AERO MODELLER

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FULL-SIZE PLAN INSIDE

MAP HOBBY MAGAZINE

MAY 1964

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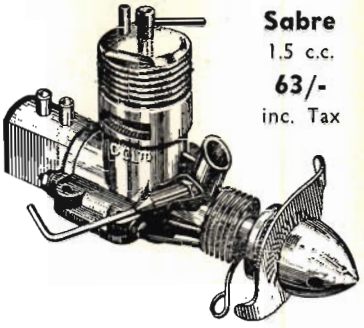

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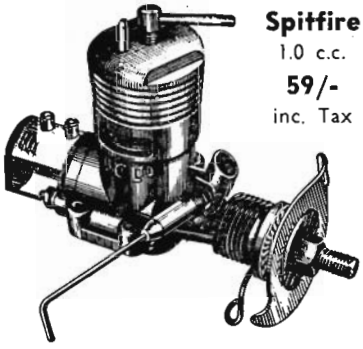

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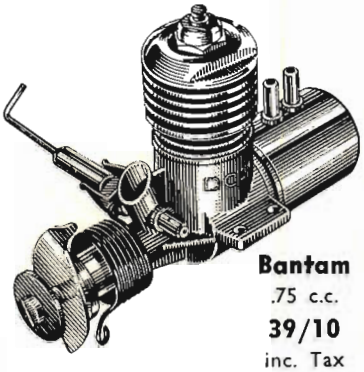
begins with a **QUICKSTART** *engine and goes on and on — especially if you use Quickstart ready-mixed fuel*



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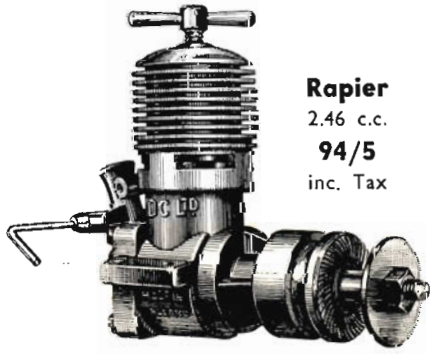

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LOOK IN AT YOUR MODEL SHOP — THIS WEEKEND!

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AERO MODELLER

MAP HOBBY MAGAZINE

May 1964

VOLUME XXIX No. 340

other modelling angles . . .

May issue of 'Model Maker' gives more information on the new 30 watt electric powered boat class, fast gaining popularity. Plans for the H.M. Customs boat, "Badger", a Ship in a Light Bulb, Paddle Steamer drawings, an exciting hydrofoil and an easily built Saw Bench are all there for your enjoyment.

In the May issue of 'Radio Control Mode'ls & Electronics', we have a really bumper issue, starting the flying season with a free full-size plan insert for Vic Smeed's "Ohm-Eight" or "Oh Mate", whichever way you like it. This is a biplane which suits single or multi channel or intermediate if you like. Data on Reeds, Beginners Series, Kit Construction are all supporting features in a very special issue which we suggest you nip out and purchase straight away because stocks are sure to go quickly with the free plan.

Third edition of the new series of 'Model Cars' has more on chassis construction, prototype drawings of the 1934 Riley Imp and the Chevrolet Stingray. A report on operation of the commercial ready to run glow plug engine for cars from America, building from commercial body shells and by popular request, track building without tears.

M.A.P. hobby magazines appear, one each Friday of the month to cover the widest interests of all hobbyists.

contents

cover

C. O. Wright of Topeka, Kansas, is one of the grand old men of American aeromodelling. His A.M.A. licence number is 6, he was an early President of the A.M.A. and he has always competed at the American National Championships in various events. One of his favourite subjects is free flight scale. He built this 58 in. replica of the 1908 Antoinette back in 1958 and had some difficulty trimming it. Success first came in 1961 at the Philadelphia Nats where he took 1st place. Further wins in 1962 led to a repeat 1st place at the 1963 Nationals, Los Alamitos, California. The 1/12th scale model has an Atwood .049 running at high r.p.m. (over 13,000) on a 6 x 3 in. prop, which according to Mr. Wright is essential for stability. A pendulum rudder is employed and the flying weight is 14 ozs. As seen in this photograph, every effort has been made to retain the atmosphere of the pioneer aircraft right down to the miniature spark plugs in the dummy engine.

next month . . .

Sport free flighters have their turn in plan of the month for A.P.S. when we publish a specially commissioned simple sport flyer designed by one of our leading power modellers, Mike Green, **Mandy** is a 45 in. high wing type, adaptable for radio control for those who want it, but primarily an auto-stable, very tough sportster for 1 to 1.5 c.c. that will give hours of fun and very little trouble in construction. Inside story of the famous Soviet Union Aeromodelling Institute at Tushino, Moscow, tells the story of the way in which the U.S.S.R. utilises the hobby in education. Our novice features "Let's Go Flying" and "Get Started in Radio Control" continue with more pearls of wisdom and for scale fans, marking information for World War I and modern types while full size plans of a 1.5 c.c. ½A Combat model will meet many readers' requests.

Editorial and Advertisement offices

38 Clarendon Road, Watford, Herts

Telephone : **Watford 32351** (Mon.-Fri.)

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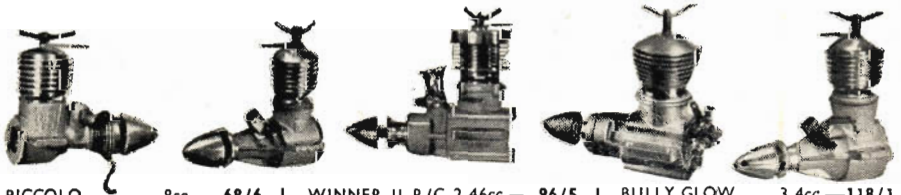

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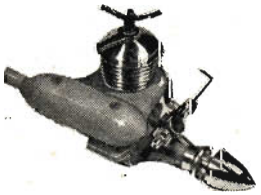
WINNER II	2.46cc.—	**86/7**	BULLY II R/C	3.44cc.—	**135/1**	BIG BEN GLOW R/C	5cc.—**137/9**
						MACH 2 RACER	2.48cc.—**146/11**

* *NEWS FLASH*



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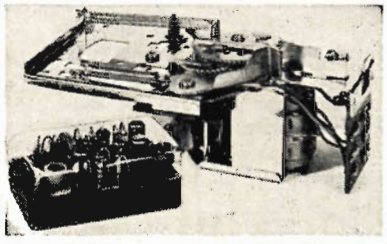

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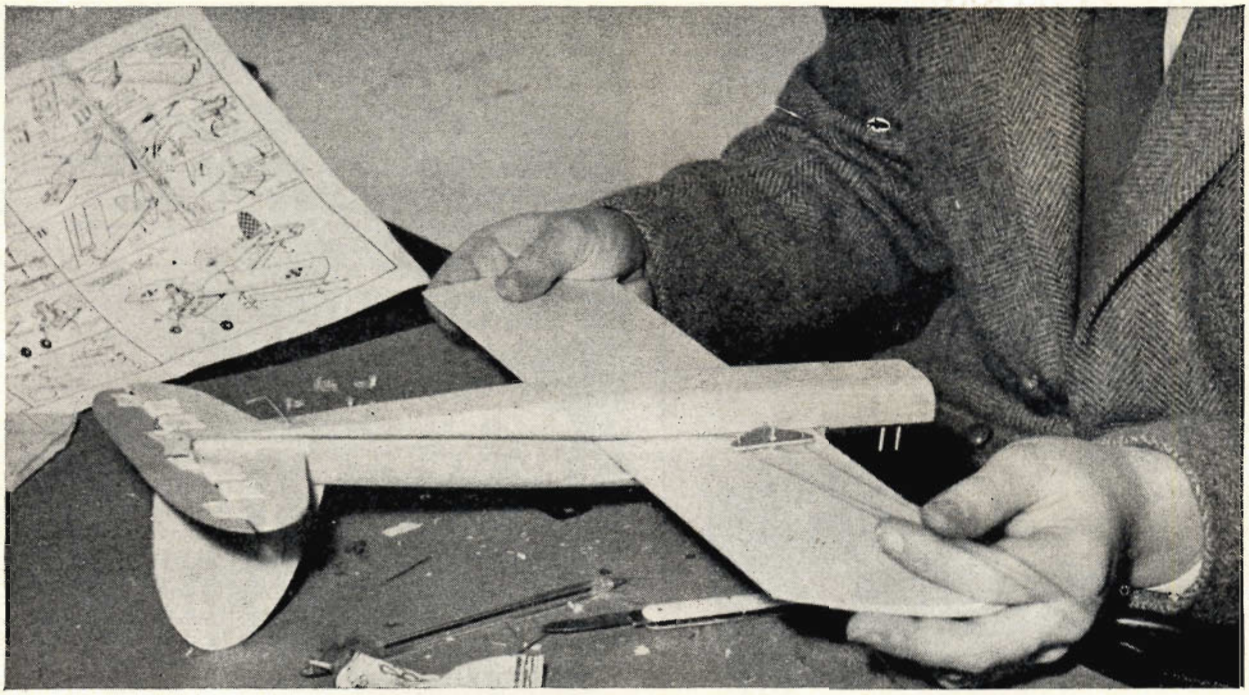

BALSA MODELS FLY BETTER . . .

At the start of the 1930's rubber powered models were the main type and a duration of 30 to 45 seconds was pretty good. The introduction of Balsa as a standard material for airframe construction soon changed all that — models became much easier to build, could be built much lighter, and performance advanced by leaps and bounds. Right from the first, Balsa models flew better, and the same is true today. Practically all the advances in aeromodelling design and performance, in fact, are directly due to the all-round qualities of Balsa as an airframe material with its amazingly high strength/weight ratio and the ease with which it can be cut, shaped and jointed with quick-drying cellulose cements or PVA.

Control line flying would not even have got started without Balsa — nor radio control — nor the high-performance power-duration model which traces its ancestry back to Carl Goldberg's pylon designs of the late 1930's. As for the high-performance rubber-duration model, that would have been — and still is — impossible to produce without the exclusive use of Balsa for the airframe. And Balsa is the least expensive of airframe materials, too.

For all its usefulness, Balsa wood is highly variable in quality as fel'ed and cut in its natural state. That is why it is so important to use only the best Balsa for models — Balsa which has been selected and graded specially for aeromodel'ing use and cut with precision to the sizes you want. The experts know the right answer — they choose SOLARBO BALSA, noted throughout the world for its consistent high quality in just the grade you want.

Solarbo — THE BEST YOU CAN BUY

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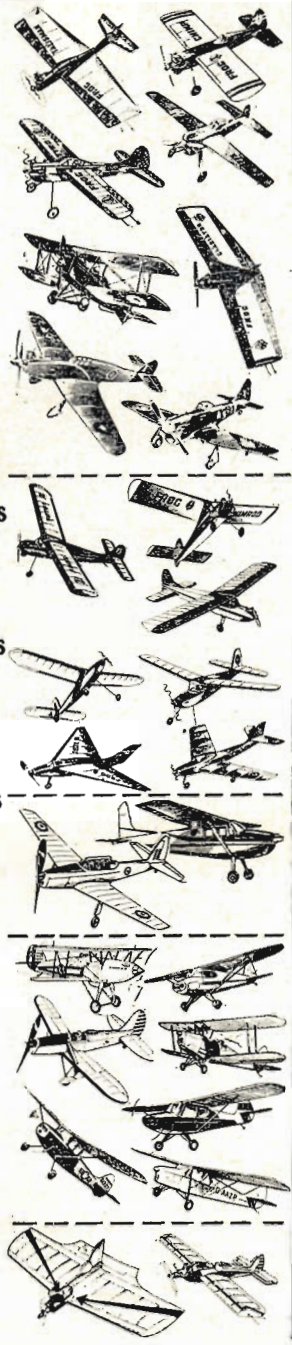

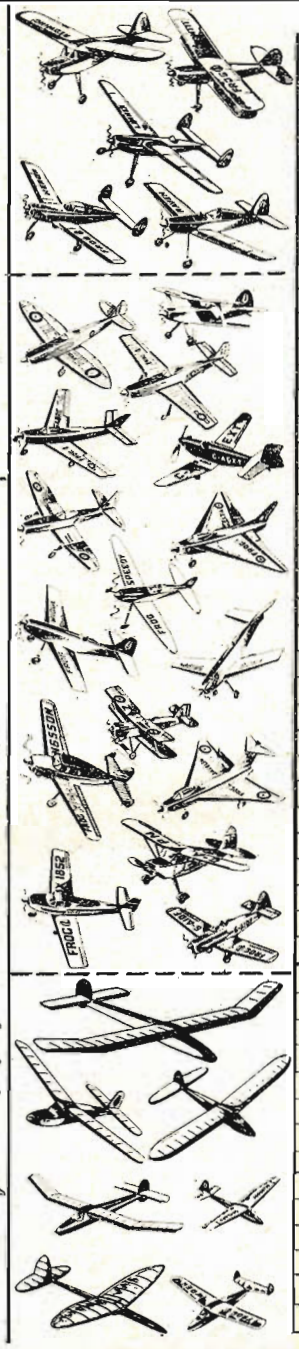

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SEE these wonderful kits for yourself at your local model shop — and ask for this FREE BOOKLET which describes and illustrates the full range (*send S.A.E. if you cannot obtain locally*).

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March cover, showing the A.P.S. Fokker Friendship by Maurice Bodey on the apron in front of Liverpool Airport Control Tower inspired M. A. Hundleby of Hazel Grove, Cheshire, to produce this picture. It shows his 34½ in. Focke-Wulf Stosser to 1/12th scale posed at Manchester Airport. The model is powered by a Mills .75 c.c. diesel with only the compression screw exposed. Its fuselage is planked with 1/64th balsa sheet and the wing is in one piece, held to the centre section cabane by rubber bands.

Heard at the Hangar Doors

Attitude to Silencers

For their radio control model rally to be held at R.A.F. Hullavington, Wiltshire, on July 12th (not June 28th as previously announced, as this clashed with another rally run by Sutton Coldfield), the Bristol R/C M.A.C. feel they do not have sufficient authority to make silencers compulsory unless other rally organisers undertake the same obligation. They are, however, encouraging the use of silencers in an ingenious way. In the scale event there will be no penalty for deviation from true scale because a silencer is fitted, and in the open multi contest, all models fitted with a silencer will be given an automatic bonus of *five per cent* in points.

These are meant to offset the supposed disadvantages due to loss of power. Whether 5 per cent is adequate remains to be seen. As the club states "Not many manoeuvres depend on the last ounce of power so perhaps the unsilenced competitors will be the ones to feel themselves at a disadvantage". Silencers are mandatory for all Bristol R/C M.A.C. club meetings from .19 cu. in. capacity upwards. See also "Readers Letters" on page 246 of this issue for further comments. Meanwhile more silencers are reaching the modelling market and manufacturers of radio control engines are devising ways and means of incorporating exhaust choke control within silencers to duplicate their purpose. The Johnson Bulldog (illustrated on page 234) could be said to have this combination.

Thirteen - year - old Air Scout Roger Claydon, of Lowestoft, Suffolk, was recently made a Colonel in the U.S.A.F. for a day in recognition of his courage and endurance in overcoming his handicap as a spastic. Roger, who is a keen aeromodeller, has had seven operations on his legs and spent many months in plaster, and his gallantry has won him the Scout's award for courage, the Cornwell Medal. He always insisted on taking a full part in scouting activities.

French Invitation

The President of the *Aero Club de Normandie* issued a very kind invitation through ourselves, which we have passed on to many radio control modellers. However, there may be others with whom we have no direct contact who will still be interested in the meeting which they are organising at Rouen, on the airfield of Madrillet on May 10th. This is to be *"un grand concours"* for radio control to celebrate

AIRCRAFT QUIZ — Answer

Designed purely for sport, the single seat RICCI R.6 was built in Italy by Industrie Aviorie Meridionali of Naples. Official government tests were completed in April of 1920. Built primarily of wood, the wings were of a thin section with terrific camber and were supported on "I" struts, with wire bracing. Owing to the short moment arm of the tailplane, the tail skid was attached to long steel tubes. The aeroplane, fitted with a 6 cylinder Anzani engine of 40 h.p., had a duration of three hours, a maximum speed of 100 Km/h and stalled at 30 Km/h.

Dimensions: Span 3.50 m., Length 3.75 m., Height 2.30 m., Wing Area 11.0 sq. in., Weight Empty 150 kgs., A.U.W. 260 Kgs.

the opening of a special take-off area established on the aerodrome. Events are to be for single and multi channel and flying scale. The contest runs from 9 till 5, hospitality and refreshments are assured and entries (5 francs each) are required by May 4th. We shall be happy to forward further details. Rouen is now readily accessible from Dieppe, only a matter of 30 miles or so inland, making it an easy trip by the Newhaven-Dieppe, and Southampton-Havre ferries.

Wedding Bells

We know that all the contest fraternity join us in wishing Ron Draper and Janet Roberts all happiness on the occasion of their marriage at Coventry on April 4th. Ron, ex-world power champion, Wakefield and indoor flyer, has been helped so much in the past by Janet as his regular "mechanic" that we are sure this will be a most happy union and one which certainty should not have any retarding effect on their modelling prowess.

French Record

An attempt on a closed circuit record by the French radio control expert Pierre Marrot, took place on 15th February at Coulommiers. His equipment was a standard Taurus powered by a 2.5 c.c. Micron racing diesel with a fuel tank capacity of 350 c.c. A theoretical possible duration with this economic engine was 90 minutes. Since the model weighed almost 8 lbs. at take-off, it was not surprising that the roll along the runway was 100 yards before the wheels left the ground. Unfortunately, a strong wind developed during the attempt and quite often windspeed exceeded groundspeed!

As the first hour passed, Pierre had managed 43 circuits of the kilometre course and finally, wind effect and the general battle with the elements necessitated landing at 1 hour, 12 minutes, 10 seconds, after 53 kilometres had been covered. The thought then occurred to our French friends "How on earth did the Russians manage 185 km.!". Certainly one would need a tank of enormous proportions.

Coupe d'Hiver Postal

The miserable conditions on February 23rd which prevailed throughout the British Isles had a heavy dampening effect on the British postal event for Coupe d'Hiver class. In fact, by allowing the flights made in France by the British team at the Anglo-French Challenge, the slightly better conditions near Paris gave an advantage to those on French soil. Only 12 official results were received in time, with 4 added later, a low return considering the growing enthusiasm for the class. First six in the postal were: 1. P. Cameron (Crawley) 257, 2. J. O'Donnell (Whitefield) 231, 3. T. Faulkner (Luton & Dunstable) 222, 4. B. Faulkner (Cheadle) 215, 5. G. W. Dallimer (Stevenage) 191, 6. M. Doyle (Belfast) 185.

N.W. Easter Meeting

Easter bonnets were certainly not to be seen at R.A.F. Tern Hill, near Market Drayton over the weekend 29/30th March. A bitterly cold north wind produced the chilliest Easter in memory and severely reduced the numbers flying on the Sunday, although it did not prevent a fly-off. In contrast, wind strength was almost zero for Easter Monday and we hear that Urlan Wannop made a 47 minute flight which landed only two miles distant. A pictorial report of this successful North Western "Nats" will be included in next month's issue, meanwhile congratulations to the North West Area for a well organised event which produced some very interesting new models.

Jimmy Stouffer holds two versions of SIMPLEX, 6 ft. span and the 36 in. span. The proportions are the same. Both are rudder only with .049 O.K. Cub and .19 rear rotary McCoy engines. Weight of the larger model is about 3½ pounds. An Ecktronics Kraft single channel receiver is installed, 3.6 volt Nickel Cadmium cells provide electrical power for the Babcock escapement operation. Wings are carved from ¼ x 6 x 36 in. soft balsa and joined at the dihedral point with multiple layers of glass fibre and resin.

S.M.A.E. Competition Results

Having been thrust (rather than co-opted) into the position of S.M.A.E. Competition Secretary, Stan Wade is tackling his difficult job on behalf of the S.M.A.E. very well indeed and has produced the following results for the events of March 22nd very soon after the event took place.

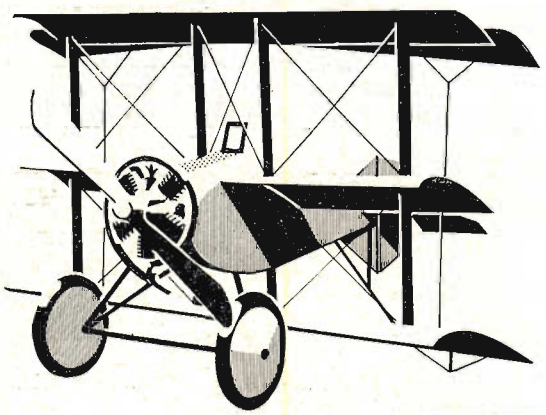
K. & M.A.A. (Glider) 125 Entries.
1. D. Wooton (Hayes) 14:23 ; 2. R. Amor (Essex) 14:22 ; 3. M. Burrows (St. Albans) 14:19.

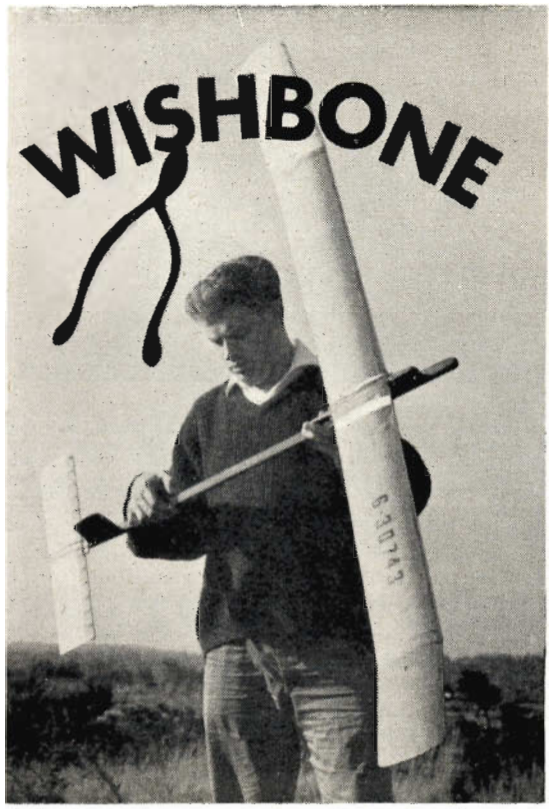
F.A.I. (Rubber) 42 Entries.
1. B. Rowe (St. Albans) 15:00 ; 2. G. Lefever (Norwich) 14:20; 3. B. Halford (Norwich) 13:48.

Frog Senior (Power) 87 Entries.
1. M. Gaster (Surbiton) 9:00 + 5:18 ; 2. R. Cummings (Bristol & West) 9:00 + 4:03 ; 3. R. Monks (Birmingham) 9:00 + 4:02.

AIRCRAFT QUIZ — Number One

What is it? When was it built? Answers on page opposite.





Britains Best A/2!

