MARCH 1955

AERO MODELLER

Vickers Valiant feature

1/6

Digital Edition Magazines.

This issue magazine after the initial original scanning, has been digitally processing for better results and lower capacity Pdf file from me.

The plans and the articles that exist within, you can find published at full dimensions to build a model at the following websites.

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

http://www.rcgroups.com/forums/member.php?u=107085

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AeroFred Gallery Free Plans.

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Diligence Work by Hlsat.

ALLBON ENGINES and ACCESSORIES

BAMBI ·15cc
108/11

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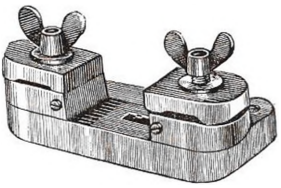

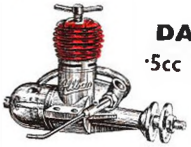

DART
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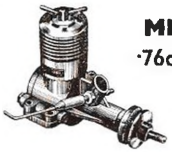

MERLIN
·76cc 47/6

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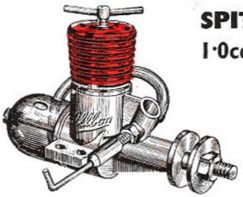
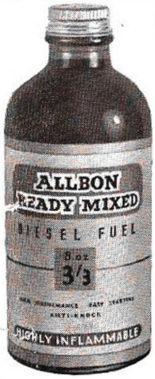


SPITFIRE
1·0cc 64/2



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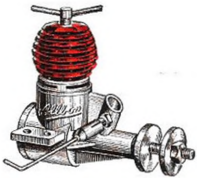
JAVELIN
1·49cc 65/4



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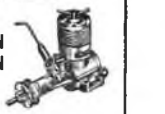

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16 MEETING HOUSE LANE BRIGHTON · SUSSEX · ENG.

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★*Sergeant Parker's own story*

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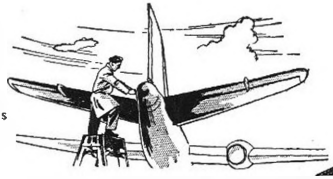

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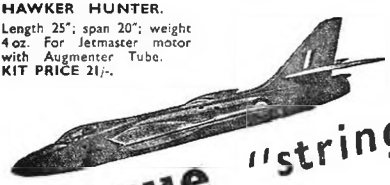

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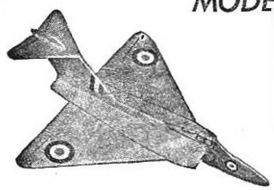

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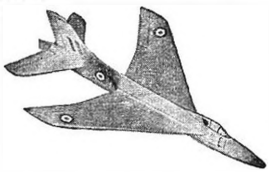

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AERO MODELLER

"Covers the world of Aeromodelling"

VOLUME XX
NUMBER 230
MARCH 1955

Managing Editor - - C. S. RUSHBROOKE
Editor - - - - - H. G. HUNDLEBY
Assistant Editor - - - R. G. MOULTON

★

In this issue

Special features

★

Regular features

★

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:

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Golden Opportunity Lost

ON PAGES 136/7 will be found a comprehensive report on the last meeting of the Models Commission of the F.A.I. as provided by the British delegate, Mr. A. F. Houlberg, who is also President of the Commission and takes the chair at its meetings. It is not perhaps sufficiently recognised that this work, entirely voluntary in nature, puts Mr. Houlberg to a great deal of personal expense to ensure that Great Britain has a voice in these vital International affairs, for no subsidy is forthcoming from either the S.M.A.E. or the Royal Aero Club. On this point alone, A.F.H. is deserving of the highest praise from British aeromodellers.

Not so praiseworthy is the attitude adopted by certain nations in insisting on retaining their option to hold certain of the World Championship events in their own countries. We understand that America offered to stage the full programme of four classes at a venue in Germany, but both France and Germany insisted on holding the Control-line and A/2 Championships separately at Paris and Brunswick. Though this insistence is understandable in part, we feel that little consideration was given to other matters, in particular that of travel and expense.

