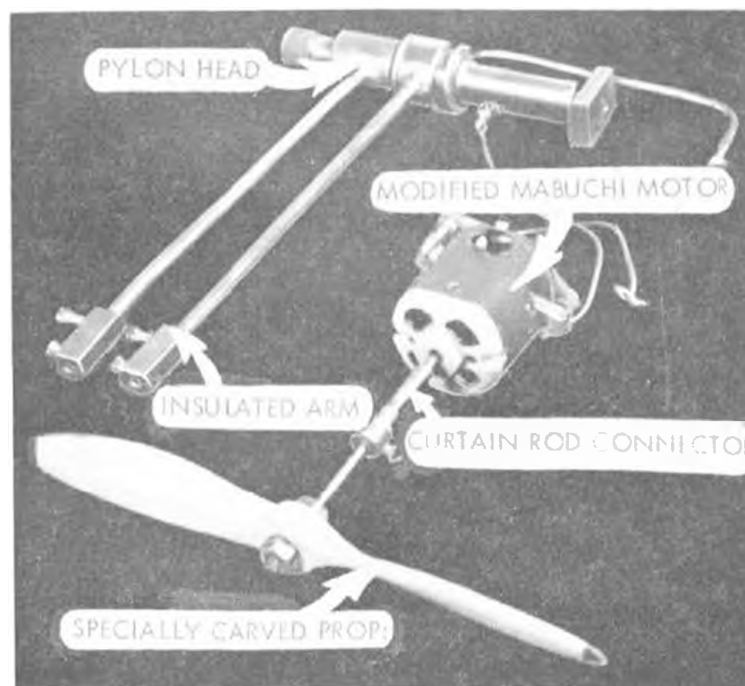
The pylon head was made from odds and ends out of the author's junk box so that two freely pivoted arms were insulated from each other, revolving around a fixed body. Another way to make a pylon head is to purchase the largest jack plug that you can find and fix two swivelling pick-ups, one on the extreme end that is insulated from the body and one on the body itself. The current wires can then be run through the pylon base. To construct the base cut four pieces of hardboard 3×1 ft. and fabricate into a pyramid shape 30 in. tall with 12×12 in.

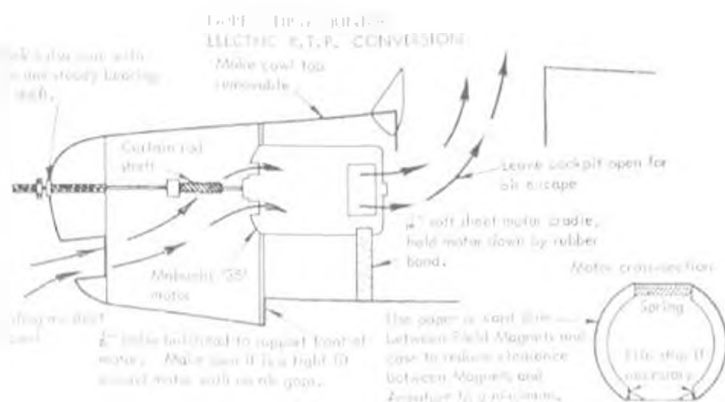
Top photographs illustrate the changes in the otherwise standard Keilkraft Topsy Junior flying scale model kit. The Mabuchi motor has an extension shaft as described in the text. At right, the vital components with the pylon head. Another pylon head was detailed with the full size plans for a Fokker E.111 with electric or small engine power (control-line) in our issue for January, 1964, when John Simmance described his system.



ELECTRIC R.T.P. FLYING

John R. Bridge reveals simple mods for inexpensive motors





base. To anchor this down during flying, load it with house bricks inside, or it will walk! For the control lines use 32 s.w.g. enamelled copper wire which can usually be stripped from an old transformer. Make the lines 8-10 ft long depending on the size of the room, but try to keep above 6 ft. as this is a shade short. Slow speeds give a much more realistic appearance in flight. The Fairey Jnr. usually flies at about 4 ft. altitude with 1/4 lap for take off run.

To drive the motor, use a wall plug socket if available and a car battery charger fitted with a variable resistance for speed control—about 10 ohms will do, but make sure that it is heavy duty as they get hot!

DEAR SIR,

Mr Shipp's letter misses, obliquely, an aeromodelling chestnut, but I would like to congratulate him on presenting a point of view which considers other farmers and landowners in this instance. (March Letters, p. 130.)

If most of us could assess impartially the value to the community of a minority sport which impinges upon land *other than that specified for its pursuance*, we might be thinking of radical alterations of F.F. competition in this country.

I fear that Mr Shipp's well-intentioned remarks may result in increasing aggravation to others outside the hobby. To quote an example—with the retrieving done by a "responsible" member. The irresponsible or unthinking chap might over ensure his flight times by delaying D.F. operation needlessly. My modification to Mr. Shipp's plan would be to station a "recorder" on the airfield peri-

MODEL RECOVERY another point of view

meter—but let others retrieve (preferably owners specialising in long flights).

It has long been in the modellers' interests (ultimately if not immediately) to limit the vast areas necessary for F.F. competition. One factor from amongst many too numerous to list is the continued participation in competition of older modellers. To the sedentary worker free flight competition becomes more of a hardship as years go by, and so we debate from our ranks, modellers with acquired skill, influence and wisdom.

The obvious requirements for in field flying are:

1. Shorter waves.
2. 'Formula' models.
3. Competition control.

The arguments for 1 and 2 are often quoted, but as far as I know

3 is seldom attempted. For this, a "comptroller" would establish flight times for the day, bearing in mind the size of field, wind strength and direction. His primary task would be to find a competition class winner *within the facilities at his disposal*. He may have to modify his findings during the course of the competition, but the efficiency of the system would depend upon keeping all competitors adequately informed.

Finally, I feel that a new interest in competitions with a luck element attached is about to become evident. We should not forget that in all sports close competition is interesting and good competition—and all participants like to feel that they have *some* chance of success. We may be hesitant to alter our F.F. competition procedure to our own discomfort in the long term, and to our lesser enjoyment in the short.

TREVOR FAULKNER, A.R.C.A.
Dunstable.

GEE BEE R-1 (Continued from page 178)

World's Speed Record with 296,287 m.p.h. The fastest run was 309,040 m.p.h. In the Thompson Trophy Race on September 5th, R-1 was quickly off the ground and took the lead halfway through the first lap. Almost a lap ahead of the field after six laps, R-1 was never challenged and won at a record 252,686 m.p.h. With another Thompson victory added to their World's Record, the Granvilles' success was complete.

For 1933 R-1 was fitted with a P & W Hornet engine, increased rudder area, and a non-casting

tailwheel. As Russell Boardman took off from Indianapolis in the Bendix Race a sudden gust caused R-1 to stall below 40 feet and crash onto its back. Boardman suffered a fractured skull and other injuries, and died two days later. Following total destruction of R-2 with a new wing, its original wing was mated with the fuselage of R-1 which was extended by two feet with a slightly larger fin and rudder. This hybrid ran into a ditch and was eliminated from the 1934 Races.

In 1935 R-1 R-2 was bought by Cecil Allen and entered in the Bendix Race. With an incredible overload of fuel the Gee Bee lumbered the full length of Burbank Airport's runway and mashed through the air for perhaps two miles before crashing in a potato field. Allen was killed and the Gee Bee destroyed, and with them ended the Granvilles' dreams of speed.

The author acknowledges the assistance of Charles G. Mandrake, author of 'The Gee Bee Story', in providing material for this brief history.

Z. D. Granville leans on the wing of his Gee Bee R-1 in the condition as at the 1932 National air races up to and including the record of September 3rd but not as flown in the Thompson trophy. The Smith propeller was fitted for this. See plan for details of the 1932 Thompson race version.



18th AUSTRALIAN CHAMPS

December 28—January 4 reported by B. Horrocks

The Australian Nats were held this year on the outskirts of Melbourne, in Victoria. Due to unforeseen difficulties the control line, and free flight areas were some 26 miles apart on opposite sides of Melbourne. This somewhat hampered the social activities.



Magnificent "Ansaldo" by B. Reid placed 2nd in C/L Scale, from C. Milan's original design.

Free flight and radio control events were flown in tiger snake infested territory, and retrieving was, to say the least, adventurous. South Australian, Jim Smyth, had company whilst fishing his "dunked" Intermediate Radio model from a nearby lake. Snakes can swim!



