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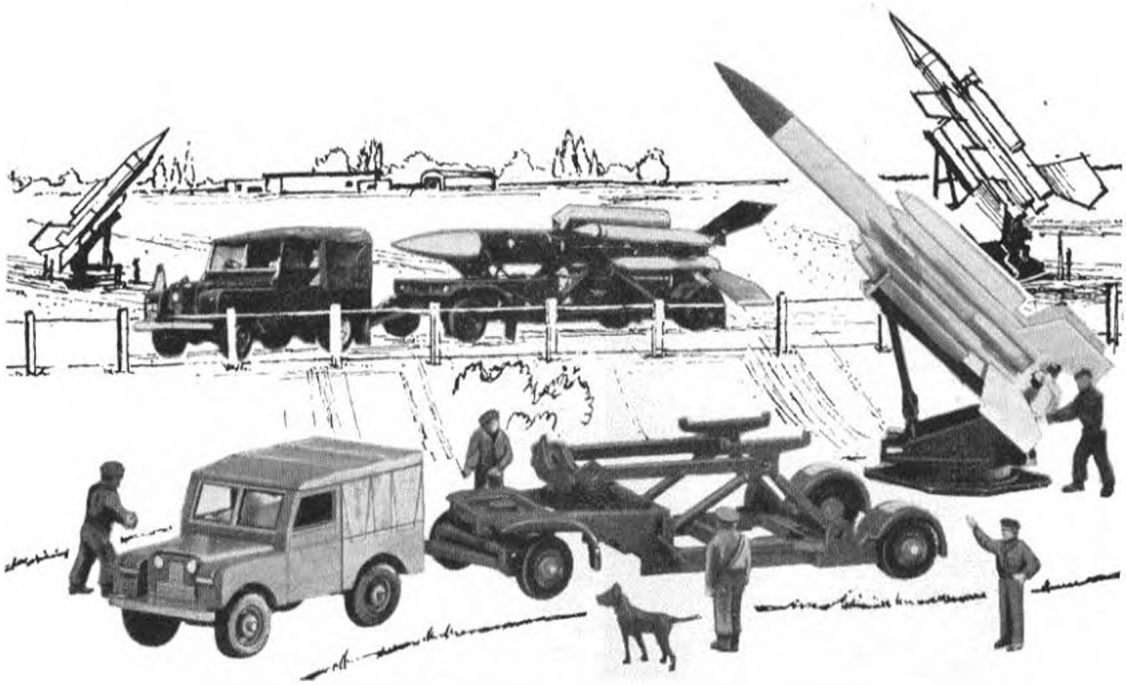

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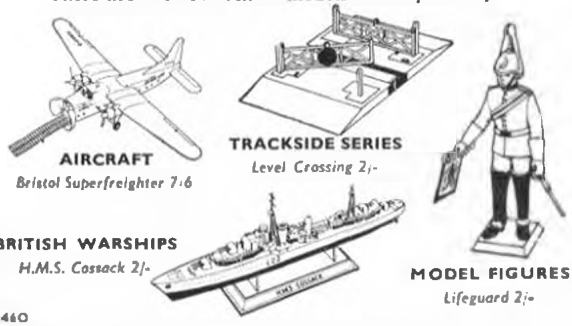

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MODEL aircraft

FEBRUARY 1961

No. 236 VOLUME 20

The official Journal of the SOCIETY OF MODEL AERONAUTICAL ENGINEERS

IN THIS ISSUE

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Here and There

AS we write these words the MODEL AIRCRAFT demonstration of R.T.P. and C/L flying at the Schoolboys Exhibition is in full swing. The terrific interest the flying has aroused, proves that there is no lack of enthusiasm among youngsters for our hobby, and if all the kits we have seen being proudly carried from the hall are completed, then there will be no lack of new enthusiasts joining the ranks.

But, and it is a big but, there are far more kits sold than are completed and flown. Obviously a percentage of these are accounted for by the type of person who never sees any project through to its conclusion, but many youngsters fail to complete their models through sheer lack of knowledge, and, possibly, an unsuitable choice of kit.

MODEL AIRCRAFT, by forming the Model Aircraft Wings Club, and publishing regular beginners' features, does all in its power to assist beginners, but we are only too well aware that many youngsters are discouraged before they become sufficiently interested in the hobby to consider buying a model magazine. This is where retail shops and clubs can be of real assistance to newcomers.

Specialist shops should know enough about the hobby to realise that selling a beginner a scale kit is no way to secure a regular customer. A little tactful advice on choice of model, plus a little salesmanship concerning helpful books for beginners, will go a long way to ensuring that a youngster with a casual interest, rapidly becomes a serious modeller.

Clubs can be the greatest help of all if the members approach a newcomer correctly. Shops will always put customers in touch with the local club if they think its members will help, thus they become mutually supporting. Remember, no matter how good a kit may be or how comprehensive its instructions, there is often some small thing that is not understood. Something so simple that anyone who has built a model will know the answer, yet to an absolute tyro it is a stumbling block that can put him off aeromodelling for ever. Yet a few helpful words from an experienced modeller, and the club has a new member.

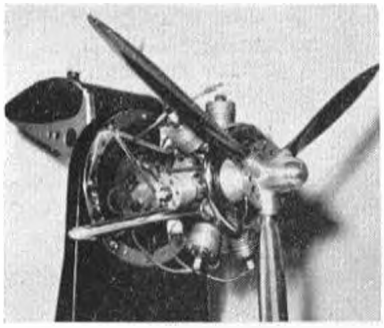
Regrettably however, many clubs do not take this commonsense approach. A youngster arrives with his beginner's glider kit only to be asked "Why did you buy that thing?" Is it any wonder he takes up model trains? Even worse is the local self styled expert, who haunts the counter of the local model shop (and the mind of its proprietor) every weekend. When a likely youngster is being advised on suitable first models, or more especially engines, big head has to open his mouth and make derogatory remarks about all beginners' goods.

The tragedy of this is that often his opinions are taken as gospel, whereas if faced with a genuine modeller he could be deflated with three or four well chosen words.

The moral of this is that shops who have no direct knowledge of the goods they sell, and clubs who are unable to resist the opportunity to show off their own superiority, are useless to themselves and the entire modelling movement. They do irreparable

Left: Dr. A. O. Wilson's collection of "solids."

Far left: Dr. T. Fletcher's seven cylinder radial two-stroke.



damage to those who welcome newcomers to the hobby in a way that will ensure their becoming good modellers.

Doctors' Hobbies

THE fourth Doctors' Hobbies Exhibition organised by Bengers Laboratories, served to emphasise that, like every other branch of the community who spend their work-a-day lives in similar pursuits, doctors certainly have very individual ideas on how to spend their leisure moments. Collections, painting, embroidery, inventions, modelling, the list of exhibits was as long as the list of hobbies themselves, but surprisingly, medical interest in model aircraft seems to be very limited.

There were in fact only two exhibits in this class—a radio controlled *Junior* 60 by Dr. C. C. Sherry and a collection of nicely made "solids" (not plastic) by Dr. A. O. Wilson. However, of particular interest was the full-size Druine *Turbulent*, which was flown down from Scotland by its builder Dr. F. E. Roche, and the seven cylinder, two stroke, radial engine made by Dr. T. Fletcher. This engine, which was designed by his son George, is a superb example of model engineering and runs well, although its power output is insufficient to power an aircraft of the size necessary to accommodate it.

On the Cover

THIS month we feature Belgian flyer L. Grondal, the reigning World Stunt champion. The photo was taken just after he won the 1959 Criterium d'Europe, and he again flew a *Nobler*, although a different machine to that shown, to win the World Championship in Budapest.

Competition Results

WE have just finished wading through the masses of entries for our Christmas Competition, and the winners are:

1. Ronald Turnbull, Fairhurst Drive, Rox, Scotland.
2. M. R. Lewis, Parkland Road, Woodford Green, Essex.
3. M. D. Pascoe, Mount Fletcher, East Griqualand, South Africa.

Special prize for Wings Club entries: Richard Peter Nixon, Windsor Road, Waterlooville.

These lucky people will be receiving their cheques shortly, but for the unlucky ones let us just say thanks for sending your entries, and double thanks for the many kind comments you made about M.A.!

Getting Together

A CERTAIN amount of concern is being expressed over the decrease in the number of contests which are suited to the less experienced modeller. More and more the contest field is becoming dominated by the roving "circuses" of top experts, all geared to a very high pitch of expertise, and often equipped with power units and technical skills outside the scope of the average competitor. At the same time the increased diversity of our hobby, which now covers a wide range of varied interests, has had a dampening effect upon the once popular club contest. Only the largest of clubs can muster sufficient support in any one branch of activity to mount a worthwhile competition.

However, this is not necessarily a cause for lament. The trend merely underlines the changing pattern of our hobby; the widening of interests and the increased technicality. Factors which tend to produce the specialising super expert, and also to indicate that model flying has ceased to be just the active ingredient in a basically constructional pastime, and become a sport in itself.

Possibly the time is ripe for some radical changes in our contest set-up. Nothing is more depressing to the initiate than certain failure. It might be a sporting gesture to participate just for the fun of it, but not a very stimulating one. After all, even a good racing driver would find very little hardware on his sideboard if he always had to compete against Stirling Moss, and very few Golf Clubs would survive without the handicapping system to broaden the competitive field.

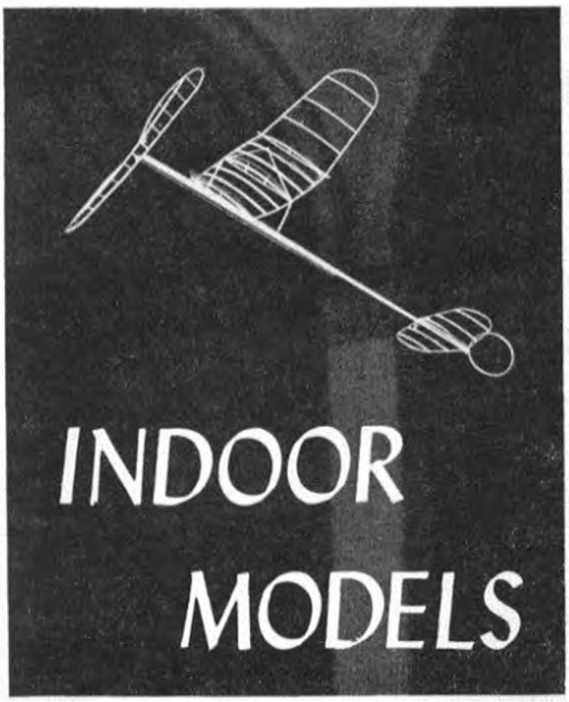
The modeller with an interest in competition flying will wish to pit himself against others of more or less equal skill. He may not have the time, nor perhaps the particular flair, to make the top grade, and if the only contests open to him are in the all comers, expert class, he can be sympathised with for losing interest. And even the up and coming modeller, with the necessary potential, will feel more confident to tackle the top opposition after notching up a few local successes.

Quite often a modeller will enter at a major rally without any previous contest experience behind him. In some events, such as radio, he can be a source of embarrassment; wasting precious time and lowering the general standard of flying. The same can also apply to team racing, where the organisers are often hard pushed to complete the event in reasonable time without the delay and confusion caused by the inexperienced and sub-standard flyer.

Perhaps one answer to the problem would be to broaden out the club contest to take in all the clubs in one locality or district. In this way sufficient entries would become available for a small but worthwhile contest for any one type of model. Some clubs are already working along these lines, giving the younger modeller a taste of competitive flying, while at the same time keeping the spirit of model flying alive by the stimulus of the get-together contest.

Thanks to All

ON behalf of myself and the Staff of MODEL AIRCRAFT I wish to acknowledge the hundreds of Christmas greetings received from readers all over the World. I sincerely regret it is impossible to reply to everyone individually but they were all very much appreciated. Thank you—Ed.



INDOOR MODELS

REG PARHAM describes the construction of his Class 'B' microfilm and tissue covered indoor models, with general notes on materials, jigs, construction, and flying that will assist everyone interested in this fascinating branch of modelling.

The writer's Class "A" microfilm model in flight in the Corn Exchange, Manchester

THE principal aim of this article is to try and provide the average aeromodeller with sufficient practical "know how" to enable him to construct and fly an indoor model capable of high performance.

Two versions of the Class "B" model shown in the accompanying reduced scale plans can be built; one with microfilm covered surfaces and built up propeller, and the other with tissue covered surfaces and carved balsa propeller. The best performances of the originals were 20 min. 7 sec. for the "mike" job, and 12 min. 52 sec. for the tissue covered model, both flights being made in the airship hangar at Cardington in May of last year.

To build a light, strong and accurately rigged aircraft, it is essential that considerable use be made of formers, jigs and templates. Care in making these is well worth the time and effort involved, as they can be used time and time again for the production of further models. Therefore I will include descriptions of these items as they are required, together with one or two tips I have found useful and notes on various materials.

Indoor balsa

The chief material used for indoor model construction is selected ultra light balsa having a density of between 4 to 6 lb. per cu. ft. It is usually available in sheets cut either straight or quarter grain. The latter cut is recognised by its speckled appearance, and has additional stiffness across the grain.

Until recent years, indoor balsa was scarce in this country, but now a useful supply is cut by Messrs. Solarbo Ltd., of Commerce Way, Lancing, Sussex. Write to them to enquire the whereabouts of your nearest source of supply.

When sanding indoor sheet balsa, always sand away from the hand holding the wood, and when cutting strips, use a good metal straightedge and a very sharp cutting tool.

Cement

This should be the thin transparent variety such as Drome and it must be used sparingly. Strong adhesives such as Britfix are only used for the attachment of bearings and hooks, as their use on a fragile wing structure would cause distortion.

Motor stick and tailboom

The motor stick is a circular balsa tube, and is the foundation of the whole model. Therefore it is absolutely essential that it be strong enough to withstand the tension and torque of a fully wound motor without distortion.

To make a motor tube the first requirement is a former of 1 in. dia. which must be smooth and straight. Metal is to be preferred, but birch dowel rod will suffice. You will need a piece of Modelspan about 3 to 4 in. wide and a little longer than the blank, which is cut to the shape shown on the plan from 1/64 in. light quarter grain balsa.

To make the tube, take the former, wind the Modelspan onto it for about two turns and place on a flat surface (Fig. 1). Soak the blank in warm water until pliable, remove it from the water and place squarely between the tissue and the former. Roll the former until the blank and the Modelspan are completely wound upon it. If necessary, damp the tissue to make it adhere. The "roll" is now placed near an electric fire for about 20 min. to dry out the moisture, after which the tissue can be unrolled and the blank (now tubular) can be slipped from the former. Slide the tube back on the former and carefully cement the seam, checking that it is straight. Remove the tube once again from the former and draw in and cement the tapered ends. Complete the unit by lightly sanding along the seam.

The method of making the tailboom is similar to that of the motor stick. A tapered former is required, $\frac{3}{16}$ in. dia. at the large end and $\frac{1}{8}$ in. dia. at the small end, and this is best made by sanding down a piece of birch dowel. The balsa for the blank should be very light, but its "cut" is not important. Take care to keep the seam of the final tube straight when cementing. When the boom is finished, cut out the small vertical stiffener from 1/64 in. sheet and cement it into the end of the boom.

Make a mark $\frac{1}{4}$ in. from the large end of the boom and then insert it into the motor stick for this distance. Check the fit and, if satisfactory, the boom can be cemented in position, checking that all is straight and that the seams of the motor stick and boom are in alignment.

Make the rear hook from music wire,

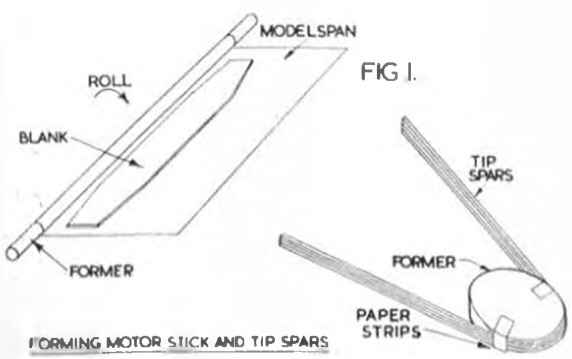


FIG 1.

FORMING MOTOR STICK AND TIP SPARS

and carefully insert its end through the wall of the motor stick at the correct position. By looking down through the open end of the tube it is possible to see the wire and therefore to guide it alongside the vertical stiffener. Cement the rear hook in position with Britfix and add the front vertical stiffener.

The bearing is made from a strip of duralumin sheet, carefully filed and bent to shape. Drilling is best done with a 1/64 in. dia. twist drill held in a pin chuck and rotated by hand. Remember to have only about 1/32 in. of drill projecting from the chuck. The slot into the rear hole is cut with a razor blade, the slot being prised open slightly so that the propeller spindle "clicks" into the hole. Cement the bearing securely to the motor stick with Britfix, checking its alignment with the rear hook and ensuring that it is under the vertical stiffener. Bevel the front of the motor stick, add the cap and lightly sand the assembly.

Mainplane, tailplane and fin

The planform has been kept as basic as possible in order to simplify construction. On the mainplane, the port inboard panel is 1 in. longer than the starboard panel. The reasons for this are twofold. One is to counteract the effect of propeller torque, and the other is to provide the port wing with a little additional lift, to compensate for that obtained by the starboard wing, due to its greater airspeed, when the model is circling to the left.

To start construction, make a $\frac{1}{16}$ in. thick plywood or thin metal template to the rib profile, and cut sufficient ribs from quarter grained sheet balsa for both the mainplane and tailplane. Cut the spars from 1/32 in. straight grained sheet. Now make a 3 in. dia. former from $\frac{1}{4}$ in. or $\frac{3}{16}$ in. thick balsa sheet, soak the tip spars in hot water and then shape them carefully part way round the former, finally holding in place with strips of paper (Fig. 1). Dry out in front of a fire and put aside until required. It is advisable to make about six tip spars at a time, enough for the wing and tail, plus two in case of accidents.

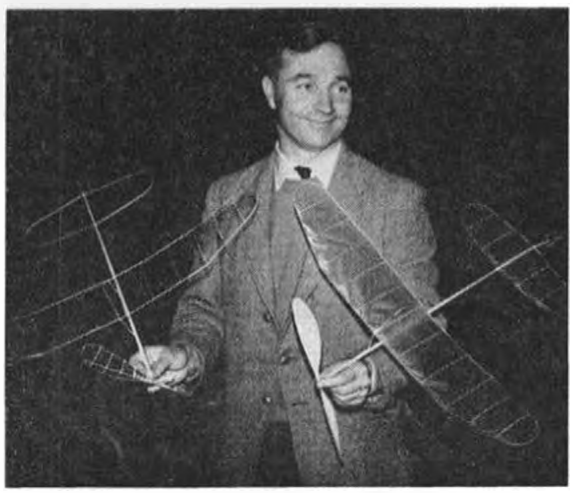
Pin the plan to the building board, lay the spars and tip spars in their respective positions and hold in place with pins in the usual manner. Where the spars overlap at the outer dihedral joints, cut through and form butt joints, then cement these to complete the outline. The ribs can now be inserted and cemented in place. The tip ribs are trimmed to size from the trailing edge and the centre rib is built up before it is installed. The addition of the little bracing stubs at this stage should not be forgotten. Leave the assembly on the board for as long as possible, preferably overnight, before removal. The tailplane is merely a simpler version of the wing.

The fin is made by winding previously soaked 1/32 in. sq. balsa around a $2\frac{1}{2}$ in. dia. former and drying it out as before. When the fin is removed from the former, it is butt jointed and a brace cemented across its diameter.

Microfilm and covering

The subject of microfilm and its production has been dealt with many times before and I do not intend to go over this ground again. The formula presented below will produce a solution from which satisfactory sheets of microfilm can be poured. As with most solutions using nitrate dope as a base, it does not make a stable film, but its stability can be improved by "ageing."

The writer with the two versions of his Class "A" model described in this article.



The ingredients are easy to obtain, sheets of film are readily produced, and therefore it is a useful solution to start with.

Two-ounce bottle of Titanine clear dope, three-quarters full plus thinners to fill.

Three drops of castor oil.

Shake the bottle well and allow all bubbles to disperse before using; additional drops of castor oil may have to be added if the film wrinkles considerably on the water. Lifting hoops for microfilm are best made from $\frac{1}{4}$ in. sq. hard balsa with the corner joints well pinned and cemented. A suitable size for the "B" class model would be about 30 in. long × 8 in. wide.

Make several sheets of film, preferably blue in colour, and hang them in a dust free cupboard for at least a couple of weeks before use.

Covering with microfilm

Clear the work table and place pieces of $\frac{1}{4}$ in. thick balsa or hardwood on it in suitable positions to support the wing framework off the table. Apply saliva or distilled water to the wing outline and dihedral ribs, and then lower a sheet of microfilm on to the framework. The film should adhere to the wetted parts and gentle blowing on to the film will assist this.

Trimming is carried out with a small brush loaded with thinners. The brush is applied to the film about $\frac{3}{8}$ in. from the wing outline and carefully drawn parallel to it, dissolving the film as it goes. When this operation is complete, lift off the hoop and surplus film. Finish the covering process by drawing the loose overlapping film on to the spars with a brush loaded with distilled water or saliva.

Weigh down the wing until it has dried out, by resting scraps of balsa on the spars. It will then be ready for bracing. The tailplane and fin are covered in a similar manner.

Covering with tissue

It is advisable to cover the wing after making and cementing the dihedral breaks, but before bracing. The best covering material is known as Condenser paper and that normally used is 0.0005 in. thick. Cover the wing in four panels using thin tissue paste as an adhesive. Try and avoid wrinkles as much as possible, but do not pull to distort the structure. Trim the edges close to the outline with a sharp razor blade and the wing is ready to be braced in the jig.

After the mainplane, the covering of the fin and tailplane will be simple.

Wing bracing and jig

To produce a mainplane that is correctly braced and rigged, a jig is a must, and is well worth making as it can be adjusted to accommodate almost any wing. It consists of five brackets, rather like miniature rugby goalposts, made from balsa to the approximate dimensions shown in Fig. 2, the crossbars being adjustable in height and attached to the uprights by pins. The brackets are attached to the building board over the plan and are positioned, one slightly to the side of the wing centre line, two just inboard of the dihedral breaks, and the other two near the wingtips. Two $\frac{1}{16}$ in. dia. holes should be made in the base of the centre bracket to receive the wing supports and the positions of the crossbars adjusted for dihedral, etc. Mark the position of the end crossbars on their upright supports and put these two crossbars on one side. The jig is now ready to receive the mainplane.

