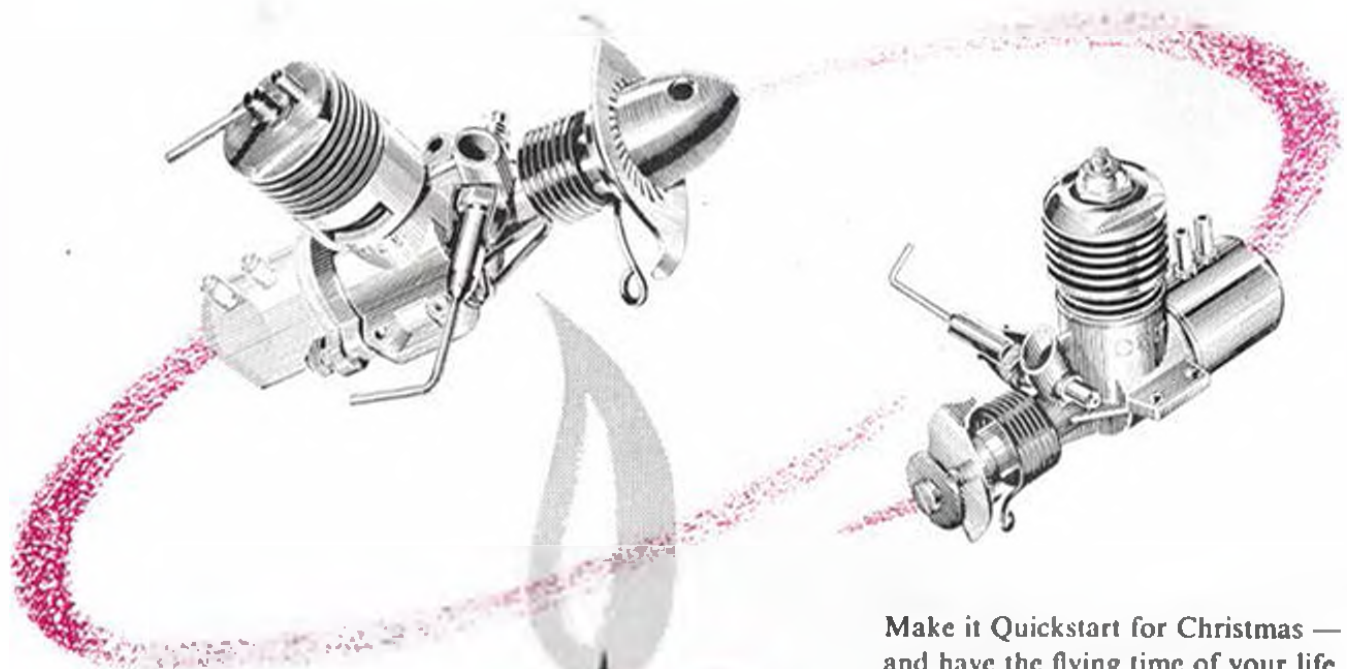


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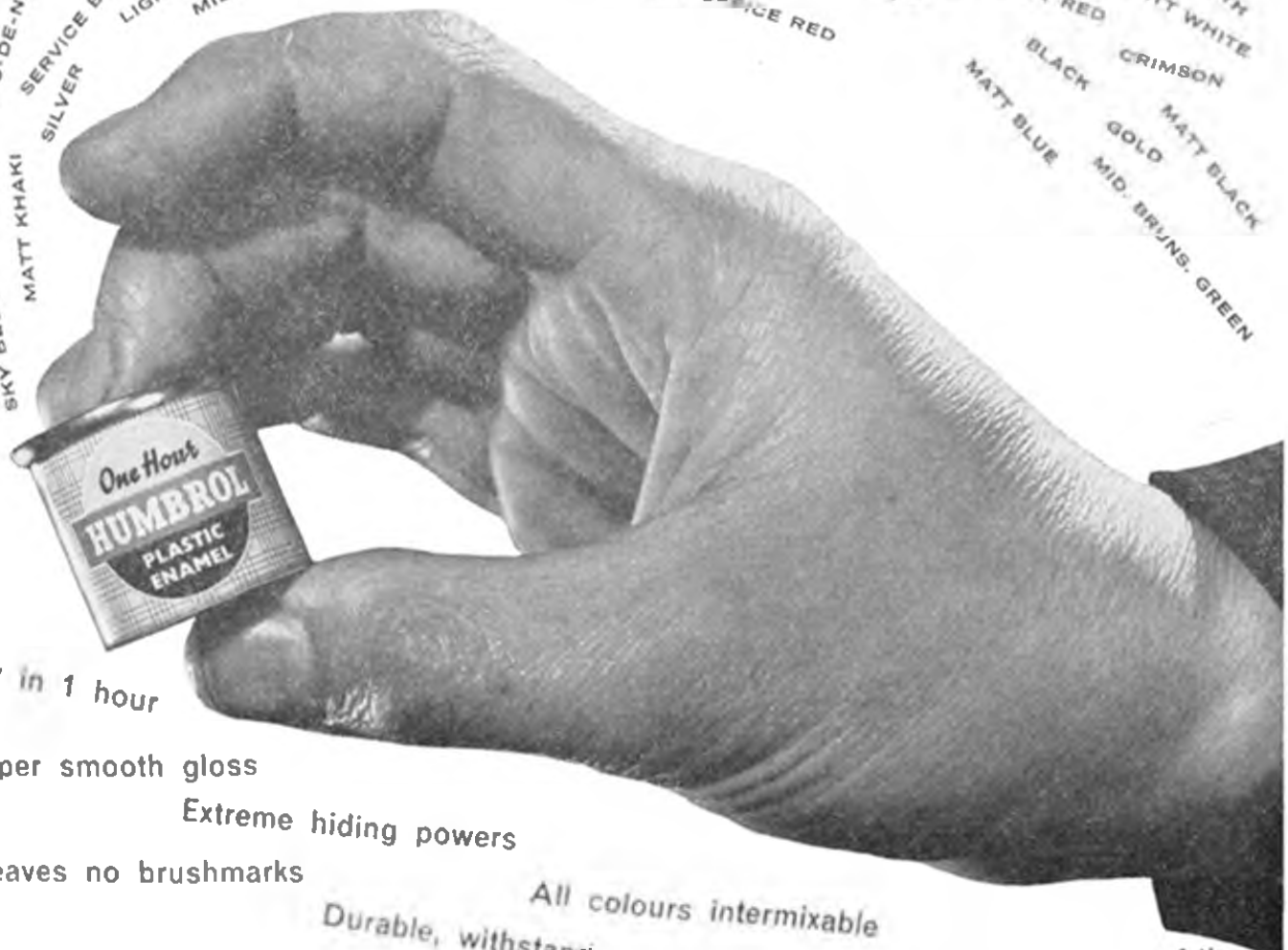


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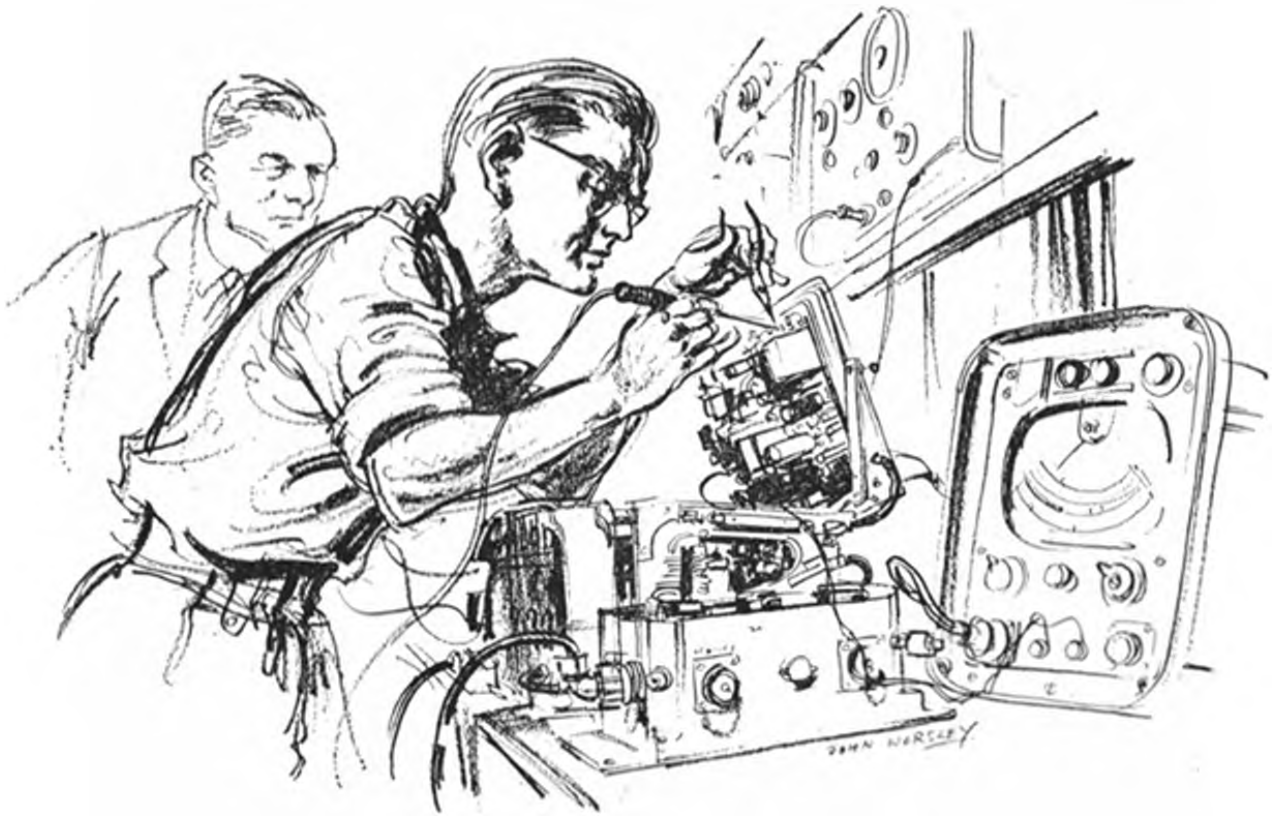


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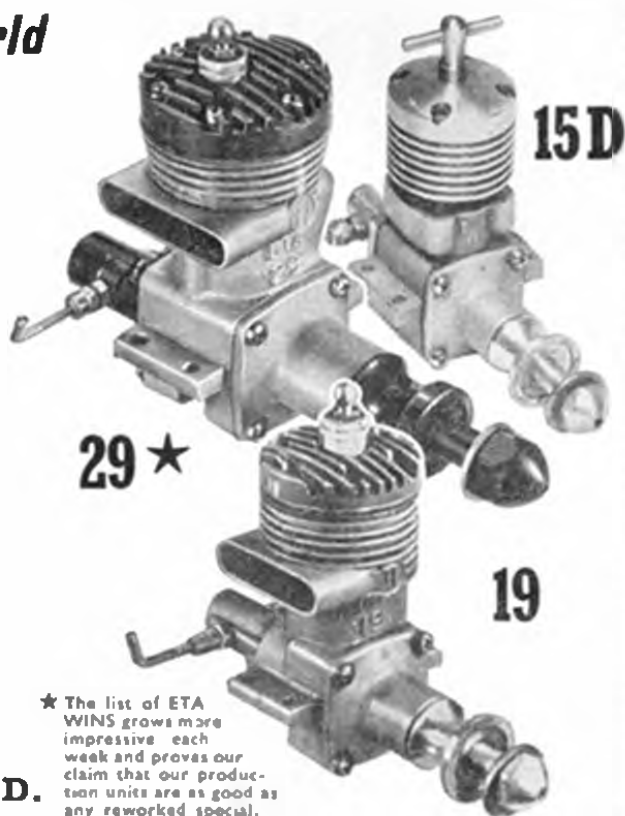
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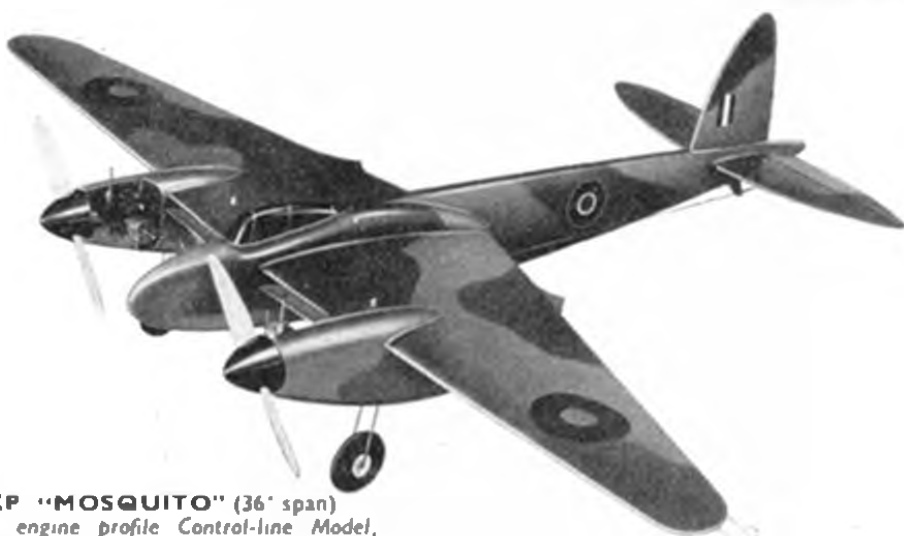
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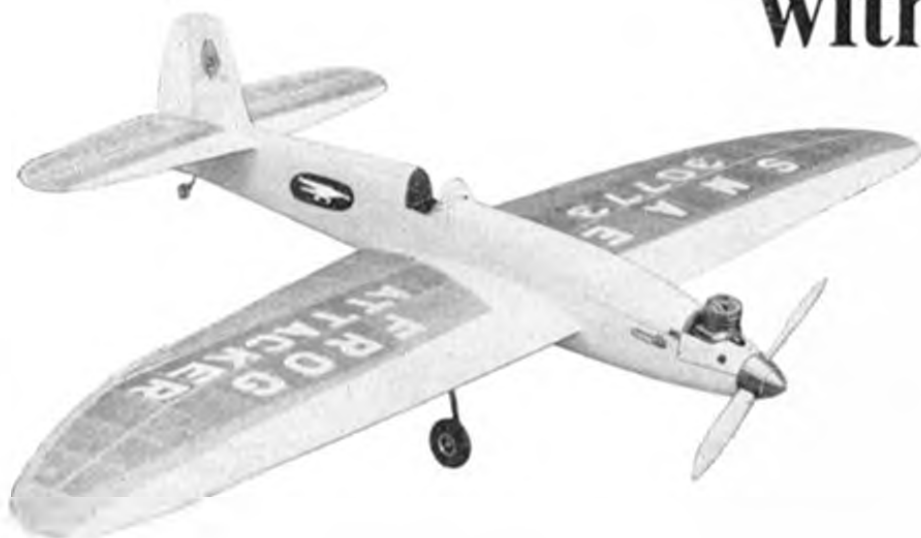
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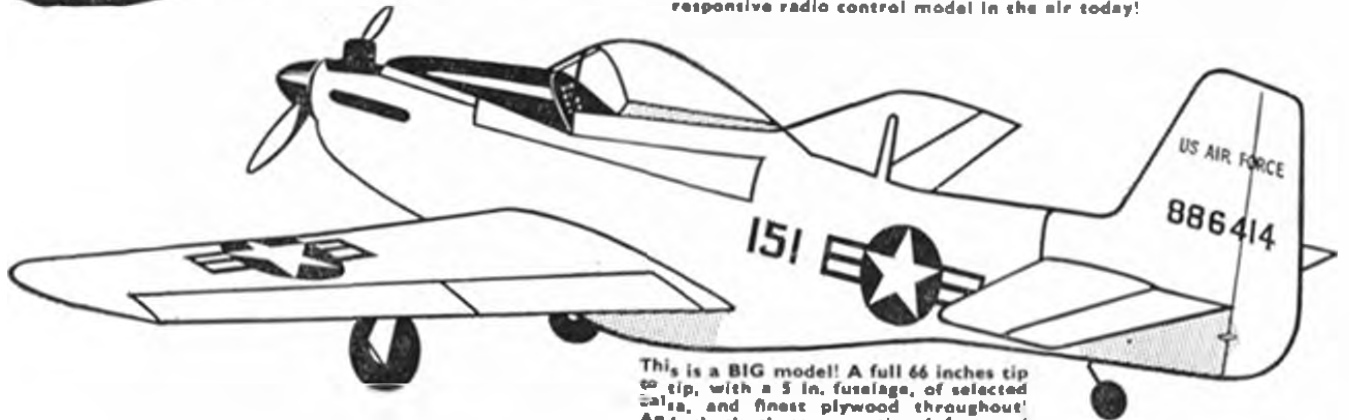
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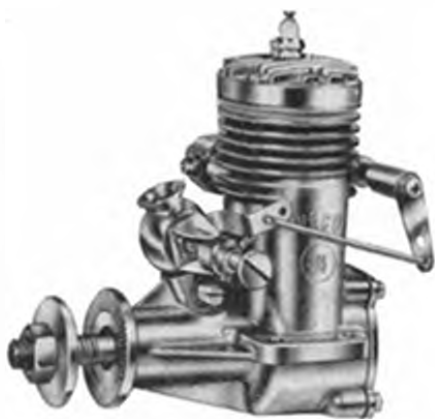
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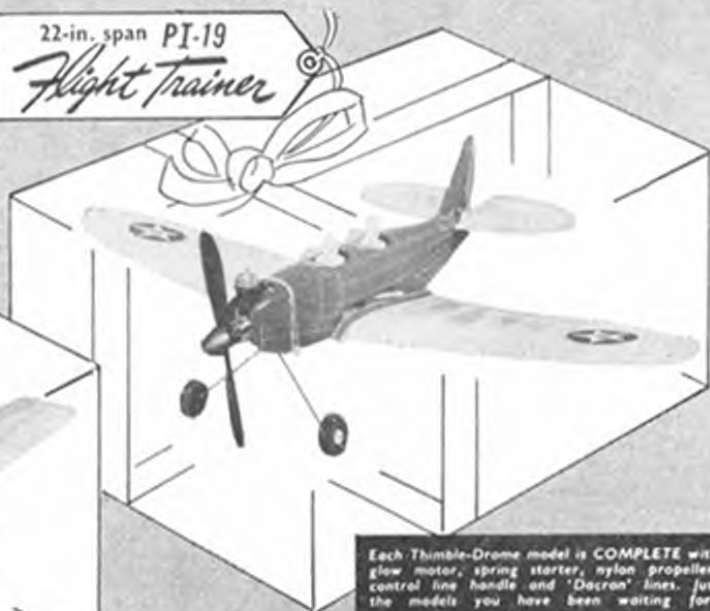


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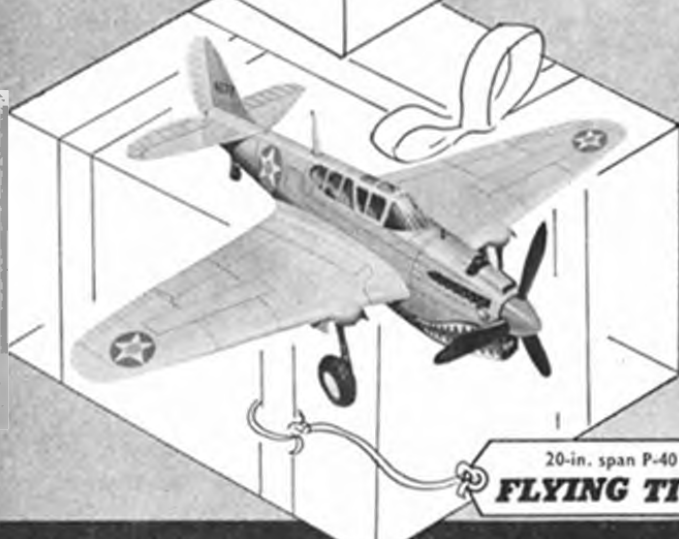
Flight Trainer

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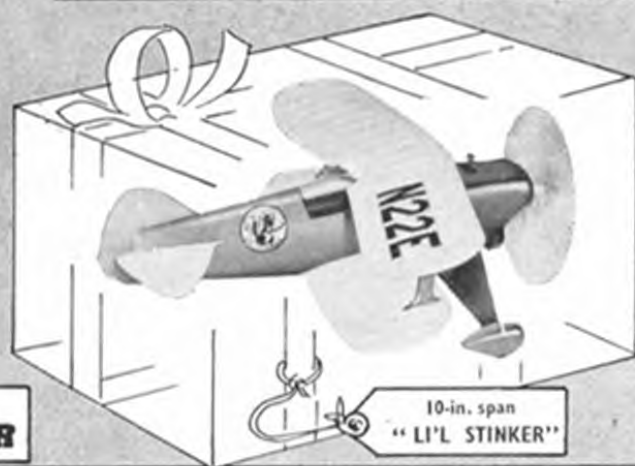
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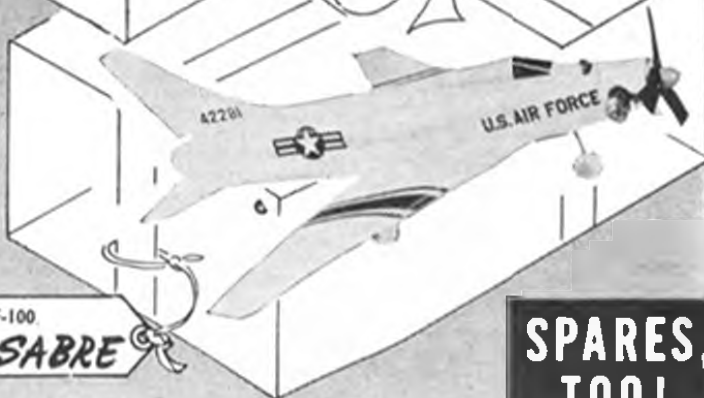
17½-in. span
Super Cub



1911 VINTAGE
CURTISS PUSHER



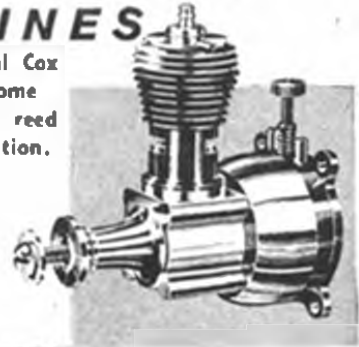
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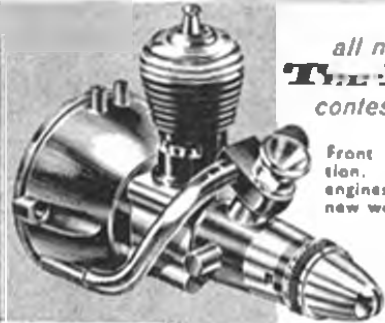
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- Not affected by metal-to-metal contact. A temperature stabilised circuit with no economy of components.
- Unhurried construction, requiring soldering only, will complete this excellent Receiver within an hour.

This is an actual size photograph of the Terrytone Receiver.

A feature article on its construction appears in the December issue of RADIO CONTROL MODELS & ELECTRONICS (now on sale).

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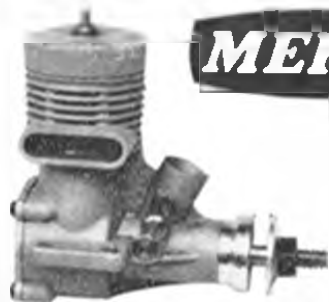
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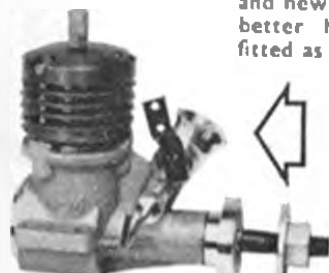
AM R C glow plug (2 volt) 5/4

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Complete with flywheel AM "15" Mark II 85/8



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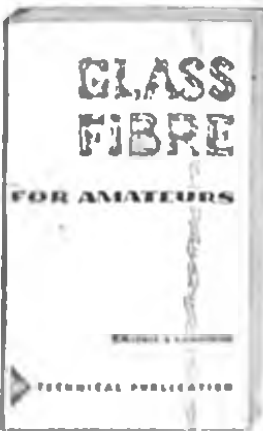
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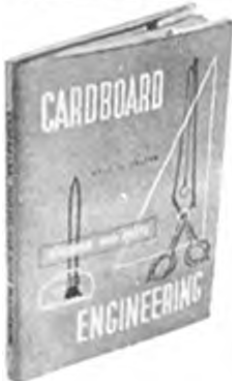
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VOLUME XXVI No. 311 DECEMBER 1961

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ON THE COVER . . .

Howard Pixton turns the 100 H.P. monocoque Gnome Sopwith Tabloid 1914 Schneider Trophy winner over the harbour at Monaco during the great race. Admirably portrayed by artist Ken McDonough, the cover will help those who make the flying scale model which is described on pages 642, 3 of this issue.

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Heard at the Hangar Doors

Time for reflection

IT IS CUSTOMARY at this time of the year, for us to reflect on the achievements of the past twelve months and to endeavour to draw some conclusion from our observations so that improvements can take place in the coming season. Naturally we do not only refer to the state of aeromodelling in general, the sporting, the contest and the "just interested"; but also examine our own product closely. It is in this way that the magazine gets its occasional face-lift, as for example the run of full colour covers throughout this year, and the reader can expect to see changes when the date switches to 1962 next month.

On looking back over the season, the most immediate impression is not entirely encouraging. We are fewer in number. There has been a pause in the normal rate of newcomers to the hobby. In many contests we see the same hard core of stalwart enthusiasts named time and time again among the results. Admittedly this is a broad generalisation, and we do know of clubs that now have greatest ever membership figures; but they are few and far between, and always associated with good flying field facilities. The two are inseparable. If you have the flying field, then local interest soars and the club prospers. Yet it is also true that if the modeller is really keen, then he'll travel quite a way to enjoy his flying; but what proportion of modellers possess such ardent keen-ness?

What can we do about this situation, which after all, follows the pattern of aeromodelling in the U.S.A. of a year or two back? Over there, the model and hobby trade has instituted a magnificent sponsorship scheme for juniors. State champions are selected through competition to earn a free, all-expenses-paid trip to the U.S. Nats. This fine idea has brought in new blood, gained invaluable publicity for the hobby, and above all, is repaying those who provided the sponsorship both in kind and in satisfaction of a job well done. Would the same work here on an Area basis?

In our campaign to "make it a more modelling year" we have played our part by distributing over 15,000 free plans over the past 3 months. It has been most consoling to have letters of appreciation from so many beginners who have used this service, as it was intended, to introduce them to the hobby with a sound yet simple design. We know that we have been able to help; but it takes a little more than supplying the plan. It is up to the experienced

The Editor and staff send Christmas greetings and best wishes for a prosperous New Year to all readers

clubsters to guide the novices in their modelling progress. One avenue they might well explore is to take up the very successful Coupe d'Hiver class which we introduce on the following pages.

Championship reflections

We always look forward to seeing other views expressed in reports on meetings which we have attended ourselves. The Triple World Championships for free-flight in Germany has produced more reportage than any other event in our memory and it is fascinating to read the various opinions, which fluctuate according to the fortunes of the particular National team. The Italians are, of course, jubilant. They had a champion in both Wakefield and A/2, which gives them every cause to be happy and yet, like most other Nations, are still seeking an answer to the disillusion which their power team suffered. One very interesting aspect taken up by *Modellismo* is the examination of the results in terms of collective team effort over the three classes. This is taken in two ways. Firstly, if one considers the team positions then Italy and Finland tie in a prominent first position. Again if one adds together the collective durations for the three classes, Finland heads the list once more with a gross total of 6936, leading Czechoslovakia with 6930 and Italy 6924. In the first case Great Britain appears at seventh place and where durations are taken into account, we rise to fourth with a gross of 6844 secs.—which is not too bad a position and perhaps will cheer those who are seeking reason for our less than anticipated results.

Success at Esher

After prolonged negotiation over three and a half years of legislation, public petitions both for and against, visits to the Home Office, and countless council meetings, the Esher and District M.F.C. have at long last gained their facility in the form of a tarmac surface completely tabled in, no less than 200 feet diameter for control line flying.

Formally opened by the chairman of Esher council on Sunday, November 19th, this circuit may yet mark a turning point in the fortunes of London area model clubs who have so frequently complained that they have no place to fly.