1963 Contest Record

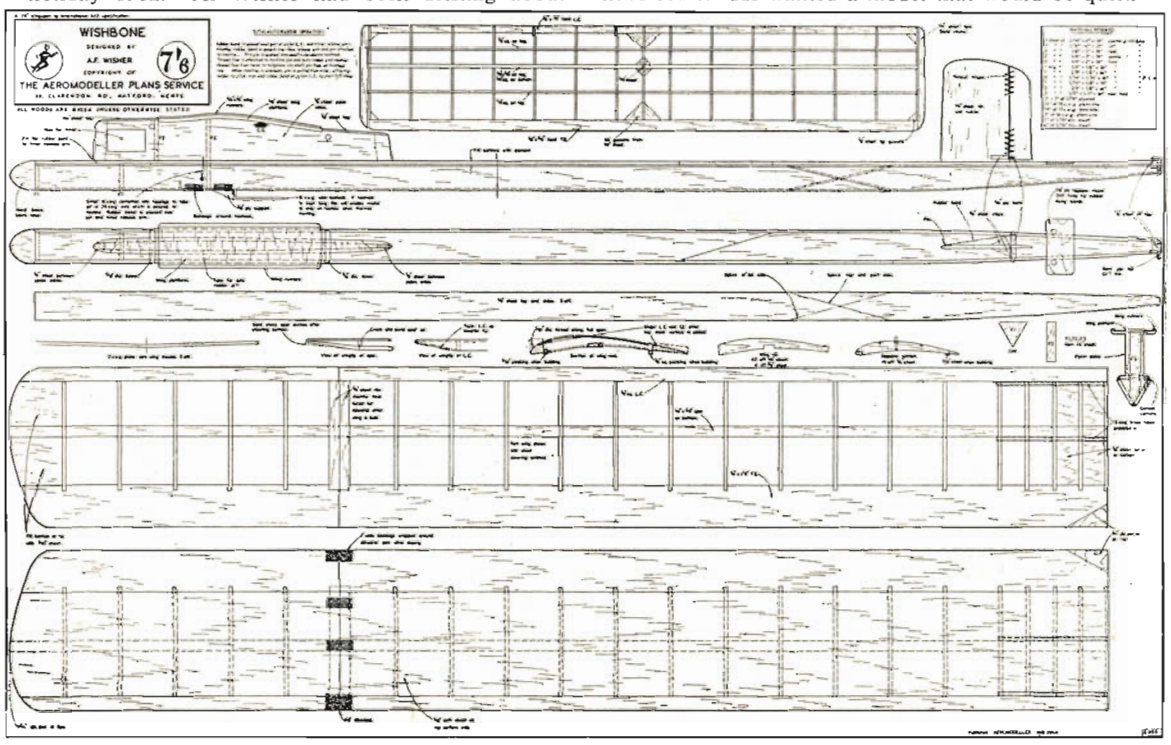
APRIL 28TH	**1st**	*S.M.A.E. Open Glider.*
MAY 12TH	**1st**	*East Anglian Gala.*
MAY 19TH	**1st**	*S.M.A.E. Cup.*
JULY 7TH	**4th**	*Hayes Gala.*
AUGUST 4TH	**2nd**	*Devon Rally.*
AUGUST 11TH	**4th**	*S.M.A.E. Scottish Gala.*
AUGUST 18TH	**4th**	*S.M.A.E. C.M.A. Cup.*
SEPTEMBER 1ST	**2nd**	*S.M.A.E. Northern Gala*
SEPTEMBER 8TH	**4th**	*South Midland Gala.*
SEPTEMBER 15TH	**2nd**	*S.M.A.E. F.A.I. Contest*
SEPTEMBER 22ND	**3rd**	*South Coast Gala.*
OCTOBER 6TH	**2nd**	*Barnstormers Rally.*
OCTOBER 13TH	**1st**	*Hornchurch Gala.*
OCTOBER 22ND	**2nd**	*Surbiton Gala.*
NOVEMBER 3RD	**3rd**	*St. Albans Gala.*

Fly Off Times

S.M.A.E. Open Glider 9.00 + 6.35 ; *Hayes Gala* 9.00 + 2.45; *Lincoln Gala* 9.00 + 2.20; *Northern Gala* 9.00 + 1.42; *South Midland Gala* 9.00 + 2.17; *S.M.A.E. F.A.I.* 15.00 + 3.30 + 4.00 + 4.30 + 4.11; *Barnstormers Rally* 9.00 + 1.41; *S.M.A.E. Team Glider* 9.00; *Surbiton Gala* 9.00 + 2.43; *St. Albans Gala* 9.00 + 2.14.

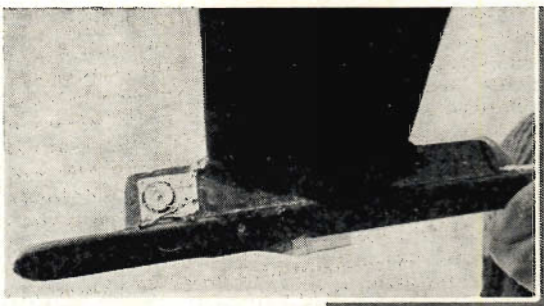
by Al Wisher

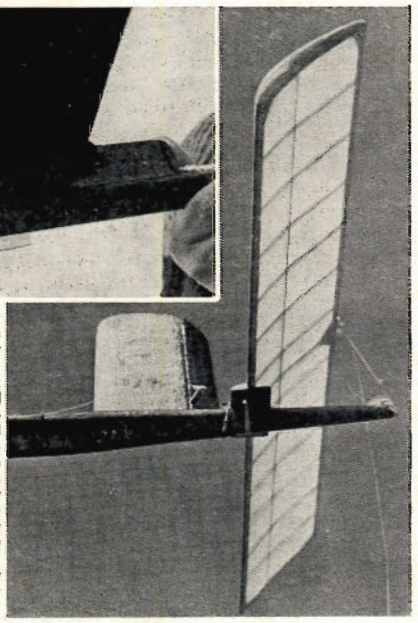
THIS MODEL FIRST CAME about during the Christmas holiday 1962. Al Wisher had been drifting about from one free flight contest class to another, and decided at this time to concentrate on one class. Glider was the choice mainly because in his view power models are too expensive to lose and rubber models too fiddlesome. He wanted a model that would be quick



and simple to build as he hated building! He is also a strong believer of the saying "if you can't cut it with a razor blade or bend it with a pair of pliers, don't use it".

The model should essentially have a good still airtime with tow-line stability, so that one could play it "on the line" until a good patch of air came along. As it turned out 'Wishbone' does not have to be played—just tow it up and leave it there !





Clockwork timer actuates tipping tail for d/t action. Note long tow hook for delayed launches as bottom picture. Al was once disqua'ified from a towing duration event for tying his line to a car door and leaving Wishbone kiting. No better advert for stability !

Only one alteration was made and that was a $\frac{1}{32}$ turbulator added to the wing. The model used to stall twice from a stalled launch. At first cotton turbulators were tried but made no difference, so a larger one was tried with success. As Vic Jays said, "it does not spill the air over the wing, it makes it fall flat on its face".

The model lasted all through 1963, being lost only twice and luckily returned both times. At the Woking Gala the model was lost upwards, though the dethermaliser was seen to pop, and it landed in Essex, some 45 miles away.

The model will do three minutes with the help of a little lift, as the 1963 contest shows.

Here are a few points to help you to get to the top with the Wishbone:—

Always, on returning home from a contest, strap the wings and tail on to a flat board. This may not be thought necessary but it is better to be safe than sorry. Practice in *all* weather will help you get used to the model on the tow line, then you will find it quite easy to hold the model on the line until the right time to launch. It often amuses Al at contests to see people tow to the top of the line and release at once, they stand as much chance of winning as they have in a raffle. Also, get a *light* winch, it's hard work having a model on the line for 15 minutes or so if your winch weighs more than a few ozs. Not only does it make it hard to feel lift, but it feels like a ton weight. When hunting for lift keep the model at 45 deg. away from you, don't worry if the model is not at the top of the line, it will soon get to the top when it hits a riser.

Construction. Start by splicing fuselage sides and top together. Then hold all corners together with pins at 1 in. intervals. Run cement down edges until all corners are full of cement (this will take about five layers). Pins can now be removed and the fuselage sanded to shape. Fix F4 into position and lay pylon sides along fuselage clamping at front and back on to sheet formers shown. After covering fuselage, fix wing and tail mounts and also fin. Leave weight out until the model is finished in order to adjust C.G. into position shown.

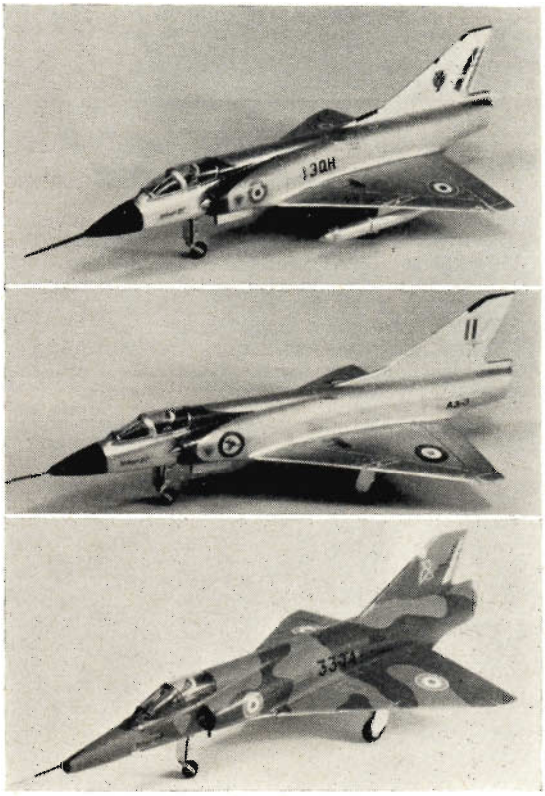
Pin wing leading and trailing edges to the board with packing as shown. Fix all ribs into position. When dry lift from the board and insert the spar. Lay $\frac{1}{16}$th top surface on to wing and pin into position. When the top surface is completely held down with pins; coat all touching surfaces with P.V.A. white glue (this is important as P.V.A. will not distort top surface when drying). After coating with P.V.A. pin wing back on to board and leave at least *one week* to dry. When completely dry, carve L.E. and T.E. and sand to section. After covering with lightweight tissue, split tips from centre sections and bevel $\frac{3}{8}$ in. ribs until the correct dihedral angle is obtained. Then cement together and when dry, bind 1 in. bandage around wing. If you want the model to last, it is recommended to now double cover the under surface of the wing.

The tail is straightforward but remember to keep it flat and that way—warp free. Remember, doping is to make the tissue tight and waterproof so don't overdo it or you will be plagued with warps.

Full size copies of the 1/7th scale reproduction are available through A.P.S. as plan G859, price 8/- including post.

IF ANYONE were to observe that the present model aircraft market is all plastic scale and radio control, he could well be excused, for that is all we have in the way of new gear to offer this month. Even in the small accessory lines, R/C dominates. For example, Peter Russell of the **Model Centres** at Worksop and Lincoln has unearthed the source of supply for those very professional 'Dzus' and 'Oddie' fasteners fancied for wing fixing by the experts and has them in stock at 3/6d. and 2/3d. per pair. Not the thing to use for shock absorption; but there's very little that stands up to a full blooded multi-channel model crash anyway !

On plastics, we were pleasantly surprised to have kits for the releases of the British Toy Fair so soon after the show, in particular the delightful 2/- range of W.W.1. fighters from **Revell.** The 'S.E. 5a' is in 41 Squadron markings with correct serial and individual



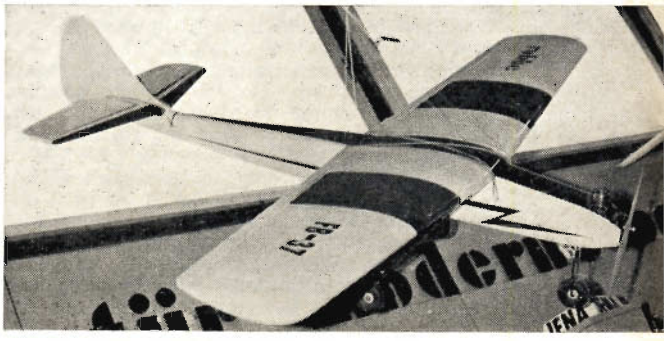
letter "L", which can be repeated (according to other Squadron machines) on the Starboard half of the upper wing. This model has a neat fabric effect on its surface. The 'Nieuport 17c—1' is similarly neat and authentic ; but one tip for the fastidious is to abrase the struts and rib protrusions to reduce their size. This also applies to the 'Fokker D.VII' coloured as Hermann Goering's aircraft. Here the serial is too large and not in the correct style. We added this in hand painting, also the weight data by the cockpit. Now we look forward to the other three to come.

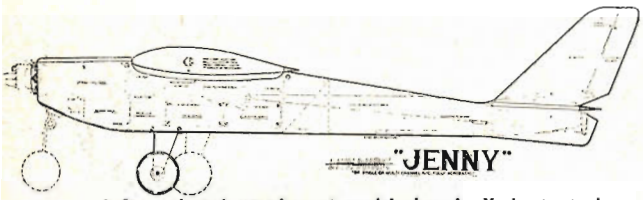
Airfix's 'Hudson Mk. 1' is another fascinator. Flap detail is missing on the underside, which we preferred to make matt black instead of the advised light grey, but otherwise the neat rivetting and the engine cowls make it well worth the 4/6d. It was natural that the advance French fighter, the 'Mirage' should come out soon in the Airfix range, and with its service in French, Israeli, S. African, Swiss and Australian colours together with many variants makes it a "natural" for the ingenious. Photographs show our trio. A touch of "wet and dry" abrasive paper over the panel lines will improve appearance. Covering with metalised paper would be an ideal modification for ultimate realism on this fine 3/- worth. Next from Airfix is the IL-2 "Stormovik".

At Nuremberg, all the news was radio control in one way or another. Those Bentert ultra lightweight control systems are to be marketed as the **Webra** 'Picco' with directional stick control on the transmitter. **Graupner-Grundig, Telecont** & **Metz** are all on the Super-het track and radio controlled semi-scale gliders, not far departed from true scale, are definitely in vogue.

Wik models by Wilfried Klinger (some of his kits were displayed by **KeilKraft** at Brighton) have brought out the elegant tee-tailed 'Bjorn', scaled from Bjorn Senders' dream sailplane to 86 in. span.

Left : Three variations of Airfix Mirage, at top. a 111 C of Fighter Squadron 100, Constructor's No. 46 as used for sparkling individual display at Paris Aero Show last year. Centre, a Mirage 111-0 of the Royal Australian Air Force, A3-3. Others do not have black nose, e.g., A3-4. Bottom, the longer nose Mirage 111 R in camouflage and markings of the 33 Escadre for Reconnaissance. Below. Seen on Robbe stand at Nuremberg was prototype of the kit for Fritz Bosch's FB-37. Will have built up balsa wing, kit to be distributed in G.B. by Skolkits.





Left : enlarged premises at model shop in York, to trade as "Monk Bar Model Shop" and carrying large stocks as well as specialised and imported items. Above, latest deBolt kit from U.S.A has interesting approaches to quick building. 24 hour assembly is claimed for the 57 in. large area (620 sq. in.) design to take from 3.5 c.c. up, single channel to full multi. Right, new shape rotary copy turned props from U.S.A. called X-pert have very tough hubs and fashionable broad roots. No practical tests to report as yet. Next is Airfix Hudson which we marked as "V" of 206 Squadron with matt black undersides having rippled edging on earth and green camouflage.

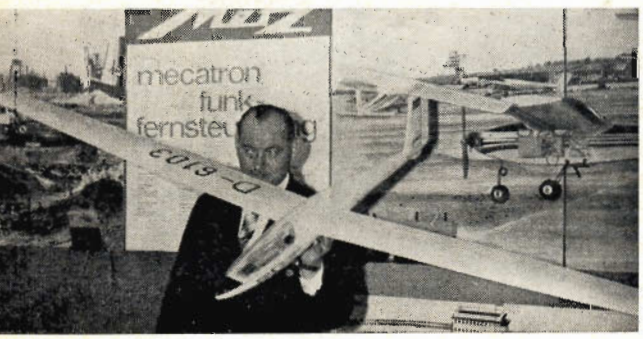
It has the novel feature of a power egg to carry .8 to 1.5 c.c. under the fuselage and droppable by parachute when the tank is empty! **Engel** has a 106 in. 'Mistral' mid wing sailplane—also a push pull scale 'Cessna 336 Skymaster' at 60 in. span for single pusher engine and dummy up front and **Schuco Hegi** have chosen the 'Akedemische Fliegergruppe Braunschweig SB-7' tee-tail sailplane as their rival for the **Graupner** 'K-10' which appeared to be first in the '64 high performance glider race.

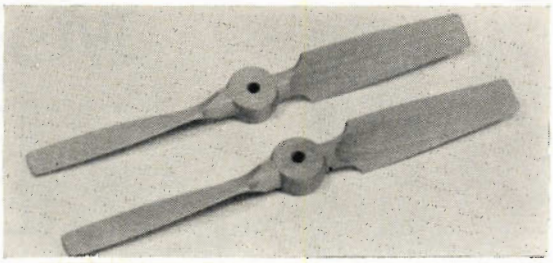
This most unusual trend in model kitting has yet to reach Great Britain and it remains to be seen whether the enthusiasm for slope soaring and gliding which excels on the Continent will have any influence here. Nevertheless it is nice to see so many graceful designs.

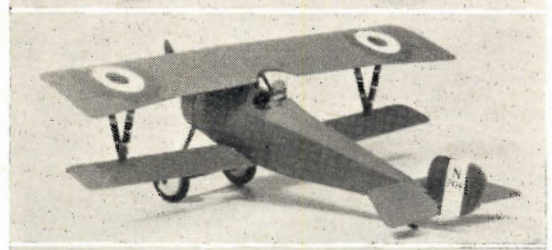
Humbrol have changed their cement tube capping back to the red plastic "pop-on" after a session of screw pins. This is welcome news, so too is the fact that the company quickly realised their change of consistency in 'Britfix 66' and have made amends to thicken it up. It was a job to keep that runny stuff in the tube, and many modellers wrote to tell us, and the Humber Oil Co. what they thought of it!

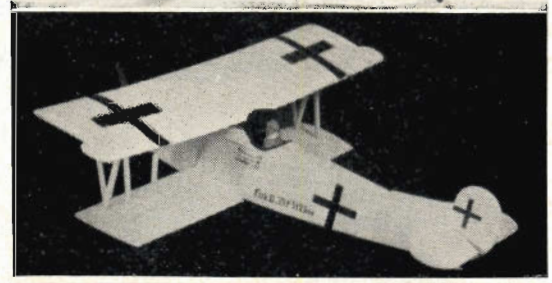
Lastly, a correction. The price of the **Ripmax** 'Maxamite' Servo was announced as 185/- in April issue, and should be 199/6d., also the correct price of the **R.M.A.** 'Steering Unit' is 49/6d., not 42/6d. as given in the Ripmax advertisement.

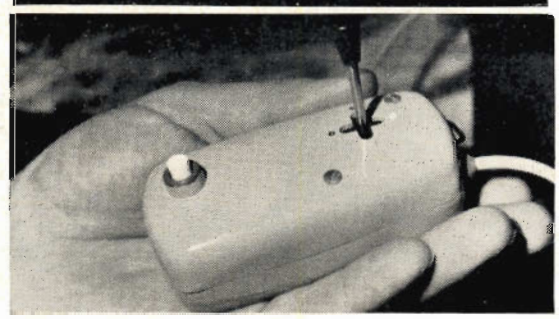
Below : At Nuremberg, one of many impressive new R/C sailplane scale kits is the 91 in. SB-7, developed by Soergel, holding prototype Schuco kit model. Below, right is the Metz control box for 3-5 channel conversion and selective operation, very neat job first displayed at trade fair. World War 1 trio of plastic scales above are Fokker DVII, S.E.5a and Nieuport 17c-1 to 1/72nd scale by Revell to sell at 2/- each. Detail extends to fabric effect on S.E.5a. Only criticisms are heavy strutting and prominent ribs—soon taken care of with sandpaper !



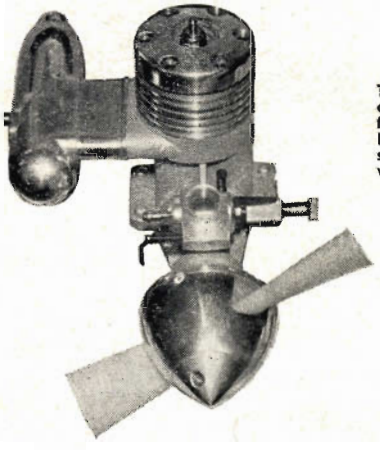








Motor Mart



The new Merco 61 utilising the basic 49 crankcase but now with solid head and fitted with optional spinner and "Turbo Flow" cast silencer. This is a clever streamlined unit in which the silencing vanes are arranged to extract exhaust without back pressure.

THE FEBRUARY trade fairs produced several new engines in a wide range of capacities from all over the World.

Firstly, from **Model Aircraft (Bournemouth) Ltd.**, importers of Webra equipment, comes news of two new engines and three silencers. The most notable engine is the much discussed **Webra** 'Mach II', to supercede the long established 'Mach I'. Primarily aimed at F.A.I. team racing and general contest work, it is the first design by Gunther Bodemann since his return to the Berlin factory last year, and has been produced very quickly by general manufacturing standards. One time saving component is the modified 3.5 c.c. 'Bully' diesel crankcase casting still retaining the substantial, long mounting lugs. The shaft is supported by two ballraces, and front rotary induction is after the Cox T-D style multiple feed jets from a remote needle valve. Venturi bore is surprisingly small (approx. $\frac{1}{8}$ in.) which results in very good suction from its large bell mouth shape. Our preliminary test run showed high vibration at speeds below 12,000 R.P.M., no doubt due to the lack of counterbalancing on the crankshaft. Test run figures on Keil Kraft nylon propellers were: 12 x 6—6,100; 12 x 4—8,200; 11 x 6—8,600; 10 x 6—8,900; 10 x 4—10,600, and on Top Flite nylon, 8 x 6—12,000; 8 x 4—14,100; 7 x 6—15,400. These figures were taken on a damp day indoors. Summarising a nicely finished engine with lots of "rework" potential for an all up weight of 5¾ ozs. Cost tends to be rather high at £7 6s. 11d. in this country, due to import duties, but we are sure the new Mach II will find many buyers!

Also from Model Aircraft (Bournemouth) Ltd. come details of three lightweight cast magnesium alloy silencers. These units are very simple and effective. Available with the same size castings, and cylinder sizes of: 'Bully' $\frac{33}{32}$ in. top, and $\frac{13}{16}$ in. bottom, 'Winner' $\frac{37}{32}$ in. top, and $\frac{7}{8}$ in. bottom. 'Record' $\frac{41}{32}$ in. top, and $\frac{31}{32}$ in. bottom. The silencer halves fit over the liner and crankcase rims, and are secured by the finned cylinder jacket. All of these silencers can be adapted to fit a wide range of similar annular exhaust motors. A small silencer manifold is also made for the 0.8 c.c. Piccolo diesel at 7/6d., but this is more of an exhaust collector ring without a baffle, nevertheless effective in reducing the high-pitched sound of a small diesel. 'Glowstar' is the name of a new 3.5 c.c. Webra glow motor. Both standard and a radio version with variable speed carburettor. Construction is conventional with front rotary induction and an exhaust restrictor linked to the carburettor. A throttle version of the 'Mach II' and a 5 c.c. glow R/C motor were also displayed at the Nuremberg Fair.