The wing (previously covered) is carefully lowered onto the inner crossbars, the underside of the leading and trailing spars are nicked at the centre line and cracked to give the centre dihedral. The spars are cemented at the cracks and then the wing is held

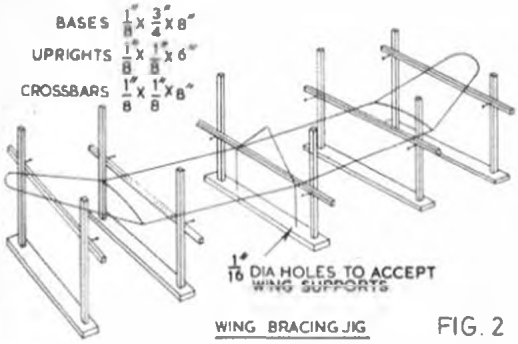


FIG. 2

down onto the three crossbars with pins angled across the spars.

Wing supports, sanded to 1/8 in. dia. and cut to length, are now located in the holes in the centre bracket and their upper ends securely cemented to their respective spars. Check for squareness and proceed to nick and crack the spars at the tip dihedral joints, gently raising the wingtips and then supporting them in the correct position by replacing the crossbars. Hold the tips to the crossbars with pins and cement the breaks securely. Loose microfilm at the breaks can be taken up by lightly drawing a soft, water filled brush along the top of the dihedral ribs. Make the bracing pylon, carefully cement in position, and now all is ready for the bracing operation.

The recommended material for wing bracing is 0.001 in. dia. nickel chrome wire commonly known as "Nichrome." It can be obtained through the radio trade and it is also found in high resistance wire wound potentiometers. Should efforts to locate some Nichrome wire fail, a good alternative material is fine nylon thread.

To brace the wing, first tie and cement the end of the wire some 1/4 in. from the end of one of the wing supports. Take the wire out to the tip dihedral joint, loop it over the bracing stub, back to the centre through the vee of the bracing pylon, out to the other tip dihedral joint, loop it over that stub and back to the support. Draw the wire taut and cement to the support. Repeat this operation for the other wing support so that in effect the leading and trailing edges have been braced separately. Make sure the assembly is true and square by sighting from all angles. When satisfied, cement the wire at the pylon vee and the stubs.

To remove the mainplane from the jig, first take out all the pins, securing it to the crossbars. Carefully remove the centre and inner crossbars, and then the wing can be lifted out, after a little easing of the supports, from the locating holes, if necessary.

Propeller

The construction of the built-up propeller requires the use of a building jig, a rib template, and a former for the outline. The jig is constructed quite simply, from balsa sheet as shown in Fig. 3, the rib template from thin metal sheet or plywood whilst the outline former is cut from 3/16 in. or 1/4 in. thick balsa sheet.

To make the propeller spars, taper a length of straight grain balsa sheet by sanding. From this cut four tapered spars which are cemented together in pairs using a bevel joint to form the complete mainspars. Cut several lengths of 1/32 in. sq. soft balsa, soak them in hot water and mould them round the outline former using strips of paper to hold them in place. Dry out the moisture in front of a fire. Cut sufficient ribs from quarter grain stock and the assembly can be commenced.

Place the mainspars in position on the jig and hold in place with little strips of Sellotape. Cut the ribs to length by trimming away the rear end and then cement them in position on the spars. Check squareness by sighting the ribs against the lines on the jig. Remove a couple of outline strips from the former, cut them to length as necessary and cement to the ribs and spars to complete the structure. When set, the assembly is lifted from the jig after removing the Sellotape strips. The propeller spindle is now formed and firmly cemented in position with Britfix, and finally the centre post is added.

It is a good idea to make several propellers. The reason for this suggestion lies in the fact that balsa varies considerably in stiffness, thus giving two apparently identical propellers different characteristics. One may flare to a coarser pitch than another under the same torque thus affecting performance for better or worse.

Due to the twist along its length, covering a propeller blade with microfilm is a little tricky, but can soon be mastered. Rest a frame of film conveniently on a table and coat the prop. outline and ribs with saliva or distilled water. Lay the blade on the film so that the trailing edge adheres; the centre of the propeller should be resting on the microfilm frame and the other blade in space. Trim the film along the trailing edge and then carefully rock the blade over until the film adheres to the leading edge. Trim the rest of the outline to complete and repeat for the other blade.

Carved propeller

A carved propeller is recommended for the tissue covered model and it can also make a useful reserve for the microfilm covered version. Only the lightest obtainable wood should be used for its manufacture. The block is cut into half blanks as shown and these are cemented together to form the final blank. The reason for this is to give one a good chance of producing a propeller whose blades will be matched for grain, stiffness and weight. In addition, two props can be made from the one block.

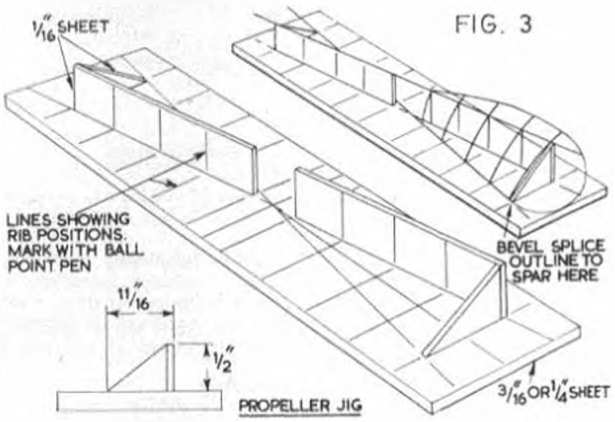


FIG. 3

Determine the centre and pierce the spindle hole with a fine needle. Proceed to carve the rear (concave side) of the blades with a very sharp knife and, checking the camber from time to time, finish with fine sandpaper. Now carve the front of the blades taking their thickness down to about 1/64 in. at the tips and about 1/32 in. near the hub. Make a stiff paper template of the blade profile, lay this on the blades and mark the outline with a soft pencil. Trim the blades to shape, sand to finish and merge the blades into the hub. When sanding indoor propellers, it is a good idea to rest the blade being sanded on the curved surface of a jam jar or milk bottle.

The spindle is pushed through the hub and the propeller checked for balance. When this is satisfactory, bend back the end of the spindle into the hub and cement with Britfix.

Rubber and rubber stripping

Good rubber for the motor is an

essential feature in obtaining indoor duration. Rubber of small cross section is obtainable in this country, but rarely in model shops. It is produced chiefly for the lingerie industry and a few enquiries will probably track down a source of supply. This rubber will give reasonable duration, but it is now being found that Pirelli is giving the best results. Pirelli rubber is not generally available in small sizes, so the next best thing is to strip one's own.

It is not difficult to make an efficient rubber stripper and Fig. 4 gives the essential features of its construction. Full

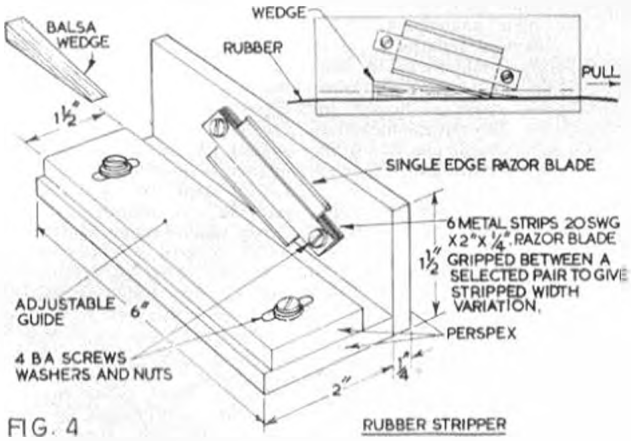


FIG. 4 RUBBER STRIPPER

credit must go to Joe Bilgri for the development of this device. Important points to watch are that the channel formed between the adjustable guide and back guide is polished and free from perspex cement, and that the razor blade is sharp.

To use the stripper, the adjustable guide is set so that the channel is the width of the rubber to be stripped. The position of the razor blade is adjusted by slipping it between a pair of the clamping strips and tightening the screws. Its position between any pair determines the width of rubber when stripped.

With scissors, a cut is made along the rubber to be stripped of sufficient length to enable the resulting ends to be threaded on each side of the razor blade and out of the other end of the stripper. A balsa wedge is made of width equal to that of the rubber and this is placed in the position shown jammed under the blade and pressing firmly on the rubber.

Holding the stripper in a vice, the two ends of rubber are held together and pulled at a steady and continuous rate. A little practice and experimentation will yield a whole range of rubber widths to satisfy all needs.

The correct way to wind a microfilm model—note the hand shielding the model against possible rubber breakage.

Rubber lubricant

Any standard lubricant will suffice, but it is important from a weight point of view to keep its application to a minimum.

Winding

The standard technique of stretch winding is employed using a high ratio winder. A suitable winder can be made by adapting a 12:1 ratio miniature grindstone mechanism obtainable from Woolworth's.

To wind a motor the services of an assistant are required and his basic job is to manipulate the winder. The model is held by the thumb and forefinger encircling the centre of the propeller and gripping the dural bearing. The motor is detached from the rear hook and wound by the assistant. While this is happening, the free hand and arm is used to shield the model from the motor and thus reduce the chance of damage should the motor break. The winding accomplished, the rear of the motor is returned to the rear hook and the model is ready for flight.

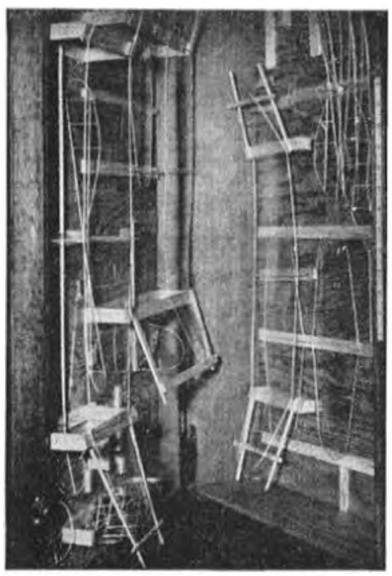
Assembly and flying

Mount the tailplane on the tailboom and see that it sits "square," and without any twist. Slip a small washer on the propeller spindle and then set the propeller in its bearing. The washer may be of brass or even a small bead, but the latest trend is to use a plastic washer of P.T.F.E. This material has a very low coefficient of friction and does not require lubrication.

Make and cement two temporary aluminium clips to the wing supports as shown and then use these clips to mount the wing on the motor stick. The mainplane should be approximately central along the motor stick and be square with the tailplane when viewed from the front.

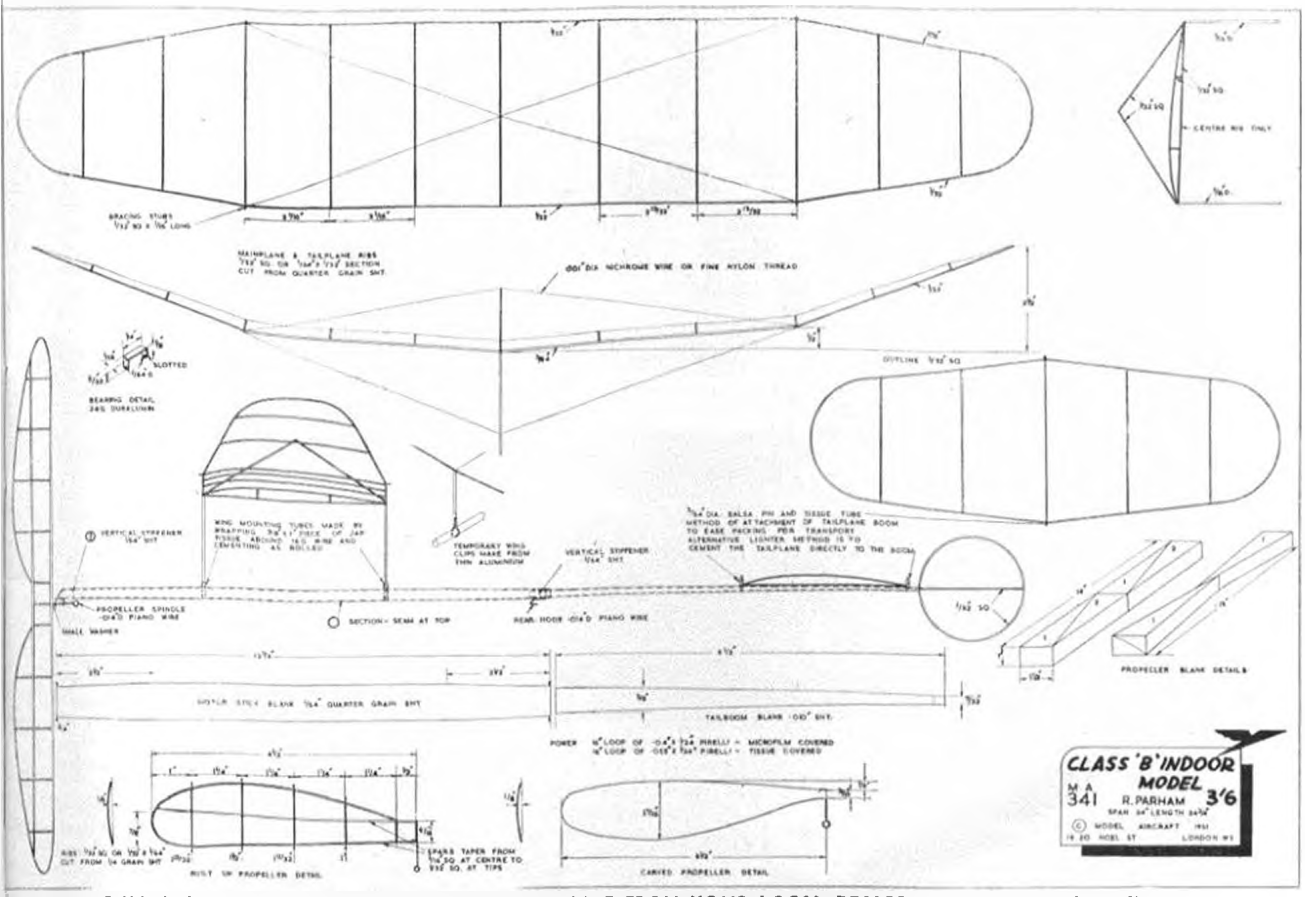
Hang a motor between the hooks and wind on a couple of hundred turns. Clear everyone out of the room and test fly from one corner to the other. Move the wing backwards or forwards as required to obtain a climb without stalling. When satisfied, mark the position of the wing clips on the motor stick, remove the wing and take off the temporary wing clips. Make holes in the motor stick at the points previously marked and cement the $\frac{1}{16}$ in. I.D. tissue tubes in position checking for squareness, etc. When set, re-mount the mainplane, check for squareness and see that there is no wash-in or wash-out.

When at the flying site, assemble and check as before and also see that the fin is set for left turn. Put about 500 turns on the motor, allow the propeller to rotate to see that it is running smoothly and when satisfied, launch the model gently, pointing it slightly upwards and banked slightly to the left.



Packing them in! The writer's box with models packed in the manner he advises.

The model should climb smoothly in 30-40 ft. dia. circles, but if it dives, increase the mainplane incidence until corrected. If the plane refuses to climb, it is obviously underpowered and the rubber cross-section must be increased. An indoor model is considered correctly powered when it touches down at the end of a flight with sufficient turns left



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 3s. 6d., POST FREE

on the motor for it to be taut between the hooks.

Sometimes a model will wag its tail in flight. This is invariably due to the pitch of the propeller blades being unequal and can be corrected by carefully bending the spindle immediately behind the propeller.

Packing for transport

Little has ever been written on the packing of indoor models for transport to and from flying sites, and so it may be worthwhile to describe my own method.

The initial requirement is a strong box of adequate size and proportions, preferably made specially for the job. The mainplane is the most difficult item to stow and once a convenient position is found for it in the box, a balsa strip having in it two $\frac{1}{16}$ in. I.D. tissue tubes the correct distance apart, is cemented to the wall or floor of the box. By pushing the wing supports into the tubes, the mainplane is securely mounted in the box. This is sufficient for small wings, but the larger ones are best supported at the outer panels by the goalpost structures shown in Fig. 5. The mainplane is steadied by pins pushed into these supports at an angle to just hold the spars as indicated.

All other components are supported by balsa blocks or strips cemented to the inside of the box. Pins hold the components in position and note that they only lightly grip the spar or motor stick.

This method of packing has been used for well over 10 years and a model has never been damaged in transit.

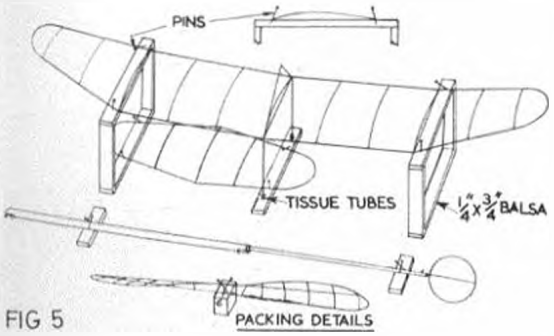


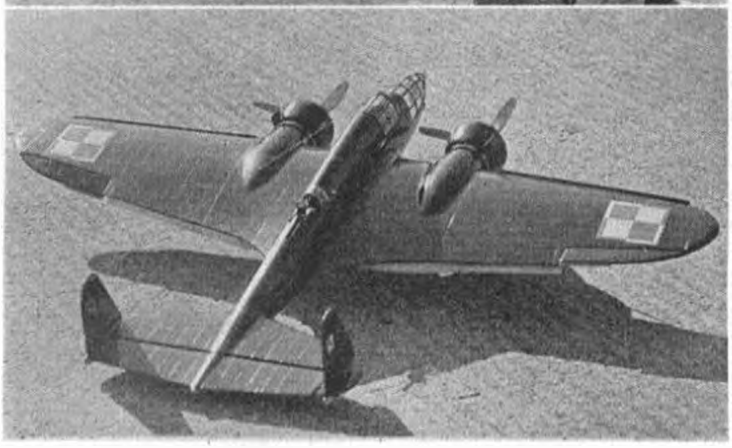
FIG 5 PACKING DETAILS

Conclusion

In this article I have attempted to cover most of the practical aspects of building and flying indoor duration models. The fascinating problem of weight has been omitted because it is best to build a model, fly it, and then see if the next one can be made lighter by careful selection of materials, etc.

Experience comes quickly with the first model, and as for flying sites, get permission to use the local cinema whilst the cleaners are at work, or a school hall. Durations of up to 7 min. can be made in these, making for useful experience. For real high times the airship hangar at Cardington with its 180 ft. high ceiling is probably the finest site in Europe. The S.M.A.E. hope to hold a number of meetings there in future and so watch the M.A. Contest Calendar for details.

PICTURES from POLAND



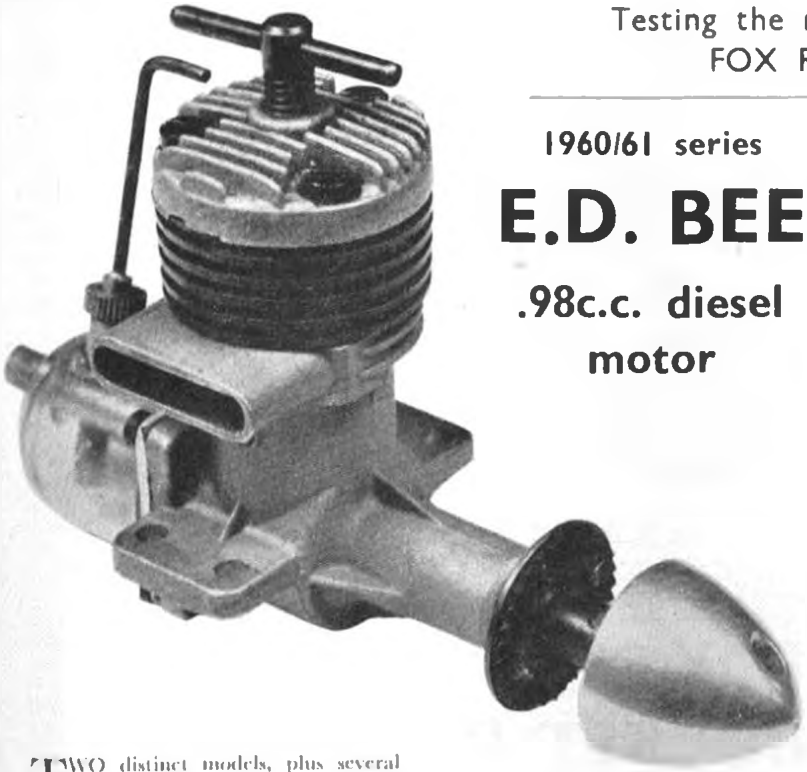
THE consistently high standard set by Polish scale models has yet to be equalled in any other country, and the enthusiasm for this branch of the hobby justifies the holding of an exclusively scale Nationals. These photographs were taken at the last such "Nats" by J. Mickalski, whose camera work is as good as his subjects.

The Bristol *Britannia* shown in the top two photos is just about the most magnificent C/L model we have ever seen, even the metal stressed skin panels are duplicated! It was built by J. Kuszilek from Krakow, is completely fitted out internally, and is powered by four "Sokol" 5 c.c. diesels each driving a scale, four-bladed, square tipped airscrew.

The *Lysander* being held by its builder E. Poniatowski also has full internal details. A beautiful dummy engine conceals a 2.5 c.c. diesel, and incidentally this is a free flighter!

A favourite subject for Polish modellers is the shapely twin engined P.Z.L.37. The example seen in the photo (bottom left) was built by J. Koczkodaj of Warsaw and won the C/L trophy. Flaps and slots work, and power is provided by two "Jaskolka 2" 2.5 c.c. diesels.