Tom Prosser's winning "Piper Pawnee" in the radio scale event.

Control line events were flown at Heatherton sports ground, on the boundary of Moorabin light aircraft aerodrome, and all model processing took place in the pavilion on Monday, 28th December.



Control line events started the programme, and were flown on the days of 29th, 31st December and the 2nd and 4th January, with free flight on the intervening days.

F.A.I. Team Race was full of excitement, with one of the favourites, Mal Pring, suffering a run-in which put the model out of his reach. Brian Leather of N.S.W. won the event with a model which was built well above area limits to eliminate any repeat of last year's disqualification.

A Team Race also had its exciting moments with D. Campbell of Victoria running off to a well deserved victory. Oliver Tiger Cubs are the popular motors in this event.

Senior and Junior Stunt were run concurrently, and right from the start it was obvious that the "big boys" were going to battle it out. What a wonderful surprise to note that no one motor outshone another and terrific flights were flown by both junior and senior.

Brian Birch was the dark horse, and put in the best flight of the competition with a beautifully built O.D. "Imperial", Merco powered, this model was a peach to fly. Ken Taylor proved consistent enough to win the senior title flying a 58 in. span Fox 59 powered "Shark" which he had modified slightly. It is significant to note that the three place getters were flying models with fully sheet balsa covered wings. Young Johnny Hughes from Victoria was a fine performer, and will be a major threat to the seniors next year. He was outstanding among the juniors and won junior stunt easily. Motors seen in the stunt event were Fox, Merco, Kyowa, Glo Chief, OS.

At left Bill Lynch was 3rd in R/C Scale with 72 in. S.E.S. Has O.S. 10 channel radio and Enya 60. At right, above, Wakefield winner Les Fahey and below the Champion of Champions Norman Bell before launching Ritz A/2 glider.

Waal—as I was saying over Cherbourg . . . Monty Tyrell (pilot), E. Kiggin (builder) and Chief Crewman in authentic USAF uniforms with Scale winning control-line "Boeing B-17 Fortress". We'd like to see Monty flying a Bleriot now, moustache and all.

and Enya, all performing well

Control Line Scale was not overburdened with entries, but what it lacked in numbers was more than compensated with the quality of workmanship. Eddy Kiggin won the event with a magnificent Flying Fortress of some 8 ft. wing span. Monty Tyrell Australia's Mr. Control Line was the pilot and as usual, when Monty does something, it's done properly. Needless to say the crew members all wore U.S. uniforms.

The model flew to perfection on its four I.D. Hunters, and was handled superbly. Second place went to B. Reid who flew a magnificent Ansaldo Biplane whilst Rev. Sheppard (not the cricketer) was third with a model of the late



Ron Hockhart's Mustang.

Speed Events were supported beyond the wildest dreams at this Nats. and a real recovery in speed flying is evident. F.A.I. honours went to Jack Finneran of N.S.W. after a count-back, but Len Buck of South Australia is joint holder with Finneran of the new record of 125.7 m.p.h.

Phil McGee turned in a magnificent flight of 147.5 m.p.h. using a Rossi "60" which is not run-in. Jack Finneran was flying like a tiger and hit top spot of 144 m.p.h. in Class II Proto speed went to Queensland, with the Neilson husband and wife team cracking 118.4 m.p.h. over the standing mile.

Junior Combat always brings out the high spirits, and it is not uncommon to see the fathers of the contestants getting as aggressive as their offsprings, this of course keeping the stewards busy, but L. Hughes of N.S.W. scored a deserving victory.

Class II Team Race was won by Ron Adamson a R.A.A.F. technician who currently flies for the N.S.W. Newcastle club. His model is P.A. powered, and will hit 115 m.p.h. Brian Father flew the model.

The Advertiser Trophy was won by a mixed crew, the model being owned by Hans Bertina of Western Australia, flown magnificently by Mal Pring of South Australia, and pitted by David Kidd of Victoria



This event is for the top class II team race crew from each State.

Open Combat must cause much glee amongst the balsa retailers, and certainly promotes "balsa planting" in the most violent manner. During this event a model had its lines cut, and after a fast climb followed by three neat inside loops, it disappeared but a jubilant crew retrieved same, unscathed.

Excitement ran high, and club mates of the winner, S. Sherlock, chaired him off the field with great

gusto. Second place man, Hull, is a training doctor, phew! what a way to practice surgery.

Junior Class II Team Race was won by Bill East, who made up in this event for his disqualified flight in stunt where he jettisoned a wheel. This race is always a great entertainer, and the lads flew well and cleanly.

Class III Team Race was a comparatively slow affair with only minor excitement, but nevertheless, a good, clean race was held and the event justified its existence. The control line events as a whole were very well contested, and Les Ball of Victoria deserves a medal for the way he undertook the organising of team racing, etc., always a thankless task.

V-1 Sailplane event set Norm Bell off on his magnificent run for Champion of Champions, and he



Above: Col Stone, winner of F.A.I. power. Left: Tom Prosser, winner of intermediate with his model and the fine Grundig trophy. Right: The Neilsons, husband and wife, winners of Proto speed. Below: F.A.I. team race winner Brian Eather and crewman P. Roach.

won fairly comfortably from P. Lloyd.

Open Power Free Flight was a most exciting and thrilling event, hard fought, and full of spectator appeal. This culminated in another victory for Norm Bell, a narrow victory, but how he earned it. Ford Lloyd was only one sec. behind.



At top: Joint winners in F.A.I. speed were Jack Finneran and Len Buck. Picture below shows Ken Taylor winner of stunt with his "Zeus" at right and 2nd place Brian Birch.

Free Flight Scale as appears customary, suffered from high wind, and a battle royal was fought to see who could manage the required 20 sec. flight. D. Marshall of Victoria finally triumphed with his smart, but wind battered Gloster Gamecock. Bob Greenhill had a magnificent Gloster Gladiator which unfortunately was too underpowered to cope with the wind.

Single Function Radio was won by Lyall Winley of N.S.W. who



won the event last year, using the same model. The model is a low wing craft, not very handsome, but boy oh boy! it really performs.

Scale Radio Control proved to be a great crowd pleaser even if the event was unofficial. Tom Prosser won the event with a superbly detailed Piper Pawnee which was even equipped to discharge a hopper load of talc powder from its dusting gear.

Lyall Winley flew a Sterling Mustang into second place and thrilled the crowd with his slow speed run, flaps extended, and very precise ground handling prior to take-off and after landing.

RESULTS OF THE 18th AUSTRALIAN NATIONAL MODEL FLYING CHAMPIONSHIPS

CONTROL LINE EVENTS

A Team Race (15 c.c.)			Time
1	D. Campbell	Victoria	9:57.0
2	I. McKelvey	N.S.W.	10:15.8
3	W. East	N.S.W.	10:31.7

Advertiser Trophy (7 c.c.)			Time
1	H. Britton	W.A.	7:00.8
2	Wilson James	Victoria	7:38.0
3	Lalorin	Victoria	7:41.4

Senior Stunt			Points
1	K. Taylor	Victoria	6,169
2	B. Birch	Victoria	6,058
3	D. Harshborne	Victoria	5,821

F.A.I. Speed			m.p.h.
1	I. Finneran	N.S.W.	125.7
2	I. Buck	S.A.	125.7
3	Neville Hughes-Jenson	N.S.W.	115.3

Proto-Speed			m.p.h.
1	Neilson	Queensland	118.4
2	Neville Hughes-Jenson	N.S.W.	113.9
3	McKellar	Queensland	112.8

Best Appearance Team Race			Class 1A
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F.A.I. Team Race			Time
1	Lather Roach	N.S.W.	1:57.3
2	Wilson James	Victoria	6:21.1
3	M. Prime	S.A.	