Another large radio engine viewed with anticipation, is the entirely new **O.S.** '60'. This follows the traditional McCoy rear intake racing layout, with a linked exhaust and venturi restrictor. Bore is 24 mm. and stroke 22 mm. The piston has two rings and is made of lightweight cast alloy. Shaft is twin ballrace supported. Flight tests have been carried out in Munich by the well known German radio flier Blauhorn. In the cautionary words of the O.S. factory. "This engine has been delayed so much and we are not yet ready for delivery yet, etc." Nevertheless, **Graupner** have it in their 1964 catalogue!

A **Johnson** 'Bulldog 0.09' R/C was also bolted in our test stand, but that was all, as our sample received from Roland Scott was suffering from a sad lack of compression. This engine looks rather lost with its Automix carburettor and exhaust restrictor-cum-manifold bolted on, and therefore is rather heavy for a 1.5 c.c. at 4¼ ozs. The throttle action tends to be rather stiff, and some escapements may not be able to operate it without increased torque. We are looking forward to a replacement example for a full test run as the throttle is uniquely involved for so small an engine.

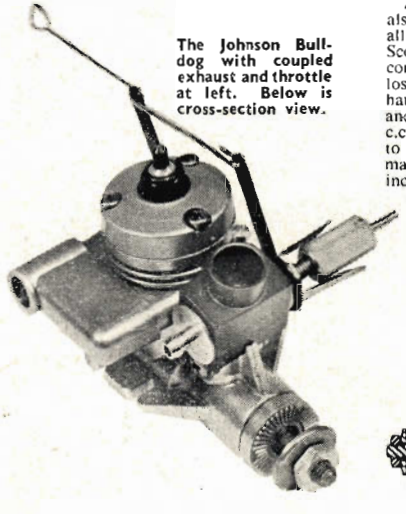
Webra's latest on the market is the Mach II with front rotary induction and remote needle valve.

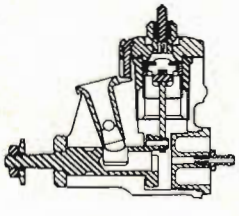
The exhaust is restricted by a rotating brass bush in the rear of the collector manifold. The brass bush and manifold each have a matching exhaust outlet hole, so that, when the throttle push rod is moved forwards or backwards, it increases or decreases the outlet area. The manifold is held on by two screws and acts as a muffler as well as an exhaust sludge collector. Our test engine did not have any instructions, and it took some thinking to fit all the parts together. Price from Roland Scott Ltd., is £6 0s. 9d.

News from **Veco** is that Clarence Lee, designer of the Veco/Lee .45 R/C engine has built a .60 R/C engine which will go into production as the Veco .60 R/C later this year. Mounting and throttle linkage will be interchangeable with the .45.

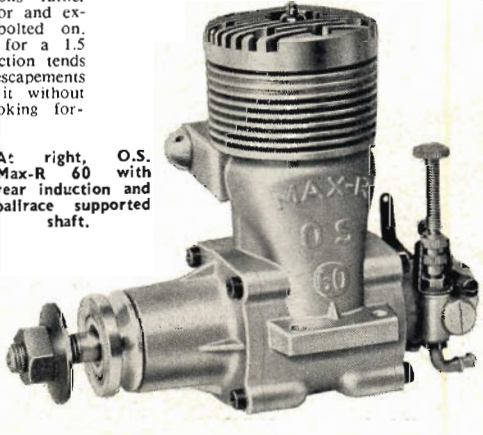
According to a display at Nuremberg, **Fuji** are producing three new glow motors. All are of the Enya pattern with fixed backplates and removable front housings. The .29 is in standard and radio versions, with a claimed power output of 0.65 B.H.P. The .35 is radio only and claims 0.7 B.H.P. Radio versions have exhaust "choppers" and variable speed carburettors. A larger engine is the new Japanese **Ueda** .45 R/C. This has a one piece crankcase, with detachable backplate and a deeply finned cylinder head. The crankcase has ball-race housings incorporated.

The Johnson Bulldog with coupled exhaust and throttle at left. Below is cross-section view.





At right, O.S. Max-R 60 with rear induction and ballrace supported shaft.



Squadron Markings

PART 18

Described by Leslie A. Rogers

Drawn to 1/72nd scale by K. McDonough

Typical of No. 9 Naval Squadron's markings when at Bray Dunes is this brightly chevroned Camel with horizontally striped wing centre and tail. Roundel and serial No. are removed. Others in background and other pictures were B3884, B6230, B5749 and 8715'B. Wheels are tyre deep in mud !

No. 9 Squadron R.N.A.S.

Was originally equipped with Sopwith Pups and Triplanes for which no marking details are available. At the beginning of August 1917 the Squadron re-equipped with Sopwith Camels.

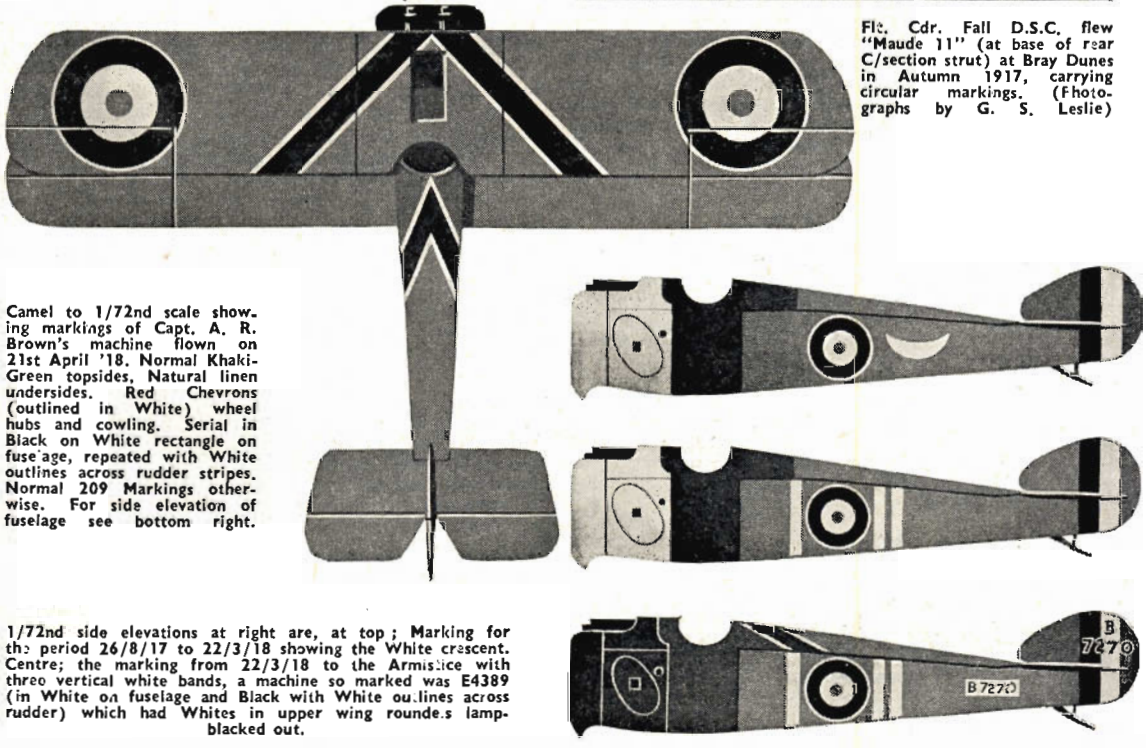
Squadron Marking. As from 26.8.17 the Squadron marking was—officially—a white crescent painted on the fuselage sides behind the cockade. It is highly unlikely that this marking was carried in action as the Squadron began to decorate its machines as no other Camel Squadron had ever done.

No recognisable system of decoration was used—wings, tails, and fuselages were painted with bands, bars, circles and chevrons, apparently in blue and white. The only thing common to the whole Squadron was the absence of a cockade on the fuselage.

On 22.3.18 the Squadron marking was changed to three vertical white bands, one painted in front of the cockade and two painted behind it. This marking was carried until the Armistice. Some of the decorations were still carried until quite late into 1918 but like the rest of the Naval Squadrons after amalgamation, No. 209 as it was re-numbered, gradually became much more sober looking.

As No. 209 Squadron was concerned with the death of von Richthofen on 21st April, 1918, the illustration of a Camel of this period shows Capt A. R. Brown's aircraft. The markings and colours, as well as their position have been drawn as detailed by Capt Brown in two letters he wrote many years ago describing his aircraft.

Flt. Cdr. Fall D.S.C. flew "Maude 11" (at base of rear C/section strut) at Bray Dunes in Autumn 1917, carrying circular markings. (Photographs by G. S. Leslie)



Camel to 1/72nd scale showing markings of Capt. A. R. Brown's machine flown on 21st April '18. Normal Khaki-Green topsides, Natural linen undersides. Red Chevrons (outlined in White) wheel hubs and cowling. Serial in Black on White rectangle on fuselage, repeated with White outlines across rudder stripes. Normal 209 Markings otherwise. For side elevation of fuselage see bottom right.

1/72nd side elevations at right are, at top; Marking for the period 26/8/17 to 22/3/18 showing the White crescent. Centre; the marking from 22/3/18 to the Armistice with three vertical white bands, a machine so marked was E4389 (in White on fuselage and Black with White outlines across rudder) which had Whites in upper wing roundels lamp-blacked out.

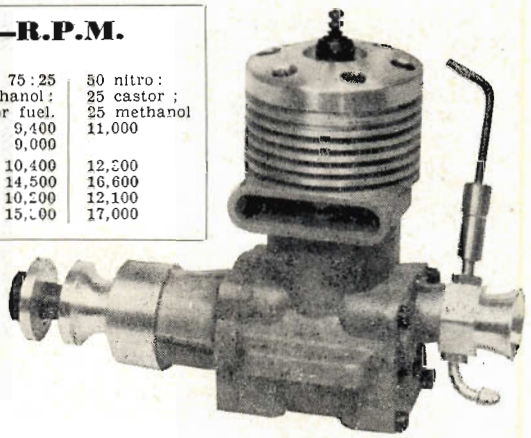
ENGINE ANALYSIS
Number 122
by R. H. WARRING

MOKI S-4

5 c.c. Hungarian racer

Propeller—R.P.M. Figures

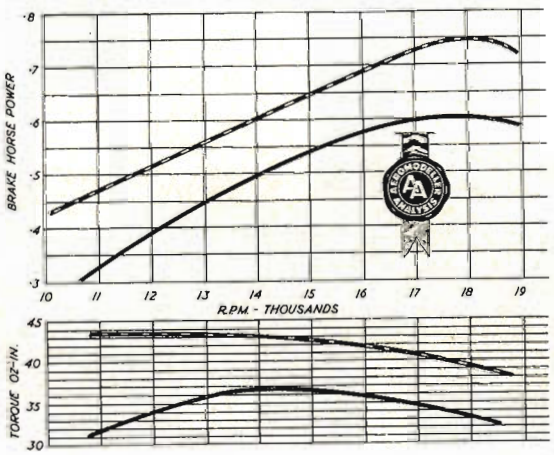
		75 : 25 methanol : castor fuel.	50 nitro : 25 castor ; 25 methanol
Top Flite	10 x 6	9,400	11,000
	11 x 4	9,000	
	9 x 6	10,400	12,300
	8 x 6	14,500	16,600
Kalkraft	9 x 6	10,200	12,100
	9 x 4	15,200	17,000



BASED on the orthodox racing glow layout, this 5 c.c. Hungarian engine has been developed for high speed running, resulting in a peak power output at around 18,000 r.p.m. on our tests, with even higher figures quoted in the Hungarian *Modellezes* Magazine (.885 b.h.p. at 19,000 r.p.m.). Performance is quite normal at the lower speeds (and even poor on non-nitrated fuel below about 14,000 r.p.m.), but torque is well maintained up to 16,000 r.p.m. plus ; yielding a peak B.H.P. of 0.6 on straight fuel and in the region of 0.75 B.H.P. on 50 per cent nitro fuel. These test figures, too, are undoubtedly conservative ratings for further improvement could be expected with extended running in. The Hungarian peak claimed, in fact, is nearly 0.9 B.H.P. on a 50 per cent nitromethane fuel with a 5 per cent nitrobenzene content.

The S-4 bears a *family* resemblance (through its external finish) to the 5.96 c.c. M-3 tested in March '63, which was a plain bearing engine with front rotary induction. The S-4 has rear rotary induction, twin ball race bearings for the crankshaft and high speed type carburettion. A large diameter venturi intake and 90 degree cut out in the rotor disc cope adequately with a considerable thirst at speeds approaching 20,000 r.p.m., and this figure would very likely be exceeded in the air with a suitable racing prop, when used for speed flying.

The S-4 will run on straight fuel, but is not particularly happy as regards handling or performance. Torque is poor for an engine of this size and actually goes on rising until nearly 15,000 r.p.m. Running from this point up to 20,000 r.p.m. is then quite good, but not as smooth as one would like. An addition of nitromethane to the fuel produces an immediate improvement. Starting is generally easier, running is much smoother throughout and the torque available is increased over the whole operating range. Power increase is almost directly proportional to the nitromethane content and a very substantial increase in performance was obtained with 50 per cent nitromethane, which was the highest proportion tried. Whilst, theoretically, there is an optimum compression ratio for any given nitro content, the S-4 does not seem to have enough to run on a straight fuel without suffering from a marked 'pumping loss' on high nitromethane content fuels. Measured test runs were carried out mainly with the dynamometer, using straight fuels and the upper (dashed) curve represents the probable performance on 50 per cent nitromethane fuel as a full set of readings were not taken over this range. The EG.200 glowplug proved capable of standing up to high speed running, although it is probably not the best plug for the engine. Some slight improvement in performance, but drastically reduced glow plug life, was experienced with Veco and K & B glow plugs.



Structually the S-4 embodies a die-cast crankcase unit extending the full cylinder length with a pressed or shrunk in liner. Back cover and front bearing assemblies are each secured by four screws. Both these assemblies seat on very accurately machined faces and seal without gaskets. The crankcase is machined through and smooth finished. Externally cooling fins are machined on the crankcase unit above the stub exhaust and the top is faced smooth to take the head. The head is turned from dural, is solid (i.e., not finned), and seats without a gasket, held down by six short screws. The plug is centrally located.

A substantial transfer passage is cast into the crankase unit, leading to a large rectangular port in the liner. The upward edge of this port is chamfered off with effective transfer opening overlapping the exhaust by some 90 per cent. A diametrically opposed exhaust port opens directly into the stub exhaust incorporated on the crankcase casting. The cylinder liner is of unhardened alloy steel with a fairly substantial wall thickness, with a bore finished by grinding and honing inducing a marked taper from bottom to top. It is impossible, to withdraw or reassemble the piston from the top of the liner. To disassemble we found it necessary to turn the connecting rod and piston until the gudgeon pin came opposite the exhaust port and pull the gudgeon pin

out through the port. With the connecting rod released, the piston could then be withdrawn from the cylinder liner and out through the crankcase casting.

The cast iron piston is of plain cylindrical form with a perfectly flat top, and machined away to extremely thin walls. Wall bearing thickness for the gudgeon pin is only about $\frac{1}{16}$ in. The gudgeon pin is of hollow hardened steel or silver steel .196 in. diameter, fitted with brass end pads, and is a floating fit in the piston. The connecting rod is machined from dural with plain big and little end bearings reamed to size. The big end is slotted for lubrication entry.

The front bearing unit comprises a casting with machined housings into which are pressed the rear (.354 in.) and front (.236 in.) TKF ball races. These races have only seven and six balls, respectively, with bronze cages, and appear to be specially selected (although the front race was not as smooth as it could have been). The hardened steel shaft is stepped from 9 mm. down to 6 mm. diameter and finish ground all over. The crank web is circular and a shade over $\frac{3}{4}$ in. thick. Grooves are cut in each side to provide a counterbalance effect and the whole periphery closed in with a thin rim of aluminium, giving the appearance a solid web with a thin aluminium rim. The crankpin is .2355 in. diameter, machined integrally with the crank web and drilled through to lighten. The propeller driver is 'pulley' type, machined from dural and locked in place by a split brass collet. The whole assembly is extremely well and accurately made and finished to very close tolerances.

The rear assembly comprises a conventional backplate carrying a laminated phenolic plastic (Tufnol type) rotor disc on a pressed-in steel pin; and a stub inlet tube into which the turned dural venturi is fitted and locked with a small grub screw. The latter enables the venturi, and thus the needle valve, to be turned to any angle required. Induction port entry is $\frac{11}{32}$ in. diameter, expanding into a 90 deg. V to match a 90 degree cut out in the rotor, which is nearly $\frac{1}{4}$ in. thick. Lubrication of the rotor hub is provided by a small hole at the apex of the vee cut-out.

Fuel feed assembly comprises a jet pipe extending to approximately mid diameter at the venturi throat with opening controlled by a conventional needle screwing through a fitting in the opposite wall. The needle thimble is split to provide locking. An external feed pipe is bent through a 90 deg. turn and when properly tightened actually lies at an angle of some 30 deg. to the venturi. We feel that this little fitting is one of the weak points of the engine as it can vibrate loose, causing an air leak at the venturi throat. A thin 'elastic' washer between the nut face and the venturi flat would appear advisable.

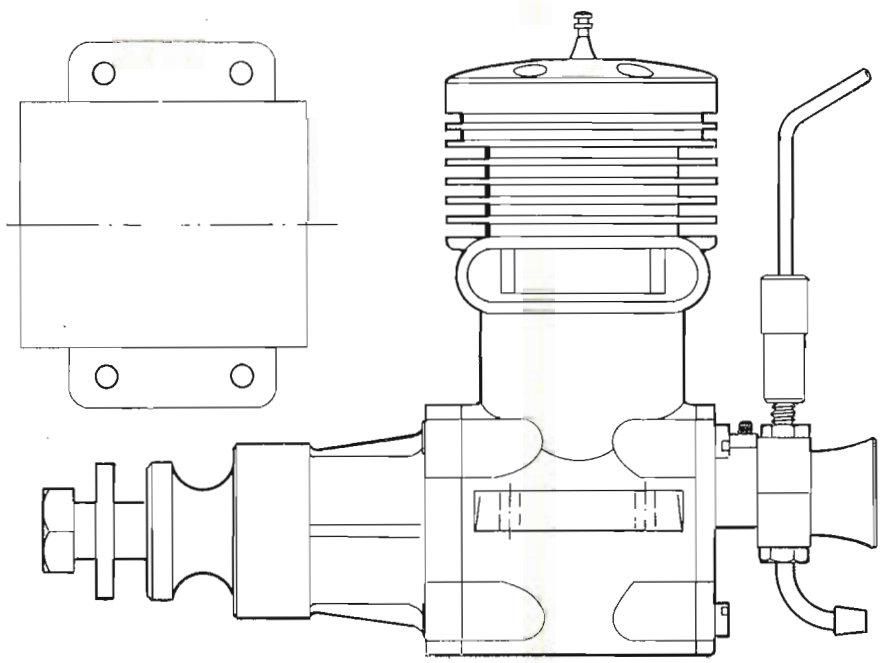
Interest in the S-4 must largely be academic, since the engine is not normally available in this country. It does, however, reflect the remarkably high engineering quality of Hungarian engine design and development, and is also particularly noteworthy for the excellence of the workmanship throughout. Just what its realistic cost of production is we would not like to guess. If it has any potential weakness it could be in the stress raiser produced by the abrupt stepping down of the crankshaft diameter immediately behind the front race. Certainly all other parts of the engine are extremely sturdy and should have strength to spare. We imagine that once completely run in it would be capable of holding its peak performance longer than most other glow motors in its class, due to its close fits and selected parts.

Specification

Displacement: 4.94 c.c. (.302 cu in.)
Bore: .7485 in. (19 m.m.)
Stroke: .685 in. (17.4 m.m.)
Weight: 9 ozs.
Max. power: .6 B.H.P. at 17,800 r.p.m. on 75:25 methanol:castor fuel; .75 B.H.P. at 18,000 r.p.m. on 50 per cent nitromethane; 23 castor; 25 methanol fuel.
Max. torque: 36.5 oz.-ins. on 75:25 methanol:castor fuel; 43.5 oz.-ins on 50:25:25 nitro; castor; methanol fuel.
Power rating: .122 B.H.P. per c.c. on 75:25 methanol:castor fuel.
Power/weight ratio: .067 B.H.P. per oz. on 75:25 methanol:castor fuel.

Material specification:

Crankcase unit: light alloy pressure die casting.
Cylinder liner: alloy steel (unhardened).
Crankshaft: nickel-chrome steel, hardened.
Piston: cast iron.
Connecting rod: dural.
Front assembly: light alloy pressure die casting fitted with two ball races (9 m.m rear, 6 m.m. front).
Rear assembly: light alloy pressure die casting fitted with a laminated phenolic rotor disc.
Intake tube: turned dural.
Jet tube and needle assembly: brass, steel needle.
Cylinder head: turned dural.
Propeller driver: turned dural.

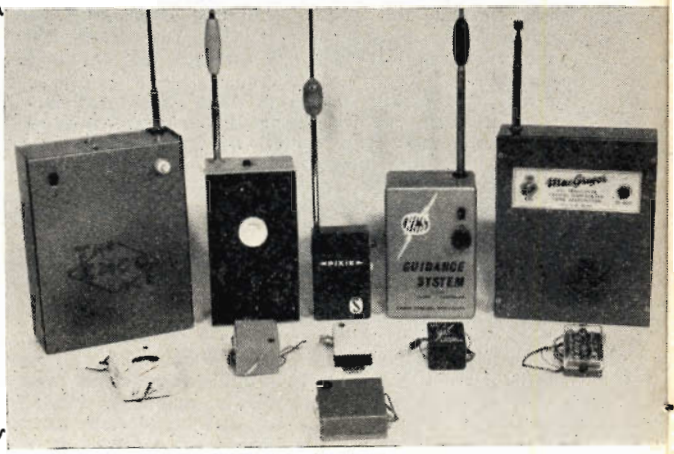


Getting started in

Radio Control

A NEW SERIES WRITTEN FOR THE R/C NOVICE

By E. F. BRYANT



Some of the all-transistor tone radio control outfits currently distributed are the Emco Ace, R.E.P. "Gemini", O.S. "Pixie", R.C.S. "Guidance System" and MacGregor "Minimac", with the Oakfield SR-3 receiver in foreground. Installation circuitry for these and other outfits will be included in this new series.

IT HAS BEEN said often enough in the past that there is no such thing as *simple* radio control. To what extent this is true must depend, as a well known professor might say, on what you mean by 'simple'. Of course, if one considers the radio gear itself, and all the components that go to make it, then one is forced to agree that it is complicated, at least to any but the well informed, but, on the other hand, if one were to consider the radio receiver as nothing but a sort of remotely controlled switch, and ignore what makes it tick, then the whole thing becomes much more simple. So simple, in fact, that it is true to say today, that the absolute novice can, with just a little help, successfully install and use a modest radio-control set up. Naturally, the beginner to radio control is not advised to be over-ambitious, indeed this failing has been the downfall of many a would-be radio flyer in the past, but there is no reason at all why he should not enjoy the added pleasure of controlled flight for his model, provided he goes about it in the right way.