The photo below shows S. Schab of Meilie flying his 10 c.c. diesel powered P.O-2. If it had a dummy pilot and had the background masked out, this model, like the *Britannia*, could indeed be taken for a full size machine. In another photo of the P.O-2 which, unfortunately, we are unable to publish because of space restrictions, it is possible to examine the really scale type construction used on the model. It uses turnbuckles on the rigging and the dummy radial engine is fully detailed, while the wings, U/C, etc., appear to be attached to the fuselage with tiny bolts with scale fixings!



1960/61 series

E.D. BEE

.98c.c. diesel motor

TWO distinct models, plus several modifications, of the popular E.D. Bee 1 c.c. diesel have appeared during its 12 years of production. The original Series I type was actually the first engine to be featured in the M.A. Engine Tests and continued in production, with small modifications, for nearly seven years. It was replaced, in 1955, by the entirely re-designed Series II engine. In 1956, this model was provided with a slightly modified crankcase and a new cylinder in which the internal flute transfer system was abandoned in favour of three inclined 3/32 in. dia. transfer ports, fed by external grooves.

The latest variant, which has now been on the market for several months, has a number of further modifications. The transfer porting has again been modified, the port area being increased by some 137 per cent. by the substitution of four $\frac{1}{8}$ in. dia. ports, drilled through the cylinder wall at approximately 30 deg. to the cylinder axis. The skirt of the cylinder is also shortened and tapered to facilitate gas flow from the crankcase and thereby does away with the need for external transfer grooves.

A lighter piston is used together with a diecast, instead of a machined, valve disc and the crankshaft is now relieved at the centre to provide inner and outer journals $\frac{1}{4}$ in. and $\frac{5}{16}$ in. long, respectively. Externally, the new model is readily identified by a grey matt sand-blasted finish on the crankcase and cylinder head, and by a blued anti-rust finish on all external steel parts—cylinder, propeller shaft, compression screw, prop driver and all screws.

Until the advent of the latest version, the Bee has always remained, despite many changes, a relatively low powered engine, peaking at moderate speed. Thus M.A. performance figures ranged from 0.061 b.h.p. at 9,400 r.p.m. for the original model in 1948-49 to 0.064 b.h.p. at 10,600 r.p.m. for the 1956-57 model. This has certainly never been any obstacle to the Bee's popularity; its easy starting and generally docile behaviour being the features which have made it so successful with newcomers to the hobby.

In its newly developed form, however, the Bee breaks with this tradition completely. The transformation which has been brought about by this development is a revelation. Our tests were carried out on an engine submitted by the factory and the figures obtained might, of course, be slightly better than those of an average production sample, but there can be no doubt of the immensely increased power now delivered by the Bee—an output which, incidentally, bears comparison with the best levels yet realised in the 1 c.c. group.

The basic design of the Bee, which has always been somewhat unorthodox among small diesels, remains the same, i.e. loop-scavenged cylinder, disc rotary-valve and a transparent fuel tank enclosing the carburettor unit. The tank is suitable only for normal upright engine installation but is easily removable where it is desirable to invert or side-mount the engine or for other installations requiring a separate, and possibly larger, fuel tank.

Specification

Type: Single-cylinder, air-cooled, loop-scavenged, two-stroke cycle, compression ignition. Disc valve induction. Flat crown piston.

Bore: 0.437 in. Stroke: 0.400 in.

Swept Volume: 0.984 c.c. (0.060 cu. in.).

Stroke/Bore Ratio: 0.915 : 1.

Weight: 3.3 oz. (including tank).

General Structural Data

Pressure diecast aluminium alloy crankcase and main bearing housing with integral exhaust duct. Detachable

Left—differences in the porting between this and earlier models are clearly shown.

Right—the parts of the 1960/61 model E.D. Bee.

flange-fitting rear cover with pressed-in intake tube and diecast aluminium alloy valve disc and secured with four screws. Non-counterbalanced disc web crankshaft with 0.242 in. dia. journals and 0.140 in. dia. crankpin and running in plain bearings. Steel prop driver taper fitted to shaft. Duralumin spinner nut. Cast-iron piston with fully-floating ¼ in. dia. solid gudgeon-pin. Forged duralumin connecting-rod. One-piece steel cylinder with integral cooling fins. Pressure diecast aluminium alloy cylinder head. Cylinder assembly retained by three long screws into crankcase. Detachable clear plastic fuel tank. Spraybar type needle-valve beam mounting lugs.

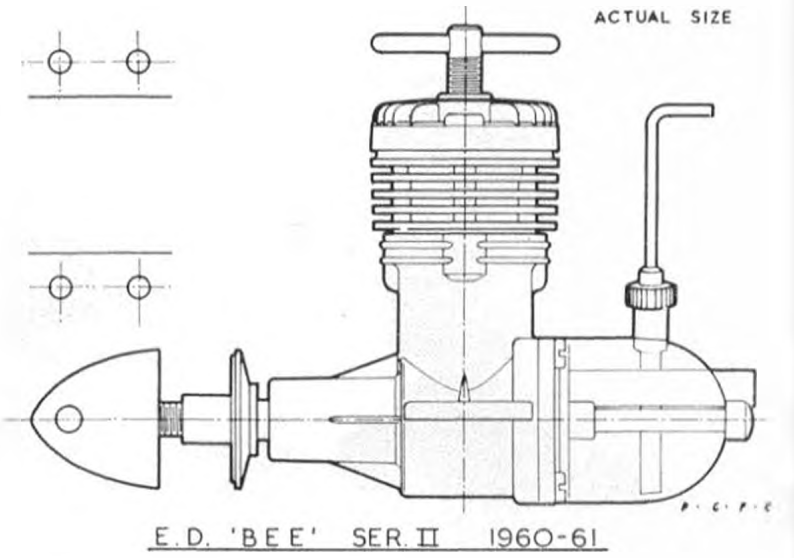
Test Engine Data

Running time prior to test: 2 hours.
Fuel used: E.D. Economic.

Performance

Initial tests of our particular Bee revealed that, with the needle-valve in

Continued on page 60



FOX'S ROCKET 15

2.4 c.c. glo-plug motor

KNOWN simply as the Fox 15 on its introduction in 1958, this American 2.5 c.c. class engine was later re-designated Fox Rocket 15 to identify it as one of the "Rocket" line of low-priced motors—others: Rocket 09 and Rocket 35—thereby distinguishing it from the more expensive "contest" Fox models. (This can, however, be a trifle confusing since the new roller-bearing 1961 model Fox Combat 35 uses a modification of the Rocket 35 main-casting and, in consequence, at present carries the "Rocket" emblem on the side of the transfer passage.)

The Rocket 15 sells, in the U.S., for a modest $6.95 (under 50s. at the current rate of exchange) and, despite the addition of purchase-tax and customs duty, is still (at 65s.) one of the cheapest 2.5's available in the United Kingdom. For this price, one can scarcely expect World Championship class performance and the Fox does, in fact, fall short of top contest 2.5 c.c. standards of power output by about 25 per cent. When one remembers, however, that the Fox sells for half the price of most competition engines of this size, its performance, in terms of power per unit of cost, is quite good.

Like the majority of American engines above "Half-A" size, the Rocket 15 is a shaft rotary-valve, loop-scavenged glowplug ignition engine with plain (bushed) main bearing. Nevertheless, it does contain uncommon features.

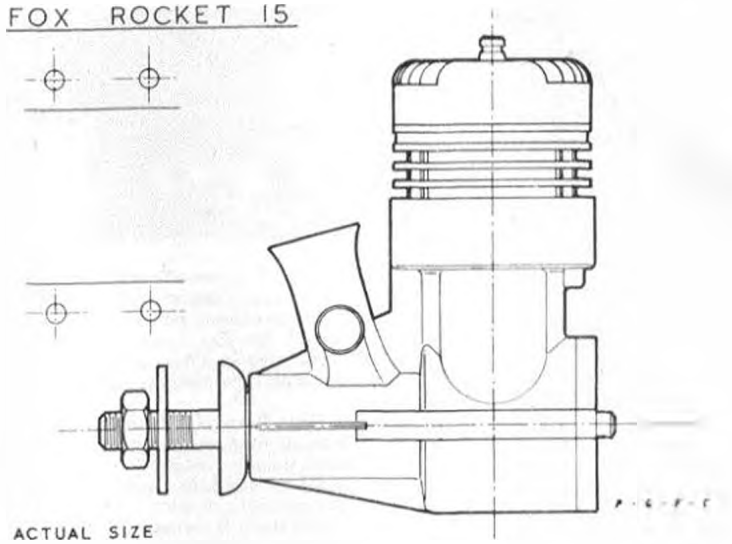
The motor is assembled around a pressure diecast aluminium alloy crankcase and main bearing unit which calls for very little machining. It carries a pressed-in brass spraybar and a bronze main bearing bush. The beam mounting lugs are arranged symmetrically on the centre-line and are tapped to receive the two screws retaining the diecast backplate. These points could, conceivably, be used for bulkhead type mounting in place of the beam mounts. The crankshaft has an above-average journal diameter, is hardened and counterbalanced.

Like all Fox loop-scavenged motors, the Rocket 15 uses a Desaxé cylinder arrangement—i.e. the cylinder is offset to the exhaust side relative to the crankshaft axis. Unlike these other Fox models, however, the 15 has a one-piece cylinder with integral cooling fins (instead of a drop-in liner in an extended main casting) plus an unusual transfer port arrangement. The cylinder has a very deep base flange, ¼ in. thick, the exhaust port being cut through this on the one side, while the transfer port is cut through the cylinder wall and into the bottom of the flange to register with

the transfer passage in the crankcase casting. The cylinder is held down with two long screws, arranged fore and aft, passing through the fins from the cylinder head and two extra screws secure the head to the cylinder.

Fairly extensive use is made of aluminium alloy diecastings. In addition to the crankcase and backplate, the cylinder head, prop driver and connecting-rod are all castings. The threaded valve needle, incidentally, is machined in one piece, with control knob, from mild steel and is not, therefore, subject to the petty failures which sometimes beset soft soldered assemblies.

The whole engine is noticeably compact when laid alongside some 2.5's and is also rather lighter than most engines of this capacity.



Specification

Type: Single-cylinder, air-cooled, loop scavenged two-stroke cycle, glow-plug ignition. Crankshaft rotary valve induction. Baffle piston. Offset ignition plug.

Bore: 0.590 in. Stroke: 0.540 in.

Stroke/Bore Ratio: 0.915 : 1.

Swept Volume: 0.1476 cu. in. = 2.419 c.c.

Weight: 4 oz.

General Structural Data

Pressure diecast aluminium alloy crankcase and main bearing housing with bronze bush. Hardened and ground steel crankshaft with $\frac{3}{8}$ in. dia. journal and 5/32 in. dia. crankpin. Unhardened steel cylinder with integral cooling fins. Mechanite piston with fully-floating $\frac{1}{4}$ in. dia. solid gudgeon-pin and pressure diecast aluminium alloy unbushed connecting-rod. Pressure die-cast aluminium alloy finned cylinder head with aluminium gasket. Pressed-in brass spraybar with steel needle-valve and compression-spring friction device. Beam mounting lugs.

Test Engine Data

Running time prior to test: 3 hours.

Fuel used: two parts Record Nitrex-15 and one part Record Super-Nitrex to give 20 per cent. nitromethane mixture. Record Methanex used for running-in.

Ignition plug used: Fox short-reach 1.5 volt as supplied.

Performance

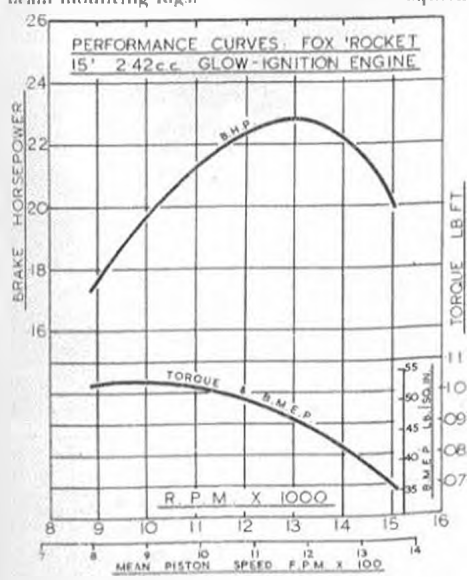
A small but sensible instruction leaflet is issued with the Fox 15. In this, the use of Fox "Superfuel," a general purpose, low-nitro content blend is specified. However, designer Duke Fox has more recently recommended Fox "Missile-Mist," a fuel containing approximately 20 per cent. nitromethane. Missile-Mist is, of course, unobtainable in the U.K., and an approximate equivalent was therefore blended by mixing KK Record Nitrex-15 and Super-Nitrex in the proportions given above.

Starting characteristics of the Rocket 15 were uncomplicated. For a start from cold, the engine responded fairly readily after a port prime. Hot restarts could be quickly obtained with either a port prime or (particularly on the larger prop sizes) after two preliminary choked flicks. Some caution is needed in adjusting the needle-valve when the motor is running, due to its close proximity to the prop. We also found a tendency for the coil spring to cause the needle to jump back a few degrees when the fingers were removed and it was sometimes necessary to go past the desired setting to compensate for this.

General running qualities were good. Running was particularly even under light loads and the engine ran extremely steadily at speeds far in excess of the b.h.p. peaking speed. Maximum torque was determined at between 9,000 and 10,000 r.p.m. and reached a value of 0.104 lb. ft. or 20 oz. in. Maximum power occurred at 13,000 r.p.m. where a figure of 0.228 b.h.p. was determined.

Power/Weight Ratio (as tested): 0.92 b.h.p./lb.

Specific Output (as tested): 94 b.h.p./litre.



Parts of the Rocket 15, note the square inlet port in the crankshaft and sturdy cylinder assembly.

RADIO TOPICS

SEEMS that we may have to change our personal opinion on the score—"the lighter the model, the better it should fly." One or two *Orions* we have seen built from the kit were definitely sluggish and we put this down to two reasons—the airframe coming out on the heavy side with all that "solid" construction, and a motor that was not giving enough power. Mentioned this to Ed Johnson when he asked us when we were going to build an *Orion*, and he pointed out that a number of "heavy" models were flying really well down his way, including an *Astro Hog* weighing in at 8½ lb.

This calls for a slight readjustment of our long-held rule. We still maintain that the lighter the model the *faster* and better it should fly (especially aerobatically) on the same engine power. Not everyone *trims* a light model to achieve this faster flying, however, and it is easy for a light model to become a "floater," especially with rudder-only, and a heavy model will still fly well—*if* it has enough power. That means a "45" for the "heavyweights"—that extra edge in thrust over a "35" can make all the difference.

* * *

New Bramco relayless receiver will have a four months' guarantee against *crash* damage, which would indicate as well as anything how much of the susceptibility of a conventional receiver to mechanical damage is bound up with the relay. Knock out the relay, and use transistors in place of more vulnerable valves, and you can end up with a set which you can, literally, throw against a brick wall without upsetting it.

Not yet released, the Bramco relayless receiver fits in a 2⅝ × 2 × 1¼ in. case, uses the standard Bramco reed unit with a lower resistance coil and will retail in Britain at £27 4s. 8d. (tax paid). Circuit embodies one valve in the detector stage followed by three transistor amplifier stages. It has so much "drive," we are told, that the reeds can be heard from 60 ft. away.

* * *

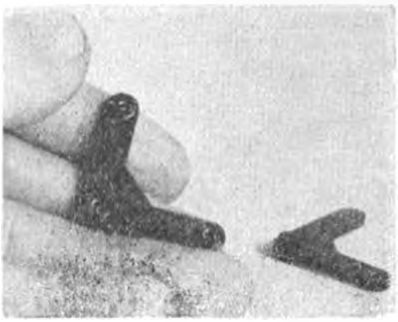
New British relayless equipment is R.E.P.'s ten-channel outfit which also incorporates an entirely new actuator—further details next month.

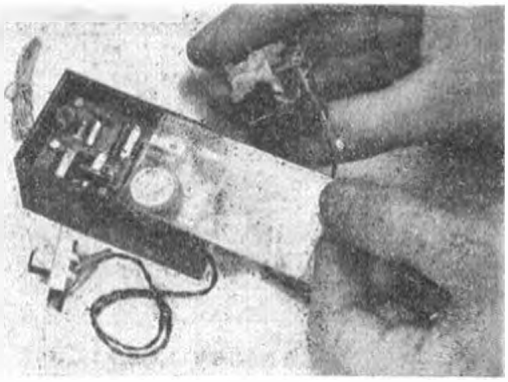
R.E.P. are also bringing out an entirely new version of the "Reptone" designed specifically for aircraft use. The original "Reptone"—which, incidentally, has been the best-selling R/C line in Britain—was intended mainly as a general purpose unit and was rather slow in control operating time for rudder-only aircraft. The new aircraft version employs a similar fully transistorised receiver, with power transistor output feeding a built-in compound escapement, rubber driven. With no relay, and therefore no back contact for second control switching, a second control operation is given by cleverly incorporating an "equivalent" back contact on the escapement itself. Receiver unit is complete with integral battery box and weighs only 5 oz. "ready to go."

This new aircraft version of the "Reptone" should be the ideal single-channel unit for the man who wants to fly inexpensive radio control but "just does not want to know" anything about the electronics. Overcoming the response-time limitation of the original "Reptone," all the modeller has to worry about is the mechanical hook-up.

* * *

We mentioned flat "cable" which provides the simplest, neatest, method of "multi" wiring yet devised, in a previous "Topics," and are glad to note that it is now available in this country, price 1s. per ft. This cable strip consists of 10 individual colour coded insulated No. 24 ASW 19-strand wires assembled in an integral flat strip. It cuts down conveniently to the number of conductors needed, also individual conductors can be fed off the main strip,





Top left: Japanese manufacture miniature transformer specially designed for transistor circuits.

Left: moulded nylon bellcranks for aileron operation—a very welcome accessory.

Right: the new Reptone receiver shown completely wired up to the actuator switch and aerial. This all-transistor set is reviewed above.

Below: a comparative table showing S.W.G. and A.S.W. wire sizes—see note on opposite page.

	Gauge No.	20	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
American (ASW)	dia.	.03196	.02535	.02257	.02010	.01790	.01599	.01420	.01264	.01126	.01003	.00893	.00795	.00708	.00631	.00562	.00500	.00445	.00397	.00353	.003
British (s.w.g.)	nearest equiv.	21	23	24	25	26	27	29	30	31	33	34	36	37	38	38-39	39-40	41	42	43	44

where required. Even an "untidy" layout can still look neat and "professional" with cable strip!

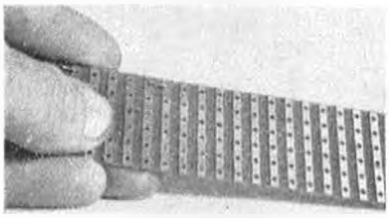
Another "cabling aid" which has come from America is a nylon spiral wrap which will accept up to 10 separate conductors, hold them neatly bunched, and allow an easy lacing to produce a neat cable form. Untidy wiring is usually associated with poor workmanship, and a good possibility of something coming adrift, but these two "gimmicks" give you neat wiring the easy way!

* * *

On the subject of wiring, with so much American influence in circuit designs and specifications, many people are puzzled over equivalent gauge sizes. American standard is the Brown and Sharpe or ASW (American Standard Wire gauge)—both the same—and the British standard, the Imperial Standard Wire Gauge (s.w.g.). Gauge numbers run the same—the larger the gauge number the smaller the dia.—but actual dia. sizes, gauge number for gauge number, are different, usually by a matter of 1 or 2. The table at the foot of page 44 gives the approximate equivalents.

* * *

Although the two were evolved independently, printed circuits and transistors seem to go hand in hand. And from the "do-it-yourself" point of view a radio kit embodying a printed circuit is half way to being correctly built before you start. For the man who likes to build his own equipment—and save some money in the process—building from a modern kit is something any modeller can tackle with confidence, even if he has no previous radio experience.



Vero board—a British product—is a special printed circuit type wiring board useful for experimental circuits. Pre-drilled and with printed circuit parallel conductor strips.

A whole range of R/C equipment put out in kit form by the American Ace Radio Control company, includes a complete transmitter-receiver outfit for as little as 172s. This is offered by Malcolm Douglass of York, who is also bringing in Kraft Multi-Fly eight- and ten-channel receiver and transmitter kits. The Kraft transmitters are designed for single, dual and triple simultaneous operation, and feature plug-in pot. boxes which can be pre-tuned to their own receivers, so that one transmitter will serve several receivers without re-adjustment.

* * *

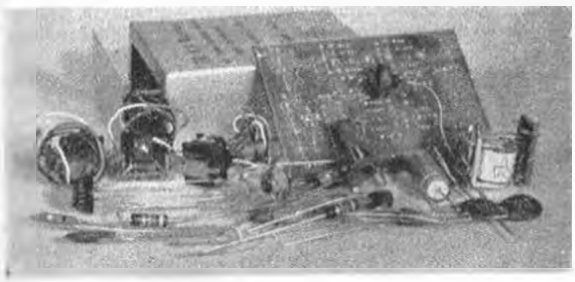
Ace (kit) receiver which particularly impressed was the TR 4.5, an all-transistor receiver designed to operate on 4.5 volts. In fact it is far from fussy on battery voltage—on some tests it was still working happily on only 1.5 volts! Typical test figures, giving current changes, are:

4.1 volts: idling current 5.5, drop to 2.0 (carrier on), rise to 42 mA (tone on).
3.0 volts: idling current 1.4, drop to 1.2 (carrier on), rise to 32 mA (tone on).
2.1 volts: idling current 0.7, drop to 0.6 (carrier on), rise to 20 mA (tone on).

The best current change and temperature stability is obtained on 4.5 volts. Only the transistor in the detector stage is temperature stabilised but complete temperature stability for the circuit is claimed between 15 and 130 deg. The receiver also follows rapid pulsing.