Modelling Holiday Camps

Heinrich Pempe of the German aero club gave us a leaflet on the youth centre at Hirzenhein, when we were at Leutkirch for the World Championships. Herr Pempe of the D.A.E.C. is in charge of promotion of youth interest in both aeromodelling and full size aviation, and the leaflet quite clearly and impressively indicates the extent of support given to German youth by its National Aero Club.

A series of courses are arranged between April and November each year at the modelling and gliding centre, each lasting from ten to eighteen days and being charged at most reasonable rates — for example, a twelve-day modelling course costs just over £5, and this in itself is a grand annual holiday!

Comparisons are always odious, but . . .

Cereal Story

Mike King, perhaps best known for his "Inchworm" glider among his series of Contest Kits designs, is also proprietor of a retail model and toy shop, as well as being secretary of the Model Trade Federation and prospective Liberal party candidate for Wrexham and



"Look out everybody,—I'm on instruments"

Tenby at the next General Election. Mike hit the news headlines recently by reversing the standard procedure of giveaways in the breakfast food packets. He gave away packets of cornflakes with model kits bought from his shop!

1961 C.I.A.M. Meeting

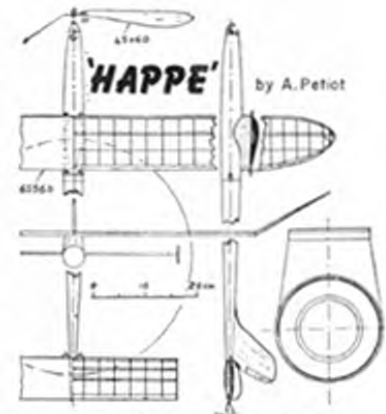
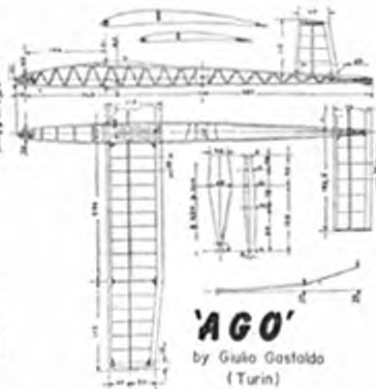
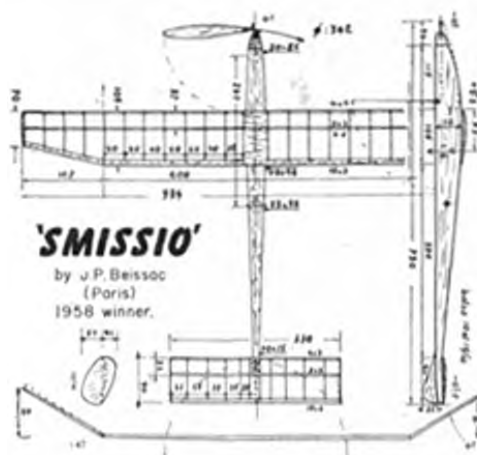
The annual F.A.I. models commission meeting is taking place in Paris as this issue reaches the model shops and newsagents. As we go to press, very little is known of the agenda and we were unable to get any inkling of propositions which are likely to be put forward for formula changes. We have, however, observed in the French magazine "Modele" that the following suggestions are being made in France regarding the International free-flight classes. They are, for the A/2 glider, a reduction of the line length to 40 metres, surface area same size, but weight 17-18 ozs. according to area within limits. Wakefield rubber motor reduced to 30 gm. (1.05 oz.), wing area and weight unchanged. Power models, engine size unchanged, 15-seconds engine run, loading 400 gm./c.c. (14.08 oz. per c.c.) and surface loading 25 gm. (.88 oz. per square decimetre). For all three classes the proposition includes six flights with 120-second maximums. One would have thought that after this year's World Championship results that everyone was satisfied with the current formulae. The view is taken in France that it is about time other countries appreciated their "400" engine loading formula which, of course, they proposed many years ago and have been using as a National formula for several seasons. We also hear of a Czech proposition to make A/1, Coupe d'Hiver and 1c.c. power the new International f/f classes!

New Lamps for Old!

We are pleased to announce that the old-established Manchester firm of Model Supply Stores is now installed in bright new premises at Shudehill, Manchester 1. This move from their well-known quarters in Brazenose Street came as a surprise to us, but a recent visit to the large basement situated under Godley's disclosed a spacious and well-lit area which should give modellers a far better selection than the rather cramped shop off Albert Square.

Mr. S. (Sammy) Norman looked very spruce and spry behind the counter, and we were soon reminiscing over pre-war modelling and modellers. Incidentally, this firm is one of the oldest in the British model trade, their advertisement appearing in No. 1 of AEROMODELLER way back in November, 1935.

We wish the company every success in their new set-up, which should benefit the many enthusiasts in the Manchester and other areas.



LE COUPE D'HIVER

Introducing a popular contest class from the continent with your FREE PLAN in this issue,

Derl Morley's Garter Knight

REGULAR READERS of the *AEROMODELLER* and collectors of our Annual will already have some knowledge of the French Coupe d'Hiver event which was originally sponsored by that admirable magazine *Modele Reduit d'Avion* (which, incidentally, has just celebrated its 25th year of publication). Editor Maurice Bayet has been largely responsible for the continuing success of the class over the 21 years of its existence, and today it enjoys unrivalled popularity with up to 138 competitors in the French National contests.

Finland, Czechoslovakia and Italy are other nations which have adopted the classification, while there are individual enthusiasts in Belgium and Spain who are already enjoying its attractions.

Why should we have a new class? Frankly there are only three good reasons, in that it suits the small field flyer, has few regulations and *will create new interest*. It could well be the stimulant that we so badly need to bring in fresh enthusiasts for the rubber-driven model. A glance at the sample Continental designs above will show there is nothing intricate required in construction and we have chosen three extreme examples.

Here we have four governing factors for the design of a *Coupe d'Hiver* model.

1. A Maximum of 10 gm. of rubber (.352 oz.).
2. A Minimum of 70 gm. of airframe (2.46 oz.).
3. A Minimum of 20 sq. cm. fuselage cross-section (3.1 sq. in.).
4. Rise offground.

These specifications demand a two-minute maximum

per flight in the popular French Winter Contest, and it is most rare for any contest to be won with a "full-house" score. Features of a general design making these restrictions lend themselves to a junior type Wakefield.

An important feature is the small amount of rubber required per motor (six strands of 1/4-in. rubber, 10 1/2-in. long) involving low cost which is a deciding factor with most juniors. Also, the cost of building materials is low and eventual performance is well within the boundaries of a large field, such as used for most club activities.

The Frenchmen aim for a short, powerful, motor run, followed by a 40 - 50 second glide, giving a total duration of 70-80 seconds.

These simple factors decided that Derl Morley's design would incorporate a 155-square inch wing, a relatively small tailplane and as many "Lincoln" Wakefield features as considered practical. Since this type of contest model may have a good following from the junior contest flyer, the design was kept simple in its general shape and without the gadgetry that is sometimes incorporated in top performance models.

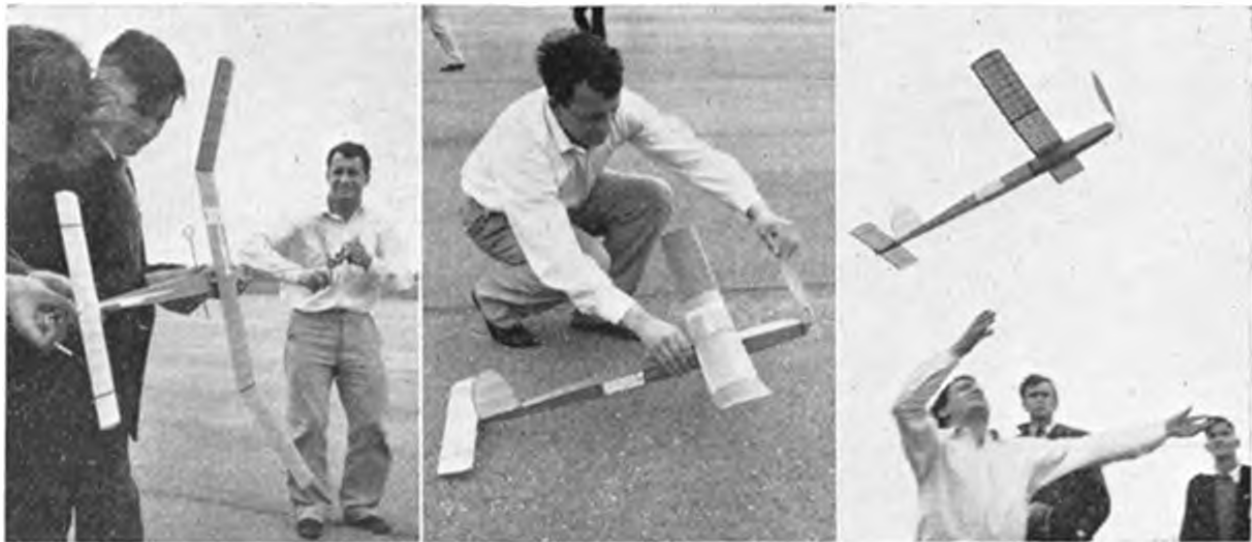
Yet, as those who have seen the "Garter Knight" on test will agree, the performance is nothing less than terrific for so small a motor (dare we say — *high size*?). Derl Morley demonstrated at this year's Northern Gala and after the now accepted initial comments on the worth of a motor sufficient in size and weight only to sustain a single 15 denier unit of feminine hosiery in sheerest nylon, he turned amusement to amazement with a series of flights averaging over 1 : 50 !

The one that landed in a duckpond was best of all, and well over the 120 secs. max required.

One point not appreciated immediately is the torque effect from the short motor. Customary right thrust proved dangerous and unnecessary. 1/16 inch *left* side thrust on the nose gives a straight climb, blending to a right spiral climb, then straightening out at the end



Happy finalists at the Coupe de la Cote d'Azur, 1960, display their Winter Cup designs made to the formula described above. Maybe we shall see some friendly international challenges issued between British and French enthusiasts if the class succeeds in this country — and why not!



of the 25-second motor run. 320 turns will give a climb to 90 feet where the prop folds and the Knight is on its own as a glider — and a good one, too!

We see this Coupe d'Hiver class as a great encourager for new interests and welcome comments on its acceptability as a club standard model for local fields and maybe some of those sociable rallies where the novice is seeking a chance to get at the hardware on the prize list. What about it?

Commence by cutting out the motor portion of the fuselage sides, then cover one side of each with light-weight tissue using dope as an adhesive. Pin the four sides together to form a laminated block and sand to a symmetrical shape. Select four $\frac{1}{4}$ in. x $\frac{1}{4}$ in. soft longerons and taper them to $\frac{3}{32}$ in. x $\frac{3}{32}$ in. at one end only. This saves weight where we don't want it.

Lay down a pair of longerons to form one side and cement one of the $\frac{1}{16}$ in. sheet nose pieces into position with the tissue covered side to the inside. Cement into position all spacers, then repeat this for other side. "Joyplane" cement is recommended for balsa jointing. Join the two sides by lightly cementing the dummy former into position, keeping the two sides in correct alignment with each other. Draw the nose sections together and cement the two remaining $\frac{1}{16}$ in. sheet nose pieces in place above and below (note re-inforcement under pylon position). Fit all top and bottom spacers, sheet fillets and ply nose former (with "Britfix"). Remove the dummy former, and cement in the circular discs for rear anchorage peg. Do not bother with the pylon at this stage. Construction of the wing and tailplane follows the usual pattern of assembling ribs to trailing edge, adding spars and leading edge, etc., not forgetting to pre-cement all dihedral joints. The fin is a little unorthodox; but if adopted provides a light, warp resistant structure that can well be employed on your future designs. Cut a $\frac{1}{4}$ in. sheet profile to the inner fin shape making it a little longer than actual. This enables trimming of the laminated outline at the base. Strip from a sheet of $\frac{1}{32}$ in., three lengths $\frac{1}{4}$ in. wide, long enough to wrap around the profile. Pin the initial strip to the profile and follow up by cementing to this the remaining two laminations. When dry, remove and add base rib, main spar and sliced ribs. Trim the shorter ribs from rear of template. Finally, sand outline to remove roughness.

The prop is carved from a soft $\frac{1}{4}$ in. sheet. Cut out the profile from $\frac{1}{4}$ in. sheet to the inner profile, marking the

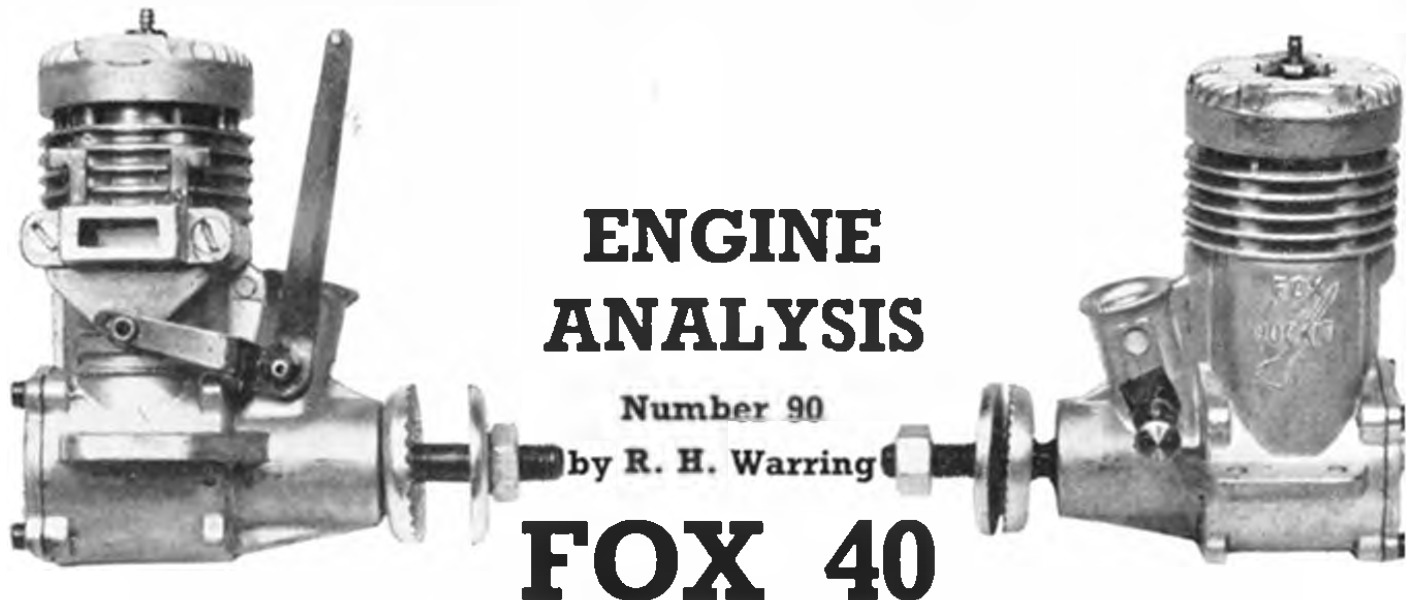
Testing Garter Knight at Rufforth. left to right, Derl Morley packs on the turns with Lou Roberts taking the strain and helper lighting the fuse. Centre is a peg leg take-off (leap would be a more appropriate expression); right is a typical hand release showing sippy climb Model surprised several experts with its performance

leading and trailing edges on the sides. Cut the wedge-shaped slot in the hub end and cement in the short length of dowel for the root. Carve the blade to the markings to give a maximum blade thickness of $\frac{3}{32}$ in. at the widest point of the blade. Undercamber at this point is to be $\frac{3}{32}$ in. The tip of the blade is $\frac{1}{32}$ in. thick and undercamber there is nil. Carve the root of the blade so that there is a gradual merging of dowel to prop blade. Drill the piece of alloy tubing (a piece of 18 s.w.g. wire sharpened at one end will serve as a drill). Reduce the dowel hub to receive the alloy tubing. Set the prop at the pitch angle, i.e., on a piece of $\frac{1}{4}$ in. sheet cut to pitch triangle. Press the tubing on to hub so that the centre line of the 18 s.w.g. hole is parallel to the base of the pitch triangle. Cap the end of the dowel with ply to retain the alloy sleeve. Drill through the dowel hub using holes in the alloy sleeve as positioned. Now you have a prop ready for the wire hub and balance weight.

The pylon is built after the model components are finished. Assemble the model with motor and balance to give C.G. position of 75 per cent. from leading edge of the wing. This enables us to erect the pylon and obtain this C.G. position. That shown in the plan was for the prototype.

All external covering is Jap tissue, giving three coats of 50/50 thinners dope ("Titanine" or "Puk-ka") to fuselage, two coats each to wing, tailplane and fin. The prop is covered with Jap tissue, but try to obtain a good finish by applying the required number of coats of 50/50 dope.

Flight trim follows the conventional style of right-right-turn. The outboard wing is washed-out to keep the nose up on the right turn. Adjust side thrust with $\frac{1}{32}$ in. packings and trim the glide by packing the tailplane. To obtain maximum performance, the motors must be wound to maximum turns at the risk of breaking motors. This fuselage is designed to stand breakages and to enable the removal of broken motors it may be necessary to employ a wire disgorger to remove rear broken half of motor. Use the dit at all times and do not forget that address — this Garter Knight is light enough to hook the slightest puff of lift!



ENGINE ANALYSIS

Number 90

by R. H. Warring

FOX 40

DUKE FOX HAS, from time to time, produced engines which have not necessarily been glowing with external glamour despite their obvious potential, but throughout has always maintained standards of workmanship in the best American tradition employing modern machines and techniques and paying particular attention to the internal parts and fits which really matter. The Fox 40 is a specially enlarged engine for control line Rat Racing stunt and combat, of conventional design throughout, well planned and built, rugged and easy to handle. It utilises the same bore as the Fox "35" but with an increased stroke, resulting in an almost square engine.

Considerable running in time was found necessary to ease the "40" down to good running fits, initial tightness being a characteristic of most Fox engines. At no stage, however, was the "40" reluctant to run quite smoothly and starting and handling characteristics proved excellent throughout—even outstanding for a high power fairly high compression ratio engine of this type. The cylinder does, however, tend to get extremely hot and the motor can seize or partially seize if continuous high speed running is attempted too early, or if running-in is attempted on too lean a mixture.

Whilst the spraybar and needle are of conventional pattern the needle tip, incidentally, incorporates the flat "bar" section introduced by Fox on earlier motors to provide a positive support against any possibility of the needle vibrating and affecting the mixture setting.

Needle valve control itself is essentially non-critical and the "40" will run well and strongly on rich settings, which is a decided advantage for aerobatic work. The "40" also seems most tolerant as regards fuel tank

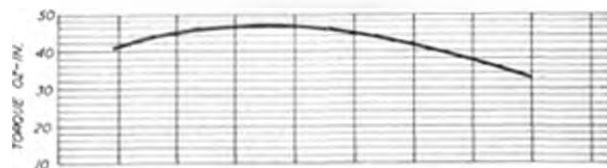
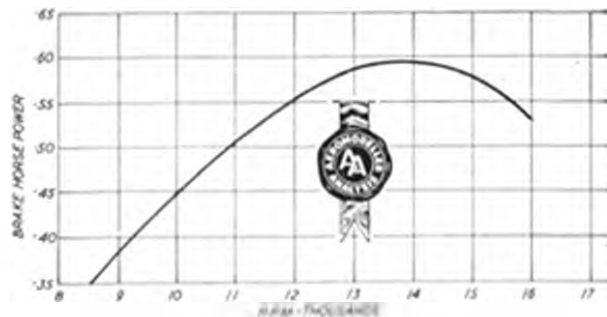
position, a change in vertical height of the tank position of several inches when bench running having no effect at all on mixture at speeds of 12,000 to 14,000 r.p.m. (Frank Warburton, has been first to recognise these qualities, and speaks highly of its potential for stunt.)

The torque curve as plotted on test showed a more rounded form than usual with very high torque developed in the 11-13,000 r.p.m. range, falling off markedly at lower speeds but being well sustained at the higher speeds. The "40" was not too happy running very slow—i.e. with 11 and 12 inch diameter propellers, but extremely consistent in performance at all higher speeds. Peak power as measured on test was just below .6 B.H.P. at 14,000 r.p.m., with maximum torque developed at 12,000 r.p.m. It thus appears well able to handle higher pitch propellers which glow motors—even large glow motors—do not always like, especially for static running.

Design and construction is fairly conventional, about the only outstanding features being the large diameter crankshaft and the quite thin cylinder liner employed—the former usual, and the latter unusual these days. Crankshaft diameter is a full $\frac{1}{4}$ in., stepping down to a $\frac{3}{8}$ in. diameter threaded length. Actual journal length is only one inch which does tend to exaggerate the appearance of the large diameter. The intake port in the shaft is rectangular— $\frac{3}{8}$ in. by $\frac{5}{16}$ in., opening into a $\frac{11}{32}$ in. diameter hole down the centre of the shaft. These dimensions are more or less consistent with what is becoming standard practice on engines of this size.

The crankweb is cut away and very heavily over-balanced, while the $\frac{7}{32}$ in. diameter crankpin is long and stepped back so that it can be ground to finish, the shaft also being ground over the bearing length. Fit is quite close and very good in the bronze sleeve in the crankcase casting, forming the main bearing. A hardened steel propeller driver keys onto lugs formed on the shaft. The shaft itself is hardened and then relieved to some considerable degree. We are not entirely happy that the fairly abrupt step-down from the $\frac{1}{4}$ in. major diameter to $\frac{3}{8}$ in. propeller shaft diameter gives the strongest possible insurance against crash damage, but lacking actual experience as to how the "40" stands up under really rough treatment we can hardly comment further on this point. Certainly the rest of the engine is really rugged and strong—without being excessively heavy—and seemingly capable of outlasting several airframes.

The crankcase unit is the "Rocket 35" silicon-aluminium die casting in light alloy with the crankcase and bore machined out. Transfer passage is cast in. Duplicated lugs on the front face of the crankcase emphasise that this design of casting is also utilised in further designs with detachable front unit, as for example the square intake, needle bearing Combat Specials.



The cylinder liner is of leaded steel, unhardened, and conventional in form. Exhaust ports are cut through the walls over a full 180 degrees, with a small bar providing support at mid length—i.e. two separate ports are cut leaving this supporting piece in the liner wall. Depth of these ports is $3/16$ in. The single transfer port, whilst not so wide, looks enormous by comparison, having a depth of $5/16$ in. The top of the transfer almost completely overlaps the exhaust.

Liner overall diameter is only .874 in. for a bore diameter of .800 in., which means that the walls are very thin. However, the fit in the crankcase unit is quite tight, so presumably it is reasonably well supported by the casting. It is located on a flange on top of the liner, clamped in position by six screws through the head. The head is a rather heavy die casting in aluminium alloy. Presumably the large volume of metal in the head and the small effective area of finning on the crankcase unit—rather more decorative than effective as cooling fins—contribute to the high cylinder temperature achieved when running.

Piston is of meehanite, machined to quite a thin walled section and is light for size. A flat plate deflector is formed on the top. Gudgeon pin is small—.155 in. diameter—is a floating fit and is hollow with brass eyelet type end pads. To remove the piston it is necessary to withdraw the gudgeon pin through a hole in the back of the cylinder jacket casting as it cannot be reached in any other way. A tight fitting liner is thus necessary in order to ensure that there is no gas leakage through this hole.

Connecting rod is machined from 24 ST aluminium alloy and then tumbled to finish, giving a matt appearance. Big end diameter is .2165 in., both big and little end bearings being plain. The bottom of the connecting rod only just has clearance in the bottom of the crankcase and had, in fact, been reworked to achieve clearance.

Unusual for an American engine, the cylinder liner appeared to have been finished by internal grinding. Certainly the chamfer relief at the bottom of the cylinder had been ground and with a set-up to do this it would appear only logical to grind the bore as well. The appearance of the bore after running was too rough to determine the original finish. Normal practice with Fox

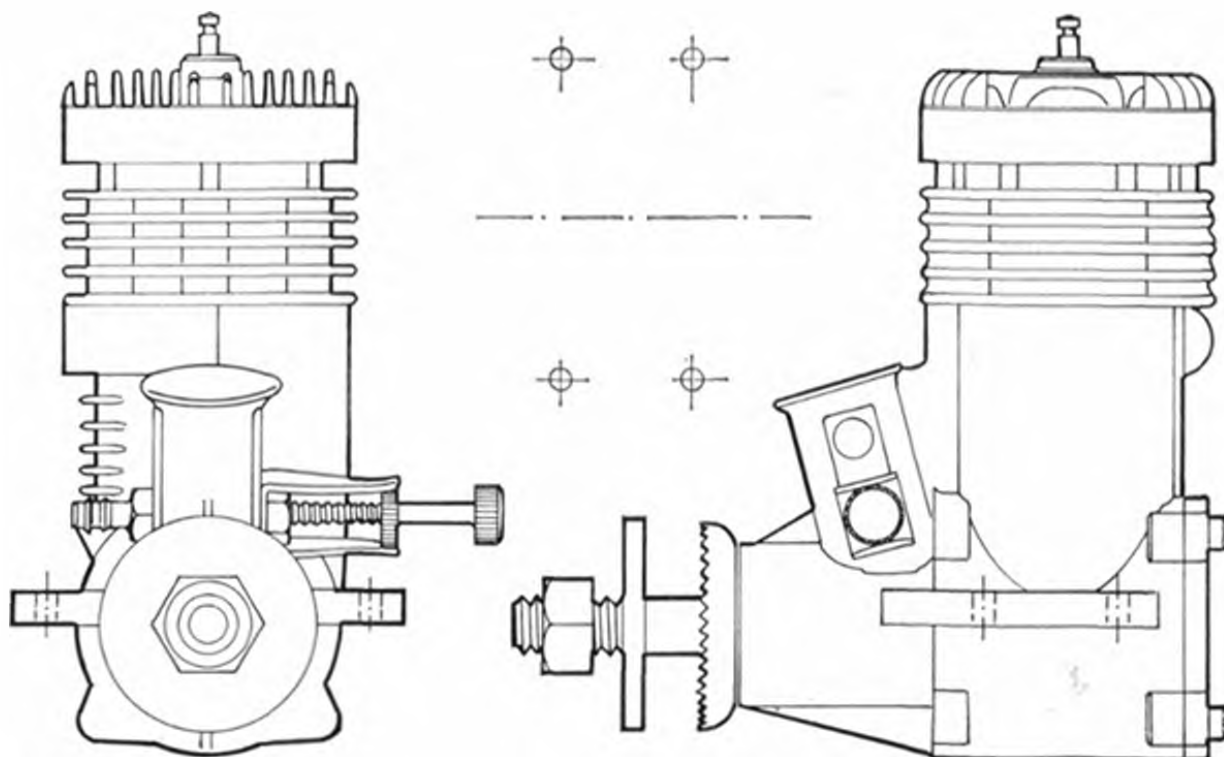
engines is to employ cross-hatch honing which does give a roughish appearance—an optical illusion, in fact, as far as judging the actual surface finish because of the nature of the marks made by the stones. In this case, however, we would not class the fit or finish as good, even after considerable running time, mainly because there appeared to be non-circularity either on the piston or liner bore. Possibly the liner is a little on the thin side and does warp or distort. Nevertheless the power output of the "40" was too high to suspect much loss through excessive friction in the piston-cylinder assembly, nor were there any signs of undue wear which would shorten the life of the motor.

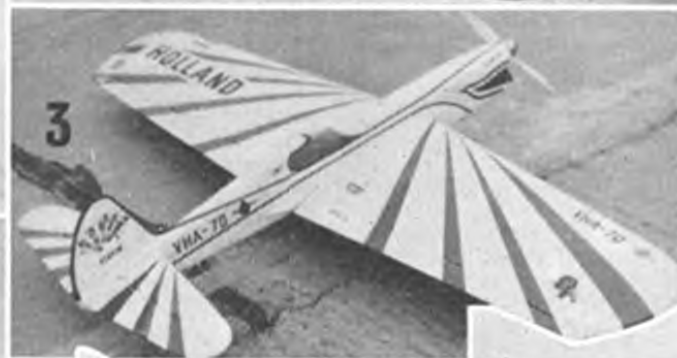
The back cover is a light alloy pressure die casting, attaching with four screws in the conventional manner and sealing on a gasket. The centre of the cover has a stud extension which could be drilled and tapped if required, to form a pressure feed port.

A turned venturi insert is fitted as standard in the choke tube, located by the spraybar. The spraybar is of brass with a steel needle, externally threaded.