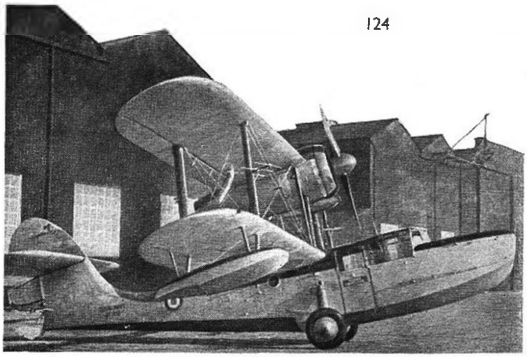
Presumably, the expense of staging the four-event "Olympics" would have been borne by our American cousins, and more than one country was in favour of a single German venue. The peculiar situation now exists that modellers will be required to attend two meetings in Germany on *following weekends*, and as it is logical to suppose that many will wish to attend both meetings, the overall expense will be increased by the intervening days between each Championship, and individuals not travelling on an expense account may find it hard going. Frankly, we see no justification in the scheduling of two major events in the same country at separate venues, for whilst the expense situation may be taken care of, it is not given to every team member to afford an unlimited amount of time from work, studies and other matters.

The Russian proposal that Championship meetings should not be staged before mid-August is good, plain commonsense, for we know from experience in this country that a programme can get very complicated when selection meetings have to be fitted in. Adoption of the Russian proposal may mean that we can revert to the system of all selection contests being staged in the operative year, and at the same time preserve a balanced programme.

Finally, we commend the proposals of the Danish delegate in his endeavour to get long term planning, for the aeromodelling world has suffered for too long from International programmes and regulations thrust on it at the last moment, invariably creating chaos in nationally planned calendars and rule books.

On the Cover

WB 210 was the first Vickers Valiant, known by the works as type 660, and this view of the brightly polished natural metal finish prototype by Charles E. Brown is perhaps the finest of his many photo's of the Valiant series. Unfortunately, WB 210 had a short life and was destroyed after a fire in the air. Significant distinctions between this and present Mks., described on p.138 are the new wing tip fuel vents and larger air intakes.



Heard at the Hangar Doors

Film Star

Those who have been fortunate enough to see the film, "The Sea shall not have them" will remember the existing sequence when a Sea Otter makes contact with a rough sea on a rescue mission. Modeller G. Massy-Collier had occasion to film, and film from, the faithful Otter and reflects on the "bashing" the airframe took on landing "in the rough". He has been kind enough to send along the heading picture above which we reproduce for the benefit of solid modellers and spotters interested in this type.

7th Northern Models Exhibition

Last year, the show of aircraft models at this well-known Manchester exhibition was decidedly poor, and this was attributable to lack of advance publicity. This year, the organisers have just got notification into this journal by the skin of their teeth—closing date was, apparently, January 31st, but entries for the model aircraft section *only* will be accepted up to February 28th. Entries received after January 31st will not appear in the official catalogue.

Classes are for power, rubber, glider, scale, scale C/L, any C/L, solids, and radio jobs; juniors (under 17) have one class only. Span of any model entered is limited to 6 ft., entry is 2/6d. per model, senior, but free to juniors. Entry forms (one per model) and full details are available from the Exhibition Secretary, 5 Winstanley Road, Sale, Cheshire. The show will be in the Corn and Produce Exchange, Hanging Ditch, Manchester. March 25-27th. If you don't wish to enter but would like to show a model, the Secretary will be pleased to hear from you.

"How would you like to be rolled up like an old cement tube?"

Aeromodellers— and their local councils

Reports continue to come in from all over the country on the knotty question of "to fly, or not to fly" in local parks, and other open spaces controlled by local councils. In some districts the unfortunate position still exists where local authorities have banned model flying out of hand, and in many places without reference to local clubs.

At Hucknall, Notts., a purely local ban was imposed in this fashion, and it is encouraging to learn that the Home Office refused to approve the byelaw concerned, thus supporting—as they always do—the cause of the genuine aeromodeller. In this particular case a compromise is being arranged which we hope will result in flying space being made available. In other instances we have investigated apparently justified complaints from aeromodellers, only to find that the facts submitted were not accurate. There is absolutely no justification for aeromodellers to expect to receive permission to fly control-line models in districts where local parks are completely surrounded by houses, for the noise factor alone will bring the wrath of nearby residents upon their heads—and affect the cause of aeromodelling in general. (In one case brought to our notice, reasonable alternative accommodation had been offered by the Council, but was unacceptable to the local modellers because it meant them travelling a mile or two! Just another instance of some people wanting it all served up on a plate, for surely an enjoyable hour or two of flying is worth a short trip.)