Let it be said straight away that the beginner should only consider single channel work in the first instance, leaving multi until he has had at least one season's experience. At the end of that time he may well decide to 'go multi', although there are many who stick to single channel, maintaining that it is more satisfying and a bigger challenge than multi. Obviously this is a matter for personal choice, and depth of pocket, because multi-channel sets can be quite expensive, apart from the higher cost and increased complications of the model itself. In this article, it is proposed to discuss one or two of the radio sets, and the accessories which go with them, that are particularly suitable for the beginner to use, and to show how they are installed and connected together.

One of the first things that tends to scare off newcomers to radio is the thought of the maze of wires, valves and transistors to be seen *inside* the case of the radio set. In these enlightened days, however, this should be one of the least of the worries. On the British market today there are many sets which are probably as fool-proof as they can get, which are made easy to install, and which require only the simplest of precedures to tune and adjust. In addition to this, some are sold fully wired and ready to be installed in the airframe.

All these radio sets are factory set and do not need to be interfered with in any way, except for the adjustment of the tuning screw, and it is true to say that the user need have no knowledge whatever of radio to be successful, in fact, he could use the set for a long time without ever seeing the inside of the casing, if, indeed, the receiver is in a case.

There is, however, one reservation, and that is that he should start off with *new* equipment. However good a used set appears to be, and however much less it costs, the beginner must realise that second-hand gear always brings with it the risk of radio failure, a risk he can well do without. The point is that, where the beginner is concerned, the radio itself must be considered to be beyond reproach in its operation, and he can then concentrate on using its power as a switch to operate the part of his model he wishes to control.

In this connection, it has long been agreed and, indeed, is fairly obvious, that, where one control only is possible, then that control should be over the direction of flight, i.e., *the rudder*. This is the most universally operated control, and, as will be shown later much can be done with it.

This is not to say that, when using single channel equipment, only one control is possible. On the contrary, it is possible to have anything up to *four* controls working satisfactorily from the one channel, via special escapements, although, at first perhaps, the most that should be aimed at is two.

If, for example, controls are applied to rudder and engine speed, the single channel set can give adequate control for any model, and practice will enable the operator to display many good flying characteristics, including stunts, touch and go landings and so on. It is felt that such luxuries as elevator and aileron control are best left until a later date.

In actual fact, most beginners to radio are well content to be able to fly their model, make it circle at will, and bring it back safely to within a reasonable distance of the transmitter, and this is as it should be, because, basically, this is what radio control is for. There are those including the author, who have used nothing but rudder control for a very long time, and ask for nothing more, getting all their pleasure from acquiring the skill and judgment needed to place the model just where it is wanted at the right time. Again, this can only be a matter of personal choice, but there is undoubtedly much to be said for this type of truly *simple* radio control.

Having decided to take the step into the realm of radio, the beginner is now faced with the task of choosing the type of gear he is going to use, and it is here that he strikes his first real difficulty. When he looks around, he finds the market filled with so many different, or apparently different, types of equipment, that he is probably discouraged before he starts. He is bewitched by the virtues of 'tone' as compared to 'carrier-wave', bothered by the alleged superiority of the all-transistor set over the one with a valve, and bewildered by the apparent supremacy of the 'relayless' receiver. If, as is quite possible, he does not know what a relay is in the first place, he is, not unnaturally, at a loss to understand whether a relayless circuit would be better for him or not. Furthermore, crystal control, super-regen, and super-het, may mean even less to him than the other terms, and so his confusion is hardly surprising. Happily, however, there is a reasonable answer to his problem. The sets are, within their particular types, fairly similar not only in operation, but in size, shape, and also in price, so that it really does not make all that much difference which set he buys, as long as it is of a type suitable for his use.

We have no intention to go into the technical details of the components and circuitry of modern radio sets and so, for convenience, they will be lumped into types, each type being generally classified. The issue then becomes much more clear and, to coin a phrase, simplification sets in.

Briefly, the main differences, as they will affect the beginner, are as follows.

1 **Carrier-wave** equipment, the oldest type in general use, is usually more bulky, is heavier, and requires a bigger battery load to operate.
2 **Tone** equipment is widely used and popular. Rereivers can be reasonably light and small, and can operate from low voltages.
3 **Relayless** merely means that the ultimate stage of the receiver has incorporated an electronic switching circuit instead of a 'relay', which is an electro-mechanical switch. This obviates the added bulk of the relay, and also rules out the possibility of the effect on a relay of engine vibration.
4 **All Transistor** equipment can be made very light and small, because of the fact that any type of valve is removed. Consequently, the battery load can also be very small, many receivers operating from a total current of only 3 v. This means that this type of set can be used in really small models. Generally the all-transistor set is more sensitive than its counterpart using one or more valves.

What the beginner will want is something fairly light and small, but not too tiny, something easy to install, and that does not need a mountain of batteries to make it work. Working on the assumption that the beginner's model is going to span perhaps something like 36 to 48 in., he must have a radio receiver that can be easily carried by such a model, and yet do all the things he will expect from it. He will want to spend only a moderate amount of money and so battery lay-out is important, batteries costing more than many people realise, and he will want a transmitter that is reasonably easy to transport and use. All in all, it would seem that the all-transistor tone outfit with a relayless receiver could satisfy most of these specifications and, indeed, a very great number are in use today, giving entirely satisfactory results. There is one more thing to be considered before leaving this subject, and it is the advisability of using a home-built radio set. Unless skilled and patient with the soldering iron, the modeller is well advised to carefully weigh the saving in cost against the advantage of certain reliability with the ready made equivalent.

Whichever of the sets the beginner decides to buy, he will, in all probability buy the receiver and transmitter together as a pre-tuned pair. It is important to realise that not all receivers can be operated from all transmitters, so that, where the two are offered as a mached pair, it is obviously best to buy them that way. In any case, there will be makers instructions for tuning and operation, which any buyer would be well advised to study carefully before attempting to use the gear, and, where transmitter and receiver are bought separately, it would be as well to seek the manufacturer's advice on tuning, before going any further.

Moving the rudder

Sooner or later the question is bound to arise as to what sort of escapement, actuator or servo should be bought to use with the receiver, and this will depend to a large extent upon which receiver is being used. For example, a compound escapement or servo will often not be suitable for use with a transistorised relayless receiver because of interference set up in the circuit when the escapement or servo operates. Nowadays there are, in fact, special compound escapements which can be used with this type of receiver, but their use is not imperative for the beginner. If as has been suggested, the newcomer decides that rudder control will be enough for him to start with, then he will need a much simpler piece of equipment. This is the self-neutralising escapement, and there are many from which he can choose. Most are driven by a small rubber motor, wound by hand, which will allow anything up to about 2-300 consecutive operations of the rudder at one winding, and which can be operated from any receiver. They are generally activated by currents in the region of 3 volts, normally using the same batteries as the receiver, and, a very important point, are light enough to be placed in the tail of the fuselage if required. The self-neutralising type is particularly recommended for the beginner because, in the event of his becoming confused, or if there is some reason why his model appears to be out of control, he has only to take his finger off the transmitter button, and the rudder will automatically return to its neutral position, allowing the model to right itself in the same way as a free-flight machine. Self-neutralising escapements are all basically similar, consisting of an electro-magnet, a moving pole and some form of claw which is allowed to escape when the pole piece moves. In this way, when the receiver receives a signal from the transmitter and the magnet is activated, the claw escapement, which is indirectly or directly connected to the rudder mechanism, will move around, under the power of its rubber motor, through 90 deg. This will move the rudder to left or right according to which is next in sequence. Upon cessation of the signal, the pole piece, with the aid of a return spring, moves away from the magnet, thereby allowing the claw to rotate another 90 deg. and so return the rudder to a neutral position. If the escapement were not self-neutralising, it would require a further signal to return it to neutral, and this may add to the difficulties of the beginner. The non self-neutralising escapement is, of course, of particular use in the control of engine speed, as will be seen later on.

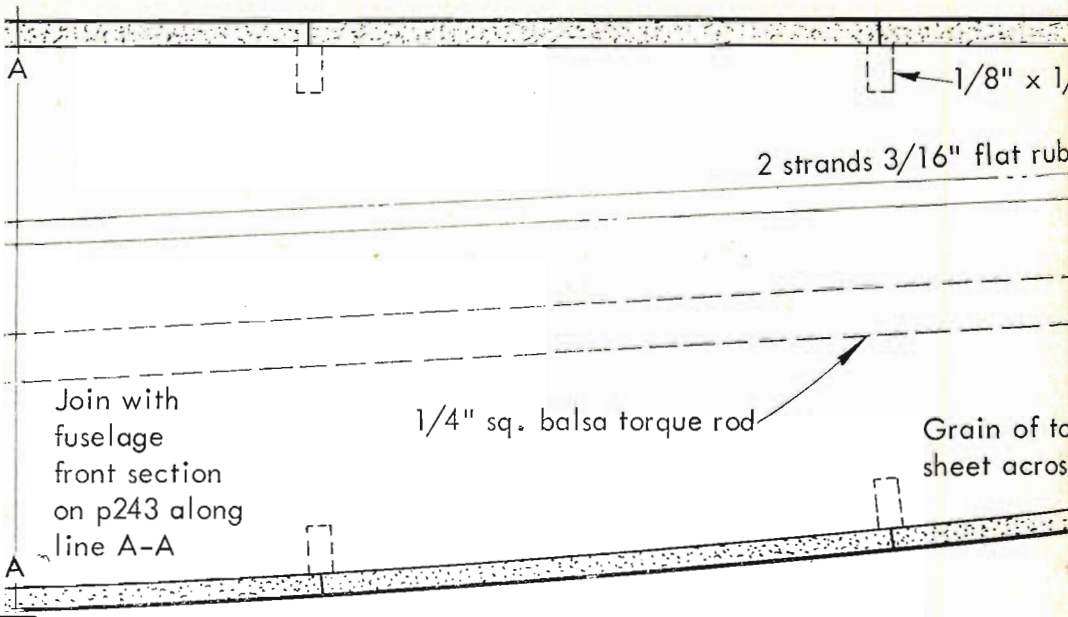
(To be continued)

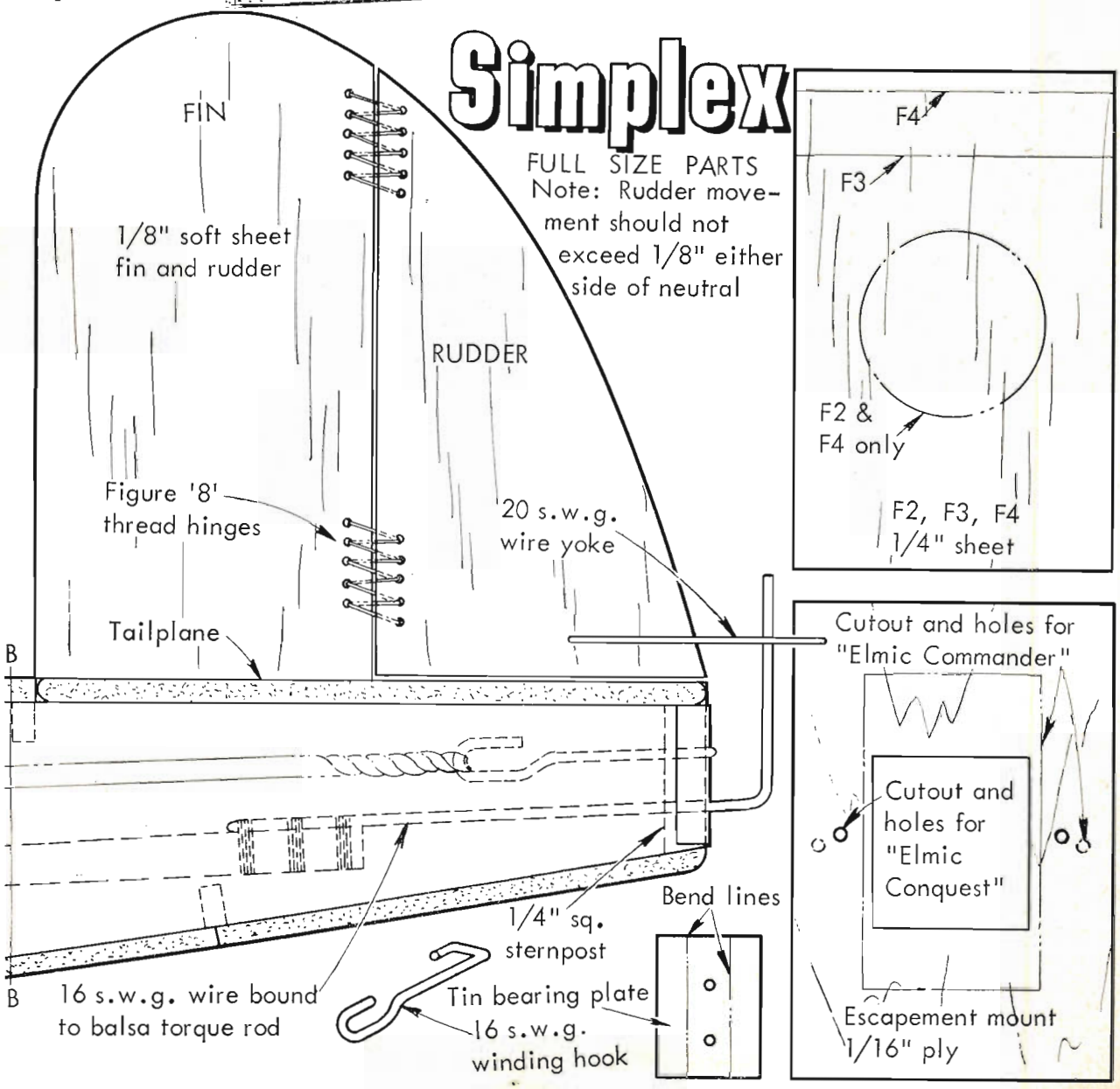
Get started in single channel radio control with this ultra-simple fully proven rough field flyer

Simplex

FULL SIZE PARTS

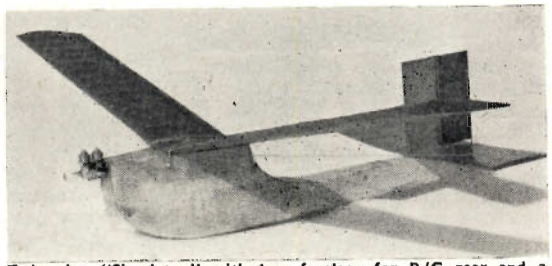
Note: Rudder movement should not exceed 1/8" either side of neutral





DESIGN PHILOSOPHY of the "Simple Simon" series of radio control models, leading to SIMPLEX starts with Simple Simon Mark II which was a direct two-times enlargement of Mark I, published as *Simpleton,* in AEROMODELLER, January 1963. Because the "Simpleton" seemed to have interesting attributes it was decided that a radio version would be "easy".

The resultant enlargement proved to have exactly the same flight stability pattern as "Simpleton". However, the power was not proportional and was in fact lower. Whereas Simpleton was a low drag profile model, Mark II had some width and drag problems. She was a slow flyer as a result. Even the relatively thin wing could not reduce, or be of much aid in this respect—as a result, the model flew backwards in a 20 knot wind! Dick Stouffer kept the model pointed into such a wind continuously for 10 minutes on one flight, and when the engine stopped he spiralled down rapidly and chased the model a



Twice-size "Simpleton" with box fuselage for R/C gear and a K & B Allyn twin cylinder .09 glowplug engine, was Mark II in the series.

flight whatsoever. This developed the feeling that wheels are a superfluous item in any event. Anyway, Mark II lasted about 8 months with about 12 flights total, what with one thing and another.

So we came to Mark III.

case history and construction notes for full size plan

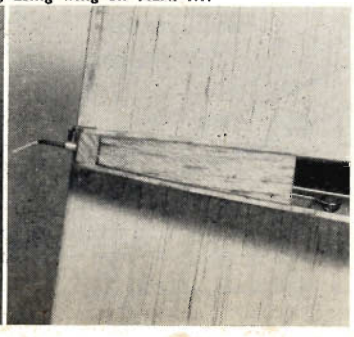
Cylinders separated! Push-pull twin .049 glow plug engines powered Mark III as a variation on the "Simpleton" theme—with radio control.

full ½ mile down-wind from the starting point. That day the model had a negative ground speed. At other times, on less windy days there were no serious flight problems.

An attempt to use a thinner wing of 48 in. span proved fruitless since the model could not generate enough speed to sustain flight with the new wing. This was a sparless, planked, all balsa wing. Structurally it proved very sound. It has never failed in any manner.

Mark II used the K & B .049 Twin (.09) with a Duo Diode receiver and Babcock Mark II escapement. The model weighed about 16 oz./sq. ft. of wing area. Wheels were left off in the original but were later installed as a modification. The modifications added enough extra weight and drag so as to make the model all but unflyable. Later, at a contest Dick was forced to remove the wheels to achieve any

Below: "Simple Simon" is author's name for Mark V as seen on square cut fin and rudder. These views above and below tail show rudder linkage to actuator, as drawn opposite. If tissue covering for .020 power, add sheet in bottom at rear as illustrated. Right: is Mark IV, a sleek version, with large wheels, using wing off Mark III.



As a result of Mark II Dick all but eliminated a fuselage except for the functional purpose of holding the various parts together and to carry the R/C gear. He wanted to keep the stability characteristics of Mark I and II so that the relative positions of wing and tail were maintained. The fuselage was to be just big enough to carry the equipment so its cross-section measured 2 in. high x 2¾ in. width. The wing was mounted on a pylon. High thrust line was maintained by mounting one .049 Cox engine on the pylon in front of the wing and another on the same line at the rear of the wing on the pylon. This gave the whole affair a configuration much like a sail on a submarine. Because drag was reduced, as compared to Mark II, it used the 48 in. all balsa sparless wing made and tried on Mark II. This wing had ribs of very soft balsa spaced 6 in. apart and a hardwood leading edge. The bottom was perfectly flat and all that was necessary was to lay a 6 in. sheet of $\frac{1}{16}$ in. balsa on the top glued to the ribs, leading edge and feathered at trailing edge so the top and bottom sheets could be glued together to form the trailing edge. Two wing halves were built and the centre section and dihedral were joined and set with glass fibre and resin. The result was one very light, strong wing of excellent characteristics. The wing depth was just ⅝ in., a very thin, very simple wing to build!

In any event, Dick was by now considered to be some kind of a nut by all his cronies, especially, when he produced Mark III for its first trials. The C.G. proved to be about right and the test glide showed the model would be *very* fast. Rudder movement was limited to $\frac{3}{16}$ in. either side of neutral.

Some difficulty was found in starting two engines. The problem was solved by providing a single jury rig tank to both engines. As soon as they were started and the model ready for launch the jury tank was removed from the top of the wing. The pro-

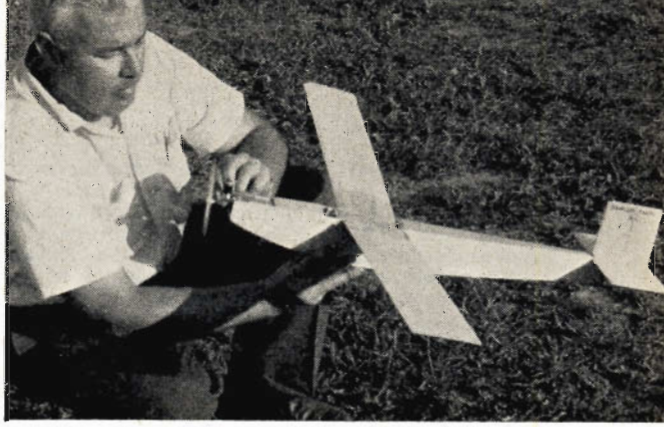
pellers were contra rotating which eliminated all torque problems. Even when one stopped and flight continued on one engine, there was no noticeable change in flight trim.

Again, no wheels were used in the original concept. However, because of the rather sharp nose it was noticed that the airframe took quite a beating upon landing on rough soil. A 3 in. doughnut wheel was later installed such that it protruded in front as much as below the fuselage line. This arrangement permitted the wheel to act as a bumper in all but inverted flight into the ground.

Equipment used in this and all subsequent models was the Bramco Signet Tone receiver and Babcock Mark II escapement. It was during this time that Dick became convinced of the necessity of using 4½ volts for *reliable* escapement operation. All his equipment functioned perfectly until one day Dick didn't. He held the wrong signal, too long, and spiralled, the Mk. III to a finish. He needed a panic button that wasn't there!

So came Mk. IV—a marked departure from II and III. Though the fuselage remained functional. It retained the concept of smallest cross-section consistent with the size of the R/C gear to be installed. The sparless wing from Mark III survived with no damages so that Dick merely needed a fuselage and tail assembly. This was to be sleek and cowled. For the first time he used a landing gear mounted well forward on the engine bulkhead. This proved an excellent location. Mark IV never flipped on its back in landing in the roughest terrain and absorbed a lot of shock.