Class 3 Team Race (over 5 c.c.)			Time
1	Wilson James	Victoria	8:38.5
2	N. Moore	S.A.	9:14.5
3	Taylor-Ginetta	Victoria	9:33.4

Junior Stunt			Points
1	I. Hitches	Victoria	5,041
2	R. Broadbent	Victoria	4,092
3	S. Chapman	Victoria	3,493

Class 2 Speed (5 c.c.)			m.p.h.
1	I. Finneran	N.S.W.	144.0
2	Larnam Hotham	Victoria	139.5
3	Neville Hughes-Jenson	N.S.W.	136.3

Combat			Points
1	S. Sherlock	N.S.W.	
2	R. Hull	N.S.W.	
3	I. French	Queensland	

Class 1			Class 2	Class 3
1	Ray		R. Adamson	

Class 2 Team Race (5 c.c.)			Time
1	R. Adams on	N.S.W.	6:59.7
2	Wilson James	Victoria	7:7.7
3	Boughton Eyer	Victoria	8:47.7

Junior Class 2 Team Race			Time
1	W. East	N.S.W.	9:28.5
2	I. Stowe	N.S.W.	11:35.0
3	Harvey-Sheppard	Victoria	

C/I Scale			Points
1	I. Kagen (B-17)	Victoria	133
2	B. Reid (Ansaldo)	Victoria	121
3	Rev. R. Sheppard (P-51)	Victoria	94

Class 3 Speed (10 c.c.)			m.p.h.
1	P. McGee	N.S.W.	147.5
2	I. Stowe	N.S.W.	146.5
3	I. Trent	Queensland	134.4

Junior Combat			Points
1	I. Hughes	N.S.W.	
2	W. East	N.S.W.	
3	G. Turrall	N.S.W.	

Class 1			Class 2	Class 3
			R. Adamson	Taylor-Ginetta

FREE FLIGHT EVENTS

Open Power			Time
1	N. Bell	Victoria	583
2	I. Lloyd	Victoria	582
3	R. Greeves	Victoria	562

F/I Scale			Points
1	D. Marshall (Gloster Gamecock)	Victoria	94

Hurl Glider			Time sec.
1	G. Bowden	Victoria	159
2	C. Stone	Victoria	147
3	P. Lloyd	Victoria	140

Junior A.1 Sailplane			Time sec.
1	I. Stowe	N.S.W.	112
2	P. Drayton	Victoria	218
3	I. Fahey	N.S.W.	169

Single Channel Radio			Points
1	I. Winley	N.S.W.	425.0
2	I. Prosser	N.S.W.	385.0
3	B. Healey	N.S.W.	295.5

Radio Scale			Points
1	I. Prosser (Pawnee)	N.S.W.	419.5

F.A.I. Power			Time
1	C. Stone	Victoria	849
2	N. Bell	Victoria	803
3	R. Greeves	Victoria	739

Power Scramble			Time sec.
1	S. O'Connor	N.S.W.	1,017
2	I. Fullett	Victoria	970
3	D. Mundav	N.S.W.	957

Junior Hurl Glider			Time sec.
1	G. DerKinderen	N.S.W.	104
2	N. Butler	N.S.W.	76
3	R. Whyte	N.S.W.	67

A.2 Sailplane			Time sec.
1	P. Drayton	Victoria	104
2	N. Bell	Victoria	76
3	Dave Anderson	S.A.	67

Intermediate Radio (and Grundig Trophy)			Points
1	I. Prosser	N.S.W.	448.0
2	I. Winley	N.S.W.	416.1
3	N. Peterew	N.S.W.	304.5

Radio Scale			Points
1	I. Winley (P-51)	N.S.W.	417.0

Class 1 Power Ratio (1 c.c.)			Time sec.
1	R. Greeves	Victoria	872
2	S. O'Connor	N.S.W.	831
3	I. St. Clair	Victoria	739

Wakefield			Time sec.
1	I. Fahey	N.S.W.	872
2	D. Bowden	Victoria	831
3	R. Atlamby	Victoria	739

A.1 Sailplane			Time sec.
1	N. Bell	Victoria	503
2	P. Lloyd	Victoria	440.8
3	C. Stone	Victoria	383

Junior Rubber			Points
1	I. Fahey	N.S.W.	448.0
2	V. Gregory	Victoria	416.1
3	I. Stowe	N.S.W.	304.5

AEROMODELLER SHIELD

1st: Victoria, 48 points, N.S.W., 75 points, S.A. 6 points, Queensland, 6 points.
 Senior Champion of Champions: N. Bell, Victoria. Junior Champion of Champions: W. East, New South Wales.

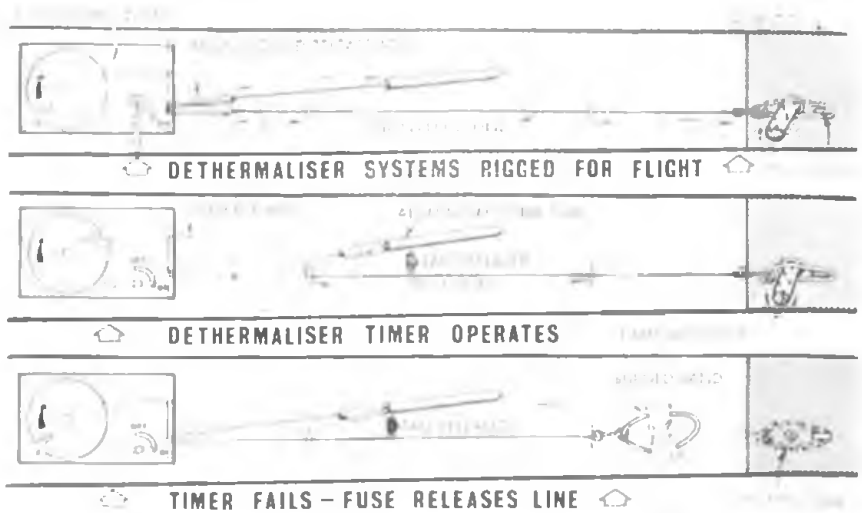
(Continued from page 183)
 Third place went to B. Lynch who deserves a mention for the way he looped and spun his mammoth 6 ft. span SE5. Very, very realistic.
Nordic A.2 Sailplanes proved to be another hotly contested event, being ultimately won by Peter Drayton of Victoria by a narrow margin from Norm Bell (that man again). Models were consistently being lost in this event, and many who could have secured placings suffered in this respect.

Junior Rubber was won by I. Fahey junior who has no doubt been coached by his very successful father into championship form. Painstaking trimming of the model and a good understanding of its flight pattern were evident in its consistency of performance.
Intermediate Radio Control & Grundig Trophy. Both events were intermediate class, and both events were won by Tom Prosser. Notable in this event was the popularity of the "Aristo-cat" design, which performs exceptionally well.

Wakefield, the original international event, was won by I. Fahey of N.S.W. flying a neat, slim fuselage model capable of 70 sec. of motor run, and being trimmed to perfection, it won the event with a last minute max.
F.A.I. Power Free Flight saw once again a fantastic battle for placings, and Col Stone narrowly defeated (guess who?) Norm Bell. The standard of free flight in Australia is still very high, and so it shall always be as long as we have flyers like these.

HAVING HAD many unnerving moments with mechanical dethermaliser timers since 1960 with no apparent reason for their malfunctions, the author has developed this "belt and braces" fail-safe system. Larry Conover used a two-way device on his "Lucky Lindy" which achieved fame at the 1960 World Championships, Cranfield, and no doubt there are several other similar systems in regular operation. They combat the situation where the normally accurate clockwork time fails to start, stops working or loses its regularity.

Obvious answer is to combine both mechanical and fuse D I systems with a delaying action so that the fuse becomes a safeguard. In operation, the clockwork timer



Fail-safe dethermalisers

... or how to make doubly sure of getting the model back again

BY

M J WOODHOUSE

is set as usual for 3 min 10 sec. delay, before releasing the tail-plane retainer. Standard fuse is introduced to the same 'circuit' so that it will sever the tail band without prejudicing the time setting operating approx. 20 sec. after the timer. This is a very simple and functional system now well proven through several seasons of intense contest flying activity.

Top view illustrates the system rigged ready for launching. Extreme end of the tail release line is a small wire hook which connects with a rubber band through which protrudes the burning fuse. This is enclosed in a safety snuffer tube of tight fit, and is positioned transversely across the fuselage in convenient position. The 5 lb. nylon line passes through looped pin guides, then has another rubber band in circuit. This passes around (not over) the timer release arm. The line then changes direction aft and runs through a

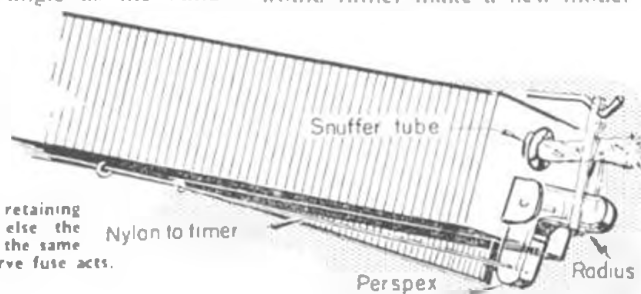
guide tube in the fuselage side and thence direct for the tail trailing edge. Note that dimension 'X' is the tail deflection limiter (usually about 4 in.). The fuse is lighted and timer stop released according to the operator's whim for most expedient action.