The neat glass plastic printed circuit panel is pre-drilled and printed with all component positions, etc., making assembly a virtually unskilled job. About the only critical points are making sure to get the transistor leads the right way round and doing a reasonably good job of soldering. Resistors, capacitors and transformers (Japanese manufacture) are of sub-miniature type, making for a complete unit which fits a 3 × 2 × 1 in. aluminium case (supplied with the kit) with plenty of room to spare. Only one

Continued on page 54

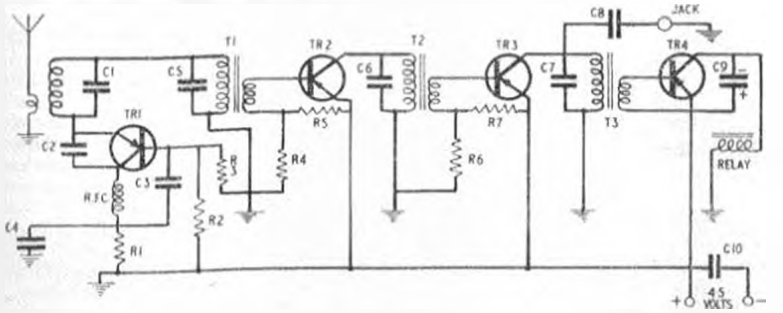


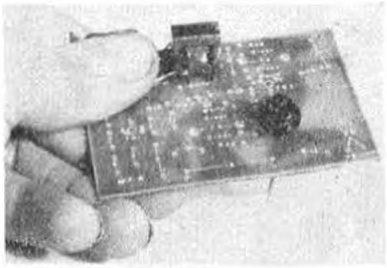
Top right: glass plastic printed circuit panel.

Left: TR 4.5 receiver kit components.

Bottom right: assembled receiver fits neat aluminium case.

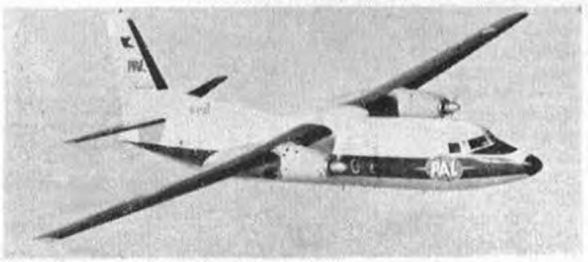
Below: TR 4.5 receiver circuit.

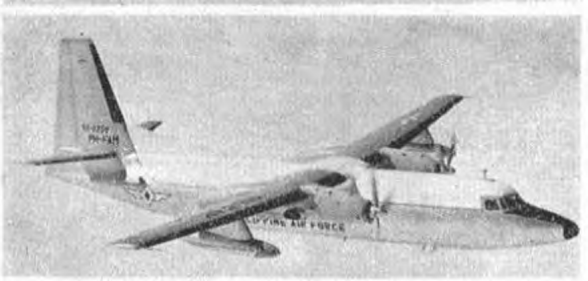


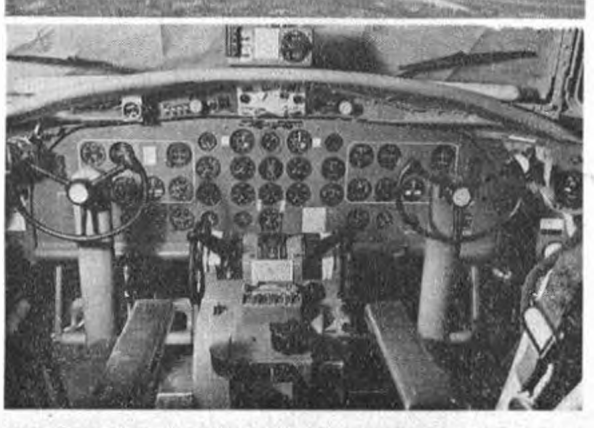


TR 4.5 RECEIVER CIRCUIT

C1-22 mmF
C2-10 mmF
C3-.001 mF
C4-.001 mF
C5-.02 mF
C6-10 mmF
C7-.02 mF
C8-.002 mF
C10-.005 mF
C9-60 mF 6 volt electrolytic
R1-1.2 K ¼ watt
R2-10 K ¼ watt
R3-47 K ¼ watt
R4-47 K ¼ watt
R5-1 K ¼ watt
R6-47 K ¼ watt
R7-1 K ¼ watt
RFC-300 microhenries or TI324
TR1-A01 transistor
TR2-T0037 transistor
TR3-T0037 transistor
TR4-2N188A transistor
T1, T2, T3-Calrad CR-60 input transformer 4.47:1 turns ratio.
Primary: resis. 1.32 K imp. 20 K ohm
Secondary: resis. 90 ohms imp. 1 K ohm







PLANE OF THE MONTH

THE FOKKER F.27 FRIENDSHIP

WHEN Fokker announced that they intended to re-enter the airliner business with a twin-Dart turboprop transport, many people believed this was a mistake. The Dart was already flying in small numbers in early *Viscounts*, but it was felt that local service operators would prefer to have an aeroplane like the original Handley Page *Herald*, with four piston-engines—the kind of power plant they were accustomed to using and servicing.

It was not possible to foresee that the Dart would become one of the great aero-engines of all times, with a fabulous reliability and overhaul life. Yet it would be wrong to give this engine all the credit for the success of Fokker's F.27 *Friendship*. The airframe with which it is matched is as beautifully-proportioned, sturdy and practical as one would expect from a company with experience of building monoplane transports ever since there were airlines to use them.

The prototype *Friendship* (PH-NIV) flew for the first time on November 24th, 1955. It had two 1,480 e.h.p. Dart 507 turboprops and seats for 28 passengers in a 73 ft. long fuselage. After a time it was re-engined with 1,650 e.h.p. Dart 511's, and it was clear that these would make possible a greater payload. As a result, when the second prototype (PH-NVF) flew on January 29th, 1957, it had Dart 511's and 32 seats in a 76 ft. fuselage, with provision for carrying up to 48 passengers in a high-density version.

This made the *Friendship* so attractive for short-haul operation that Fairchild quickly acquired a licence to produce it in the United States, and the first American-built F-27 (Fairchild do not use the name *Friendship*) flew on April 15th, 1958. Deliveries by Fokker began in December of that year, when EI-AKA was handed over to Aer Lingus, and orders received by the two companies to date total 168, of which 115 had been delivered by last October.

Both manufacturers are disappointed that the number is no greater, because the *Friendship* has so much to offer as a DC-3 replacement; but it is the kind of aeroplane that can continue in production for years and nobody doubts that it will do so. To ensure this, the design is undergoing considerable development.

The basic F.27 *Friendship* Series 100 has a perfectly straightforward all-metal structure, with a two-spar wing. Britain's aircraft industry contributes a high proportion of the equipment, including the engines, Dowty undercarriage, radio, instruments and the Redux bonding which is used extensively throughout the airframe.

PH-NIV was re-engined with two 2,020 e.h.p. Dart 528's in 1958 as a prototype for the F.27 Series 200 (Fairchild F-27A), which is in parallel production for anyone who wants more power.

Also in production is a cargo or combined cargo/passenger version, with an enlarged loading door and reinforced floor, which is called the *Freightship* by Fokker and F-27B by Fairchild. The military F.27M *Troopship*, of which nine are being built for the Royal Netherlands Air Force, also has a large cargo door and will carry 45 parachute troops, 13,000 lb. of freight or 24 litters and 7 attendants.

Next variant to appear will be a STOL (short take-off and landing) model with double-slotted flaps and variable-incidence tailplane (Fairchild F-27H). The military counterpart of this is intended to have a swing-tail, for rapid cargo-handling, and up-rated Darts. Also under consideration is a "stretched" F.27 with 2,555 e.h.p. Darts.

Data Series 200: Span 95 ft. 2 in.; length 75 ft. 9 in.; height 27 ft. 6 in.; weight empty 23,105 lb.; loaded 37,500 lb.; cruising speed 306 m.p.h.; rate-of-climb 1,800 ft./min.; service ceiling 30,000 ft.; take-off run 1,880 ft.; range with max. payload 780 miles; range with max. fuel 1,495 miles.

PROUD MOMENT for Ireland was the inauguration of Irish International Airlines' "Shamrock Jet" service over the Atlantic on December 14th. Earlier attempts to get into the big-time trans-atlantic traffic with their own aircraft had ended in disappointment. Now they are not only in business but have equipment second to none.

St. Patrick (EI-ALA) is the first of three Boeing 720-048's ordered by Irish International Airlines. Although described sometimes as the 707's baby brother, the 720 has similar dimensions to the basic 707-120, except for a slightly shorter fuselage, and is powered by four 12,000 lb.s.t. Pratt and Whitney JT3C-7 turbojets.

A reduced fuel load has permitted a lower structure weight, and the 720 has a maximum cruising speed of over 600 m.p.h. A revised wing leading-edge, with droop and increased sweep and chord inboard of the inner nacelles, contributes to this high performance and reduces runway requirements.

Finish of the "Shamrock Jets" is, needless to say, green and white. Recognition features are the shorter fuselage and ventral fin, which is less deep than that on the intercontinental 707's.

* * *

THE LEPRECHAUNS seem to have had a hand in *St. Patrick's* delivery flight from New York to Shannon. According to Boeing, the lightly-loaded airliner clocked a ground speed of 800 m.p.h. on one section of the trip. Other explanations varied from a hefty tailwind to a homesick pilot.

* * *

BJORN ANDREASSON has been one of the best-known amateur designers in America in recent years, with seven different types of light aircraft to his credit. Latest of these is the BA-7 side-by-side two-seater, illustrated below, which is powered by a 75 h.p. Continental flat-four engine and has a top speed of 150 m.p.h.

Construction of the BA-7 is all-metal, with a slab-sided fuselage to avoid double-curvature. The tail surfaces consisted originally of elevators and rudder only, but a swept fin and inset rudder have been fitted in the past year. The cowling lines have also been cleaned up, so that the cylinders are now completely enclosed.

The BA-7 is small, with a span of only 23 ft. and loaded weight of 1,200 lb. As a result, it will take off and land in 400 ft. Andreasson has taken it to Sweden, where an improved version is to be put into production by AB Malmo Flygindustri.

* * *

FOR "600" READ "990." The designation of the Convair 600 jet-liner has been up-graded to Convair 990 in its domestic version and *Coronado* 990 in its intercontinental form as ordered by Swissair and SAS. This has been done to satisfy customers and is logical, as the aircraft is a later development of the Convair 880 with aft-fan turbojets and a considerably higher performance.

A feature of the 990 is its supersonic wing, with four "speed capsules" built on to the trailing-edges to keep the airflow smooth at the 640 m.p.h. cruising speeds of which it is capable. Latest application of the Area Rule, these capsules are up to 24 ft. long and function also as integral fuel tanks. Wind tunnel tests have shown that they prevent formation of the massive shock-wave and resultant drag that have plagued earlier jet transports at high speeds, when airflow over the top surface of the wing becomes supersonic.

Other features of the 990's wing include leading-edge slats, double-slotted Fowler flaps and large spoilers.

Wintry scene from Switzerland featuring the C-3603 attack bomber of the Swiss Air Force.

The BA-7 all metal side by side two-seater which is powered with a 75 h.p. Continental flat four engine.

Bird's eye view of the Convair 990, the distinctive "speed capsules" are clearly seen.

* * *

WINTRY PICTURE above shows one of the C-3603 two-seat attack bombers which still serve with the Swiss Air Force in a target-towing role. Altogether, 150 were built during the war period by Fabrique Federale at Emmen, with a 1,000 h.p. Hispano-Suiza 12Y-51 engine. Span is 45 ft. 1¼ in., length 36 ft. 9½ in. and max. speed 295 m.p.h. at a normal loaded weight of 7,600 lb.

OVER THE COUNTER

The Airfix Fokker *Friendship* plastic kit to 1/72nd scale.

YET another **Airfix** kit is in the shops this month—the Fokker *Friendship*—which brings the number of 1/72 scale models in the Airfix aircraft range to over 50! The *Friendship* makes up very well, and for once the cabin windows are transparent, while the cabin doors can be arranged in the open or closed position and the undercarriage can be properly retracted, although the u/c well doors are not hinged. If you are not going to use the display stand you must add a considerable weight to the nose to keep it down! Aer Lingus transfers are supplied and the model is most colourful when fully decorated, with the correct green upper fuselage, etc.

An informative little illustrated leaflet is enclosed with the kit, showing the types of aircraft operated by the Irish Airline, and enthusiasts will be quick to note that the ubiquitous *Dakota* is among them. Some of the Aer Lingus transfers which come with the *Friendship* can be easily adapted for use on the Airfix "*Dak*" which was reviewed last month. The *Friendship* costs 7s. 6d.

* * *

Less than a couple of years ago, British modellers would resort to almost any means, fair or foul, to get their hands on American model goods. Now, with the easing of import controls, anyone can buy foreign kits, etc., over their local model shop counter—if they can afford them! However, having had the chance to examine a wide selection of imported kits, we have begun to realise that perhaps the home brewed product is not so inferior after all—although, of course, not all imports are poor.

Two **Sterling** kits came our way recently—the Fokker D VII and the PZL-1 Polish fighter, both being for C/L models of around 3 ft. wingspan. On the credit side, they are stoutly boxed, and the wood is of very high quality. The die cutting, unlike many U.S. kits, is excellent and a sheet of high quality transfers is included. The PZL-1 kit features an aluminium spinner, while the Fokker D VII has a pressed metal cowl face, undercarriage wire is pre-bent and many of the complicated carved block parts are nicely preshaped. With the aid of the large plan, any established modeller should have no difficulty in making up the kits into really attractive scale models, but these are *not* beginners' projects.

Bearing in mind the high cost of the kits (£3 13s. 9d.), a large proportion of which admittedly is duty and tax, we would criticise the absence of wheels of any kind. There is also no control gear (bellcrank, leadouts, etc.), while one of the engine bearers in our PZL-1 kit was unusable due to its having a large knot in it. Summing up, these are good kits, but it is a pity that the price cannot be as realistic as the models.

Sterling also produce an interesting line of smaller single and twin engined scale C/L kits costing 16s. 9d. each, some of which can be flown F/F with a Cox Pee-Wee for power. The range includes such interesting subjects as a 24 in. span *Dakota* and Piper *Apache*, both twins of course, and, therefore, C/L only.

The kits include some very nice vacuum formed plastic engine cowlings, the wood is of very good quality and sheet balsa parts are numbered and die-cut. No difficulty should be found in assembling these kits as the plan is very clearly drawn, with many perspective sketches and copious instructions.

Material is also included to enable the models to be flown R.T.P. without locking the control horn; the system is not new, but it is quite ingenious and Sterling, in the best American tradition, have a name for it—"Auto Magic Pilot"!

Sterling kits are being distributed by Holt Whitney and should be ordered through your local model shop or from one of the retailers who advertise them in MODEL AIRCRAFT.

* * *

Davies Charlton are now supplying their Quickstart diesel fuel without the familiar 3 in. long spout inverted inside the can. Following several incidents of fuel leakage, the fault was traced to a pressure build-up in the can due to ether evaporation. The spouts will now be supplied by the dealer as a separate item when you buy your fuel—no extra charge, of course.

Three new 1.5 volt glowplugs are also in the shops, priced at 4s. 2d. each. They are the E.G.98 especially designed for 0.49 engines, the E.G.99 long reach for larger high performance engines, and the E.G. 150, which is used in the Tornado Twin, a short reach version of the E.G.99.

Combined Forces!

IN order to give an even better service to their customers two of the best known Midland retailers, Roy Lever (Leigh Models) and Roland Scott, have merged their respective companies to form Roland Scott Limited.

We recently paid them a visit at their new Bolton headquarters from where mail order goods are packed and despatched, and where all personal customers receive a very warm welcome.

The wide range of products stocked is obviously too numerous to list, but the remarkable R/C section is worthy of particular mention. A complete range of both English and Foreign R/C equipment is stocked and our photograph gives some indication of the scope of this particular section. Just visible beneath the array of R/C gear is a wide selection of new and used engines, and these, by the way, comprise another speciality of this fast growing establishment.

Roland Scott Limited are now publishing a monthly newsletter, which is forwarded free of charge to all their regular mail order customers, numbering at the moment something over 2,000 from both home and overseas. It is typical of the enterprise shown by this enthusiastic organisation and we know it is much appreciated.

Roy Lever (left) and Roland Scott in their well stocked shop.

The R.E.P. electric motor shown just a shade under life size.

For those who use accumulators and prefer to wire up their own Quickstart glowplug connector, D.C. now supply a "wireless" clip for 3s. 2d. It is sold under the name "Glowclip."

* * *

When we recently had the opportunity to examine one of the new **R.E.P.** motorised servos, our covetous gaze fell immediately upon the minute 1.5 volt electric motor. This is quite the neatest little power unit we have yet seen and we are pleased to hear that it will soon be available as a separate item. The compactness of this motor will suggest many uses to the experimenter and home R/C builder.

We hope to report more fully on this interesting item shortly.

* * *

After over a year of research, **Britfix** are now ready to launch their new hot fuelproof butyrate dope. It will be in the shops during February and we are certain that it will be extremely popular.

There are some differences between this and previous British butyrate dopes, and it would seem from these, that the Britfix formula more nearly approximates the original American one. Butyrate has for years been the favourite U.S. finish, and now that glowplug engines are well established in Britain, its advantages over ordinary cellulose will be even more appreciated.

Even "cold" diesel fuel containing castor oil will very rapidly ruin an unproofed cellulose finish, but with Butyrate no proofer is needed and this Britfix formula really does seem to resist the attack of even a hot glow fuel!

It is important to remember that this dope must *not* be applied over normal cellulose, which means using butyrate clear dope to shrink the covering tissue. The clear butyrate, however, now has ample shrinking power, and is no more expensive than "normal" clear dope. It has a rather different "feel" about it when being applied and those who use the dope-and-thinners method of tissue covering, will be disappointed to find that the doped frame cannot be satisfactorily re-activated by application of thinners through the tissue. However, if a little dope is mixed with the thinners, the covering process can be carried out in the normal way.

The adhesion of the clear butyrate dope to metal or non-porous surfaces, is not as great as cellulose clear dope, and as the shrinkage is at least as great, a corner fillet often pulls away from the surface.

Unlike some other fuelproof dopes which need special thinners, the Britfix dope uses ordinary cellulose thinners, and this can be a decided economy. A radio model (for which this finish is particularly suitable in view of the vast amount of fuel normally spewed over the machine) needs a lot of dope, while if it is sprayed, it also needs a copious supply of thinners, and "special" thinners tend to be expensive!

One of our models being demonstrated at the Schoolboys Exhibition has been completely finished with butyrate.

* * *

We recently received some samples of the new **Joy** plastic enamel which is now marketed in a wide range of intermixable colours at 1s. per tin. Available only with a glossy finish, matt and camouflage colours are not included in the range, but for general purpose use where a bright, glossy surface is acceptable, these enamels are quite suitable.

The decoration of plastic models is the obvious use for Joy enamel, although on the tin the contents are said to be proof against petrol, diesel and glo fuels. We put this claim to the test, but unfortunately we are unable to endorse it, since the painted test surface was extensively softened and wrinkled following immersion in both diesel and glo fuels.

* * *

Le Pages have a new line which may be of interest to modellers, although not exclusively intended for them. It is the "Dot" ink marker, consisting of a sort of stubby fountain pen type body with a felt "nib." Eight colours are available and we would suggest these markers as suitable for decorating all-balsa models since the colours are intense and do not "run." The ink will also "take" on smooth doped surfaces and is diesel fuel proof. Useful for last minute application of those S.M.A.E. numbers!

The Service behind the Van!

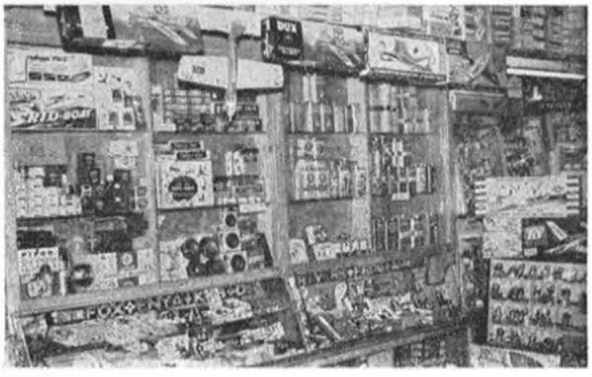
Bill Davies behind the counter. Photo below shows another view of this well stocked shop.

SHEEN MODELS need no introduction to visitors to the various model meetings up and down the country. Their Volkswagen van, brimming over with model goods, is now a familiar, and often very welcome, sight to the rally flyer. For the last three years, this mobile model shop has been the salvation of many a modeller who, in the customary pre-contest panic, has forgotten some vital component!

The home base of the van has, however, been an established modellers' emporium for much longer than this—for 10 years in fact. The success of this flourishing business is due entirely to the genial proprietor Bill Davis, who still devotes his personal attention not only to both mobile and static shops but also to an expanding mail order department which is rapidly becoming famous for its by-return service.

One of the Sheen specialities is their used engine service; the stocks of good second-hand motors is very extensive and prices are more than competitive.

One important factor contributing to the stability of the business is the wide range of goods which are stocked. Besides the aircraft side there is also a railway department and one corner of the shop is devoted to toy sales. This diversity of interest does not, however, interfere with the authoritative individual service given to the model aircraft customer whose goods occupy the greater part of the large shop. As you can see from our photographs the stock is very comprehensive, and for 9d. post free, you can obtain a special catalogue which is particularly valuable to those not fortunate enough to live within easy reach of a good model shop.



MODEL AIRCRAFT at the National Schoolboys Exhibition

THE flying display, organised by MODEL AIRCRAFT, in co-operation with *TV Express*, at this year's Schoolboy's Exhibition, has certainly lived up to its claim to be the largest display of power model flying ever staged indoors in this country. Immense enthusiasm for the mixture of r.t.p. and C/L flying has been shown by youngsters and also the dads who accompanied them. Indeed, many visitors spent literally hours "glued" to the safety barrier, determined not to miss a thing.

A representative selection of kit models were supplied by their respective manufacturers, and it is significant to note that the demand for flying kits from the two retail stands, was vastly in excess of previous years when there has been no flying display. The only non-

The heading photo gives a good idea of the general layout of the cage. Left: Roger Dupuy prepares the actual "Wee Snifter" featured on our last month's cover for a flight. Right: Doug McHard and Raymond Pipe prepare the German camouflaged "Wee Snifter," while George Fletcher starts the motor in the Frog "Tutor" assisted by Martin Willsmore.

kit design flown was the *Wee Snifter*, featured in our January issue. The version, finished in German markings, performed very consistently and was a firm favourite with the crowds.