Summarising, a sound, rugged engine with excellent starting and handling characteristics. Torque is well maintained up to 14,000 r.p.m., giving the "40" exceptional pulling power for a glow motor with peak power realised at 14,000 r.p.m. It should be an excellent choice for control line stunt and combat work with the larger sizes of models. The Fox R/C 40 (illustrated opposite) has a combined throttle and spraybar plus exhaust slide valve. Bradshaw Model Products loaned us this example from their new stock and it exhibits several minor changes.

PROPELLER—R.P.M. FIGURES		Displacement: 6.495 c.c. (.3961 cu.in.)
dia x pitch	r.p.m.	
11 x 4 Top Flite	10,500	Bore: .800 in.
10 x 6 Top Flite	11,900	Stroke: .788 in.
10 x $3\frac{1}{2}$ Top Flite	13,400	Bore/stroke ratio: 1.015
9 x 7 Top Flite	11,800	Base weight: 78 ozs.
9 x 6 Top Flite	12,800	Max. Power: .595
9 x 7 Keilkraft nylon	11,800	B.H.P. at 14,000
9 x 6 Keilkraft nylon	12,000	r.p.m.
9 x 4 Keilkraft nylon	15,800	Max. torque: 47 ozs.—
9 x 6 Frog nylon	14,000	inches at 11,500 r.p.m.
10 x 6 Frog nylon	11,700	Power rating .0915
11 x 4 Tornado nylon	11,200	B.H.P. per c.c.
11 x 6 Tornado nylon	9,000	Power/weight ratio:
		.078 B.H.P. per oz.





1. Toth and single cable speed winner, with Moki S-2 engine. 2. Grondal's elegant new stunt winner. 3. Sexbom on fin does not disguise a "lark" by van Dorp of Holland. 4. One of several fast Spanish delta's. 5. Winners at last—Bjork and Rosnlund with Miss F.A.I. 6. Ken Long's fast, and fated racer. 7. Azor's 3rd placer was a lonely 2-wheeler. 8. Fastest on 2 lines, Kriasma with Moki S-2. 9. Magnificent racer by Czech's Drazek and Trnka.



XIth Criterium of Aces

Genk, September 15/17

MAGNIFICENT! ANY OTHER expression would do less than justice to this most successful of all the Belgian organised control-line Internationals. We would even venture to suggest that in due course, the name of Genk will be associated with World Championships and Criteriums with the same revered appreciation as enjoyed by Cranfield in the free flight classes. For this we must thank the initiative and enterprise of the F.P.A.B. and in particular Rene Conina, secretary of the *Limburgse Vleugels*. Through him, the four superb concrete circles, central control point, and all the attendant needs of accommodation and catering at the nearby miner's hostel became reality. Seventeen nations were represented in the contests, eight nationalities administered in Jury duty and though small incidentals need smoothing for the next time, we can report that all the effort made by the executive of the F.P.A.B. was more than rewarded by the most favourable impression given to the many visitors.

All the grand spirit of rivalry and fervent enthusiasm which was so characteristic of the tarmac Eitterbeek circles at Brussels was transferred in full to the concrete of Genk.

In Team Racing, the first speculation was of a U.S.S.R. finalist. One model was timed repeatedly at 103 m.p.h. for over 40 laps; but obviously being whipped up to speed. None of the British models could match the airspeeds of either the Czechs, Drazek Trnka, or the Swedes, Bjork Rosenlund but until lady luck intervened, the Davy Long and Nixon Ellis models had reliability and range. Then came misfortune and Nixon lost his long ranger through a practice line tangle and in the very first heat, Long lost a wing in a mid-air collision when certain for a 4:50 time. Dick Edmonds was persevering with a malfunctioning tank, changing engines galore, but all to no avail (although he did strain out a 60 lap run on the last flight which surprised him as much as the opposition). By all rights, Long deserved a place in the final. His reserve (Nationals, and many a Gala winner) *Tigress* was well on its way to easy qualification when too fast a pit stop tore the wing off that one too! There was also a good case for Czech Drazek's model joining the final instead of Hungarian Azor's as the latter had been allowed a re-run which was disputed. But to be perfectly fair one could say that all the first 5 in the results, *plus* Long deserved a chance to win the final though none could really hope to eclipse the beautiful teamwork of Kjell Rosenlund and Nils Bjork with *Miss F.A.I. Mk V*. They came with a new model, hurriedly constructed after exams, and 3 Olivers. In practice all 3 engines lost form due to dust ingestion. Appealing to his fellow countrymen in Combat, Kjell was given the choice of a further three after the combaters had selected their best 3 and with this "reject" he proceeded to prove by way of 4:47, 4:47 and then 4:40 in the final that streamlining pays, making a good model fly fast on a wide range of settings—for Kjell would be the first to admit that his needle was off peak position in each of the heats.

Fabio Contini and his brother Marco were very unlucky with their chrome lined Super Tigre G.20 diesel racer which was as fast as the leaders. A Russian model all but flew right through the Italian entry when well in the lead and reduced it to pieces that were beyond repair, which was far more than a pity. More "drama" came just before the final when the Belgian team of Leloup and Lecuyer discovered engine trouble which they had experienced in their 2nd heat, was due to a bent con-rod. With only minutes to spare, they made a quick change, ran-in the bearings with metal polish and provided excellent competition for the Swedes and Hungarians.

Incidentally one must comment on the way in which Criterium finals always seem to end up with these same 3 Nations (except when G.B. manages to qualify!)

To summarise one's lessons of this two day racing session, first impression is obviously one of admiration for the consistency of the winners who have at last achieved the actual, as well as moral victory after three years of superb demonstration. Next impression is that of effective streamlining and its importance, for example the *Miss F.A.I.* wheel is only 4 mm. thick at the hub and 2 mm. at the "tyre". Then

OPPOSITE. 10. Herber with maroon and white 3rd place stunter uses MVVS 5.6 c.c. 11. New trend in fuel proof super finishes is Polyester, Italian Ricci had the finest surface of all on grey Super Tigre model. 12. Outstanding effect of Hsiner's Lockheed WV-2 which was started on all 4 Webra's within a minute, was lost as he failed to produce scale drawings for checking. 13. Juri Sirotkin and his deep bellied 1961 design, pristine white with pale blue trim, MVVS 5.6 engine and large flap movement. HEADING. Shows the four magnificent circles with central control point, tents in foreground, smaller car track and Aero Club hangar in background. Darker areas are green turf. *Luchtfoto-Trekair*, Genk taken during early practice with 4 circles in use.



the prevalence of one-stop models (Leloup, Edmonds, Nixon etc.) and finally the real challenge of the U.S.S.R. models which will be even greater at next year's World Champs.

There were 14 entries in Combat and without doubt, the Germany versus G. Britain finish in the semi finals was a highlight of the meeting. Fully supported by the Kenton and Northwood clubsters—in natty pink as usual, the *Razor Blade* fliers Tribe and Perry carved their way through what became known as the battle of Genk in most impressive determination. In the 1st semi, Perry got away first and took three cuts off R. Kellner's *Zack-Zack* streamer within two laps. They tangled and Perry was first away again to keep his trailer "clean" until the signal to ditch. (Rules called for a limit to flight time, and it became common practice to simply put the model straight into the concrete or grass surround). In the 2nd semi, Tribe was first off; but P. Schonepe clipped him and then in retaliation, Tribe snipped the very end off the German's streamer after which the lot fell off! Officials signalled to stop attacking and finally gave Tribe the win for 3 secs air time advantage. There was no argument, particularly as the *Razor Blade* was faster with a streamer than the *Zack-Zack* without. Then in the all-British final, Tribe was first off but Perry cut him twice on the same early lap, went after the remaining 9 in. and took 8 in. of it. Tribe took one cut, then they tangled and restarted after swapping handles and thoroughly confused everyone as to who was flying which!

Inauguration of an International Scale contest was bound not to be a rousing success but we expected more than 7 entries, the most attractive of which was really ineligible as the entrant could not provide scale drawings! Any of the top twelve at our Nats would have comped home. One wonders why the S.M.A.E. failed to persuade anyone to make the trip. Perhaps those who qualify will consider the personal expense of a week-end across the channel worthwhile for the next meeting. Cesare Milani, who went to judge and took along his *Asvaldo SPA.4*, provided the insight our Continental friends need for scale modelling, and his workmanship has literally shocked them. A nice touch was that the winning *Chippmunk* could be seen in same full-size decor on the adjoining airfield.

This was the first International to employ the standard fuel rule for Speed. It also saw the first use of "behind the handle" single cable control, and several new engines, including the plain piston Moki S-2, latest MVVS, the Fred Carter CCS and a lonesome Cox TD among a phalanx of Super Tigres. Among the diesels was Coupre's *Micron* from France which was going well until he failed to engage the pylon

Continued overleaf

C.I. AEROBATICS

		FAI(1)	FAI(2)	AMA	Totals
1.	Grondal — Belgium	962	1086	1029	2115
2.	Sirotkin — U.S.S.R.	986	976	1111	2073
3.	Herber — Czechoslovakia ...	1024	1074	1008	2082
4.	Seeger — Germany ...	922	950	1064	2054
5.	Kroh ... — Germany	906	987	1021	2008
6.	Barjos ... — Czechoslovakia ...	861	1010	971	1981
7.	Hedinger — Switzerland	980	988	988	1976
8.	Gabris ... — Czechoslovakia ...	850	961	997	1958
9.	Kondratenko ... — U.S.S.R.	862	1032	918	1950
10.	Tegvary — Hungary	915	899	1009	1944
11.	Souliac ... — France ...	877	984	931	1915
12.	Compostella ... — Italy	961	967	919	1886
13.	Scherbakov — U.S.S.R.	685	962	913	1875
14.	Warburton — G.B.	855	931	929	1840
15.	Doering — Germany	753	930	910	1840
16.	Deville — Belgium	816	917	903	1820
17.	Koelwein — Holland	790	981	828	1809
18.	Cappuyns — Belgium	834	891	911	1804
19.	Richter ... — Austria ...	752	861	836	1697
20.	Van Dorp — Holland	775	910	93	1003

18 others did not qualify for 3rd flight including D. Day (26th) 775,818

XIth Criterium of Aces continued

and a subsequent wingover splattered places all over the concrete. Paul Bugl of Austria also had one of his own drossels but failed to get in a time, otherwise it was all glomping and the majority of entrants chose the 25 per cent. oil mixture. Those who hoped for new enthusiasts after the fuel handicap imposition were heartened by Swede Mans Hagberg's lead over Peter Wright, Toth and Prati all on 2 lines after the 1st round but the change to single cable by the Czechs, Sladky and Pech, as well as Imre Toth decided the result easily. The drag reduction of the single line has such advantage that it is a marvel that so many ignore it. Toth was extraordinarily lucky on his fastest flight, for the mechanism jammed and he was obliged to take the line and finish the flight in a manner of control first introduced by the Stanzel *G-line* twenty one years back! Protesta over his handle and implication that he whipped served only to blacken the sporting reputation of the Nation making complaint. Sladky and Pech also had control difficulties resulting in bent motors, and one was left with the thought that four "pros" in the clear lead have done little to substantiate the misguided opinion that standard fuel would give Joe Soap his chance in the World Champs, and we still have lots to learn about single cable control handles.

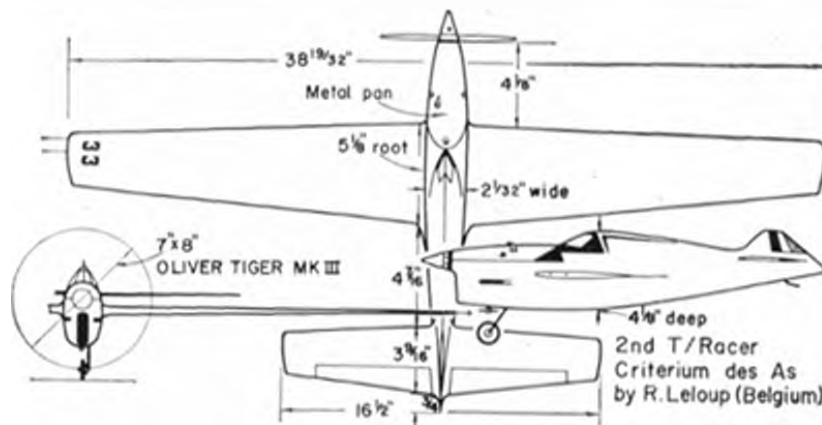
No-one ever agrees with the Stanzel judges, and naturally it is also rare for judges of five Nationalities to agree among themselves. We have a new points scheme and are saddled with the "discard" method of eliminating the more critical or flattering opinions, and there we must stick. But exactly how Jurij Sirotkin lost this contest will remain a mystery. On our scoring he made third best F.A.I. flight with 1052 pts. and best A.M.A. flight with 1136 pts. giving a total of 2188, which is 32 pts. more than we credit D. Kroh of Germany, who led the F.A.I. scoring (on our card) with a magnificent 1115. Third on our scores came the quiet and unassuming Louis Grondal who always seems to be in the thick of these disputes. But that is purely the writer's opinion and not meant in any way to remove the honour of victory. The truth of the matter is that the human element in judging will never provide a result to satisfy everybody! As in team racing, the top five were all in a class of their own, with Michel Souillac of France equal to them in F.A.I. only. Some entries were not of the standard we expect at the Criterium, and even some of the accepted best were sadly affected by wind. Grondal was lucky to have pal Deville stand down for an evening flight in calm. Highlights among those who made near perfect manoeuvres were Soderberg's double wingover, (one of the few who could do this well) Kroh's triangles and cloverleaf, Compostella's overhead 8's, Herber's loops (best ever seen) and vertical 8, all Sirotkin's triangular and square manoeuvres, Seeger's cloverleaf, Warburton's triangles, Hedinger's horizontal 8's and Grondal's outside loops. But one good manoeuvre does not make a flight! Sirotkin needs to improve his vertical 8's and inverted flight, Kroh his outside loops and Grondal to equalise the size of all his eights and make them symmetrical before they approach perfection.

Designwise it was a *Nobler* year though greatest influence on the o'd models stemmed from Steve Wooley's *Argus*. Sirotkin used Wooley's flap shape and had a very low geared control that took some getting used to when Dave Day and Louis Grondal were giving "Moscow 1961" the works after the comp. Dave was most impressed, and we fancy that Sirotkin was equally impressed by Grondal's model too by the way he was putting it through the squares. Next year's World Champs is going to be a real ding-dong battle to see who can stop Grondal's succession of wins, three in a row now, and each of them against tough competition.

What a credit to Belgium are these successes, both in the contests and in the administration of memorable control line Internationals—congratulations F.P.A.B.!

FLYING SCALE

		Scale	Flight	Total
1. Huybrechts ...	Belgium (Chipmunk)	67	81	148
2. Groot ...	Holland (Thunderb.)	56	88	144
3. Engels ...	Belgium (Ju 87)	47	81	128
4. Heinen, P. ...	Germany (Bv 141)	35	56	91
5. Labordery ...	Belgium (Spitfire)	18	55	73



SPEED

		Speed in K.P.H.		
1. Toth ...	Hungary	181.82	202.25	200
2. Pock ...	Czechoslovakia	179.10	195.65	201.12
3. Krizma ...	Hungary	180	0	193.55
4. Prati ...	Italy	181.82	138.46	189.47
5. Hagberg ...	Sweden	183.67	177.34	0
6. Wright ...	G.B.	172.25	181.82	176.47
7. Grandesso ...	Italy	0	180.90	178.22
8. Sladky ...	Czechoslovakia	180.90	0	0
9. Gogorcena ...	Spain	175.61	172.25	180
10. Romeyer ...	France	0	175.61	180
11. Katona ...	Hungary	0	180	0
12. Gorziza ...	Germany	0	175.61	178.22
13. Riecl ...	Italy	171.43	176.47	0
14. Bjork ...	Sweden	0	175.61	171.43
15. Copeman ...	G.B.	0	175.61	171.43
16. Giro ...	Spain	168.22	0	174.76
17. Battlo ...	Spain	174.76	161.43	0
18. Ziegler ...	Germany	171.43	169.81	169.81
19. Batcher ...	G.B.	171.43	167.44	167.44
20. Bulg ...	Austria	0	0	168.22
21. Frolich ...	Germany	0	135.85	163.64
22. Kiehlberg ...	Sweden	162.90	0	148.76
23. Hic ...	France	0	0	156.52
24. Jenatton ...	Switzerland 1	0	0	153.19
25. Studer ...	Switzerland	139.53	144.58	152.54
26. Freundt ...	Austria	124.14	151.90	135.85
27. Couprle ...	France	0	133.83	145.75
28. Gafner ...	Switzerland	0	145.16	144
29. Cappuyts ...	Belgium	0	0	136.88

Six others did not complete a speed run.

TEAM RACING

		1	2	Final
1. Rosenlund/Bjork ...	Sweden	4:47	4:47	4:40
2. Leloup/Locuyer ...	Belgium	4:55	—	5:06
3. Azor/Kuhn ...	Hungary	5:15	4:50	5:15
4. Drizek/Trnka ...	Czechoslovakia	4:58	5:23	—
5. Malik/Robler ...	Germany	—	5:00	—
6. Pierree/Grondal ...	Belgium	5:13	5:25	—
7. Magne/Malfait ...	France	5:16	6:09	—
8. Egervary/Toth ...	Hungary	6:41	5:17	—
9. Schluchter/Fromm ...	Germany	5:18	5:31	—
10. Scherbakov/Gelman ...	U.S.S.R.	—	5:20	—
11. Saxer/Hedinger ...	Switzerland	5:23	6:00	—
12. Koponenko/Chkursi ...	U.S.S.R.	6:28	5:25	—
13. Gafner, N. Gafner, Ch. ...	Switzerland	5:27	6:10	—
14. Anderson Bjornwall ...	Sweden	5:58	5:28	—
15. Nixon/Ellis ...	G.B.	5:28	—	—
16. Edmonds/Taylor ...	G.B.	5:36	5:32	—
17. Fernandez/Battlo ...	Spain	6:15	5:32	—
18. Pennosi/Zana ...	Italy	7:56	5:33	—
19. Raschnov/Stoil ...	Bulgaria	5:50	5:36	—
20. Schnotrebner/Remzen ...	Germany	6:05	5:36	—
21. Fischer/Neuburger ...	Austria	—	5:37	—
22. Mattelassi/Mattelassi ...	Italy	7:55	5:40	—
23. Gogorcena/Gil ...	Spain	5:45	7:14	—
24. Nordin/Sadlerberg ...	Sweden	5:55	5:56	—
25. Vogelmar/Gelman ...	Holland	5:58	6:12	—
26. De Hoge/Frouwhein ...	Holland	—	5:58	—
27. Katona/Gombotz ...	Hungary	6:38	6:12	—
28. Lauron/Romeyer ...	France	6:04	8:06	—
29. Vlaytchev/Topalov ...	Bulgaria	6:25	6:16	—
30. Puchinger/Heldner ...	Austria	6:24	—	—
31. Cappuyts/Proesmans ...	Belgium	6:43	—	—
32. Paonov/Nevenkine ...	Bulgaria	—	7:53	—
33. Baria/Bartoli ...	Monaco	—	8:10	—
34. Carmo/Piccolo ...	Portugal	—	8:20	—

Eight others did not complete a heat.

COMBAT RESULTS
FINAL SEMI-FINALISTS

1. Perry, P. (G.B.)	3. Schoppe, P. (Ger.)
2. Triba, P. (G.B.)	4. Kellner, R. (Ger.)

QUARTER-FINALISTS

Bjornwall, E. (Sweden)
Haeneballe, G. (Belgium)
Benoy, J. (G.B.)
Trnka, Y. (Czechoslovakia)

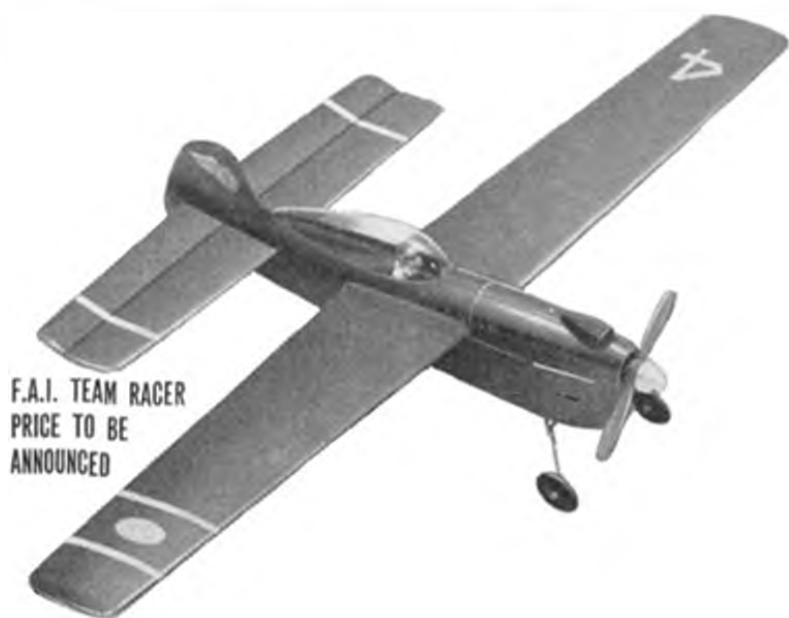
Six others eliminated.

CRITERIUM POINTS

1. Czechoslovakia ...	8 points
2. Hungary ...	9 points
3. Belgium ...	14 points
4. Sweden ...	15 points
5. Germany ...	16 points
6. France ...	18 points
7. Italy ...	20 points
8. Switzerland ...	21 points
Great Britain ...	21 points
10. Spain ...	26 points
11. Austria ...	29 points



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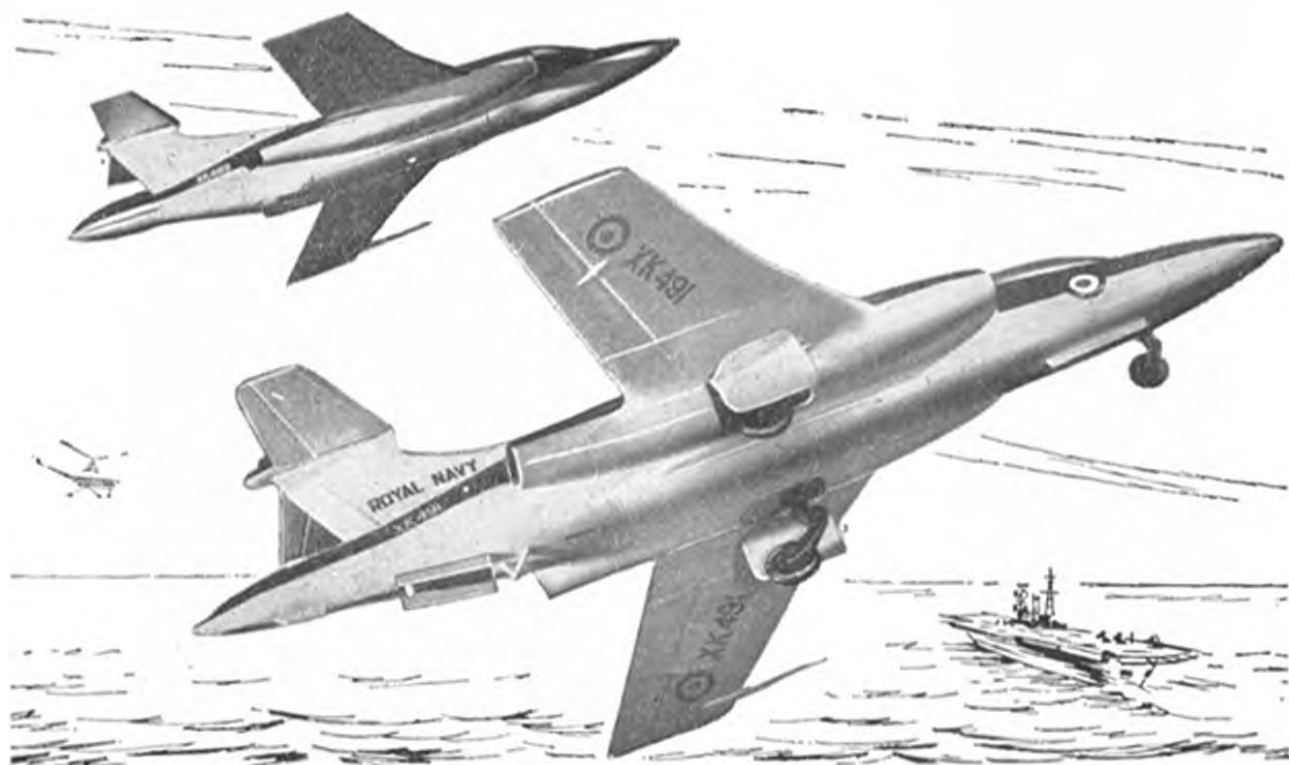


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Also New: Austin-Healey "Sprite", the second in the new Modern Car series.

—52 part kit ... 2/-

INTRODUCTION OF THE all-plastic ready to fly control-line model has taken most of the bugs out of learning to fly a model on lines; but for many novices, there are mysteries to unravel that even the best prepared instruction manual cannot anticipate. We've heard of so many "faults" that turned out to be operator's errors that we decided to see for ourselves how a pair of less experienced modellers would fare.

We used the Cox Thimble Drome PT-19. It is powered by a Cox Babe Bee, and due to clever rubber band assembly; engine, wing and tailplane can come off in a crash to avoid damage. Cox provides ample instructions on operation of the model and yet after a quarter of an hour both "modellers" were quite prepared to condemn the PT-19 as "useless"! What had happened? Why didn't the Babe Bee produce so much as even one "pop"? The elementary answer comes in one word. IGNITION. They had the correct voltage battery (1.5 volts) of adequate capacity (Ever Ready Flag Cell, or ADI) and a recommended quick glow clip to connect to the plug. But the arm touching the centre electrode on the plug *also* contacted the body so there was a direct short circuit and hence no glow ignition! Here's how to check the engine for correct operation, using the right battery and connection clip.

First fill the tank with the *correct fuel*. In this case we were able to use the newly imported American Thimble Drome fuel which is ideal for Cox engines. Close the needle valve. Next, inject a small amount of fuel in the upper cylinder. This is called a *prime*. Then flick the engine over by hand to see that it is free and to distribute the prime. Now connect the battery. Use *no more than 1.5 volts* and be sure that the two clip parts touch the centre electrode and aluminium body only. If attached to the black part of the cylinder it may not conduct the current, due to insulation.

With the plug energised by 1.5v, it will glow brightly and reflection of the glow should be seen in the excess prime fuel on the piston crown. If the plug is too wet, it will hiss as the fuel is burned off. Flick the propeller smartly in an anti-clockwise direction and it should fire and prove that ignition is O.K. If not, try again. If still no joy, prime again and then if not successful, thoroughly check the plug connections. It is **NOT NECESSARY** to remove a plug for checking. If the battery is good and the connections are satisfactory a reflection of a

Ready to fly?

Hints for the novice about to enjoy one of the new plastic models

With all-moving tailplane, the PT-19 is a lively model, virtually crashproof due to rubber band assembly. Pics below illustrate clever multi-thrust setting adjustment for training, on bulkhead and rubber band which holds fin, and tail bearing, being checked. Use tight bands!!

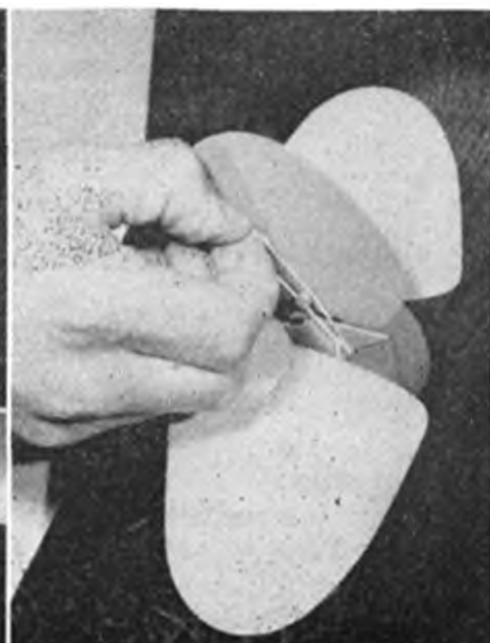
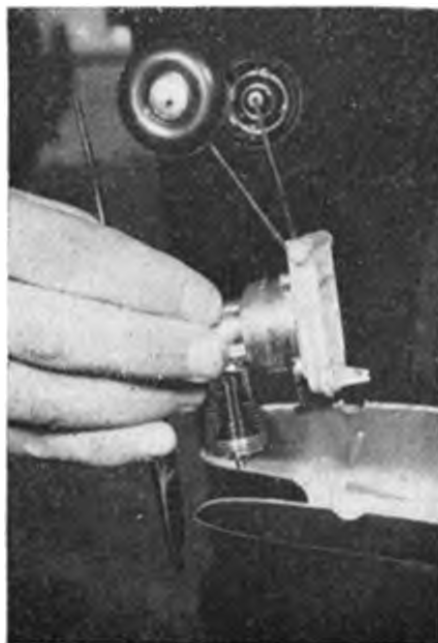


serviceable plug can be seen on the piston. If there is no glow, then we have the unlikely possibilities of (a) exhausted battery or one of insufficient capacity, (b) broken wire to clip, (c) Clip connections short circuiting centre pin to body on one of its two insulated arms, (d) Clip not conducting 1.5v, check with a spare plug or bulb, (e) Plug blown through use of excess voltage.