The design aim was an aircraft with good stability, high airspeed, low rate of climb, and little or no tendency to balloon or gallop after a downwind turn into the wind and to have a good glide. To achieve this, the thrust and drag moments had to be kept close together. So the wing was lowered to a shoulder configuration. Since the wing dihedral would raise



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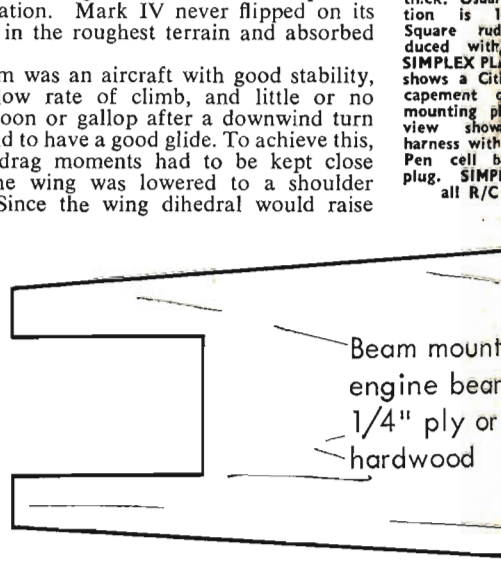
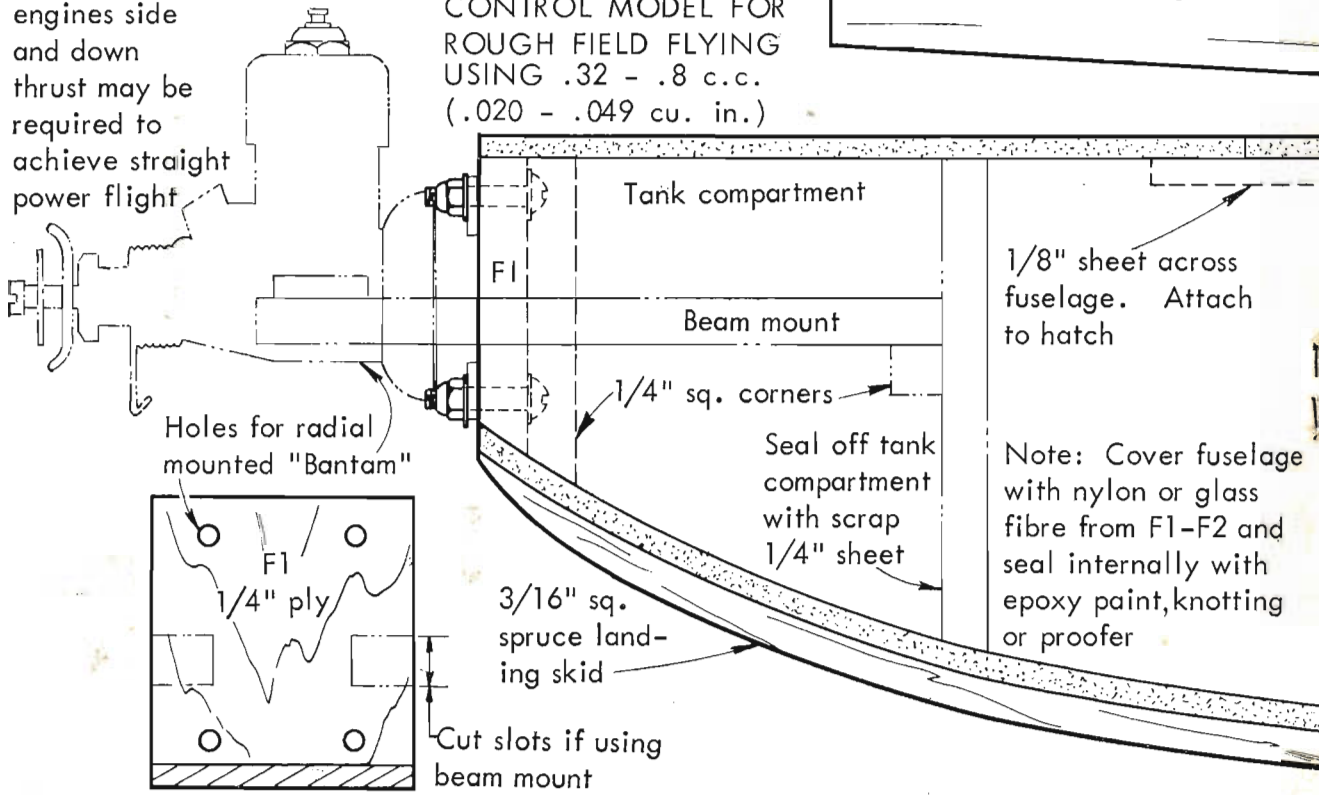
SIMPLEX FULL SIZE PARTS

by Dick Stouffer

A 36 INCH WINGSPAN ALL-SHEET-BALSA RADIO CONTROL MODEL FOR ROUGH FIELD FLYING USING .32 - .8 c.c. (.020 - .049 cu. in.)

With .049 engines side and down thrust may be required to achieve straight power flight

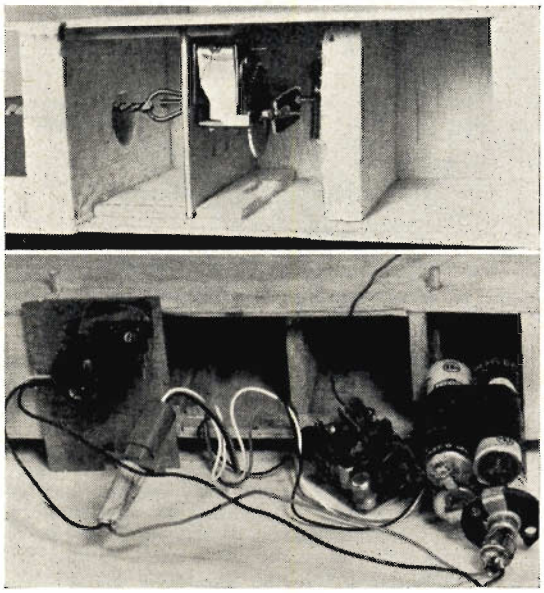




the effective drag centre, wheels were added to balance it out. For good directional control the rudder area was kept large and reduced in height and and a sub rudder with tail skid added to keep the centre of lateral area as low as possible.

The tailplane was placed at the bottom of the fuselage where it was felt there would be little interference from the wing.

The nose and tail moments were lengthened, for directional stability as well as to prevent ballooning in flight. This model turned out to be more conventional in appearance than the others and performed as expected. Test glides were fast and flat, under power, the model flew at 30-40 m.p.h. with a very slow rate of climb. There was no major trim problem except for need of *slight* downthrust on the engine. Mark IV was, in fact, so close to neutral stability that one could establish 20 deg. banks right or left—neutralise the rudder—and the model would stay grooved in the turn without losing altitude or varying the angle of bank. It could make several 360 deg. turns consecutively in this manner without touching the transmitter. Opposite rudder was required to recover from this manœvre. Mark IV glided at about 30 m.p.h. with a very low sink rate. As a consequence there was always plenty of time to establish a spot landing. (*Cont. on p.* 244)



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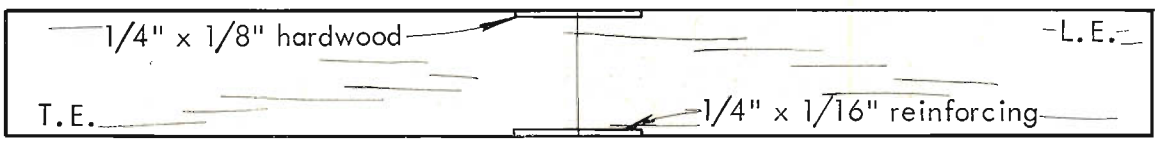
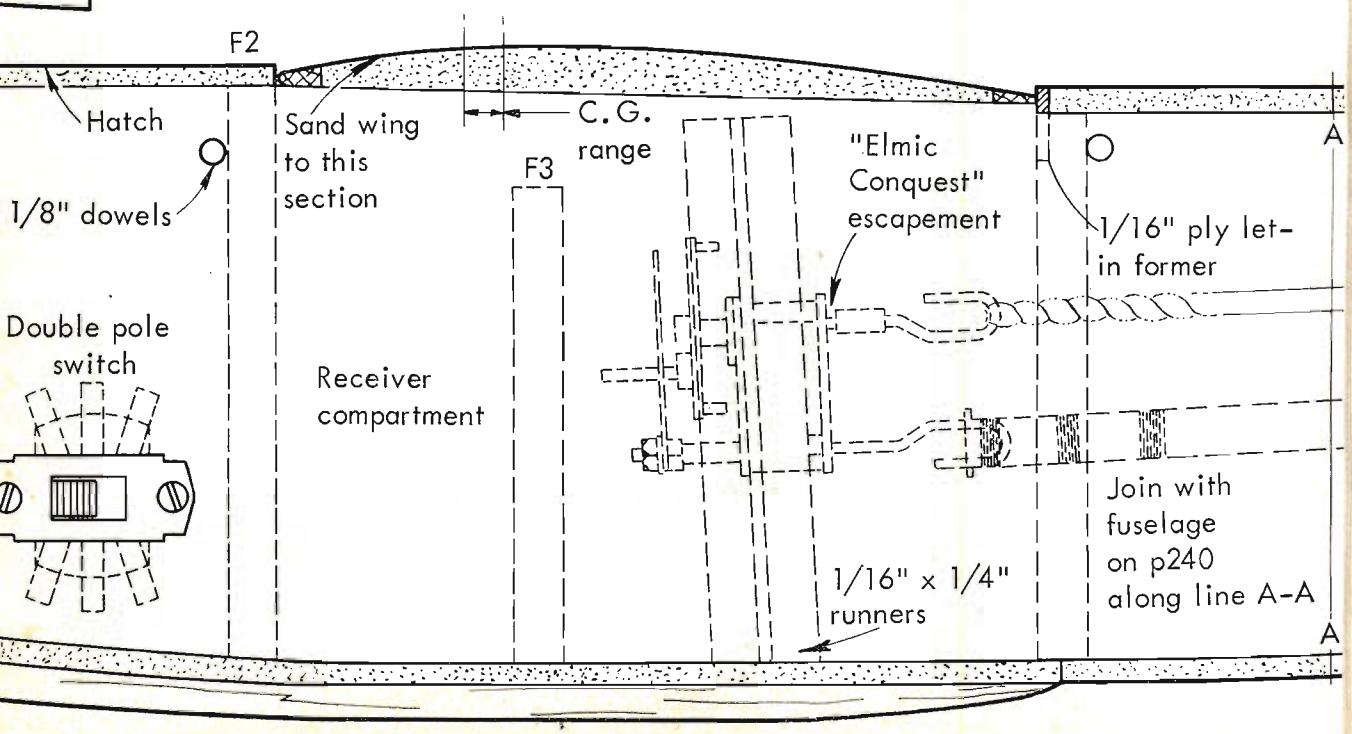
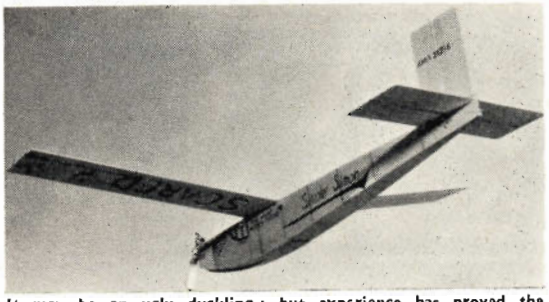


1/6 size WING. Wing dimensions are 1/4" x 4" x 36" soft sheet balsa
TAILPLANE is same rectangular shape. 1/8" x 4" x 9" soft sheet balsa
Dihedral under each wing tip to be 2 1/4"





It may be an ugly duckling; but experience has proved the point that this all-sheet design from the U.S.A. makes a perfect introduction to R/C for the novice.

From the structure of Mk. IV, next development was SIMPLEX which carries back to Simpleton through these evolutions. Very straight forward, very functional and in a time proven tradition.

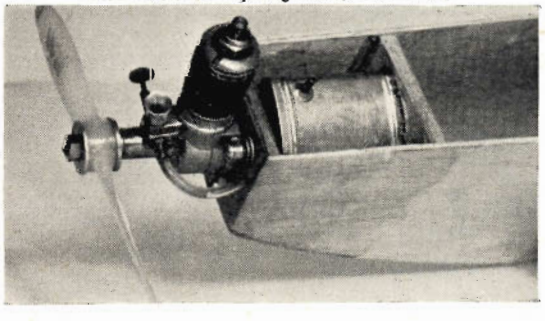
The thin, high aspect ratio wing, for maximum performance, is common to the series. The stubby tail is as simple as it can be. The long nose and tail moments were proven in the Mark IV configuration. The lack of landing gear goes back to the skids of the Wright Bros. as embodied in Mark II and III. Use of minimum number of bulkheads also reduces weight, and construction problems. Having the R/C gear readily removable for repair or adjustment was found to be very desirable in all previous models. In SIMPLEX the units, and the wiring harness, are all removable for inspection. The shoulder wing was proven in Mk. IV as well as the close coupling of thrust and drag moments.

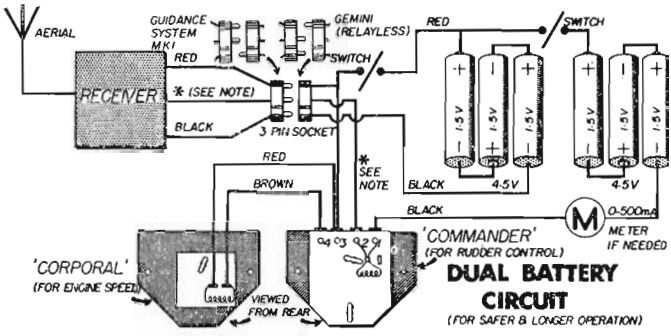
This model maintains a positive ground speed, even in the glide, in 20-25 m.p.h. winds From the first flight, when the model flew under a very rich engine setting and moved out smartly in the 20 m.p.h. wind, its future looked bright and promising for a simple, uncomplicated, rudder only, ½A power, radio control model.

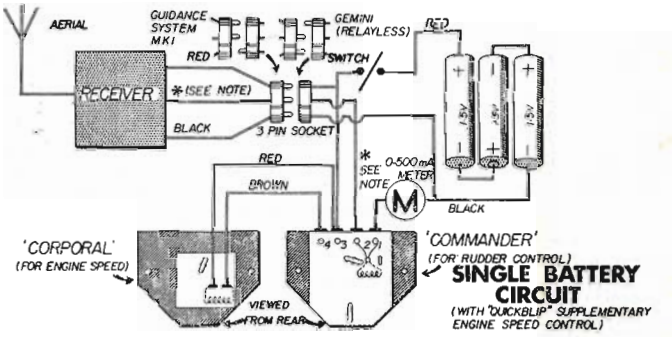
Under power, the flight was straight out and fast with a shallow climb. Rudder reaction was positive —left and right—but not abrupt. There was no tendency to go into wild gyrations. SIMPLEX holds a moderate bank without dropping the nose—a full 360 deg. is required for the model to develop a spiral.

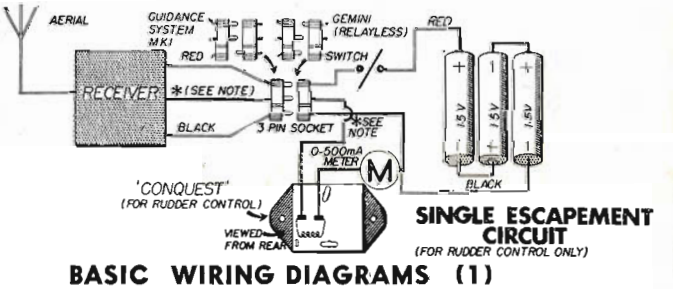
After the initial Anderson powered SIMPLEX, two more were soon made, the second with a Cox Babe Bee and having the wing reduced to 28 in. span for a fast straight forward climb. Considerable downthrust was used—about ⅛ in. under the top mounting brackets and $\frac{1}{16}$ in. right thrust. The model was fully controllable, but "hot". Members of the "old Guard" in the locality had their collective eyes opened as regards model flight speed, stability, controllability, and rate of climb with respect to this type of model in rudder only escapement flying.

Engine and tank installation for a radially mounted Anderson Spitfire .045 cu. in. glowplug engine. Liberally coat the interior with a proofer before sealing off the tank compartment. SIMPLEX takes anything from .32 to .8 c.c.







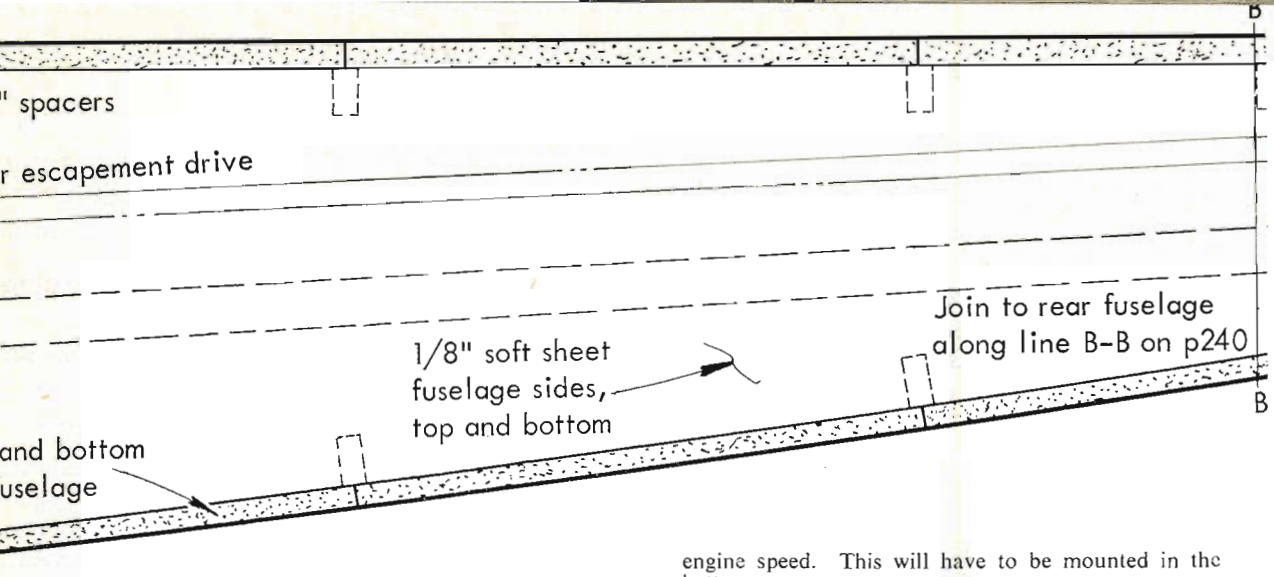


BASIC WIRING DIAGRAMS (1)

Three permutations to suit relayless receivers. When a supplementary escapement is added for motor control, most manufacturers approve use of extra batteries to compensate extra drain. Nickel Cadmium cells are strongly advised in all cases. It should be noted that on the **Elmic Commander**, Tag 3 is a junction only and may be by-passed with direct connection from battery (through switch) to **Corporal**. In the case of **R.E.P. Gemini** receivers, the prepared wiring harness has the switch wired in the Black (Negative) lead. R.E.P. do not recommend the dual battery circuit and also suggest use of a 4½-6 volt 150 mA Bulb or Dial light across the escapement tags as a tuning aid to replace the Meter. **MacGregor's** instructions advise 3 volts for **Terrytone 11 & Minimac** in the dual battery circuit (remove cell nearest Rx in top diagram). **Colours** of output wires vary according to manufacturer of sets which suit these diagrams, as follows :

* **NOTE.** Rx output colour code (centre lead in diagram). EMCO ACE—White. R.E.P. GEMINI (Relayless), OAKFIELD SR/3, and R.C.S. GUIDANCE SYSTEM—Yellow. MACGREGOR TERRYTONE II & MINIMAC—Green.

NEXT MONTH : **Relay, and 9 volt supply circuits.**



The third model was of the same design with a 36 in. wing as specified but powered with the Cox .020 Pee Wee. This is a much more gentle aircraft and speed and rate of climb were reduced. Glide is vastly improved over the .049 version. To simplify C.G. problems without adding weight to the nose of the .020 SIMPLEX, the wing and radio compartment areas were moved aft 1 in., a total of 7 in. from engine bulkhead to wing leading edge. Two pen-cells were placed just aft of the bulkhead to bring the C.G. into place.

How to build the model

The "anglicised" version of SIMPLEX as presented in the full-size plans and scale details for wing and tail, utilises up to .8 c.c. power. If the engine of your choice happens to be for beam mountings only, it is a simple matter to cement a plywood plate into the nose projecting forwards and secured to the fuselage sides behind the front bulkhead. First join the drawings for the fuselage sides and trace on to soft $\frac{1}{8}$ in. balsa which has been found to be the most suitable shock absorbing stock size, far superior than, for example, hard $\frac{1}{16}$ in. sheet. The sides are joined by the two rectangular, equal size, soft balsa bulkheads which come at wing leading and trailing edges. Pull the nose together to fit the $\frac{1}{4}$ in. plywood front bulkhead which takes the engine and fit a $\frac{1}{4}$ square tail post at the rear. The fuselage has now adopted its own plan shape and all one needs to add are the $\frac{1}{8}$ in. x $\frac{1}{4}$ in. spacers at positions shown.

Now plan the installation of your particular choice of equipment. The electrical circuits we show cover some of the combinations possible with equipment on the British market (also over a popular price range). Arrange the $\frac{1}{4}$ x $1\frac{3}{4}$ x $2\frac{1}{2}$ in. balsa bulkhead to come at the rear of the radio compartment in such a position that you have just enough room to pack around your receiver with sorbo rubber. This bulkhead not only locates the receiver but also forms a crash stop should the escapement fly forwards on impact. The escapement for the rudder is mounted on a $\frac{1}{16}$ in. ply plate, which slips down between the pairs of $\frac{1}{4}$ in. wide balsa rails stuck to the fuselage sides. Get this positioned accurately and then make up the torque rod, which will drive the rudder and fit its bearing which could be a piece of tin plate or brass wrapped around the tail post. The rubber motor winding hook will also run through the same bearing plate at the tail post.

For the moment one should be satisfied with rudder only operation but SIMPLEX is adaptable and no doubt the more experienced modellers will soon be adding a supplementary escapement to control the engine speed. This will have to be mounted in the battery area.

If the engine is not one which has an incorporated tank with the radial mount, than a separate tank can easily be fitted behind the front bulkhead but an extra bulkhead is recommended behind the tank not only as a sealer against fuel seepage, but also as a locator. Now plank the fuselage with soft $\frac{1}{8}$ in. balsa, preferably with the grain running across the width of the fuselage with strips cut across the sheet. On the top side, note that you will need a separate battery hatch with a lip added to its underside at the front to help hold it in place. The wing retaining rubber bands will keep it secure.

If using .020 power, the top and bottom of the fuselage behind the wing position can be covered with strong tissue to save weight. Now make up the tail surfaces and arrange the rudder to have $\frac{1}{8}$ in. movement either side of neutral. The range can easily be adjusted by swinging the loop on the rudder up and down to alter the leverage from the torque rod.

The fin should be permanently stuck to the tailplane.

Solid sheet wing

The wing is simplicity itself, merely a sheet of $\frac{1}{4}$ x 4 x 36 in. soft balsa carved and sanded to the section, then cut at the centre to give $2\frac{1}{4}$ in. dihedral under each wing tip and reinforced with a bandage or glass fibre covering for at least 4 in. of the centre area. It is advisable to also add reinforcing strips at the leading and trailing edge, which can be made of plywood strips of spruce or celluloid.

Construction is now complete! For finish, it is recommended that the entire model be given a smooth sanding then two coats of sanding sealer followed by another rub down, then either tissue covering or colour decoration and fuel proofing or, if you want to keep it light and simple, simply a coat of fuel proofing with transfers for decoration.

The charm of SIMPLEX is that it is all sheet balsa, can be made and flying within *seven hours* as proven by the designer, it is flexible in its design so that you can alter the fuselage consruction to suit your whims and above all, it has good performance for the typical rough field used by the average model club.

If you want SIMPLEX to last through a long season of hard use, we advise you to proof the interior of the fuel tank and battery areas and to cover the exterior of this section from the engine back to the wing with nylon, or glass fibre.

From here on, SIMPLEX is all yours and we are sure we are going to see a lot of them in the coming season spot landing on the local heath or moor.

Readers' Letters

Cuts or burns?

Dear Sir,

I recently had my thumb fairly severely lacerated by absentmindedly sticking it in the propeller of my engine and, due to the reaction of my parents on this occasion, I know that if I ever again walk into the house holding the top of my thumb in place, my aeromodelling activities will come to an abrupt end.

Anyway, I have other reasons besides parental pressure for not wanting this to happen again. I play the piano for a jazz band, trumpet for the school orchestra and am being taught to play the organ, and these most enjoyable pastimes cannot be pursued very diligently with a bandaged thumb.

Well, the upshot of all this is that I have become interested in pulse jets. My knowledge of these, however, amounts to practically nothing, beyond that there are no external moving parts in which I could catch my fingers. I would therefore be very grateful if you could either supply me directly with, or inform where I might obtain, information pertaining to their commercial availability and other points which a person in my situation ought to know. I do not know whether it makes any difference or not; but my interests lie with control-line flying.

A. Caldwell.

Ardrossan, Ayrshire.

Scale drawings

Dear Sir,

The excellent scale drawings that regularly appear in Aero Modeller in the "Aircraft Described" series are always appreciated. Tucked away in the November 1963 issue, is a page that surpasses your usual efforts, and that should have special markers attached! This is the page entitled "Beechcraft 17 Dimensions".