Two models were flown at a time, separated by a special stop on the wire and some of the models towed banners or streamers which were unfurled, after the machine was airborne, by means of a piece of D/T fuse. The C/L demonstrations were equally popular, and although the short lines prevented anything in the way of aerobatics except loops and inverted flight, two in a circle combat with streamers was most effective. Perhaps somewhat surprisingly, the mortality rate among all types of models was very low, and maintenance required, at a minimum.

The Cage

This, the largest structure of its type used at an exhibition, measuring 50 ft. in diameter by 8 ft. high, was especially designed by Mills Scaffolding, who had to solve many problems in its construction. It was covered by 3 in. mesh Gridweld which made a most secure safety netting to guard against accidents; while the stand was "squared off" with portable lengths of crowd control barriers.

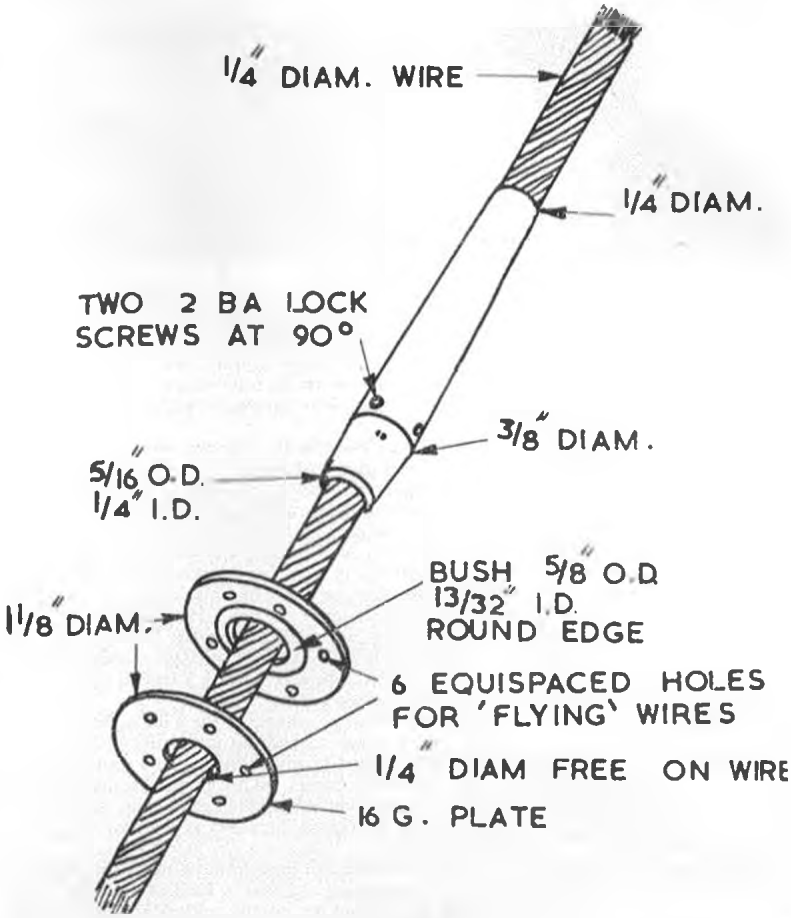
Technical Details

With tethered flying of this type it is essential, if more than one model is to perform, to have a "stop" between the two machines. In the past this has normally consisted of an aluminium tube which is carried up the wire by the lower model. However, using 20 ft. lines as at Olympia, for such a tube to effectively separate the models, it would have had to be of such length that it would have been difficult for the model to lift the weight. While this problem was being considered our Managing Editor, C. E. Waller, came up with the idea of the tapered stop shown in the accompanying drawing, which is quite self explanatory.

In practice some slight difficulty was experienced in getting the top ring to "jump" the stop on which the bottom ring was to "ride," but this was mainly caused by the wire being slightly under the stipulated diameter, which meant that the stop was wider than anticipated. Fortunately, a sharp "twang" on the wire would solve the problem each time and the model would continue to the top stop which was a 5 in. dia. brass ball. The stops were fixed at 17 ft. and 30 ft. from the floor.

Flying was carried out by a team, ably led by Mick King, whose commentary was tireless and should gain many converts to the hobby. Assistant Editor of MODEL AIRCRAFT, Doug McHard, shared the work at the microphone and remained imperturbable during the occasional disaster, while George Fletcher was a tower of strength in the "pits."

The youngsters whose display of C/L flying thrilled the huge crowds, were Roger Dupuy, Raymond Pipe, Martin Willsmore and David Perry.



MODEL AIRCRAFT WINGS CLUB

Cody and the Chinese Cook

WHAT does "Cody" mean to you? When you read or hear that name you probably think at once of the Wild West and of a picturesque horseman galloping across the plains. The hero whom you have in mind was a great buffalo-hunter who lived a dozen fantastic lives before he went on tour with a Wild West show. You are thinking of Colonel Cody. I am too—but are we, I wonder, both thinking of the same Colonel?

By a confusing coincidence the American West in its romantic era produced two men who had the same surname and almost identical reputations. One was William Frederick Cody, or Buffalo Bill; the other was Samuel Franklin Cody, who, after years of high adventure on the ground, took to the new adventure of the air.

It is Samuel Franklin, of course, who concerns us here. While he would be well worth writing about at any time, there is a special reason why we should remember him in 1961. He was born on a farm at Birdville in Texas on March 6th, 100 years ago.

You had to be tough in Birdville in 1861. Young Cody had his first taste of Western adventure when Indians raided the farm and set it on fire. He crawled wounded through the woods to Fort Worth, and it was not until some years later that he saw his parents again. Like the first Cody (Buffalo Bill was born in 1846), Samuel earned his living shooting buffalo on the Great Plains. He was already a legend in the West when the Klondike Gold Rush sent him heading hopefully north.

After failing to trip over any nuggets in the snow and ice of the Yukon, he returned to his old routine of rounding up herds, fighting off Indians and missing death by a hair's-breadth. Eventually, with a bullet lodged firmly in his leg as a souvenir from a drunken cowboy, he began to train and sell horses. This career brought him to England and provided him with a wife in the lively person of Lela Davis, daughter of John Blackburne Davis, one of the most successful breeders of bloodstock in the country.

If S. F. Cody had searched the world, he could not have found a more suitable wife than Lela. Besides being a fearless horsewoman, she was a kind of English Annie Oakley, quick with a gun, and ready to be shot at, on the understanding that the bullets would miss her by a quarter of an inch.

Obviously, the two had to create a Wild West show. In addition to everything else, Lela was an accomplished actress as she vividly proved in that blood-curdling melodrama *The Klondike Nugget*. At one point in the play she stood in front of an iron frame with a large number of clay balls stuck close around her head and body. From the aisle of the auditorium Cody broke every one of the balls with a rapid series of shots, and for extra good measure nipped a cigarette from between his wife's lips.

To a man like Samuel Franklin Cody such feats as these begin to pall after a while. Early in the century some young Army officers in Britain and on the Continent were experimenting with big kites, and when Cody heard of the experiments he remembered how, as a boy back in Texas, he had flown kites made by his family's Chinese cook. As the Chinese had been making kites for three thousand years at least, it was not surprising that the Codys' cook should like to build some for the tall sky over Texas.

Now, in England, Samuel Cody began to construct kites himself; and it is because of this new interest and its consequences to the history of aviation that we are celebrating the centenary of his birth. I will tell you more about him later.

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 . . .

Here in Bulawayo, which is nearly in the heart of Africa, modelling is very popular. My father is the Chief Flying Instructor of the Bulawayo Light Plane Club and I have had many trips in its Cessna 140. I cannot yet reach the rudder pedals so I concentrate on flying model aeroplanes.

There are quite a few members in the flying club who are keen on model aircraft and it was one of these who really started my aeromodelling hobby for me. He gave me a F/F model called

the *Pioneer* as a present. It is a Frog model made completely of aluminium, and was already half built when I received it.

I am mainly interested in C/L models and I now have four. My favourite models are a K.K. Class A Team Racer called the *Ranger* and a Frog *Vandiver* which is a small stunt model. The other two are a speed model and a C/L trainer. All of my models are powered by 1.5 c.c. diesels.

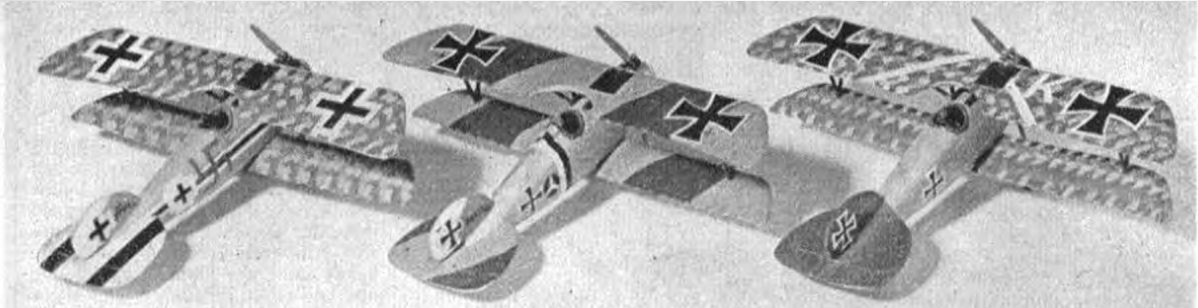
The photograph shows me with the *Vandiver* and *Pioneer*.

I think your club is terrific.

Yours faithfully,

Belmont, NIGEL WESTWOOD.
Bulawayo.

Remember I pay 5s. for every letter published and a further 5s. if a picture is used.—A.W.



Collecting is Fun!

"Workbench" this month tells you how to get the maximum enjoyment from plastic models

THE long dark winter evenings that we are now experiencing compel us to desert the flying field, so one would think that now is the time to get down to some serious building for the coming flying season. Unfortunately, many workrooms are inadequately heated and balsa chippings make an awful mess of the living room; so more and more Wingmen are finding that the construction of plastic kits is an ideal way to keep their aviation interest alive.

There are so many different models at present in the shops that it is impossible to ever hope to build them all. Therefore, it helps if your "plastic" building has a definite aim, and what better than to form a collection of aircraft you find particularly interesting? But don't just rush out and buy any kit or you will end up with an *assortment*, not a *collection*.

For instance, it is helpful if all the models are to approximately the same scale. It is much more fun, for example, when you can take your model *Spitfire* and place it alongside your *Lancaster* bomber to see just how enormous the real "*Lanc*" appeared when standing beside the little "*Spit*" fighter on a wartime airfield. It would be far less impressive if the model *Spitfire* was bigger than the *Lancaster*. So at the outset it is wise to decide whether, to you, scale is an important factor. If it is, then a whole host of kits will be immediately eliminated, since many are not made to any specified scale.

There are three scales which have become widely adopted by collectors of plastic models, and each one has its own advantages and disadvantages.

The most widely adopted scale in which the largest number of prototypes is represented is 1/72nd. Simple mental arithmetic will tell you that this scale means every inch on the model represents 6 ft. of the full size aeroplane, since there are 72 inches in 6 ft.! In addition to all the plastic kits, there are also many plans and drawings available in this scale.

A 1/72nd scale *Lancaster* measures about 16 in. wingspan while our *Spitfire*, to the same scale, measures about 6 in. As you can see, then, this is a good all-round scale for a general collection.

However, you may not be particularly interested in bombers, preferring a collection of the more colourful fighters. In this case, 1/72nd is perhaps a little small, particularly if the tiny World War I biplanes are to be included. A 1/72nd Sopwith *Camel* is only 3 in. long and this is not really big enough to include any extensive detail or interesting paint schemes. So for a fighter collection it may be better to choose the next size up, which is 1/48th, or 4 ft. to 1 in. The range of models available to this scale is much more restricted, but still fairly extensive, particularly in the early biplanes for which the larger size is very helpful, simplifying as it does both assembly and painting.

A collection of bombers and airliners made to either of these two scales would take up considerable space and so some manufacturers use 1/96th for these big ones. This brings the span of our *Lancaster* down to about 12 in., still large enough to be able to incorporate detail, but not too big to become an embarrassment for display purposes.

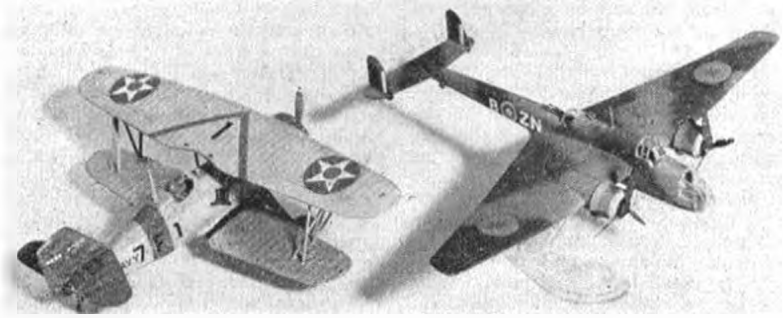
Most manufacturers state the scale of their models, but even if a scale is not stated, one dimension is always given—usually the wingspan. From this it is easy enough to work out the scale, since the dimensions of the full size machines are always available in your reference library. It will frequently be found that although not exactly to any of the three scales mentioned above, a model will closely approximate to one of them. In many cases the error is so small that it will pass unnoticed in a collection.

A comprehensive catalogue, listing several hundred plastic kits now available, is obtainable from Belwynn Ltd., Dept. M.A., 58, Shenley Road, Borehamwood, Herts. Just send them a 6d. stamp to cover postal charges, the catalogue is free. Incidentally, the dimensions of most of the models are given in this catalogue which will enable you to work out the scales of those odd-sized kits!

Another useful reference is the 1961 Gamages Model Book, which lists all the latest plastic kits and also, of course, deals with flying kits, railways, etc. Fully illustrated, it costs 1s. plus 6d. postage, from Gamages, Holborn, London, E.C.1.

There is yet another approach to collecting, not often exploited, which should appeal to the more experienced modeller, who finds the assembly of plastic kits dissatisfying because of their simplicity and unavoidable repetition.

For the military minded collector, how about making a collection of every



The three Airfix "Albatross" biplanes in our heading photo have been painted in authentic individual W.W. I colour schemes. There were so many personal decorations used during this war, that a "one-type" collection can be very interesting and of considerable value.

Although individual models may be finely made, the value of a collection is considerably lessened by scale inequalities. The Curtiss "Hawk" (left) is an Aurora 1/48th scale model and the model on the right, a Frog Handley Page "Hampden," to a very much smaller scale.

mark of *Spitfire*? The basic aeroplane altered very little throughout its long production run, apart from the fitting of the bubble canopy on the later marks. This collection could run into dozens of very interesting models, not only could the different marks be produced, but many of these machines served with a number of air forces, and could thus be painted in several colour schemes. The newly published "Spitfire" book, reviewed in our December, 1960, issue, would be an ideal reference containing as it does extensive details of every "*Spit*" produced.

Those who prefer civil machines, have an excellent subject in the Douglas D.C.3 *Dakota*; there are, again, dozens of different very colourful schemes from which to choose, including of course, several military ones. Nearly every airline in the world has at some time or other used the faithful *Dakota* and some of their colour schemes are really attractive.

To complete a collection of this type it is sometimes necessary to alter the outline of a model as kitted, and this can be done with Bondafiller as described in our July, 1960, issue. When a severed part needs smoothing off, No. 400 wet-or-dry abrasive paper followed by an application of Brasso, will restore the polished plastic surface.

New plastics ideas from Wingmen are always welcome, and if published, are of course, paid for. So don't forget, let me know of your latest brainwave—the publication money will buy you another plastic!

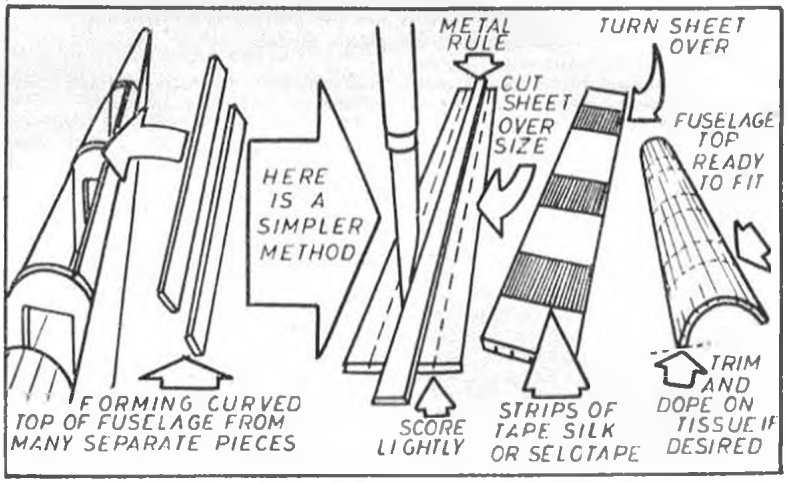
IMPROVE YOUR MODELLING *with this month's*

Tip

BY RAY MALMSTROM

CURVES WITHOUT TEARS

CURVED decking on sport or scale models can be difficult to make as the separate lengths have to be pretty accurately cut and fitted. The method shown below is much easier, and results in a neat job. Cut the decking piece oversize and trim when fitting, and score *lightly* along the piece of sheet. Do not cut right through. The slight gaps along the lines can be filled in with plastic wood, or cement with tissue doped on. Actually they are almost unnoticeable on a small model. Sellotape backing strips are recommended for lightweight models, tape or silk for larger models.



RADIO TOPICS—*Continued from page 45*

component is "out of scale"—the electrolytic condenser could have been smaller in physical size. This is not an important point but we mention it because one way to judge an "intelligent" kit is by the amount of mixing of miniature and sub-miniature component sizes—and surplus components. The less the amount of "mixing," generally, the greater the care and attention which has been given to working out the kit. With only one "odd man out," this kit rates high. Good instructional material, too, which makes this kit just about foolproof. Price in this country 207s. Not cheap, but it appears to be an excellent tone receiver for working on a 100 per cent. modulated transmitter signal of 400 c/s.

* * *

Whether or not superhet receivers will become the equipment of the future now seems to be doubtful. At one period this was thought to be the only logical development, but a superhet inevitably means more cost, usually more bulk and a lot of complication—even frustration—in specifying and obtaining certain components. One particular advantage offered by superhets is that, being inherently more selective, a number of different transmitter-receiver combinations can be operated simultaneously in the permitted band without interfering with one another.

George Redlich raised an interesting point about the requirements for simultaneous operation. One of the pioneers in this particular field—he was working simultaneous controls on model boats some 10 years ago with Col. Bowden and others—George emphasised that experience with racing yachts simultaneously under R/C inevitably led to chaos when more than two models were involved.

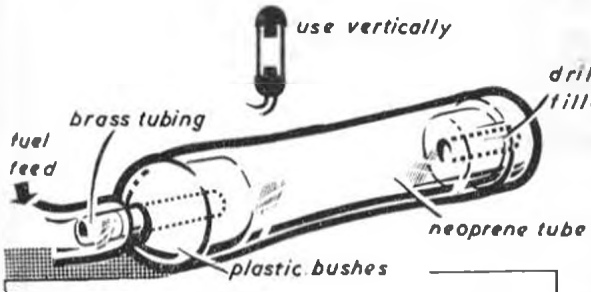
The same could apply to radio controlled aircraft—with even more limitations. Tangle up aircraft in a mid-air collision pylon racing and you can write off a lot of time and money, and that could well happen trying to manoeuvre more than two models, close together, round a distant pylon. Two-in-a-race seems enough—you can watch the pylon, and the other model closing in. Add another model on a collision course on a different plane—with perhaps yet another coming in from a further angle—and the situation would be merely a matter of luck as to whether they piled up or not.

The same with F/F "combat." Two is enough—three would be a crowd, with likely expensive consequences. Aerobatic contest schedules flown simultaneously to get in more flights in less time? Two is enough, again, and that calls for *six* judges. Try for any more and you could end up with more judges than models—and each judging panel with different ideas on rating.

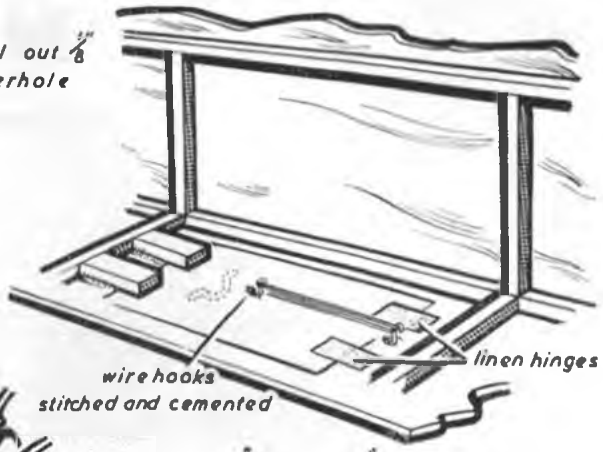
All this seems to boil down to is that provision to fly two models, simultaneously, and interference free, within the permitted band should cover most requirements, and this can be done with existing equipment. R.E.P. are bringing out small pre-RF amplifiers which attach to any existing receiver and provide complete "separation" over the extremes of the band. One transmitter, for instance, is adapted to crystal control at a frequency at the top end of the band and the other crystal controlled to a bottom band frequency. Each receiver is fitted with a pre-amplifier and, provided both receivers are fully screened (e.g. totally enclosed in metal cases), simultaneous interference-free operation of the two sets of equipment is assured.

Size of the R.E.P. pre-amp unit is about 1 × 1 × ½ in. and weight 1 oz. Cost about £3 to £3 10s.—ready Feb.

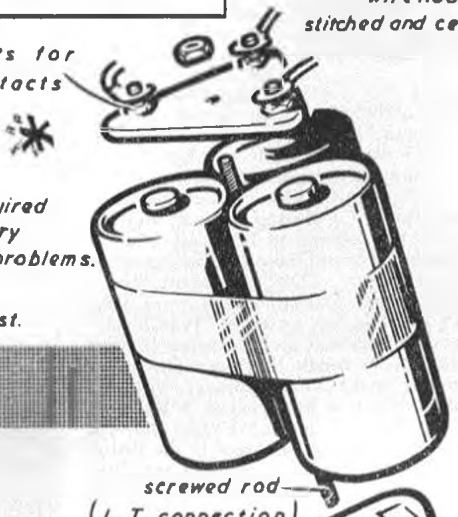
Readers hints and tips . . .



