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MARCH 1961

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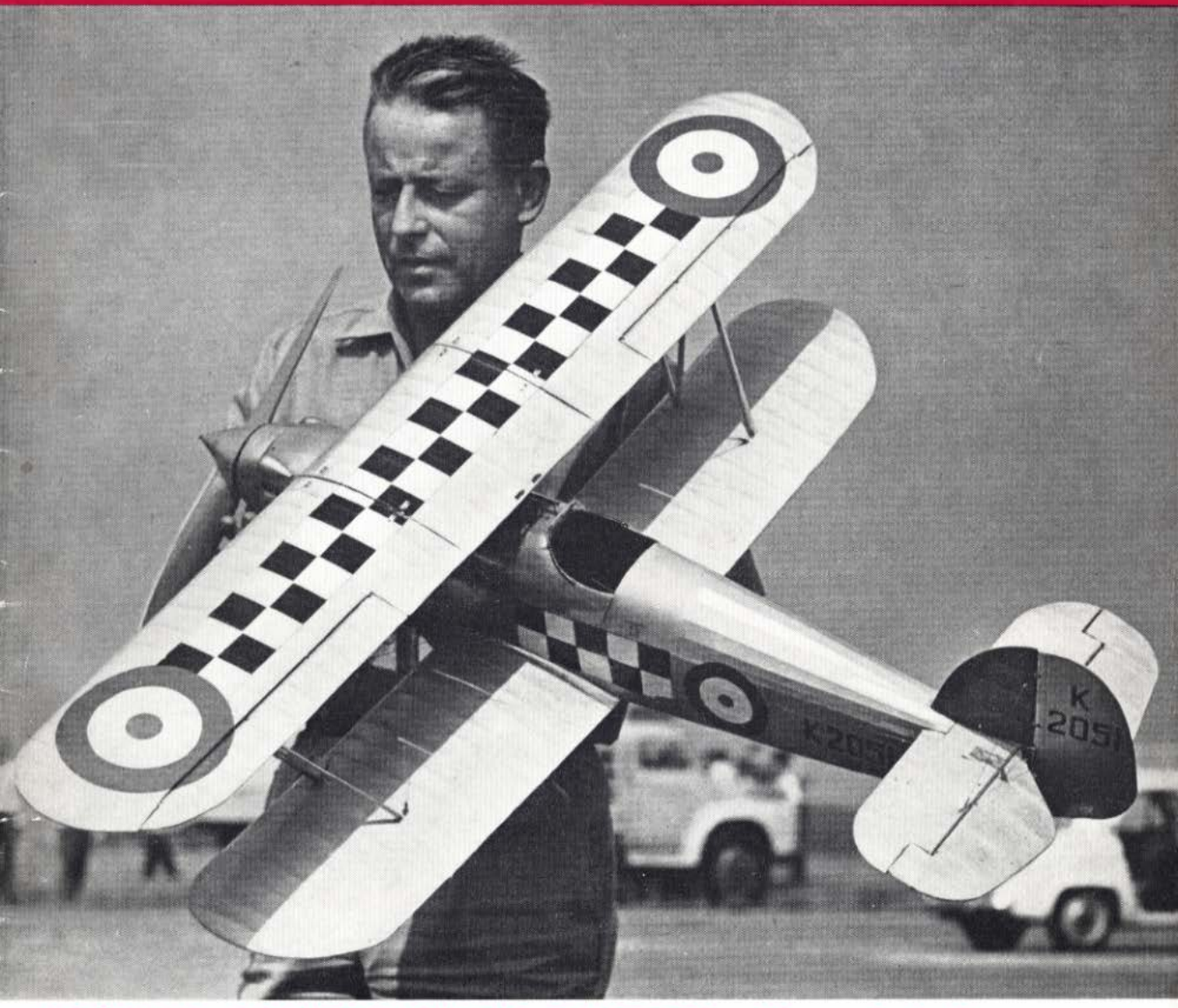

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MODEL aircraft

MARCH 1961

No. 237 VOLUME 20

The official Journal of the SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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Here and There

Control Lyon !

UNIQUE among the many distinguished visitors to the Schoolboys Exhibition at Olympia, Richard Lyon actually took up the C/L handle and flew one of the hot little Frog *Hurricane* profile models in the MODEL AIRCRAFT flying arena ! Richard confessed that it was some years since he last practised the art, but once a flyer always a flyer, and after a couple of circuits he had the *Hurricane* at his command ! It was something of an occasion in more ways than one, for on the day of his visit Richard became engaged to Miss Andrea Andreé who is seen with him examining a Keil Kraft *Snipe*, which had just landed after one of its flights.

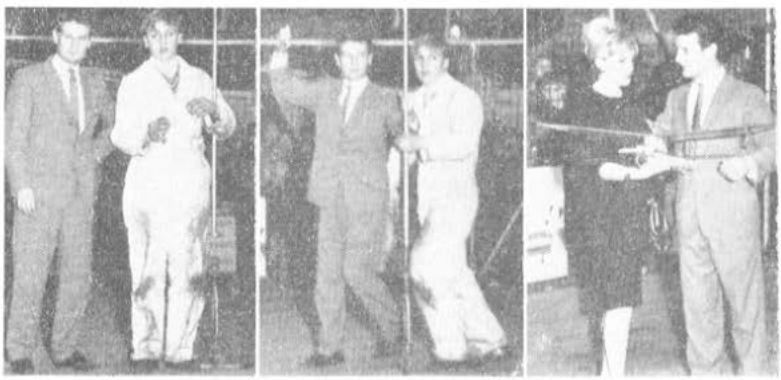
On the Cover

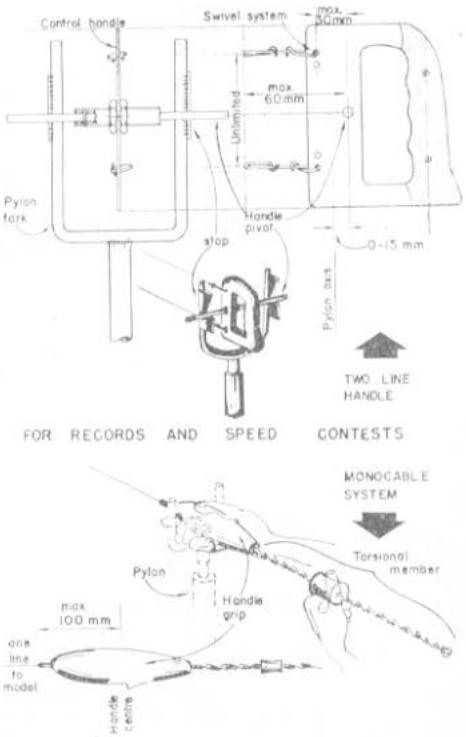
CAESAR MILANI and his beautiful C/L scale models always make good camera subjects, as this month's cover amply proves. Taken at the 1960 Nationals, Caesar is seen holding his K & B 45 powered ¼ in. scale Hawker *Fury*. The model is completely detailed, the construction closely following the prototype, with removable metal cowlings all hand beaten in a most realistic manner. The scale airscrew provides that added touch of realism which typifies a Milani model, and distinguishes them from run of the mill designs.

R/C Scale Contest

IN our October issue we published a letter from the Sutton Coldfield R/C M.F.C. suggesting that a R/C scale event would prove popular.

We now hear that this club have taken the initiative and included such a contest at their rally at R.A.F. Wellesbourne in May. See Contest Calendar for further details.





Oversight

IN spite of its being checked by three people, we managed to omit the most obvious item of information from the *Plover* plan published in our January issue—the dihedral. This is 3½ in. under each tip, the centre section being flat. We apologise to everyone who has been puzzled by the omission, and hope no one is trying to fly their *Plover* with a completely flat wing!

Historical Section

IN Club News this month will be found a brief history of one of our best known clubs, the Croydon & D.M.A.C. Each month we will publish similar histories, so if you would like details of your club to appear, just send us the necessary information, together with a club badge or transfer as an illustration, but keep it brief (about 300 words maximum) please.

F.A.I. Speed Handles

DETAILS of the officially approved handles for use in International Speed events are shown in the accompanying drawing. It will be noted that only slight modification to existing pylons will be necessary and we welcome this attempt to eliminate whipping from speed contests, although judges will have to keep a sharp eye open for the unscrupulous few who will, doubtless, still try to "lead" the model if they can get away with it.

Gala Publicity

WITH the contest season rapidly approaching, now is the time to start sending in dates for inclusion in the MODEL AIRCRAFT Contest Calendar, so as to avoid some of the unfortunate "clashes" which occurred last year.

One point which is often overlooked by rally organisers is local publicity. A lot of benefit can accrue to a club by showing residents, and particularly local councillors, that model flying is an interesting, instructive hobby and what better way to do this, than to attract them to your rally?

Attractive posters displayed in the local shops will help here and we would remind readers that the Federation of Model Aeronautical Manufacturers and Wholesalers, have available a specially prepared poster measuring 28 × 18 in., and attractively printed in three colours, with a space for the club to letter in details of the particular event.

The posters can be obtained from the Secretary, 156, Marine Parade, Leigh-on-Sea, Essex, and up to 10 will be provided free, "extras" will cost 1s. each.

Monetary Matters

WE wonder just how many members of the S.M.A.E. appreciate the fact that the amount of money their annual subscriptions bring to the society, far from covers the outgoings. Balance sheets are pretty dry reading and often completely indecipherable to the layman, so few people perusing the accounts at the A.G.M., and seeing that there was a balance in the bank of "X" pounds, appreciated that but for outside assistance to the tune of almost £800, the society would be well and truly in the red!

Last year the Society of British Aircraft Constructors contributed £500 towards the cost of financing our International competition commitments, while members of the model trade donated a further £260. If this money had not been forthcoming Great Britain would not have been able to stage the World Championships at Cranfield, or send a C/L team to Hungary, without getting hopelessly into debt.

The members of the model trade who contributed were:

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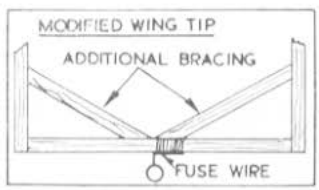


Swingin' from the Chandelier

ARTICLES from MODEL AIRCRAFT are often reproduced in overseas journals, so we were not surprised to see the plans of our little drawing room flier *Scraps* (featured in the December, 1960, issue) in the Hungarian magazine *Modellezes*. We were, however, intrigued by their r.t.p. modification, and if anyone would like to try flying their *Scraps* in this manner the drawing is self explanatory.

OVER the WAVES

The many creeks and inlets of the Cornish coast, once the haunt of wreckers and smugglers, now attract attention from a different source—aero-modellers. A. Warren describes the fun to be had with flying boats and seaplanes performing over their natural element—water.

OVER the last decade it has become increasingly difficult for aero-modellers to obtain flying space. Hardly a month passes without reference to the subject in the clubroom, the journals, and the press, with stories of the modeller being barred from parks, playing fields and aerodromes. Ideal flying sites no longer exist so it seems, but I fly in large areas sheltered from the wind, flat and clear of obstructions with no small boys tripping over the lines and no one standing in the flight circle. Impossible? Certainly not. Most of my flying is carried out over water!

At Falmouth in Cornwall, flying fields are also difficult to come by, but we are fortunate in having an abundance of sheltered creeks and many square miles of enclosed water. If you would like a change from normal C/L flying why not find a pond, or river bank and join in the fun? It is a great sport, though only in the summer! The ideal spot is a pond or creek with a depth of 18 in. and a firm bed, but as you can see from the photographs this is not always possible. Of course, it is not essential to stand in the water. Standing on the bank of the pond is in fact quite satisfactory, whipping the model back to the water if the motor cuts on the "hard" part of the circle.

My main interest has always been scale models. I freely admit that absolute performance suffers greatly due to this, but careful planning and design selection can and does eliminate many failures. The essence of consistent performance lies in strong construction of the basic airframe—the finishing touches such as pilots, cockpits, guns, etc., must take second place. My early designs ignored this policy, and consequently my models rarely flew without damage of one sort or another.

It is necessary in choosing a design to make a careful study of its obvious advantages and disadvantages from the strictly modelling angle. My own particular method is to give a great deal of thought to a particular design, searching magazines, etc., for photographs and details and generally accumulating as much information as possible. Then comes sketching, thinking, scheming and finally drawing plans, perhaps scaling them up from black silhouettes or 1/72nd scale drawings.

The method I adopted in scaling up my 72 in. wingspan *Albatross* from a small black and white silhouette may be of interest. Using an episcope, I projected the image onto a large sheet of lining paper, available from all paperhangers

The writer's 6 ft. span Grumman Albatross in the heading photograph makes an impressive sight as it skims the water during its take off run. This picture really captures the unique fascination of this neglected branch of the hobby.

Right—one engine out, the Albatross with nose high, comes round for a touch-down.

A close-up of the Albatross at rest gives a good idea of the bulk of this 9½ lb. model. The special techniques involved in the construction of water-borne models are fully discussed in this article.

in rolls 12 yd. × 22 in. at 1s. 8d. per roll. This was pinned to the wall and after having worked out the approximate size of the model, the projector was moved until the image filled the dimensions required. Then with a soft pencil I ran over the outline of the projected image. Quite satisfactory results have been achieved like this, and as regards the equipment, most A.T.C. or R.O.C. groups have an episcope which they will let you use.

When flying C/L from a boat, or standing in soft mud, it is not possible to step back quickly to regain control if the model should veer in whilst flying up wind. Therefore, it is important that the model must remain tight on the lines throughout the flight and this is effected in the design by engine offset, line rake, rudder offset and weight in the outer wing tip. Bear these points in mind and build them into the design. It is also important to trim the model with the C.G. well forward, as a nose heavy model will, through centrifugal force, tend to swing its nose out. Careful consideration of this point at the design stage will obviate the necessity to add unwanted weight—I had to add 11 oz. to the nose of my *Albatross* before it was completely safe!

The construction of float planes and flying-boats follows the normal pattern, but the use of some PVA glues must be avoided unless the machine is completely waterproof. These adhesives, although excellent for general modelling and water resistant, are not, in fact, waterproof.

Floats can be made in various ways: built up from formers and covered in sheet balsa, carved from solid blocks then hollowed out, moulded from acetate sheet or built up from a form of papier mâché. For this latter method newspapers are pulped and mixed with resin-bonded glues such as Cascomite or Aerolite. Laid in wet layers over a mould of wood (waxed with candle grease beforehand) a tough light structure results—very cheap compared with glass fibre, but not as strong.

The only design of floats I have proved to be efficient in practice are the flat bottom type, "Vee" bottom sections may be to scale and are certainly suitable for F/F models, but for C/L, where the model is flying in a circle, the "Vee" section is unsuitable. This caused headaches on my scale model of the S6B racing seaplane.

This model, powered by a Frog 500, would taxi well, but upon reaching "hump" speed, the nose would dip and the propeller shower spray over the flying surfaces. On removing the "Vee" from the floats and substituting a flat bottom the model would quickly reach top speed and skim over the water with every success and complete control at the critical moment of take off.

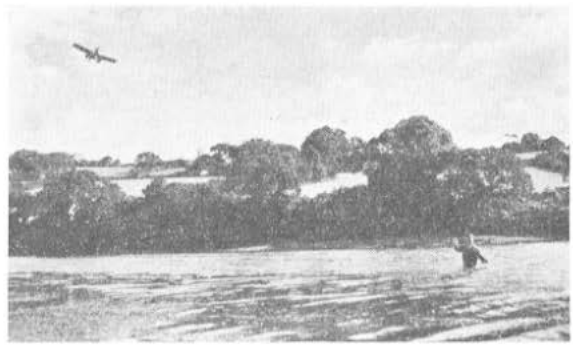
Until I built the highly successful Brandenburg *Sea Monoplane* I was unable to effect touch and go landings. Unlike a land plane, a water plane travelling at about 30 m.p.h. and touching down onto a calm, glass-like surface of water, engages about 12 sq. in. of flat suction surface, compared with the point of impact of a pair of landing wheels. Thus the immediate effect is a rapid deceleration, generally ending up in a nose over, but the low wing loading and slight over power of the Brandenburg enables me to touch and go at will with complete control.

With a large heavy model it is, of course, easier to land, as the momentum carries the machine over the critical moment of touch down. The *Albatross* weighs 9½ lb. and the touch down is fast and smooth but hard on the nerves, the slap and crunch as the model hits the water being quite unnerving.

The models I have mentioned have been flown in public displays at Falmouth, and have become one of the events at the Water Gala week. C. Badger and helpers, and myself have performed over the years with C/L models on these occasions. We have tried various methods of launching and handling models, originally from rowing boats and eventually from a specially constructed pier-like structure. In the 1958 gala we used an 8 × 8 ft. tethered raft to fly from. Unfortunately, a leak had developed in some of the buoyancy chambers at one end, causing an 8 deg. list and making it difficult to fly the models from such a sloping platform.

On this occasion the Supermarine S6B was on the programme and C. Badger was starting and launching from a small rowing boat—a system that can be dicey to say the least, with plug leads shorting out and fuel cans swishing about in the water in the bottom of the boat. Adjusting the Frog 500 to maximum revs the machine slipped from the starter's hands and severely cut his finger. This is one of the more unpleasant aspects of float plane operation. A model wet with sea water, castor oil and methanol is very difficult to hold, so a large assortment of absorbent rag is an essential part of the water flyer's equipment. Also, it must be appreciated that tools don't float. A pair of pliers placed carelessly on the gunwale of a

The enlargement of the small three-view drawings to working size, is simplified by the use of an episcope which may be borrowed from some local club or institute.



The Brandenburg in flight, with the Cornish coastline forming a picturesque backdrop. Those trees and other obstructions offer no hindrance to the aquatic modeller.

craft will disappear for ever with a plop, an oily trace marking its grave. I have lost engine parts on occasions in a similar way, while some years ago, whilst flying a MODEL AIRCRAFT *Seagull* flying-boat, it crashed into the side of an oil tanker in the shipyard, and the carburettor assembly was lost. I have found it good practice to tie the compression lever and needle valve to the bearers or some part of the model.

I have enjoyed many hours of sport flying with F/F flying-boats, ranging from a *Seagull* to a small version of the American *Seacat* with a long planing hull and powered by a 0.5 c.c. Dart. On one occasion, while flying the *Seagull* in the harbour, I knocked the rudder as I released it. Consequently, instead of its usual trim the model flew in a great circle encompassing the town. My wife happened to be at our window overlooking the harbour and was surprised to see the machine passing not 50 yd. away on its glide, only to disappear from view behind the chimney pots. I recovered the model undamaged 45 ft. above the main street after a spell of roof scaling, and this exploit was recorded in the local newspaper with great gusto.

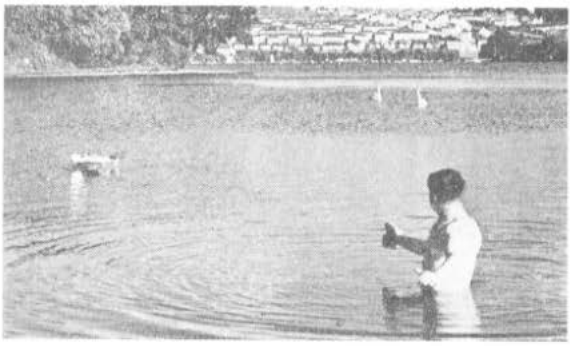
Another amusing incident happened when I flew the same *Seagull* some time later. After launching somewhat rich, the engine slowed down and the model landed heavily loosing a float on impact. Resting on the water with one wing dragging, the motor still running and a full tank, it continually turned in its own length, occasionally throwing up flurries of spray. Due to the light and dark camouflage scheme it appeared

The writer's son is seen alone with dad's beautiful Supermarine S.6.B which uses a Frog 500 for power.

from a distance that someone was struggling in the water. A harbour patrol launch saw this and I watched, with horror, as the powerful boat opened up to top speed, and made for the spot, the crew mustering forward with boathooks, etc. On arrival they hove to and watched with disgust this buzzing, flapping, contraption but having sighted me labouring up with my 1½ h.p. outboard motorboat, they waved and went on their way. I recovered my lost float and my *Seagull* and I went home.

It is necessary when operating flying-boats or float planes to ensure that they

The two swans keep their distance as the Brandenburg seaplane taxis over the calm water. Readers will appreciate from this photograph that over-water flying of this kind is a warm-weather occupation!



are waterproof, as it does not take much water to add a few extra ounces weight, and a few ounces in the wrong place can make a tremendous difference to a model's handling. Plugs and drain holes are therefore essential. Drilling holes in the dorsal surface and fitting rubber drain plugs is satisfactory, but the screw cap from a toothpaste tube is most effective. Remove the male part of the tube, with some of the tube itself, fix this firmly into the hole so that the screw part just protrudes, screw on the cap and you have a perfect watertight drain plug.