Fairlop

More welcome news concerns modellers in the London area. At the last L.C.C. Council meeting, the sale of the popular Fairlop site to the Ilford Borough Council was approved at a sale figure of £360,600 which includes a surrounding area totalling 920 acres. The aerodrome is scheduled as an open space and will definitely not be used as a housing estate. We understand that the latter authority will consider applications from clubs in the area for the use of the 'drome. We advise those people interested to make all approaches through the London Area Secretary rather than any form of direct approach to the Ilford Council for it is logical to have one authority to negotiate on behalf of a number than for the Council to be bothered with numerous applications. Previous friendly relations between the S.M.A.E. and the Ilford Council justifies an optimistic view, but at this stage there is no guarantee that flying can be permitted.

Aeromodelling Stamps

Our old friend Just van Hattum, Chairman of the Technical Committee of the Koninklijke Nederlandse Vereniging voor Luchtvaart (Royal Dutch Aero Club) Model Aviation Section, takes us to task for stating that the Hungarian Aeromodelling Stamps featured last month, were the only examples of direct use of aeromodelling in connection with postage stamps. He sends two examples of aviation stamps, one in green issued in 1954, value 2 cents, depicts an aeromodeller hand launching a glider, and the other in blue, value 10 cents, shows Dr. Albert Plesman, President of K.L.M. who died in 1954.

The interesting part about these stamps is that each carries a surcharge over and above the face value, the proceeds of which are credited to the Dutch National Aviation Fund. Proceeds to date apparently total £6,400 which is a sizeable sum. How nice it would be if the G.P.O. indulged in such practices, it would certainly solve the problems of financing our international teams.

First of the Year

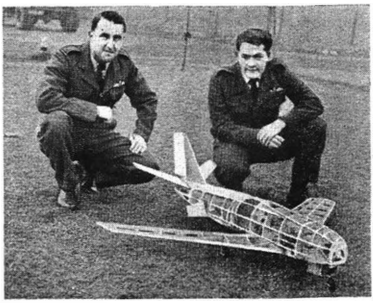
The brightest flying day for several months luckily coincided with the date of January 9th and the Annual Blackheath organised Bill White and Winter Glider trophies. Modellers came out of hibernation to enjoy wintry sunshine and unusually calm conditions at Epsom Downs and more than 60 maximum flights of over 3 mins. were recorded for the total 145 entries. It became a North versus South all-rounder battle as John O'Donnell and Tony Brooks vied for top places in both events—with John collecting the Bill White and Tony placing second in both. Outstanding for an eighteen man tie with double max's, in the fly-off, the Bill White now goes to a flier who can manage 7 : 52 without perceptible thermal aid, a clear two minutes ahead of the next man, and flying in the same air as a dozen other models returning from 3 to 5 mins.

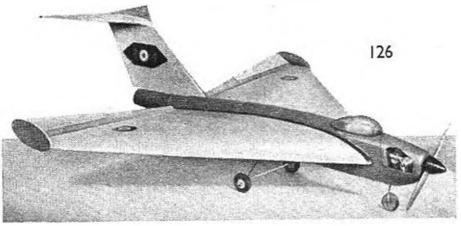
Winner of the Glider trophy, J. Blount (above) flew clubmate Roy Yeabsley's A.P.S. Nebula design for 2 : 43 in his fly-off. If times like these are indicative of what to expect in '55 contests, durations are due to go up with a bump in open rubber and A/2 events—though we doubt whether we shall ever get a repeat of the calm conditions prevailing at Epsom on this occasion.

Bill White		Winter Glider	
1. J. O'Donnell	13 : 52	1. J. Blount	8 : 43
2. A. J. Brookes	11 : 53	2. A. J. Brookes	8 : 06
3. D. Sugden	11 : 23	3. J. O'Donnell	5 : 55
4. B. Rowe	10 : 49	4. C. J. Hancock	5 : 54
5. J. North	10 : 43		

R.A.F. Models

Models rarely gain mention in the regular Air Ministry News Letter: but the efforts of F/O Egginton and F/O Jones stationed at Wildenrath, in Germany with their 1/20th scale Sabre have come to official attention. Since it is the first radio-controlled scale ducted fan model of our acquaintance, and with retracting undercarriage, flaps, dive brakes, rudder, elevators and aileron controls, plus a repeater transmitter in the model to indicate model speed, we reproduce the builders and their product to date for we envy their confidence.