Two plastic prop shaft bushes are used to produce a neat and efficient free flight fuel tank by E.C. JARRET of Chistlehurst.

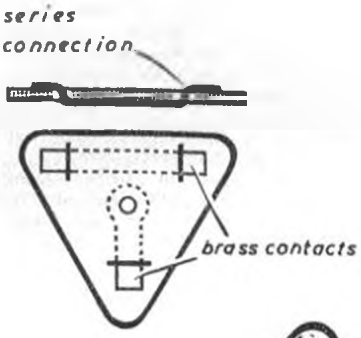


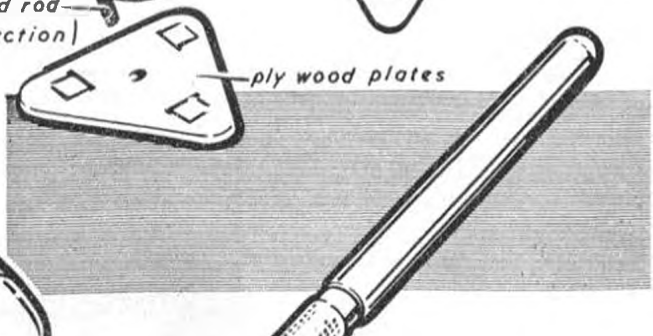
This "snap-action" inspection hatch is suggested by E.J. ALLBONE of Luton.

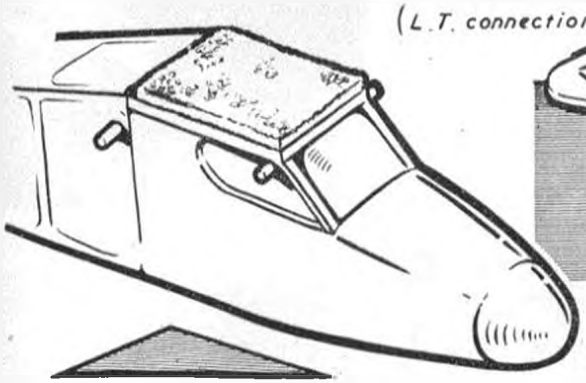


When only 3 dry cells are required for an R.C. receiver, this battery pack will solve your mounting problems.

It wins for J.R. SLACK of Wilmslow, this months tool chest.







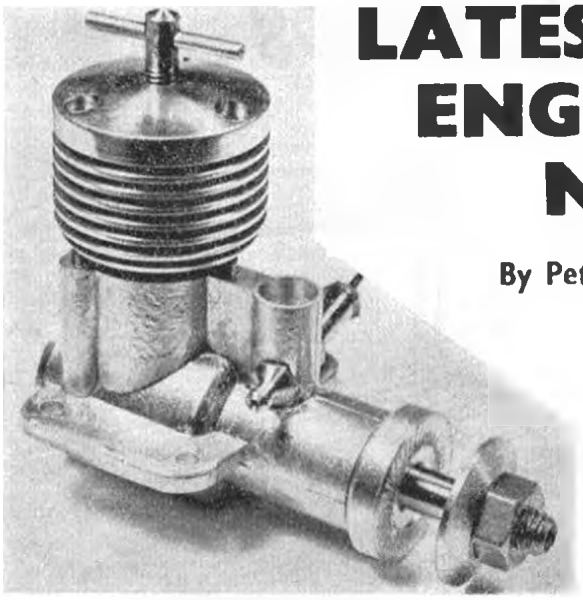
W. DAWSON of Carshalton suggests the use of foam plastic strips as sold for model railway trackbed, between wing and fuselage which effectively prevents wing movement due to engine vibration.

TWR

D. SHOUBRIDGE from Balla Balla Southern Rhodesia improves the grip of a balsa knife by covering it with a pen bladder.

LATEST ENGINE NEWS

By Peter Chinn



A NEW version of the 2½ c.c. P.A.W. Special 2.49-D to be known as the 2.49 Mk. III, is now on the market and shown in the heading photo. The earlier Mk. I and Mk. II engines were tested by M.A. for the July, 1957, issue and received a very favourable report. The 2.49-D was later joined by the smaller 1.49 model which proved outstanding in its capacity class.

Of interest to all of us is the fact that the new 2.49 has been very substantially reduced in price — from £6 5s. 8d. down to £4 18s. High quality construction is, nevertheless, maintained and the engine retains its single ball-bearing mounted shaft. Externally, the engine now more closely resembles the 1.49 model; the cylinder barrel is of slightly smaller diameter with heavier fins and the original cup shaped prop drive hub has been abandoned in favour of a conventional drive disc. Weight has gone up fractionally to 5¼ oz.

Internally, porting has been further modified. The three large and nicely contoured transfer flutes which are one of the more interesting features of P.A.W. design, now extend further up the bore, than in the Mk. I and Mk. II, to give, in accordance with current trends, a transfer timing which is close to that of the exhaust timing—although not so close as in the case of the 1.49. To permit this extended timing without destroying the smooth contour of the ports or interfering with the exhaust area, the exhaust ports have been re-shaped and are wider at the top than at the bottom edge. The cylinder liner material, incidentally, has been changed from silver-steel to heat-treated high-tensile steel.

We shall be reporting on the performance of this new model P.A.W. in due course.

Latest engine from the American Fox company is the 1961 Combat-Special. Developed from the earlier Combat 35, the new model features needle-roller main bearings and pressure feed. Bore and stroke remain the same as for all previous Fox .35's, i.e. 0.800 × 0.700 in.

The main casting is an adaptation of that used by the Rocket 35 and earlier Combat 35. This, however, has a separate front bearing housing, attached with four screws to lugs cast into the crankcase as per those used for backplate attachment. The crankshaft has a ¼ in. dia. journal and a very large (⅜ in. dia.) gas passage. It is heavily counterbalanced and is supported, fore and aft, by needle bearings. The needle rollers make direct contact with the shaft which is hardened to a Rockwell C-32 hardness index. Unlike the type of roller bearing employed in the British Rivers diesels, no spacers are used between the needle-rollers and there are 27 needles in each bearing.

As one might expect, the Combat Special is generously ported. The square section intake has internal dimensions of just over ½ in. × ⅜ in. and ends in a rectangular valve aperture. This obviously offers very limited fuel suction at the needle valve and the engine is therefore fitted with a pressure nipple in the centre of the crankcase backplate for a pressurised fuel system. Transfer and exhaust ports are very large. The transfer port is some 5/16 in. deep and almost fully overlaps the exhaust timing, its top edge being only 1/32 in. below that of the exhaust port. The exhaust port occupies 180 deg. of the cylinder circumference and has a narrow vertical bar at the centre to prevent any tendency towards piston rock developing with such deep and wide ports.

Claims for the Combat-Special include easier starting and less vibration than with the black-head Combat 35, plus an ultimate output, with maximum possible nitro-methane under the best possible conditions of "1.1 h.p. at 21,000 r.p.m." The engine has a 12:1 compression ratio and weighs 7⅛ oz.

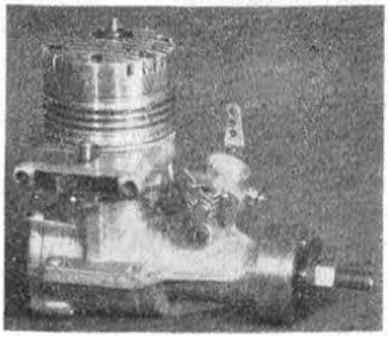
* * *

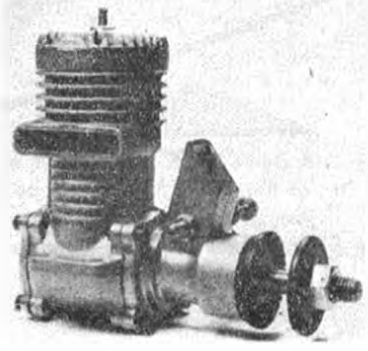
Expected shortly from the O.S. company is a new multi-speed 0.49 cu. in. (8 c.c.) R/C engine. This motor has been under development for over a year and our photos show a prototype unit with sandcast crankcase. This engine is equipped with a coupled throttle unit of somewhat different design from the type currently fitted to the O.S. Max-III multispeed 35 engine, including a butterfly type exhaust throttle. Full details of the new O.S. 49 will be released in MODEL AIRCRAFT as soon as we have clearance from the O.S. company.

Top right—the Lee "45" engine installed in Sprengs American Nats R/C winner. See Roving Report for more details.

Right—the Fox Combat Special.

Below—sandcast prototype O.S.49.





TESTING COMMERCIAL RUBBER

The results of some interesting tests undertaken by R. J. North and other members of the Croydon & D.M.A.C. Reported by M. Dilly

WHEN the Wakefield rules were changed for the 1958 competition, reducing the amount of rubber allowed from 80 grammes to 50 grammes, I (R. J. North) was not really interested. The fortunes of the Croydon & D.M.A.C. were at a low ebb, and it did not seem likely that anyone would bother to build a model for the new rules. Further, to many of us, it seemed that the good old days of Wakefield models had gone when the limited rubber rule was first introduced, and this new change was the bitter end. The performance of the models would be so low that they would be uninteresting to fly.

However, I did have an 80 gramme Wakefield which was pretty useless, and easy, go to a shop and buy some. Unfortunately that season (early 1958) I had already found that there was no rubber of good quality available, either Dunlop or Pirelli. A search started for old stock and eventually Ron Ward turned up with some anonymous ¼ in. × 1/30 in. strip. Flight tests were made and the performance seemed reasonable, if not quite what it was with the original Dunlop.

So far, all test flying had been done at Epsom or Chobham with the usual uncertainties which prevail at these two sites. By way of a digression it might be mentioned, for those who are not aware of this situation, that the performance of a model can be very different on a flat airfield from what it seems to be on a

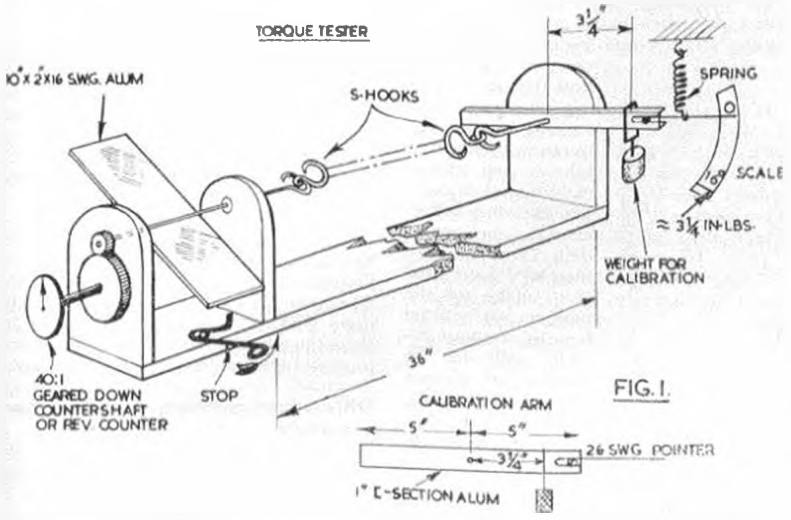


FIG. 1.

one evening, when I had nothing better to do, I cut an inch off the propeller blades, 6 in. out of the fuselage, discarded the pylon and installed a 1.75 oz. motor. It flew from the start, and what is more, it had a much better performance than in its original form with 2.8 oz. of rubber. This was surprising and I decided to persevere with these new rules. Altogether I made about 50 flights, fully wound, with this model before the 1958 Trials and none was under 150 sec., many being dethermalised at around 180 sec. Having seen no other new rule models in this class at Chobham, this seemed to be good enough, especially as the model was extremely stable and reliable.

There was, however, one snag. In test flying, all the original batch of rubber had been used up, and I had to find some more. In principle this was hilly site. Thus it is rather difficult to assess the likely performance of a model on an airfield, by test flying at the grounds available to the London area. Further, the terrain at Chobham is so rough that five or six full length flights are all that anyone wants to do in one day. This factor, and the relatively high chances of damage on landing, tends to reduce the amount of test flying which can be done. However, I went to the trials with some hopes.

You may recall that Ron Draper had the model of the year, John Palmer's model was performing with 1.75 oz. of rubber as it had in previous years with 2.8 oz., and John O'Donnell had a wonderful climb; Eric Barnacle and Ray Monks also had notable models. John Palmer got into the team, and the Croydon contingent went home not too unhappy as a club. For myself, I had two troubles: (a) the rubber was obviously not as good as the Dunlop I had been using, and (b) even allowing for this, the model did not compare in performance with some of the others.

The answer seemed to be to do a little research into both aspects but the rest of this article is concerned with the rubber question.

The usual method of testing rubber is to make test flights, but this process has several disadvantages:

(a) The results are subject to far too many variables.
(b) In order to eliminate the effect of these variables, many tests have to be made to obtain an average. This takes a long time.
(c) The results may only apply to one model. To confirm that they do not, requires further prolonged testing.
(d) Repeated testing with a changeable material like rubber is of questionable value.
(e) Suitable test conditions occur only occasionally.

On the other hand, if the experimental conditions can be controlled, the results can be relied on and repeated if necessary. Some years of experimental work have shown that results are of no value unless they can be demonstrated at will. If this is not so, no one believes the answers, soon not even the experimenter himself!

Rubber testing

As a preliminary exercise we (R. J.

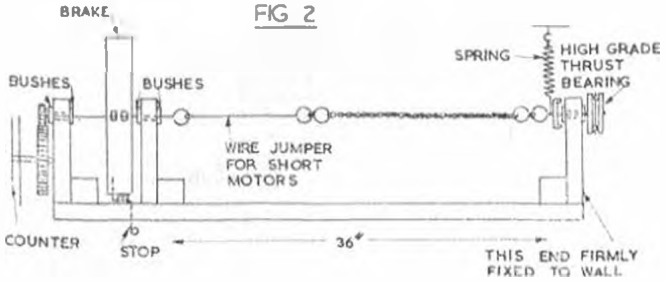


FIG 2

North and P. Scarbrow) had been using for some months a small torque indicator for use when winding motors. This soon proved what was confirmed later:

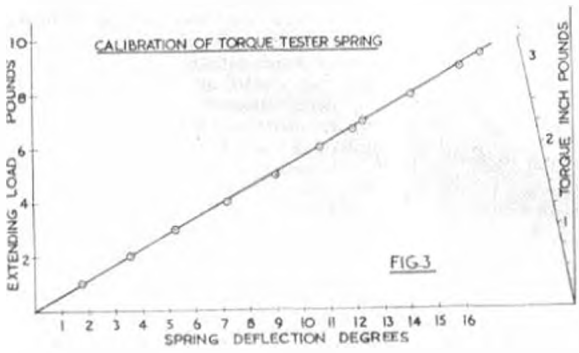
(a) That the torque of the motor whilst it is being *wound* can be misleading as far as the *unwinding* torque is concerned.

(b) That the *maximum* torque of the wound motor (which is the same as the maximum torque of the unwinding motor) is *not* the whole story.

The torque of the unwinding motor is what drives the propeller and is all that matters; the torque required to wind the motor is greater and, within limits, it does not matter how much greater. A certain weight of rubber is allowed (or can be carried), and what counts is how much energy it can deliver during unwinding.

The torque indicator consisted of a thrust-bearing from a war surplus bombsight computer, a spring wound from piano wire, a paddle blade to act as a load (i.e. a propeller), and a gearbox to reduce the speed of the driven shaft so that the revolutions could be counted easily, either visually or by a revolution counter.

The first machine actually drew the torque curve in ink on a paper-covered rotating drum driven by pulleys. However, I had more trouble with the pulley drive than anything else and as I needed the answers quickly, the device was simplified by omitting the graph-plotting facility. It is, however, a worthwhile convenience if it is done properly, and I am sure that a mechanism made from Meccano parts would be fine. It seems to be a sign of the times that bombsight parts were easier to come by than Meccano.



The general arrangement of the machine is shown in Figs. 1 and 2 and the only part that is critical is the thrust bearing, which should be as frictionless as possible. The bearings of the other rotating parts do not matter in this respect, as the energy of the rubber can go in bearing friction, as well as spinning the paddle blade. The torque measured at the other end of the motor and the number of revolutions will be the same, but the time taken to unwind will be a little longer if there is some friction.

The work done by the motor is calculated by plotting the torque against the revolutions, and measuring the area under the curve (for explanation see any elementary maths textbook on analysis). It is not necessary to calibrate the torque meter in oz.-in. or lb.-ft. if only comparative tests are proposed. However, it is better to do so in order to be able to exchange results with other workers. Calibration is arranged by hanging weights on the pointer arm to extend the spring in the same manner as the rubber torque. It is worthwhile doing this before you start serious testing in order to confirm that the extension of the spring you are using is proportional to the load (Fig. 3).

It is not, of course, necessary actually to measure the area under the graph if the intention is merely to compare motors, since the relative merits of two motors can be seen by inspection of the graphs. Alternatively, a quick check can be made by adding all the torque readings together, but for this to be valid, the intervals must be equal.

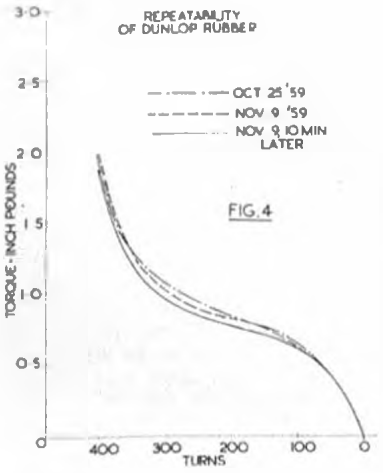
Preparation of the motors

If you weigh out 1.70 oz. of rubber (as I do), then make up a motor of so many strands and measure its length, you will generally find that the resulting motors will be of varying lengths. The question then arises: how to test motors of different lengths and therefore different cross-sections or densities? The method I have used is to make up the motors to initial lengths of about 22-23 in. and let the number of strands come out 10, 12, 14, or 16.

Someone will now object that each of these motors will take a different number of turns before breaking. This is no doubt so, but some sort of standardisation has to be introduced to simplify the problem, so that our minds can concentrate on the main aspects. So, whatever the motors might take in the way of turns, they are pre-wound to 240, 320 and 400 turns, the last wind-up on 400 turns being used as the test run.

The next wind-up can be a contest flight with 420 to 440 turns on; I have used this procedure on well over 50 motors and found it acceptable. I am aware that running-in rubber motors is a bit of a fetish with some, and if they want to run-in motors as well as test them, they are welcome. For me life is too short and anyway I detest winding motors.

The motors are lubricated with a mixture of glycerine and green soft soap. There is a practical advantage in this mixture over castor oil—it comes off the wallpaper more easily after you have been using the torque tester in the lounge!



Now for some practical results, but one word—if you do not like them and think I am wrong, do not buttonhole and tell me you think so. Build a machine, do some tests, and prove it. Then you will believe my results, and I will be able to believe yours.

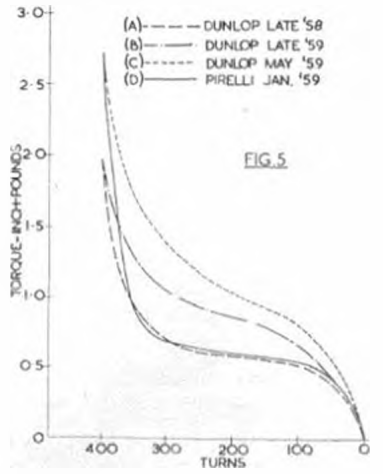
How do the results repeat?

One of the first precautions was to check that tests on a particular motor would repeat. This was done by testing a motor one day, using only about half turns so that the rubber was not worn out, and repeating the test the next day, and so on.

Fig. 4 shows three plots of the same Dunlop Wakefield motor tested on October 25th and November 9th, 1959. The two tests on November 9th were done within 10 min. of each other to show the effect of not allowing the rubber to relax between tests, or between flights.

Differences between good and bad motors

Fig. 5 shows the results of tests on: (a) a very good motor, one of the best



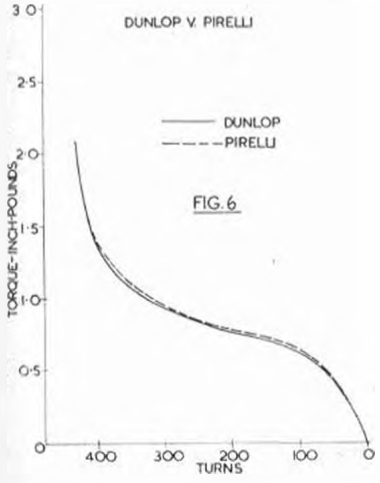
two or three I have come across (Dunlop, bought in winter, 1958). (b) An average motor, actually one of those used by Denis Partridge to win the Croydon all-comers Wakefield contest at Chobham, winter, 1959-60. This particular motor was chosen because it is typical of recent Dunlop commercial production. (c and d) Two very poor motors, one Dunlop bought in early 1958, one Pirelli bought in mid-1958. Note the remarkable similarity in the curves; there was no catch in this—they were different rubbers of different colours.

If you consider the area under the curves as proportional to the energy available, in each case the differences in performance to be expected are quite startling. This, of course, merely confirms what most Wakefield flyers already know, but it is nice to be able to demonstrate it, indoors, in front of the fire. Note also that the maximum torque levels recorded do not indicate whether the motor is any good. In other words the motor can feel very tight when you stop winding, and when you release the model it whirrs away for about 20 ft.; then the torque falls rapidly to the almost horizontal portion of the curve and the model levels out. You realise it is another of those debacles and wonder why you do not stick to power, until you recall that rubber is at least quiet and clean.

How do various makes differ ?

The graphs show that rubber from major suppliers varies a great deal. I have shown in Fig. 5 how two poor motors of different manufacture can be very similar in performance, and Fig. 6 shows how two fairly good examples, one Pirelli and one Dunlop, compare. You can see that they do, in fact, compare very well, and that there is no evidence so far that one type of rubber has a different torque curve from the other.

You will note that I do not say that such differences have not existed in the past or will not exist in the future. All I know is that they cannot be demonstrated with samples available to me since 1958.