The line drawings in this feature are excellent, but some of the comments in the text are of special significance. In fact, they should be printed in 'BOLD FACE' type. These are the comments relating to manufacturers' G.A. drawings and the development of scale model drawings from such sources.

For various reasons, manufacturers' General Arrangement drawings are routinely accepted in the modelling world as "accurate"—unless they are *most* obviously innaccurate. Actually, there is generally little effort on the part of an engineering group to provide scale model building accuracy in a G.A. drawing—it merely has to look more like the airplane concerned than it does like any other airplane. Nothing is built from this drawing; therefore, accuracy is not required. There have been some few exceptions where the draftsman involved chose to do an accurate job, but these cases are very rare and the draftsman in such cases was probably criticized by his boss for spending too much time on the G.A. drawing! I understand that the Curtiss XP-62 G.A. was one of these rare examples, though I have yet to see a print of this drawing.

For many years model draftsmen have tended to devote all manner of effort to elaborate drawings with extensive details based on manufacturers' G.A. drawings. This has been particularly true in the model magazines published in this country. The results are really worthless and most of these model draftsmen make no effort to fair section lines in three dimensions to see if their sections are even possible!

Congratulations on highlighting this apparently little known facet of scale modelling. Let us hope that your comments — and example — will lead others to devoting more time to useful development of basic lines in their scale drawings instead of elaboration of detail on an inaccurate foundation.

Harold Andrews.

Arlington, Virginia, U.S.A.

Such is progress . . .

Dear Sir,

Once upon a quite time there was a hobby. A good hobby. With interest and skill, endeavour and enjoyment. Each weekend the laddies used to meet on the field, sporting their creations, smoking and chatting. Showing a lively interest in each others models and offering congratulations upon a remarkable flight, or woe in a fly-away. Kits were cheap and good. Engines good and offered variety and cheapness, good quality, good performance. Good hobby. Along came radio. It livened the interest. It was fun finding that elusive gremlin or wondering why the actuator chattered. When the model flew you had achieved something by your skill. Things were cheap! Then a gong sounded somewhere. The transistor arrived, and with it the electronic expert! Prices began to climb as receivers grew smaller and smaller and smaller and smaller. I wonder why they are so small. We aren't, after all sending a rocket to the moon where a gramme counts as much as a pound!

Then the rat race arrived turning a hobby into a professionals circus! Manufacturers seeking the best and charging the most. £30-£40, £60-£80, £100-£150. £200-£315 . . . !

Soon the receiver will be sold with a magnifying glass (to see it!) to control a flying brick worth £500 Then think of it if one of these proportional efforts pile in or fly-away! Fields are vanishing, the "hobby" grows smaller. Soon Ferdinand Fetlock will roll up in his Rolls to compete against Sir Percy Vere and Lord Love-us in the world Radio Comps to fly their thousand quid jobs to win a frying pan. Anyone know of a factory for sale? There's money in that there hobby.

R. Wilson.

Hyde, Cheshire.

Enforcing Silencers

Dear Sir,

I agree with Flt. Lt. Falconer, I also love the sound of a noisy engine, but I am afraid that, like fast driving on unobstructed roads, it is a pleasure that we shall just have to do without in this country.

Competition models are put at a slight disadvantage by the weight and power loss of a silencer but all will be affected equally, and I cannot agree that models will immediately go up a step in size as a result. Anyhow, anyone flying a racing 60 with, or without a silencer, near a built up area needs a letter to the nearest Psychiatric Out-patient Department.

A accept that accurate definition of silencer performance in terms of decibels, phons, frequency ranges, etc., is impossible. The recent London Airport Noise Survey ended up with a subjective assessment by local residents, but this should not stop us trying.

I believe that a compulsory silencer rule will produce two main effects, and years of talk have produced little.

Firstly, competition modellers will demand, and get from the manufacturers, efficient engines with silencers.

Secondly, as a result of this the "Sunday afternoon" modeller will follow suit and I will hopefully predict that the schoolboy flying a control line trainer on the local sports field, possibly not even a club member, *will* be using a silencer in a year or so.

This must make modelling as a hobby available to a larger number of town dwellers, increasing the size of the market for modelling goods, and bringing down the price of competition engines!

I am lucky in being able to fly on a large airfield whose usual occupants are far more noisy than any unsilenced thing that modellers use, and after all if I ever feel nostalgic for the din that we used to make I can always take the darned thing off for a while.

It is a good thing that Singapore is well out of earshot.

Dr M. F. Hawkins.

Boscombe Down,
Amesbury, Wilts.

Dear Sir,

I read with interest Noel Falconer's letter setting out the case against mandatory fitting of silencers on all engines. Let me say that I don't like the idea of having to use a silencer any any more than most modellers but the rate of loss of flying fields is increasing rapidly. Noise is the usual complaint levied against modellers; the fact that the largest contributor to the noise levels is much more likely to be motor bikes and cars running up and down the road outside than a couple of models flying a quarter of a mile away is undeniable. Noise, though, is unwanted sound and whereas people will come to accept car and jet aircraft noise they are unlikely ever to accept it from aeromodellers. Many local authorities are quite willing to let modellers use a local area *on condition that the noise is kept to an absolute minimum*. The universal use of silencers, then, has *got* to come or there could well be no flying areas available anywhere in Great Britain in a few years' time. The "degree of quietening" resulting from the fitting of a silencer in any particular case is not of the greatest importance initially. The first big step is to get something attached to the exhaust of all engines. One possible method of ensuring an acceptable degree of quitening is to only allow the use of approved commercial silencers; it can be safely assumed that there will be a silencer available to fit *any engine* within 12 months. The engine test on the Tiger Major in the April '64 Aeromodeller shows that an efficient silencer on a high performance motor need not cut power noticeably and the extra unit cost can be negligible. This small decrease in power also indicates that silencers will not necessarily handicap British international teams; it should also be remembered that many other countries are having similar noise troubles.

Perhaps Noel Falconer has no such difficulties in Singapore but we in G.B. certainly have.

K. Lindsey, P.R.O., S.M.A.E.

Left: fine Douglas factory photograph showing the prototype under construction. Below, the 'Chicago'. Note exhaust manifold fitted in this picture, and absence of the tail skid when floats were fitted.

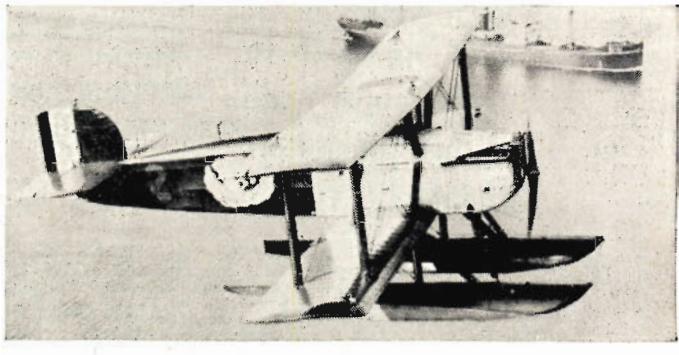
In the process of preparing his "Famous Biplanes" drawings, a tremendous amount of George Cox's research work is left unpublished and it is felt that at least the layout drawings containing valuable informaion for the flying scale modeller, have an appeal. 1/8th scale dyeline prints of the 1/72nd scale reproduction below are available from Aeromodeller Plans Service, price 3s. 6d. including post, and we commend them as a magnificent effort in establishing the true shape and proportions of this aeroplane.

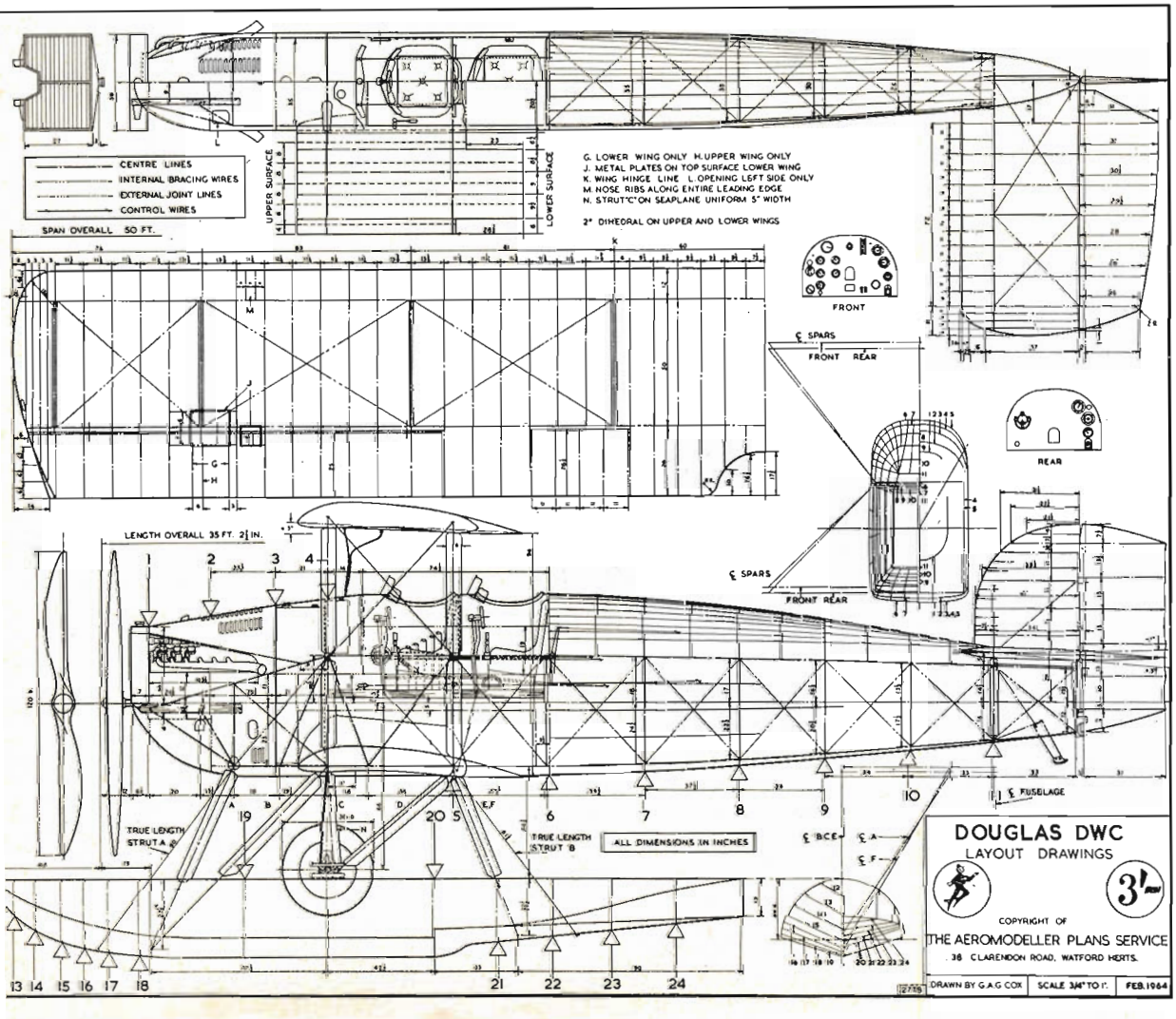
DOUGLAS 'WORLD CRUISER' DIMENSIONS—by G. A. COX

THERE ARE conflicting reports from authoritative sources in the United States concerning the true dimensions of the Douglas DWC. This disagreement is the more remarkable when even the U.S.A.F. Museum and the Smithsonian Institution give different figures for identical airframes and neither body mentions the upper wing dihedral.

The following dimensions for the "World Cruiser" are extracted from a detailed test report on the prototype made at McCook Field and dated October 23, 1923.

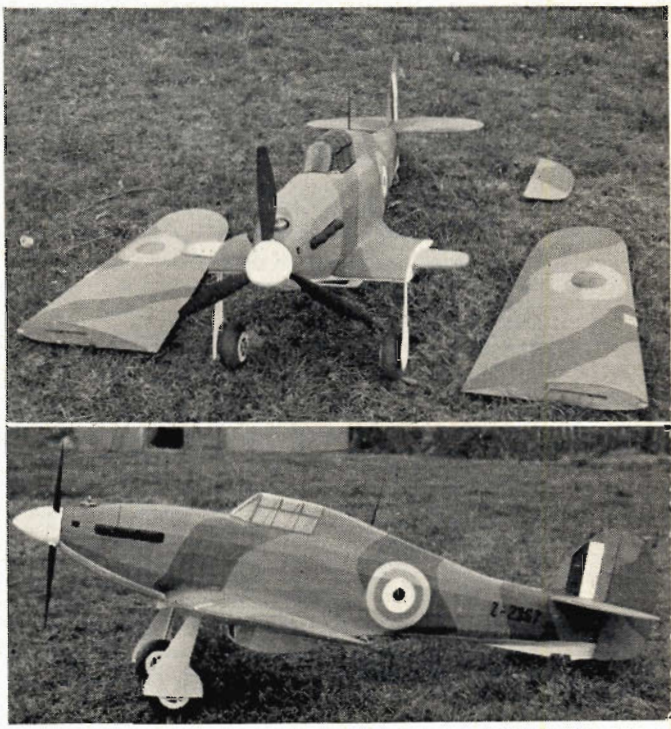
Overall Span, 50′; Overall Length, 35′ 2½″; Overall Height (Subject to loading), 13′ 7¾″; Gap, 8′; Chord, 7′ 6″; Angle of Incidence, 3 deg.; Max. Chord of Stabiliser, 3′ 10½″; Max. Chord of Elevator, 28′ 5″; Chord of Rudder, 2′ 7″; Distance from Elevator Hinge to Lower L.E., 26′ 2″; Stabilizer Angle of Incidence, + 5 deg. –1 deg.; Max. Fuselage Cross-Section, 71″ x 39″; Span of Elevator, 16′ 4½″; Aileron, 13′ 8¾″.





Let's go FLYING

—with John Barker who details the basic approach to model construction in this conclusion of PART TWO



C. J. West's Hurricane framework shown last month is now completed and awaits flight tests. Wings are made to knock off and give a span of 58 in. Length is 45 in. and the power, an A.M.35 driving a large diameter 4 in. pitch prop. Total weight is 2½ lbs. and radio control is to be fitted later. Fuselage is stringered with ¼ x 1/16 strips, joined at intervals to provide the fuselage length and Mr. West states this adds to the strength with extra rigidity where needed. Unfortunately it would take a long extension shaft to totally enclose the engine so the head remains exposed.

Splicing

SPLICING, ALSO KNOWN as Scarfing, is a method of joining two pieces of wood endwise. The idea is to cut the ends of both pieces of wood at an angle to give a long glued joint. Maximum strength is achieved with a joint which is four or five times as long as the width of the material but joints two or three times long will serve for many jobs. Splicing is one of the few jobs in aeromodelling that is probably more difficult than it looks. However, the method illustrated in *figure* 2.8 overcomes most of the difficulties. The only technique left to master is to keep the knife blade upright during the whole of the cut.

The two pieces of wood to be joined are placed on the board and preferably fixed with pins. Hold the straightedge firmly across the wood at the required splice angle. Make the cut across the ends of both pieces of wood thus ensuring that both are cut to the same angle. All you have to do now is reverse one strip and you should have a joint that fits perfectly. Extra care in glueing a splice is usually worth while. Pre-cementing is normally necessary and the parts should be pinned down flat to dry. Check for straightness when pinning down.

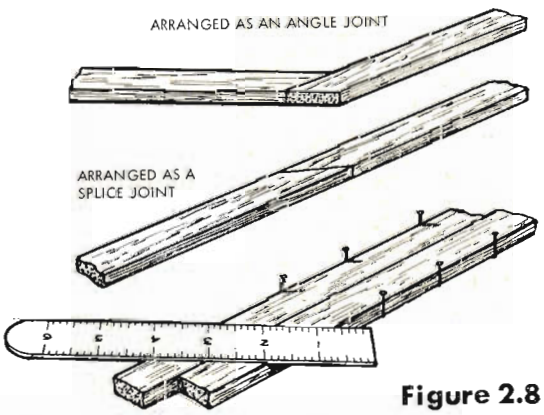


Figure 2.8

A method very similar to the above can be used for making angled joints. It will be found that the two pieces of wood cut for the scarf joint could also be arranged to give an angle joint as shown in the figure, and that the angle of the joint is the same as the angle used on the straight-edge to make the cut. Here then is the difference, with an angled joint the straight-edge must be positioned accurately but with an ordinary splice joint it is not critical.

Note also that with the angled joint two pieces of wood are not necessary and that a cross across one piece, at the angle of course, will give the same conditions.

Gussets

Gussets are the small pieces of wood, usually triangular, which are used to strengthen corner joints in the framework. The grain direction is important and should be parallel to the long edge of the gusset as shown in *figure* 2.9. If more than one gusset is required a strip of wood is cut to the width shown in the illustration. This strip is then cut up at the correct angle to form the gussets. The angle can usually be cut accurately enough by eye but if you do have difficulty use the corner of a steel rule or set-square as a guide.

Note that this method leaves a small hole in the extreme corner which clears the blob of glue normally left from glueing the joint. The hole makes the

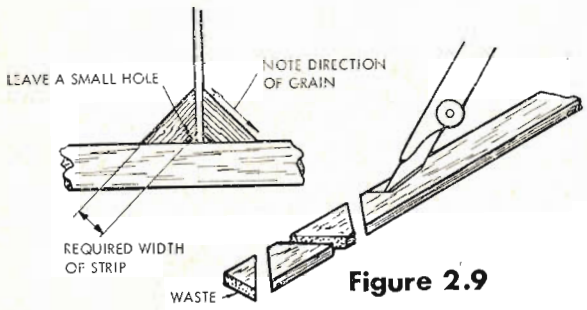


Figure 2.9

job much easier and whilst plans don't usually show it, it is quite in order to put it in.

On many modern models you will notice that in the wing the gussets are often much longer in the direction of the rib than along the trailing edge. This is because of the thin wing sections used. The gusset is partly to strengthen the joint and partly to stiffen the thin rear portion of the rib.

Gussets at the dihedral joints of a wing will require individual attention as the sides of the gusset will require bevelling to match the dihedral angle.

Adding sheet balsa panels

Very often parts of a model are sheeted to improve strength. A typical example is the nose of a built up fuselage. See *figure* 2.10. The principle usually followed is to mark out the sheet from the framework which is already built, i.e., do not try to cut the sheet to shape directly from the plan. In the example shown, the framework is laid on top of the sheet and the required position of the cuts is marked with a very sharp pencil. In some cases, such as wing sheeting, the sheet may be held in place with pins or sticky tape until the marking is completed. With panelling of the type shown in the illustration, the corners of the panel would be removed as mentioned for gussets. It is quite in order to use one of the existing sheet edges as one of the edges of the panel.

Cementing and Pre-cementing

The efficiency of modern cements means that very few difficulties arise. It is rarely necessary to cement both faces of the joint. Just put on a blob of cement and push the part into place. It is advisable to draw the finger over the joint as it is made to spread the blob into the corners. This also avoids lumps of cement which would otherwise have to be cut off before covering.

Now *pre*-cementing — if you look at the end grain of a piece of balsa, you will find that it consists very largely of holes. If cement is applied, most of it soaks into these holes leaving very little at the surface to make a joint. For this reason, end grain joints are usually given a coat of cement which is allowed to dry before the final cementing is carried out. You will soon develop a feeling for how much pre-cementing is required, depending on the type and importance of the joint and the hardness of the wood.

A final point of cementing. Replacing the top of the cement tube when not in use and rolling the tube up from the bottom may not produce better models, but in the long run it will save an awful lot of time, and cement.

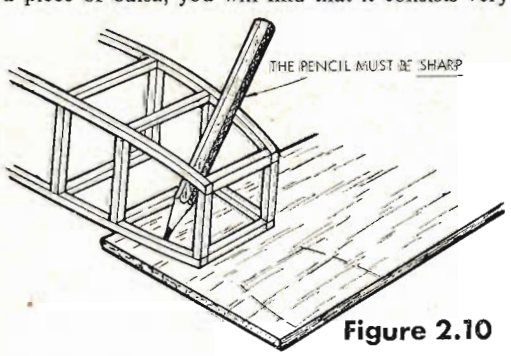


Figure 2.10

Sandpapering

Balsa wood roughness is very easily removed by sandpapering, so sandpaper can be a very useful piece of equipment, if used correctly. To get the full benefit a range of grades must be kept in stock. The coarser grades will give rapid removal of wood but it is essential to use fine grades for final finishing otherwise too much wood will be sanded away. The coarsest grade you should normally need would be ½/60 (Garnet) or 52 (Glasspaper) ranging to the finest you can get hold of. An old dodge when you have finished sanding with your finest grade is to give the job a rub over with the *back* of the sandpaper.

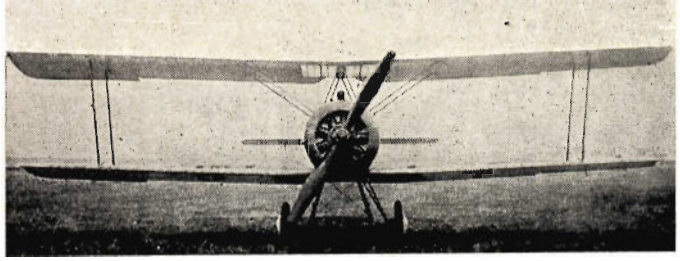
Before using a piece of sandpaper hold it on the top of the workbench with the sanded side uppermost. One edge of the sandpaper should just overlap the edge of the workbench. Now grasp this free edge and pull it vertically downwards until the complete sheet has been pulled over the corner. This will help to prevent the sandpaper from cracking in use. Cracks in the sandpaper cause nasty scores in the wood.

Most of the sandpapering we do is carried out with the paper wrapped around a sanding block. A thick block held in the middle, as used in ordinary woodwork, can be useful on the 'heavy' work. For most aeromodelling work, however, try a block about a foot long and about 1½ in. x ¾ in. in section. The sandpaper is wrapped around one end and the whole lot is then held rather like a file with the index finger extending along the back. This will give much better control.

On the few occasions when a sanding block is not used it is useful to take a piece of sandpaper twice the size required and fold it in half. This gives the fingers a non slip surface to hold on to. Also the paper can then be turned over frequently which helps to prevent clogging.

It will be fairly obvious that many of our frameworks are very light and will therefore need careful support during the sanding process. What may not be so obvious is the danger of a forward and backward motion when sanding thin sheets and strips prior to assembly. Correct procedure here is to hold the wood with one hand and make the sanding strokes away from where you are holding. Sanding towards the support will often buckle the wood. If you are trying to sand a piece of sheet smooth on both sides, avoid disappointment by checking your workbench first. Any blobs of cement or other bumps will indent the bottom surface of the sheet whilst the top is being sanded. The remedy either to keep the bench clean or to lay down a few sheets of newspaper. Wise precaution prevents dismay!

NEXT MONTH: Construction methods.