New Delta by 'Vultan' designer Laurie Ellis is especially for the ·5 to ·8 c.c. diesels

JAVELAN

THE JAVELAN is the fourteenth of a series of Delta design by S/Ldr. Laurie Ellis of "Vultan" fame. In each design various ideas have been tried to ascertain the characteristics of the delta wing in model sizes. The better features of each design have been built into the Javelan and the results have paid off. Perhaps those deltas should not be called "designs" instead they should be termed "projects". Not being a theoretical or mathematical bod., Laurie tackled these "projects" from a purely practical angle, it is surprising what one can learn by the trial and error method. Laurie does not recommend more power than the Mills ·75 or Allbon Merlin for the Javelan. Experimenters *could* try a Spitfire but they might encounter trimming difficulties. Experience has shown that a delta does not need a great deal of power to fly it and any power in excess of that required, brings trouble.

If the Javelan is built the way it is shown on the plan, one will have a robust model which will give hours of fun and fly in conditions bad enough to ground the conventional.

Wing. Pin leading edge and trailing edge on plan. Position the centre cap strip, but do not cement along the centre line as dihedral break forms here. Fix all $\frac{1}{8}$ x $\frac{1}{4}$ lower cap strips. Now add $\frac{1}{8}$ sq. lower spar. Fit rib W.1 in position and cement along the right side. This rib is to be placed directly over the crack formed by centre cap strips. Work on the right side of the wing only, add strip at T.E., top $\frac{1}{8}$th sq. spars, and sheet leading edge, then fit top cap strips and T.E. Add reflexed trailing edge and elevons with an angle of 21 degrees. When the cement is dry raise the right wing tip $2\frac{1}{4}$ inches and run cement along *left* side of W.1. This makes the dihedral break complete. Proceed as for right side. Sheet centre section. When dry remove from plan. Shape the droop snoot as shown and cement in position. The wing now should be covered and doped.

Fin and Tailplane are built on the same principle as wing.

Fuselage. Build lower fuselage crutch inverted on plan. Pin the longerons on plan. Install mount support then sew leg to F12 and cement in position. Add all formers, stringers and while still on the plan, cover with $\frac{1}{16}$ sheet. Carve the balsa nose block to approx. shape and hollow out. Cement in position. Lift fuselage from plan and sand smooth and cover. Now install main undercarriage legs. Sew around longeron with a binding fit. This will allow the legs to move back and forth easily. Fit 20 s.w.g. undercarriage leg support. Thus the wheels may be moved back and forth to attain the best position in relation to the C.G.

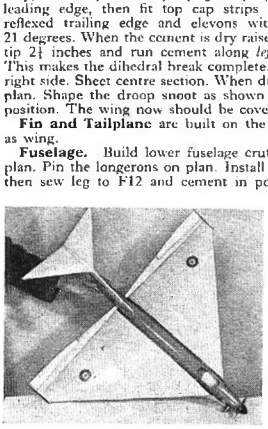
The $\frac{1}{8}$ ply engine mount can now be cemented in the slot. If using the Mills ·75 the TOP of the mounting lugs are placed on the left face of the mount with the cylinder sticking out on the right side. This gives the desired thrust off-set. If you use an Allbon Merlin, mount the engine with the cylinder to the left and the BOTTOM of the mounts against the left face of the ply mount.

The offset thrust line is necessary to avoid the use of approx. 7° right thrust. It is hardly noticeable. The wing may now be cemented to the fuselage. The "V" of the leading edge of the wing should be right up against the $\frac{1}{8}$ ply engine mount cut-out. Cement F8 to F11 in place. Slide paper tubes on dowels in fin and fit R1 in position. Cement paper tubes to R1. Cement rear paper tube to lower support. Make sure fin is vertical. When dry the fin will slide off tubes. Cement the remainder of the formers across top of the centres. Fit the remainder of the formers across top of the centre section, add all stringers. Cover with $\frac{1}{16}$ sheet, sand smooth and cover. Build up cowl to suit engine used, the front end of the cowl acting as a support for the upper front part of the engine mount to keep it from vibrating.