Like everything else, we know that rubber was better in the past. If we had any to test we could prove it; unfortunately most of the old rubber still left has been well used, and it is no longer in its prime. However, I did get a sample of unused, carefully stored, 1953 Pirelli from one of my friends who has "kicked the habit." Imagine my dismay when it turned out to be only so-so. What fearful doubts arose in my mind? Were the good old days as good as they seem in retrospect? Or could it have been that we used more of the stuff then and were satisfied with less in the way of performance? The curve for the 1953 Pirelli (first registered 1959) is rather lower than the middle curve in Fig. 5 (it has not been plotted in order to retain a simple presentation).

Variations in different batches

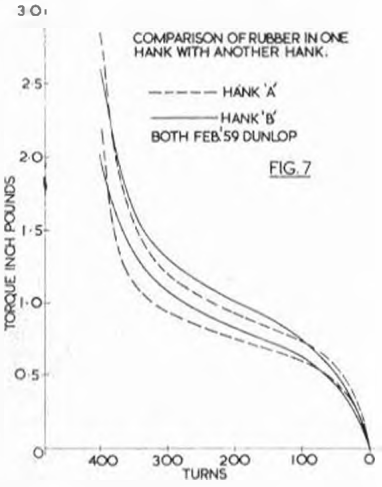
In 1959 when I made the Wakefield Team, I went home and dug out some Dunlop bought at the same time as the two skeins used for the two Eliminators and two Trials. This was to be used in the Wakefield Contest but I was in for a bit of a disappointment. It was no good. So a search began for something better, and a large number of motors was made up and tested. This was the only way, because it had already been found that there was a considerable variation in the motors made from one skein (about 1 lb.). Therefore, testing one motor from the end of a skein told me nothing about what else there might be in it.

It took about three solid days to confirm that I had better stick with the motors I had already used, rather than try newer and less satisfactory material. This decision, undoubtedly the right one, was made on the basis of machine tests alone as by that time I had complete confidence in the information it gave. Even since the contest I have not come across any motors which compare with those I used then, except some which John O'Donnell bought from a shop in Manchester in February, 1959. It seems likely that these were from the same batch of production from Dunlop as my two motors.

When next you read some statement by an expert on these things—how, if we were more serious about this business of aeromodelling and selected our teams in a different way, we might do better in International Contests—you will, perhaps, recall that I tested over 50 motors in three days to select a few to use! I saw a previous Wakefield winner making up his motors the night before the event at Brienne-le-Chateau. You might also like to know that, after I had won the Trials, I was asked what rubber I was using. I told the enquirer Dunlop, and he remarked that the others in the team had used Pirelli. I gathered from his tone that I was in error in using Dunlop; at this I'm afraid I was a bit off hand.

The point I am making is that, over a period of years, I am sure that more commonsense development has gone into model aircraft in this country than anywhere else, including Russia and America. But none of this is enough in a contest—one needs luck, too and this element, on occasion, cancels out all else.

I do not know what has been done elsewhere in rubber testing, but this article contains the first set of data published anywhere in the world, giving actual figures and stating the rubber makes, on more than just a few motors.



As a result of the tests made before the 1959 Wakefield contest, Fig. 7 shows the spread of curves for eight motors made from each of two skeins of Dunlop rubber bought on the same day, 16 motors in all. You can see that there is considerable variation and some overlap.

Special batches

Some tests have been made in collaboration with Dunlop but I have not been informed of the results of these tests. As far as I can tell, the product available in the shops is not any better than it has been at various times in the past. However, none tested recently is as bad as that sold in early 1958 and so there could have been some improvement in the consistency of the product. Only time will tell on this count.

Acknowledgments

I should like to acknowledge the co-operation of many members of the Croydon and D.M.A.C. in this work. In particular Pete Scarbrow and Dennis Partridge for help with test flying, Ted Setterfield (of Heset Model Supplies) and Ron Ward for providing rubber samples, John Palmer for lending some of his known good motors and for assistance with tests in collaboration with Dunlop Rubber Co. Ltd. Thanks are also due to John O'Donnell for discussion, provision of motors for test purposes, and for a copy of his report on rubber testing.

LETTERS
to the Editor

Radio requirements

DEAR SIR,—Having been a C/L enthusiast since my first engine, the radial mount Frog 1 c.c. diesel of 1948 vintage, this also being the year I started to obtain my regular copy of MODEL AIRCRAFT, I would like to mention how much I enjoyed reading your report on the World C/L championships. Further, I really thought it more than appropriate that the cover should feature a picture taken at the said championships. Enough said!

May I also add that I doubt if any other model aeroplane magazine anywhere in the world publishes more up to the moment news on engines—"Latest Engine News" definitely being one of my favourite articles.

However, at long last I have taken the step that I have threatened to for a year or two now. I have severed the strings that tied me to C/L (no joke intended) and have gone over to radio.

At present my *Junior* 60 is built and nylon covered, except fuselage, which is held up pending delivery of a Unitone outfit. Rudder is operated by the Rising compound escapement, while my Enya 19 is being fitted with an exhaust throttle by Eifflaender and will be operated by a Rising two-pawl clockwork actuator. The model is also fitted with 3½ in. air wheels by Model Aerodrome, Birmingham.

When I sat down and counted all this up I got rather a fright as it came to £32 (I must hide this letter from my wife), the said amount being spent to give me a 5 ft. model with what I think is really reliable equipment as I do not want a great deal of trouble on the radio side.

While the above possibly reads like an advertisement for various firms, it is in fact the sort of thing I would like to read in some of your radio articles. The reason I write you on the matter is because I believe your magazine has done more than any other in this direction. When I say this I am thinking mainly of those extremely interesting and practical articles by Harry Stillings.

Now while it would be very nice indeed to have resources to obtain eight-channel equipment plus associated servos running up to £70 with still further outlay for the model, I feel that they are only obtained by, to quote from an American magazine, "those well heeled few."

This brings me to the "not so well heeled many," including in its ranks myself and, I think, Harry Stillings. I would like to see more practical articles backed by proven use in the air as per Stillings, whereby rudder, elevator and engine controls are obtained (even with limitations) without the expense of multi-channel stuff.

Yours faithfully,
G. HALLEY.
Fife,
Scotland.

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.

A correction

DEAR SIR,—In the test report on the Cobra 0.49 Glowplug motor which appears in your December issue, this motor is incorrectly referred to as the "Keilkraft Cobra."

To avoid any misunderstanding, we would explain that the Cobra motors are manufactured by John Rodwell Ltd., Vicarage Road, Hornchurch, Essex, and E. Keil & Co. Ltd. are the sole distributors to the trade.

Yours faithfully,
E. F. H. COSH,
General Manager.
E. Keil & Co. Ltd.

E. D. BEE
Engine Test

Continued from page 42

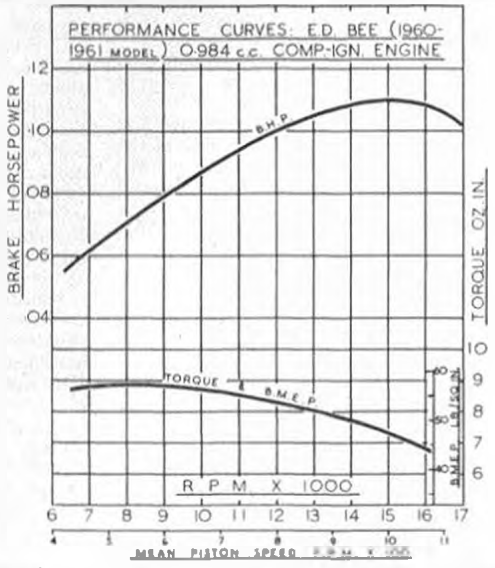
the fully closed position, fuel was still reaching the intake in sufficient quantity to keep the engine going. This was found to be due to the threaded thimble having been brazed on too far down the needle stem and, since complete control over mixture strength is obviously desirable for test purposes, the needle was replaced with that from our 1956 Bee. With this the normal running setting was 2½ turns open.

The high performance of the new Bee has already been mentioned. On our example this was at the cost of some deterioration in ease of starting. This was noticeable only because the Bee has always been noted for its extremely good starting qualities. The engine now seems to prefer port priming for a start from cold and cold starting was better on large props than on small ones. This also applied when the engine had been allowed to cool down for several minutes after a run. If refuelled and restarted immediately after a run, however, starting was virtually instantaneous following one preliminary choked flick of the prop.

The improved performance of the new Bee was evident even at quite moderate speeds. Torque was up by 30 per cent. at 8,000 r.p.m. and by 60 per cent. at 12,000 r.p.m. Brake horsepower peaking speed was up by no less than 4,500 r.p.m. or more than 40 per cent. and the sum total of these improvements was to raise the output to just on 0.11 b.h.p. at a shade over 15,000 r.p.m.—an increase of nearly 72 per cent.

To make full use of this performance, a 7 × 3 prop would seem to be the best size for F/F or a 7 × 4 for C/L. For normal (non-contest model) use, however, these sizes can be comfortably increased to 8 × 4 and 7 × 6.

Thanks to this greatly increased top end performance the scope of the Bee is appreciably widened. The modeller who is ready to move out of the beginner class will find this latest Bee well able to cope with the power requirements of a much larger range of model designs.



Power/Weight Ratio (as tested): 0.53 b.h.p./lb.

Specific Output (as tested): 112 b.h.p./litre.

ROVING REPORT

Brings you up to date with the latest world model news

Winner of the multi-channel R/C event at the U.S. Nationals, Doug Spreng, with his winning 10-channel "Stormer" design.

WE are indebted to John (World Engines) Maloney for the photograph of Douglas Spreng, winner of the 1960 U.S. Nationals multi-channel R/C event. The model, of Spreng's own design, has a 72 in. span and is powered by a Lee 0.45 cu. in. engine. The radio is a 10-channel outfit on 51.4 mc/s, designed by Don Mathes (well known for speed and pylon racing R/C models and who, incidentally, was third in multi-channel R/C) and operates rudder, motor throttle, elevator, elevator trimmer and ailerons through Bonner servos.

In contrast to the low-wing or mid-wing semi-scale trend that has been apparent in the leading American R/C models during the past couple of years or so, Spreng's winner, it will be noted, is a shoulder-wing design with simple lines, parallel chord wings and no cockpit or cabin. With the absence of Ed. Kazmirski, Bob Dunham and Hal deBolt, who were in Switzerland for the World R/C Championships at the time, it is interesting to note that the first three place winners at the U.S. Nats all used shoulder-wing models; though whether this signifies anything seems open to question, since 12 of the first 16 places were still taken by low- or mid-wing designs.

On the subject of model trends, we are reminded that the 1961 edition of the *American Modeler Annual* (formerly *Air Trails Annual*) carries a résumé of the specifications and main points of interest of over 350 entries at the U.S. Nationals including first, second and third place winners in all the many events and age groups. The annual costs 50 cents (3s. 7d.) and anyone who is at all interested in, for example, the trend of winning design, which motors are most consistently at the top, etc., should find this excellent value. We always find it rather interesting to check up on the popularity and/or success of the various makes of commercial equipment—R/C gear, engines, props, fuels, etc.

For instance, over 50 per cent. of all radio equipment used at the 1960 Nationals was of Orbit manufacture, 12 per cent. was own-design equipment, 8 per cent. was C.G., and 5 per cent. Bramco. The remaining 25 per cent. was shared between upwards of a dozen other makes. One could scarcely expect to find a clearer indication of the high regard in which Orbit equipment is held by leading American modellers.

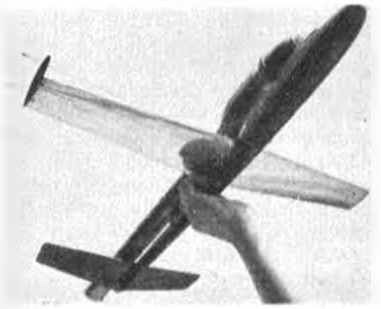
A rather similar story comes to light concerning motors used. Here, K & B engines outstripped the field in R/C popularity, although, in fairness to other makes, it is only right to say that this is largely accounted for by the wide use, for multi-channel, of the K & B 45, a capacity class which has not, as yet, been adopted by other leading manufacturers. At least 45 R/C models were powered by K & B engines, against nine each for Veco and Fox and six for O.S. There were also three Lee 45's, three Enyas, two each of McCoy and Super-Tigre and one each of Kyowa, Johnson, Forster and E.D.

Getting away from R/C, we observe that of the first, second and third place winners in each of the three Half-A (0.049 cu. in.) power duration classes (Junior, Senior and Open), no less than six were powered by Holland Hornets; two had Coxes and the other an Atwood. Hornets (.051 models) were even more successful in the A class in which they were competing against models of up to .19 size and seven of them placed with single examples of O.S. Max-15 and K & B 19. In F.A.I. class power, O.S. Max-15 took three places, Oliver-Tiger and Super-Tigre two each and K & B and Enya one each.

In the speed events, Cox 049's won two of the three age groups in Half-A, the third going to a Hornet. Class A (2.5 c.c.) was topped by Bill Wisniewski using one of his own motors (but in a smaller model) which subsequently proved such a sensation in the World Championships. The senior class was won by Larry Thomas with a Max 15 and the junior class was topped by Niki Burt's Super-Tigre. In Class B (5 c.c.), specials topped the open class results and Dooling 29's were the winners in Junior and Senior. McCoy 60's dominated Class C, the best time being 162.8 m.p.h. by Bob Lauderdale.

The new Acada clockwork dethermaliser timer from Olshi & Company, Japan. Although marked 1 to 5, it will cover up to a maximum of six minutes.

Built by Hiroshi Suwada, who is in charge of the O.S. experimental department, this O.S. Jet type 2 powered model has recorded 149 m.p.h.



"J.Oki" on the side of this graceful looking 10-channel R/C model, is the name of the builder. The model is powered by a 10 c.c. Enya 60 throttle-equipped engine and weighs just under 10 lb. It has been used to carry a small 8 mm. movie camera for aerial cine-photography.

A sleek stunt/combat model for 2.5-3.5 c.c. motors.

Designed by HOH FANG-CHIUN

WHEN "Combat" was first introduced the models flown were usually old stunters retrieved from the scrap box. However, in a very short time, this new branch of the sport rapidly gained in popularity, and specialist combat models were produced with a stunt performance but simplified construction. As the mortality rate of models increased, the emphasis was more and more on ease of building until, today, a combat model is the simplest and often the ugliest of contest models!

In an attempt to get away from this rut, I have designed *Dragoon*, in which I have tried to combine a slick, manoeuvrable stunt model, with a fast, easy-to-build combat job. Powered by a well-broken-in Taifun "Tornado" 2.5 c.c. diesel, the prototype flies at an average speed of 60 m.p.h., and with a line length of 55 ft. it is capable of doing the most advanced manoeuvres.

Construction

Build the entire mainplane first, by first joining up the $\frac{9}{16}$ in. sq. leading edge and $\frac{3}{8}$ in. sq. hard balsa mainspar. Cut all the ribs from $\frac{1}{16}$ in. medium balsa, not forgetting to cut slots in the port wing ribs for the lead-out wires.

Slide and cement the ribs onto the mainspar and check that they line up correctly. Note that the 3 mm. plywood bellcrank mount has to be cemented in place before the ribs are added. Cut notches for the ribs in the leading and trailing edges and cement these in place. Add the $\frac{1}{8}$ in. sheet balsa tips and insert the 14 s.w.g. tubes through the port tip for the lead-outs. Don't forget to fix a 1 oz. lead weight in the starboard wing tip.

Before sheet covering the centre part of the mainplane, cement the $\frac{1}{8}$ in. balsa reinforcement at the trailing edge joint and bolt the complete bellcrank assembly in place.

The entire fuselage is hollowed from balsa block except for the engine compartment which is built first. Cut the three plywood formers (F1-F3) and the hardwood engine mounts. If you wish to instal a drop-off undercarriage, cement and bind the two 14 s.w.g. brass tubes to the firewall at this stage. Now instal the fuel tank between formers F2 and F3 and cement these to the bearers. When dry, cut away (if necessary) the wood on the inside of the bearers to suit your engine. To mount the engine, use nuts and bolts—*never* use wood screws for this purpose. While the engine is bolted in place, fix the ring former F1 in position by means of two small nails.

In order to obtain a strong and straight joint between the nose assembly and the mainplane, the two $\frac{1}{4}$ in. balsa webs must be cemented in position. Join the nose assembly to the mainplane with plenty of cement.

For the main fuselage, select two medium-soft balsa blocks and cut these roughly to the required size. Commence to shape the blocks by sawing out the mainplane slot, then pin the blocks together and trace the fuselage *top* view directly on the block and saw it to shape. The fuselage side view is transferred in the same way, always keeping the two blocks pinned firmly together. Before separating the blocks, sand them to the correct section.

Now separate the blocks and hollow them out to the dotted lines shown on the plan. Cement the blocks to the mainplane, add the nose block and balsa fillet at the tail, and give the whole fuselage a final sanding.

The tailplane and the fin, which are from $\frac{1}{8}$ in. hard balsa, can now be cemented in place, but check that there is enough elevator movement (about 30 deg. up and down is sufficient). Note that the fin has a lifting section and is slightly offset.

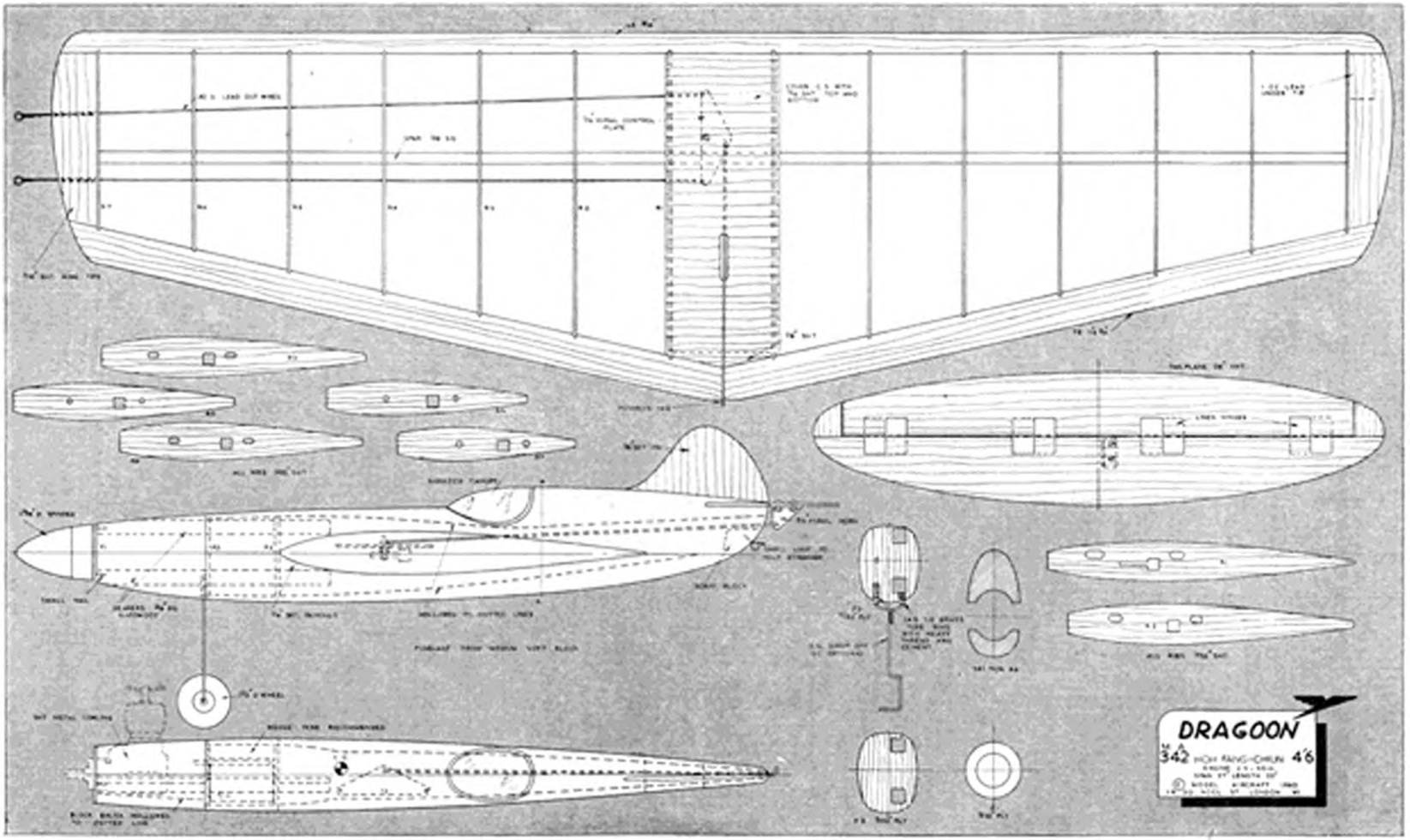
Complete the model by fitting the canopy—a commercial one can be used—and instal a small pilot for added realism.

Before covering the model give all outside balsa surfaces two coats of thin clear dope. Cover the mainplane with either silk or heavyweight tissue, but be sure that the grain of the covering material runs spanwise to minimise "sag," between the ribs. Cover the rest of the model with lightweight tissue. Apply four coats of clear dope, sanding lightly between each coat. The model is now ready for colouring, but don't forget to protect the transparent canopy with Sellotape during the process.

The engine cowling can be made of thin sheet metal (aluminium or brass) or moulded in sheet acetate. It is held in place with four small wood screws. Bend the drop-off undercarriage if required, and check that it drops freely.

Before you go out to fly, check that the model balances correctly, and that there is no warp in the mainplane. The length of the lines will depend on weather conditions varying from 35 ft. in windy, to 50 ft. in calm weather.

Always make the take-off downwind and if you use the drop-off u/c, apply slight up-elevator. When hand-launching the model hold the elevator in neutral, and let your helper launch the model with the nose slightly up. When flying your model over a concrete surface, be sure to put a wire skid under the fuselage or hold on the drop-off u/c with rubber bands in order to minimise damage upon landing.



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TOPICAL TWISTS

by PYLONIUS

Ruling Passion

Most of you kiddies must be aware that the dear old F.A.I. recently held its annual beano. And, no doubt, some of the little pedagogues among you have dutifully waded into the small print just to find out exactly how bad the hangover really was, and what playful pranks are in store for you next season.