Having checked and found that ignition is satisfactory by the response of a short burst of power after the initial prime, we are now ready to start. Open the needle valve control 4 turns. Place a finger on the intake in the mounting bulkhead and rotate the prop 3 times. This is called a *choke*. Re-connect the battery to the plug after a small prime in the upper cylinder, engage

the spring starter, turn prop clockwise once and *no more*, release smartly and presto!—the Cox should, by all that is right in our experience, run the fuel tank dry. Disconnect the plug clip soon after starting.

Points to note are:—Inverted engines start better with the model held on its side to prevent plug fouling. Low grade fuels need longer warming period with the plug connected and give less r.p.m. The engine should only be dismantled if absolutely essential and then only with a proper wrench provided by the manufacturer. The engine is "reed valve" type and will run in either direction—be sure it is slipstreaming backwards, and rot forwards before you attempt to fly! Always inject 3 in 1 machine oil to preserve the engine and prevent "gumming up" after use.



1/12th scale SOPWITH TABLOID free flight for

SIMPLICITY WAS THE hallmark of Sopwith aeroplanes, and many of them, including the diminutive Tabloid, make ideal subjects for flying scale. Ken McDonough's model prototype has completed several seasons of successful flying and has a performance comparable to a sports model. Flying speed is realistically low and the glide particularly flat due to the corrective action of the pendulum operated elevators. The degree of realism of the model in flight can be judged by the very true-to-scale appearance in photographs on these pages.

Construction will present no difficulties to the average modeller. Really hard balsa should be used for the longerons and wing spars. Build the fuselage side frames on the plan and cement the hardwood engine bearers securely. Join sides together with formers A and B, then fit $\frac{1}{8}$ in. ply mounting plate to bearers with four counter-sunk screws. Cement well before screwing mounting plate to bearers. The fuselage may now be completed. Before covering top of fuselage with 1/16 in. sheet, bind and cement centre section struts in place, and fit wing runners and spreaders which should be bound with fuse wire and well soldered. Install pendulum assembly before adding bottom crosspieces of fuselage at tail.

Tailplane and elevators should now be constructed.

Elevators being temporarily hinged and connected to pendulum gear to ensure free movement. Pendulum should be vertical with neutral elevators. The pendulum weight should be just sufficient to give a positive elevator movement. The fin is constructed on $\frac{1}{8}$ in. diameter dowel which plugs into a rolled paper tube cemented in front of fuselage stempost.

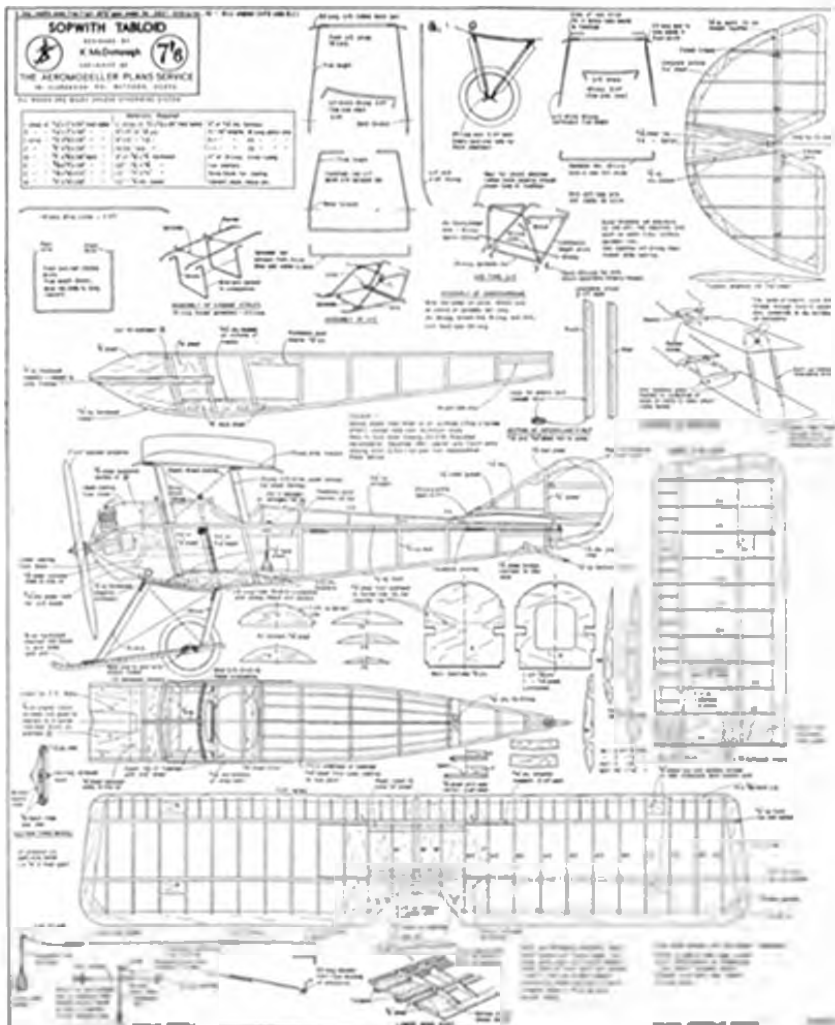
Upper wings are first constructed as a single unit and paper tubes cemented in centre section to tube wing dowels. When upper wings are complete they are separated along the centre line and are connected by the dowels. The prototype model was designed to break down into a number of small components for ease of transport. A model will last much longer if carefully stored away after flying, but it is left to the individual builder to decide how much of his model can be dismantled for transport purposes. Upper wings are attached with rubber bands to wing runners. Lower wings are in two halves plugging into fuselage with hardwood tongues and slots in fuselage. Really hard balsa must be used for spars. Lower wings are connected to upper wings with elastic cord passing through built up hollow interplane struts.

Particular care should be taken when soldering the

undercarriage. Hardwood skids are bound and cemented to undercarriage with silk tape. The wheels are built up on 1/16 in. ply discs, hard balsa being used for the tyres. The model flies very well with an E.D. Baby but a D.C. Dart or Cox .020 may be substituted if extra power is desired. $\frac{1}{8}$ in. ply wedges should be fitted under the lugs to give the downthrust angle shown on the plan. At least five degrees of right sidethrust should also be incorporated. Upper cowling is of balsa block, clipping to fuselage with 4, 20 S.W.G. spring clips. Give at least three coats of cellulose or fuel proofer to all exposed wood parts near engine. Two holes cut in lower cowling (see cutaway drawing) will assist in dismantling engine and in drawing off surplus fuel waste.

Cover entire airframe with heavy-weight tissue and give two coats of clear dope followed by one of coloured. The correct finish for the Tabloid is a faded primrose shade to represent the natural fabric finish. Do not water spray the tail surfaces and dilute dope with 50 per cent. thinners for these components. The elevators should be finally sewn to tailplane with linen thread after covering. Leave covering of underside of fuselage until last in order to make final adjustments to pendulum control. Note the positive incidence on the tailplane. The elevators should also have a slight positive angle which can be adjusted by moving the pendulum forward in its bearers.

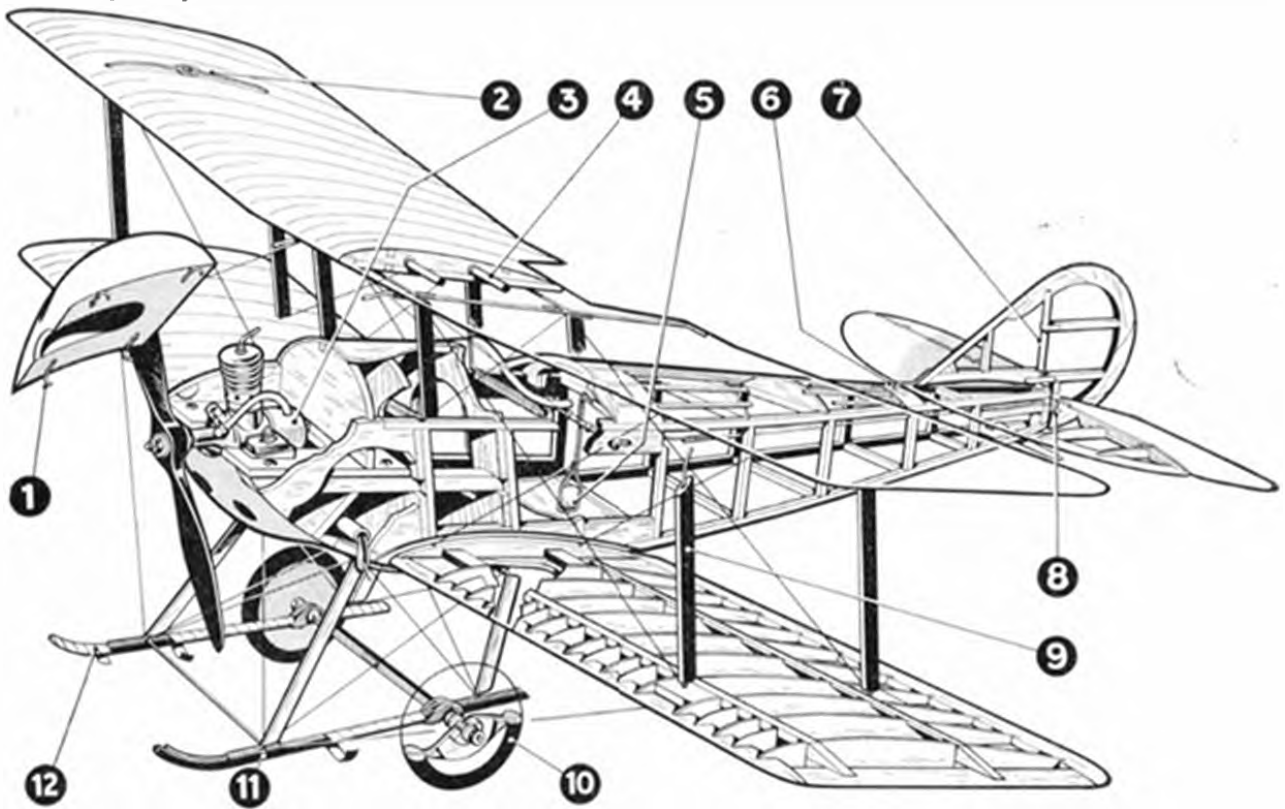
Test for glide over long grass then proceed with minimum power. Points



FULL SIZE COPIES OF THIS 1/12th SCALE REPRODUCTION ARE AVAILABLE PRICE 7/6 PLUS 6d. POST AS PLAN FSP210 FROM A.P.S.

5 C.C. by K. McDonough

to watch are correct engine thrust angles. The downthrust is essential. The elevators should be depressed when model is in flying position. As power is increased a certain amount of right rudder should be applied to keep the nose up on the turn which should always be to the left. The dihedral angle should not be less than 4 deg. allowing for a certain amount of sag in the assembled wing structure so it is advisable to incorporate at least 5 deg. when building the wings. Do not attempt to fly the model with an



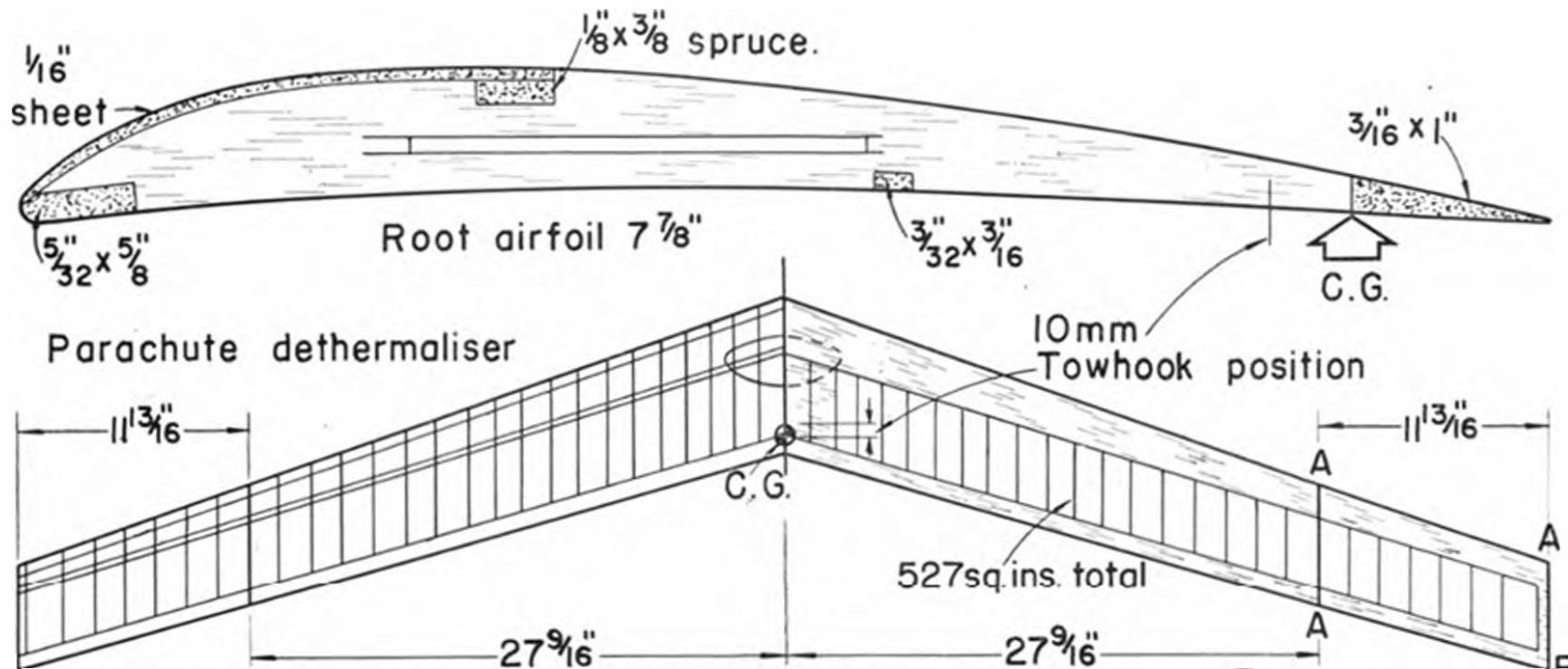
KEY TO DRAWING

(1) Solid block upper cowling attached by 4 x 20 s.w.g. wire clips. (2) Ends of elastic cord passing through struts, tied, and ends passed through thin card eyelid cemented to upper surface. (3) E.D. "Baby" or Allbon Dart. Note downthrust obtained by $\frac{1}{8}$ " ply wedges under lugs. (4) $\frac{1}{8}$ " diam. dowels connecting left and right upper planes. (5) Pendulum control for elevators. (6) Fin adjustment: 1 mm. ply quadrant on fuselage; 20 s.w.g. prong on fin. (7) $\frac{1}{8}$ " diam. dowel in paper tube in fuselage. (8) 20 s.w.g. control horn on elevator. (9) Built up hollow interplane strut. (10) Built up wheel on $\frac{1}{8}$ " ply disc. (11) $\frac{1}{8}$ " sq. skid; steam curve at front end. (12) Skid bound to 18 s.w.g. undercarriage with silk.

airscrew smaller than 7 in. x 4 in. A scale model is more controllable with a larger diameter airscrew.

Correctly trimmed the model will fly well in light wind.





4° dihedral

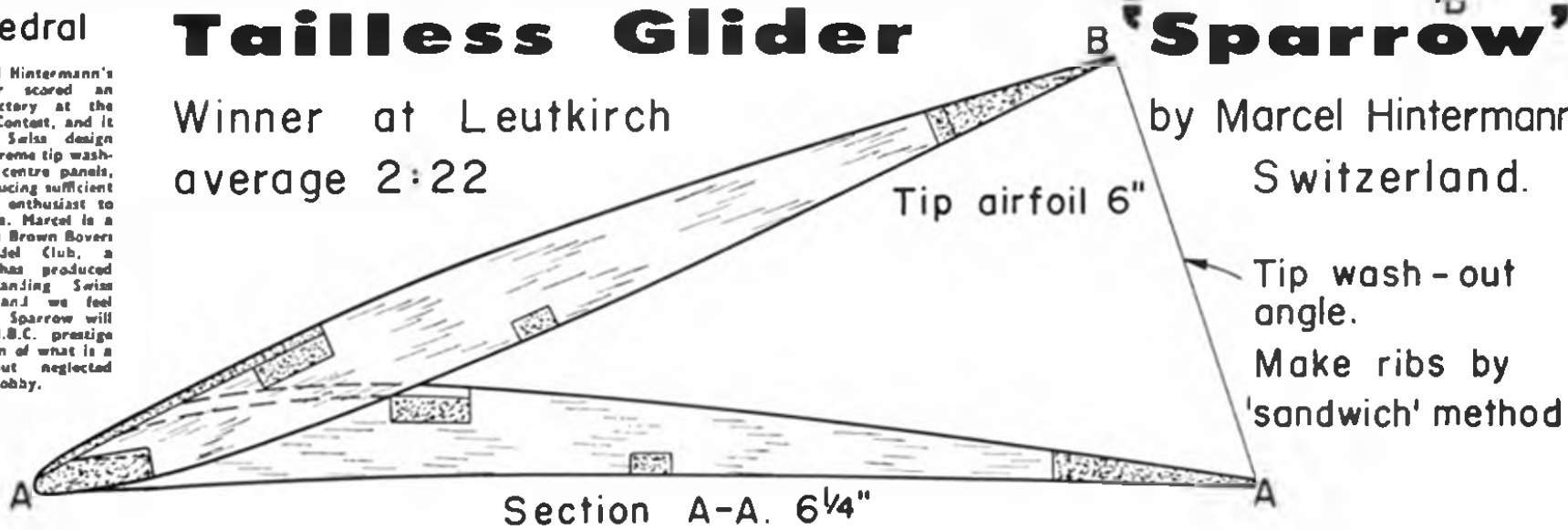
Tailless Glider

Winner at Leutkirch
average 2:22

'Sparrow'

by Marcel Hintermann
Switzerland.

Because Marcel Hintermann's tailless glider scored an impressive victory at the International Contest, and it displays the Swiss design trend with extreme tip wash-out and flat centre panels, we are reproducing sufficient detail for the enthusiast to build a replica. Marcel is a member of the Brown Boveri Company Model Club, a group that has produced several outstanding Swiss competitors, and we feel sure that the Sparrow will uphold the B.B.C. prestige with promotion of what is a fascinating but neglected side of the hobby.





TAILLESS International at Leutkirch

WHEREAS IT WAS the intention of the organisers to attract more interest in the flying wing class of model by combining the annual International events with the World Championships in Germany, it must be admitted that the contests completely lost their identity and were submerged within the confusion of the meeting.

With only 13 entered in glider, 3 each in rubber and power, the tailless models were looked upon more as novelties amid the glamour of their conventional equivalents. Power models flew like sportsters when so vividly contrasted with some of the overpowered rockets. Fea of Italy, with his amusing twirl of the rubber to stretch it and throw off excess lubricant and Laue of Germany each had impressive climbs though sometimes loop-happy. Only in glider was there something to match the A:2's, with Marcel Hintermann showing how a very simple approach can provide most satisfying results.

The United Arab Republic was to have been represented by three modellers from the Cairo aeromodelling institute; but a hitch prevented their departure.

Run on a separate day, or in conjunction with a meeting of less grandeur, the International tailless events could have derived greater interest. Maybe some of the Championship team members saw in it a challenge for improvement; but we doubt that, for one has little time for concurrent events when partaking in what is for most the ambition of a lifetime.

Above: Having distinction of 3rd place in all three classes, Mikulic holds his Aero 249 tractor wing which displayed acute downthrust. Top right: power winner Neuhauser of Germany used the more popular pusher approach on eng-box structure wing which had surface turbulator. Below title is glider winner with his Sparrow, drawn opposite. Has parachute dit on centre "fuselage". Sharp taper on Laue's rubber winner and huge prop which gave torque-antics more than once! Bottom, regular t'less performer, Wassenaar of Holland.



F.3 CLASS FLYING WING GLIDER

1. M. Hintermann ...	Switzerland	180	180	111	67	173	711
2. G. Zsilling ...	Germany	153	50	86	157	109	555
3. I. Mikulic ...	Yugoslavia	68	145	43	141	156	553
4. W. Gerlach ...	Germany	180	62	115	66	110	533
5. S. Heinig ...	Germany	180	31	126	105	85	527
6. J. Cedomir ...	Yugoslavia	82	180	55	110	74	501

TEAM RESULTS FLYING WING GLIDER

1. Germany ...	1615	3. Switzerland	1398
2. Yugoslavia ...	1471	4. Netherland	886

F.1b CLASS FLYING WING POWER

1. H. G. Neuhauser	Germany	97	69	110	46	54	376
2. W. Wassenaar	Netherland	67	84	40	53	128	372
3. E. Mikulic	Yugoslavia	60	62	50	51	45	268

F.1a CLASS FLYING WING RUBBER

1. H. H. Laue	Germany	87	131	56	98	105	477
2. G. Fea	Italy	97	90	74	108	98	467
3. E. Mikulic	Yugoslavia	43	71	40	52	44	250

Contest Gliders

- part eight by J. Baguley
- Lateral stability of a model glider
- and effect of side area and dihedral

DETERMINATION OF LATERAL stability is more complex than longitudinal stability, which we discussed in October issue. It is a problem which has a wide range of solution, and which can be easily rectified on the field if necessary.

A model circling on the glide will be subject to two sets of conditions as far as lateral stability is concerned. There will be those produced by normal circling flight

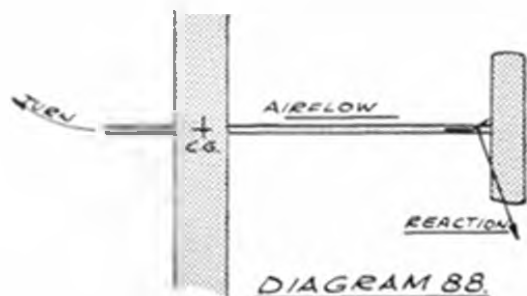


DIAGRAM 88

in calm and also those produced by the effect of gust disturbances. First, let us discuss the effect of a circling glide in calm air. When we apply any turning effect by means of an auto-rudder we will cause a disturbing turning moment which will have to be balanced out exactly to give equilibrium at a certain turning circle diameter.

Consider what happens when we force a model into a turn. The first effect is that the fin and auto rudder effectively constitute a crude undercambered section which will lift the rear end of the model over to one side to an angle of yaw. See Diagram 88.

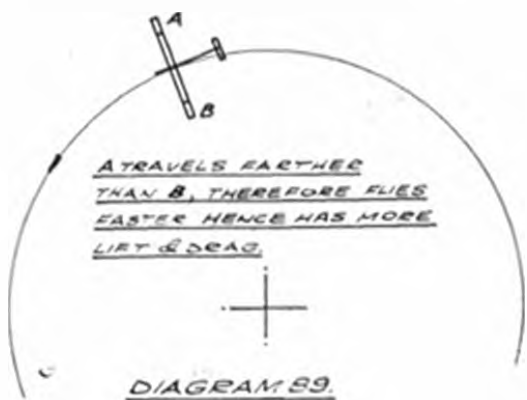


DIAGRAM 89

This will mean that the wing on the outside of the circle will travel faster than the inner wing and will consequently give more lift and drag than the inner wing. The drag will produce a turning moment which will tend to counteract the turning moment imposed by the auto rudder. See Diagram 89.

The extra lift will roll the model into the turn, also the C.G. will usually be below the wings and the effective centre of action, which will tend to throw the model outwards and roll it inwards. See Diagram 90.

The overriding factor which will maintain stability is the slight cross flow due to yaw inevitably present at the wings, which will increase lift and drag of the inner

dihedralled panel and have the reverse effect on the outer dihedralled panel due to the increased and decreased effective incidence.

The changes of lift will balance roll brought about by the outer panel travelling faster and the changes of drag will increase the turning effect. See Diagram 91. The overall result of this will usually be that the model will reach a state of equilibrium, circling with very slight inward bank (but not always) and with the airflow passing, as far as the model is concerned in a circular fashion around it as in Diagram 92.

Now the effect of the slight bank will be as explained by Frank Zaics "Circular Airflow" theory.

To explain this, imagine that a model achieves a 90 deg. bank circling; the "circular airflow" will then have the result of decreasing the wing incidence, and increasing the tailplane incidence slightly, as in Diagram 93. Hence it will tend to underelevate the model slightly if turn is added and overelevate it slightly if turn is

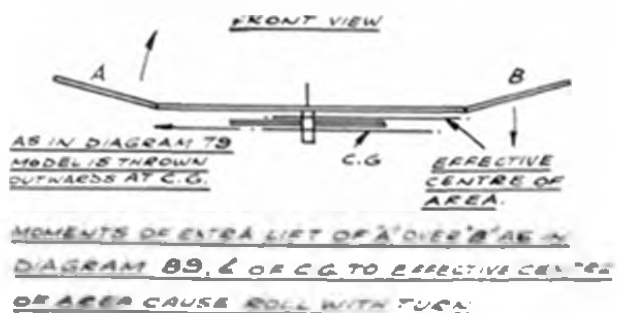


DIAGRAM 90

removed. This is well known in practise as most modellers tend to increase longitudinal dihedral slightly if they increase turn.

Now let us consider the effect of circling in gusts as applied to lateral stability. Diagram 94 (a) shows the change in velocity relative to the air as the gust strikes the model. The new velocity GB is found by adding vectorially the velocity increment GC relative to the gust, and the original velocity GA relative to the hitherto undisturbed air. Diagram 94 (b) shows the resultant velocity relative to the gust if it strikes the model at different parts of the circle. Once the model starts to respond to the new airspeed then of course its flight path is no longer a circle.

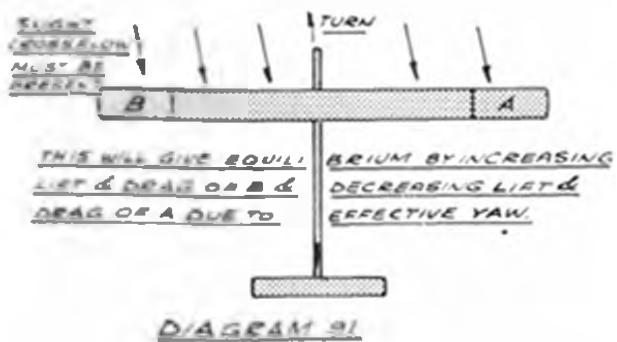
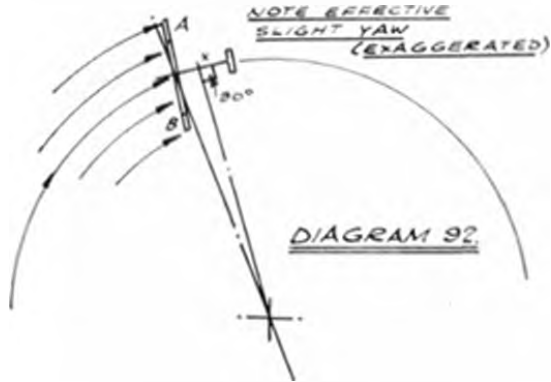
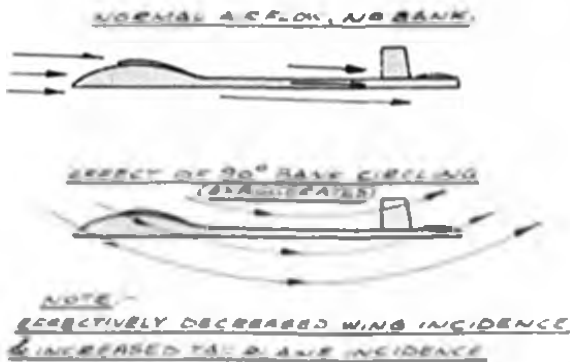


DIAGRAM 91

We can analyse the effect that side area in various places, and dihedral changes will have when considering both the effect of the sidewind component and the constant circular airflow. See *Diagram 95*. This shows the areas we will consider for side area *g, h* and *j* are at lengthwise position where the flow, when considering circular airflow only, is longitudinal. *Diagram 96* shows the circular airflow as it will effectively be imposed upon the model. *Diagram 97a* shows the effect of circling only. *Diagram 97b* shows the effect of sidewind only in positions *B, C* and *D* (of *Diagram 94*). *Diagram 97c* shows the effect of sidewind only in positions *F, G* and *H*.