As in all public displays two or three in a circle attract all the interest and we have flown in this manner on a number of occasions using normal stunt models. The effect of swooping and low flying over water is very thrilling to the spectators and it is possible to fly a "straight" stunt model quite successfully over water without floats. The actual flying pattern is unaltered, only the landing is different, but with practice, and holding off until the last moment before allowing the model to splash gently onto the water, then careful reeling in, one can be airborne again in a matter of moments. If you are unlucky enough to "ditch" it is usually a simple matter to get dried out.

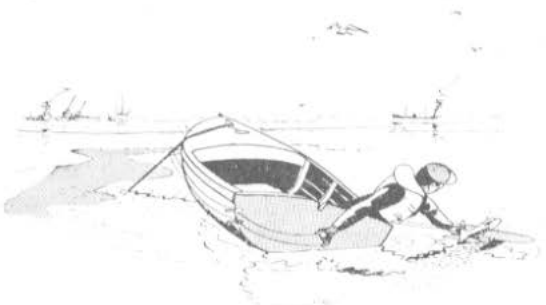
In the early days of C/L I have seen a flyer strip a Frog 100 right down after ditching, but in general practice it is unnecessary to go to this trouble. A good blow through the exhaust ports will shift quite a lot of water, then by turning the motor over and continuing to blow through the ports the rest of the moisture can be removed quite easily. A squirt of fuel into the ports, a little more flicking and blowing and generally the motor will start, emitting a sludgy emulsion of oil and water until it runs steadily. Sometimes it is necessary to empty the tank if this contains traces of water, but apart from this a thorough shaking and wiping down is all that is necessary.

After all sessions of water flying I merely give the engines a full tank run on the bench, followed by a good wipe down with an oily rag and this seems to be all that is necessary to keep them in reasonable order. The small size of polythene bags comes in useful here, one over each engine attached with an elastic band and the motor is safe from dust and moisture.

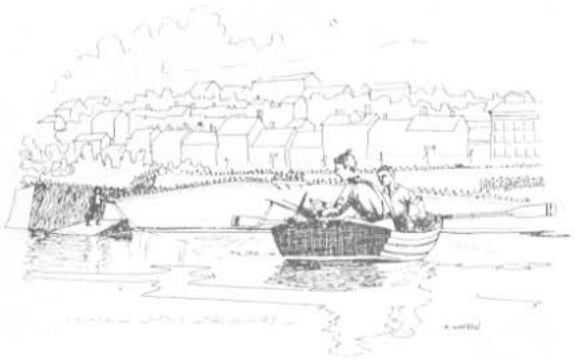
Lines also require some attention after use. Dry well and run down the lines with an oily rag. Tinned lines *will* rust in salt water but are more resistant than uncoated lines. I store my lines wound round syrup tins, securing them with rubber bands cut from a bicycle inner tube as these bands are more resistant to oil, etc. After securing I rub oil liberally over the lines and wrap them in polythene.

A floating C/L handle is an asset in shallow water as the lines can be laid out in the normal manner from the model and run through your fingers as you make for the centre after starting the engine.

Normally the methods of launching and operation can be graded into four main groups. (1) hand launch from boat or shore, (2) R.O.W. helper release from boat or shore, (3) wind lines about boat, (4) single-handed release. (1) and (2) are generally the best, the flier standing in shallow water with the helper standing



The fact that you may be a lone hand need be no handicap, since the model can be launched by carefully laying out the lines around a dinghy as shown on the right.



Falmouth Water Gala week, and a model demonstration in progress. On this occasion the 8 ft. square raft from which the models were flown, developed an 8 deg. list which increased the already numerous difficulties of the fliers.

on dry land, or the flier standing in a boat anchored a line's length from the shore. Winding the lines about the boat is only recommended for use in deep water and is not a very satisfactory method so is best avoided if possible.

For a single-handed launch one can either use a "stooge" release with a separate line to disengage the model, or double the lines round a pole firmly fixed in the river bed half the line distance from the pilot. The pilot starts and holds both model and handle and when released the model will taxi around the pole before entering its full radius to take off. Both these methods are, of course, successfully used on land for normal C/L flying.

A few points on finish may be of some interest. Covering and doping must be carried out thoroughly and it is advisable to dope or banana oil the whole airframe before covering. Three coats of dope should be applied to the covering before painting, which can be carried out with oil or synthetic paints. I have painted many models in oil paints as opposed to cellulose, as they are more easily applied, this is also true of Valspar and other fast drying enamels.

For 1914/18 models I make my own colours from ordinary decorators' non-lead undercoats mixed with oil colours or white and thinned with turps sub. The disadvantage to this is in the event of tissue patching being necessary, as although synthetic enamel or oil paint can be applied over cellulose (clear dope, etc.), cellulose *cannot* be applied over oil and synthetic paints.

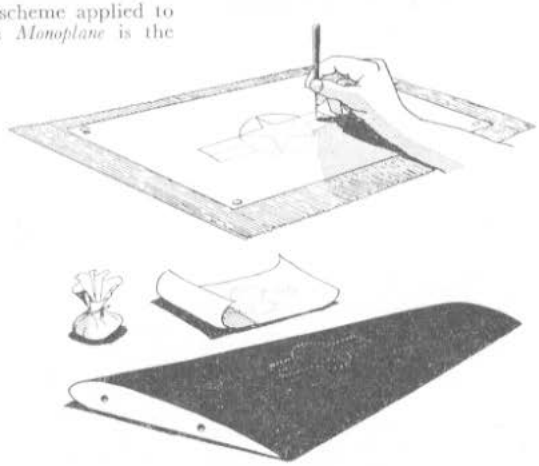
The actual colour scheme applied to the Brandenburg *Sea Monoplane* is the regular hexagonal pattern and this was effected by the simple method of marking by a "pounce" operation.

A pattern of hexagons are marked in pencil on stiff paper approximately the chord of the wing. Then placing the paper over a sheet of corrugated cardboard, prick the entire pattern with the point of a compass or a large pin. Place the pattern over the wing which has been prepared in one of the dark colours of the camouflage pattern and is now dry. Make a little linen bag containing a small quantity of powdered whiting or powdered chalk dust and with a dabbing motion dab the entire pattern onto the wing.

When the operation is complete lift carefully from the surface and a pattern of little white dots about ½ in. apart will faithfully reproduce the hexagonal pattern, blow lightly to remove surplus chalk and all that remains is to paint the pattern with a lettering brush. A square chisel end brush will be most satisfactory for many marking out jobs especially roundels, insignias, lines, etc.

My next model, a 6 ft. wingspan replica of the Martin *Marlin*, will have a dark blue finish and its American markings will be marked out in this manner. In this machine I hope to embody all the virtues, and none of the vices, that have become apparent from my experiences with the *Albatross*.

The future? After I have finished the 17 ft. cabin cruiser I am building, I shall have more time to think and plan, but until then I shall from time to time fly the Brandenburg and the *Albatross*. Who knows, when you are on holiday in this part of the Cornish Riviera you may spot me, if so, come along, have a chat and join in the fun.



A novel method of marking out patterns on models is described on this page. The process illustrated on the right shows at the top a design being pricked out; centre, linen bag of chalk and completed stencil; and below this the design transferred to a wing ready for painting.

Here is a method of single handed launching if no boat is available. The stake around which the lines pass can be seen in the upper right hand corner of the photograph.

Turn to page 74 for plans and building instructions of A. Warren's Brandenburg *Sea Monoplane*.

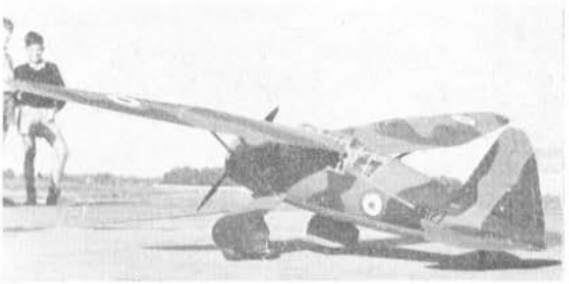
ROVING REPORT

Brings you up to date with the latest world model news

A LITTLE over three years ago, M.A. carried an account of the then newly instituted American R/C event: closed-circuit pylon racing, including details from Keith Storey of his Oliver powered *Gold Rush of 57*, the winning entry in the 1957 contest.

Pylon racing has come a long way since that time and Storey's latest model, *Gold Rush III*, gives us a foretaste of what the next year or two may have in store. *Gold Rush III*, a sleek low-wing job on scale racer lines, won the pylon event at the 1960 LARKS meeting. It has a moulded fibreglass fuselage, coupled aileron and rudder control for improved pylon turns and a retractable undercarriage.

With engine size limited to 0.19 cu. in. maximum (*Gold Rush III* uses a McCoy 19) a really practical retractable U/C is an obvious aid to higher performance. Storey's undercarriage is wing mounted and retracts inwards into wells in the wing root. It is, of course, fully operative; retracting after take-off and extending again for landing. *Gold Rush III's* average speed for the five laps of the one-fifth mile course was just over 43 m.p.h., nearly 20 m.p.h. faster than the 1957 Nats winning speed. Remember, these models are timed from a standing start take-off and have to make 10 pylon turns. They actually cover quite a bit more than a mile in making those pylon turns and their actual straight and level speed capability may be very nearly double the recorded race speeds.



Fine 5-ft. span F/F Lysander designed and built by Eugeniusz Poniatowski, of Stupsk, Poland. Model powered by Polish Jaskolka 2.5 diesel.

* * *

With Ed Johnson offering ready-built *Orions* complete with Orbit equipment and Torpedo 45 motor, at £150, we are reminded of other offers of models for moneyed types, such as ready-made *Astro-Hogs* in the U.S. ($130 with O.S. Max 35 but less all R/C gear) and, currently available, Polk's *Oakie*, a .09 powered 4 ft. high wing cabin model, equipped with rudder and elevator control at $149.95 (approximately £53 11s.) including transmitter.

Radio equipment supplied with this model is interesting. The receiver is a semi-transistorised single channel working on 22½ volts HT and is wired to a Quad-Trol selective escapement which is, in effect, a pair of compound escapements and is capable of giving rudder and elevator control (self neutralising) plus motor control. To match the Quad-Trol, there is a control-box for the transmitter called the Code-a-Matic. This has stick control for up, down, left and right, plus a separate throttle button and is mounted direct to the front of the Tx case.

* * *

Aimed at providing high quality multi-channel R/C at considerably less than usual cost, is a new eight-channel simultaneous receiver by World Engines Inc., of Cincinnati. This set is available in kit form at $49.95 or at $69.45 ready assembled. Most American eight-channel receivers cost upwards of $100. World Engines' eight-channel weighs 8½ oz. complete in metal case measuring 3¼ × 2¼ × 2 in. It employs a printed circuit, operates on 45 volts HT and 1½ LT and uses three transistors plus one XFY-43 valve. Appropriately enough, coming from a firm with connections all over the world, this receiver, though designed by an American (former U.S. Nats winner Jack Port of Controlaire) has quite an

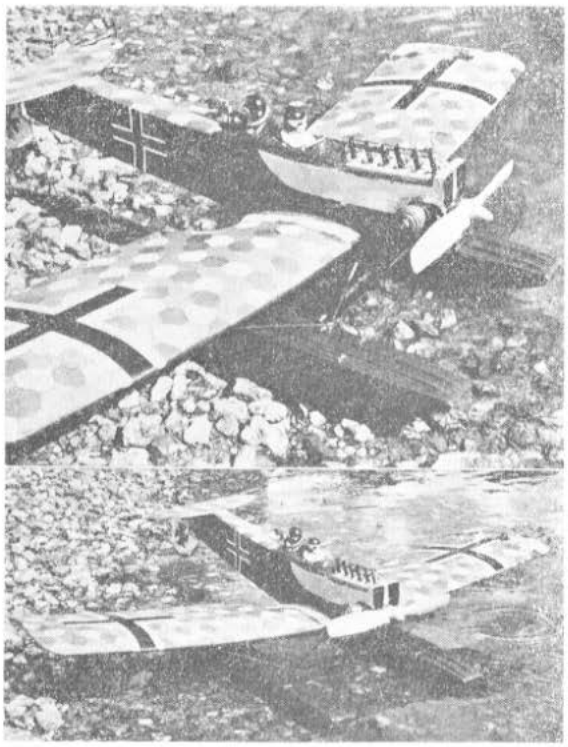
Continued on page 80

Above: Keith Hoover is seen with his latest high-thrust line low-wing model. Keith's latest experiments include fibreglass fuselages and he tells us that an H.T.L. F.A.I. model is in the offing.

Right: smartly decorated Fox powered Noblers were 1st and 2nd in 1960 German Nationals. Here is Udo Doering with his 2nd place winner.

Below: Yoshiro Enya, one of the Enya engine manufacturing brothers, built this little R/C model for British E.D. radio equipment and Enya 0.06 diesel.

The BRANDENBURG *SEA MONOPLANE*



A simple to construct, easy to fly, scale control-line Seaplane for 2.5 c.c. motors

Designed by A. WARREN

THE Brandenburg was chosen as suitable for a scale float 'plane control-liner, because of its close resemblance to the conventional sport C/L type of layout. It is a proven flyer, capable of being handled by a novice, the control being extremely smooth—almost giving the impression of an ability to fly "hands off." The original was powered by a Taifun Rasant 2.49, although with any motor of about this power it will fly on 50 ft. lines in a wind, and will hold a 60 deg. bank on a 9 × 6 nylon airscrew.

Building Instructions

Start by cutting the fuselage formers, F.1, 2, and 3 from ¼ in. soft balsa, cut one F.1 from 1/32 in. plywood and cement the ply former to the balsa one to form the fire-wall. Cut two complete fuselage sides from 1/16 in. balsa sheet, make two ply side pieces as shown on the plan, cement these to the insides and add the ¼ in. sq. bracing. When dry, mount the three formers upright onto one of the fuselage sides and cement the other side in place to form a box-like structure. Hold in place with rubber bands until dry, then chamfer the bracing pieces at the rear and pull and cement the sides together.

Slide the pre-drilled engine bearers into position and cement, the longest one being on the bottom to form the base for the bell crank. Fit the tank and bell crank assembly in place leading the 16 S.W.G. push rod out through the slot at the rear of the fuselage.

Cut the tailplane and elevators to shape, sand to section, bind and cement the hinges in place, fit the control horn, and cement the assembly to the model, truing up with a set square.

Bend the 16 S.W.G. piano wire float struts to shape, bind the assembly into position on the engine bearers and cement well, then bind and cement the plywood squares to the float ends of the struts. This completes the basic fuselage.

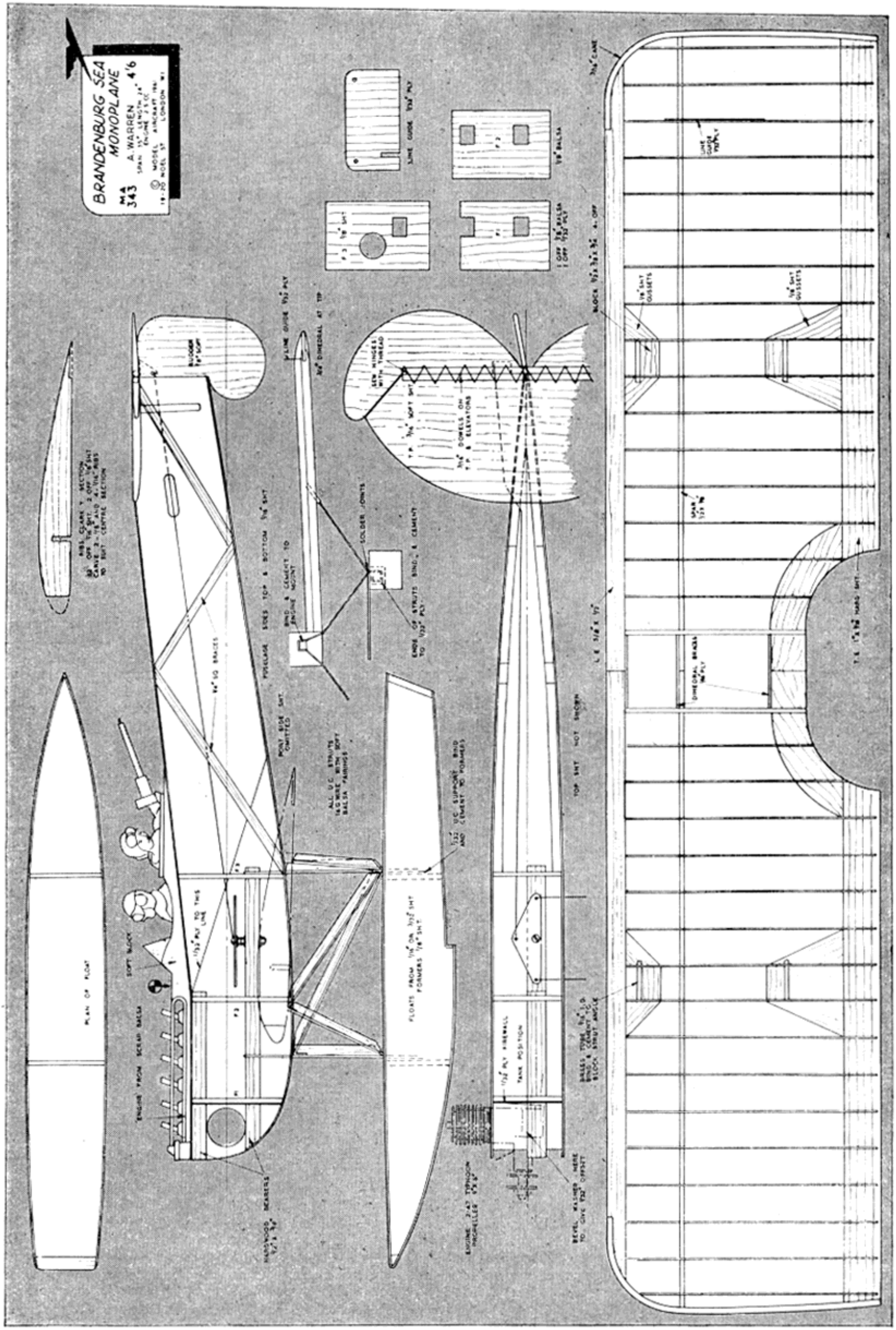
Now cut four float sides and formers, and cement together to form the two floats. Add the bottoms of the floats and when dry cement the struts onto the float formers, lining up the floats before the cement sets. Finally add the float tops, sand, seal, and cover with tissue.

The wings are built in one piece in the usual way, then cut in half, leaving the stub ends of the L.E. and spars to cement into the fuselage before adding the plywood braces. It is easier to cover and dope the wings before cementing into the fuselage, also they can be pinned down to prevent warps as the dope dries.

Solder the remaining struts onto the floats then locate and solder them into the wings. Care must be taken not to ignite the doped tissue with the hot soldering iron. Now check that the whole machine is true and correctly aligned, then add the finishing touches—dummy engine, pilots, etc. The balsa fairings can be fixed to the piano wire struts with any of the proprietary brands of contact adhesive.

When the model is complete, sand, seal and finish in the Navy hexagonal pattern camouflage on the upper surfaces. These regular hexagons are of blue, grey/green and variations of these colours, while the floats and under surfaces are olive green. Black crosses of the 1918 pattern can be painted on the top and bottom of the wings and the under fin is white with a black cross. The forward engine casing can either be made from aluminium foil stuck to the finished model as with my original, or painted with aluminium paint.

Of the flying, little need be said. The machine will take off from water with ease, touch and go landings can be made, while with the pilots and parabellum gun silhouetted against the sky, it is a thrill to fly.


BRANDENBURG SEA MONOPLANE
A. WARREN
MA 343
4'6
PLAN OF FLOAT
ENGINE FROM SCRAP BALSA
SOFT BLOCK
FLOATS FROM 1/16" OR 3/32" SHT. FORMERS 1/8" SHT.
TOP SHT. NOT SHOWN
SOLDER JOINTS
TANK POSITION

TOPICAL TWISTS

by PYLONIUS

Torquing Point

We have gravely misjudged the experts. You can cleanse your nasty little minds of all those wicked rumours about secret supplies of super power rubber strip. The wholesome truth is that the expert uses the same rubber that you can buy over any model shop counter. It is only that he selects it with a little more care.

Now when getting your six yards of ¼ in. strip off the reel suspended over the radiator you should ask, with a knowledgeable air, what vintage it is. Not that this would be wise, as the proprietor would take this to be a cheap jibe at the age of the wretched stuff, and surlily reply that it had only been hanging up there for a year or two.

But, in the selection of rubber strip any connoisseur will tell you that it is only the vintage year stuff that has the real kick. Wherever experts meet, you will hear them wax eloquent on the glories of late '58 Dunlop and early '59 Pirelli. But you won't see them sniffing delicately at the bouquet; they'll all be pounding away with their torque meters, the only way by which the excellence of the product can be judged.