Centre view shows how the timer will normally free the release line as soon as the release arm is cleared to move through the cut out in the timer disc. The fuse action which follows will not affect tail tip angle as the band

acts as a limiting stop at the end of the guide tube. *Lower view* illustrates "fail-safe" operation when the timer does *not* release the line. When the fuse burns through the rear band it also allows the timer arm band to be pulled up to the fuselage guide tube face.

Simple to construct, this system can save many a thermal borne model. It is well worth the little effort required in ingenuity and patience before launching unless of course you are dead keen and would rather make a new model!

At right, Larry Conover's fail-safe system on "Lucky Lindy" first seen in 1960. The bell-crank is released by the timer to free the rubber band retaining the tailplane or else the burned band does the same job when the reserve fuse acts.



The Power Scramble, a most popular event, which always appears to fill the sky with models, and during which many pounds avoirdupois are lost over hill and dale. Noteworthy was a hovercraft entry in the scramble. There are no rules which could be found to prohibit its entry, so the contest director used his discretion, to the relief of all other contestants.

Multi Channel Radio was won by Tom Prosser who found the top of the ladder a little crowded

this year, although he still won in a very precise manner.

The standard of flying is undoubtedly world class, and rumour has it that Tom Prosser will be competing in the world champs in the near future. Motors were varied in this event as in C I stunt, but Mereo's seem to be slightly more favoured.

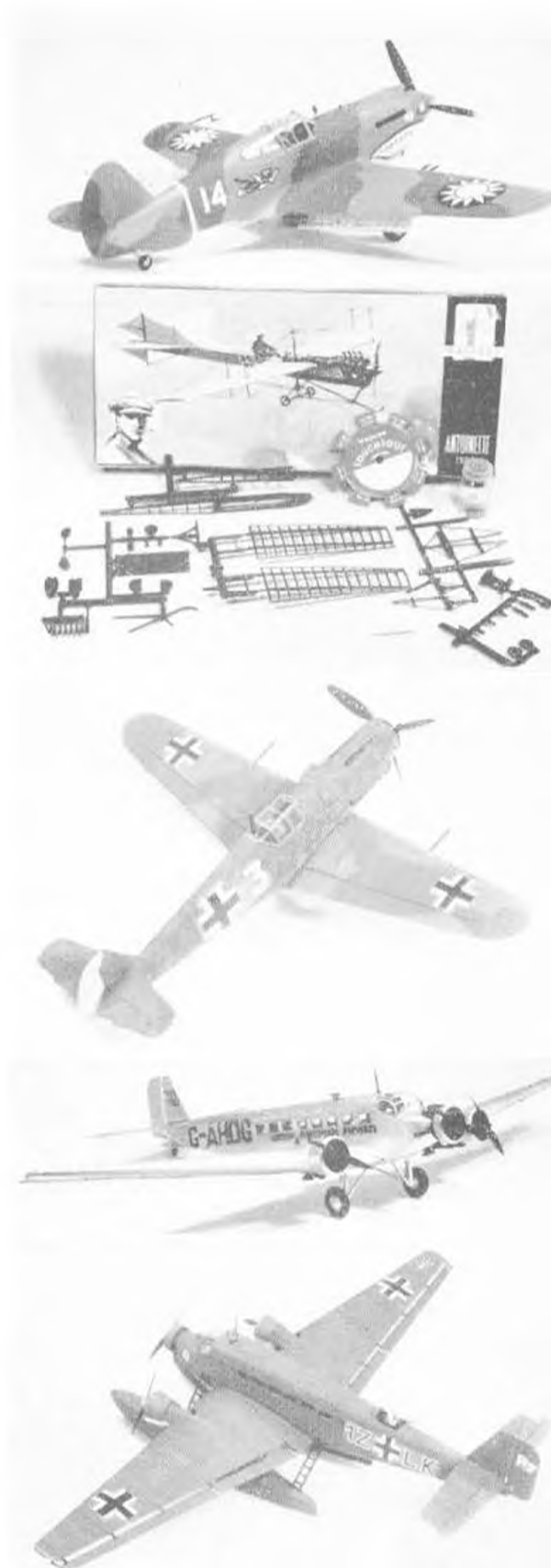
I think mention of the Silver-tone radio equipment is not amiss here. This equipment is Australian made, using a valve transmitter,

with Hi-Lo power switching, and a transistorised superhet receiver. Silver-tone took the majority of placings in radio, and has demonstrated beyond doubt its wonderful reliability. Congratulations to Bob Young for his fine equipment.

These National Championships are bound to be remembered for a long time for the keen and powerful competition which was common to almost all events.

NEXT MONTH The New Zealand Championships, unavoidably stalled out by pressure on space this month.

Trade



IT IS INEVITABLE that the cost of modelling is going up. Members of the Model Trade Federation have fought to keep costs down. Many importers have absorbed as far as they could the Government import surcharge soon to be reduced from 15 to 10 per cent but the facts remain that the U.S. dollar comes out in most cases to 13/- or almost double its par value and basic materials for the home produced modelling item are causing an increase in retail price structure.

A significant increase which does not in the least surprise us is that Balsa Cement will be priced at 8d, 12d and 110d. per tube from **Turnbridges** ("Joy") and **Humbrol** ("Britlix"). Similarly all the other adhesives marketed by these two Companies go up in price but on the face of it, the increases are very reasonable considering the rate at which other trades have been obliged to put up their charges.

On the other hand, **Ripmax** have decided to absorb, as far as possible, all price increases on **Grundig** radio equipment themselves, so that what would have been the 1965 figures (as given in their March advertisement) have been reduced to: 2 channel transmitter £25, 4 channel £39 10s., 8 channel £47 10s., new 10 channel £54 10s., Superregen receiver and Filter units each £10 19 6d., and Superhet receiver £29 10s. Incidentally the new Grundig Superhets are to be issued with 12 pairs of crystals to line up with American and British used frequencies. Ripmax will be bringing out some new **Top Flite** kits from the U.S.A. including the detailed scale Mustang, a 37 in. control-line model as designed by U.S. National Scale champion, Gerry Worthy, which will sell for £7 19 6d. Additionally, following a visit to the Chicago Trade Fair, Ripmax have secured agencies for Citizen Ship radio control including the latest analog proportional system which will retail for approximately £139 10/- complete. This will give propo aileron and elevator plus progressive engine. Also in the radio field, the top quality S-Ray and H-Ray kits by **Lou Andrews** are on their way to Ripmax from the States.

Hoorah for a new British flying model kit! **Performance Kits** have introduced their 28½ in. "Kingfisher" club type rubber powered semi-scale cabin model at 13 11d. As our picture shows, it assembles well, but we would advise use of a nose block locator. Ribs are die-cut, plastic propeller and wheels are supplied and an instruction sheet covers all points so that the design could be considered a novice project as well as suitable for club competitions.

Dick Edmonds has introduced a new range of team racing tanks which are 6 c.c., 7½ c.c. (for Australian ½A) and 30 c.c., all made to a new simplified design with new type valve spring for easier operation. Price list and details of the items for the EMP range

Top left, the Monogram 1/48th scale Curtiss P.40B in Chinese markings. Note flaps depressed for landing. Cockpit is fully detailed inside, can have sliding hood as alternate. Next is the French Brifauf kit for 1/70th scale Antoinette showing the framework parts which are fabric covered for realism. Central is Airfix Messerschmitt Bf 109 G-6 with mottled fuselage and splinter wing camouflage. Two variants of the Junkers Ju52/3m are a B.E.A. early post-war transport and wartime Luftwaffe floor plane. This fine kit offers a challenge for colourists — one could almost create a Ju52 museum with dozens of differently marked versions.