AIRCRAFT DESCRIBED Number 131

Sopwith 1½ Strutter

by Peter L. Gray

REJOICING IN PROBABLY the oddest name given to any aeroplane, the first Sopwith 1½ Strutter was produced on 12/12/1915 and was a remarkably advanced aeroplane, being the first tractor two-seater to be fitted with a synchronised machine gun firing forward as well as a machine gun aft, and as such it set the classic pattern for two-seat fighters. No. 5 Wing R.N.A.S. at Coudekerque was the first operational unit to receive the Strutter, one complete flight being so equipped by the end of April 1916. No. 70 Squadron was the first R.F.C. unit to take the Strutter on strength: 'A' Flight becoming operational towards the end of May 1916, 'B' Flight crossed to France on June 29th reaching base at Fienvillers on July 3rd, while 'C' Flight did not arrive in France until July 30th, 1916. Initially the aircraft were fitted with Nieuport type gun ring in the rear cockpit (as used on Nieuport XII two-seaters), a somewhat crude affair as compared with the No. 2 Scarf ring (as drawn) first introduced on the machines belonging to 'C' Flight of 70 Sqdn.

With a performance equal to that of contemporary single-seaters the 1½ Strutter was much in demand and was called upon to fulfil a diversity of tasks: from escorting bombers, long distance reconnaissance, long distance bombing (in a single-seat version), and as a two-seat fighter. In the event only two other overseas R.F.C. squadrons were equipped with the 1½ Strutter: Nos. 45 and 43. Production difficulties delayed supplies and it was not until September 30th, 1916, that No. 45 Squadron was completely equipped. No. 43 Squadron did not arrive in France until January 17th, 1917, by which time the Strutter was becoming obsolescent and heavy losses were beginning to accrue. Some 1½ Strutters were used briefly for Home Defence duties by 37 and 44 Squadrons.

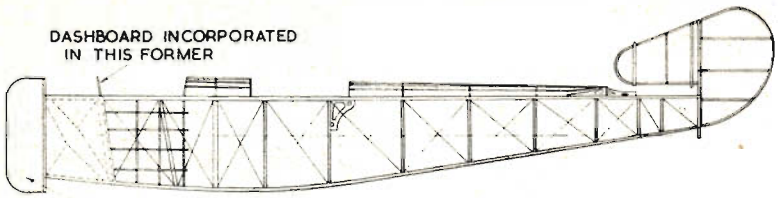
The single-seat version was built in fair quantity and was used as a bomber by the 3rd and 5th Wings of the R.N.A.S. Although some 89 single-seat versions were supplied to the R.F.C. there appears to be no record of their being used operationally. Visually the single-seater differed only in having the curved rear top decking extended over the location of the rear cockpit. The forward firing Vickers machine gun was retained and on some R.N.A.S. machines a Lewis gun was mounted—quite inaccessibly for reloading in flight—above the centre-section trestle. Some 1½ Strutters were used by R.N.A.S. detachments operating a mixed complement of aircraft from islands in the Aegean Sea. It was also used as a shipboard aircraft operating mainly from aircraft carriers. Experimental versions with skid undercarriage chassis and hydrovanes also existed. The standard type was also widely used by the French, by whom it was manufactured under license, the two seat reconnaissance version being designated Sopwith 1A2 and the single-seat bomber the Sopwith B1. The majority were used on the Western Front although some were used in Macedonia. Three squadrons of the Belgian Flying Corps flew Strutters; the machine also served in Russia and even turned up in Roumania before the end of the war.

Heading view of a captured machine shows the Cellon panels in upper wing roots and strut arrangement which produced the unofficial name. Right, at top an RFC machine without guns and translucent panel, note polished cowl. Centre is RNAS 9378 in natural finish. Cowl was 2½ in. shorter on RNAS A/C. Note air brake "up". Bottom: profile of N.5220 with Mann Egerton constructor's note under tail. Note absence of outer white ring on roundel. (G. S. Leslie photographs.)

Constructionally the Sopwith 1½ Strutter followed orthodox methods but featured two innovations in being fitted with air brakes in the lower wing roots and a tailplane that was adjustable for incidence during flight. The Strutter was a very stable machine with a marked reluctance to change its attitude suddenly and an adjustment of the tailplane was essential to get it quickly into a dive. Undoubtedly the air brakes were fitted due to the likelihood of the machine being called upon to operate from small fields. They were pivoted at about one third of their chord moving upwards through 90 deg., the smaller, forward, portion projecting below the centre-section and forming an aerodynamic balance to the control.

Basically the fuselage was a wire braced box-girder of spruce longerons and spacers with a rounded top decking of light formers and stringers. A circular aluminium cowling housed the (initially) 110 h.p. Clerget rotary engine, later the 130 h.p. version was standard. Cowling contours were preserved along the fuselage, tapering in over a lightly stringered structure, to the slab sides just aft of the forward cockpit. The wings were of conventional construction based on twin spars, the main ribs being inter-spaced with nose riblets to preserve the airfoil section. The upper wings were without a centre-section as such and were fixed direct to the centre-section strut trestle; the inboard panels were covered with celluloid material to afford added upward vision to the pilot. The lower wings were attached to a flat centre-section which housed the aforementioned air brakes. Unbalanced ailerons were fitted at all four wing tips being linked with a balance cable running through the top plane.

The tailplane and elevators were of composite spruce and steel tube framing while the fin and rudder (the shape of which set the pattern for nearly all subsequent Sopwith designs) were wholly of steel tube construction. An orthodox vee type undercarriage chassis of streamlined steel tube was fitted, rigidly braced to spreader bars as the axle was hinged at the centre to allow the end to spring independently within the elastic cord with which they were bound.

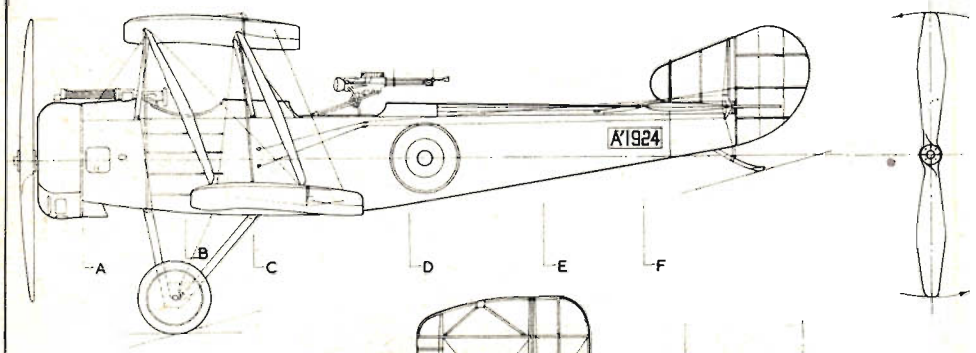


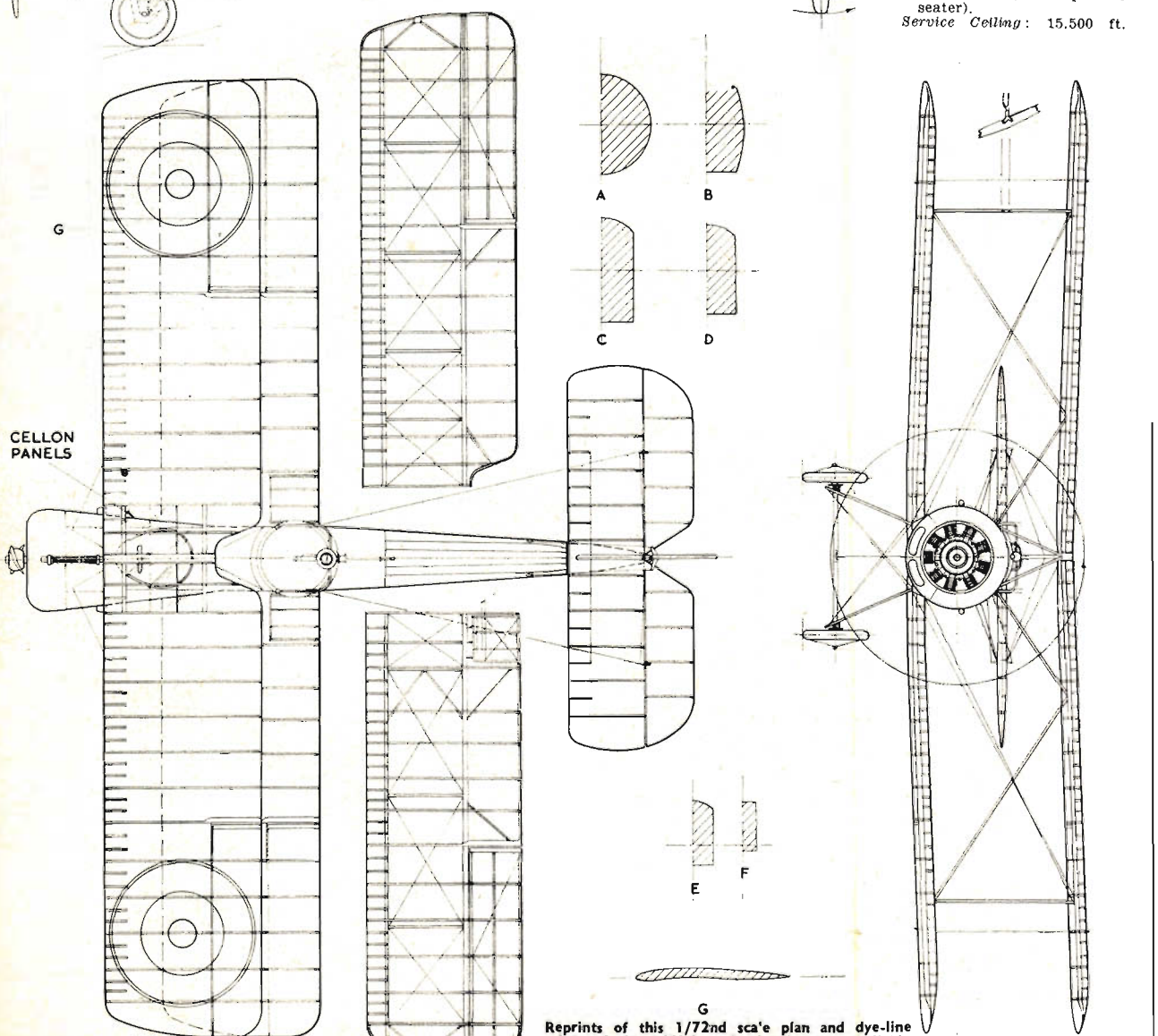
R.N.A.S COWL
2½" SHORTER THAN R.F.C. COWL

Colour details : Initially 1½ Strutters were finished all over in clear doped natural linen fabric but during the later part of the summer in 1916 they were being delivered to France with the upper and side surfaces finished in Khaki-green. Cowlings and metal nose panels were sometimes bright metal but more usually painted grey as were the metal undercarriage and centre-section struts. Wheel discs were either natural linen ; as were the under-surfaces, or were khaki-green. Blue (outer-most) white and red roundels were applied to all four wing tips, those on the upper surface being narrowly outlined in white. Fuselage roundels were not always outlined. Detail's of individual markings appear in "R.F.C. Squadron Markings" parts 9 and 10 in June and July 1962 issues.

Specification

Span: 33 ft. 6 in.
Length: 25 ft. 3 in.
Height: 10 ft. 3 in.
Chord: 5 ft. 6 in.
Gap: 5 ft. 4¼ in.
Stagger: 2 ft.
Dihedral: 2 deg. 23 min.
Weight, empty: 1,259 lb. (110 h.p. two seater) loaded 2,149 lb.; 1,305 lb. (130 h.p. two seater) loaded 2,150 lb.
Max. speed: 100 m.p.h. at 6,500 ft.; 96.5 m.p.h. at 10,000 ft. (110 h.p. two seater); 97.5 m.p.h. at 10,000 ft. (130 h.p. two seater).
Service Ceiling: 15,500 ft.

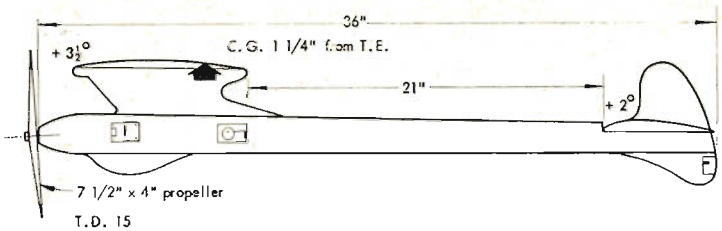




Reprints of this 1/72nd scale plan and dye-line prints of the 1/48th scale drawing are available as plan pack AJ2779. Price 2/6d. plus 6d.

SOPWITH 1½ STRUTTER

FT.

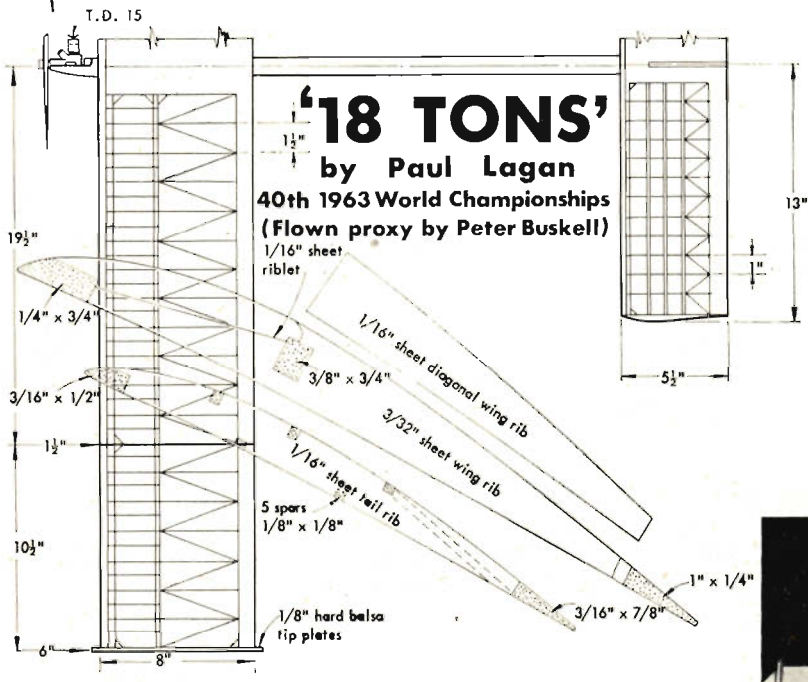


'18 TONS'

by Paul Lagan

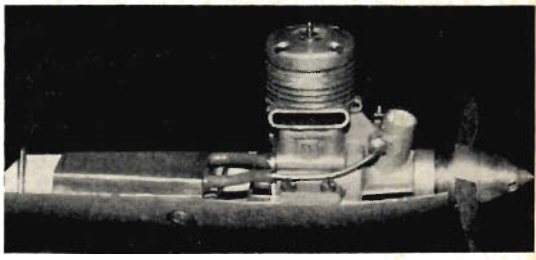
40th 1963 World Championships

(Flown proxy by Peter Buskell)

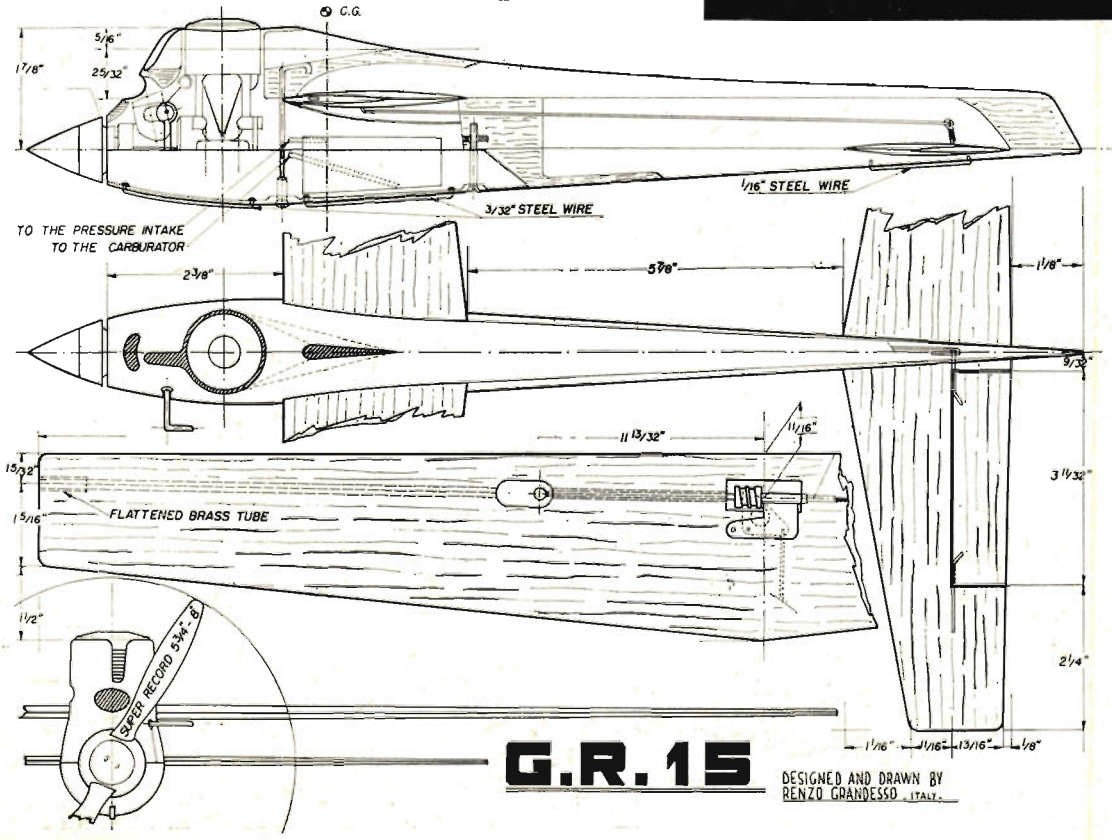


PAUL LAGAN'S "18 Tons" from R.N.Z.A.F. Wigram, New Zealand, is based on Ed. Miller's "Texan F.A.I.-Ton", using the airfoils from Pimenoff's "No. 18"—hence the origin of name. Paul found sheeted surfaces prone to heavy D/T landing damage so relies on normal covering. Tip plates are there purely to simplify construction. With Eta 15, it gained 1st place in South Island Team Tria's (4 max's plus 1:29) and 3rd place at N.Z. Nats. Also held N.Z. records prior to rule changes. Two models went to Austria fitted with Cox Tee Dee 15. Auto rudder is a suggested mod, otherwise "18 Tons" is easy to trim.

RENZO GRANDESSO'S winner of the 1963 Criterium of Aces (138 m.p.h.) uses a Super Tigre G.20/15 with lapped piston. Weight is 15 ozs., tank capacity 30 c.c. and the entire model made from the solid Italian Cirmolo wood. Wing and tail are each set at zero incidence and total elevator range is 20 deg. Maximum wing thickness is ¼ in. and for the tail, 5/32 in. The standard Monoline system is used for control and the engine is mounted in a new Speed King cast alloy pan.



2 Contest designs



G.R.15

DESIGNED AND DRAWN BY RENZO GRANDESSO, ITALY.

who admire the character of the true aviator.

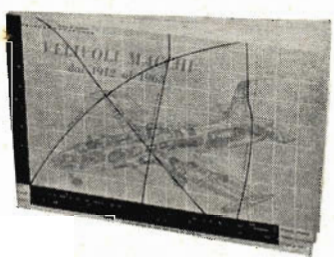
Second of the Kookaburra Technical Publications deals with the **Commonwealth Boomerang** and it's no surprise to find loads of hitherto unrevealed gen in the 24 6½ x 9¾ in. pages when we know how long the Australian author Geoff Pentland has been on the trail of this Aussie fighter. Being a stickler for scale, and an ardent modeller, Geoff has covered all the variants and provides fine 1/72nd scale drawings, plus additional colour diagrams. Cockpit data is not neglected and so for 7/6d. through Beaumont's (24 Ridge Ave., London, N.21) the scale fan has a most inexpensive reference to really pile on the detail of a suitable modelling subject.

Recommended Reading

AEROMODELLERS have particular tastes in their reading matter. Aviation literature must be packed with fact, well illustrated, and above all, accurate to satisfy their whims. For these reasons, we have a specially interesting selection of recent publications to mention this month, beginning with the latest MacDonald Monograph **The Gloster Gladiator** (35/-), a 136 page 7½ x 10 in. description by Francis K. Mason of our last biplane fighter and its many exploits. Four tone drawings, one in colour (with 72 Squadron markings) are irritatingly slightly under our standard 1/72nd scale, but otherwise here is detail in plenty with hundreds of photos to help the scale modeller. It seems a shame that cockpit views or for that matter an opinion on the 'flying' of the aeroplane are missing in so fine a work that recalls those tough campaigns in Norway and Malta so well.

From the same publisher, Tom Moulson's story of 601 Squadron **The Flying Sword** (30/-) brings similar nostalgia for days of courage, and with tales of truly great characters. Inter-Squadron "warfare" with clandestine attacks on summer camps by D.H.9a's dropping anything from red ochre to sacks of bad eggs and cartons of treacle, changed to more serious action with Gauntlets, Blenheims, the unpopular Airacobra and of course Spitfires among other types. This is a tale well told, a book that grips the enthusiasm of those

We wish in a way we could say the same for Len Morgan's **P-47 Thunderbolt** sold over here at 22/6d. by W. E. Hersant, 228 Archway Rd., London, N.6; but this 52 page 8½ x 11 in. work deals more with the pilot's viewpoint. Nevertheless, that is not to say that here is a gem for "Jug" modellers and coupled with those excellent "Superscale" drawings by David Brazelton, the book covers all a scale fan would need for a replica of this colourful World War II fighter. It has a special interest in view of the many pictures of British based "Jugs".

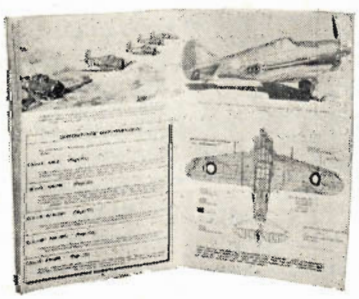


Racing 'Plane fans who want an all-in-one reprint of those now classic features in pre-war U.S. magazines plus many lesser known post war features, can have their appetite satiated by **The Golden Age of Air Racing,** at 4 dollars from the Experimental Aircraft Ass: Hales Crs., Wisconsin, U.S.A. 67 articles in 167 8 x 11 in. pages include many drawings and priceless photo's. Alas, all are not well reproduced since original artwork has disappeared with the mists of time, and the publishers had to rely on the printed pulp pages, now quite old.

From Italy, a pictorial history of Macchi aircraft **Velivoli Macchi** at 12/6d. through G. K. Scott, 84 Grosvenor Rd., London, N.10, has 144 pages 4 x 6 in. 66 of them being photographs to face text matter. An English introduction helps but otherwise the data is universally comprehensible and our only criticism of a fine reference is in the binding . . . have the Sellotape handy!

Finally, from Arco, a reprint in Paperback at only 5/- of Ray Malmstrom's **Aeromodelling,** exactly the same as the original hard bound volume of earlier issue. Ray's inimitable style and methods of condensing full size dimensioned plans down into tiny pages make this a condensed 168 page pocket book, ideal for all novices.

▸ Superscale plans to ⅜ equals 1 ft. for Mustang, Thunderbolt, Zero, Spitfire, Lightning, Me 109 and others are $3.00 each from Box 201, Arlington, Texas.