You may have thought at the time that two funny columns in one issue was a bit much, but had the full report been published instead of a short summary you may have thought you had picked up your favourite comic by mistake.

Perhaps it might surprise you to know that the funny patter was meant to be taken seriously. But we can assure you such is the case. And those of you who are laughing now will be suffering later. Free flighters can expect little reduction in the size of corn plasters, while those who brave the more technical hazards of our hobby will need bigger and better ice packs.

First thing to note is the courageous and radical manner in which the meeting faced up to the problem created by the flop of last season's much ballyhooed comedy, "The Summer of the Seventeenth Fly-off." The show is to be livened up by a new and daring dance routine called "The Thirty Second Step." This, it is hoped, will be the biggest sensation since "Rock around the Clock." Featured as a grand finale to the contest proper, the principal performers leap into action after the fifth round with 75 per cent. Methyl Alcohol, followed by 80 per cent. Methyl Alcohol. Or have I been mixing my formulas? (hic!)

Anyway, the happy solution to our F/F travails, or travels, is to push up the fly off maximum by 30 sec. per flight. This is rather like living in a house with a low beam, and instead of remembering to duck your head you merely increase your stock of aspirin.

Another new idea concerns a more serious subject—hard cash. Now, if you are the sort of sporting gent who doesn't take his defeat lying down, you might wish to lodge a friendly complaint against the unscrupulous winner for using a team race pilot with a non-standard moustache. But, here's the snag. You have to put down a deposit, in Pounds, Dollars, Roubles or Yen, as the case may be. This money is forfeit if the Judge's private set of rules don't happen to agree with yours.

This should introduce a nice Monte Carlo touch into future events, with the competing countries outbidding each other on the Protest Stakes. Of course, some people might think this system unfair to the underprivileged countries which may not have the funds to compete in the top international events. Perhaps, after all, a set of simple, unequivocal rules might save a lot of trouble, even if it did spoil the fun.

Coming to the revised radio schedule, I must say this was a bit beyond me. I got as far as K — 6, 8 and 10, and Split S.K — 10, then decided to give it to the wife to knit.

Oh, I did mention team race pilots earlier, but reading on I was shocked to learn that this link with the nursery is to be severed. No longer will those apoplectic little faces glare fixedly, and perhaps frustratedly, into the opacity of the cockpit bubble. Obviously, after last year's C/L debacle, someone's head had to fall. Pity it was only that of a team race pilot.

Hire Wire Act

Round the Pole flying has taken on a new dimension. Schoolboys will be amazed to see their Own Exhibition enlivened by the spectacle of model planes doing the Indian Rope Trick. Or, at least, Bloggs Minor and company will be hoping for such as the models wing up the wire to Olympia heights. Perhaps a little timer sabotage would add to the fun—raise the roof, in fact.

The idea of sending a tethered model up a vertical wire is as simple as it is ingenious. It calls to mind an earlier experiment in circulatory levitation when a Mr. L. Whipper gave a between-films demonstration in a cinema. He was seen to rise majestically to view, precariously poised on the organ seat. Unhappily he was temporarily blinded by the spotlight, lost control, and crashed the model into the icy depths of the usherette's tray. A tragic end to a bold experiment. Modellers wishing for more details should consult Professor Swivel's treatise on the subject, "Notes on the Characteristics of Flight Behaviour over Organic Matter."

Child's Play

It is certainly true that children mature more quickly these welfare days. I forget by how many inches in height, pounds in weight, and fags per day they have improved upon my retarded generation, but you only have to read some of the Wings Club letters to make you realise that, short trousers or no short trousers, you were quite a daddy-o when you pinned down your first strip of $\frac{1}{4}$ in. sq.

I well remember the stirrings of family pride when, at the decrepid age of 14, I produced a passable imitation of a model plane. At the time I was looked upon as quite the child prodigy, although by present standards my building gaffes would be attributed to senile tremors, and my building operations generally to second childhood.

In deciding your future as a model builder the age of indiscretion is now a not so tender five. Among other things which this portends is a new nursery layout. The rocking horse will give way to a power tool bench and the counting bead frame to an electronic calculator. Nursery rhymes, too, will have to be given an up-to-date treatment—perhaps on these lines:

Little Jack Horner
Sat in the corner,
To which he'd suddenly retired,
Sucking his thumb
And crying for mum—
His 2.49 had misfired.

Twinkle, twinkle, little star,
How I wonder what you are.
But, hark at me! I'm talking wet.
It's the blazing tail of my rocketry set.

Little Bo-Peep
Has lost her *Creep*,
And doesn't know where to find it.
The timer stuck tight
As it climbed out of sight
Wagging its tail behind it.

Cracking Pace

The fun you can get from a model engine is inexhaustible. You don't have to be the conscientious type who puts it in a model plane, that is, if you equip yourself with the latest in finger clonking novelties. The bench bound antics are to be seen to be believed. At 25,000 revs the propeller shatters into fragments, and at a whizzing 28,000 the engine disintegrates.

What more could the enthusiast ask?

Bottles and Crates

Careful readers will have noted that the McDonnell *Phantom* featured in last month's issue has nothing to do with the O'Donnell *Afaxie*. The only thing they have in common is a similar rate of climb.

Looking at this latest creation, with its wing loading of a million dollars per sq. ft., I thought we were in for one of those "Ooh, just fancy!" articles on insect flight. However, it proved to be just another windfall for the plastic designer, and a large size in headaches for the flying scale enthusiast.

Undoubtedly those who believe in clean lines and classic contours won't go much on the flappery and frillery of this nightmarish phantom. It's just another instance of the modern designer carrying his surrealistic motifs just a bit too far. True he has to earn his Dali bread somehow, and we might forgive the odd dog tooth wing, but a fuselage shaped like a coke bottle is just about the last straw.

CLUB NEWS

Members of the Northwood Club with a fine display of models at their annual exhibition.

LEICESTER M.A.C.

A return bout of a Combat competition with Macclesfield Club resulted in a win for Macclesfield outright winner Snape, with J. Bramby of Leicester second, and Gig Lifflander of Macclesfield third. Nearly all the competitors ended up by being bogged down and freely spattered with mud. Although the weather was dismal, numerous spectators were in attendance, and appeared very interested in the competition.

BLACKHEATH M.A.C.

Our annual gala was held at Chobham in perfect conditions, the results being: *Open Rubber (Bill White Cup)* (six in fly-off), 1st—D. Greaves, Leamington, 9 min. 00 sec. + 6 min. 26 sec.; 2nd—N. Elliot, C.M., 9 min. 00 sec. + 5 min. 08 sec.; 3rd—F. Boxall, Brighton, 9 min. 00 sec. + 5 min. 05 sec. *Open Glider*, 1st—R. Humphries, Anglia, 9 min. 00 sec.; 2nd—J. Baguley, Hayes, 7 min. 56 sec.; 3rd—D. Partridge, Croydon, 7 min. 50 sec. *Open Power* (11 in fly-off), 1st—G. Fuller, St. Albans, 9 min. 00 sec. + 6 min. 00 sec.; 2nd—J. Simeons, St. Albans, 9 min. 00 sec. + 5 min. 43 sec.; 3rd—P. Buskell, Surbiton, 9 min. 00 sec. + 5 min. 29 sec.

NORTHWOOD M.A.C.

This year our Annual Exhibition was held in rather more spacious premises—the Northwood New Acre Hall. After the old hut which cramped the previous exhibitions, the large array of models seemed less than in previous years, although this was not so.

All classes were exhibited, with a natural good showing of Combat, two beautiful white *Sabre* Stunters by M. O. Maddock, and evidence of a welcome increase of interest in scale projects, both F/F and C/L. Ian and Paul Bracken showed their models unfinished: a C/L E.D.2 with retracting U/C, for a .35 glow rear mounted, and a F/F Fokker Dr. 1 respectively. John Simmance's Sopwith *Snipe* and *Swallow* were also shown.

Besides an interesting display of engines, photographs, plans and a list of the last three years' Combat successes, there were two amusing demonstrations. The first was of the electric powered plastic C/L *Mustang* model made by Lindberg, the model being kindly lent to the club by The Model Shop, Harrow. This demonstration proved most amusing and was followed by visitors attempting to "spot land" a plastic Airfix *Swordfish* fitted with a small electric motor and mounted on a counterbalanced beam.

A most successful evening was concluded with a raffle of three donated kits, won, strangely enough, by three of the ladies present!

Class winners were: *Open Scale*, P. Bracken, Fokker Dr 1; *Open C/L Concours*, M. O. Maddock, *Sabre* Stunt; *Open F/F Concours*, R. Brice, A2 Glider; *Junior C/L*, 1st—B. East, Combat Wing; 2nd—M. Penniston, *Kombat Kapers*; *Junior F/F*, I. Thomas, .8 c.c. Cabin Sport.

NORTH-WESTERN AREA

The Area A.G.M. and Dinner were held in Liverpool, the only committee change being that of P.R.O.—a position now held by D. Millachip of Wallasey. The R/C sub-committee was replaced by a R/C director—W. Neild. It was felt that better results would be obtained by having one person instead of several spread around the area. It was decided to award prizes, during the coming year, to an overall F/F champion and to the winners of the three F/F classes—a change from previous years. Our regular airfield, Stretton, has been turned into an open prison, and so only a few flyers will be able to use it in the future! The Winter Rally, postponed from December, will be held on February 5th, *subject* to being able to obtain a suitable venue.

The dinner was held after the A.G.M. and the number present, over 60, was a good increase on previous years, mainly due to its being well supported by the members of two local clubs. After the dinner itself, the various certificates, cups and medals were presented, but for some unknown reason there was no-one from Chorlton present to receive the numerous certificates and medals due to members of that club. An M.C. arranged some amusing and very interesting entertainment during the evening. After this, one of the Whitefield members showed some very interesting and amusing films of R/C meetings this year, also a trip to Liverpool on the East Lancs road at 900 m.p.h.!

WALLASEY M.A.C.

Our southern exile, Stan Hinds, picked up second prize in the A2 event at the Southern Gala—a meeting he usually does well at. He has just converted a relay carrier wave six transistor Rx, to a tone relayless version which is super-sensitive. Two members are building relay versions of the matchbox-size "Monitor" receiver, one for an indoor radio job and the other for an R/C A2.

Due to the "take-over" of Stretton by the prison authorities the unusually large number of members entered for the N.W. Area Winter Rally were very lucky—it was a filthy day! Our secretary was unable to stand the pace, so he resigned and was replaced by R. Angell.

Sixteen members from the club attended the Area Dinner, thereby swelling the numbers to over 60—the highest for some years, and as well as the meal all enjoyed the carefree evening.

U.S.A.C.

Combine a barbeque with a model meeting and you are assured of a fine time—at least, this was the opinion of U.S.A.C. members who attended the first event of this kind held at Goodwood Motor Circuit recently. Flyers from the Crawley, Chichester, Horsham, Horley, Worthing and East Grinstead clubs attended the event.

The barbeque was held in two marquees on the Saturday night, and, after a mammoth feed—half a chicken, six hotdogs, shepherds pie, baked potatoes and beer, all for 5s. each—the gluttons fell into an uneasy sleep, to be woken by four noisy sports cars tearing around at 2 a.m.! At 7.30 a.m. things began to move, and all "enjoyed" a breakfast of shepherds pie—and beer!

The contest was blessed with perfect weather, there being no wind, except in the stomachs of the barbeque boys! As is usual with U.S.A.C. comps. the F/F events were held in the morning and Combat and R/C in the afternoon. This ensures a plentiful supply of timekeepers—the C/L types timing F/F and vice versa.

All events ran very smoothly, so much so that all competitions were finished by 4 p.m.—including combat.

We shall be holding more events of this type next year, and if any Southern clubs who are not members of U.S.A.C. would like to join this flourishing and active group, will they please contact the P.R.O.: D. Burgess, The New Cottage, Selsfield Place, Nr. East Grinstead, Sussex.

RESULTS

Open Power, Individual: 1st—R. Munester, Chichester, 5.46; 2nd—J. Potter, Chichester, 4.46; 3rd—R. Hackett, Chichester, 3.52; Open Power *Team* winners—Chichester.

Open Glider, Individual: 1st—A. Puzey, Chichester, 4.54 + 3.00; 2nd—R. Boxall, Chichester, 4.54 + 1.05; 3rd—R. Wykes, Horsham, 4.39; Open Glider *Team* winners—Chichester.

Open Rubber: 1st—D. Plunkett, Crawley, 4.44; 2nd—J. Potter, Chichester, 4.20.

R/C Spot Landing: R. Biggs, Chichester, 47 ft. 4 in.

Combat: N. Tidy, Worthing.

Chuck Glider: R. Lelliott, Worthing, 49 sec.

DUMBARTON M.C.

We would welcome as members boys of 14 years and over, especially from the Clydebank area, as this is the only area around Dumbarton not represented in the club.

All branches of aeromodelling are encouraged here, but our main interest is team racing. We would therefore like to see any boys who are especially interested in this branch of aeromodelling. Club nights are Tuesdays and Thursdays, the sessions being held at Hartfield School woodwork room, Crosslet Road, Dumbarton.

SOUTH WEST R/C M.F.S.

At the A.G.M. held at Paignton recently, by kind invitation of Mary and Courtney Gill, far-reaching plans were laid for next season. Regular monthly rallies (alternating Sport/Contest) will be held on the first Sunday of each calendar month from March 5th to November 5th inclusive. Opening rally is at Winkleigh airfield (Sport) followed by the first contest meeting at the same site on April 2nd. Later sport rallies to be held at Salcombe, S. Devon, and contest rallies at Winkleigh, all properly organised and controlled by stewards, with P.A. equipment, rally rules, etc., to ensure no loss of flying time.

It is hoped to hold a big "Open" R/C event at Winkleigh on August 6th, provided this does not clash with any similar fixture elsewhere. Further details will be given later.

CROYDON & D.M.A.C.

The weatherman's forecast showers held off for most of the day at Chobham for our Open Rubber contest. In spite of mediocre visibility and a fair amount of drift, some reasonable times were put up—the top seven people all managing over 8 min. for three flights.

The 200 sq. in. models were very much in evidence, but possibly were at a disadvantage, in the murk below the horizon, from the visibility point of view.

John O'Donnell repeated his last year's win with the inevitable *Maxie*, runners-up being country member Elliott and Fred Boxall, whose wing folded 8 sec. out after a hasty repair before the fly-off.

Results: 1st—J. O'Donnell, Whitefield, 9 min. 00 sec. + 3 min. 21 sec.; 2nd—J. Elliott, C.M., 9 min. 00 sec. + 3 min. 03 sec.; 3rd—F. Boxall, Brighton, 9 min. 00 sec. + 0 min. 08 sec. Overall Champion—George Fuller, St. Albans.

WOKING & D.M.A.C.

We attended a large number of rallies during last season, and P. Newell gained two third placings with his Mills .75 powered ½A model—the first at the S. Midland Gala and the second at Surbiton.

GLEVUM M.A.C.

The A.G.M. this year was held in conjunction with our first indoor contest in an attempt to coax a few more members along. However, it appears that our A.G.M., even complete with scale R.T.P. contest, is no competition for Saturday evening T.V. programmes.

The contest, to be held annually, was for a trophy presented by our President, A. Blackbourne. Entries, though small in number, were to a high standard in general. Points were awarded for scale, finish and duration, one or two fine models falling down on the latter score. The contest was judged by Mr. Blackbourne who later presented the cup to Dereck Harper.

Dereck's *Seamew* just had the edge over the opposition by virtue of its high duration. Second was D. Bannister with a Bristol *Fighter*, and third J. Blackford with a *Tiger Moth*.

Despite lack of interest in the A.G.M. there has been a spate of activity in the club recently. Unaccountably six members turned up at the second indoor meeting all bent on smashing the R.T.P. record, which had lain unmolested for some three years now. Quite a hectic time ensued with the record, and motors, being broken at frequent intervals throughout the evening. The unscheduled contest finally ended at about 11.30 p.m., Charles Aitkinhead triumphing with the final flight. He managed 2 min. 15 sec. with a microfilm covered model. We realise that this time is low by some standards, but we have done very little R.T.P. duration work and it has more than doubled the previous record.

The committee were caught unawares for the Newman cup for scramble. In the first place it was fine, then about 20 members turned up, 13 to compete. Having banked on the usual weather and the usual five or six members flying and only having three stopwatches, this presented something of a problem ! However, with the aid of some wristwatches, and the holding of three 20 min. rounds, we managed to decide the winner before dark—just ! John Blackford, very fit but very tired, managed to keep his glider, a *Satan*, airborne for 11 min. 41 sec. out of the 20 min. Not bad going considering the 2 min. maximums. Second was D. Harper with 11 min. 8 sec. flying a Bantam powered *Chatterbox*, and third Andy Gaunt with 9 min. 22 sec. flying an O.D. A2. The contest was very keenly fought and thoroughly enjoyed by all despite the cold and the mud.

HALIFAX M.A.C.

The coming into force of the Noise Abatement Act in recent weeks has been the cause of some anxiety to members. It is feared that the residents living near the local flying field will make every effort to ban power flying on that particular site. We are, however, continuing to use this field, pending further developments.

THORNABY PATHFINDERS M.F.C.

Our T/R section has been particularly successful over the past year, mainly due to the efforts of Messrs. Pasco, Watson and Haley. The most outstanding time recorded recently being a 4 min. 53 sec. in F.A.I. team race by Pasco's Oliver powered model. This time included over 20 sec. wasted on the ground during a pit stop.

Several members now have their own lathes etc. and are making their own engines, not without some considerable success. Having designed new models for F.A.I. T/R we were surprised to find that the new cross-sectional area is slightly bigger than the area that derived from the old height and width rule.

Membership has fallen off since the summer and any unattached modellers, or interested beginners, in the area are invited to contact the secretary: R. Gillow, 89, George Street, Thornaby-on-Tees, Yorkshire. We have the use of Thornaby Aerodrome any weekday, and hold regular meetings on alternate Wednesdays.

SHARSTON D.M.S.

Though our flying ground at Houghend T.A. Centre is overgrown with tall grass and weed, there is ample room for several C/L models to be in the air at the same time. We share this ground with a number of non-club members, from the surrounding residential area, so it is hoped that we can run some Combat and other C/L comps with them in the near future.

WHARFEDALE M.F.C.

This year we will be holding the first Wharfedale C/L rally. Events will include ½A, A and B, T/R, plus Stunt and Combat. Date to be fixed for soon after the Nats, and the venue will almost certainly be RAF Rufforth.

Also for C/L fans, a request has been made to the S.M.A.E. to hold C/L stunt and speed (all classes) at the 1961 Northern Gala in September. This will make this usually well attended rally second to none for C/L events.

LEICESTER M.A.C.

Membership is now up to 110, and despite the recent bad weather, meetings at Braunstone Aerodrome have been well attended, with strong Combat, F/F scale, and Radio groups flying regularly. Mr. Summers has presented a cup to the club as a trophy for a monthly combat competition, and this should stimulate still further interest.

The winter building contest is now under way, the model this year being any stunt control-liner capable of the S.M.A.E. schedule, while a recent bring and buy sale made an enjoyable evening, with about £8 changing hands for a collection of doubtful junk.

Unfortunately, we will not be running a combat rally at Stapleford Hall this year, owing to past financial losses on the event, and the growing disrepute of combat flying.

HAYES & D.M.A.C.

During 1960 the club took 13 first places, 8 seconds, and 14 thirds in contests up and down the country. This splits up into F/F (glider) Jim Buguley, three firsts and a couple of seconds; Team Race, Mike Smith and Dave Balch, 11 placings between them (including 7 firsts), all with Rivers Silver Streaks, while John Brailsford and John Taylor each won three places.

R.A.F. M.A.A.

There has been a switch-round of officers following the A.G.M. and the former competition secretary, Sqdn. Ldr. Eric Cable now becomes P.R.O. His vacated position is to be filled by Flt.-Lt. Ted Norman, recently returned from Far East service. We hope that his additional duties will not prevent him from turning out his annual scale masterpiece for the R.A.F. Championships, which this year are once more expected to be held at Debden, sometime between Easter and Whitsun. The exact date is yet to be fixed.

Service modellers should note the date of the next postal contest for F.A.I. T/R and Open Power, which is January 29th. Prizes are a Veco *Mustang* and a Cox Olympic. The friendly liaison between Air Force and civilian modelling is very gratifying, and this year the R.A.F. M.A.A. have offered to run the ½-A Team Race at the Nats. Entrants are, therefore, advised to ensure that their pilots are properly dressed, with buttons polished, etc., and that their aircraft specifications conform to current regulations, and—sorry, we got quite carried away !

CHANGES OF SECRETARY

HALIFAX M.A.C. G. Spencer, 36, Haigh Street, Pellon Lane, Halifax.

LEICESTER M.A.C. H. S. Fletcher, 33, Sycamore Road, Birstall.

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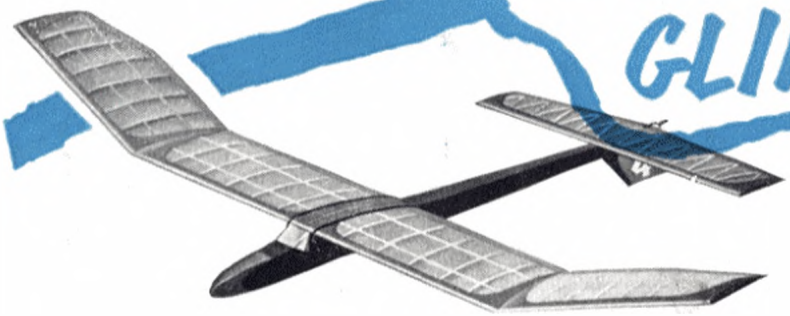

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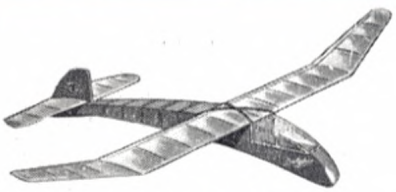

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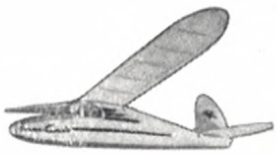

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