General Notes. The original model was first flown with a Dart and an all up weight of $9\frac{1}{4}$ oz. C.G. position was forward of that on the plan. The model flew very well using a Stant 7 x 3 cut down to $6\frac{1}{4}$".

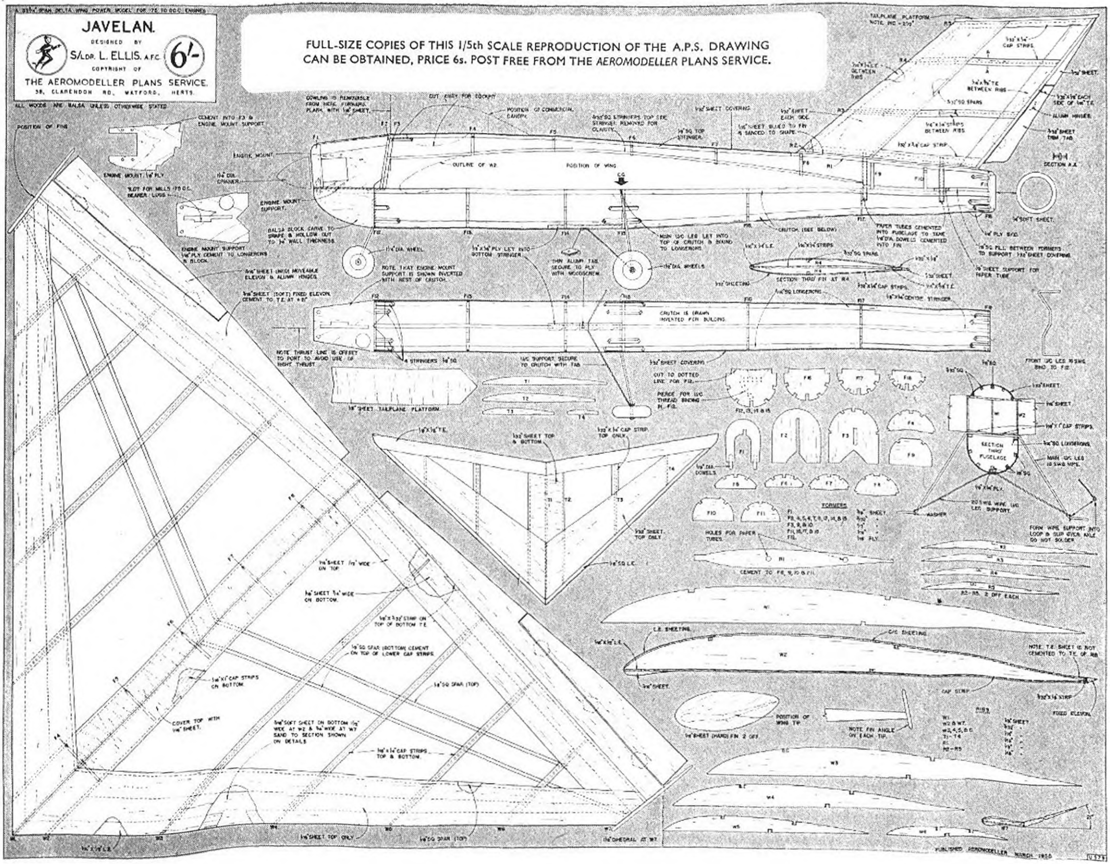
A Mills .75 is at present powering the model. Indicated C.G. seems best for this power. With the Mills or Merlin use a Stunt 7 x 3 for best performance. Original weight with the Mills was $10\frac{1}{4}$ oz. and after several flights the model was ballasted to a weight of 13 oz., and it showed little change in flight characteristics. Take off run remained at 20 feet and the climb away seemed unchanged. Glide the model over grass. Adjust elevons until glide is flat without a stall, then adjust rubber tab for very slight turn to the RIGHT. Be very careful with the tab because the model answers it readily. Use $\frac{3}{4}$ power and a hand launch, it will now go into a steep initial climb and turn to the left, when the engine stops it will glide to the right. Now give her full bore and watch it sizzle, for this run give it at least fifteen second run because it may show stalling tendencies and will take a few seconds to iron itself out. Now try a few R.O.G.'s (and once you have tried one, they will all be R.O.G.'s . . . they are lovely).