Notes

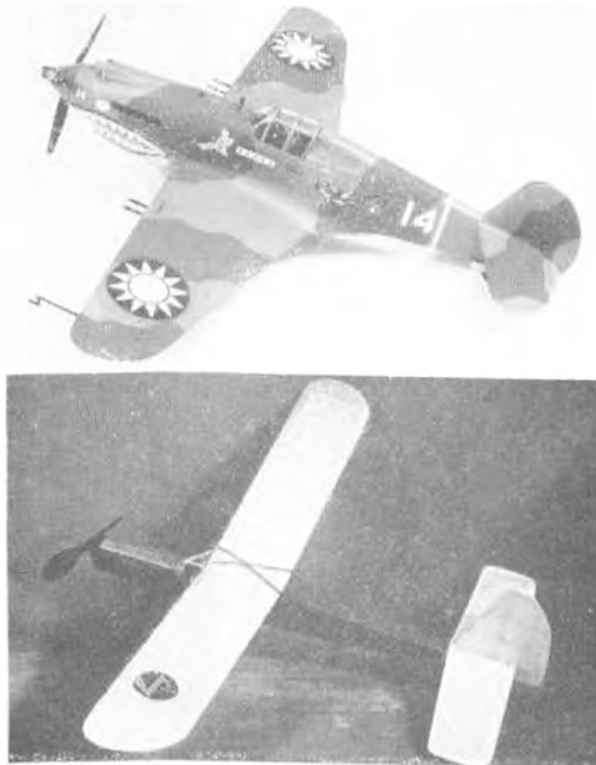
of team race "specials" are now available.

Plastics of the month are particularly interesting. First, from France, the Brifaut range covers early aviation with his first three kits, being the Clement Ader "Eole" of 1890, the 1908 Antoinette and the Bleriot XI as on page 167 of this issue. The kits are a challenge to the constructor being quite different to established assembly systems and because of their unusual nature more expensive. The Bleriot costs approximately 14 6d, and the others about £1 in France. Latest from Monogram is the "Tiger Shark" an all embracing title for the Curtiss P-40B which comes with markings for Chinese, R.A.F. and U.S.A.F. versions. Well up to the standard of the Monogram 1/48th scale range, the P-40 is superbly detailed in the cockpit and particularly well furnished with external markings, we fancy it will be much in demand.

Airtis have revamped their Messerschmitt Bf 109 into a G-6 for 2- and have produced the most accurate 109 model yet. Splinter camouflaged on the wings in two tone green and authentic transfers make this one of the best value and most impressive 1/72nd single engine fighter kits obtainable. The fin leading edge is a trifle burly and the radio mast could do with a file but otherwise we have little cause for complaint on this one. The Junkers Ju 52 3m is even more impressive. Amazing value at 7 6d, and adaptable into civil, Luftwaffe or Swiss Air Force transport versions, or as a float plane, the kit is exceptional in many ways. We made two versions. One as an early post war British European Airways Jupiter G-AHOG all silver, and the other a transport float plane as suggested in the kit. Avoid a shiny silver, if you choose to make a civvy version, the reflection in the well reproduced corrugations tends to lose the scale realism. Opportunities for variations are infinite. We believe a float plane could be made in Norwegian or Swedish markings and the land plane served in many Air Forces and Airlines of the world. One could also select the version with the large De Gaussing mine exploding ring suspended beneath the wings and fuselage but making such a device would not be an easy task.

Revealed at Chicago was the new Cox Special 15 Mark II engine with, as quoted in the brochure "New improved single exhaust". It has, as before, a special alloy piston and hardened steel wrist pin. Plugs are claimed to be long life but as many have discovered the output of the Mk I is sufficient to burn plugs rapidly so the Santa Ana factory must have found a wonder element to cope with the new power. Three transfers of the boost port arrangement are removed to be keyed with single exhaust. On the kit side, a significant development is the deBolt "P-Shooter". This follows the quick assembly style of the "Jenny" but is low wing for multi-training using reeds or proportional. Spanning 57 in., it has a 620 sq. in. wing, plywood fuselage and a minimum of parts. As Harold deBolt says, "You simply assemble it like a plastic model".

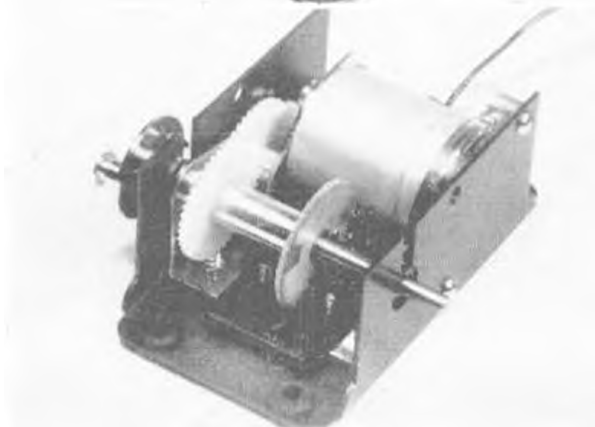
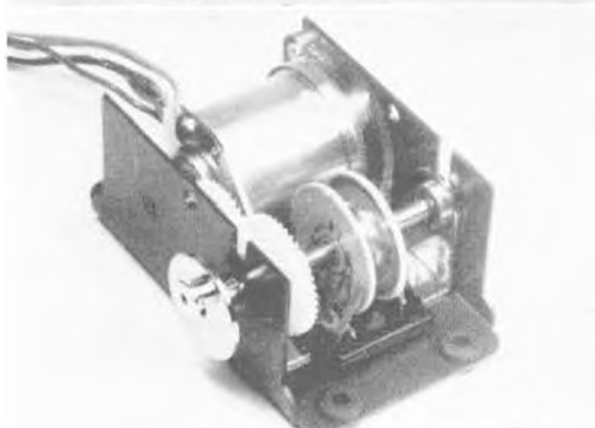
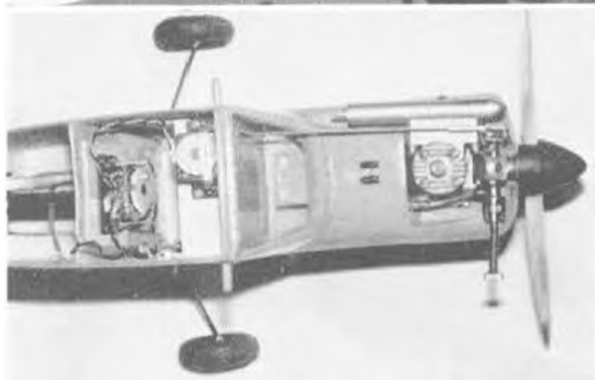
Our own "Jenny" lived up to all the claims made for its 24 hour building time and has proven to be an attractive model. Burglars made straight for it in an office break-in and must have had quite a task wrenching the motor from the front bulkhead!



Top: We liked the 1/48th Monogram P-40 so much — here is another view. Kit permits several alternates, we chose Chinese version with undercarriage fixed down for display. Next is the 28 in. span Performance "Kingfisher" — a simple cabin type for club flying. Dick Edmond's latest tanks for team racing are simplified rectangular shape, with easier moving valves, note three sizes. Bottom — Max Coote of "Ripmax" caught in Chicago with prototype of new Top Flite 37 in. P-51D Mustang.



Over the (ra



AT LAST OUR "Frechdax" has flown. It has been a truly international effort, the kit being the Schuco-Hegi, 47 in. model distributed by F. & A. Allen at a retail price of 74. We equipped it with an Enya .15 with Spinaflo silencer and O.S. radio control. This entailed the Pixie transmitter/receiver with O.S. rubber driven miniature escapements. A detailed account of first flights by a novice with "Frechdax" (covered with the new KK nylon which we can strongly recommend) will come next month. For now, suffice it to report at this time that the combination has proven to be thoroughly robust, prang-proof and capable of returning to base even when control was distinctly in one direction only. The O.S. escapements call for considerable practice in timing their selection. We tried all types of rubber including some Hungarian round section strip but returned to two strands of $\frac{1}{16}$ in. flat and decided to tune the pilot's thumb to the speed of the compound.

Are rubber escapements over-complex? For two years now we have observed how in Japan which is clearly the leading nation for single and intermediate control development these days, that the rubber driven escapement has been overtaken by at least nine different makes of electric servo. Our companion magazine *R.C.M. & F.* has produced most favourable reviews of those marketed by M. Kato, photos of which also appeared in this feature, February issue. Now we have received two advance samples of servos for single channel produced by the O.S. Company. Slightly smaller in length than the M.K., measuring $1\frac{1}{2} \times 1\frac{1}{2}$ in. the O.S. units are quite different in design but appear to have the same excellent characteristics in overcoming the "tuning-on" problems which were unfortunately common to earlier attempts at electric servos. Logical development for the motorised servo which is fast enough for quick neutralising action and yet can be within the speed range of manual keying is to employ the servo for a control system which takes fullest advantage of the continual high power factor and the compactness of installation.