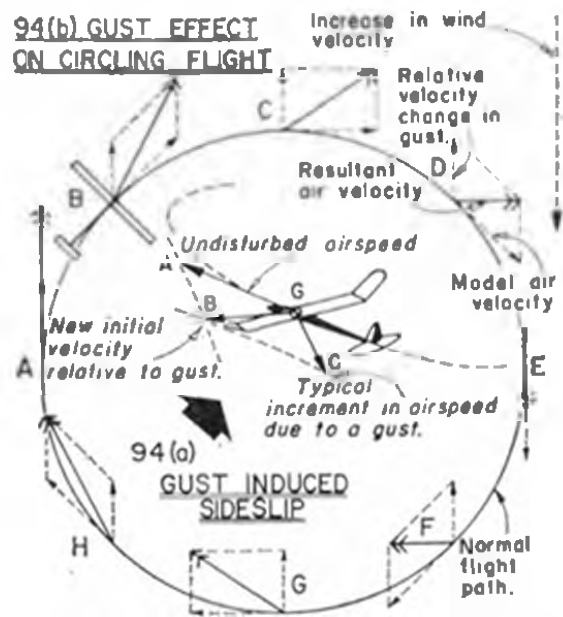
If the model is reasonably satisfactory in calm but not in wind, we can add side area above or below the C.G. to see which cures the tendency to spiral at certain points of the circle. A specially interesting effect is that concerning the auto-rudder where the increase of airspeed due to circling in wind, may cause the efficiency and relative effect to increase out of proportion. If the auto rudder is low this will give a rolling moment with turn which could develop a spiral if trim is marginally stable. If the auto-rudder is high, the roll will be against turn



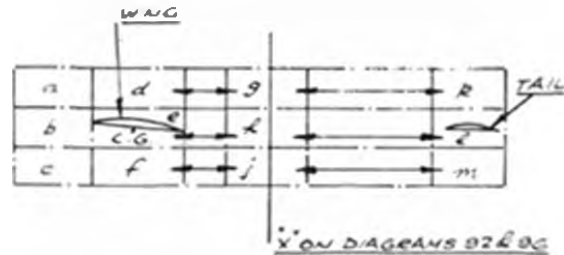
which will give an (admittedly small) tendency to straighten. The writer would rather have a model which tends to straighten and stall than one which tends to spiral in. See *Diagram 98*.

The roll effect can be analysed from *Diagram 97* by saying that if during the upwind turn, *A, B, C, D, E* in *Diagram 94* the model tends to spiral, in or sideslip then area low down should be increased, or high area decreased. If it happens during the downwind turn, *E, F, G, H, A* in *Diagram 94*, the area low down should be decreased or the high area increased. This assumes that the eye is practised enough to discern between roll and turn effect. It should be noted that fin

94(b) GUST EFFECT ON CIRCLING FLIGHT



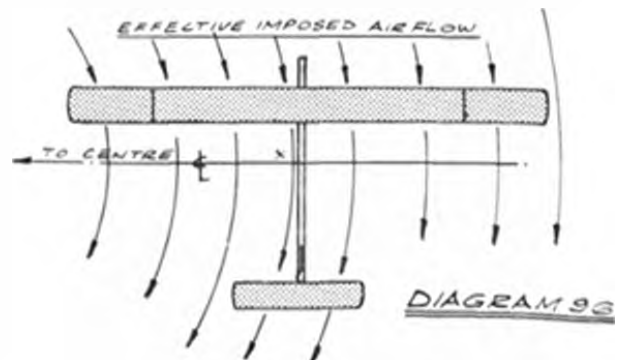
area low down is not necessarily bad as many think but low auto rudder area is. Also, auto-rudder area should not be too small or it may stall at lower speeds with the resulting large deflection needed and high sideflow and its effect may increase rapidly at higher speeds. As far as the amount of side area is concerned with respect to dihedral, if the side corrective forces from disturbances as a whole, are insufficient for the dihedral then a



tendency to oscillate in the form of dutch rolling will be noted. Also, if side area (fin area in particular) is too great, there will be a tendency towards divergence usually resulting in a spiral dive. The remedy here is only to use as much side area as is necessary.

Now consider the turn effect in conjunction with *Diagram 97*. If, for instance, fin area is far too great for the dihedral, it may not be possible even in seemingly still air to have a stable glide as even the slightest disturbance will upset the model. Similarly a lack of side area will also suffer.

The turn effect may be summarised here by saying that if during the upwind turn a tendency to spiral or increase turn is evident then there is excess frontal area or insufficient rear area. If there is an excessive tendency



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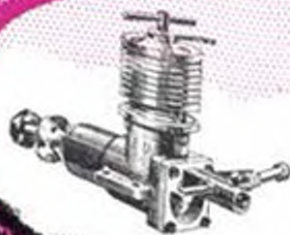
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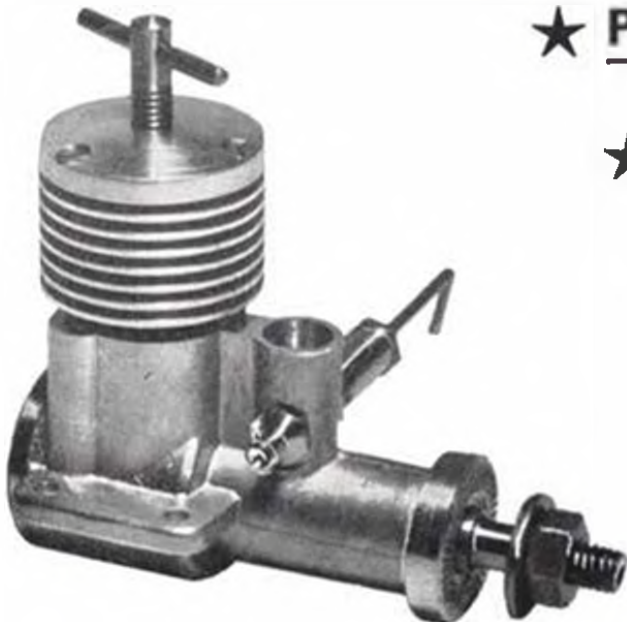
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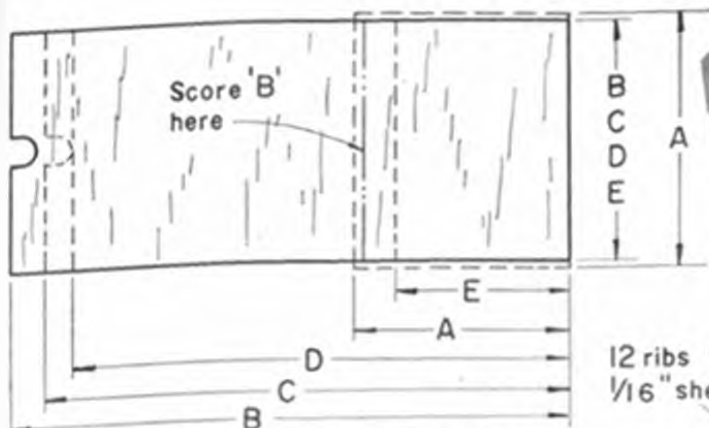
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**FULL-SIZE
PLANS!**



12 ribs from
 $\frac{1}{16}$ " sheet

'A' from $\frac{1}{32}$ " ply and $\frac{1}{16}$ " sheet.
Rest of formers $\frac{1}{32}$ " sheet.

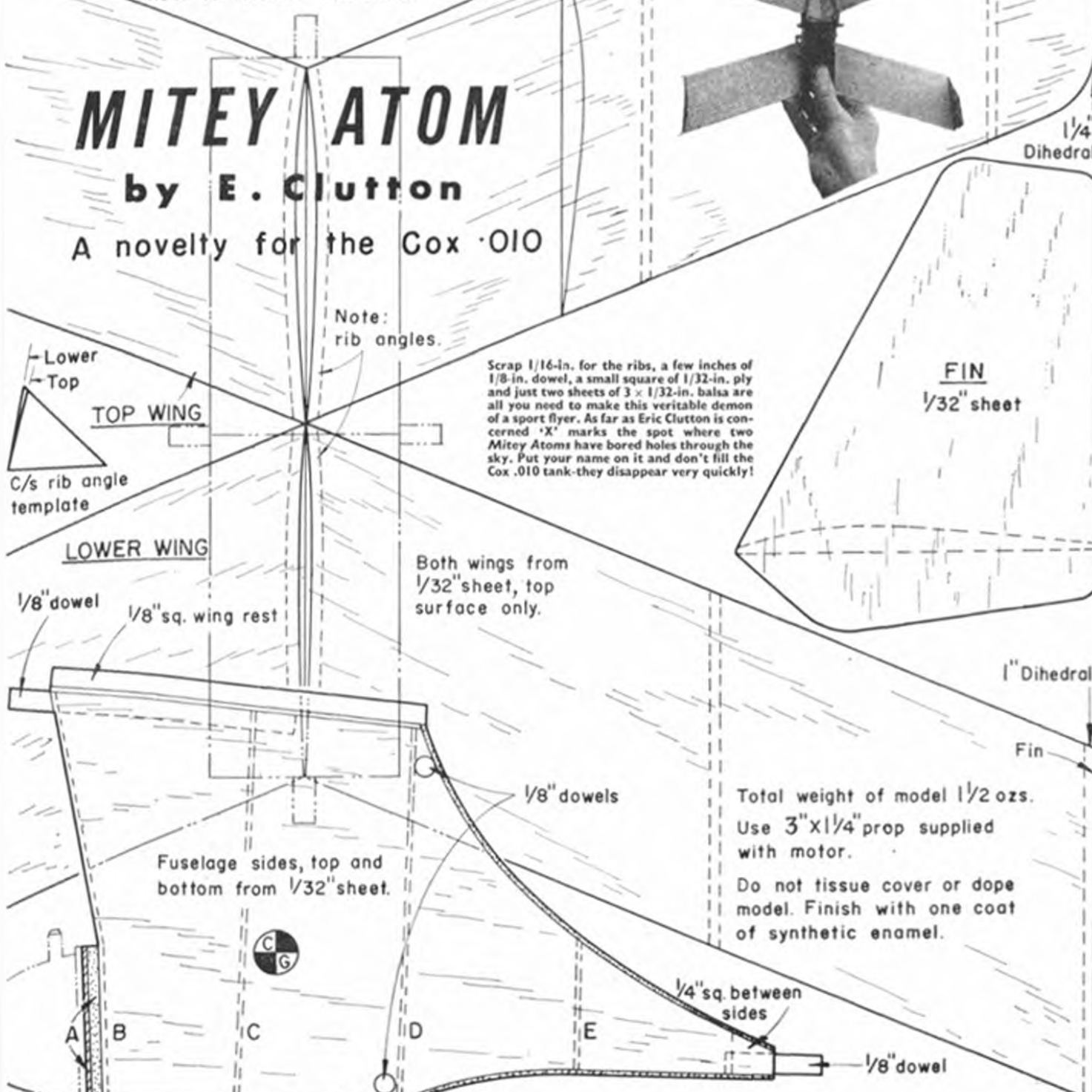
MITEY ATOM

by E. Clutton

A novelty for the Cox .010



$\frac{1}{4}$ "
Dihedral



Scrap $\frac{1}{16}$ -in. for the ribs, a few inches of $\frac{1}{8}$ -in. dowel, a small square of $\frac{1}{32}$ -in. ply and just two sheets of 3 x $\frac{1}{32}$ -in. balsa are all you need to make this veritable demon of a sport flyer. As far as Eric Clutton is concerned 'X' marks the spot where two Mitey Atoms have bored holes through the sky. Put your name on it and don't fill the Cox .010 tank—they disappear very quickly!



**YOUR
FREE
PLAN!**

Peter Moir's **BOUNCER** Control-line trainer for 1-1.5 c.c.

MY FIRST ATTEMPTS at control-line flying were disastrous. I learned the hard way, in a series of spectacular prangs, because I simply did not know that wrist movement spells disaster for the beginner. Eventually, I got the idea of the "flying business" and the memory of those initial mishaps gradually faded, but they were brought sharply into focus again by some young school-boys who wanted to fly control-line and sought assistance. They needed two things. The first was an aircraft which simply would not break, and the second was some physical means of restricting the movement of the wrist. Thus BOUNCER and RIGIDRIST handle were born.

Two fuselage scheme

Let's get busy with building. The fuselage can be built in two versions using either balsa or plywood. $\frac{1}{4}$ in. plywood is heavier, and more difficult to work than balsa, but stronger. Cut out the housing for the bellcrank, the lightening holes in the rear fuselage and the canopy; Percy the pilot is optional, but he looks well in his greenhouse. Incidentally, his canopy makes a most convenient carrying handle! Do not form the cut-out for the engine until the fuselage and doubler are glued together. Use Cascamite glue rather than cement for this joint, also for jointing the wing platform and tailplane platform to the ply fuselage. Cover the rear of the fuselage with paper and dope it well. Finally, form the cut-out for the engine, drill the engine bolt holes, the bellcrank pivot holes and the hole for the tail-fixing dowel. The curves in the wing platform are easily shaped by bending the balsa over a tin can containing a 100 watt electric lamp, or even over your soldering iron.

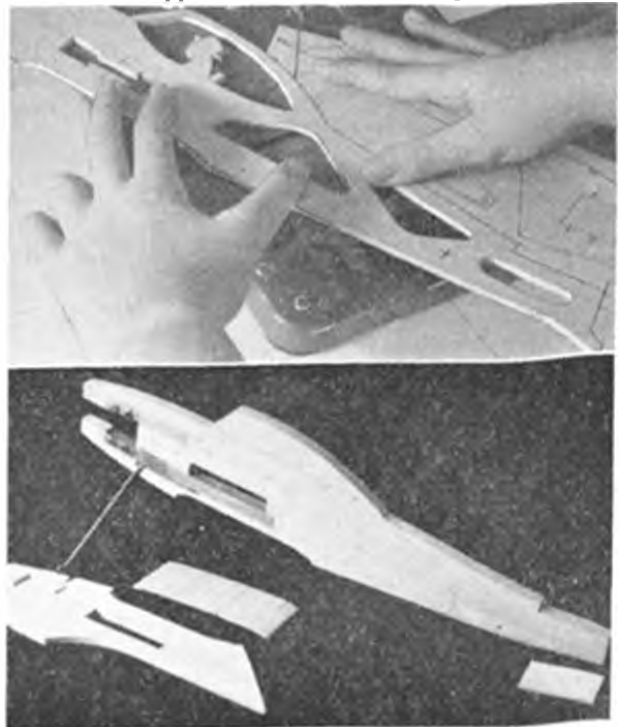
Cut the bellcrank from a scrap of plywood and mount it on its pivot, cut from a nail and secured with cement. The lead-outs and push rod are bent as shown; cranking the ends dispenses with the need for soldered retainers, and, of course, simplifies reassembly.

Using balsa, the fuselage has a $\frac{1}{4}$ in. medium backbone and a $\frac{1}{4}$ in. medium balsa doubler. The fuselage must have cut-outs to receive the engine bearers and the bellcrank, and the doubler must be relieved to accommodate the undercart, engine crankcase and fixing nuts. Upper and rear edges of the doubler should be chamfered before assembly. Engine bearers are $\frac{1}{4}$ in. square hardwood, and it is advisable to drill the lower bearer for the bellcrank pivot *before* the bearer is fitted.

Form the undercart from a length of 12-gauge steel wire, bent as shown and bound to the lower engine bearer, smothering the binding in cement. Now glue the bearers into the balsa backbone, using slow drying glue in preference to cement. Before the doubler is glued to the backbone, the engine fixing nuts must be set in position, so drill the bearers for the bolts, cut two rectangles of tinplate and drill them, too. Slip the plates over the bolts, run on the nuts and then solder the nuts to the tinplate. Finally, cement the nut assemblies to the engine bearers. This is a good time to ensure that the bolts are cut off so they do not project beyond the nuts.

The doubler is glued to the backbone and the two are cramped together while the glue sets. Round off the edges of the backbone, and doubler and glue on the wing and tailplane platforms, pinning them in position while the glue sets. Finally, drill the fuselage and fit the tail dowels and tailskid. Cut the tailplane parts from $\frac{1}{4}$ in. hard balsa, then sand to section. The elevator cut-out permits the rubber bands to be passed through. This may look larger than necessary, but after a few flights, when hands, bands and aircraft are uniformly oily, you will appreciate it. Elevators have sewn thread hinges, using light nylon fishing line. The elevator horn is well cemented in place.

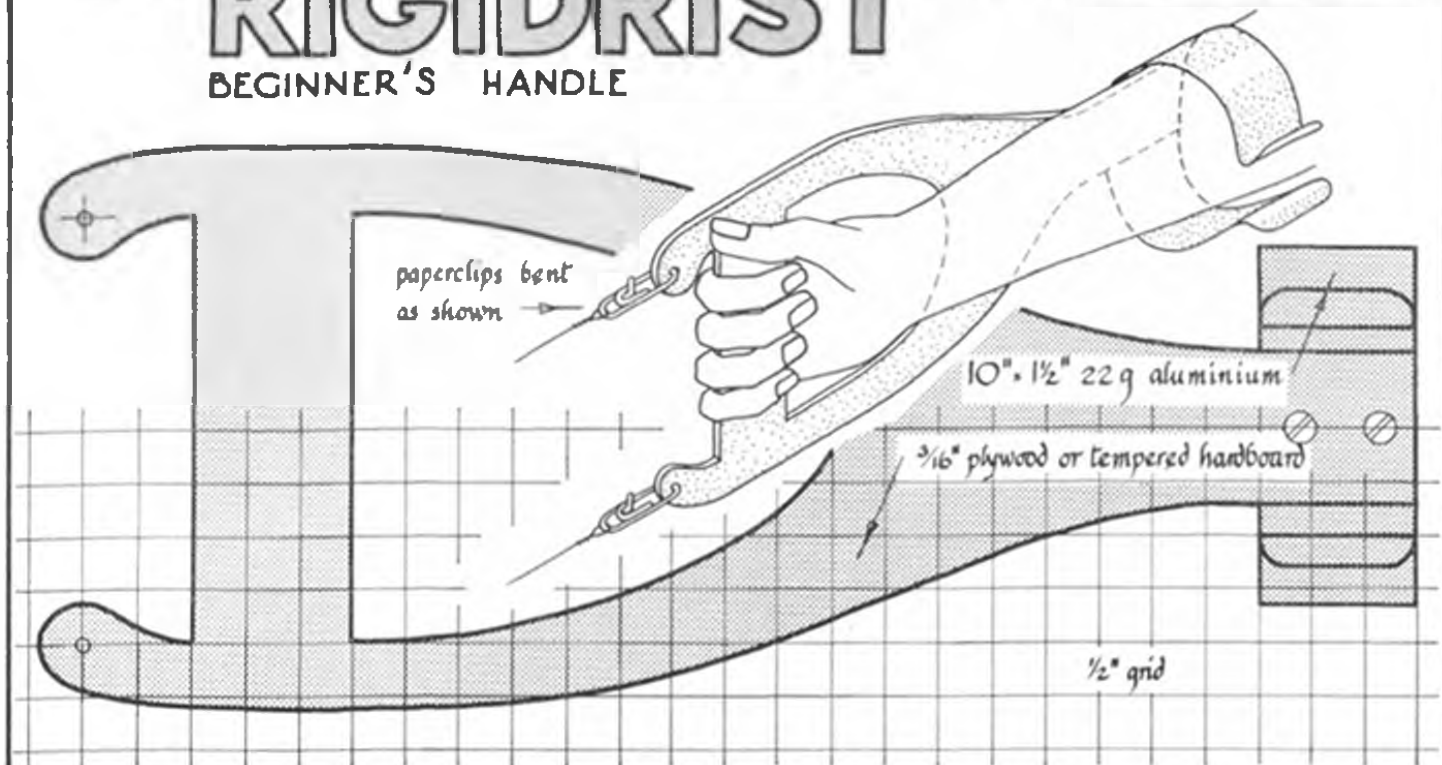
The wing is the simplest part of all. It is made of $\frac{1}{4}$ in. balsa, sanded to a rudimentary aerofoil section, but the section is not critical. What is more important is the reinforcement of its circumference with nylon fishing line set in cement, as for the tail unit. It gives really "wallop-proof" edges. Super Bouncer has square tips with end plates. Cut the wing at the centre section for dihedral and cement together with $\frac{1}{4}$ in. dihedral at each tip. Pre-cement these joints for extra strength, and reinforce with a strip of cloth cemented on top and bottom. In fact, a worthwhile strengthening measure is to cover the entire wing with linen. This is the ultimate in strong wings; it is more trouble, of course, and heavier, but strength is what we are after, not contest performance. Two copper wire line guides complete the wing.



The RIGIDRIST

(SCALE: HALF SIZE)

BEGINNER'S HANDLE



PETER MOIR
ZULULAND

The undercart for the ply version is in two parts, the rear component being shortened and bent after forming. A simple jig consisting of a board with nails driven into it makes light work of the undercart shaping. Bind the two parts together with thin copper wire before soldering. Cut two slots in the bottom of the fuselage to locate the undercart components, then drill the fuselage and secure the undercart with two bolts. For wheel retainers copper wire can be wrapped twice around the axle and soldered.

The tank is simple, there being no need for an elaborate wedge type with involved venting. Solder it from tinfoil, tin your material well before soldering and use a really hot iron. Solder in the feed tube before the two parts of the tank are mated; that way it is easier to get the end correctly positioned in the tank. Fix with two $\frac{1}{8}$ in. screws.

The fuselage, wing and tail unit are all given three coats of dope, rubbing down between coats, as a base for subsequent painting. Then you do your decorative best.

Now install your engine, equipped with a really flexible nylon propeller, and either use locknuts or solder lockwires between the pairs of bolt heads. Assemble the wing and tail unit to the fuselage with suitable size rubber bands to achieve a firm fixing. To prevent the wing sliding on its platform under the action of centrifugal force, which it can well do when everything is oily, cement $1\frac{1}{2}$ in. wide strips of medium glasspaper to the

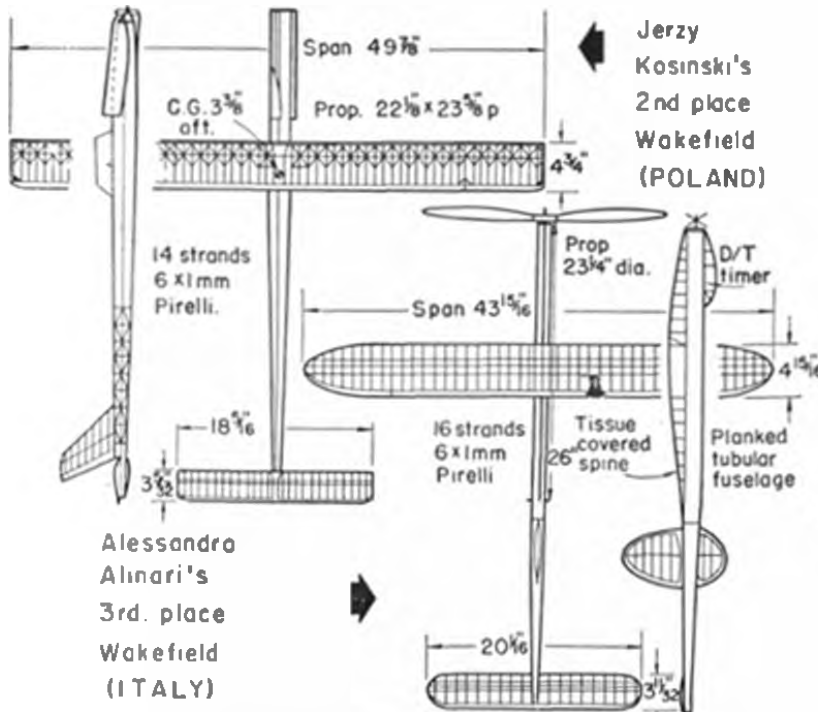
wing platform and centre section. Then all you require before flying is a pair of 30 ft lines. If you are a beginner, then the Rigidrist handle is just the thing for you.

The RIGIDRIST is simple enough. Cut it from $\frac{1}{8}$ in. plywood or hardboard and equip it with two connectors made from paper clips. The forearm strap is made from a 10 in. x $1\frac{1}{2}$ in. length of 22-gauge aluminium, which is easily re-shaped to suit different arms.

A few words of advice for the beginner. 1. Ensure that your assistant points the model slightly out of the circle when he releases it. 2. Make sure that the lines do not catch in the grass during take-off. 3. Keep the arm well up for take-off, but as soon as the aircraft comes off the ground, gently lower the arm to a horizontal position. 4. Remember that the aircraft will go wherever you point your arm, but the wind will affect the altitude of your model, and you will have to correct—but gently! 5. At all times and at all costs maintain line tension; watch this during take-off or when flying in a breeze, and if the lines go slack, step back smartly. 6. When the engine cuts, allow the aircraft to come down, but when it is just above the ground, raise your arm to flare out the approach and make a perfect landing. Happy Bouncing!

At left, salient differences between ply and balsa fuselages showing fretted ply example in the process of shaping and part assembled balsa fuselage with bearers and u,c legs, nose doubler, wing and tail refts. At right are Bouncers no's 17 and 18 showing how they come apart to avoid damage in a hard landing.





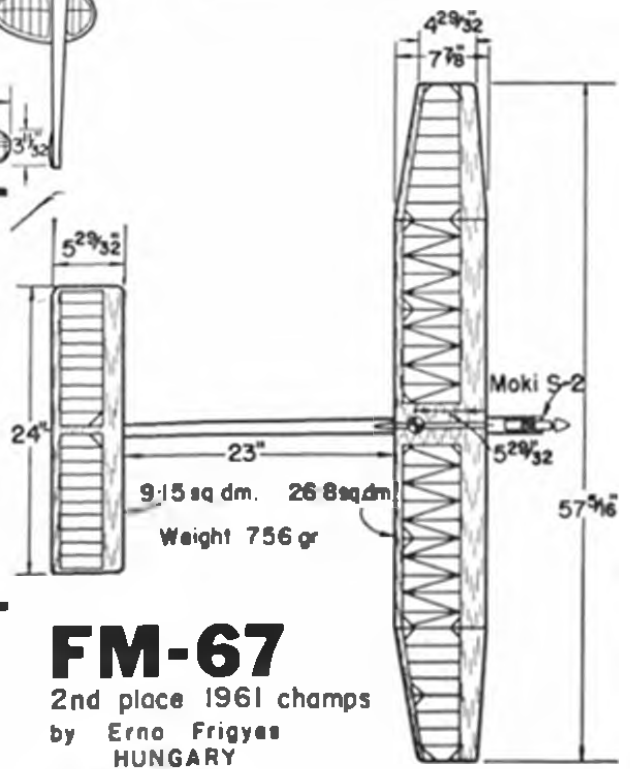
Jerzy Kosinski's 2nd place Wakefield (POLAND)

Alessandro Alinari's 3rd place Wakefield (ITALY)

TWO WAKEFIELDS at left are those which placed second and third in the 1961 World Championships after the sixth round fly-off. When compared with the winning "Max-Maker" by George Reich, which we published last month, they illustrate the diversity of design which exists in the Wakefield class and also the standard of refinement. Kosinski's model was finished in red and white and was extremely well made, with particular attention to lightweight tail surfaces and a simple yet efficient folding propeller. Alinari's model had the most intricate propeller and alloy nose block with three point screw adjustment. Wing was carried on a twin vertical spine over the untapered motor tube.