These experts, testing motor after motor in their garrets, must lead a very lonely existence, but, as they say—"you're never alone with a strand."

Talking Shop

In this country it is popularly conceded that aeromodelling is kid's stuff. You can fool around with bats and balls until you trip over your ancient beard and no one will question the maturity of your actions, but you only have to be seen within 10 yards of a model plane to bring into play the cynically lifting eyebrow and the dubiously nodding head. The odd fact is, though, that one of the rarest sights to be seen, outside of an advertising page, is that of a small boy romping in the park with his little model plane.

For some reason, known only to aeronautical science, small boys do not seem able to operate the toy plane with the same facility that gives them such mastery over the model railway and round the pond watercraft. You would think that to an air-conscious, child doting public this state of affairs would be alarming. Not a bit of it. By some miracle of mass hypnosis they see our parks and open spaces simply swarming with model flying toddlers, and woe betide any misguided adult who dares to join the phantom hordes with his miniature flying craft.

Happily there are times when the layman comes down to the same earth from which the toy planes never venture. Full of confidence in the ability of 1961 science to appease Space Cadet's thirst for air power, he breezes into the toy shop for the latest flying thing in plastic. He then learns the full, sad story, through a dismal parade of ancient wood and paper kits. "What! No plastic push-button toy planes, in this day and age?"

In a much chastened mood he might even be tempted to buy one of these do-it-yourself relics. "Just to knock together for the lad, you know." Now, at this point, according to all the best fairy tales, another aeromodeller is born.

However, what actually happens in the big bad world of reality, according to statistics and the starkness of our airfields, is that dad runs out of elastoplast somewhere between the sixth and tenth fuselage formers. In certain kits he just runs out of balsa.

But this might not be such a bad thing after all. Kits are like Chinese puzzles; if they were made too easy they would lose their value. Just think of the frightful state of affairs if every kit which was sold evolved through to the airborne state. Our open spaces would be absolute chaos, with every Dad and Sonny fighting for launching space. Model flying would become a national peril. There might even be public "Ban the Model" demonstrations, with marchers lying across the approaches to Chobham Common.

So you see, its a jolly good thing that the kit makers provide the necessary safeguards. Indeed, one of the most effective is provided for them. All the best balsa is now required for industrial packing; leaving only the cheese and mahogany grades to go into the coloured boxes. Very few kit buyers have the good sense to obtain a crate of nitric acid to go with their purchase, and are left with the problem of cutting 60 assorted formers and ribs from a 6 in. × 3 in. sheet of toughened balsa.

In certain obstinate cases the project is carried through to completion, and the stage is set for the first exciting park outing, the sort of typical family romp that I witnessed the other day. Dad hadn't made such a bad job of the super stunt model. No doubt some Gold Trophy type could have handled the monster, but it was extremely doubtful if six-year-old Sonny, who was hanging hopefully on to the handle, could have kept the brute in check. Fortunately, Dad's ideas on engine starting were as timid as they were futile, and the finer points of my private set of aerodynamic calculations on the rate of ascent, per foot, per sonny, were never verified.

Had Dad had the good sense to join a model club all would have been different. For one thing, he wouldn't have taken home the model in one piece—not after the club "experts" had been to work on it.

Free as the Air

Come to think of it, you could compile quite an interesting dossier on the fate of our former flying fields—a whole history of lost causes. Then, some day, when long in the beard, and too senile to chase model planes any longer, even if there was anywhere left to fly them, you could take your grandchildren on the Grand Tour. That was a fine flying field, you would say, pointing to an already crumbling council estate, and you might wax nostalgic over the sunny days you spent on the site of that atomic power station.

With the latest casualty, however, you would be well advised to maintain a tactful silence, for the take over is for an open prison. Most people regard model flying as an arrested form of development, anyway, so the change will not likely evoke much comment. Of course, some disgruntled modeller might ask just who is losing their freedom, but as modellers are also regarded as a social menace the general hope will be that stone breaking makes less noise than model engine revving.

In Brief

In these polysyllabic times gadgets and social groups equip themselves with such ponderous titles that, in the interest of modern space economy, we know them only by their initials. For instance, we are first asked to use a plastic washer of P.T.F.E., and before we are halfway through this puzzle we are called upon to tackle the intricacies of U.S.A.C.

Well, I believe in taking these problems in life one at a time, so leaving the first conundrum to the technical boys, I concentrated my meagre resources on the enigma of U.S.A.C.

Now, all we know about U.S.A.C., is that it flourishes in the south of England, and has strong connections with barbecues and model flying. At this point we might take the first two letters to mean either "United States" or "Unlimited Stuffing," but we still have to solve the mystery of the post gastronomic model flying workout.

Possibly it has to do with one of those nature cure cults, popular in the States, but thankfully rare over here. You can well imagine the eruptive state of the digestive system after gorging yourself into a state of stupefaction. In search of relief you'd leave no medicine bottle unturned, and wrack your fevered mind in search of the name of the stuff that brought such instant relief in the telly advert.

Now, the Americans, with a long tradition of barbecue binges and bilious awakenings behind them, have long exhausted all the telly tummy cures which we find so irresistible, and it's not improbable that a sect has sprung up which passionately believes a bout of hectic model flying to be the panacea of all digestive ills.

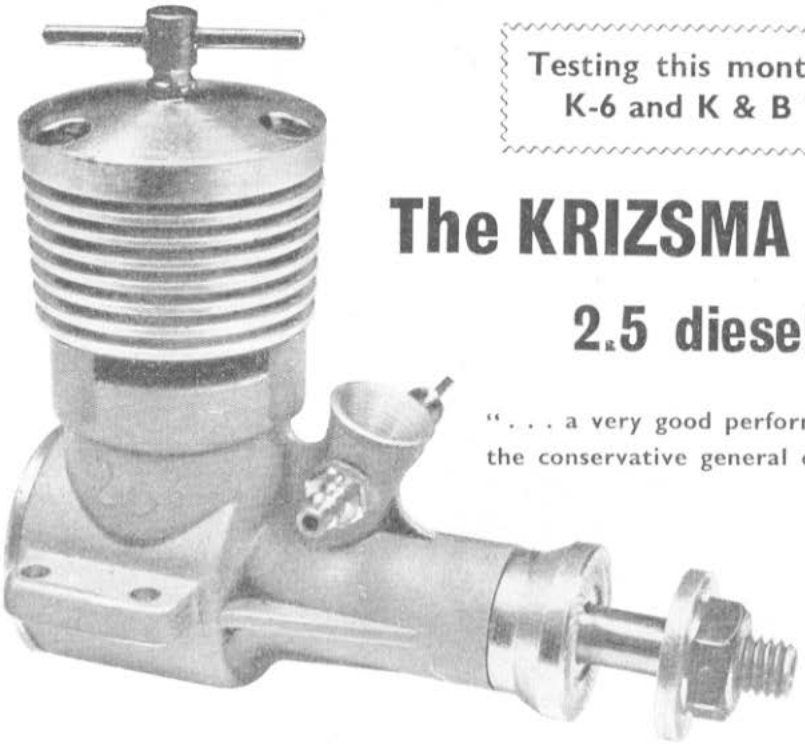
The early a.m. ceremony begins with the ceremonious blurping of engines and ends, no doubt, with a general pardon. What about Universal Stomach Acidity Cure?

(What about United Southern Aeromodelling Clubs?—Ed.)

Testing this month—the Krizsma K-6 and K & B Tornado .049

The KRIZSMA RECORD K-6

2.5 diesel motor



"... a very good performance having regard to the conservative general design ..."

TEN examples of the new Hungarian Krizsma Record engines were seen at Cranfield last year for the World Power Championships. They were used exclusively and to good effect, by the Hungarian and Polish teams. Two models are currently available: the K-6, which is the subject of our present report, and the K-8, a ball-bearing version of the same motor.

Unlike the special MOKI engines constructed, at the official state model research institute, especially for international contest work, the Record engines are a "production" item available to the "ordinary" modeller. They are not, however, to be confused with previous examples of Hungarian production motors seen in the United Kingdom; they are to an altogether higher standard of construction and are comparable, in this respect, with some of the best engines produced in the western countries.

The Record K-6 is assembled around a very well executed pressure diecast crankcase and bearing unit, with bronze main bearing bush. The crankshaft is unhardened but finely finished and has a 9 mm. dia. journal with 5.5 mm. dia. gas passage and circular valve port giving the quite conservative induction timing of 60 deg. ABDC to 30 deg. ATDC. The shaft has a tapered section in front of the journal, to which is fitted a machined alloy driving hub and beyond which the shaft steps down to 6 mm. to receive the prop.

The cylinder drops into the top of the crankcase and is located by a narrow annular seating in the latter. It is held down by three long screws, threading into lugs cast on the outside of the case, which pass through the machined alloy cooling barrel. This barrel, incidentally, is an excellent close fit around the upper part of the cylinder—sufficiently close on our engine, in fact, to require heating before it could be removed. This suggests better than average heat transference for this type of construction and may well account for the low level of power loss with warming up, experienced during tests.

The 360 deg. cylinder porting system resembles that of the Schlosser 2.5 and Webra Mach-1, and consists of six deep internal flutes below three exhaust slits. Minimum cylinder wall thickness is 0.058 in. The piston and connecting-rod quite closely resemble those of the Schlosser and consist of a fairly heavy, conical crowned piston with pressed-in gudgeon-pin and machined alloy connecting rod.

Workmanship throughout is to a high standard with good internal fits and finishes and an attractive external appearance.

Specification

Type: Single-cylinder, air-cooled, reverse-flow scavenged, two-stroke cycle, compression ignition. Crankshaft type rotary-valve induction. Conical crown piston and matching contra-piston.

Bore: 15 mm. (0.5905 in.). Stroke: 14 mm. (0.5512 in.).

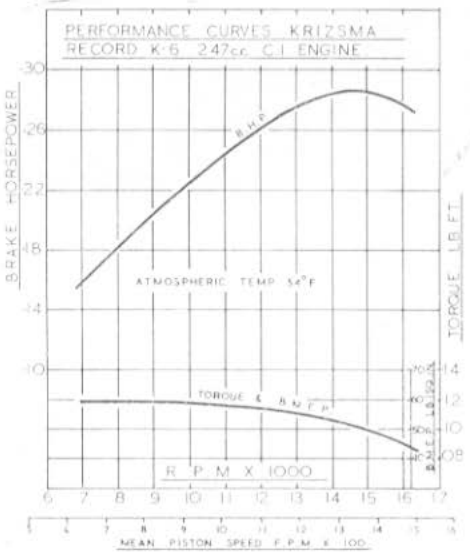
Swept Volume: 2.474 c.c. (0.151 cu in.).

Stroke/Bore Ratio: 0.933 : 1.

Weight: 4.7 oz.

General Structural Data

Pressure diecast aluminium alloy crankcase and main bearing unit with bronze bush. Screw-in machined alloy rear cover. Non-hardened, non-counterbalanced, disc-web crankshaft with 9 mm. (0.354 in.) dia. journal and 5 mm. (0.197 in.) dia. crankpin. Hardened and ground cylinder axially positioned by seating within crankcase



casting and encased by machined alloy finned cooling barrel and head unit. Entire cylinder assembly secured to casting with three long screws. Lapped cast-iron piston with pressed-in 4 mm. (0.157 in.) dia. gudgeon-pin and machined duralumin connecting-rod. Machined duralumin prop driver fitted to taper on crankshaft. Reversible brass spraybar type needle-valve assembly. Beam mounting lugs.

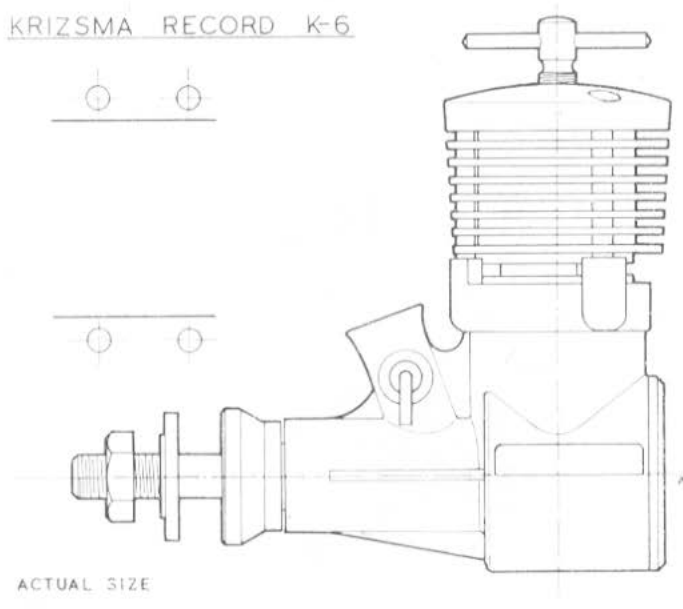
Test Engine Data

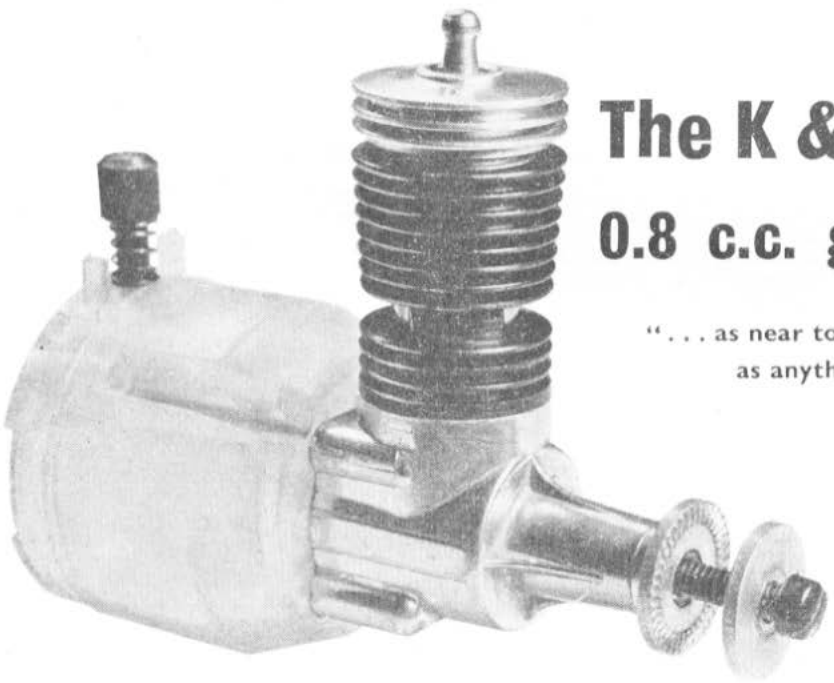
Running time prior to test: 2 hours.
Fuel used: KK-Record Powerplus Diesel. (Castor base, 4 per cent. nitrate.)

Performance

On the basis of its bare technical specification, one would not expect the Record K-6 to be of more than average performance, with an output of, perhaps, around 0.25 b.h.p. at 13,500-14,000 r.p.m. In fact, the figures obtained for the K-6 on test were appreciably up on this estimate, as our performance curves indicate.

Continued on page 80





The K & B TORNADO

0.8 c.c. glo-plug motor

"... as near to the ideal beginner's engine as anything yet offered ..."

FROM time to time, an engine is received for test which, in some particular way, proves outstanding, perhaps to the extent of setting a new standard for subsequent comparison.

Such an engine was the K & B Tornado 049, for, out of the hundreds of model engines which we have handled, we have never encountered one which is simpler to start than this American 0.8 c.c. glow motor. In fact, we are sorely tempted to suggest that this engine could justly claim to be the world's easiest flick-starting model engine to date. Certainly it is just as quick starting as the better starter-equipped beginners' engines.

Only by reason of its inherent easy starting qualities, in fact, did the Tornado 049 get into production at all. The engine was designed, not for the general model market, but to a rigid specification laid down by the Aurora Plastics Corporation, who wanted an engine for their then impending entry into the ready-to-fly toy field: an engine that could be guaranteed to respond to totally inexpert handling without the aid of starting devices. It was only after the engine had been built in several tens of thousands for these plastic models and after the K & B Allyn Company had become the K & B Manufacturing Corporation and a subsidiary of the Aurora Plastics Corporation, that the Tornado 049 was released as a separately available item for the model market at the end of April last year.

One may ask, at this point, what is the particular brand of magic that makes this such an easy starter. Obviously, there are several factors which are conducive to easy starting in any model engine: good piston seal, suitable cylinder port design, etc., but if any one feature of the Tornado 049 requires special mention, it is the system of intake valving used. This, known as "Flex-

O-Valve" is a variation on the reed-valve principle and, like the reed-valve, is operated by crankcase depression and compression as the piston reciprocates. Construction, however, is quite different.

As on a number of small American glow engines produced during recent years, notably the Cox "Pee-Wee" and "Bee" and more lately, certain revised Herkimer Cub models, a self-contained fuel unit is employed, comprising tank, carburettor, induction tube and admission valve. In the Tornado, the body of the unit is moulded in two parts from a special material, 100 per cent. inert to all fuels, similar in appearance to nylon but having a higher tensile strength, and better resistance to heat. The rear part, or backplate, carries the needle-valve in an inserted brass bush. This is joined to the front, or tank section which carries an induction tube through its centre, emerging in a central boss at the front which plugs into the rear of the engine crankcase. This boss carries the valve parts, consisting of a perforated aluminium disc, the valve diaphragm and a keeper. The disc forms the valve seat and has five $\frac{1}{16}$ in. dia. ports spaced around a shallow cone in the centre. The valve diaphragm is of a plastic material, 3 thou. thick, with an aluminium rim and has a 7/64 in. dia. hole in its centre. This hole is sealed by the conical centre of the valve seat when crankcase pressure is positive, the diaphragm sealing off the five small ports at the same time. When crankcase depression draws the diaphragm away from the seat, fuel mixture is admitted through the ports in the valve seat and thence through the hole in the centre of the diaphragm.

The remaining parts of the engine are fairly representative of modern U.S. small engine practice and are detailed below.

Parts of the Tornado motor—note the huge, by general standards, integral fuel tank with the induction valve parts.

Specification

Type: Single-cylinder, air-cooled, reverse-flow scavenged, two-stroke cycle, glowplug ignition. Automatic diaphragm valve induction. Flat crown piston.

Bore: 0.400 in. Stroke: 0.394 in.

Swept Volume: 0.0495 cu. in. = 0.818 c.c.

Stroke/Bore Ratio: 0.985 : 1.

Weight: 1.7 oz. including integral fuel tank.

General Structural Data

Pressure diecast aluminium alloy crankcase with plain unbushed main bearing. Hardened, counterbalanced pattern crankshaft, with two 7/32 in. dia. journals, 7/64 in. dia. crankpin and splined and internally threaded at front to receive alloy prop driver and prop retaining screw. Hardened steel connecting-rod, ball-jointed to hardened skirt piston via swaged socket in underside of piston head. Blued steel cylinder with integral fins, twin opposed exhaust ports and single internal transfer flute and screwed into crankcase. Alloy screw-in cylinder head with integral glow filament. Translucent, large capacity moulded fuel tank and backplate unit with integral carburettor unit and intake valve assembly and secured to crankcase with four screws. Four-point bulkhead type mounting via fuel tank.

Test Engine Data

Running time prior to test: 1 hour.

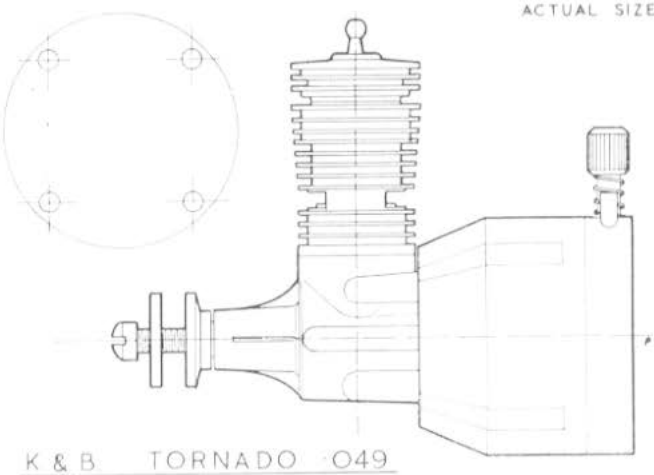
Fuel used: KK-Record Super-Nitrex (30 per cent. nitromethane).