This is where the Japanese modellers have scored so heavily. Eighty per cent of their published designs for single channel operation over the past two years have been for aileron control. In some cases by use of selective compound control, the one motorised servo is employed for coupled ailerons and rudder, motor speed servo selection, nose wheel steering and even landing flaps! Whilst this might be the ideal for a sport loving Cessna 172 flyer, the simple operation of strip ailerons has greatest appeal. Ask any multi-channel flyer which of his control surfaces he would discard to save a pair of channels, he would inevitably say Rudder. Yet the single channel

Top left the Schuco-Hegi, Frechdax in light blue finish with kit supplied transfer decoration plus of course our MAP insurance badge! Model flew straight off the board and is an ideal local field sports type. Second photo reveals installation of OS escapements and Enya .15 engine. Note metal tank which protrudes into transparent cabin area. Bottom two photographs show the versions of the OS motorised servo for single channel which we are testing. JPN compound servo can switch the motor control servo at bottom. Doubled discs on drive shaft of the compound carry seven wipers. Gearing is identical in both cases and the motor appears to be of a special type with very quick acceleration and no over-run.

dio) waves...

operator in this country always chooses rudder operation. The reasons are obvious, the rudder is more easily actuated by the rubber driven escapement system and it offers a measure of control that includes elevation as well as direction.

We shall be experimenting with motorised servos this summer to accumulate our own thoughts on the matter. The Climax Unimite is quite obviously a first choice and the Japanese products will make interesting comparison both in function and operation.

That prolific designer and kit production engineer for Graupner, Fred Militky gave us some details of his indoor radio control model which is electric motor driven and has been flown underground in a salt mine. Fred has been a pioneer of successful electric power flight for many years and remains faithful to the Micromax using the T 03 in this case with 15:1 ratio. The model has a tubular fuselage, single surface wing and tail, and a total weight ready to fly with radio control of 2.46 oz. We are fairly sure that Fred can claim a world-first in making successful underground radio control flights.

At the Nuremberg Trade Fair a number of fascinating new Graupner gimmicks were revealed to aid the R C modeller. Details will follow when production permits importing these items into the United Kingdom. They include the new, smaller Mark 2 version of the SERVOAUTOMATIC which can be adapted as a polarity reverser or switcher for boat operation, or as a very compact motor throttle servo. Most ingenious is an entirely new servo idea which fits on the elevator pushrod. To be called the Trim-o-Matic, it is in brief a device which will extend or contract the length of the pushrod and should vastly simplify multi-channel installation. Naturally it combines with the new Variophon 10 transmitter to utilise the two extra channels. Among new kits on show were two Graupner R C gliders which we are sure will have a fine reception.

Another clever elevator trim device spotted at Nuremberg is a pendulum which fits into the elevator pushrod and is designed to provide automatic trim when the model is flown inverted. The degree of pushrod movement can be pre-set. This is item 215 in the new Schuco list which includes a new wing kit for their "Telstar" multi-channel model, the new Metz 2 channel control-system and, as is nowadays to be expected yet another radio controlled glider, this one the 50 in "Spassvogel".

From Engel a kit for the Swedish "Mustfire" and a semi-scale Me 109 both for multi channel and 49.61 engines show the trend towards better looking models. On the same theme Wilfried Klinger, producer of Wik kits has added a 58 in. "Tiger" R C Multi-Channel Biplane to his range of exceptional quality kits each of which has a particularly distinctive appearance.

Telecont announced their proportional control at the German Trade Fair and a new servo which has

Phil Gerrard of Los Angeles California and his 1,150 sq. in. Delta design which has a silver glass fibre fuselage as made by Max Beauchamp. Model weighs 10 lb. and is powered by a Super Tigre S6 driving a specially carved left handed prop for pusher operation. This very clean aerobatic design is controlled by Orbit 12 channel reed equipment.



First to fly radio underground? Fred Militky, designer for Graupner in Germany and his ultra lightweight model after a successful flight last year. Model is 36 in. wing span and weighs 2.46 oz. ready to fly using specially prepared Grundig radio. Micromax T 03/15 electric motor which is the heaviest single component, drives a Silentius type propeller. Flight is at slow speed enabling simple magnetic rudder control to be fairly non-sensitive.

a distinct external relationship to the familiar Bonner, no doubt influenced by the extensive use of Bonner servos with Telecont equipment by many flyers.

Largest of the new German catalogues is that of Robbe who beside being distributors for Telecont, add several new kits to their range including two "powered" gliders, one for up to 2.5 c.c. the "Silbermowe" and the other for 3.5 c.c. known as the "Baron". The latter can accept full multi channel and both follow the new trend towards slower flying R C sports models which can also be flown as slope gliders. Robbe also introduce a new servo. More on these items when and if we have the opportunity to check them over physically.



N.W. Area Foresight

At the N.W. Area S.M.A.E. Annual General Meeting, Brian Wannup was elected competition secretary. Brian's contest programme seems even more comprehensive than that of the Society. In addition to the events shown on the S.M.A.E. contest calendar, N.W. Area will be running open events at several area centralised meetings. This means that if the events for the day are for instance F.A.T. power, F.A.T. rubber and F.A.T. glider, the Area will run the events for open power, open rubber and open glider with prizes for all three from the entry fees. They hope that by having incentive cash prizes it will encourage more people to attend area centralised events by providing them with a competition that will be fought out against area members only and they will know the winner at the end of the day instead of having to wait for the result of the National event.

The control-line pits are not neglected as Burtonwood airfield is now available and could become a control-line "Utopia" for Northern England. The Area has advised control-line clubs to run their own affairs at R.A.F. Burtonwood to overcome the organisational problem and let the Area do all the touring publicity, etc. Also the Area has a need to loan equipment needed that the clubs cannot provide. The N.W. Area has never before provided so much for its members as it intends to do this year including the running of three National events, the Easter meeting, centralised control-line meeting and Woodford rally.

The S.M.A.E. has donated a limited fund to the Area for preparation of a permanent control-line site at R.A.F. Burtonwood which will be used for the centralised meetings. At the moment they have the use of five airfields though none are named. One, initially the Area P.R.O., Dave Millachup, points out in their newsletter that if any club is prepared to break from the Society when for a mere 12.6d upwards its members can make use of facilities as detailed above, the Society will be a lot better off without them.

Esher

Riverside Spree

At their annual club Dinner Dance on February 13th Esher D.M.F.C. Dinner Chairman H. S. Emery revealed that negotiations are in hand for a radio control flying area to go with their already famous control-line site. (Wonder who will be first, Hillingdon or Esher in the enlightened Council tables?). The event was a great success, ably supported by the appearance of Eric Penn's radio controlled fire-breathing "Dalek" upon the well-populated dance floor and a most impressive display of Multi-radio, control-line and free-flight models. Club President, R.A.C. test pilot Jack Bayce was unfortunately a few miles away in Australia at the time so could not make his eagerly anticipated appearance.

Alan Armes (Hayes) placed 4th in the Wakefield trials, has now taken Geoff Lelever's place in the team following his withdrawal. Alan's model will be "at home" in Finland—since it is a Reino Hyvarinen "Jeppo" design (3-view in June '60 issue).



CLUB AND CONTEST NEWS

Postal Coupe d'Hiver and A 2 Contest

Crawley M.A.C. that enterprising club who always seem to be in the postal contest realm with someone held their last postal event on December 6th between themselves and four American clubs including Kansas City Winged Motors Club, Illinois M.A.C. and the Omaha Group. On team results Crawley came second in the A 1 Glider and third in Coupe d'Hiver. Top individual was Carl Perkins from the Kansas club with 5.24 including two moves, and Dave Linstrom of the Omaha group in A 1 with 4.56. Dave flew with the temperature in the 19 deg. F region and occasional snow. The wind was very light and just to show that thermals can happen any time he made two 10 minute and one 41 minute flight, hope he in the D.F. Crawley's old rivals Illinois M.A.C. only put in two flights both of these being made by Charlie Soukh, the explanation was that the flying field was a mass of mud and snow. An interesting note from the Kansas City club explains that their flying site at Overland Park is known as the "Grave Yard" so it is not surprising that no one entered the A 1 glider, fancy trying to dodge all those head stones with a glider on tow at the same time.