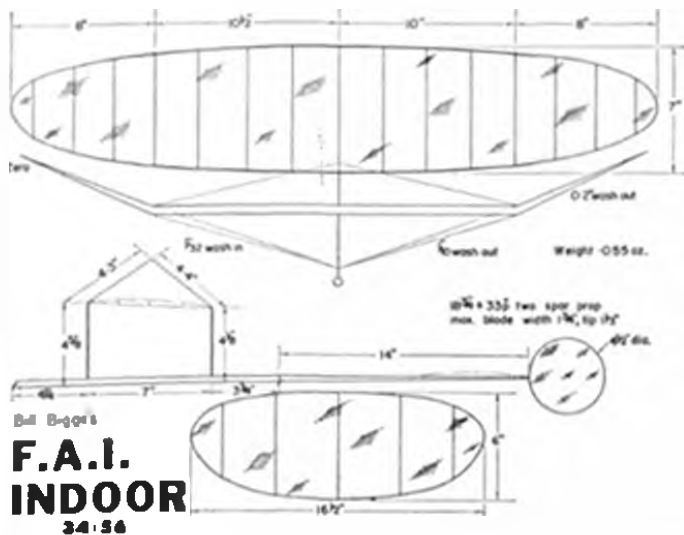
More Contest Designs

A selection of models which have made news in recent months



FM-67

2nd place 1961 champs by Erno Frigyes HUNGARY



F.A.I. INDOOR 34.56

INDOOR THIRD PLACE model at the Championships by Bill Biggs, who comes from the "Sky Lancers" of Washington (S.L.O.W.) club D.C. U.S.A., at left. Well known for his experimental indoor models, helicopters, etc., Bill has reached success with the conventional type very quickly and he was, in fact, leading the event at Cardington for two rounds out of three. Large tail surface area contributed greatly to stability in climb. F.A.I. POWER design above by Erno Frigyes came very close to earning him a second World Championship.



Over the Waves



ROUNDUP OF IMPORTED RADIO GEAR AND THREE NEW R/C MODEL KITS

CARLO BERGAMASCHI, well known Italian Contest modeller and international team member and also proprietor of Olympic kits, has produced a fine shoulder wing rudder-only R/C model of 53 ins. span. The *Orbit* has placed in Italian contests and is a carefully considered variation on the accepted high wing-low tail set-up. Spruce longerons, give adequate strength without resorting to a sheeted fuselage and help keep the uncovered bare airframe weight down to 24 ozs. There is more than adequate room inside the fuselage to accommodate a *Quetone* receiver, O.S. compound escapement on rudder and *Rising 2* pawl clockwork for *Mamiya* .09 glow engine as used for our test. Performance so powered was rather docile, the model having difficulty in gaining altitude, though slow speed passes were thrilling. Re-engined with a Fox .15 the *Orbit* had a hair-raising climb, continuing to do so even on reduced throttle, necessitating a change in trim. Strength of the airframe was shown when it survived a long spiral into the ground, sustaining only slight structural damage. Price in Italy is equivalent of £3 15s. to which duty and purchase tax must be added.

Ed. Johnson was good enough to let us inspect some of his latest U.S. Imports, and they provide an interesting insight on the latest from America.

The *Min-X Powermaster* transmitter has been duly tested in the most practical way possible by turning it over to a group of single-channel enthusiasts to try out with various receivers and, more important, use on the flying field. All were impressed with the eye appeal of the transmitter, having a gold anodised case with red inscriptions. In fact the only score on which one could complain is the Keying button. Not a micro-switch, it has little "feel", though it does improve with use. Some who handled the transmitter had difficulty in obtaining "quick-blip" engine control, but no trouble was experienced gaining the same control via third position signal. Much approved was the HI-LO power switch, which is arranged as a change-over switch between the two 67½v H.T. batteries. In the HI position they are connected in series for 135 volts, but this is only required at extreme range. Therefore, by switching to the LO position the two H.T. batteries are connected in parallel, considerably easing battery drain.

Constructionally the 18 swg. case size 7½ in. x 5½ in. x 3½ in. (very comfortable to handle) encloses a printed circuit component baseboard mounted horizontally. The back of the case removes, being held in place by four self-tapping screws provided.

The circuit provides 100 per cent. modulation, employing the two halves of a 3A5 valve as oscillator and modulator, and a rather massive (by comparison) 3D6 valve as power amplifier. Our unit had a 26.995

crystal. A chrome-plated removable 56 in. telescopic aerial reduces to 20 ins. An A1D4 L.T. and two B101 H.T. batteries are employed and all up weight with batteries is 4 lbs 4 ozs. (less batteries, 1 lb. 6 ozs.). Price, ex-stock from Ed Johnson is £12 15s. 9d., which considering that this is an imported item, and one cannot obtain any built-up crystal stabilised commercial Tx for very much under £10, is a very reasonable price indeed.

The *Bramco Apollo Rx* is nothing revolutionary as ten-channel relayless receivers go, but construction and workmanship compare favourably with any modern equipment. It uses the well tried valve detector (X1Y 34) and two transistor amplifier stages, calling for 30 volts H.T., 1.5 volts L.T. Enclosed in an 18 swg. blue anodised case measuring 1½ in. x 2½ in. x 2½ in., it weighs 4½ ozs. There are six input wires and 30 output, six to each of the servos. Each set of output wires is ready for direct connection to a Bonner Transmite servo, using the Bonner coding and arranged from alternate reeds to avoid any possibility of two reeds coming on at once and burning out transistors. British retail price is £24 17s. 6d. through Ed Johnson and the set is already used by Stuart Uwins and Paul Rogers.

In characteristic gold anodised case comes the *Min-X Relayless 6Rx*. This is an all transistor set using four transistors (one T1334, two T0037 and a 2N223). It weighs 3½ ozs., measures 1½ in. x 2½ in. x 2½ in. overall and being transistorised, works off 6-volts power. The reed unit is a revised *Min-X* product, having thicker, wider, reeds with square ends. Price is £21 6s. 3d.

The *C.G. Nike Superhet Converter* converts any audio super-regen receiver to superhet standard (it is not usable with carrier receivers). Basically it is a complete Rx. less the audio and relay stages, and replaces the super-regen detector. In the case of a valve detector stage, the valve is removed and the two converter output wires connected in its place. In transistorised Rx's it connects to the red spot in the detector transistor, which is removed. In an 18 swg. blue anodised can measuring 1 in. x 1½ in. x 2½ in. it weighs only 2 ozs. Audio response is 30 to 2,000 cps. and the unit is temperature stabilised for operation between 0 to 130 deg. F. 3 volts operating. The circuit employs six Philco 2N232 transistors and has four Miller I.F.C. transformers. The unit we inspected had a 26.699 m/c. crystal, but the *Nike* is available tuned to any of six spot frequencies, though 27.255 m/cs. is avoided due to extreme congestion on that band in the *New Varon Kit* soon to be released. Is *Camna Skytana* soon with designer Phil Smith and sketched above. Can have rudder, elevator and engine control on single or lightweight multi R/C gear. Has 54-in. wing with 42-oz. empty weight. For 1.5 to 3.5 c.c. engines, it is claimed carry up to 20 oz. gear.

Continued on page 660



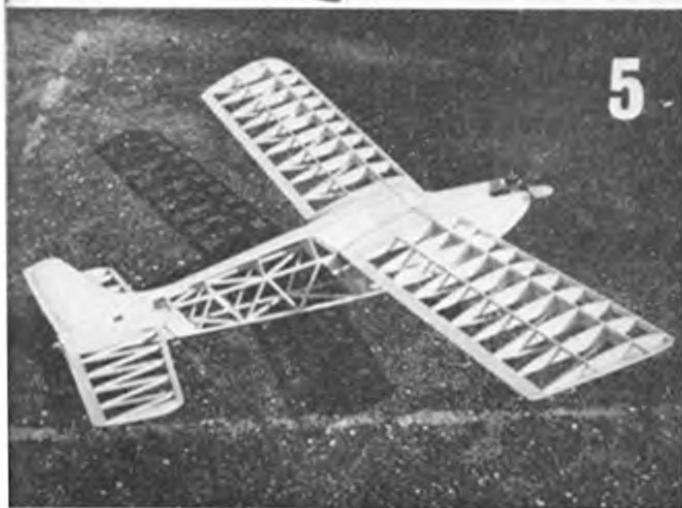
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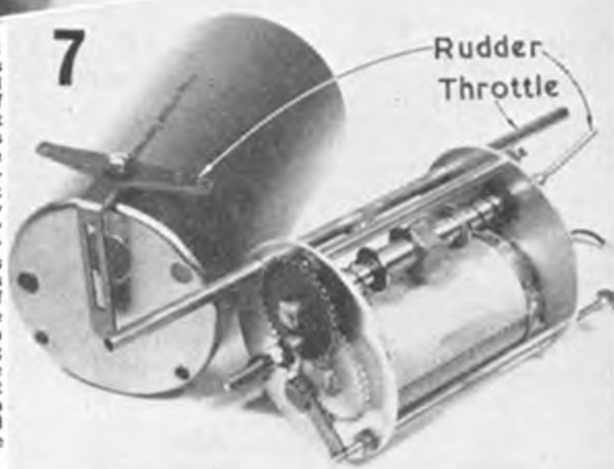


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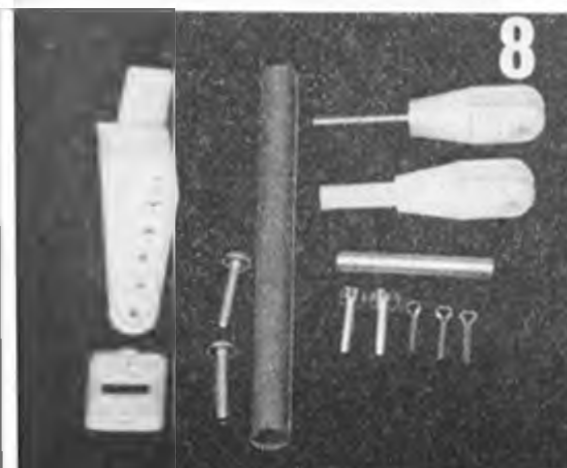


(1) Orbit Relayless Superhet Rx has Medco reed bank. (2) MiX 6 superregen Rx; square ends to reeds, the current fashion, can be seen well in this view; tiny components in bottom of picture like mustard cross seeds are in fact transistors. (3) Bramco 10-channel Relayless has long reeds. (4) Outside and inside the Min-X Powermaster; extra large valve prominent here and HI-LO switch. (5) Bare framework of Olympic Orbit with Mamiya .09 engine; may look rather flimsy at this stage but is really very strong. (6) C.G. Nike Superhet converter is packed with components; boxes with holes in the tops for tuning are I.F.C. transformers pre-set at factory. (7) Case and internals of Propomatic servo showing bellcrank on case and throttle rod. (8) Graupner R/C nylon control hinge push rod couplers make neat job; up to 1-inch horn length, with adjustable forked end and bearing. (9) Minicombi MK2 selective servo is small in comparison with hand. (10) Exploded view of Space Control Wheel Brake; middle component is brake shoe which is prised open by cam on drum

7



Rudder Throttle



8



9



10

OVER THE WAVES *continued from 658*

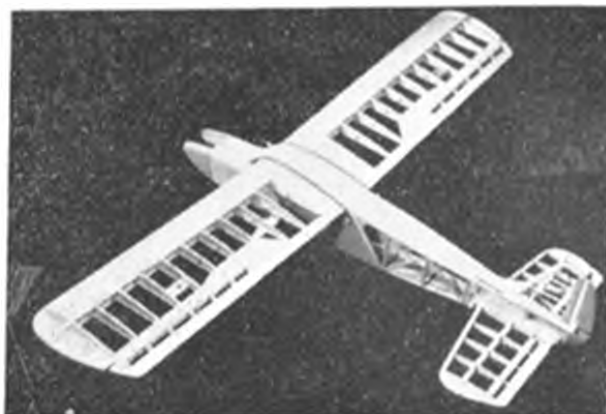
U.S.A. British retail price is £18 15s. 0d.

One of the embellishments (encouraged by the A.M.A. ground manoeuvre rules) now beginning to appear on multi R/C models in this country is the wheel brake. Space Control, manufacturers of the eight-channel proportional system, have produced a simple expanding brake shoe of phenolic fibre. An oval cam on the inner side of the drum (locked to the axle) fits into the slot in the phenolic shoe and on moving the actuating rod the cam rotates, prising the phenolic shoe open to engage on the inner walls of the wheel hub. Price for the 2½ in. diameter wheel which weighs 2½ ozs. is £2 2s. 0d.

The new Orbit relayless ten-channel Superhet is as fine a piece of radio equipment as any we have seen for a long time. Up till now Orbit have scorned the use of a transistor detector stage, relying on the well tried and reliable, valve type receiver front end. Constructionally, this new Orbit 10 receiver is enclosed in a 16 swg. case (tough by any standards), with a 20 swg. cover. Components are mounted on the fibreglass p.c. board, neatly laid out and displaying a high degree of workmanship. Seven Philco transistors (5, 2N1728) and three Miller I.F.C. transformers are identifiable. The extremely neat Medco 10-Reed Bank (manufactured by Fred Dunn, the *Astro Hog* designer) is enclosed in a plastic case except for the reeds which are abnormally thick to allow a coarse amplitude setting and also enable the receiver to be mounted more firmly in the model. The example we received for review had a 26,690 Mcs. crystal. The receiver weighs 4½ ozs. and measures 1 in. x 2½ in. x 2½ in. overall. There are four input which may be connected through a five-pin plug to a Ritchie Power Pack or suitably tapped pack 500 DKZ Deacs, which supplies all the power for the receiver and servos. Price, as quoted by Ed Johnson, is £42 7s. 6d. British retail (Tax paid), though for export (overseas readers) this is reduced to £32 5s. 0d. Ten wires connect to the five servos.

From Henry J. Nicholls come four imported items from Germany. First is the German Engel *Propomatic* servo, which as the name may suggest, is a proportional servo. It provides proportional rudder and trim engine in the same manner as the Hogg servo featured in *AEROMODELLER*, March, 1959, closely following the same principles. The blue anodised cylindrical case measures 1½ in. x 3½ in. long and the unit weighs 4½ ozs. It utilises a Distler motor which features very low (100 mA) battery drain on 4.5v. The *Propomatic* costs 62s. 6d. and is of course, ideal for "Galloping Ghost" operation if used with suitable stick box.

Another Engel unit is the *Minicombi II*, a selective motorised servo working off 2-3 volts for single channel operation. Mounted on a paxolin base, size 2 in. x 1½ in., which also serves as the printed circuit board to the input wires, it works on the principle of a wiper board with "dead spots" for neutral and "signal" positions. The



Uncovered structure of our frog Jackdaw is reinforced inboard of alarons. Is easily and quickly constructed thanks to simple structure and pre-fabrication, to be equipped with Min-X 6

Uniperm motor is geared down 9 : 1 onto a bellcrank having ¼ in. throw each way. The unit weighs 1½ ozs. and costs 32s. 6d.

The *Escap* electric motor is Swiss made, with incorporated gears. It is 1½ in. long and is 1 in. in diameter, weighing 1½ ozs. Characteristics are like those of the Distler and Mikromax, giving very free shaft run and low drain, calling for electrical braking at neutral points. It appears to have great potential as a servo motor. Price is 36s.

Following our description in the May issue, S.Ldr. Dave Davidson has been flight testing Graupner's motorised servo for single channel and have been most impressed by its performance and reliability, he reports

"The Unimatic is designed to operate from batteries of from 2 to 2.4 volts. If D.F.A.C. cells are used, 500 DKZ are recommended, as the servo draws at least 300 ma on load. Two pencils were found to be satisfactory but life would be very limited on these. On 2.4 volts the action is quick and positive but with a smoothness not found in rubber-driven escapements. Power is adequate for all but the heaviest or high-speed models.

"Using the P.C. disc No. 1, we obtained selective left and right rudder and "quick blip" engine control. The "quick blip" is not easy to accomplish on a micro-switch, as it is a third pulse which must follow the normal 2-pulses, but at a faster rate. The other two P.C. discs give sequential left and right, with self-neutralising between, or sequential left or right with no neutral, respectively. This latter is meant for use when the unit is employed as a motor control servo.

"Replacing the P.C. discs is a simple job, but care must be taken not to damage or alter the tension of the wiper brushes which bear upon the disc. The selected disc should be contact glued in place for security.

"The Unimatic is attractively boxed and comes with very clear and comprehensive instructions. The only point to watch when connecting is to make sure that the two leads for motor control servo (if required), which must be soldered to tags inside the coupling, are connected to the correct tags. Remember that when numbering the tags on a standard B7G socket, you start at "7 o'clock" and work clockwise."

"The servo is very well made, extremely robust, yet of surprisingly light weight. It represents very good value for money and should give long and reliable service for the "rudder only" enthusiasts and represents an advance on rubber-driven escapements for these purposes, as well as being readily adaptable for use as a powerful slow/fast engine control servo in a cascaded system." See also *Radio Control Models* for November.



The "works" of the Unimatic servo, seen with case bottom removed, shows p.c. disc and wiper bank imposed and worm drive from Microperm motor



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HOW DO YOU QUALIFY? You must be between 17 and 25. You must be fit, keen to fly and to accept the responsibilities of an officer. And you must hold, or expect to gain, G.C.E. at 'O' level (or equivalent) in five acceptable subjects including English language and mathematics. You can obtain further details without obligation by writing, giving your date of birth and educational qualifications, to Group Captain J. A. Crockett, R.A.F., Air Ministry (AM 1620), Adastral House, London, W.C.1.

THE FUTURE IS WITH THE R.A.F.

The Royal Air Force

PREVIEW

OF WHAT WE HAVE IN STORE
IN THE CHRISTMAS

Model Maker & Model Cars

The December issue of "Model Maker", traditionally a bumper number, will again include a top-class

FREE FULL-SIZE PLAN

This year scale-lovers will delight in
35 in. GERMAN E-BOAT

suitable for electric or up to 1½ c.c.
diesel propulsion.

Also — H. M. S. HOOD

plans for a 54 in. model, available through Plans Service in the usual way, will be one of the most eagerly awaited articles. Others include a John Lewis A Class yacht design, a "secret" novelty, report from Ulm, the collier brig "Driver", etc., etc.

Car readers can fathom out the circuit marvels of the Tiffin lap recorders, build a free-running B.M.W. Isotta—full-size plans and enjoy articles on the big Southport meeting (263 entries!), the record-breaking M.G. EX101 in Prototype Parade, more on tyre moulding, and many other quality articles.

MAKE SURE OF YOUR COPY NOW!

Published Nov. 25th Price (for this bumper issue only) **2/6**

AND IN THE JANUARY

Aeromodeller out Dec. 15

Lots of new motor gen, with a review of what's coming out for 1962. Tony Young's remarkably simple yet very successful contest winning ½A free flihter, the "Dynamo"—an ideal job for novice or expert with wide range of engine applications. Aeromodelling in India. Return of Squadron Markings for scale enthusiasts. A neat low wing sportster, "Pinky" for those who fly for fun. Contest design three-views. Latest model news and details of new items just released by the trade for the Christmas market. World News and all the favourite regulars—all for 2/-.

AND ALSO DECEMBER

Radio Control Models

now on sale

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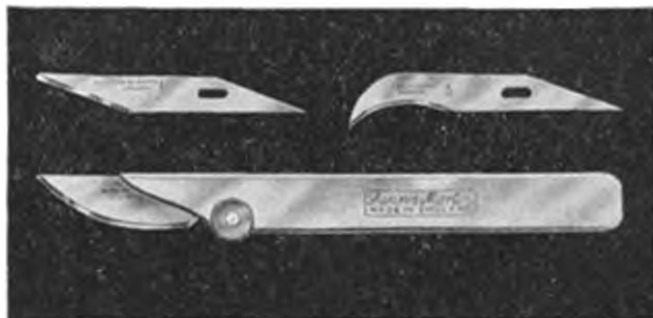
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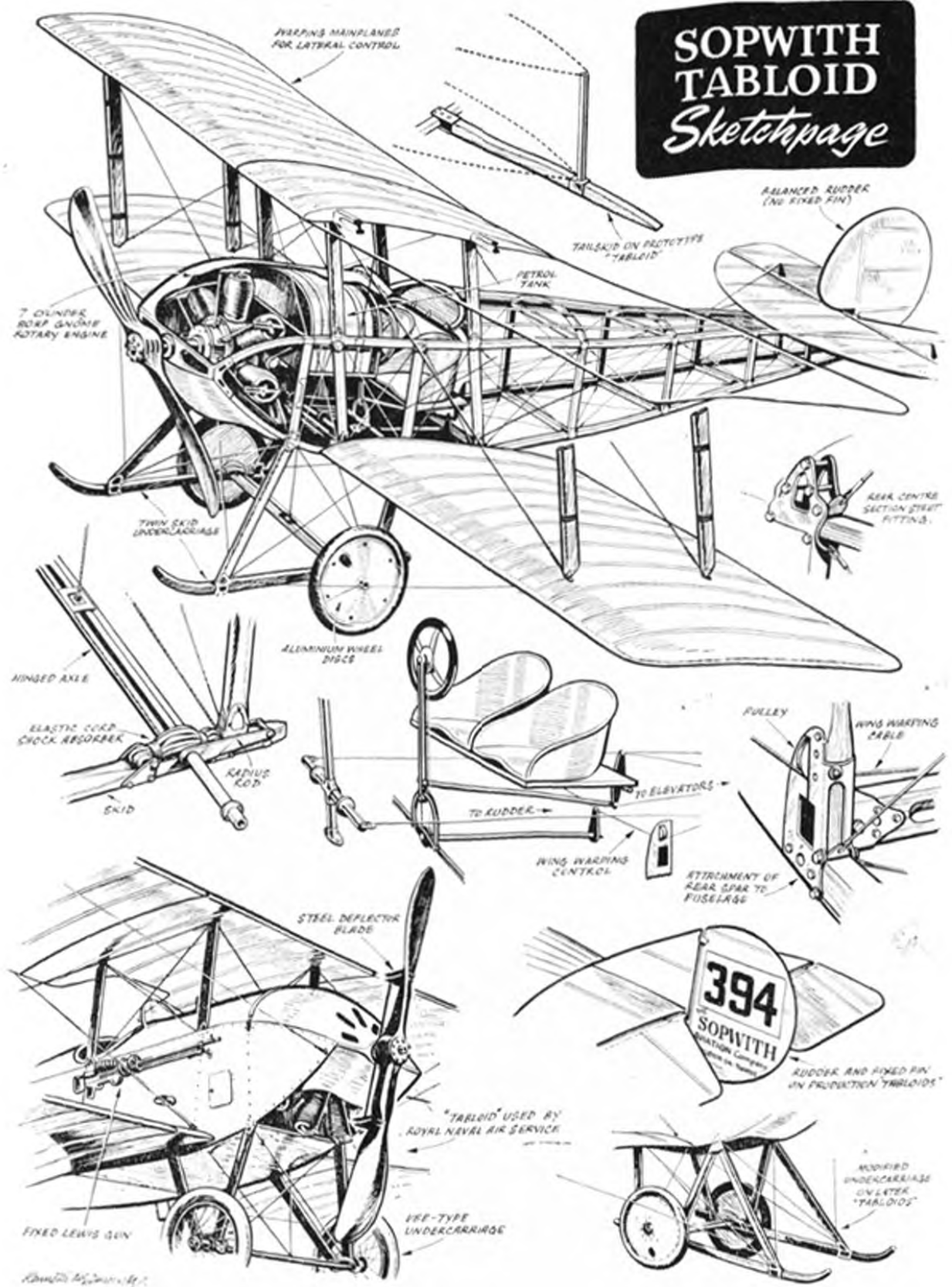
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3841A

SOPWITH TABLOID *Sketchpage*



FULL DESCRIPTION & 1/72nd SCALE PLAN OVERLEAF

The magnificent Schneider Trophy now resting at the Royal Aero Club flight photo



THE 1913 TABLOID was a new conception in aeroplane design; a classic example of compact simplicity. Hitherto, biplanes were braced by a multitude of struts and wires and were invariably of the pusher type. Though experiments along similar lines were made at Farnborough, the Tabloid was a more practical design and enjoyed publicity both as a product of private enterprise and for the battle over its name, with a medical tablet company.

Aircraft 326 with warping wings and landing skids. I.W.M. photo MH3286 Naval seaplane 3804 on twin floats, showing increased fin area. I.W.M. photo Q67584 Bottom, racing No. 14 on Tabloid with Vee strut undercarriage, showing cowl intakes. Flight photo 0195



AIRCRAFT DESCRIBED

No. 112

Sopwith Tabloid

described and drawn by K. McDonough

Originally designed as an exhibition machine, the little biplane astounded the crowds at Hendon when Harry Hawker flew it over after the completion of its official trials at Farnborough. With pilot and passenger it had a top speed of 92 m.p.h. which few monoplanes could emulate, and the low stalling speed of 37 m.p.h.

Chief distinction of the Tabloid was the single bay tractor layout. There was nothing superfluous in the design. Given the engine power available in those days it would be difficult to conceive a more practical airframe. The Gnome rotary was completely cowled and cooled by two small slots in the front of the aluminium cowling. The fuel tank followed the contour of the fuselage and the seats were mounted side by side. Lateral control was by warping and the wings were braced by four interplane struts and the minimum of cables. The undercarriage was a neat twin skid affair with aluminium faired wheels.

In 1914 a special version powered by a 100 H.P. monosoupage Gnome and equipped with floats, won the Schneider Trophy (*above left*) at Monaco piloted by Howard Pixton. The compact little seaplane had a profound influence on French manufacturers who until then, had placed their faith in the monoplane layout.

During the early stages of the First World War the Sopwith Tabloid saw service with both the R.F.C. and the R.N.A.S. But for the lack of a suitable interruptor gear it would have been more than a match for the Fokker Eindekker; a copy of the French Morane. The R.N.A.S. did indeed attempt to solve the problem by fitting deflector blades to the airscrew after the manner of the Morane Bullet but such experiments met with limited success.

In a military capacity, the Tabloid is chiefly famous for the attack on the Zeppelin sheds at Dusseldorf. Flying from Antwerp, F.Lt. R. L. G. Marin destroyed the new Zeppelin Z.IX, bombing from a height of 600 ft. This was the first German airship to be destroyed by a British aircraft.

Military Tabloids differed little from the civil counterpart. The main modification was the addition of a fixed fin in front of the rudder and a stronger undercarriage. Production Tabloids were single seaters and only the prototype was equipped to accommodate a passenger. Later a neat Vee-type undercarriage was incorporated, dispensing with the cumbersome skids and some of the final aeroplanes had ailerons.

About 40 Tabloids were produced. They were distributed widely among the R.F.C. Squadrons in France and served with Wing-Comdr. Samson's Fastchurch Squadron in Belgium. Two Tabloids were among the aeroplanes operating from H.M.S. *Ark Royal* during the Dardanelles campaign.

The following data is for the prototype.

Type: Two seater scouting and exhibition aircraft.

Power: 1 80 H.P. 7-cylinder Gnome rotary engine.

Construction: Single bay tractor biplane wooden structure, wire braced, fabric covered. Aluminium covering on front fuselage.

Dimensions: Span—25 ft. 6 in. Overall Length—20 ft. Chord—5 ft.

Height—8 ft. 5 in. Area of mainplanes 240 sq. ft.

Performance: Maximum speed—92 m.p.h. at ground level. Stalling

speed 36.9 m.p.h. Climb to 1,200 ft.—1 minute.