Performance

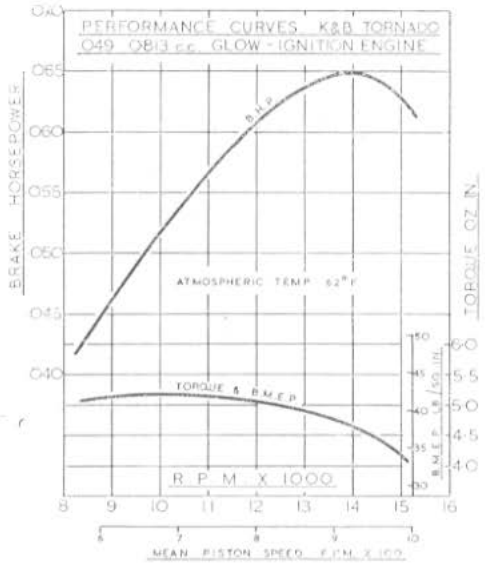
Some indication of the remarkable starting qualities of the Tornado will be apparent when we mention that, after setting up this engine for the first time, priming it and connecting the battery leads, it started on the very first flick of the prop. This ease of starting continued throughout the following tests. For hot restarts it was not even necessary to choke the intake (which, incidentally, is fortunate, since it is not too easy to seal off the narrow intake channel in the backplate), a single flick being all that was necessary to get the motor into its stride again.

On some props it was found that, if the needle was closed down too far, the motor would begin to slow, then cut abruptly before the needle could be opened up again. On props best matched to the engine output however, such as the Top Flite 6 × 4, this did not occur. The only other slight bother experienced

ACTUAL SIZE



K & B TORNADO 049



(one common to most non-rotary valve engines especially on light loads) was a tendency to start in the reverse direction. This could be counteracted by stopping the motor and flicking the prop the other way.

Torque tests of the Tornado revealed an output appreciably exceeding that generally associated with beginner class Half-A models and a maximum of just under 0.065 b.h.p. at 14,000 r.p.m. was recorded using Record Super-Nitrex. A high nitromethane content fuel is specified for the engine and Super-Nitrex was chosen as being the nearest British equivalent to the K & B Supersonic 1000 recommended. This, of course, gives a slightly flattering comparison with the performance of recently tested British 049's using medium nitro content fuels. Brief checks of the Tornado indicated that, on these latter fuels, the Tornado's output would drop to about 0.058 b.h.p.—which, however, is still above average.

To sum up, we would rate this as near to the ideal beginner's engine as anything yet offered anywhere and wonderful value at its U.S. price of $3.95.

Power/Weight Ratio (as tested): 0.61 b.h.p./lb.

Specific Output (as tested): 80 b.h.p./litre.

KRIZSMA K-6 TEST

Continued from page 78

General handling characteristics were normal and satisfactory. A preliminary examination of the cylinder and piston of our K-6 revealed that it had obviously received no more than a brief check run before reaching our hands, but no extensive running-in proved necessary. There was very little evidence of loss of power on warming-up (which is common to most diesels, particularly at moderate speeds, even when well run-in).

Starting was quite easy, the K-6 requiring a port prime from cold, but restarting after choking the intake only, when hot. Generally, it was found best to open the needle-valve a half-turn beyond the optimum running setting, otherwise there was a tendency for the engine to cut out unless hot from an immediately previous run. The K-6 was fairly docile as regards starting behaviour and showed no tendency to "bite" on props down to the minimum size likely to be used.

The needle-valve and compression lever were positive in operation and non-critical although the engine did become increasingly sensitive to both controls under light loads—i.e. at speeds in excess of 14,000 r.p.m.—as the range between the misfire and pre-ignition points closed up. The fairly heavily nitrated fuel used was found to be helpful here. Contra-piston fit was excellent, becoming slightly easier as the motor reached its operating temperature but not so much as to cause slackening off of the compression adjustment.

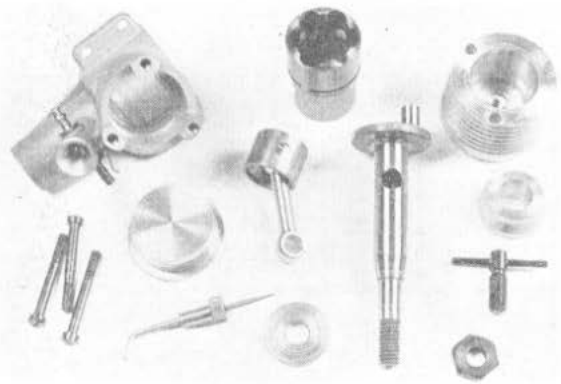
Maximum torque reached by the K-6 was just under 0.12 lb. ft. or 19 oz. in., equivalent to a b.m.e.p. of just on 60 lb./sq. in.—a very good figure for this class of engine—and was maintained at this level up to nearly 10,000 r.p.m. Beyond this speed, torque fell off gradually to give a peak output of 0.286 b.h.p. at 14,700 r.p.m.

This, as we have mentioned, is a very good performance having regard to the conservative general design of the engine and, we would suggest, may well be due to wise material selection and working, to maintain a high mechanical efficiency. One is tempted, for example, to look to the piston and cylinder and to consider the possibility that intelligent study of the relative expansion of these components has resulted in a happy state of affairs being achieved in respect of piston drag at operating temperature.

In conclusion, it may be worth noting that a Hungarian test report quotes an output of just over 0.30 b.h.p. at 16,000 r.p.m. for the K-6, so that, even allowing this source a little optimism, our test engine was not, apparently, an above-average example of the type.

Power/Weight Ratio (as tested): 0.97 b.h.p./lb.

Specific Output (as tested): 116 b.h.p./litre.



The conservatively ported crankshaft is noticeable in this dissembled view of the Krizsma K-6.

ROVING REPORT

Continued from page 73

international flavour: valves are from Britain (Hivac) and reed banks and relays from Japan (O.S.). Incidentally, we have received a copy of the very complete and informative instruction manual on this set. This is available separately at $2 and anyone contemplating the purchase of one of these receivers from the U.S. can, therefore, get all the gen they need about the unit from this (plus a lot of helpful hints on multi-reed sets) before buying.

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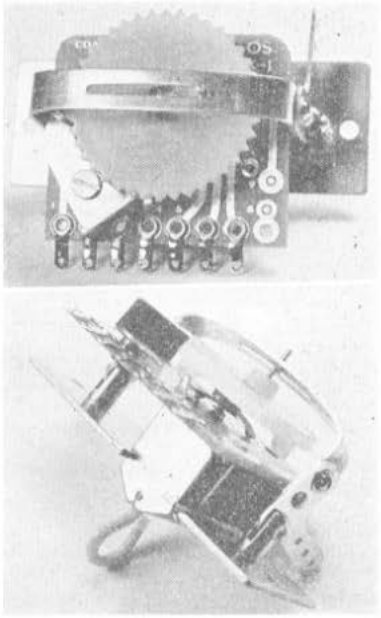
Still on the subject of R/C, O.S. have recently brought out the improved compound escapement illustrated. This uses a printed circuit, wiper contacts



The new O.S. K-1 compound escapement.

and a nylon wheel. Construction is really top class. Like earlier O.S. compound escapements, it retains the yoke fitting giving direct push-pull action for control linkage.

* * *

Dr. Keith Hoover of the famous Chicago Aeronuts Club and an exponent of the unconventional approach to high performance F/F design, has sent us details and a photo of his new Half-A class model. Rather a remarkable example of successful non-conformity, the model is a high-thrustline *low*-wing, has a forward fin, butterfly tail and underslung tail-fin. It has a Jedelsky sheet wing of 250 sq. in. and the tail-plane area is only 15 per cent. of the wing area. The crowning touch? All this handles a souped-up Holland *Hornet*!

MODEL AIRCRAFT WINGS CLUB

Cowboy in the Sky

WHAT makes a kite fly? Many boys, though not perhaps many who are members of the Wings Club, would say that it is kept aloft by the air. In an examination this answer would be worth three marks out of ten. It is the pull of the wire, holding it against the thrust of the wind, which keeps it airborne.

Knowing this, Samuel F. Cody told himself that if, in place of the wire, he could use some kind of light engine, he might be able to leave the ground and fly. The engine, of course, was the problem. Cody did what he could without it; in his man-lifting kite of 1902 the engine was, in effect, represented by a number of kites supporting a cable to which the man-lifter was attached by a pulley. Sitting in a basket-chair, the pilot controlled the rise and fall of the main kite by altering its angle of attack.

At first Cody used his kites as an extra attraction at his Wild West performances. Crowds came to see them during the day, and after enjoying the free entertainment many people returned for the theatrical performance in the evening. But the showman had realised that a man-lifting kite had a value in war.

A Chinese general of about A.D. 200 scared the enemy troops by sending kites into the night sky with flutes and whistles attached to them. While Cody may have heard this story from the Chinese cook in Texas, the suggestion which he made to the War Office was less colourful—or less Chinese! His idea was simply that a man-lifting kite could be used, like a balloon, for observing the enemy positions and it had the advantage over a balloon of being far harder to hit and bring down.

The War Office was usually not much interested in new ideas, until they had been used with success by the enemy, but the men in Whitehall listened to the cowboy from Texas, perhaps because he was such a picturesque character that they found him hard to ignore. His courage, too, earned him respect; the military man who dislikes new-fangled notions is also the first to recognise and admire bravery.

That Samuel Cody was a brave man no one could doubt. He had proved it in the West, he demonstrated it again in his touring show, and he confirmed it spectacularly with his kite-flying. There was a day in North London, for instance, when he sent up a train of large kites, tethered one above the other, from the side of a hill. While he was floating 80 ft. above the ground, a sudden gust of wind hurled the train downwards. He owed his life to some tall trees which happened to be in the way.

During the staging of a Wild West play at Stratford (the London Stratford, for *The Klondike Nugget* was not trying to compete with *Hamlet*!), Cody decided to let a team of kites tow him across the Channel. Six large ones towed him quickly out of Dover harbour in a canvas canoe, but a choppy sea ended the venture. Naturally he tried again, and this time he set out from Calais. When he left in the evening, the kites were pulling strongly and all went well until the wind dropped and left him entirely at the mercy of the waves and currents. Midnight and mid-Channel are not a happy combination for a man in a canoe, and Cody was almost run down by a big steamer before the wind rose again and he made for Dover with the kites pulling.

Soon afterwards he had a more thrilling escape, as I shall relate next month. ALAN WINTERTON.

Dear Alan Winterton—I am between 10 and 16 years of age and would like to become a member of the Model Aircraft Wings Club. With this coupon I enclose a postal order (overseas readers should send an International Money Order as local postal orders cannot be cashed in England) for 1/- to help cover the cost of the badge, transfers and membership book. *All membership applications must be on this form.*

Name in full.....
(Underline christian name normally used)

Address.....

.....

..... Date of birth.....

School or College.....

Name of other club or clubs to which I belong (if any).....

.....

Send to—MODEL AIRCRAFT WINGS CLUB, 19-20 NOEL STREET, LONDON, W.1.

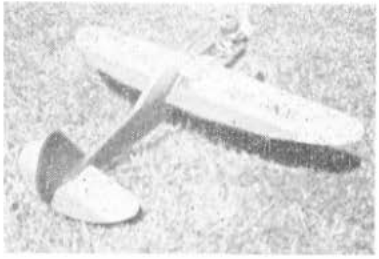
Wingmen Write . . .

I have written to thank you for putting my name as a pen-pal in MODEL AIRCRAFT. Already I have received seven letters from prospective pen-pals, including boys from Nigeria, Nyasaland, New Zealand, and Ceylon! So far I have only rather regretfully refused one boy's offer, so I have quite a busy time writing to all the rest of them!

Yours faithfully,
Pluckley, JOHN RICHARDS.
Kent.

* * *

I thought that readers might be interested in this photograph of my K.K. *Champ* which I have christened



Red Gnat. It is powered by an E.D. Bee which is fitted with a 15 c.c. tank to give a longer motor run.

It is my first power model, and it has given me great satisfaction.

Yours faithfully,
Waterlooville, PETER NIXON.
Hants.

Pen-Pals Wanted . . .

Roger Ladds, 7, Rochford Tower Lane, Boston, Lincs., mainly interested in gliders and C/L stunt models.

Silvio Cerati, Via Sebastiano Grandis 38, Cuneo, Italy, wishes to correspond with a British Wingman, particularly keen on C/L and R/C.

Query Corner

Can you forward me details for building a model rocket?—Barry Ivory, London, E.10.

The building of such a craft is forbidden in this country, as we pointed out on page 11 of the January issue of MODEL AIRCRAFT.

It is very dangerous to experiment with rocket fuels unless you are a qualified chemist, but a lot of fun can be had from the larger Jetex units, which have been carefully designed, are completely safe and much cheaper than experimenting with dangerous home-made devices.

D. Sebel and Co. Ltd., West Street, Erith, Kent, manufacture the Jetex range of jet propelled models and units, and will send a price list upon receipt of an S.A.E.—A.W.

ON THE WINGS CLUB WORKBENCH —

PHOTOGRAPHING YOUR MODEL

Of the hundreds of photographs received from readers, many are unsuitable for publication only because insufficient thought has been given before actually pressing the shutter release. The most frequent photo faults are discussed below, and avoidance of these pitfalls will certainly result in better photographs.

THE two hobbies of model building and photography often go hand in hand, as the models provide excellent subjects for the camera, and the photographs thus produced will, if carefully preserved and presented, form a fascinating record of one's modelling activities. Apart from this personal angle, there is often the satisfaction of seeing a photograph of one of your models in the pages of MODEL AIRCRAFT. We are always on the look out for good photographs of interesting models, and of course, we pay you hard cash when the picture appears in print! There are, however, some simple basic points worth remembering which, irrespective of whether you use a Leica or a Brownie "box" camera, will make the difference between a snapshot and a really good model photograph.

We obviously cannot, in such a limited space, tell you everything about all types of model photography, since this would run into many pages, but there are several useful tips which will improve your pictures.

When you decide to take a shot of your latest masterpiece, don't just rush out into the garden and snap the shutter, without first considering the finished result. So many people in these circumstances, are so concerned with getting the angle of the model correct that they completely forget one of the most important points in the making of a good photograph — the background! You've all seen that picture of someone standing in front of his house with a chimney pot apparently sprouting from his head, as in Fig. 1. The photographer was paying so much attention to the subject that he didn't notice the background!

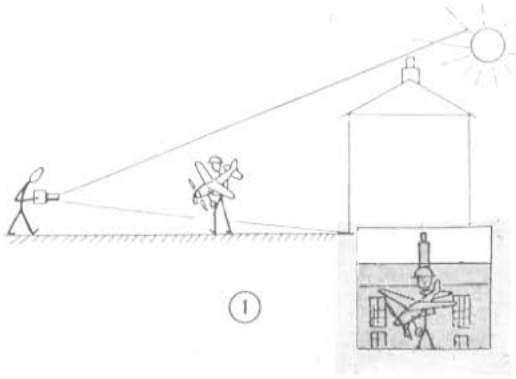
For model aircraft, the obvious and most natural background is the sky, particularly if there are a few fluffy white clouds about to complete the picture. If there are houses or other distractions on the skyline it will be necessary to hold the camera right down in a low position, and to have the model held up high against the sky as shown in Fig. 2. Remember also that for normal photographs the sun should be behind the photographer and slightly to one side. Never point the camera into the sun!

There are, of course, occasions when you may not want a photograph of the model being held aloft, perhaps preferring a side, or downward viewpoint. In this case further careful consideration must be given to a suitable background. The chief essential is that the tone of the background must contrast with the overall tone of the model. Therefore, if you have a dark model, the background should be very light and vice versa, also the background must be as plain as possible, so as not to cause any undue distraction from the subject. Grass, even a closely mown lawn, is definitely unsuitable!

For instance, a piece of floral design curtain material would not be a suitable background, whereas a plain blanket or sheet might be quite acceptable. We say might, because although of uniform colour, blankets and sheets need very careful preparation in order to ensure that they are smoothly spread out. Creases and folds may be even more distracting than the floral printed pattern!

By far the best and cheapest background is the coloured paper sold by art shops in large sheets. The paper is of

David Thomas of Liverpool took this photograph of his wife holding his Mercury "Tiger Moth." Notice how well the model shows up against a plain sky background, although a little more tilt would have revealed more wing detail. A good sharp negative has been obtained, a portion of which (dotted outline) can be enlarged to make a really fine picture.



USEFUL SANDING TOOLS

PREPARATION of surfaces on both flying and non-flying models demands careful sandpapering. Broad open surfaces are handled fairly easily with a normal sanding block. However, when curved surfaces such as wing and tail fillets confront one, steps have to be taken to make special sanding strips and tools.

For the smallest models, the top ends of old No. 1 to No. 5 squirrel-hair paint brushes are coated with glue and a 2 to 3 in. wide strip of sandpaper is wound on and bound with rubber bands, which are removed when the glue is set. This is done with several handles until one has a set with different grades of paper, from fine to coarse. Hardwood dowel of sufficient length, from ¼ in. up to ¾ in. diameter, will extend the range further, and when the sandpaper is worn out, it is but a few minutes' work to renew it. For small solid-scale work on flat surfaces, ideal sticks ready to receive their sandpaper, are those from "iced lollies."

The time spent in preparation of these tools is well worth it to be able to get the desired result more quickly and accurately.

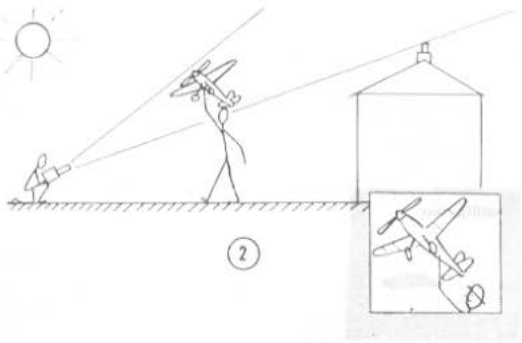
quite low quality to keep the price down, but is thick and crease resisting. It can be bought in rolls up to 10 ft. wide and in almost any length, while it may, of course, be used repeatedly if care is taken when rolling it up after use.

One sheet of white or light grey paper, and one of black (for uncovered frameworks) each measuring 6 ft. sq. should be adequate for most modellers' needs. The background paper must be at least 3 ft. larger than the biggest model you expect to photograph, and will be a very good investment indeed, relieving you of much trouble in searching for suitable settings for your models every time you want to take a photograph.

Always try to visualise, when you are arranging the model, just how it will look in the finished print. In Fig. 1 the model is too small in relation to the picture area, whereas in Fig. 2, besides a better viewpoint, the photographer has filled all his picture frame with the subject. With a very small model, of course, going in too close with a simple camera will often produce a "fuzzy" (out of focus) picture. Cameras without means of focussing, such as box cameras, cannot be expected to produce sharp photographs if the camera to subject distance is less than 5 ft. In this case it is far better to have a small crisp image (that can later be enlarged) than a frame-filling but "blurred" picture that no amount of after-treatment will improve.

One of the most frequent causes of unsatisfactory blurred photographs is camera movement at the instant of exposure. Whenever possible, rest the camera against something solid, such as a wall or a solid post. At all times, be very careful when pressing the shutter release, to avoid any sudden jerks. Don't push the button, but very gently squeeze it until the shutter clicks, as even the most minute movement or vibration of the camera will ruin a photograph. This is, perhaps, the most common cause of all unsatisfactory pictures and one which is not recognised by many amateur photographers. The correct exposure of the film is a subject too lengthy to deal with here, but reference to the guide included with every roll of film will put you right on this score.

J. E. Rieley of Malpas, Cheshire, sent us this photograph of himself with his Keilkraft "Ladybird." As you can see this is a well built model and it is being held at a nice angle, but from a pictorial point of view, the background is still confusing. This could have been eliminated by getting the camera right down onto the ground (Fig. 2).



There is one more important factor to bear in mind and this is the cleanliness of the camera lens. Even the smallest greasy finger mark on the lens will completely ruin a photograph. The finger print will not register as such, but it will make the whole picture very fuzzy and unsharp. So clean your camera lens most carefully and then keep your fingers off it! Your local camera dealer will give you lots of useful information about lens cleaning materials, but one of the finest is ordinary lightweight Modelspan. Take a piece of tissue about 4 in. sq., crumple it into a ball and very gently brush your lens surface until it is completely clear.

Never, of course, dismantle a lens, small pieces of dust on the inner surface will do less damage to a picture than an incorrectly reassembled lens, and it is not, as you may imagine, just a matter of screwing the lens together again! The assembly of a lens is so very precise that it should be stripped down only by a qualified optical specialist.

So there you have it—a few do's and don'ts to help you to take better pictures of your models. If you bear them all in mind, your photography will show definite and immediate signs of improvement.