Scottish Flying Sites and Silencers

Most of the South of Scotland area modellers' worries are now concentrated on where to fly especially the free flight and radio control areas. Until recently they had use of Aberdeen aerodrome in company with the full size aerodrome, but unfortunately progress in full size aviation has stepped on and decided that Renfrew is too small so Aberdeen must be used and new runways constructed by 1969 when it will be handed over to Glasgow Corporation. Although there is much open moorland around the City it is very rough and rather boggy and the good sites can only tolerate a few modelers, nothing like a full free flight contest. As Glasgow Hornets team race boys seem to have their own field, the free flight boys are busy looking around, one likely site being an aerodrome near Dunbar that was in use when the Turnhouse runways were being lengthened. The Scottish Radio Modellers' Association A.G.M. was held in Stirling on January 14th and also included a dance and slide show as part of a combined social event. It was revealed at the

JUNIOR INTEREST HIGH

North Sheffield M.A.C. who have always voiced concern over the subject of young aeromodellers now have a Junior Stunt Challenge Trophy. A simplified schedule is used with added encouragement in the form of cash prizes contributed by senior members whenever six or more contestants enter Present Challenge. Trophy holder is R. Evans of Roy Carrwood.

meeting that their membership and financial position was the best ever and they now have some 250 individually insured members from 15 affiliated clubs. The flying field situation may have prompted the decision of the well-attended meeting to apply the S.M.A.E. ruling on silencers to S.A.A. insurance and their contests from May 1st, 1965, which just goes to show how wise the decision of the S.M.A.E. was to introduce the silencer ruling to their insurance.

Midlands Rat Race

Huddersworth M.A.C. the up and coming Birmingham club recently held a club Rat Race for minors up to 15 c.c. This was very well attended with excellent weather conditions. The two model heats were run over 70 laps each entrant having two heat flights and the fastest three times went into the 140 lap three-run final. Amongst the interesting variety of models entered the older more consistent ones tended to oust the newer and sometimes faster ones. In the final the two rivals Hta and Oliver were shown together with the surprise inclusion of an F.D. 246 Racer. When the starting whistle blew, the F.D. 246 was airborne, almost immediately quickly followed by the Hta which took the lead and then the Oliver model which was easily the fastest but had starting trouble and failed to complete the 140 laps. Results were 1st, G. Bryant, 2nd, A. Howley, and 3rd D. Jones. The club also received a boost when stunt flyer Dave Tubby's crew took Wolves to join them, so they look forward to stunt flying this season.

First Silenced Contest

The first ever silenced contest in G.B. open power model class took place on February 7th and was run by the London Area Clubs at Chobham Common. In poor weather conditions Dave Hipperson whose silencer was ineffective, was not allowed to fly his G10 model, and winner Graham Head seemed to have a louder engine as the less processed power entries were low due mainly to the weather conditions, not the silencer ruling as plenty of models were seen with silencers but unflown. J. O'Donnell won the Glider event and his club if it had one of his own climates model regarding for him whilst making a time of 8.00. Al Wisler's model came first in Rubber despite hitting some power lines with both his first and reserve models. Old time contest flyer Paul Lewis had his best ever win in A Power at 8.10. Results: Rubber: 1. A. Wisler (Croydon) 9.00; 2.54; 2. R. Bailey (Surrey) 9.00; 3. J. Boxall (Bournemouth) 9.00; Glider: 1. J. O'Donnell (Woking) 8.18; 2. Southampton (Whitefield) 8.27; 3. J. Pount (Croydon) 8.10; Power: 1. G. Head (Purtonmouth) 8.55; 2. G. Cunnell (Croydon) 8.34; A Power, 1. P. Lewis (Croydon) 8.31; Chuck Glider: 1. R. Fleegwood 2.21 (Croydon) three flights.

COMBINED S.M.A.E. AND CLUB CONTEST CALENDAR

March 21	S.M.A.E. Area Event. F.A.I. Glider, Rubber and Open Power.		
April 4	Rolls Royce Pylon Race. Thulston on B5010, 1 mile south of Derby off A6. Single and Multi channel Relay Race. Enquiries to: P. Clark, 70 Brisbane Road, Micklover, Derby.	May 9	S.M.A.E. All Scale Meeting. R.A.F. Hemswell, near Lincoln. F.F.C.L. and Single Channel R/C. Also incorporating 20th Century Fox "Those Magnificent Men in Their Flying Machines" contest, details in March 1965 <i>Aeromodeller</i> .
April 11	S.M.A.E. Area Event. Open Rubber, Glider and F.A.I. Power.	May 16	S.M.A.E. Area Event. Open Rubber, Open Rubber Glider, Team Rubber.
April 11	S.M.A.E. Control Line Meeting. Hayes C.L. Circuit, Charville Lane, Hayes, Middx. F.A.I. T.R. Speed and Combat plus S.M.A.E. Speed. Starts 8.00 a.m. Pre-entry to: S.A. Wade, 10 Storer Road, Loughborough, Leics. No practice tarmac available.	May 16	Wanstead Warhawks F.A.I. Meeting. Hayes C.L. Circle Charville Lane, Hayes, Middlesex. F.A.I. Team Racing. Pre-entry 2.00 to: G.A. Green, 20 Meadowside Road, Upminster, Essex, by 10-5-65.
April 18-19	North Western Area S.M.A.E. Easter Meeting. R.A.F. Ternhill, on A11 road between Whitechurch and Newport, Shropshire. Sunday Events: Open Rubber and Power, A Power, Combat, Stunt, F.A.I. T.R. Free Style R/C. Multi. Monday Events: Open Glider, Tailless Glider, Combined F.A.I. F.F. Control Line Scale, Combat, A T.R., B T.R., F.A.I. Multi R.C. Details and Pre-entry forms from: U. A. Wannup, 13 Dene Court, Stockport, Cheshire.	May 16	Dunfermline C.L. Rally. Pitreavie Playing Fields, Nr. Rosyth, Scotland. Rat Race, Combat, Stunt, A, F.A.I. B, Team Race, Scale, Chuck Glider 2 6d. Field Entry.
April 25	S.M.A.E. Multi Radio Control Meeting. Venue to be announced.	May 23	S.M.A.E. Control Line Team Trials. Criterium of Aces. Provisionally R.A.F. Hemswell, Lincoln. F.A.I. Speed, T.R., Stunt, Combat. No silencers required. Pre-entry 10 - Full Members, 20 - Associates, 40 - Non Members to S.A. Wade, 10 Storer Road, Loughborough, Leics.
April 25	Croydon D.M.A.C. Open Gala. Chobham Common, Open R/G/P. 2/6 no re-entry.	June 6	British National Championships. R.A.F. Ouston, 12 miles west of Newcastle upon Tyne, just off B6318 road. Thurston Cup (Open Glider), Women's Cup (Open R/G/P), S.M.A.E. Trophy (Multi R/C), Knokke Trophy (C.L. Scale), Gold Trophy (C.L. Stunt), Davies A Trophy (A T.R.), Combat heats, Handicap Speed, and Scale Radio.
April 25	South Bristol Vintage Gala. R.A.F. Hullavington, on A129, Wilts. Open R/G/P. pre-January 1951, and Chuck Glider. Details from: J. B. Mayes, 17 Northville Road, Northville, Bristol, 7.	June 7	Model Aircraft Trophy (Open Rubber), Sir John Shelly (Open Power), R.A.F. M.A.A. Trophy (A T.R.), Scale Radio (Judging), Scale C.L. (Judging), Combat heats and finals, and Speed. Pre-entry to: S.A. Wade, 10 Storer Road, Loughborough, Leics.
May 2	Airtech M.F.C. F.F. Gala. Haddenham, Bucks. Open R/G/P and Chuck Glider.		(Continued on page 192)

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Contest Calendar

(Continued from page 191)