Laurie has had some very sucessful deltas but can safely say that this one is the best in every respect and would not hesitate to show it off anywhere. It is a sport flyer but it will hold its own with the best of them. It cannot, however, compete against the pylon variety because it is not a contest job.



Like the Vultan, the Javelan carries a slight twist in its name to indicate the full-size aircraft on which it is based. Virtually a double-delta, this latest Ellis product will fly in all conditions, even when the wind is too strong for conventional models

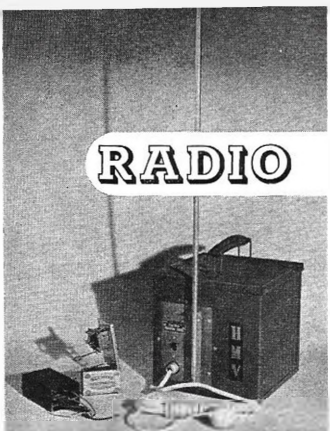
FULL-SIZE COPIES OF THIS 1/5th SCALE REPRODUCTION OF THE A.P.S. DRAWING CAN BE OBTAINED, PRICE 6s. POST FREE FROM THE *AEROMODELLER* PLANS SERVICE.



RADIO CONTROL NOTES

see Zaic Yearbook 1955-56 p.8 to 15

A Review of Radio Control activities in New Zealand including a description of H.M.V. Radio Control Outfit designed by Les Wright, and the famous R6-B. Radio Model designed by Allen Rowe.



Complete H.M.V. Radio outfit with matchbox for size comparison. Transmitter has attractive grey crackle finish.

THROUGH THE good offices of Les Wright, Technical Manager of His Master's Voice (N.Z.) Ltd., we have been fortunate in obtaining a H.M.V. Radio Control Outfit, which sells in New Zealand for 18 guineas. It is a radio outfit with a difference—uses no relay as such, but a combination unit known as a "Relaytor", which as the name suggests, combines both relay and actuator.

To accommodate the "Relaytor" a two valve receiver producing a current change of 9 m/a has been evolved. Yes, we said "change" for the standing current is 11 m/a. The outfit is available for either of the two N. Zealand frequencies of **27.12** megacycles or **35.7** megacycles.

The New Zealand boys have been operating these sets for some time now with considerable success, and as we shall undoubtably be asked "Are they available in this country?" let us hasten to add that they are not at the moment, but the possibility is under consideration.

For the benefit of radio enthusiasts, here is a brief technical description of the outfit.

Transmitter

A two valve (3S4) battery operated oscillator using a very stable circuit, which under no operational conditions will deviate from the frequency band allocated by the New Zealand P. & T. Department. The metal case includes a special compartment for carrying tools and spares, etc., and the lid can be removed merely by undoing a snap lock. Height is 8½", width 7", depth 7½" and weight including batteries 10 lb. It uses 90 volts H/T and 1½ volts L/T, i.e., 2 Ever-Ready B104 and one A.D.4.

Receiver

A stable and sensitive two valve (Detector 1R5, Output 3S4) transformer coupled circuit which on reception of a signal gives a current change of approximately 9 m/a in the coil of the "Relaytor". The high current change remains constant to the limit of the transmitter range. Tuning is by means of an adjustable iron core in the aerial coil. Aerial length is not critical depending on space available and range required. A lead of any length between 6" and 36" will suffice. Length is 3¼", width 1⅞", height 1¼", and weight 3 oz., complete with protecting case. H/T voltage is 45 volts and L/T 1½ volts, *i.e.*, Ever-Ready Battrymax B102, and a D18 or D19. Battery drain is H/T (no signal) 1 m/a, (on receipt of signal) 11 m/a L/T 150 m/a.

Relaytor

A rubber driven (one loop of ¼" x 1/30) actuator cum relay, with balanced armature and return spring incorporating a trigger mechanism, which, activated by the pull in of the armature, moves the driven shaft a quarter of a turn for each depression of the transmitter key. The escapement wheel gives a "Left" and "Right" position, is self neutralising, and operates a "Rocking crank" which connects to the rudder linkage. The core is laminated, and resistance of the coil windings ???? ohms. Panel width is 1⅞", height 2⅛" and overall length 3". Weight is 2¼ oz. The Relaytor is, of course, included in the receiver circuit and uses 45 volts.