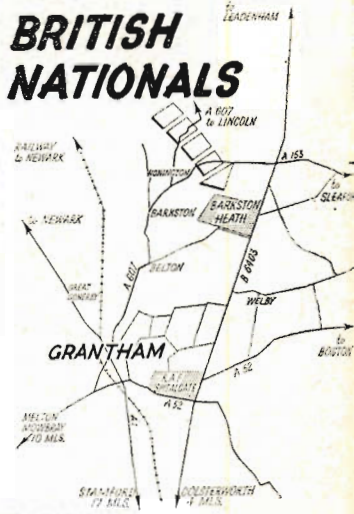


Camping at Whitsun?

ONCE MORE, thanks to the goodwill of the Officer Commanding, all roads lead to **R.A.F. Barkston Heath**, near Grantham, Lincolnshire, during the Whitsun holidays for the Annual British National Aeromodelling Championships. Modellers will arrive from all parts of the British Isles during Saturday, May 16th, to report at the camping site. They should all have camping tickets which are issued to competitors and S.M.A.E. members through the Comp Sec., 10 Storer Road, Loughborough, price 5/- each.

We wonder how many of our readers, not yet enthused with thoughts of a Nomad existence, realise what a tremendous range of lightweight tents are available.

Camping equipment manufacturers have many excellent catalogues to offer, and it is surprising how inexpensive this second hobby can be. Once equipped with a tent, all your accommodation troubles are over and for the cost of a few nights lodging, you can have your own permanent, fully weatherproof, portable home. Prices by "H & G" range from £3 6s. 6d. upwards. For just under £14 one can get an army bell tent that would sleep a small club. There are Continental frame tents with family capacity at £60 and over, pneumatics, cottage, ridge and separated room tents. One can even hire equipment nowadays for Continental holidays. If you have yet to make your choice of gear, we can supply a list of recommended catalogues (S.A.E. please). It's fun to camp, why not try it?



What's on . . .

May 17th Thurston Cup (U/R Glider); Women's Cup (G/R/P); Lady Shelley Cup (Tailless); S.M.A.E. Trophy (Radio Control Multi); Scale Flights (Radio Control); Scale Flights (Free Flight); Scale Flights (Control Line); Gold Trophy (C/L Stunt); Team Racing (Class A); Combat (Prelim. Heats); Speed (Classes 1, 2, and 3).

May 18th Model Aircraft (U/R Rubber); Sir John Shelley (U/R Power); P.A.A. Load (Payload); S.M.A.E. Trophy (Radio Multi); Scale judging (Radio Control); Scale judging (Control line); Scale judging (Free Flight); Team Racing (Class A); Team Racing (Class B); Combat (Heats and Finals); Speed (Classes 4, 5 and 6).

SIGN POST

A MONTHLY ENQUIRY SERVICE

Each month, *Aeromodeller* and *Air-Britain* combine forces to answer interesting questions sent in by readers. Postcards, please, to "Sign Post" c/o Aeromodeller, 38 Clarendon Rd., Watford.

No White Top

Will the fleet of Boeing 727s of American Airlines continue the odd practice of not applying white top decking to the fuselage? Why does AA turn its back on the "fashion" and can you let me know what colour scheme will be given?

(F.T., Arbroath).

American Airlines may have other good reasons but it is worth recalling what the then boss of EL AL—Israel Airlines once remarked in the writer's hearing: "You know, if we didn't have to paint the top of our Constellations white we could have enough extra payload to put in one more passenger!" Apart from looking extremely smart, the white decor serves the useful purpose of reflecting the sun's rays and thus reducing cabin temperature. Yes, the Boeing 727s of American Airlines will be without white except for the radar nose cone, AA markings and two curious areas on the tail, namely the cone holding the tee-tail plane and just below the rudder, a section which joins with the fuselage.

Addresses Known

Are there any U.S. counterparts of *Air-Britain* and, if so, do they specialise in World War One aircraft?

(W.L., Monkseaton).

The straight answer is "no" in terms of blanket coverage of aviation interest and sheer weight of membership which is approaching 1,750. However, there are two U.S. specialist organisations that are known to "Air-Britain" as being serious and worthwhile bodies. For war history, there is CROSS & COCKADE. *The Society of World War I Historians, 10443 South Memphis Ave., Whittier, Calif. For wider appeal, with occasional sorties outside the U.S.A., there is the* AMERICAN AVIATION HISTORICAL SOCIETY, *P.O. Box 2013, Torrance, Calif. It would be advisable to write to one or both describing your interest. If you mention* AEROMODELLER *and this "Sign Post" feature you will be assured of sympathetic interest. Both organisations publish quarterly journals which are filled with data*

Sticky Business

Can you confirm that the Royal Air Force is using stick-on strips of "Day-Glo" in place of the usual paint job? I saw recently a Varsity with the fluorescent nose, etc., and what appeared to be thin silver lines at regular intervals suggesting the use of some sort of strip application.

(E.S., Salisbury).

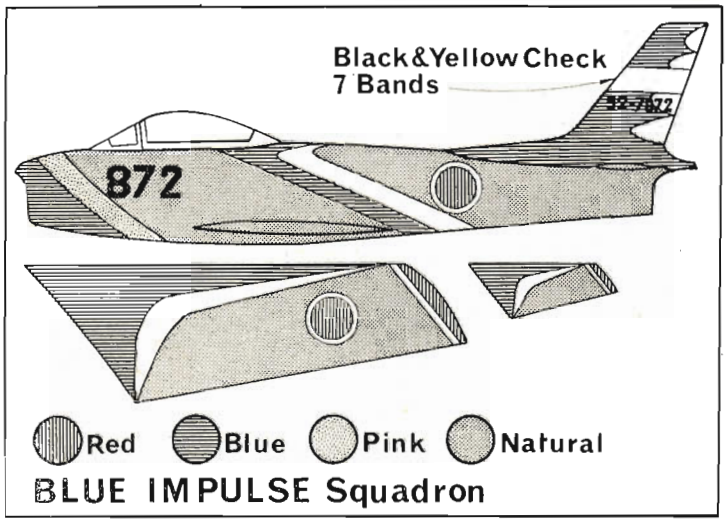
Yes, the use of fluorescent tape is used by the R.A.F. The reason is that highly eye-catching paint "weathers" more quickly than traditional types and it has been deemed more economical to apply strip to worn areas and then to replace again "as and when".

Tuck's Spit

There is an excellent photo of six Spitfire I's in Larry Forrester's biography of Stanford Tuck ("Fly for your Life", Fred. Muller, 18s., 1957). The Spit in the foreground is said to be Tuck's. Strangely, no serials are visible. Why?

(B.L., London).

The photo mentioned shows six Spitfires of No. 65 (F) Squadron, Hornchurch, in echelon to starboard. The code letters are "FZ", the individual numbers after the small red and blue roundel are "L" (Tuck), then "O, P, A, H. and B". Under the hurriedly-applied "sand and spinach" camouflage can be discerned in the original photograph the serial K9906. Curiously enough, half way up the fin and in diminutive form appears this serial as confirmation. Those of the other Spitfires in the formation cannot be made out because of the grain of the photograph. Although this is a famous photograph, no-one has hitherto observed this point. For one thing, it made the task of the ground crews easier to check which Spitfire was which since all paperwork would carry the serial number and not the individual letter.



Natty Nipponese

I have a Veron ducted fan ('IMP'eller) Sabre which I would like to dress up in Japanese colours just to ring in the changes. The brighter the better!

(N.B.W., Isleworth).

How about this then? These are the dazzling colours of the North American F-86F Sabres of the Japanese "Blue Impulse" aerobatic squadron. Note that the "buzz" no. 872 on the nose forms the "last three" of the tail serial 92-7872. Otherwise, just follow artist Bruce Rigelsford's accompanying diagram at left.

Club and Contest News

FINDING THE CHAMPION CLUB

THE R.A.F.A. SHIELD CONTEST for clubs in the South Eastern Area has many good features which will interest other Areas. Held over three meetings for the three open free flight classes, the contest gives clubs an inverse No. of points from 7th to 1st place. Individual awards are given in each class on an aggregate time basis taken over the three meetings. The Shield originated in 1949 when a decision was made to divide the South Eastern Area up into Sub Areas. This was not a success. However, the clubs in the "North Kent" Sub Area, Maidstone, Sevenoaks, Gillingham and Tunbridge Wells, decided to get together for an inter-club free flight event. Sevenoaks Club secretary approached the Sevenoaks Branch R.A.F. Association for a trophy, which was duly supplied, and the final round was tied in with the local "Battle of Britain" programme. First event was in 1950 when the Gillingham Club won. The Shield was then competed for annually until 1953 when the competition went into abeyance until introduced again in 1959. John Whitaker and his clubmates at Tunbridge Wells have been responsible for the revival. Past holders have been :— 1950 Gillingham, 51 Sevenoaks, 52 Tunbridge Wells, 53, 59, 60 and 61 Tunbridge Wells, 62 and 63 Crawley.

Though they may have missed the R.A.F.A. Shield this year, Tunbridge collected the Gallon of Beer Trophy at the South East "Noggin & Natter" on February 22nd for their success in Slope Soaring during '63 at Wilmington.

Four Crawley D.M.A.C. competitors at the St. Albans Vintage Rally held January 26th at Chobham. L. to R., John Oulds (G.H. 20) third, Don Plunkett (Hep Cat), Ron Flain (Lulu Mk. II) and Jack Darby (Jersey Javelin).

Cardington Indoor Meetings

The **Indoor World Championships** are to be held at R.A.F. Cardington with contest days on September 12th/13th. Four other meetings are arranged in the vast airship shed (See "S.M.A.E. Contests" for dates). Those who have any interest in Indoor flying will be well advised to take advantage of this use of the world's finest indoor flying site, arranged by the S.M.A.E.

London FAI C/L Meetings

Wanstead Warhawks are combining with those combat boys from Northwood to run a series of F.A.I. T/R and F.A.I. combat meetings. They will all be flown at the Hayes circuit. Dates are June 14th, August 9th and October 4th. Only changes are that the F.A.I. combat rules will require R.O.G. and max. engine size of 2.5 c.c.

R.A.F. News

Contest news from the R.A.F. is that the R.A.F.M.A.A. Championships are to be held over 26/27th of September at R.A.F. Debden. A R/C pylon event is being included, and both Vintage and Tailless, subject to approval from Commands. An Area Rally is to be held at R.A.F. Wroughton on June 28th with contests for all classes, dependent on attendance. They are also holding two postal contents; one on April 26th for Open Glider, A/1, Glider, and F.A.I. power. The other is on July 26th with Open Power and Open Glider (Double Event).

Final S.E. Area Indoor Meeting

Four Crawley members attended the final winter meeting on March 1st and Pete Cameron added to his many modelling laurels with 1st in R.T.P. Racing to make the hat trick with three wins in a row. Bill Horton was 2nd and Dave Burton 3rd in duration. In the final overall positions, with times from all three meetings, Pete Cameron won both Racing and Duration, with Bill Horton 3rd in both events. 2nd place in racing went to Dave Burton. This was a very successful series for Crawley D.M.A.C.

Washed Out

Northern Area Winter Rally held on February 23rd at R.A.F. Driffield was well damped down by heavy mist and rain. Visibility was only 200 ft.—*upwards*. Combat streamers fell repeatedly and final rounds simply could not be flown, so the winner was decided by a draw! ½A team-race was the most active event with a good proportion of the entries braving the elements. Dave Balch crashed due to his lines binding, and Alan Dell's motor stopped through getting too much water up the intake! Next door, Rat-Race was plagued not so much by the weather but by much potent and untried machinery, which never reached the starting line. Winner was Dick Place and second was Frank Bradley of Feltham flying a Fox 40 B.B. model. Undoubted heroes of the day were Dick Place and his mechanic Don Howarth with their "double" in the racing events. Also deserving a mention are the Feltham/Hayes and Canterbury entries, who travelled all that way to a winter rally, they must be keen. Control line results were :— Rat Race, 1 Place/Howarth, Wharfedale 7:29.6; 2 Meekins/Bradley, Feltham 128 laps ; 3 M. Adams, Wharfedale 90 laps. ½A Team Race, 1 Place/Howarth, Wharfedale 9:3.4; 2 B. Turner, Cambridge 12:58.3; 3 Peake Feltham/Hayes 16:10.

Tee-Dee—R.T.P.

Five Towns M.A.C. have been busy creating enthusiasm for their "Tee Dee" R.T.P. indoor flying as in our March full-size plans for the Stuka and Spitfire. They are now flying individual team racers using Tee Dee 0.020's. Winter activity wound up with a showing of the classic full-length feature film "Hells Angels"—nothing to do with models but lots of combat just the same.

NOTTINGHAM'S LOSS

After 14 years of continual use, Foresters (Nottingham) M.F.C. is no longer able to fly at Tollerton aerodrome. The reason is a large increase in full size private flying. Further sad news of the death of their veteran member, Mr. Tozer, always an ardent supporter of the hobby.

Silenced Club

Peterborough M.A.C. have ruled that all their engines above 1.5 c.c. 'must' be fitted with a silencer. Though this has put some of their large glow motors out of action for a while we're sure they will benefit through better public relations and flying facilities.

On show at Southampton

Southampton M.A.C. were allocated a stand at the local "Co-op's" Hobbies and Handicrafts Exhibition on March 7th. Sandwiched between Cactii and home-made wine stands, their Models ranged from 1/72 plastics to 10 channel R/C. Star model was Pete Waxham's A.M.25 powered 'A.P.S. Lysander'. Outdoors, control line old time Pete Cock has built a single channel cabin fuselage design with servo operated ailerons. A D.C. Twin—powered R/C. Hovercraft is well under way, builders Derek Coffin and Bill Bessant having consumed, something approaching "24 yards of Balsa".

PLYMOUTH M.F.C. SUBSIDISE 10 MODELLERS

At their A.G.M. on February 28th, members of Plymouth M.F.C. voted to encourage the growth of a younger element in the club, by subsidising up to 10 prospective members (min. age 14 years) and so bring their club subscriptions down to pocket money level. The club is very anxious to gain new members, both young and old. Anyone interested should contact the secretary, B. Welton, 19 Lockyer Road, Mannamead.

Contest Calendar

May 3rd	*South Bristol M.A.C.* Vintage Model contest, Blakehill Farm airfield. R/G/P, Jetex, Chuck Glider, and C/L Stunt (1950 S.M.A.E. pattern). All models pre 1.1.51.
May 31st	*Finchley Fliers C/L* Gala, Glebe Land, Finchley, London, N.12. ½A Combat, A Combat, Stunt Class A, Stunt Class B, Rat-Racing all Classes (F.A.S.T.E. Rules). Pre-entry 2/6d. by 1.5.64 to K. D. Lesser, 20 Squires Lane, Finchley, London. N.3.
May 31st	*Barnstormers/Kirkaldy Rally* Abbotsinch Airfield. R/G/P, ½A, A and B, T/R, Combat.
June 7th	*Wharfedale Rally* (Venue not fixed). ½A T/R, F.A.I. T/R, Stunt, Combat, Rat-Racing (2.5-10 c.c. 60 ft. lines).
June 14th	1*st Wanstead & Northwood All F.A.I. Rally.* Hayes C/L Circuit, Charville Lane, Hayes. F.A.I. T/R and F.A.I. Combat. Pre-entry 2/6d. by 7.6.64 to J. Franklin, 82 Grove Hill, South Woodford, London, E.18.
June 28th	*Esher R/C Contest*, Odiham, Hants. Area Intermediate R/C (Rudder, Elevator, Engine). S.M.A.E. Multi-Control programme of manoeuvres. Pre-entry 5/-. Entry forms from A. W. Ambrose, 37 Grove Road, Ashtead, Surrey.
June 28th	*R.A.F.M.A.A. Area Rally*, R.A.F. Wroughton. All classes.
July 4th & 5th	*Irish C/L Nationals*, Baldonnell. T/R classes, ½A, A and B, Combat and Stunt.
July 5th	*Devon Rally*, Woodbury Common, nr. Exmouth. R/P/G, ½A Power, F.A.I. Rubber, and Combat. Entry fee 2/6d. per event.
July 5th	*S.A.A. Gala*, Abbotsinch Airfield. R/G/P, ½A, A and B, T/R and Combat. Pre-entry 2/6d. to K. Johnston, 113 Kinarvie Road, Glasgow, S.W.3.
July 5th	*Wharfedale* 1000 *Lap* F.A.I. T/R (International Postal Contest).
July 12th	3*rd Annual Bristol R/C Rally*, R.A.F. Hullavington, Wiltshire. Multi to F.A.I. schedule, R/C Scale, single or multi channel. Pylon racing (min. wing area 1 sq. ft. per c.c.). Field Entry only. Rules from Charles Thorn, 164 Summerhill Road, St. George, Bristol 5. (S.A.E.).
July 12th	*Clywd R/C Glider*, Open, A/2 and Junior Slope Soaring. Pre-entry (R/C) by 1.7.64 to C. R. Filtness, 26 Raymond St., Chester.
July 19th	*Lincoln & Wigsley Rally*, Wigsley, nr. Newark. Open R/G/P, Multi-channel R/C. Pre-entry 2/6d. to P. Wyatt, 1 Wharfedale Drive, Fosse Estate, Lincoln.
July 26th	*R.A.F.M.A.A. Postal Contest.* Open Power and Glider (double event).
July 26th	*East Grinstead Gala*, Ashdown Forest. Open R/G/P and ½A power.
August 9th	*Leinster C/L Championships*, Baldonnell. T/R Classes, ½A, A and B, Combat and Stunt.
August 9th	2*nd Wanstead & Northwood.* All F.A.I. Rally, Hayes C/L Circuit, Charville Lane, Hayes. F.A.I. T/R and F.A.I. Combat. Pre-entry 2/6d. by 2.8.64 to J. Franklin, 82 Grove Hill, South Woodford, London, E.18.
August 23rd	*Scottish Open Rally*, at Abbotsinch. Open R/G/P F.A.I. "B", ½A. Pre-entry 2/6d. to K. Johnston, 113 Kinarvie Road, Glasgow, S.W.3.

S.M.A.E. Contest Programme

April 19th	Gamage Cup (Open Rubber); Pilcher Cup (Open Glider); F.A.I. Power, *At Area Venues.*
April 19th	Centralised C/L events at R.A.F. Tern Hill.
April 19th	Multi Radio Control at *Woburn Abbey*, Beds.
May 3rd	F.A.I. Control Line Team Trials at *R.A.F. Wigsley*, Lincs.
May 17th & 18th	BRITISH NATIONAL CHAMPIONSHIPS, *R.A.F. Barkston Heath.* All classes.
May 23rd & 24th	Indoor meeting, *Cardington.*
May 31st	*White Cup* (Open Power). *Frog Junior Trophy* (Open Glider/Rubber), Flight Cup (Open Rubber) *Area Venues.*
May 31st	Centralised C/L events at *R.A.F. Topcliffe* (nr. Thirsk).
June 14th	Multi Radio Control, *Woburn Abbey*, Beds.
June 21st	*Scottish Gala.* Abbotsinch Airfield. R/G/P, ½A, A and B T/R and Combat.
June 20th & 21st, July 11th & 12th, Aug. 22nd & 23rd,	*Indoor meetings Cardington.*

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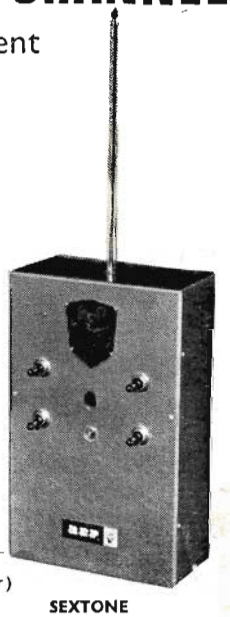

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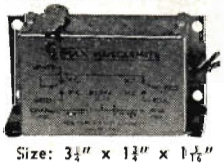

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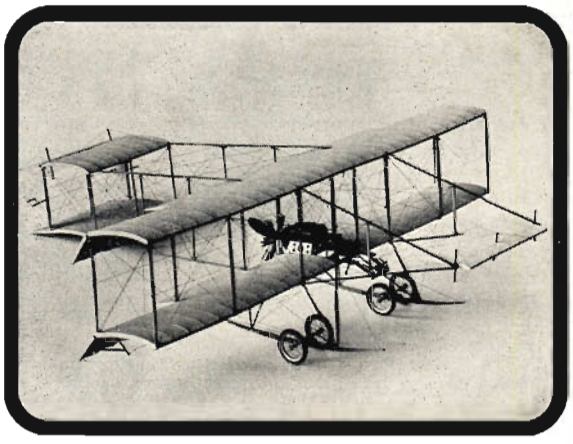

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The models shown here have been designed for the novice. They are easy to build and fly.

CONQUEST

Towline glider for beginners, with a very good performance. Kit contains die-cut parts. Wingspan 30".

9/-

NOMAD

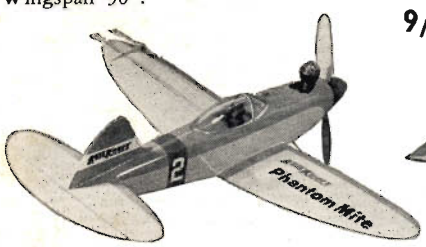
Beginners model with fuselage parts, tailplane and fins in pre-cut, decorated sheet balsa. 20" span.

5/6

GEMINI

Duration model with all fuselage parts, tailplane, and fins in pre-cut, pre-decorated sheet balsa. Wingspan 22".

9/2



PHANTOM MITE

Just about the toughest model available to the newcomer to control line flying. Features all sheet construction with wings, tailplane, fin and fuselage sides ready cut to shape. Suitable for .5 to .8 c.c. motors. Wingspan 16".

16/3

PHANTOM

Featuring all sheet construction for long life and easy repairs. A very steady performer for engines from 1 to 2 c.c. Contains ready shaped parts as in the Phantom Mite kit. Wingspan 21".

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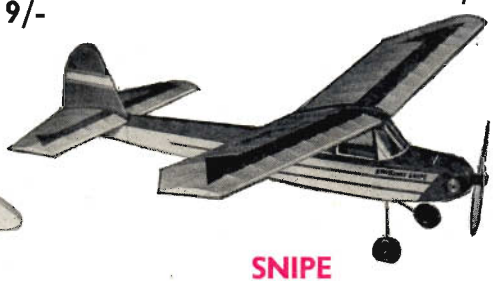
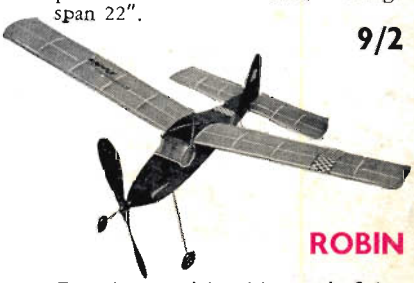


SNIPE

This nice looking model is especially suitable for beginners as it is so straightforward to build and easy to fly. Kit contains die-cut parts and has been specially designed for .5 diesel and .8 glow motors. Wingspan 40".

22/1



ROBIN

Duration model with good flying performance. Kit features die-cut parts, plastic propeller and wheels. An ideal "first" model. Wingspan 22".

9/8

All these Keilkraft kits contain die-cut parts for speedy, accurate assembly, and full size plans plus building and flying instructions.

KEILKRAFT ***Right from the Start***