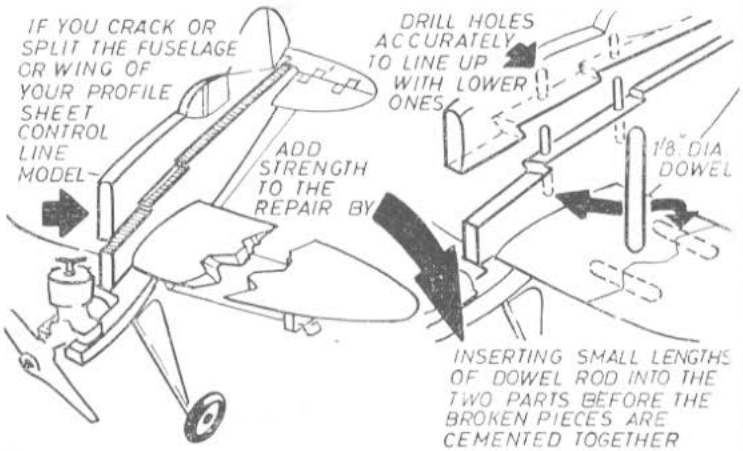
IMPROVE YOUR MODELLING *with this month's*

Tip

BY RAY MALMSTRÖM

SHEET MODEL REPAIR

IN a bad crack-up (and we all have 'em!) with an all sheet control-liner, the fuselage often splits in two, or the wing is badly damaged. Sheet jobs are easy to repair, but this tip adds strength to the repair. Before cementing the parts together, carefully drill small holes (about $\frac{1}{2}$-$\frac{3}{4}$ in. depth) in the two parts. Cut pieces of dowel (usually $\frac{1}{8}$ in. dia.) about 1-1$\frac{1}{2}$ in. long. Cement these into the holes in one of the pieces. Squeeze cement into the holes you have drilled in the other piece, and then re-cement both pieces together. Result is a stronger repair—and more flying!



The L200A MORAVA

BACK in 1947, when even America's "big three" business plane manufacturers still thought mainly in terms of a single engine, the Czechs built the prototype of the *Aero* 45 light twin. It was an immediate success and developed versions have been in production ever since.

Customers included Aeroflot, who bought 130 *Super Aero* 45s for use as air taxis; but these were a bit on the small side so, a few years ago, the decision was taken to develop something a little larger and more powerful. The result was the L200 *Morava*, which flew for the first time on April 8th, 1957.

In its original form, the *Morava* had 160 h.p. Walter Minor 6-III engines, which gave a maximum cruising speed of 162 m.p.h. With its car-type cabin for five persons, tricycle undercarriage and tip-tanks, it looked like a slenderised Cessna 310. An obvious recognition aid was the use of a twin-fin tail unit on the *Morava*, which also spanned some 3 ft. more than the U.S. machine.

Flight trials soon showed that directional stability needed improvement and a long dorsal fin was added, followed by two large rudder trim-tabs. Other changes were introduced as the design was refined for production. The cabin top was lowered at the front to improve aerodynamic form, at some cost in forward visibility which was already impaired by the wide windscreen and door pillars. Fairings were fitted between the wing-root trailing-edges and fuselage, and a switch from electrics to hydraulics was made for flap and undercarriage operation.

Biggest change of all was the replacement of the original engines by two of the brand-new 210 h.p. M337 supercharged fuel-injection engines developed at the Walter factory. These not only offered a 20 m.p.h. jump in cruising speeds but, coupled with the light weight and ample wing area, gave the *Morava* a considerably better take-off performance than the Cessna 310—an important asset in many potential markets.

With its new engines, the *Morava's* designation became L200A and this version can be identified by the fact that its ejector exhausts are on the port side of each nacelle, compared with the starboard exhausts of the L200.

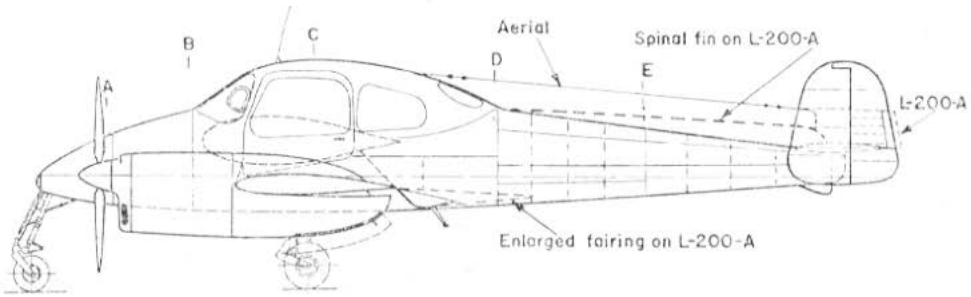
An order for 70 *Moravas* for Aeroflot led to the type being put into large-scale production at the First Five-Year-Plan Machine Works at Kunovice. Photographs show that at least some of the Soviet machines are L200s. When delivered they had no special markings, except for Russian registrations (e.g. CCCP-14342 and 3), but they have joined the *Super Aeros* as air taxis.

Structurally the *Morava* is a perfectly straightforward all-metal monoplane. The two-spar wing has a double-skinned leading-edge for hot-air de-icing. Normal fuel capacity is 50 gallons in the fixed tip-tanks, but this can be supplemented by a further 42 gallons inside the wings. For year-round operation in places like the north of Russia, the wheels can be swapped for floats or skis, and it is quickly convertible into an ambulance, stretcher loading being made easy by the large car-type doors.

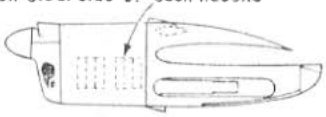
Data: Span 39 ft. 4 in.; length 28 ft. 3 in.; height 7 ft. 3½ in.; wing area 186 sq. ft.; weight, empty, 2,810 lb., loaded 4,300 lb.; max. speed 193 m.p.h.; max. cruising speed 183 m.p.h.; stalling speed 70 m.p.h.; max. rate of climb 1,260 ft./min.; service ceiling 18,700 ft.; take-off run to 50 ft. 1,265 ft.; landing run from 50 ft. 1,960 ft.; max. range 1,025 miles.

Colour scheme: Natural metal finish. White cabin top and tip-tanks. Black anti-dazzle flash forward of windscreen. Blue, green or ruby trim.

Heading photo shows the Morava L-200A—note the dorsal fin and modified engine nacelles.
Below: the prototype L-200 on display at a Czechoslovakian exhibition.

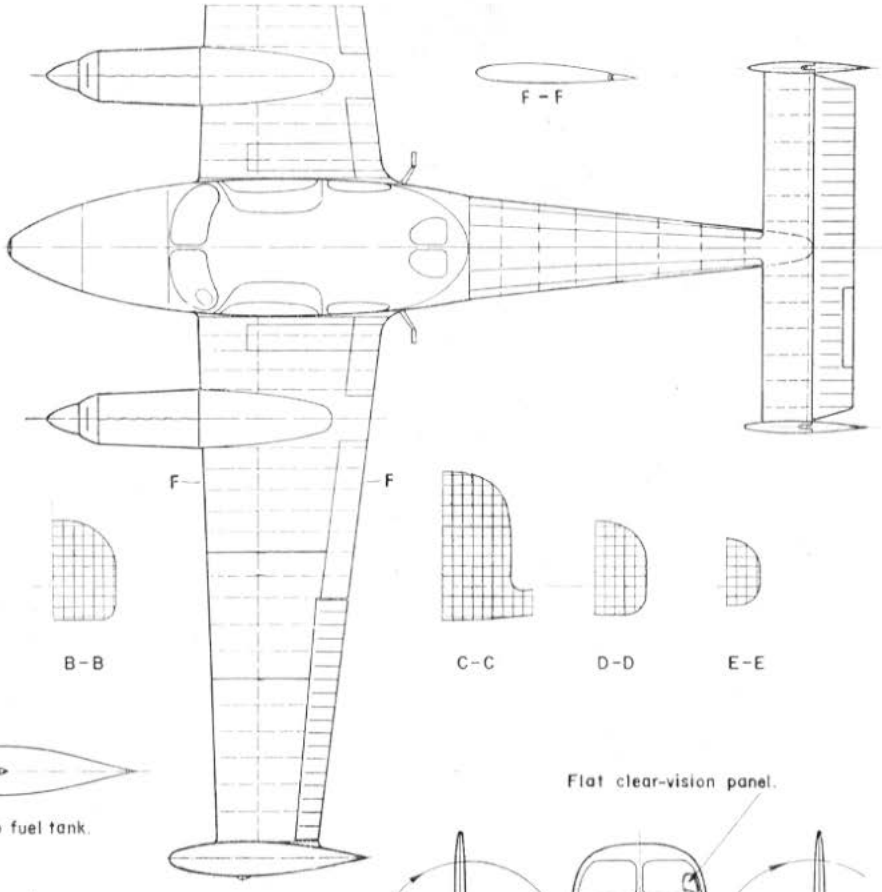


Louvres on st'bd. side of each nacelle



L-200-A engine nacelle

L-200-A engine nacelle is extended to the flap trailing edge, the exhaust pipe is moved to the port side, louvres are fitted on st'bd. side and an air-intake is added to the starboard side.



MORAVA L-200 and L-200-A.

RADIO TOPICS

METZ Mecatron transmitter/receiver units are beautifully engineered productions, both electrically and mechanically. The units identifiable in the heading photo are: (1) tone transmitter in moulded plastic case with telescopic aerial; (5) basic fully transistorised receiver; (6) three push-button hand switch for plugging into the transmitter to convert to three channel operation; (3) receiver attachment, plugging into standard receiver and embodying two additional relays and attendant circuitry; (2) multi-channel servo; (4) single channel actuator; and (7) transmitter battery lead extension for plugging into car battery or 6 volt accumulator supply, thus obviating the need for frequent replacement of the internal transmitter batteries.

The transmitter is approximately 8 × 6 × 2 in., weighs 2 lb. (without batteries) and requires a 6 volt supply (four dry cells enclosed in the transmitter case, or external 6 volt battery). Maximum claimed power output is 3.5 watts. Basically, the transmitter generates three separate tones which can be selected individually by a colour-coded switch for single-channel operation with, in the selected position, tone output controlled by a press-button. In this condition the transmitter can be matched to three separate (standard) receivers, a feature of the receiver design being that it, also, is capable of being switched to tune to a particular tone (i.e. one of the three transmitter tones). Because of the high selectivity of the receiver circuit, simultaneous operation of separate single channel receivers is then possible on different tones—either by actuating the tone switching on the transmitter, or using separate transmitters each switched to a different tone.

For multi-channel operation all three transmitter tones are controlled by the plugged-in channel selector hand switch. Plugging in the receiver attachment extends the receiver circuit to three tone circuits each with their respective relay—i.e. three independent AF filter circuits each responsive to one transmitter tone. In single-channel form, the inductance of the AF filter circuit is formed by the primary winding of the second transformer, and its capacitance is varied by the selector switch to give three different resonant values exactly matching those of the transmitter.

The circuits are most interesting, and definitely aimed at foolproof operation. We shall be spending a bit more time on them and will report on the more technical aspects shortly. Prices are certainly attractive for the class of product — transmitter, £16 19s. 6d.; press-button adapter, £2 15s.; receiver, £13 13s. 6d.; three-channel adapter, £12 3s.—with the limitation that it is still only three-channel equipment. Whether the unique single-, simultaneous-single-, or three-channel "multi" operation are more than a "gimmick" is possibly debatable.

* * *

As far as we remember it was Harold de Bolt who first developed the "orthodox" high wing R/C design layout with "boxy" fuselage and tailplane mounted right on the bottom of the fuselage—although Walt Good first demonstrated the advantages of a fin built integral with the fuselage and low slung tail. A first class arrangement it is too, with structural and aerodynamic advantages—the benefit in the latter case being that it carries the tail well clear of downwash from the wing.

Since freedom from downwash *is* a definite benefit, it has been rather surprising to find many low-wing designers following a similar tailplane layout, in spite of the fact that this is tantamount to mounting the tail right in the downwash. We are willing to take a bet that most of the new low wing designs will adopt a higher tailplane position—somewhere on the level of the top of the fuselage—and benefit as a consequence.

* * *

Just how good is the *Orion* as an aeroplane? Winning a world championship is as good an advertisement as any for a design, yet in contest work it is mainly the man behind the model that really counts. Ultimate proof is to see

how other people get on with the design.

On that basis the *Orion* looks like being recognised as a pretty good aeroplane! Flown by Tom Prosser (New South Wales) it has won the recent Australian Nationals "Multi," powered by a Glow Chief "49" and with O.S. eight-channel radio. Second was a Blackwell *Ranger* (Fox "29" and Orbit eight-channel); and third a *Smog Hog* (K & B "45" and Orbit eight-channel).

* * *

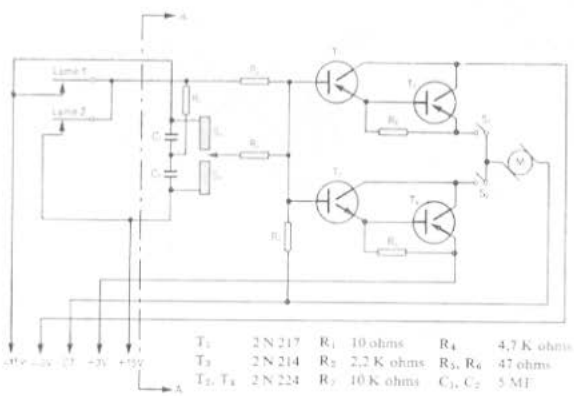
Some people are still blissfully ignorant of the large aerodynamic forces that can build up on fast-flying models, and particularly on movable control surfaces. You need properly engineered construction, hinging and linkage to stand up, and a very careful approach to aerodynamic balance, if this is to be incorporated. What seems a small geometric balance area, can generate a large effective force at high speeds and not necessarily a steady force.

Standing under a "45" powered low wing job doing some high speed manoeuvres rather low down, we suddenly tumbled to the fact that that buzzing noise was not something loose, but the ailerons fluttering. The fact that they did not break off after a dozen or so passes was surprising, but nothing compared with the fact that aileron's control response was still there even during the flutter period. Over-balance was the cause, coupled with enough slack and "give" in the linkage to allow oscillation to build up. If you just happen to be unfortunate enough to get complete aerodynamic flutter conditions, then even the most rigid geometry develops alarming "elasticity."

Control surface vibration (usually caused by engine vibration as opposed to "aerodynamic" flutter) is not necessarily harmful—just undesirable. It can be very hard on hinges, especially tape ones. For similar reasons, soft materials like aluminium are quite unsuitable for control horns or bell-cranks. Holes elongate quite rapidly, introducing slack movement which accelerates wear still further.

* * *

Circuit diagram (below) of Dunham's four-transistor servo amplifier is taken from *Aero Revue* (Swiss), and is that used by him at Zurich. Utilising one N-P-N and one P-N-P transistor for differential switching of the "charge" circuit, in practice individual reeds must be insulated and not pairs of reeds (since adjacent reeds are not used as a practical "pair"). We were a little disappointed in seeing the circuit for it did not appear to offer a complete solution and was, in fact, dropped. The "standard" is now the six transistor "Transimite" type which does not require split insulated reeds—and we are still waiting for our unit to arrive to pull it to pieces and report on. R.E.P. new transistorised servos, incidentally, *do* need insulated reeds.



* * *

Extracted from *The Printed Circuit*—newsletter of the North Jersey Radio Control Club—this "R/C Dictionary of Advertisement Terminology.":

New: Different colour from the old design.

All New: Parts not interchangeable with old design.

Exclusive: Imported product.

Unmatched: Almost as good as competition.

Design Simplicity: Costs cut to the bone (manufacturer's cost—not yours).

Foolproof Operation: No provision for necessary adjustments.

Advanced Design: No one understands it.

It's here at last: No one knew it was coming.

Field Tested: Manufacturer lacks test equipment.

Temperature Compensated: Works at 30 deg. below and 160 deg. above, nowhere in between.

High Accuracy: Parts fit.

Direct Sales Only: Manufacturer had argument with the distributor.

Rugged: Too heavy to lift.

Easy to Tune: Any electronic PHD can do it.

No Critical Tuning: Even the electronic genius can't.

Years of Development: Read about it in last month's magazine.

Durable: Might last all season, with luck.

Takes Out the Guesswork: Replaces it with something worse.

Light Weight: Lighter than rugged, still too heavy to lift.

Trouble Free: Until airborne, also trouble isn't free, it costs.

Discriminating Modeller: One possessing a multi-meter.

Pays to Use the Best: You also pay to use the worst.

Gadget Minded Modeller: One looking for a way out of building.

Versatile: Will cause crashes in any type of model.

Superior Design: Effective range exceeds 50 ft.

Fabulous Performance: Two consecutive flights without failure.

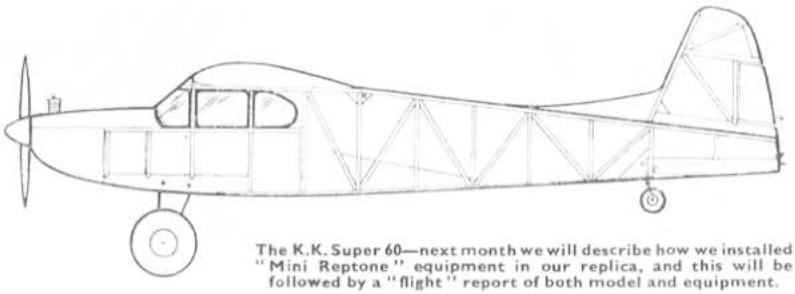
Unprecedented Performance: Three consecutive flights without failure.

Simple: You were, to buy it.

Satisfaction Guaranteed: Manufacturer's (upon receipt of your cheque).

"We're kidding of course, one thing that any R/C'er that has been around realises is that if it were not for the constant development carried on by the various manufacturers, large and small, receivers would still require 7 ft. aeroplanes to carry them, transmitters would still drive you nuts and R/C as we know it to-day just simply would not exist."

* * *

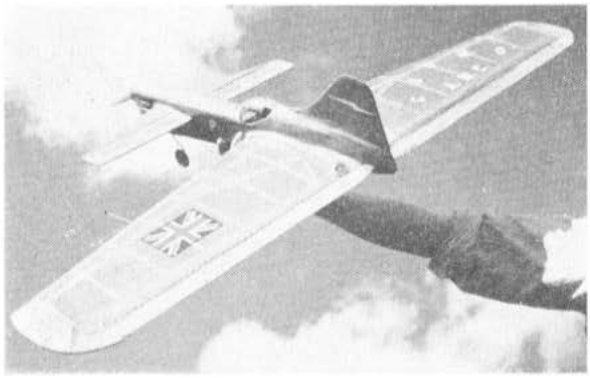


The K.K. Super 60—next month we will describe how we installed "Mini Reptone" equipment in our replica, and this will be followed by a "flight" report of both model and equipment.

First of the anticipated British kits designed expressly for R/C to reach the market, is the Keilkraft *Super* 60. Although bearing a superficial resemblance to the veteran *Junior* 60, it is not just a re-hash of this model, but a completely new design. Test flights using a "Reptone" receiver and Enya 0.19 were carried out by Eddie Keil on his birthday, intentionally, we believe, as a present from the design staff!

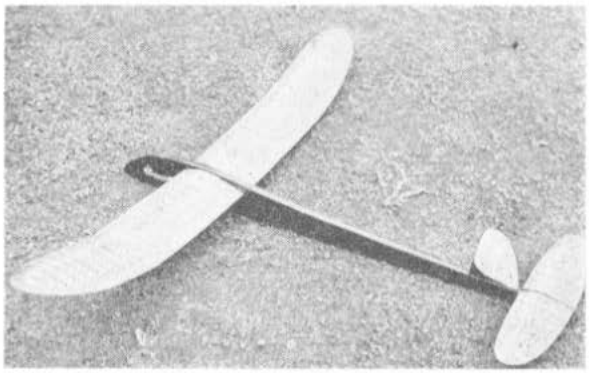
The kit includes a "chunk" tank and finished undercarriage of wire and dural, while, needless to say, the quality of balsa and die cutting is to the accepted K.K. standard. Of particular note is the 16-page instruction leaflet, which is illustrated with photographs and line drawings, while the comprehensive two-sheet plan has many useful auxiliary sketches. The attractive but simple lines of this model, which costs 97s. 6d., are shown in the sketch at the top of the page.

PHOTONEWS— *brings you a selection of readers' photographs*



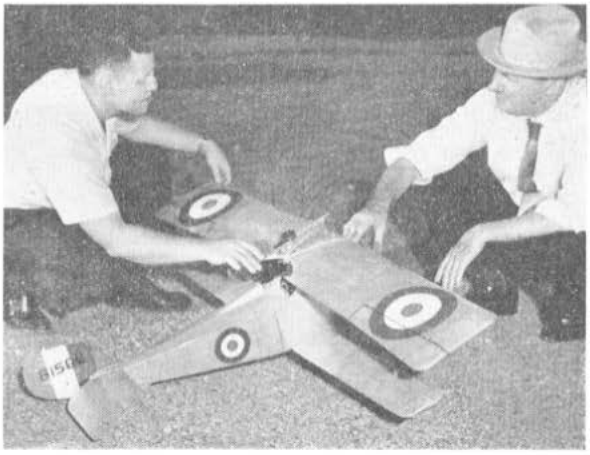
Aerobatic canard control-liner by Stan Robinson has a tricycle undercarriage, 4 ft. wingspan, 430 sq. in. area and all up weight of 36 oz. Powered with an S.R. Special 2.5 c.c. diesel, it stunts well on 60 ft. lines at an airspeed of about 70 m.p.h.