Data for military version

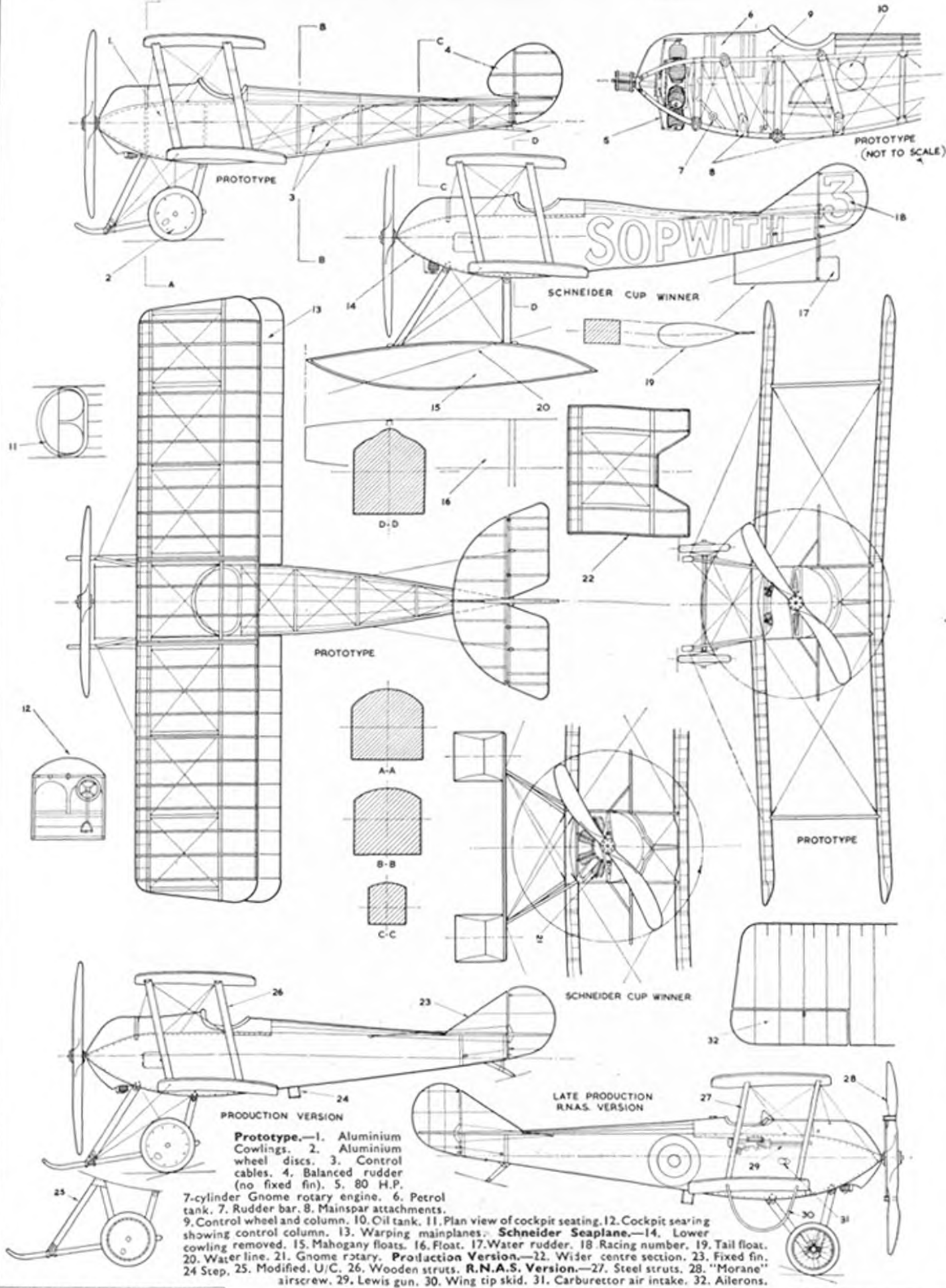
Power: 1 100 H.P. 9 cyl. Gnome Monosoupage.

Dimensions: Span—25 ft. 6 in. Length 20 ft. 4 in.

Weights: Empty 730 lb. Loaded 1,120.

Armament: Lewis gun mounted on centre section or on side of fuselage

with deflector blades on airscrew. 4 x 20 lb. bombs.



Prototype.—1. Aluminium Cowlings. 2. Aluminium wheel discs. 3. Control cables. 4. Balanced rudder (no fixed fin). 5. 80 H.P. 7-cylinder Gnome rotary engine. 6. Petrol tank. 7. Rudder bar. 8. Mainspar attachments. 9. Control wheel and column. 10. Oil tank. 11. Plan view of cockpit seating showing control column. 13. Warping mainplanes. **Schneider Seaplane.**—14. Lower cowling removed. 15. Mahogany floats. 16. Float. 17. Water rudder. 18. Racing number. 19. Tail float. 20. Water line. 21. Gnome rotary. **Production Version.**—22. Wider centre section. 23. Fixed fin. 24 Step. 25. Modified. U/C. 26. Wooden struts. **R.N.A.S. Version.**—27. Steel struts. 28. "Morane" airscrew. 29. Lewis gun. 30. Wing tip skid. 31. Carburettor air intake. 32. Ailerons.

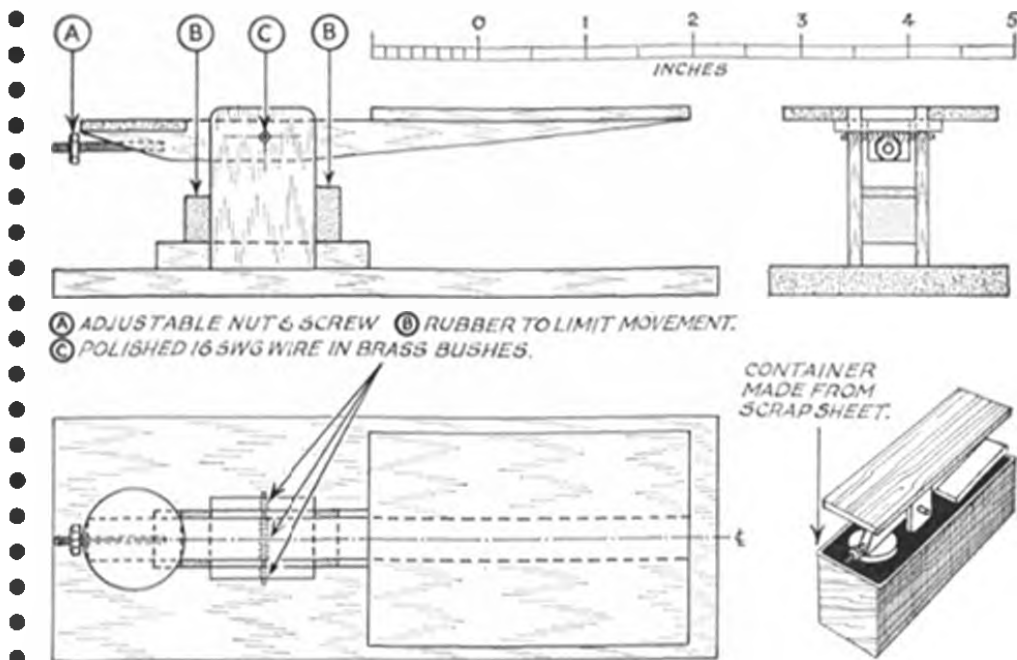
SOPWITH TABLOID & VARIANTS

FT. _____

A simple POCKET SCALE

for selection
of balsa

Devised by
John Pool



THIS MACHINE IS simply a balanced beam, ($\frac{1}{4}$ in. sq. balsa), with the pivot hole, bushed with 16 S.W.G. brass tube, arranged one third of the way along the beam. On the long side ($2\frac{1}{2}$ in.) a small weighing table (3 in. by 2 in.) is cemented. The centre of this must be exactly on the $2\frac{1}{2}$ in. mark, it will extend $1\frac{1}{2}$ in. either side of this. A disc of $\frac{1}{4}$ in. sheet cut round a penny is cemented with its centre exactly on the $1\frac{1}{2}$ in. point on the short side. The beam must then be balanced; Plasticene, or cement tube will do. A screw and nut can be used to provide fine adjustment if desired. The beam swings on a well polished piece of 16 S.W.G. wire, supported by two $\frac{1}{4}$ in. sheet side pieces glued to a $\frac{1}{4}$ in. sheet base. This needs to be slightly longer and wider than the overall length and width of the beam. Two pieces of rubber glued to the base and stand limit the movement of the beam and make balance easier.

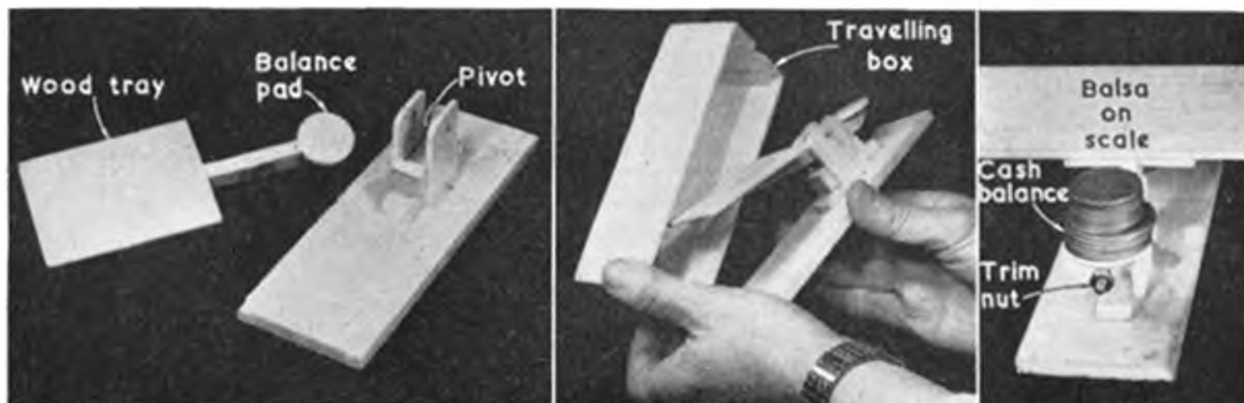
The scale is intended for approximate weighing of sheet and strip in the model shop. Weight consists of one or more half-pennies, or pennies. When operating,

the coins, and sheets must have their centres exactly on the $1\frac{1}{2}$ in. and $2\frac{1}{2}$ in. points. Each half-penny is worth 0.1 ozs. on this scale. Three pennies will weigh the equivalent of $\frac{1}{4}$ oz. One must first decide the maximum and minimum weights of the desired sheet(s). For example, the author looks for quarter grain $1/32$ in. sheet weighing about .25 oz. for ribs. Having sorted out those which appear suitable they can be checked with three half-pennies on the scale. Any which tip the scale weigh over .3 ozs. and are rejected. Checking the suitable remainder with two half-pennies on the scale, but this time retaining the ones which tip the scale, will ensure sheets weighing between 0.2 and 0.3 ozs.

A box of scrap sheet can be assembled, using the scale base as a base. This makes the gadget very easy to carry around in a jacket pocket.

Charts showing the weights of sheet suitable for different purposes are to be found in *Construction for Aeromodellers*, the M.A.P. five shilling book. See also the 1961/2 *Aeromodeller Annual* and table opposite.

Simplicity of this easy to make portable scale is emphasized by these photographs. End picture shows $3\frac{1}{16}$ in. sheet being weighed, hence the pile of cash!



House of HARLEYFORD

Harleyford authors and production team (clockwise around table) front, left, Bruce Robertson, W. Lamberton, M. J. Nowarra, J. D. Carrick, W. F. Hogworth, Mrs. D. A. Russell, D. A. Russell, Lt.-Col. K. S. Brown (U.S.A.F.), E. J. Cheesman, M. C. Russell and P. Yeoman. All of them have a tremendous enthusiasm for their work in publication of books which serve as invaluable and permanent reference on fascinating aspects of aviation.



IT IS SPECIALLY pleasant in these days of mammoth book combines to find a specialist publishing firm in the field of aviation literature willing and able to devote the time and effort needed to produce works of the high quality demanded by a well informed public. Such a company is Harleyford Publications Ltd., which has been consistently publishing winners over the years, culminating in their latest title—*United States Army and Air Force Fighters 1916-1961* which may well break all sales records with its particular appeal to U.S. enthusiasts. Typical of their enterprise is the full colour advertisement for this new title in our centre pages.

Managing Director is Mr. D. A. Russell, M.I.Mech.E., who has been publishing aviation books since 1935, originally with the Harborough Publishing Company Ltd., which under his aegis offered the phenomenally successful *Aircraft of the Fighting Powers* series of seven volumes, a number of one-make books such as the classic *Book of Bristol Aircraft* and *Brief Glory*, a history of Air Transport Auxiliary plus many others. When he disposed of his interest in that company in 1949, the right to use the word "HARBOROUGH" on all future aviation books was expressly retained, and to this day Harleyford books continue to use the "Harborough" imprint, covering a publishing history of over 25 years.

The company is unique in its approach to the production of new titles. Experience has shown that the amount of research and fact-chasing necessary for their type of book is far beyond the capabilities of any one author, and must be the combined operation of a qualified team. Over the years a formidable array of experts has

been brought together as may be seen in the heading picture. Added to this, it is essentially a family business of enthusiasts. D. A. Russell himself is well known as a pioneer aeromodeller, for very many years Managing Editor of *AEROMODELLER*. His wife, as First Officer Joan Naylor served as an A.T.A. pilot, ferrying all types of aircraft to the R.A.F., and retains an active interest as a qualified pilot; whilst his eldest son Michael has been gliding since he was fifteen, was an R.A.F. pilot, and is now a captain flying for an independent air line.

Harleyford titles of recent years have covered the histories of such famous aviation figures as Baron von Richthofen and Fokker, books on aircraft of the 1914-1918 war, camouflage markings, and the glorious Spitfire, which earned a book to itself. They all follow a successful pattern. First, facts are gathered, involving perhaps many thousands of miles of travel, long hours of delving through official documents, collating often unique photographs. Then drawings are prepared of the aircraft described, sometimes from original work drawings. The final product aimed at is the best that technical skill, quality paper and authentic information can provide. For that reason price is a secondary consideration to value, a bold policy that has assured the company of a world market for their titles, with first prints often sold before publication.

If we can voice one plea on behalf of our enthusiastic readers may we ask for one more refinement to an already excellent series in future efforts? Namely that colour details are given on the 1/72nd scale drawings. Meanwhile, we look forward over the years to many more books from the House of Harleyford.

Balsa weight

A handy table compiled by John Scott

Used in conjunction with the balsa scale opposite, this table of weights will enable the modeller to find approximate weight per cubic foot. Check the sheet weight in grammes (one ounce equals 28.35 grammes) then read off the row against the sheet size and the vertical reading gives the desired figure. For example, a sheet of 36" x 4" x 4" weighing one ounce or 28.35 grammes will be of 6lb. cu. ft. stock density.

Weight per cubic foot (pounds)

36 in. Sheet	4	6	8	10	12	14	16	18	20
1/32 in. x 2 in.	2.25	3.5	4.75	5.75	7	8.25	9.5	10.75	12
1/16 in. x 2 in.	4.5	7	9.5	11.5	14	16.5	19	21.5	24
3/32 in. x 2 in.	6.75	10.5	14.25	17.25	21	24.75	28.5	32.25	36
1/8 in. x 2 in.	9	14	19	23	28	33	38	41	48
3/16 in. x 2 in.	13.5	21	28.5	34.5	42	49	57	64.5	72
1/32 in. x 3 in.	3.5	5.25	7	8.75	10.5	12.25	14	15.5	17.5
1/16 in. x 3 in.	7	10.5	14	17.5	21	24.5	28	31.5	35
3/32 in. x 3 in.	10.5	15.75	21	26.25	31.5	36.75	42	47	52.5
1/8 in. x 3 in.	14	21	28	35	42	49	56	63	70
3/16 in. x 3 in.	21	31.5	42	52.5	63	73.5	84	94	105
1/32 in. x 4 in.	4.5	7	9.5	11.5	14	16.5	19	21.5	24
1/16 in. x 4 in.	9	14	19	23	28	33	38	43	48
3/32 in. x 4 in.	13.5	21	28.5	34.5	42	49.5	57	64.5	72
1/8 in. x 4 in.	18	28	38	46	56	66	76	86	96
3/16 in. x 4 in.	27	42	57	69	84	99	114	129	144

Weight in grammes per sheet

GADGET REVIEW

IN SOME CASES, a rear induction, radially mounted engine can present a problem, but B. Faulkner of Cheadle devised **A**, to mount his Thermal Hopper in a free flight power model. Basically, the mount is a Woolworth's celluloid screw container, ideal for round fuselages, but can be faired into a square fuselage using balsa fairings. As can be seen from the drawing, the mount is also an integral fuel tank and construction goes like this. Make a mount ring for the engine from $\frac{1}{4}$ -inch ply, drill engine bolt holes and affix nuts to the rear face with fibre glass. The tank is made by fitting two celluloid blanks across the tube as tank walls, gluing in place with cement but be sure to remember to fit the feed pipe in the front tank wall. The inside of the tank is then fuel-proofed by injecting fuel proofer into the tank and shaking same. The mount is secured to the fuselage by a spigot cut from block balsa and the joint between the two components is reinforced with fibreglass. Naturally, the Thermal Hopper is not the only engine that can be fitted this way and Brian Faulkner's idea should serve as inspiration to others with a similar problem.

Exhaust sludge can so easily ruin a fine finish on a model. The answer to the problem is to fit an exhaust collector round the exhaust ports and lead the exhaust off via a pipe. **B** shows the exhaust collector used by C. Moores of Manchester for 360 deg. ported engines which worked very well on his D.C. Sabre. A "Jubilee" clip was drilled to take a $\frac{5}{16}$ -inch dia. brass tube, soldered in place. The unit is then slipped in place over the exhaust ports using a card gasket to ensure a good seal. A final seal is obtained with a coat of "Red Hermatite". Clips should be obtainable from ironmongers and motor accessory dealers and sizes can be selected to suit motor. **C** is a little tool for cutting holes invented by Dennis Rattle from Brackworth, Glos. An expended shell case is ground sharp on its open edge and a countersunk woodscrew sweated to the other end. The screw is then driven into the end of a piece of dowel and there we have one handy tool — just the job for making holes in wing ribs for control line lead outs.

D is an idea for metal motor mounts from R. Redfern of Birmingham. Top is his modification to the bearers

of his A.P.S. *Pedro*. After engine vibration had distorted the holes in the engine bearers, pieces of right-angled section extruded aluminium (better than bent sheet) were screwed in place and the engine mounted on these. Lower is the mount Mr. Redfern used on his K.K. Phantom after breaking the engine bearers. Bent from fairly heavy gauge aluminium sheet, it is then bolted to the old bearer stubs.

Another exhaust stack is shown in **E**; where L. Appleton of Newton-le-Willows, Lancs fabricated this one from a cigar tube. The stack is fitted between the crankcase/cylinder-jacket and the lowest cooling fin and the depth of the stack is determined therefrom. A wooden former is then made and the cigar tube moulded to the stack shape over it. Note that the Stack should be $\frac{1}{4}$ -inch wider back and front than the diameter of the cylinder it enshrouds. Measure the internal diameter of the cylinder jacket and scribe a circle to that diameter on both sides of the stack, still on the wooden former. Cut out these discs and remove the stack from the former. The edges of the holes are smoothed with sandpaper, (cigar tube foil is soft) and the stack fitted in position, held in place by screwing down the cylinder head.

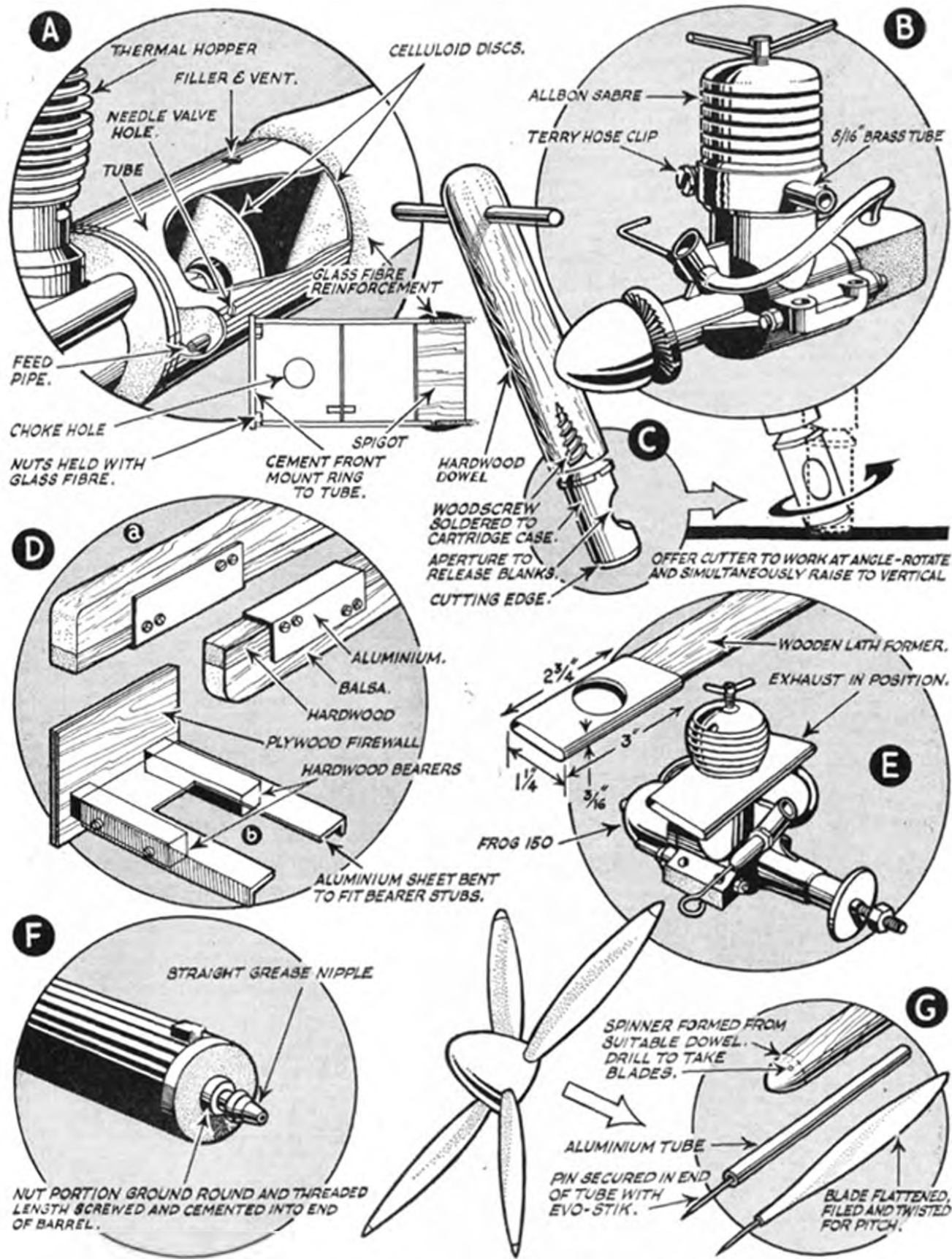
Points to note: (1) The engine must have a screw-down cylinder head. (2) Slight errors in measurement and cut of tube are tolerable as the metal is sufficiently pliable to give a good fit. (3) A silencer can be fitted to the end of the stack. (4) No special tools are required.

W.W. 1 scale fans will like **F**. When making machine guns, Ken James Poole used a straight grease nipple as the machine gun nozzle pushed into the body of the gun. The nut portion is ground circular and the threaded portion screwed and cemented into the body of the gun.

Another for scale fans is **G**, this time for 1/72nd scale. To make propeller assemblies Tony Berry of Radcliffe carved a spinner from dowel. He stuck a pin in one end of aluminium tube (for prop blades) with Evo-Stick, then flattened each tube, filing and twisting to blade shape. The pins are then driven into the shaped end of the dowel which is then sawn off to give a complete propeller assembly, three or four blades as needed.

"Quite bothersome indeed, Uncle Ruyard but Aeromodeller plainly insists upon first flights over TALL grass always!"





Out and about

South Coast Gala—R.A.F. West Malling—October 1st. DELAYED FOR TWO hours whilst a U.S. Navy Lockheed WV-3 prepared for take-off and dogged by unfavourable wind direction for free flight, the annual South Eastern organised meeting was nevertheless a happy occasion in spite of circumstances.

Radio operated from a very restricted, obstacle surrounded area and was accident free to prove that multi-channel really does not need an airfield. It was enlivened by a particularly "hot" deadstick landing by Van den Bergh's new *Sweeper*, which just scraped in over trees, cars, etc., for a perfect landing on a pathway!

The U.S. Navy were admirable hosts, many of their servicemen obviously enjoying looking after the visitors and giving capable directions.

Power (26)	1. G. Fuller ...	St. Albans	9:00
	2. P. Barrett ...	Vickers	8:03
	3. A. Muxwell ...	Farnham	6:50
	4. A. Fathers ...	Abingdon	6:30
	5. B. Mack ...	Stevenage	6:12
Rubber (20)	1. F. Boxall ...	Brighton	9:00
	2. P. Hedgeman ...	Hayes	7:49
	3. R. Holmes ...	Blackheath	6:21
	4. N. Elliott ...	Croydon	6:33
	5. B. Rowe ...	St. Albans	6:00
Glider (45)	1. M. Burrows ...	St. Albans	7:38
	2. D. Carroll ...	Unattached	7:37
	3. D. Butler ...	Surbiton	7:01
	4. J. Baguley ...	Hayes	6:46
	5. C. Hayward ...	Springpark	6:21
1/4 A Power (7)	1. D. Posner ...	Surbiton	8:26
	2. M. Burrows ...	St. Albans	7:57
Tailless Glider (4)	3. A. Fathers ...	Abingdon	7:22
	1. J. Marshall ...	Hayes	5:29
	2. J. Kay ...	Hayes	5:08
	3. F. Brench ...	Hayes	2:10
Chuck Glider (7)	1. A. Young ...	St. Albans	2:19
F.A.I. Team Racing	1. D. Allen/A. Cooper	W. Essex	6:20
	2. J. Hall ...	Belfairs	9:48
Radio (Multi) (9)	1. E. Johnson ...	2452j	
	2. F. Van der Bergh	2138	
	3. P. Leach ...	2026	

CROYDON GALA September 17th

The weather man said this year's Croydon Gala would have four-eighths cloud, sun and winds, gusting to thirty knots; in fact there was complete cloud cover at 500 ft., a flat calm and heavy drizzle. However, the rain stopped around midday and the cloud went up a couple of hundred feet to enable some quite reasonable times.

Cox Tee Dees and three blade props were much in evidence in the 1/4 A event, won by Dave Posner's pressurised specimen in his *Mint Weaver*; in second place was Burrows of St. Albans, with a non-pressurised fast climbing 190 square inch model.

In Open Power, seven people did a "full house", J. West of Brighton repeated his last year's win with a *Distalander*. Dave Posner unfortunately set his D.T. for 3j minutes on his first fly-off and would have certainly done four minutes otherwise.

Rubber	1. B. Rowe ...	St. Albans	11:53
	2. R. New ...	C.M.	11:40
	3. C. Wells ...	Hornchurch	11:34
Power (Fly-off)	1. J. West ...	Brighton	4:00; 4:40
	2. P. Buskell ...	Surbiton	4:00; 4:04
	3. D. Posner ...	Surbiton	3:51
Glider	1. G. Woods ...	Cambridge	10:37
	2. B. Hughes ...	Hornchurch	9:57
	3. A. Wisher ...	Croydon	9:46
1/4 A Power	1. D. Posner ...	Surbiton	11:45
	2. M. Burrows ...	St. Albans	11:42
	3. D. Butler ...	Surbiton	11:25
Slope Soaring	1. A. Wisher ...	Croydon (Fly-off time)	1:03
Gala Champion	M. Burrows	St. Albans	

Area Championships R.A.F. BARKSTON HEATH, October 15th 1961.

	Rubber	Power	Glider	Total
1. East Anglia	14:56	14:47	15:28	45:11
2. Midland	12:33	14:03	17:42	44:14
3. Northern	14:07	13:06	16:50	44:03
4. North Western	14:01	13:02	15:07	42:12
5. South Midland	12:02	13:07	14:36	39:47
6. London	13:47	11:07	12:43	37:41

FOG! and with it, wind! This delayed the start of what would have been a truly glorious battle with strong teams from the six keenest Area's. Many better models disappeared in the climb, and some were flown too hastily to lose weather advantage of clearing conditions. Flights were cut to 2 each for 4 reps in each class with 3 minute max's and the very closeness of the final scores shows just what a meeting it could have been had the fog not clamped.

WHO WILL OWN up to being the chump who lost a small scale model at the South Coast Gala? No address on the model of course but the owner can recover his charge upon correct identification S.M.A.E. number) from Mr. J. S. Webb, 98 Blackfen Road, Sidcup.

The LONDON area have a new club, the West Middlesex Radio Control Club under the presidency of George Redlich, with prominent members Chris Olsen, Stewart Uwins and Charles Riall. Flying ground is Hounslow Heath and a local R.A.F. station. Flying on the Heath is only allowed for members, who must be S.M.A.E. affiliated. At the Laton Slope Soaring meeting at Ivinghoe Beacon on October 1st members took top four places in R.C., I. E. A. Faulkner 5:00, 2. Charles Riall 5:01 (both with *Galloping Ghost* radio), 3. P. Thornton 5:03, 4. J. Dumble 5:05 (five minutes nominated air time). All used R.E.P. equipment. Still on the subject of radio control, the Chingford M.F.C. boys have come out of hibernation, producing some very small R.C. jobs, including a 17 in. span biplane with C.G. *Pioneer Rx* and D.C. *Dart* power.

"Lads of Ilford" (formerly Bernard's brotherhood of Boys) have now been absorbed in the parent Dagenham M.A.C., meeting at Valence House every Thursday 8 p.m.