- June 20 S.M.A.E. Area Event. F.A.I. Power and Rubber, Team Glider.
- June 20 S.M.A.E. Control Line Meeting. Venue to be announced.
- June 26-27 U.K. Radio Control Championships. S.M.A.E. Multi, Single Channel, left and right rudder only. Immediate class, left right rudder up and down, elevator and engine control or proportioned rudder, etc. Details from: T. W. R. Galway, 34 Roddens Park, Belfast, 5
- June 27 S.M.A.E. Multi Radio Control Meeting. Venue to be announced.
- June 27 Wanstead Warhawks F.A.I. Meeting. Hayes C/L Circle, Churville Lane, Hayes, Middx. F.A.I. Team Racing. Pre-entry 2/6d. to: G. A. Green, 20 Meadowside Road, Upminster, Essex, by 20-6-65.
- June 27 Scottish Gala. Provisionally Irving. R/G/P and A Power. A, F.A.I. B, Team Race and Combat. Pre-entry 2/6d. to: A. Oakley, 9 Elizabeth Street, Dunfirmline, Fife, Scotland. Field entry 3/6d.
- July 4 S.M.A.E. F.A.I. Gala. F.F. R/G/P C/L Stunt, Combat, T/R, Scale, R/C. Venue to be announced.
- July 11 S.M.A.E. Indoor Meeting. Cardington.
- July 11 Clwyd Slope Soaring Meeting. R/C Glider, Multi and Single Control surface, open and A.2 and Junior slope soaring.
- July 18 Essex Open Intermediate R/C Rally. Club flying site Nr. Oditham. Models may have Engine, Rudder, and Elevator Controls.
- July 25 S.M.A.E. Control Line Meeting. R.A.F. Burtonwood, Nr. Warrington, Lancs.
- August 1 East Anglian Gala. R.A.F. Upwood, Nr. Ramsey, Peterborough. Details later.
- August 8 S.M.A.E. Summer Gala. Provisionally Oditham Aerodrome, Hants. Open R/G/P, P.A.A. Load, Chuck Glider, Multi R/C, Combat, Stunt, A & B T/R.

- August 22 S.M.A.E. Radio Control Meeting. Venue to be announced.
- August 22 Glasgow Hornets C/L Rally. College Milton, East Kilbride. 1A, F.A.I., B T/R, Combat 2/6d. Pre-entry to: G. McCree, Sloop, Langgrieg Road, Newton Mearns, Glasgow. 5 - field entry.
- August 29 S.M.A.E. Indoor Meeting. Cardington.
- August 29 South Coast Gala. Chobham Common, Open R/G/P, 1A Power, all in F.A.I. Tailless Glider
- August 29 Woodford Rally. Woodford Aerodrome.
- August 30 Sucktan Free Flight Gala. Chobham Common. Open R/G/P, 1A Power, F.A.I. combined event.
- September 5 S.M.A.E. Northern Gala. Venue not known. Open R/G/P, Tailless, P.A.A. Load, R/C Multi, Combat, Stunt, A, F.A.I., B T/R
- September 12 South Midlands Gala. College of Aeronautics, Cranfield, Beds. Open R/G/P, Chuck Glider, F.A.I. and A T/R, Combat, Single and Multi R/C. Enquiries to: J. Stevens, 4 Abbotia Close, Aylesbury.
- September 19 Craveley Rally. Great Buckwood Farm on A261, turning off A23.
- September 19 Wanstead Warhawks F.A.I. Meeting. Hayes C/L Circle, Churville Lane, Hayes, Middx. F.A.I. Team Racing. Pre-entry 2/6d. to: G. A. Green, 20 Meadowside Road, Upminster, Essex, by 12-9-65.
- September 26 S.M.A.E. Area Event. Team Power, Open Glider.
- October 3 S.M.A.E. Area Championships. R/G/P and F.A.I. Team Race.
- October 10 Croydon D.M.F.C. Mini Gala. Chobham Common, 1A Power, Coupe d'Hever, A/1 Glider (5.08 oz. min.) 2/6d. entry fee, no re-entry.
- October 17 S.M.A.E. Area Event. 1A Power, Open Rubber.
- October 24 Northern Area F.A.I. Meeting. R.A.F. Topcliff. F.A.I. R/G/P, T/R, Stunt and Combat.

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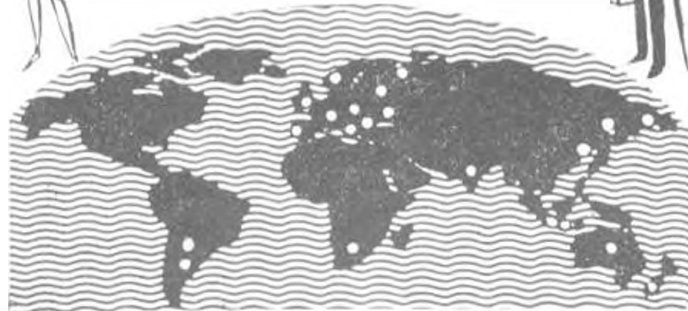
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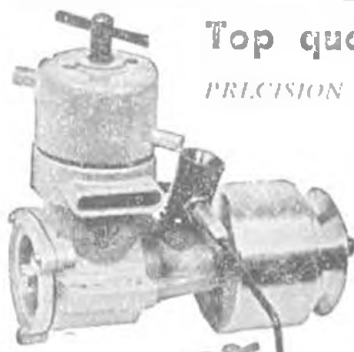
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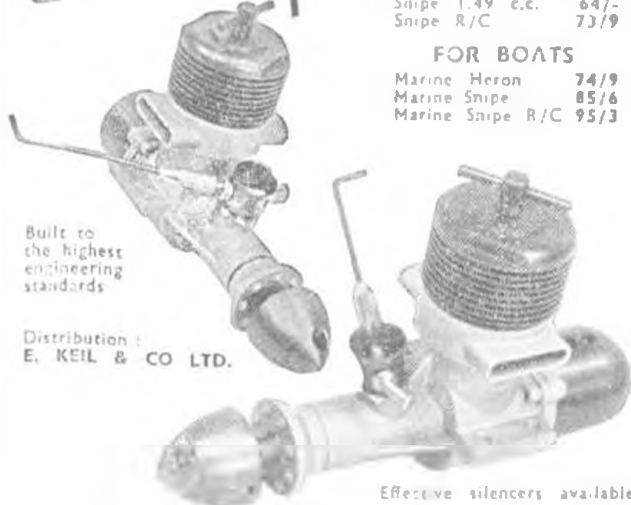
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Box replies to be sent care of Advertisement Department, Model Aeronautical Press Ltd., 38 Clarendon Road, Watford. Copy received after first post on March 22nd, 1965, will be held over until the next issue, unless cancelled in writing before 20th of following month.

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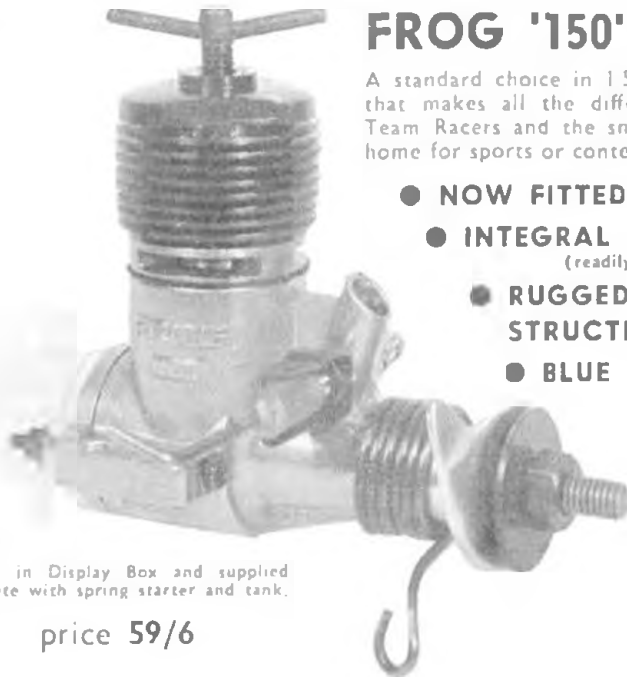
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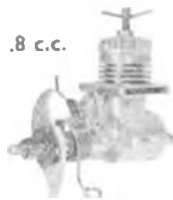
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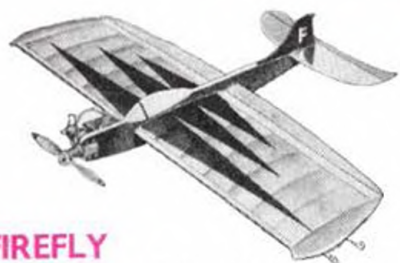
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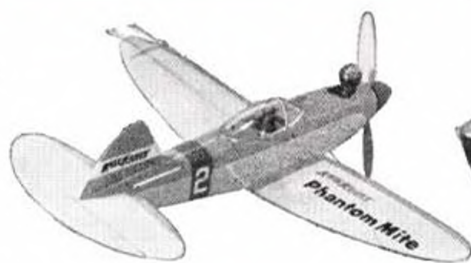
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