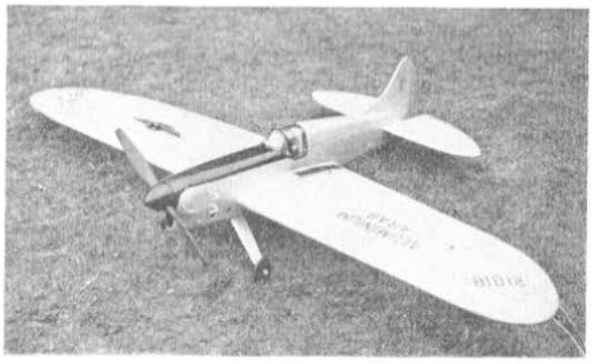
Interesting A1 glider from D. Burt of Cardross features tongue and box wing fixing and auto rudder on leading edge of fin. Is named Sploggy *because of its stable D/T descent. (Sorry don't get the connection—Ed.)*



Neat semi-scale sportster finished in cream and red is a Frog Zephyr *powered with a 0.5 c.c. Allbon Dart. Built by Alec Morley in Ireland—hence the shamrock—when the photo was taken the model was making regular sorties (with a marked preference for landing on hangar roofs) over R.A.F. Wildenrath, Germany.*

Single channel R/C Nieuport 17C1 is the work of C. La Mar Kemp of Dallas, Texas (right), who is being advised on trimming techniques by Carlyle Linskie. To a scale of 2 in. to 1 ft., the model weighs 4½ lb., complete with Deltron receiver, and is powered by a Johnson " 29*." Colour scheme is that used by W. A. Bishop, W.W.1 fighter ace.*

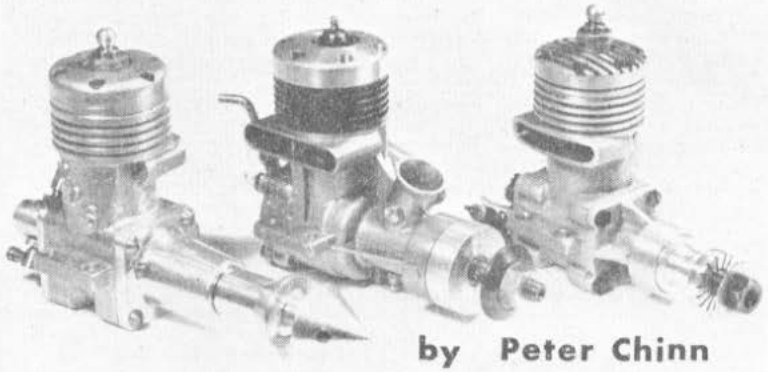




Ian Smith, who is Junior Champion of Macclesfield M.A.S. sent us this photo of his very attractive o.d. 40 in. span P.A.W. powered stunt model. Neat engine cowling and detail design has helped to produce a real thoroughbred look.

Latest Engine News

by Peter Chinn

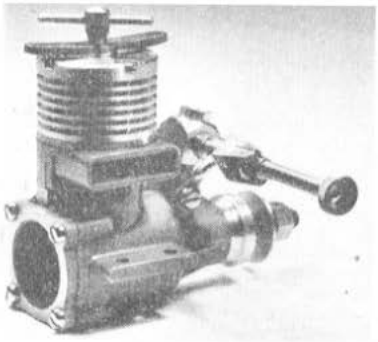


An interesting group of hot 2.5 glow engines. Left to right: British Carter-Special, Japanese O.S. Max-15 Special and Czech MVVS 2.5/1959.

U.S.A.

BY the time these words appear in print, the L. M. Cox Manufacturing Company Inc., of California, will have just announced a completely new line of Thimble-Drome high-performance rotary-valve engines—incidentally, the first front rotary valve engines to be offered by Cox since 1952 when, with the original Space-Bug engine, they set a fashion for reed-valves.

Three of these engines are intended primarily for contest work and supplement or replace existing Cox engines of similar size. The fourth is an entirely new sub-miniature size of only 0.010 cu. in. swept volume (approximately 0.16 c.c.)—half the size of the Cox Pee-Wee which, up until now, has been the smallest motor manufactured in the U.S.A. All four engines will be known as the "Tee-Dee" models and the next up in size will be the Tee-Dee .020 designed especially to make a still better job of the contest work (notably PAA load events) started by the Pee-Wee .020. The Tee-Dee .020 is said to peak at some 22,000 r.p.m. and since it will cost $6.98 against the Pee-Wee's $3.95, we may suppose that it will, in fact, offer a worthwhile improvement in performance over the already very good performance of the Pee-Wee. Talking of high revolutions, the 0.010 cu. in. engine is claimed to peak at no less than 27,000 r.p.m. !



The new 2.5 c.c. Enya 15D Mk. II diesel in its throttle-equipped version. Throttle is of the barrel type. Compression locking lever is optional fitment.

The third new Cox is the Tee-Dee 049, latest addition to the long line of Cox Half-A contest engines, priced a little higher than the highly successful reed-valve Hopper series and, presumably, right at the top of the tree as regards 0.8 c.c. class performance.

Finally, and of particular interest to FAI F/F enthusiasts, there is the new Cox 2.5 c.c. model, successor to the reed-valve Olympic and its experimental rear rotary derivatives, the Tee-Dee .15.

All four models are fitted with the special Cox triple peripheral jet type carburettor, with separate needle-valve body and all have provision for fuel tank pressurisation. The .010 and .020 are for radial mounting and are provided with integral fuel tanks. The .049 and .15 are beam-mount motors and are sold without tanks.

Illustrations and further details of these new engines will follow in M.A., starting with the .15 next month.

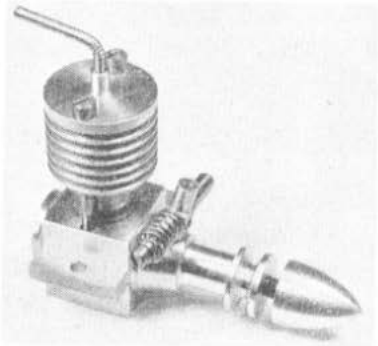
Great Britain

Interesting home news is that the 1.5 c.c. Oliver Cub Mk. 2 is at long last in production, two years later than originally scheduled. Continuing demand for the 2.5 c.c. Tiger Mk. 3 and much work on tuning contest flyers' motors have been responsible for the delay, but limited numbers of the Cub Mk. 2 should be available shortly.

When we tested a prototype of the Cub Mk. 2 in 1958 for John Oliver, we commented that it was the hottest 1.5 we had handled. The Cub may not, possibly, now have such a commanding lead, having regard to the fact that other good 1.5's have appeared during the past couple of years, but, if the production versions equal the 1958 prototype, it should still have a slight edge on any regular production 1.5 currently available.

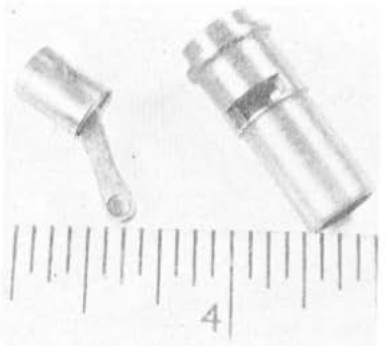
The new Cub is, of course, an entirely different engine from the original Oliver (Mk. 1) Cub introduced in 1954. The Mk. 1 Cub was withdrawn after only a relatively short period in order to enable full production facilities to be devoted to satisfying demand for the 2.5 c.c. Tiger Mk. 3, then beginning to establish a reputation as the world's best FAI team-race and F/F motor. The Mk. 2 Cub is a stronger motor than its predecessor: more compact, lighter and more powerful. It has a much larger diameter ($\frac{3}{8}$ in.) crankshaft carried in two ball journal bearings and a lower stroke/bore ratio derived from bore and stroke dimensions of 0.465 × 0.525 in.

We have just received a production Cub Mk. 2 and will report on its performance in due course.



Left—one of the world's smallest model engines, the British Dragonfly 0.15 c.c. shaft-valve diesel.

Below—diminutive size of Dragonfly piston and cylinder is indicated by comparison with ruler which is scaled in sixteenths of an inch.



The Oliver Tiger Mk. 3 continues in production for 1961 with one or two improvements. The crankshaft is now of E.N. 36 steel, hardened and ground throughout and seems to have put an end to the tendency toward shaft failure that plagued the Tiger earlier on. The engine also has a new crankcase which has been strengthened around the bearing housing.

* * *

In our November, 1960, issue, we described a little-known British diesel, the Dragonfly. Since that time, we have acquired another Dragonfly, this time a shaft rotary valve model, slightly lighter than the disc-valve type. The Dragonfly engines are hand-made in very small numbers and although it has been stated that they are made in 0.1 and 0.2 c.c. types, it appears that, in fact, several variations between these two sizes have been turned out. Our shaft-valve engine, for example, is just over 0.15 c.c., derived from a bore and stroke of 0.220 × 0.240 in.

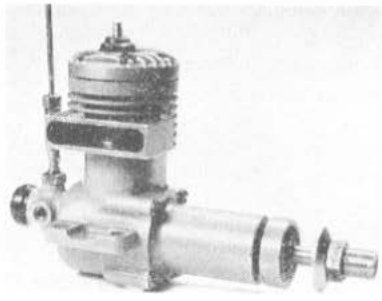
For those interested, Henry J. Nicholls Ltd. sells these tiddlers at 75s. each.

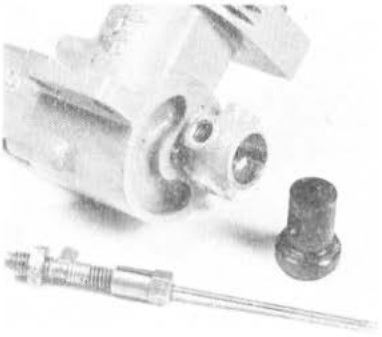
* * *

Through D. G. Turtle of Belvedere, Kent, we have learned of a new 3.5 c.c. diesel that has been built by E.D. designer Basil Miles and which is being made to special order.

The engine is of roughly the same external dimensions as the Miles 3.49 c.c. "Contest Special" of 1958 and, in fact, uses the same crankshaft, piston and connecting rod. It is, however, a loop-scavenged, rather than radially-ported, motor and features drum-valve induction instead of a disc rotor. An unusual feature of the engine is that the crankcase casting terminates below the exhaust port. It is topped by a second casting, embodying the exhaust duct and cylinder cooling fins. The main purpose of this departure from more orthodox methods of assembly was, apparently, to facilitate machining the special transfer passages.

We are informed that the engine is estimated to have an output of around 0.4 b.h.p. Most of the initial batch of a dozen of these motors have been ordered by the Dartford club and will be seen in action, we understand, in the combat circles at this season's rallies.

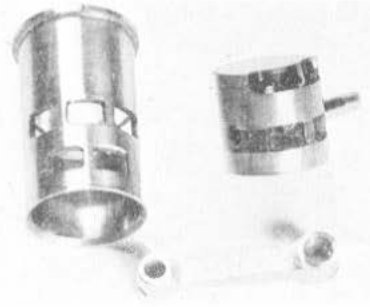




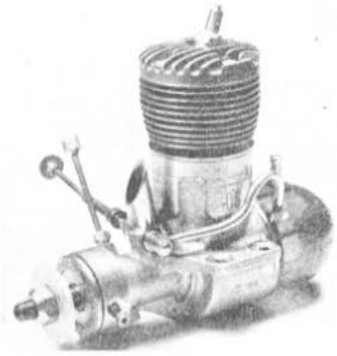
Left—a lesser-known but interesting Russian engine: the VIP-20 2.5 c.c. glowplug motor.

Below, left—unorthodox carburettor on VIP-20 allows needle-valve to be installed in any one of four positions.

Below—cylinder and piston assembly of the VIP-20. Note step type deflector on piston, also rectangular skirt ports and multiple cylinder ports.



A lesser-known O.S., the 9.85 c.c. Type 12 of 1947. Example shown is part of the Chinn collection of over 200 model engines.



U.S.A.

As fine and varied a collection of FAI class 2.5 c.c. F/F engines as you would find in any club anywhere in the world seems to be in the hands of the members of the Minneapolis club in Minnesota. They include Oliver, O.S., Super-Tigre, Cox-Olympic, Enya, Rivers, Eta and even MVVS. Clint Cross and Sid Jepson, of this internationally-minded U.S. club, keep us informed of their impressions and experiments.

For example, regarding the Super-Tigre G.20 Jubilee glow, we learn that Sid Jepson uses the "speed" venturi insert and pressure tank but taps crankcase pressure from the side of the crankcase instead of using the high-pressure rotary-valve timed outlet provided below the main bearing. He quotes a figure of 18,500 r.p.m. on an 8 × 3½ Top-Flite prop using 55 per cent. nitromethane. With the MVVS 2.5/1959, Jepson obtained an increase of 1,100 r.p.m. by replacing the standard needle-valve with a Dooling needle assembly and using pressure feed. Ultimate performance on a Top-Flite 8 × 3½ was then closely similar to the G.20 Jubilee. Pressure feed is also favoured for the Super-Tigre Jubilee diesel and, in conjunction with the large venturi, raised r.p.m. by over 600.

U.S.S.R.

One of the most interesting Russian engines we have yet seen is the 2.5 c.c. VIP-20 glowplug engine designed by V. I. Petukov. An example is owned by Ian Russell of the Hayes Club who was kind enough, recently, to send it along for our inspection. As it happens, we also have some Russian drawings of this engine, so, between the two, we were able to assemble fairly complete data on the engine.

The engine is of the disc induction type, with the crankshaft supported in two ball-bearings. The body of the engine is in two parts, the bearing housing being one, while the cylinder block and crankcase comprise the other. General construction, therefore, tends toward racing engine practice. The piston, however, is of the lapped type, flat crowned with a curved step deflector on the transfer side. There are two rectangular skirt ports that register with similar ports in the hardened and ground cylinder liner, which is beautifully made. Exhaust and transfer ports are both divided into three ports, despite the use of a lapped piston. The engine gets away from the usual Continental 15 × 14 mm. bore and stroke and has a lower stroke/bore ratio derived from a bore and stroke of 15.2 × 13.6 mm.

The valve rotor is mounted in the rear of the crankcase and gives an induction timing of 48 deg. ABDC to 46 deg. ATDC. The valve is fed via an intake in which there is provision for installing the needle-valve four different ways: vertical, inverted, left or right.

General construction and finish of the VIP-20—unlike some Russian model motors—is to a very high standard. It is also very refreshing to see the original thinking that has gone into this engine, in contrast, for example, to the Mk. 12V and Kometa engines which are merely copies of German and Italian designs. Russian figures for the VIP-20 quote an output of 0.36 b.h.p. at 18,000 r.p.m. This may be just a trifle optimistic but it is clear that the example examined is capable of exceeding 0.30 b.h.p.

LETTERS
to the Editor

Ticked off!

DEAR SIR,—I was astonished to read in the December issue of MODEL AIRCRAFT that the "Acada" timer was made by the manufacturers of the "Tatone" timers. This statement implies that I endorse this new timer. Nothing could be further from the truth, as I am not familiar with this timer at all. Evidently the exporters feel that they must infringe on the reputation of the "Tatone" timers in order to boost their sales.

The majority of clockwork timers today are made in Japan. However, the inconsistent quality of the timers exported often leaves a lot to be desired, the performance and mechanical reliability appearing to hinge solely upon the assembly workers' mood of the day. Therefore, when we receive our timers from Japan, we take every one of them apart and completely rework every detail. It is then checked, checked and rechecked. No "Tatone" timer is placed on the market until it is in perfect running order. We will not sell any timer that we are doubtful of. Our scrap box of new timers that did not respond to reworking will attest to this.

Naturally this customising of each timer takes time and expense. For a fact, we are the only firm who devote so much attention to each timer. However, our ever-increasing amount of repeat orders from satisfied modellers make our efforts worthwhile. Many of these fliers, from all parts of the world, now correspond with me, sending photos, plans and activity reports. I would feel badly if these many friends of mine were confused by the association of my name with another product. Perhaps this letter will help clarify the situation.

Yours faithfully,
JOHN TATONE.

Tatone Products,
California, U.S.A.

A sample Acada timer was received from the exporters in Japan early last year. Internal examination of the timer clearly indicated a strong resemblance to the well-known timers made for Tatone Products and the exporters were questioned as to whether there was any connection to account for this. In reply, we were informed that the Acada was, in fact, made by the same manufacturer as the Tatone.

In fairness to the exporters, there seems to be no evidence of their having deliberately attempted to use Tatone publicity for their own advantage, as their statement was made only in answer to a specific enquiry.

The excellence of the Tatone Tick-Off timers distributed by John Tatone is, of course, well known and the current range was illustrated in our June, 1960, issue.—Ed.

After the gala's over

DEAR SIR,—I wonder if any thought is ever given by the public to what happens after a gala, when the last plane has landed and the crowds have departed?

For instance, what happened at Rufforth on the night of September 4th, with the rain beating down in the gathering darkness? Did some cataclysm obliterate the airfield and sweep away all the gala officials, or did some dreadful wind whisk them off like dead leaves? Perhaps they merely decided to give up the sport and have since taken up golf.

I only asked because this is now early 1961 and the prizes won that day have not yet been paid. How lazy can you get?

In Newcastle we do things differently and all the prize money is paid out before the meeting closes.

Yours faithfully,
T. W. LIDDELL,

Hon. Treasurer,
Novocastria M.A.S.

Pet power!

DEAR SIR,—I was very interested in Jack North's experiments on how to sort out good quality rubber, but I must confess that my own experiences lead me to the conclusion that the entire approach is far too complicated, as the following story will indicate.

About 1947/8, I had a very potent lightweight rubber job finally trimmed out, ready for use in a competition at the West Essex Gala, some three days hence, and I set about procuring some new rubber of matchless output.

For three days I scoured all the local and distant model shops in search of the magic blend without success, so, at the eleventh hour, I was forced to look through my old stocks of used rubber, which upon examination turned out to be well flogged. However, I did discover a motor that I had overlooked, which had been left lying on the top shelf of a greenhouse workshop, fully exposed to the very strong light and heat. Worse than this was the fact that a window near this shelf had been left open, and the motor had apparently attracted the attention of our cat!

Nothing for it but to press this motor into service at the gala on the following day. The model not only had an inspired climb, winning first place, but the same motor was used by other members of the club in the same contest, all of whom placed fairly high up the list.

In later weeks this rubber motor was used on repeated occasions and continued to turn in astonishing performances, being finally traded in for some other piece of modelling equipment. It may still be going strong to this very day!

The moral of all this is not to make a torque tester but to become a cat lover!

Yours faithfully,
L. G. BARR.

Harrow,
Middx.

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

Not quite last!

DEAR SIR,—In the January issue of MODEL AIRCRAFT you state that the last flight of a B.E.A. *Dakota* was last October.

This statement is inaccurate as B.E.A. are operating *Pionairs* and *Pionair-Leopards* (freighter version) on regular scheduled services between Southampton (Eastleigh) and the Channel Islands until March 19th. From March 20th these services will be operated from Bournemouth (Hurn) using Viscounts. The other services operated by B.E.A. *Dakota* are between Renfrew and the Scottish Isles.

The flight between London and Birmingham last October was the last internal scheduled *Dakota* flight.

Yours faithfully,
IAN M. JAMES.

Southampton.

We stand corrected, and thank reader Ian James for bringing to light the unpublicised fact that B.E.A. still operate these fine machines.—Ed.

More on Stunt classes

DEAR SIR,—My letter in the November issue of MODEL AIRCRAFT, suggesting an "experts-barred" stunt class for small models to a simpler schedule, has certainly provoked discussion.

The main criticism seems to be, why all the complication of "experts-barred"? Why not simply junior and senior stunt? This would be O.K. if all seniors were experts, but they are not.

Stunt ability has nothing to do with age, and such a breakdown of classes would leave the inexperienced senior in his present position. We must provide a challenge which tests his abilities, but is not completely beyond him.

I brought down much wrath on my head when I claimed that all the major stunters were very much alike, and that the expert gained definite advantages by using a big job. I stand by this. Anyone with a ruler can see just how close the dimensions of the "35" jobs are, and they are even closer when you analyse them properly—within 10 per cent. in most cases. We need new legislation to pull us out of the rut. I want to see a McCoy 60 Stunt Special again!