Brixton D.F.C. went to Debden for the Speed contest on September 24th. P. Drewell broke two records, F.A.I. at 121 m.p.h. and 2.5 c.c. unrestricted at 138.9 Dick Taylor's 29 model had control trouble during a 160 m.p.h. flight but his pilot, Mike Billinton managed to bring it down safely.

Beside their very successful outdoor season (see rally reports) St. Albans member's club room has been a scene of great activity with many building and flying indoor gliders from almost every material possible, including metal foil from cigarette wrappings, all tissue and even one from cigarette papers only! Most popular, however, is the conventional construction with an average wingspan of about nine inches.

Kenton M.A.C. main event has been the *Criterium*, attended by 8 of them travelling in 2 Mini-vans—a memorable weekend enjoyed by all! A big hand to the Combateers, Pete and Pete who made several dents in the concrete during the course of their battles. The speed team proved by comparison that Kevin Lindsey's props are fastest (as they expected). At the S.M.A.E. speed "do" at Debden the Tribe Copeman team using the same motor and model as at Genk turned 116.5 m.p.h. for 2nd place and after an unofficial 122.5 m.p.h. have decided to pickle the motor in oil yet again pending the World Champs team trial next year, Kenton's H. Morris and G. Copeman built a 1 full size *Cleaver* for a Frog 150 in an afternoon and the next day won Northwood's club 1/4 A combat with it! First prize 4s (approximate cost of model.)

Haye and D.M.C. Gala, held on Chobham, October 8th, called for no-fly-offs, in fact only 1 competitor, C. Simeons (Power) managed a full score. There was considerable drift and what little lift there was, needed a lot of finding.

Rubber.—1st. A. Young, *St. Albans* 8:00; 2nd. C. Jackson, *Surbiton* 7:53; 3rd G. Fuller, *St. Albans* 7:25.

Glider.—1st Giffen, *N. Kent* 6:27; 2nd. D. Roche, *Anglia* 6:20; 3rd. D. Butler, *Surbiton* 5:37.

Power.—1st C. Simeons, *St. Albans* 9:00; 2nd Rieley, *Bristol* 8:17; 3rd McLean, *Essex* 5:37.

1/4 A Power.—1st M. Burrows, *St. Albans* 7:01; 2nd G. Cornell, *Croydon* 6:20; 3rd D. Posner, *Surbiton* 5:27.

In the semi-final of the London Area K.O. Cup Hayes were surprised to win against Surbiton, who must have had an off-day. Team was, L. Barr, J. Baguley, J. Marshall. Best Hayes flight in tailless all he South Coast Gala was 2:46 by John Kay, with his well proven *all sheet A 2 Wing* which earned him 2nd place.

Wanstead M.A.C. were hosts to exactly 100 entries, 67 in Class "A" Combat and 23 in Class "B" Combat for their Rally. B. Buxstead was clearly the Class "A" winner, flying very cleanly and Class "B" Combat showed a promising start, but lack of practice in engine starting and model design soon showed up. The final was three up on 60 ft. Lines. K. Fuller of Hayes M.A.C. flew a very good third, being hampered by only having half a wing. The "London Boys" must be congratulated on being 1st and 2nd first time out. The winner, L. Moorcroft was flying an enlarged "Dongus" with a Fox Black Head Combat special.

Class "A" Combat—1st B. Buxstead *Worthing Bald Eagles*; 2nd J. Bone *Northwood—Kenton*.

Class "B" Combat—1st L. Moorcroft *Laindon*; 2nd M. Taylor *Laindon*; 3rd K. Fuller *Hayes*.

A strong turn out for the Keil Trophy at Finedown resulted in Brighton "A" team totalling 40:03 with Ian Lucas scoring 3 maxes and a fly off of 4:20 and John West just missing a perfect score through a down draught in the second round. On October 8th for the Farrow Shield at Tangmere, high winds prevented any good scores and the club team had a real struggle to achieve 22:39.

A new club in the SOUTHERN Area is the *Sperry Model Aeronautical Club* at Bracknell, with a yen towards competitions, exhibitions and flying displays, how about a gyro-dethermaliser, lads? Winchester members gave a 45 minute demonstration at a local fete, opening with a large stunt model towing an 11 ft. streamer, with silk letters forming the name of the club. A balloon was attached to the end of the streamer and a lead weight fixed to the bottom to prevent spinning. Those few technical details may help others intending to use banners. Star attraction was fire in a circle Combat which was really good fun. A new club in the S. MIDLANDS (there seem to be quite a number springing up) is the *Hawks M.F.C.* who rent a room at Stanstead Abbots School, near Ware, Herts. Meetings are on Friday evenings at 7 p.m. Activities deal mainly with Combat and

free flight, with hope for competitions with other clubs. No less than six "U.K." Receivers are in use by Northampton M.A.C. members. This was the circuit in June 61 *Radio Control Models and Electronics*.

Up in the MIDLAND AREA, Outlaws (Cannoek) M.A.C. regrettably postponed their *Rat Race Rally*, due to be held on October 29th, as no suitable venue could be found. On September 3rd, 21 cars loaded with Leicester M.A.C. members and families arrived at Grantham for an inter-club competition with the Grantham and Littleover clubs combined. Leicester won Power and Glider, and the Grantham Littleover combination won Chuck Glider. New club at Shrewsbury, Salop is Priory M.A.C. at a local school where 20 members have the facilities of the woodwork classroom at their disposal. Hope this does not result in a load of chivelling!

First rally run by the Littleover Club on September 17th at Kedleston Hall, Derbyshire, ended as follows: Combat—1st B. Sadler, Derby; 2nd M. Kendrick, W. Brom; 3rd K. De Ville, Derby; 4th D. Hawes, Leicester. Stunt—1st R. Crofts, Derby; 2nd T. Day, W. Brom; 3rd M. Grammet, W. Brom.

It has been mainly a year of organising, or helping other clubs organise, combat events, for members of Bilston M.A.C. The first Area Meeting had 32 entries, the "Nats" 200, and the Midland Area Rally 90 entries. NORTH now to Rotherham & D.M.F.C. who recently had a JA Combat competition for their "Hanniman Trophy". The winner, George Stringwell, fought hard to beat two juniors, Brian Parkin and Tony Baker. Their visit to the Northern Gala was much enjoyed. There, Ron Boid scored two max's and 1:41 in Power with his Cox Tee Dec 15 O.D. job and Eric Jepson made 4:32 with a Dixielander in the same event. In Flying scale E. Coates of Blackburn Aircraft (Welfare) M.F.C. placed third, flying a *Blackburn Rippon*. He also won the club ratio glider comp. with an A.P.S. *Alget*, whilst in a control line weight lifting event T. Barrett heaved off 83 ozs. with an *Oliver* powered K.A. *Specie*.

In the SOUTH EAST the final round of the R.A.F.A. shield held at Ashdown Forest on September 24th was again blessed with good weather. Despite an all out effort by Crawley club, Tunbridge Wells recorded their fourth consecutive win with 142½ points, 2nd were Crawley 107½, 3rd East Grinstead 85, 4th Medway 35, 5th Horsham 15, and 6th Leatherhead 10. The East Grinstead and Horley M.F.C.'s have merged. This does not mean that either of the original clubs was dying, merely combining their facilities since they worked so much together anyway. At the South Coast gala, 12 year old Anthony Howard of Cosmo was drawn again George Copeman in combat and only lost 15 to -1. When Anthony overcomes his contest nerves he will go far.

EAST ANGLIAN. Congratulations to Norwich M.F.C. members "Mick" Smith and Miss Janice Shingles on their recent marriage. Mick starts married life with nine well built A 2s. Best man at the wedding with British A 2 team member Barry Halford.

Wharfedale staged a display for the patients of the local children's hospital on September 16th. In spite of wind, combat and stunt flying was arranged, and proved to be a great success. 30 members attended the NORTHERN Area's "All F.A.I. Meeting" at R.A.F. Rufforth on October 1st. Richard Place home from R.A.F. Hemswell for the day "Won" F.A.I. speed with his pressurised O.S. Max 15 MK1 model which circulated at 170 K.P.H. The Long/Davy Team also won the F.A.I. T/R event.

The de-centralised S.M.A.F. comp on October 8th was held at Rufforth for the Northern Area Clubs and the Davy Long team entered a class JA version of their *Tigress/Daleman* powered by a "very new" *Oliver Tiger* Cub. It did 162 laps on its first tankful! and later in the race, set a new unofficial British record for a 10 mile race

with 8:27. In practice they were doing 100 laps, "non-stop" in 4:16 and 4:06 (10 c.c. tank). Second in the Northern Area was junior Wharfedale member J. Northage (Oliver T/Cub) with 9:28 using the "two-stop" system (80 laps per tank).

First WDale F.A.I. model to take the air was the E.T.A 15 powered *Tigress VII* entered by the Long/Davy team, with times of 4:35 and 4:41. Next was Les Davy's *Tigress VII* (E.T.A 15) which was knocking the 100 m.p.h. mark for 42 laps. This resulted in a 4:50 and 4:34. Thus topping the Northern Area F.A.I. T/R results. Class B was very thin indeed, the only time being returned by the Adams Edwards team who did 7:46 (McCoy 29 and "Single Cell" tank).

Baildon M.F.C. juniors are in the news. Mick Proctor placed 2nd in the fly-off of a Northern Area Open Power event run with the Keil Trophy, and John Pencheon (in his first competition season) beat all the so-called experts at a further Area Open Power comp. His is a very fast climbing O.D.A.M. 35 powered model of 360 sq. ins., 12½ oz. weight, using a 23s. Autoknips timer. The club slope soaring competition, held annually at Baildon is always good for a laugh. Frank McNulty was seen getting good flights in the usual Baildon gale with a ½ oz. chuck glider. Tom Stoker finally won with what is known in the club as his "square" model. Despite about 4 deg. positive incidence on the tail, it caught a thermal in addition to hill lift and disappeared at great height!

Juniors in the York M.A.S. have been showing promise. Peter Kazer came first in the Frog Junior Trophy in the Northern Area with a time of 6 minutes. D. Wiseman won the club combat comp. for the second year running. First 2 places were taken by "Silver Arrows" followed up by 2 P.A.W.'s.

Carnivals again, this time in the NORTH WEST where Whitefield M.A.C. gave two, half-hour control line displays and attracted by far the most attention of all the shows, which brought some good publicity in the local press. A 1,000 lap *Rat Race* was held to keep the control-line contingent busy. Heats of 250 laps cut down the competitors to J. Jones and Jeff Edmunds, the latter winning the gruelling 1,000 lap final.

NORTH EAST now where two members of Novocastria M.A.S. have recently completed a series of T.V. programmes, one of which included film of the club in action.

A film unit also approached South Bristol M.A.C. in the WEST, to make a Television advertisement, for a well known Washing powder, using model aircraft as the subject. Fred Newman, and his wife spent several days of anxiety as the film boys arranged and re-arranged their furniture for the domestic scenes.

The film will probably be released in a few weeks time and they hope aeromodellers will find it entertaining—all 20 seconds of it!

Aeromodeller Trophy (Multi Channel R/C), R.A.F. Odiham, October 8th.

Postponed from September 24th, when rain and low cloud precluded competition being, this contest was re-run at R.A.F. Odiham on October 8th in clearer but windier conditions. Frank Van den Bergh aired his new Merco 49 powered *Sweeper* but dissatisfaction with the operation of its Orbit 10 relayless Rx lead him to rely once more on his familiar Nats winning Skyduster, which he flew into top place. In second place Ed. Johnson flew his year old Orion, showing that the best landings are not necessarily executed with nose wheel u.c. Chris Olsen was third with his latest mark *Uproar* which really accelerates on its Merco 49 prototype. Chris now uses a home made ten channel three transistor Rx with home constructed reed bank. Fourth placer was fast improving newcomer Peter Leach of Bromley flying a C.G. Hercules eight channel equipped *Stunner*, with normal Nosewheel leg discarded in favour of a tail wheel, since this is more convenient for his normal flying ground. During the first round Stewart Uwins was unfortunate enough to crash his *Uproar* (Bramco App'lo).

After the comp' we saw some refreshing variations of model shapes. A 72 in. span Ryan P.T. 19, Jack Morton's Gipsy Moth (flown in competition) were interesting scale types, while D.G. Walker was trying out his new Orbit Ten channel relayless superhet Rx in a Voltswagen.

- | | |
|-------------------------------|-----------|
| 1. F. Van den Bergh (Bromley) | 3792 pts. |
| 2. E. Johnson (A.R.C.C.) | 3636 pts. |
| 3. C. Olsen (W.M.R.C) | 3515 pts. |
| 4. P. Leach (Bromley) | 2875 pts. |

1st Northern Area F.A.I. Meeting, October 1st, 1961 R.A.F. Rufforth

The object of this 1st Northern Area F.A.I. meeting was to promote an annual contest for those types of model flown at World Championship level and to try to improve the standard of flying among potential British team hopes.

This first attempt was successful because it attracted entries from all over the country and the standard of flying was of a high standard; also the clerk of the weather was kind and calm bright conditions prevailed. The Neasham Trophy for A 2 Glider was a particularly keenly fought contest and only 11 seconds separated the top 4 competitors. French and Eggleston fought out the Stockton D.M.F.C. power event; the Essex man winning by almost a minute and Henry Tubbs of Baildon kept the Muxlow Trophy in the Northern Area, being closely challenged by British team member John O'Donnell and Derl Morley (from Lincoln) with a really beautifully constructed model.

R. FIRTH.

Wakefield: E. C. Muxlow Memorial Trophy—

- 14 entries
- | | |
|------------------------------|--------------------------------|
| 1. H. Tubbs (Baildon) | 3:00 3:00 1:34 3:00 3:00 13:34 |
| 2. J. O'Donnell (Whitefield) | 2:30 2:22 3:00 2:17 3:00 13:09 |
| 3. D. Morley (Lincoln) | 3:00 2:27 2:04 3:00 2:31 13:02 |
| 4. G. Tidswell (Baildon) | 12:26 |

A 2: Neasham Trophy—31 entries

- | | | |
|-------------------------------|-------------|-------|
| 1. G. McGowan (Novocastria) | "Sans Egal" | 11:02 |
| 2. G. Freeston (Sheffield SA) | | 10:55 |
| 3. J. Entwistle (Whitefield) | | 10:54 |
| 4. H. Tubbs (Baildon) | | 10:51 |

Power: Stockton D.M.F.C. Trophy—

- 14 entries
- | | |
|---------------------------------|-------|
| 1. G. French (Essex) | 14:38 |
| 2. B. Eggleston (Baildon) | 13:48 |
| 3. R. Boid (Rotherham) | 12:58 |
| 4. J. D. E. Bailey (Whitefield) | 12:26 |

F.A.I. Radio—7 entries

- | | |
|---------------------------|-----------|
| 1. M. E. Elmer (Lincoln) | 3733 pts. |
| 2. A. Collinson (Baildon) | 3173 pts. |

CONTROL LINE EVENTS run to International rules included the RIVERS TROPHY (team race), with entries from as far away as Scotland and Leicester. General standard of flying was better than for Wharfedale Trophy at N/Gala but there is still room for improvement. Retirements were largely due to mechanical failures mostly in motors, although several teams had faulty tanks. There was no question about the Long/Davy team being the worthy winners of the "Rivers Trophy" but the dice for second place was very close. The Novocastrians just beat Hincley by 0.8 sec., only about ½ of a lap in it!

- | | | | |
|--------------------------|--------|-------|--------|
| 1. Long/Davy Wharfedale | 4-41.9 | — | 4-49.8 |
| 2. A. Laurie Novocastria | 5-33.0 | 5-1.7 | 5-47.3 |
| 3. T. Ellis Hincley | 6-4.7 | 5-6.5 | 5-48.1 |
| 4. Davy Long | | | |

STUNT had a low entry but an appreciative group of spectators. Judge was Pete Russell.

- | | | | |
|---------------------------|------|------|------|
| 1. T. Jolley Whitefield | 2390 | 2860 | 5250 |
| 2. F. L. Warburton Bolton | 2440 | 2540 | 4980 |
| 3. G. Higgs Bolton | 2160 | 2010 | 4170 |

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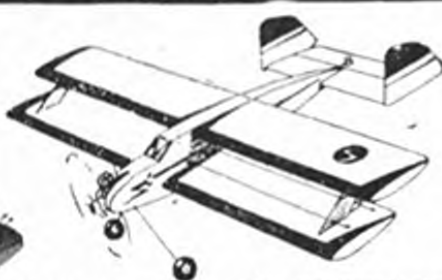
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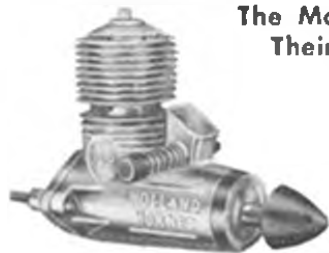
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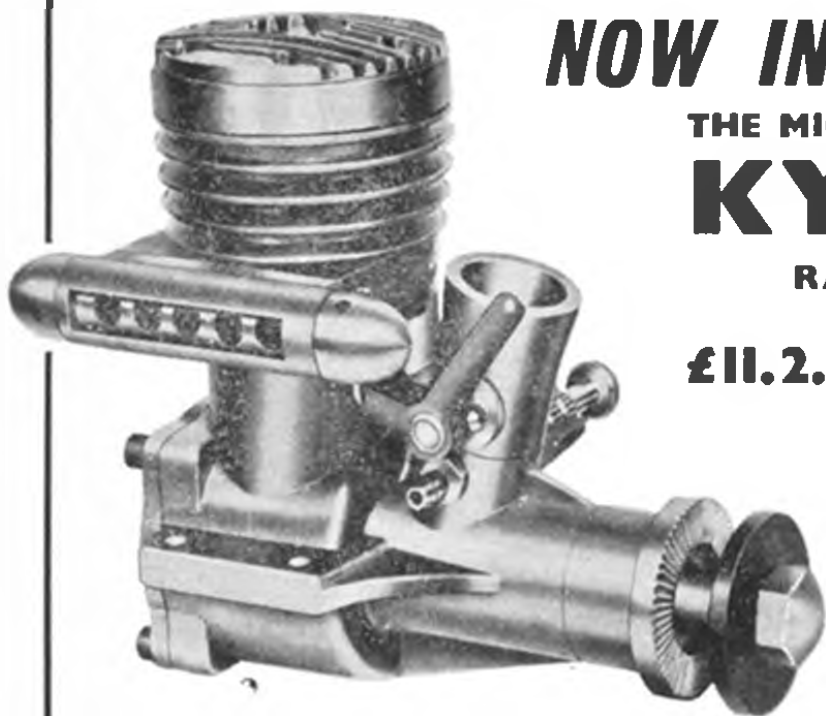
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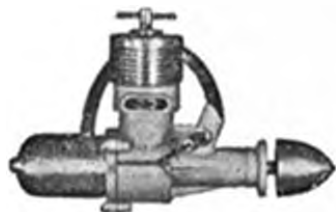
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For the first time ever we are this month offering our stocks of discontinued motor lines at much reduced prices. All units are brand new and perfect in every respect. Topflite props are again available in the full range as we have just received a shipment direct from the U.S.A.



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The following motors are offered at much reduced prices to clear. In many cases they are below cost price. ALL POST AND PACKING FREE

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Webra Komot 3.5 c.c. BB	£6/6/-	£3/3/-
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TOPFLITE WOOD (wide blade)	11 x 4, 11 x 6, 12 x 6	3/10
4 1/2 x 3, 4 1/2 x 4, 4 1/2 x 5		1/9
7 x 4, 7 x 6, 8 x 3 1/2, 8 x 5		2/9
8 x 6, 9 x 4, 9 x 5, 10 x 3 1/2		
10 x 5, 10 x 6		
11 x 5		3/10
13 x 5 1/2		4/5
POWER PROPS WOOD (narrow blade)		
5 1/2 x 3, 6 x 3, 6 x 4, 7 x 8		2/9
7 x 9, 7 x 10 1/2, 8 x 5		
8 x 6, 8 x 8, 8 x 9, 9 x 6, 10 x 6		
TOPFLITE NYLON		
5 1/2 x 3, 5 1/2 x 4, 6 x 3, 6 x 4		2/9
7 x 4, 7 x 6		4/4
8 x 4, 8 x 6		6/5
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PRESS DATE for issue January 1962, November 28 1961

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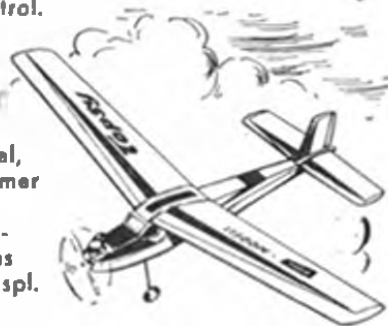
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E.D. TRANSMITTERS

Black Knight single ch.	£5 17/6	21/3
Black Prince I	£10 0/0	21/4
Black Prince 4 4 ch.	£12 0/0	43/4
Black Prince 6 6 ch.	£13 2/6	47/5
P.C.I single ch. carrier	£5 0/0	18/-

E.D. RECEIVERS

Airtrol Hard Valve 1 ch. carrier	£4 2/0	22/-
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Modulated C/W Receivers		
Black Arrow 1 1 ch.	£4 8/4	23/2
Black Arrow 4 4 ch.	£12 7/6	44/9
Black Arrow 6 6 ch.	£14 7/6	51/11
(3 1/2" x 2 1/2" x 1 1/2" - 8 oz.)		
Boomerang 1 ch. carrier	£5 7/6	18/-
Ever-Ready Factory-fresh Batteries.		

ACCESSORIES

E.D. Duramatic multi Servo	£4 11/0	13/4
E.D. Octave 8-tuned relay	£1 0/0	
Bleep Relay	£1 4/0	
E.D. Multi-channel motorised Servo Unit — in our opinion the best ever at the price	£3 0/0	10/10
E.D. Mk. II Compact Est.	£1 0/0	3/8
E.D. Mk. III Standard Est.	£1 0/0	3/8
E.D. Mk. I Clockwork Est.	£2 8/0	8/8
Siemens Relays		2/-

We can service commercially-made R/C equipment. Write for quotation with article. If you have a query we shall be pleased to advise without obligation.

FROG RISING EQUIPMENT

2 Pawl Control	35/-	6/4
4 Pawl Control	37/6	6/9
Compound Esc.	42/4	7/7
Rubber Esc.	21/-	3/10

VALVES

XFY 34, XFY 35	each	15/-
XFGI		15/-

CABLE

14-strand single cable, covered, per yard	4/6
Multi-way, 7 pairs 14-strand sheathed, per yard	2/6

SOLDERING IRONS

12-volt, battery	25/-
Main	29/6

R/C BRUKA TANKS

Designed specially for R/C flights. Telescopic feed for any position with non-return fuel feed to prevent surge.
200 c.c. — 20/4; 250 c.c. — 23/6; 100 c.c. — 27/-

REP

Unitone Tx	£9 3/0
Unitone Rx	£7 7/4
Octone Tx and Rx	£30 0/0
Sextone Tx and Rx	£31 17/3

- Parcels sent by air at cost to order.
- Orders despatched by return.
- SPECIAL ATTENTION TO REQUIREMENTS OF H.M. SERVICES. WRITE FOR DETAILS.
- Home Buyers — Orders over 30/- post free. Under, please add 2/- for p.p.

A MUST FOR R/C FLYING

16 oz. SQUEEZE TUBE For radio flyers, etc., 100% efficient. Complete with 9" Feed Tube — 2/11

RE-CHARGEABLE DEAC CELLS

1" diam. x 1/2" deep. Deliver approx. 1.5v. Easy to recharge. each 3/11

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COX Full range in stock NOW.

0.49	£3 7/0	11/10
0.15	£5 5/0	19/-
Italian Super Tigre 24 c.c.		
Type V Glo	100/-	18/1
Type V Diesel	100/-	18/1

GLO-MOTORS

D.C. Bantam 0.75	30/-	4/10
D.C. Tornado Twin	£9 19/0	33/1
Marco 29	101/4	18/3
Marco 35	101/4	18/3
Marco Multipass for R.C.	130/4	21/9
Fox 15 2.5 c.c.	70/4	
Frog Venom	50/-	8/-
Frog 0.49 RG	42/6	7/-
Eca Mk. VI C	£5 19/6	22/5

DIESELS

ETA 150 — 2.5 c.c.	101/-	18/11
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OS MAX III Multipass for R/C

A.M. 10 R/C Version	59/9	9/11
A.M. 15 R/C Version	60/-	10/-
Silver Streak Tuned	134/-	21/-
Taplin Twin	£7 7/0	25/-

A.M. 1 c.c.

A.M. 1.5 c.c.	40/-	8/11
A.M. 2.5 c.c.	56/3	10/2
A.M. 3.5 c.c.	58/10	10/8

D.C. Super Merlin

D.C. Dart Mk. II	56/-	8/7
D.C. Spitfire	46/-	7/-
E.D. "Baby" 0.46	46/-	8/4
E.D. "Bee"	44/6	8/-
E.D. "Hornet" 1.46	46/-	8/4
E.D. Super Fury 1.49	£7 4/12/10	

ETA 150

ETA 150	100/11	19/1
E.D. Hunter	66/-	11/11
E.D. Mk. IV	65/-	11/9
Heron 1 c.c.	41/-	6/3
Frog Viper 1.5 BB	72/-	13/-
Frog 80	39/6	6/6
Frog 2.49 BB modified	73/4	12/2
Frog 3.49 BB modified	73/4	12/2
Frog 3.49 PB	59/8	10/-
Frog 2.49 BB	79/-	13/6
Frog 1.49 Vib	45/9	7/2
Frog 150B	46/-	7/2
P.A.W.	72/10	13/2

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Firefly	13/6	2/3
Gazelle	14/6	3/4
Talon	21/3	1/7
Spectre	29/9	4/10
Halo	17/6	2/9
Caprice	13/6	2/3
Firefly Stunt	12/6	2/3
Gaucho	18/3	2/9
Marquis	28/3	4/3
Tiger Moth	18/3	2/9
Bandit	18/4	3/1
Cessna 170	18/4	3/1
Pacer C/L	15/-	2/6
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Southern 60	40/-	6/8
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MAGGREGOR R/C KITS

Full range available.

● MERCURY

Galahad	31/-	5/-
Cobra	24/-	4/6
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Grebe	13/4	2/6
Junior Monitor	19/6	3/2
Lightning	49/6	8/-
Marauder	14/9	2/5
Marquis	27/9	4/9
M.E. 109	24/6	4/-
Monocoupe 40	28/6	4/9
Monarch	30/-	4/10
Picador	16/6	2/9
Skyjap	28/6	4/9
Spitfire	21/3	5/1
Thunderbird	22/-	3/7
Tiger Moth	28/6	4/9
Toreador	22/4	3/8
Viper C/L	15/-	2/6

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Tutor	19/4	3/2
Nimrod	15/-	2/6
S.E. 5a	27/10	4/8
Condor	25/-	4/2
Frog 45	25/-	4/2
Gladiator Combat	24/6	4/3
Tempest	41/-	7/2
Tutor	20/6	3/5
Talisman	15/-	2/6

● VERON

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Phoenix	30/-	5/-
Bombast	20/-	3/6
Colt	23/6	4/-
Deltaceptor "Imp"	21/3	5/3
Cardinal	15/4	2/7
Deacon	28/9	4/10
Fairy	41/3	6/10
Focks Wulfs	22/-	3/8
Loachkin	26/-	4/4

Philibuster	23/6	3/11
Sea Fury	23/6	3/11
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As a result of such a large demand in response to our recent Anniversary Gift offer of a free prop with every engine bought, we are renewing it in order to give everyone a fair chance.

SO NOW IT'S THE PROP OF YOUR CHOICE FREE WITH THE ENGINE YOU BUY AND THE OFFER LASTS TO DECEMBER 31st, 1961. (State second choice when ordering)

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LINE, SOLID RUBBER, AIR TRAP, INFLATABLE. All types in stock.

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E.D. BLACK PRINCE I	
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For RADIO CONTROL
and FREE FLIGHT

Wingspan 63in.
For motors
2.5 c.c. and over

A large plane that is quite easy to build. Although designed for radio control the SUPER 60 is equally at home as a normal free flight model. £5.7.0



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This nice looking model is especially suitable for beginners as it is so easy to build and fly. It has been designed specially for .5 diesels and .8 glow motors and is capable of real contest performance. The kit contains die-cut parts for speedy and accurate assembly. Wingspan 42in. 21/6

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