The modeller whose experience and skill justify building a big glow model (which is strictly *not* for beginners) gains on at least three points :—

Our judges are good and fair, but they must be influenced subconsciously by the size and the glorious noise of a "35" in a "switching" motor run. Of course, you might appeal to the British feeling for the underdog with a tiny model. But a big job can over-awe the opposition, too.

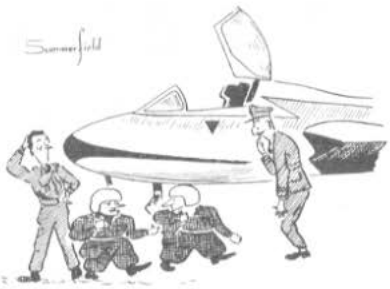
The scale factor is all in favour of the larger jobs, which are less affected by wind and weather.

Engine development has been concentrated on the "35," and the Merco 35 is certainly the best British stunt engine, indeed it may well be the best in the world. The "switching" motor run—four-stroke for level flight, two-stroke in manoeuvres—works best with this type of engine.

I must agree with Stan Robinson that I was not strictly accurate in saying that the 35s take all the places at all the meets. When 35s arrived in 1958, I was using Oliver Tigers, and I was very loath to change from this superb engine. This feeling was strengthened when my Oliver-powered *Gaisgeach* proved to be the finest stunter I had ever flown. I used this design through two seasons, five variants and some 1,000 flights.

In the 1960 season, till June, I took two third places, and some lower places. I then changed to my "35" *Sionnach*, a much simpler aircraft, and took two firsts, a second, five thirds, a fourth and a sixth.

The Editor welcomes letters for publication on any subject, but preferably of "newsy," topical interest or controversial nature. Address is "Model Aircraft," 19/20, Noel St., London, W.1.



"You had too much 'G' on that last turn."

Certainly *Gaisgeach*, and Stan's *Kentish Wind*, are fully capable of the schedule, and more. However, they are both highly developed, sophisticated, complex jobs, as big as most 35s, and flown by very old hands.

One point, on flaps. Flaps give little, if any, extra lift in squares. If properly tapered, with the area concentrated at the wing roots, they eliminate tip-stall and *reduce* induced drag, which is very large in a tight turn. This, and the improved smoothness of control, is why they are used. Most certainly they do not increase the drag unless the design is completely botched.

Finally, should we have a fly-off when only a few points separate two pilots? I think so. I prefer winning by a couple of points to losing by the same amount, but I don't like doing either. No judge can work to such accuracy, and, of course, the weather may have changed completely between the two flights. It seems much more fair to fly-off close places, and these flights might well be worth watching. After all, Top Score Stunt, where open, senior and junior stunt champions fly off for the Grand Championship at the U.S. Nationals, is possibly the most thrilling of all aerobatic contests.

Yours faithfully,

St. Mawgan, Cornwall. NOEL FALCONER.

. . . and design

DEAR SIR,—I have been interested by the recent correspondence in MODEL AIRCRAFT about stunt model design, particularly as I had come to the same conclusion as Mr. Robinson about 2.5 c.c. models and my *Satellite* (M.A., February, 1959) is similar in layout to his *Kentish Wind*.

Progress in stunt model design has been slow and I feel that the main reason for this is that there is no quantitative way of assessing performance. Judgment is subjective and without accurate figures under standard conditions it is impossible to make a real comparison of one model with another and thus pick the better one.

As far as I know no one has ever tabulated what we do want in a stunt model and I would like to suggest the following list of criteria which would at least give a basis for comparing models and thus improving the breed:—

(a) Speed. This should be moderate, 60 m.p.h. being quite fast enough for the "35" models and 50 for 2.5 c.c.s. I should be very interested to see a list of measured speeds of successful stunt models.

(b) Maintenance of speed through manoeuvres. If the model is still going well at the end of the second square figure eight that is good enough for me.

(c) Small turning radius. The mythical turn of 5 ft. radius is aimed at, but does anyone achieve it? The only way to prove it is to start a wing-over pull-out at head height. You try it!

(d) Maintenance of line tension. I think that the "35" models are genuinely better than the smaller models here.

(e) Stability, i.e., smoth level flight and smooth recovery from manoeuvres. The big models seem better here as well.

(f) Reliability. This includes airframe and engine. Even diesel experts seem to get bad motor runs more often with their motors than Glo-plug engine users. After all there are two related controls to adjust instead of one. Having used both types of engine I find the Glo-plug easier to adjust.

(g) Appearance.

Design seems to go in fashions with often no more logic than those of the ladies. Two present day fashions are small elevators and differential flaps.

The small elevator requires large deflection to make the model "go square" but at large deflection the drag is also high—just when we don't want it. A large elevator with limited travel—say, a maximum of 40 deg.—is much more efficient.

The differential flaps—as used on my 1960 Palmer Thunderbird—are supposed to increase line tension, but consider what happens at the top of the square bunt. Full down elevator is applied to bring the model out of a vertical climb. The inner flap goes up more than the outer and pushes the inner wing down—banking the model into the circle at a most awkward moment.

What developments lie ahead for stunt models? I feel it likely that the 0.19 and 0.25 cu. in. models will eventually combine the smooth performance of the present day 35s with the quicker building and ease of transport of the 2.5 c.c. models.

Retracting undercarriages have arrived—Noel Falconer does it with rubber bands and I have a unit powered by a Meccano "Magic" clockwork motor. "35" models can also be built with Naval style folding wings for transport—I have one to fit my small car! Canard

Continued on pag 98

MARTIN DILLY

describes the development of Jack North's highly successful Wakefield Model

THIS model is one of a number that I (R. J. North) have built, in an attempt to produce a design, suitable for Wakefield competitions, but which was simple, stable and free from any defects which might make it unreliable. The necessity for reliability is obvious and now that the old idea of unlimited fly-off times has been abandoned, there need be no compromise with reliability for the sake of maximum performance in a hypothetical fly-off. While building this series of models, I have gained some insight into the factors which influence the performance of this type of model and it seems worthwhile to briefly discuss these factors.

Theoretically, the performance of a model should be better if the aspect ratio of the wing and the diameter of the propeller are increased. We all know that increasing either brings practical problems of an engineering kind, but I felt that these could be solved if it were shown to be desirable to do so. Therefore, I did not limit my early investigations to practical shapes and sizes.

An increase of aspect ratio with a fixed wing area results in a decrease of the airfoil chord, and sections of small chord are more subject to boundary-layer separation effects, which tend to reduce the efficiency of model wings. However, different sections behave very differently in this respect, so it was decided to find a wing section which was satisfactory in small chord sizes and then increase the aspect ratio as far as practicable.

Theoretically, a large propeller diameter improves the efficiency of propulsion, but as excessive torque may be required to drive it, this torque may be difficult to control at the beginning of the flight. Further, the long blades result in a large C.G. movement after folding. Also as, of course, this immediately follows the stage of the climb when the model trim is decided principally by the glide trim requirements after folding, therefore, before folding there will be an unusually large nose-down pitching moment. As the modeller has it, the model will be under-elevated.

The series of models was based on a single design of fuselage, with a wing mount which would accommodate any reasonably sized wing; while the tail was the same for all configurations, since it could only affect the performance in a trivial way. The propellers could be changed on these models using the same noseblocks, a shaft and hub design which made this job a matter of a few minutes, having been developed and thoroughly tested, some years ago.

Peter Scarbrow already had a wing which produced a considerable increase in performance when it was used in place of my original 41 × 5¼ in. design. So in the winter of 1958 he and I built a number of further wings based on his original 50 × 4½ in. planform, but differing somewhat in size and airfoil section. As it turned out, none of these was any improvement on Scarbrow's original choice!

Initially, a number of propellers were tried varying from 18 to 24 in. in diameter, and the simple result emerged —the larger the better!

It sounds simple enough to say that these combinations were tested. This all hinged on the weather being satisfactory, and we were very fortunate that winter in having a run of calm Sundays without complication of thermal conditions. It has not happened since. The other factor, besides the weather, which could affect the tests, was variability in rubber. This subject was covered at some length last month and I shall merely remark that the torque tester was used to select a number of suitable motors. They were used with care, and the experimental flights were planned so that rubber variations had no effect on our conclusions.

By this time the Eliminators had arrived so I assembled the two best model combinations from the parts I had made. At that stage, none of the models had pylons and in test flights, before the first eliminator, both models were crashed due to spiral dives developing after they were hit by gusts of wind. This difficulty had not appeared previously, although many flights in strong winds had taken place. It illustrates the fact that a contest is required to bring out the worst in a model! However, a model was assembled from the pieces and it did well enough in the contest, comparing favourably with the best in the London Area. Before the next eliminator the best model was repaired and I did rather better, although once more the odd spiral dive appeared, fortunately at high altitude, and the model levelled out before hitting the ground.

Two measures were taken to avoid the reappearance of this trouble—a small pylon was fitted, which to date has been completely effective, and various changes in C.G. position were tried. This showed that however stable the model might be in most respects with various C.G. positions, the transition from climb to glide was hopeless unless the C.G. was over the wing trailing edge as shown on the plan.

After the second eliminator, the wind calmed right down and some test flights were made with the most exotic item in the wing programme—a 62 × 3¾ in. high aspect ratio device. This was an attempt to make a wing of the largest feasible span and its debut was striking, impressing all who saw it by doing over 5 min. on the third flight. Subsequently many more flights were made with this model using a 26 in. dia. propeller and there is little doubt that the performance of this combination is equal, if not superior, to the standard configuration. It was used as a reserve for the first Trials but was broken, due to an error of mine in test flying, before the second Trials. In fact, only the standard model was used in the Trials, since it was the one which had been flown the most.

The model's performance at the first Trials was most gratifying to me; it was the only occasion in recent years that I have been to a contest knowing that if I made no errors, I was certain to finish well up the list.

The second Trials were held in very poor conditions; hot sun, clear sky, little wind, strong thermals and strong down-

Jack North with a few of the wings built during the development of "North Star."

draughts. Under these conditions many flights of under 2 min. were made by perfectly trimmed models flown by potential team members. For myself, after a contest flight of 1 min. 48 sec., I retrieved the model, wound it up again to exactly the same turns as before, made no adjustment whatsoever, and made a test flight which dethermalised at 3 min. at 200 ft. altitude. I mention these facts to emphasise that whereas once contests were won by lucky thermal flights, nowadays they are won more often by those who avoid unlucky down-draughts. The element of chance remains!

The Trials conditions were reproduced at the Wakefield contest in France, except that the temperature was somewhat higher. It was perhaps clever of us to select our team under conditions representative of the actual contest, but I regret that on this occasion my personal good luck did not prevail against the weather conditions. At about 7.30 a.m. on the day of the contest my reserve model was broken by dethermalising onto a small spiky bush. Such was the turmoil into which the team members were thrown by our various troubles once the contest started, that I did not have time to repair and test fly this model until 4 p.m. when the contest was almost over. In the meantime, my other model had landed in a pond after a test flight to check that it was a down-draught and not maladjustment that caused a poor contest flight. It was immersed for half an hour before I found a way of getting it out but the soaking did not seem to affect the subsequent flights.

Construction

I do not think it is necessary to tell you how to build this model, but it is essential to build the wing and propeller properly, because these items determine the performance.

Wing

This should be free of warps if possible; if there are warps they should be in the form of wash-in on the right side or wash-out on the left side. Do not try to make the wing too light: the weight of the wooden parts to be used, or the uncovered weight, should be 1-1½ oz.

Propeller

This should be made as shown on the plan. If you cannot make it properly, do not bother with the rest of the model. If you have not carved a successful rubber model propeller before, look at a few before you start. The first and most important step is to get the right piece of wood, and the second is to orientate it properly so that quarter-grain appears on the faces of the blades. The wood should be straight-grained and of even texture without hard or soft veins.

The propeller shaft and hub are made of 16 S.W.G. wire, using a pair of Bernard pliers. It is not essential to use this particular form of hub but it is the only design which I have used which is completely reliable; in addition, it allows the propeller to be changed at will. Observe the shape and size of the hooks and get them right; they are not guaranteed to work unless they are. The arrangement as shown permits winding with the tube system (1 in. o.d. tube).

Fuselage

The construction is obvious enough and I found the assembly was very simple using UHU or PVA glue instead of the faster adhesives. A celluloid flap to cover the motor peg is desirable because when the model lands, the dust kicked up by the front end all goes in the hole at the back unless thwarted.

Dethermaliser

On the original model this was a fuse type, but I (and Dave Posner!) recommend a Tatone clockwork timer. Apart from greater accuracy in setting, it is one less thing to worry about when preparing for a flight; this is quite important as it is at this stage that mistakes are made.

Trimming

Get the C.G. about ⅜ in. forward of the trailing edge of the wing by adjusting the ballast position. The ballast I use is thin lead sheet taped (Scotch Boy paper tape) to the bottom of the fuselage; waterproof tape is a good idea so that when the model lands in a large puddle (Chobham) or a small lake (Brienne-le-Chateau) the ballast does not fall off. Hand glide into tall grass, as they used to say; nowadays, hand gliding and long grass seem to have gone out of fashion but it is still good practice nevertheless.

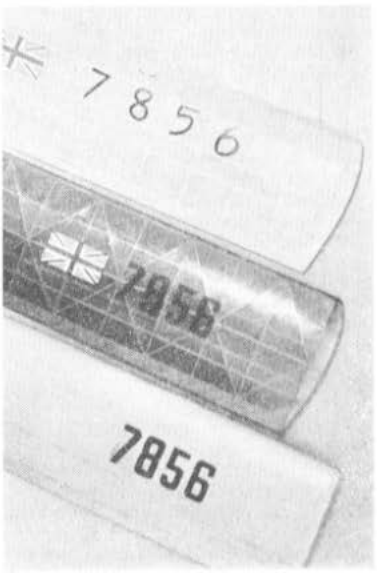
Adjust the turn by means of balsa strips along the fin trailing edge. I do not claim to have invented this trick, but have talked quite a few people into using it—they never go back to tabs, which can get knocked off or bent in the box. Use, say, $\frac{1}{16} \times \frac{1}{4}$ in. strips, flat side against the fin, and adjust by trimming the length; do not stick one piece on top of another because the effect is proportional to length, not thickness. The glide turn should be apparent from the hand launch but do not have it too tight.

Put in some down and right thrust and proceed as usual with the "power" trimming. The climb and glide circles on the originals were to the right and quite open. Tradition has it that glide circles should be tight, but I seem to do fairly well with wide circles and there is less chance of the model spinning in a strong thermal on the glide, or coming in with a spiral dive in the early stages of the climb.

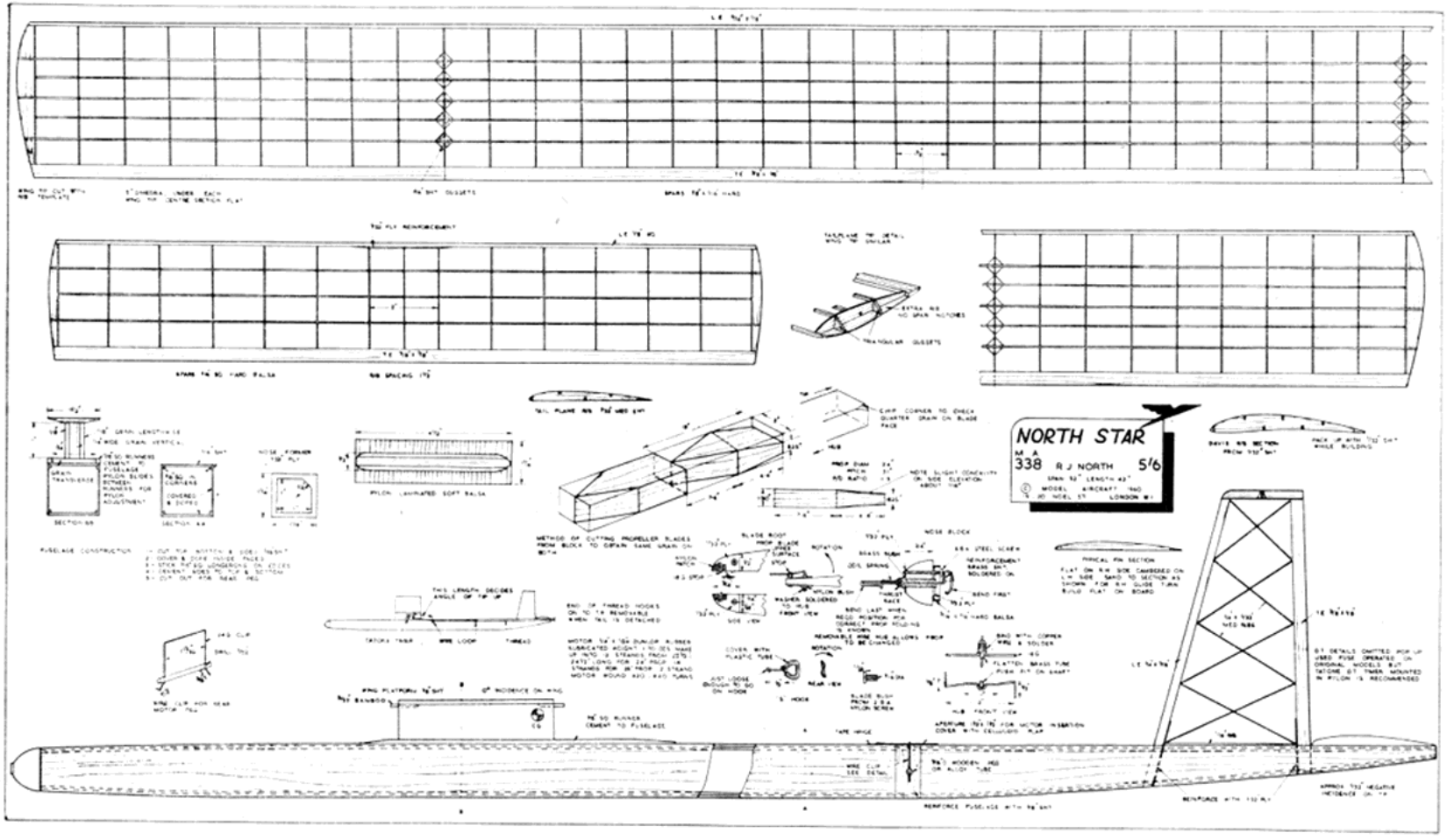
In order to get the climb right for a contest I test fly using full turns on the best motor I have. If the model does not stall on the first burst with the best motor, it will not do so on the others. Of course, if you have no torque testing machine, I do not suppose you will know which is your best motor.

You will, if you build this model properly, have a copy of one of the better models of 1959. If you expect to fly in the 1961 Trials, now is a reasonable time to start building the models and trying to find some reasonable rubber. Last month's article suggested how to recognise good rubber when you have it, but I cannot offer any advice on how to get hold of it!

I should like to acknowledge the part played by Pete Scarbrow in the early stages of the development of these models, the assistance of Dennis Partridge and Ken Smith in test flying, and the invaluable help of all three at the Trials.

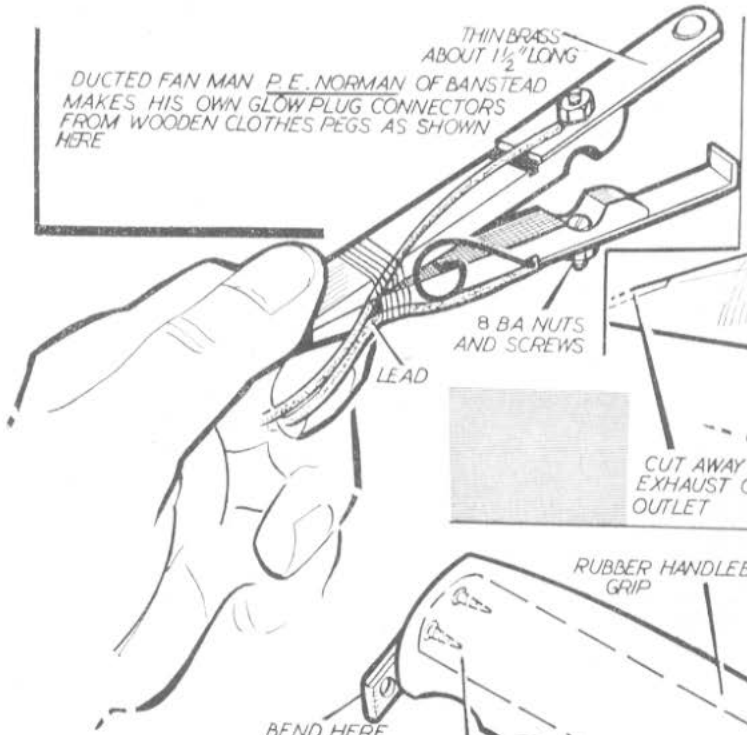


Three types of wing construction. Top: the one featured on the plan; centre: high a/r with multi spars and geodetic ribs; below: fully sheet covered.



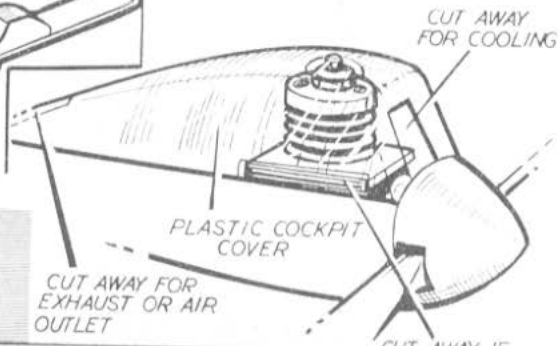
FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 19-20, NOEL STREET, LONDON, W.1, PRICE 5s. 6d., POST FREE

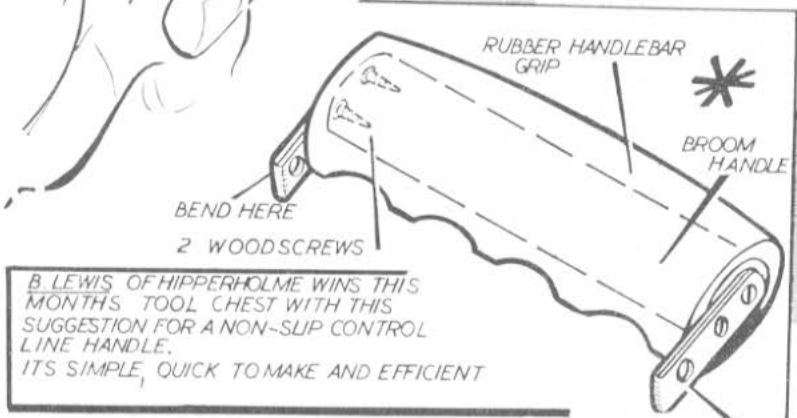
Readers hints and tips . . .



DUCTED FAN MAN P.E. NORMAN OF BANSTEAD MAKES HIS OWN GLOW PLUG CONNECTORS FROM WOODEN CLOTHES PEGS AS SHOWN HERE

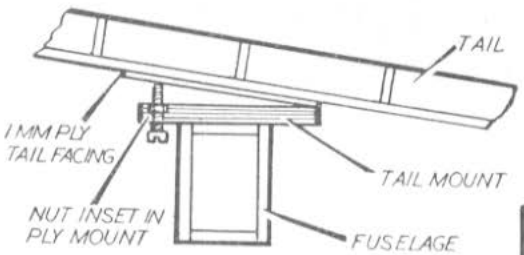
IS YEAR OLD P.H. ENNIS OF SMALL HEATH BIRMINGHAM FINDS A PLASTIC BUBBLE COCKPIT COVER USEFUL AS AN ENGINE COWLING.



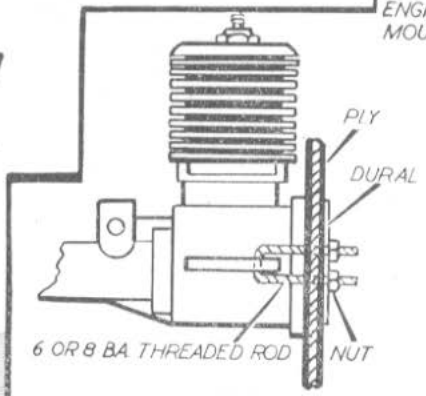


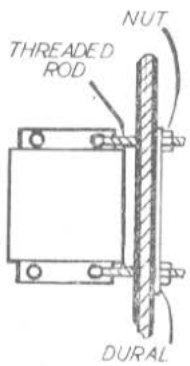
B. LEWIS OF HIPPERHOLME WINS THIS MONTHS TOOL CHEST WITH THIS SUGGESTION FOR A NON-SLIP CONTROL LINE HANDLE.
ITS SIMPLE, QUICK TO MAKE AND EFFICIENT

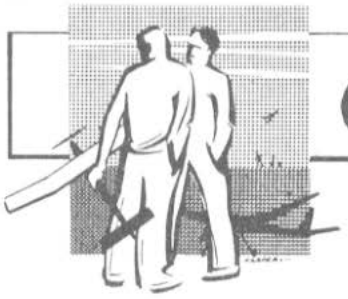
THREADED ROD BENT AS SHOWN BELOW IS USED BY I. BEATTIE OF ABERDEEN TO ADAPT A BEAM MOUNT ENGINE FOR RADIAL MOUNTING.



JOHN O'SULLIVAN OF CORK USES THIS SIMPLE SCREW JACK ADJUSTMENT FOR POWER MODEL TAIL TILT TRIMMING.







CLUB NEWS

BATS M.A.C.

This new club has been formed in the Basildon New Town area, our interests being mainly in C/L Combat. Membership is low at present, but new members will be welcome (see under New Clubs).

WALLASEY M.A.C.

Notification that John Hannay's Hill-equipped radio job has been found was received a short while ago. He lost this model whilst flying on Dartmoor—on holiday? He was discouraged from following it after local reports of the snake-infested bog that he had to cross. Five months of wind, rain and snow have left the model somewhat soggy, and the radio—ugh! The PAW 2.49 is in reasonable condition, and once stripped down should be O.K. again.

The Birkenhead Y.M.C.A., on the first Saturday in every month sees the gathering of the clan. New members are very welcome, especially those that use our flying field but are not members!

ST. ALBANS M.A.C.

At the A.G.M. an impressive array of trophies and diplomas were presented to the members. No less than three of these diplomas were presented to our Junior Champion M. Knight, who has done extremely well over the past season. G. Fuller is club champion, J. Simeons power and glider champion and B. Rowe rubber champion.

PETERBOROUGH M.F.C.

At the South Midland Area Championships at Cranwell, Combat was our main entry, with one entry in stunt, and one in T/R, but it was not until after Graham Clark's 100 m.p.h.-plus team racer *Winkle Picker* had smashed its wings in cartwheeling down the runway that it was decided to hold the event between the hangars, sheltering from the gale force wind.

The wind was the bugbear of the day, and in combat only the faster models survived. Mick Fountain reached the final, but this was never flown owing to lack of moonlight. A flip of a coin gave him second place, but he couldn't grumble after coming first in stunt. Third equal in combat was Ian Duffy who lost to Red Phin of Cranwell, the eventual winner.

SOUTHAMPTON M.A.C.

Our club premises have just been redecorated by the council and we consider ourselves fortunate, as the colour scheme is the one we suggested. This, we consider, shows the wisdom of personally seeing the people concerned. Our past attempts by letter had all been unsuccessful, but when explained fully, the situation was soon altered.

OLDHAM & D.M.A.C.

A savings club for the Nationals has been started. Several of the lads went for one day last year, and now think it a good idea to turn up for the weekend. We will be camping out, or just mucking in anywhere so long as we all have a good time.

A chuck glider comp. was held in the club room, and quite a large number of the members turned up with some very good models. Prizes were given for best times and a booby prize for the worst.

BRIGHTON & D.M.A.C.

The fly-off for the Arthur Mullett Rose Bowl, postponed from November, took place and John West's *Dixielander* did 5.56 to win against Fred Boxall's open rubber job's 3.36.

The Chairman's Cup for seaplanes was held at Ditchling in misty conditions, and 11 members turned up, five with seaplanes. The conditions were such that there was no drift and de-thermalisers were dispensed with in truly still air conditions. Fred Boxall, flying a rubber power model, scored three perfect maximums, including a last flight of well over 4½ min. Ian Lucas, flying a Frog 150R powered *Clot*, just missed a perfect score by 4 sec. on his second flight. *Results*: 1. F. R. Boxall, 9 min.; 2. I. C. Lucas, 8.56; 3. J. West, 8.20.

On Boxing Day, at Chobham, Dennis Latter won the Glider event and Fred Boxall came second in the rubber.

HINCKLEY & D.M.A.C.

Now that Keith Hunt's wife is allowing him to get the bugs out of his F/F job, we are expecting great things in the field, as well as the T/R circles, where, this year, Mick Ellis practically flicked his way to Hungary for our new secretary Dave Nixon. Between them these two won for the club the Midland Area F.A.I. T/R championship with firsts at the last three meetings at Wellesbourne.

WHARFEDALE M.A.C.

The first ever Wharfedale C/L Rally will be held at R.A.F. Rufforth, provisional date June 4th. Events will include combat, stunt, ½A, A and B team racing, plus plenty of good clean fun.

At a recent club meeting it was unanimously agreed that Wharfedale should present a trophy to the S.M.A.E. to be awarded to a T/R competition. It was suggested that the trophy should be called the "Wharfedale Trophy" and may possibly be competed for at the 1961 Nats.

We were pleased to hear that Ray King, one of our keenest F/F power exponents, was placed top of the Northern Area power averages for last year.

In addition to our own club rally we hope to stimulate interest in C/L still further by assisting in the running of T/R events at all Northern Area centralised meetings this year. Concentration will be directed towards International class racing, but other classes will, of course, receive attention according to demand.

We would like to invite anyone interested in any aspect of aeromodelling in the Leeds/Skipton/Harrogate district to come along to a club meeting and see the activities and sample the benefits offered to keen enthusiasts in a really progressive model club. Meetings are held on the first and third Fridays of each month in the Salum School Rooms, Burley-in-Wharfedale, Ilkley.

HALIFAX M.A.C.

Recently permission to fly on the local flying field was given by the Town Council. This, we feel, is a step in the right direction in our efforts to get aeromodelling accepted by the general public as an educational and absorbing hobby.

HAYES & D.M.A.C.

Our club Combat Competition was won by Dave Balch who beat Robin Greenaway in the final. We would like to hold a club speed competition but are unable to find a suitable venue. Are there no suitable sites left in the West London area?

The club's professional Laurie Barr, who runs his own flourishing model making organisation, recently gave us a talk on model finishing which was most interesting. He brought along a part

CROYDON AND DISTRICT Model Aeronautical Club

FOUNDED in 1935, this extremely active and well-known contest club still has as its President one of the founder members, H. W. Hills, noted for his shooting stick and timekeeper's eyesight, at every major contest until quite recently.

The club's fantastic run of contest successes started during the war with lightweight rubber specialists Mick Farthing and Ted Buxton, but really got into full swing in the "40's" when junior Norman Marcus beat all the seniors to win the National Championship. Anthony Watkins and Norman Standing were also Junior and Senior National Champions respectively, while the list of normal contest first places alone, secured by club members, would more than completely fill these two pages.

The Plugge Cup has spent much of its life in the Croydon area, as has also the Farrow Shield, in winning which, in 1959, the club returned the first ever perfect team score.

In the late 40's and early 50's—the contest fliers' heyday—it is doubtful if any gala finished without at least one Croydon member featuring in the results (at one gala they won every contest and were also second and third in all but one event!). The Yeabsley twins with their gliders, Norman Marcus, Bob Ladd, Ron Ward in power, Jack North, Ed Bennett, John Palmer not to mention the redoubtable J. L. Pitcher (who only took up modelling when he was past 60) in rubber, the list is endless, but it is worth recording those who represented Great Britain in World Championship teams:

Wakefield—Derek Piggott, J. L. Pitcher, John Palmer, Archie Allbone, Jack North and we mustn't forget Jim Tangney, a visiting American, who was a member for several years and reached team level in the trials.

Glider—Bob Gilroy, Dex Yeabsley and Jack North.

Power—Pete Cameron and once again Jack North.

The club is certainly not exclusively F/F. Pete Kelsey held the "49" speed record for some years, while the Cameron/Martin/Butcher team racing equipe certainly left their mark in A and B, with either a first, second or third place in practically every meeting entered!

Following in the footsteps of Norman Marcus who held the F/F scale record for several years, Den Partridge was first in '59 and third in '60 at the Nationals, leaving it to George Fletcher to win the C/L scale last year.

Radio would seem to be the club's only real weak point—at the moment!

Secretary: D. Partridge, 126, St. John's Road, Redhill, Surrey.

We intend to make this a regular feature. If you would like a brief history of your club to be published send us the details, together with a copy of the club transfer and/or badge, but keep the details brief please.—Ed.

sectioned and detailed D.H. *Comet* as an example to achieve. We have now revised our ideas as to what *is* a good finish.

The club F/F Gala was held on Chobham Common on Boxing Day, it was not an unqualified success. The morning dawned very stormy, and must have put off several possible entrants, while conditions at the Common on arrival were boggy enough to discourage the rest. There were about two organisers or timekeepers to each of the 14 competitors, and each deserved a prize. The flights were restricted to a 2½ min. max. with the wind in a bad direction. *RESULTS—Power*, G. Fuller, St. Albans; *Glider*, D. Latter, Maidstone; *Rubber*, A. Wisher, Croydon.

Needless to say the weather on the following day, which was also a holiday, gave almost perfect flying conditions.

HORNCHURCH M.A.C.

Hornchurch aerodrome is still available to us although the future seems uncertain, so members are asked to take full advantage of the flying facilities while they are still there.

LIVERPOOL D.M.A.S.

In F/F our power genius, Alan Carter, ended a moderately successful year with a second place in the Frog Senior, so we expect great things from him this year. Rubber interest is small but strong and we may provide a few surprises at the Wakefield trials. Since an excellent talk given by John Hannay recently there has been new interest in the glider class.

WESTON CONTROLINERS

Because of the bad weather the Sunday flying outings to RAF Locking have been cancelled for several weeks, much to the annoyance of the many keen modellers in the club who want to get in practice for the coming competition season.

Bill Evans of the Model Shop has an ambitious project at hand; he is building a Handley Page V1500 for four 2.5s. The span is 7 ft. and he has been asking for volunteers to help cut out the 250 ribs! This he hopes to fly at the Nationals. He is also getting some speed pans made for his two Dooling 60s. Top speed on the first outing was 134 m.p.h., but this should easily be surpassed by his future models.

CONTEST CALENDAR

May 7th	Sutton Coldfield R/C Meeting. R.A.F. Wellesbourne. Single, Multi and Scale. Entry forms and full details—R. Masters, 30, Western Road, Wylde Green, Sutton Coldfield, Warwickshire.
Oct. 1st.	South Coast Gala. Venue to be announced.

URMSTON D.M.A.C.

With the acquisition of a new clubroom and the promise of a new flying field, there has been a revival of interest and we now boast 25 enthusiastic members.

A monthly competition is now a regular feature and the most recent, a weight lifting comp., attracted much interest and was finally won by W. I. Bannett in sub-arctic weather conditions. K. Hulme's twin-engine flying wing had to be content with second place.

KENTON M.A.C.

After a reasonably successful season in which we reached at least the semi-finals at every combat competition we entered, the lads have begun to rouse themselves from their early winter sleep and some new models are at last appearing at Northwick Park. Olivers are being "rejuvenated" and tuned up and we are all looking forward to the 1961 Comps.

At a "paper dart competition" in the clubroom, everyone was given a piece of paper of the same size and was asked to make a paper dart of any design, the winner being the one to amass the longest time in three attempts in the clubroom (50 ft. × 50 ft. × 18 ft. high). All furiously folded and refolded but we were most surprised at the efforts of Ian Bone, his "model" was a "T"-shaped piece of paper folded to give the horizontal piece pitch. Result—one helicopter! Folded round a piece of chalk, it was thrown up to the ceiling, the chalk fell away and the model floated down. He won—cheat!

WHITEFIELD M.A.C.

Back in these columns after a long absence, the club has taken on a new lease of life. Our victory in the Rootes Trophy was the result of teamwork, between seven flying members and nearly a dozen helpers. Several club contests have been well attended, including a Novices F/F event to give our new members a bit of encouragement. Unfortunately, we have had to have a purge of a few members who have lost interest in the movement and the club, but their replacements are shaping well, so we are looking forward to a good season for 1961.

CHANGES OF SECRETARY

HINCKLEY & D.M.A.C. D. W. Nixon, 11, Station Road, Elmesthorpe, Earl Shilton, Leicester.

ST. ALBANS M.A.C. D. Knight, 10, Great Ley, Welwyn Garden City, Herts.

EAST ANGLIAN AREA. L. J. Sayer, 58, Skerry Rise, Chelmsford, Essex.

CROYDON & D.M.A.C. D. Partridge, 126, St. John's Road, Redhill, Surrey.

BLACKBURN AIRCRAFT (WELFARE) M.F.C. D. C. D. Cope, 86, Northfield Lane, Horbury, Nr. Wakefield, Yorks.

NEW CLUBS

BATS M.A.C. M. Taylor, Green Trees, Dry Street, Langdon Hills, Basildon, Essex. (Phone: Laindon 3247.)

COATBRIDGE M.F.C. D. Brown, Dunolly, 40, King Street, Coatbridge, Lanarkshire.

CLUB SECRETARIES AND P.R.O.'s ARE REMINDED THAT COPY FOR INCLUSION IN CLUB NEWS MUST BE RECEIVED BY THE 15th OF THE MONTH

READERS' LETTERS

(*Continued from page 92*)

layouts are theoretically very promising and how about a thin wing model with hinged leading edge moving the opposite way to the flaps? It works on the Victor so why not on a model?

Yours faithfully,
M. F. HAWKINS (DR.)

Sheerness,
Kent.

Lap counting

DEAR SIR,—F.A.I. Team Racing is, happily, becoming very popular, but poor timekeeping and lap-counting is proving a source of continual irritation. Having done quite a lot of timing and counting last season, I have reached several conclusions.

Lap-counters and timekeepers should be positioned alongside the segment from which the model originally started. If all the timekeepers sit together, then how does one timekeeper know when the model passes a segment say 1/3rd of the circuit away from him?

Staying by the relevant segment and thus the pit-man, also has another use—the pit-man can check his model's lappage at each pit stop. This helps the pit-man and is surely no infringement of the rules?

In a close finish, where two models are credited with times less than 1 sec. apart, then the result should be recorded as a tie as most ordinary stop-watches are only accurate to about ½ sec. in 5 min.

Yours faithfully,
KEVIN LINDSEY.

Richmond,
Surrey.

Plastic projects

DEAR SIR,—When is some enterprising manufacturer going to put on the market plastic kits of some of the interesting aircraft of Italy, Japan, and Russia that flew in World War II?

As a keen collector I should welcome the S.M.79 *Sparviero*, Macchi *Saetta*, *Betty*, *Sally*, I-16, LaGG 3, and a lot of others well worth modelling. There is a surfeit of *Spitfires*, Me109s and F.W.190s, so how about something less well known, but more interesting?

Yours faithfully,
G. BRUNT.

Freshwater Bay,
Isle of Wight.

No twist!

DEAR SIR,—I hope I may be given, through your columns, an opportunity of replying to J. O'Donnell's criticism of the winding aid published under my name in your issue of November, 1960, and to protest against your apologetic and inaccurate footnote.

If Mr. O'Donnell will take two minutes to *look* at the sketch he will see that the gadget is formed, not from "two pieces of wire," but from a continuous length and once he has conducted a further test—as he no doubt will—of a properly made item, I am sure he will have as much satisfaction *as I have had over a period of 15 years*.

When he has done so, I trust he will have the grace to retract his impertinent and unwarranted innuendos.

Twisted Gadget, indeed—Twisted Thinking forsooth!

Yours faithfully,
WM. C. MORRISON.

Elderslie,
Scotland.

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CONTINUED ON PAGE xiv

The crew of a Sea Vixen prepare for take-off as a Buccaneer passes overhead.

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FROG

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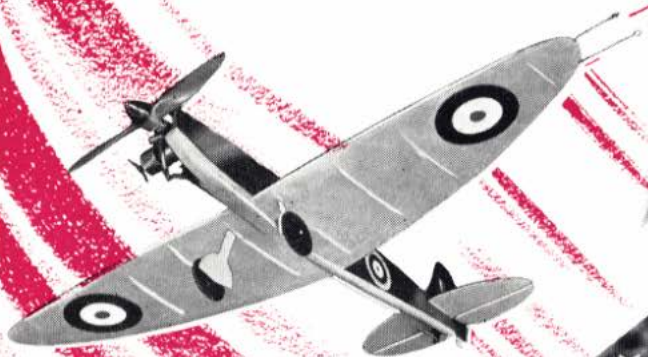

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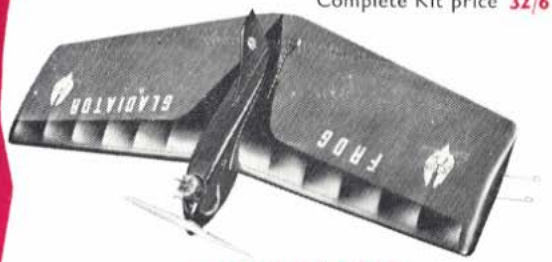

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