Operation

The Receiver depends for its action upon the characteristic hiss of a super-generative detector being eliminated on the reception of a transmitted signal. Under normal idling conditions the "hiss voltage" originating in the detector, is stepped up in the interval transformer, amplified by the output valve and then rectified. The negative D.C. potential produced is applied to the grid of the output valve thereby limiting its plate current to approximately ½ m/a. This is not sufficient to affect the Relaytor which is connected to the plate circuit of the output valve. When a signal is received the hiss disappears and hence the negative grid bias on the final valve is reduced to a point where the Relaytor will operate.

The whole outfit is beautifully made and complete with very detailed instructions. Les Wright, who is a radio modeller of some repute, besides Technical Manager of H.M.V. New Zealand, is to be congratulated on his design skill, and for some refreshingly new ideas carried to a successful and practical conclusion.

We shall be using the outfit this coming season, and will give a detailed report of its operation at a later date. So much for the equipment, now let us pass on to general information on radio flying in New Zealand, which on an overall basis would appear to be slightly more advanced than it is in this country. Notice we say "on an overall basis", as the leading British radio-control fliers are as good as will be found anywhere, certainly their equipment is. It does seem, however, from reports received from reliable correspondents, such as Frank Bethwaite and Alan Rowe, that the ordinary flier out there has progressed beyond the normal comp. flying we see at our Nationals. Listen to this description of a contest passed on by Frank.

"The local lads, tired of the usual contests and their variants such as combat; (where the object seems to be to ram the other bloke, and everyone hopes that it will

never happen, but it did!) and put their heads together to organise a day's fun. The result was a reliability trial with models flown by order of hallot. Two minutes from call were allowed to launch, with no delayed flights permitted. There were five rounds. First a simple course flying section with points for a spot landing. The course involved up, down, and cross wind flying. Next, a race round a triangular course some 300 yards between pylons, timed, and all points lost if model was not landed and Tx off air within 3 minutes from launch. Again points for a spot landing. Thirdly, five minutes under full power, height not to exceed 50 feet. Some of our R/C models are like C/Line Stunt models, in that they have enough power to go where they are pointed, even straight up, so this round was really tough for the high power jobs. Fourth, aerobatics to a submitted schedule. Fifth, fly the model through a "goalpost" made of light bamboo. I know it sounds crazy, but they intended to have fun. There were 18 entrants, 14 starters, and 5 finished the course. The winner was Morton Glading, with a moderate power model of beautiful handling characteristics."

Another New Zealand radio-control diversion is to form two "camps" about 100 yards apart and conduct a "buzzing" contest. Models are rarely more than 20 ft. up and bounces of the ground are quite frequent. We presume that one camp used the 27 meg. frequency, and the other the 35, and can imagine the entertainment of buzzing the opposition, whilst at the same time dodging their model yourself! This is not so dangerous as some people might imagine, when you consider the time it takes a model to complete a 360 degree turn.

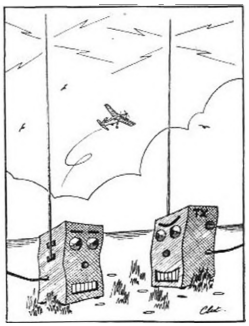
The R6-B.

The most popular model design, flown by the majority of New Zealanders is Allan Rowe's R6-B., or variants thereof. Main feature is the mounting of the motor above and behind the trailing edge of the wing. The advantages of such a set up we leave to Allan himself to explain in the article that follows, and state without hesitation that it is the most intelligent and practical approach to radio-control model design that we have yet seen. Over to Allan then:—

This ship, Mark 2 of a sixth series of R/C designs, was built around the new H.M.V. radio-control equipment and was intended as a general purpose and unashamedly functional aeroplane.

It will do everything required of a single control R/C model.

It will fly sedately and with precision—it will penetrate in gusty conditions—at ground level it will give precise



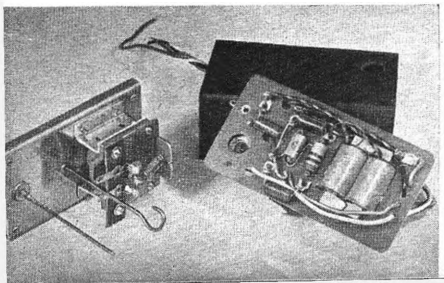
"Wait 'til he gives full right rudder, then you hold on the signal"

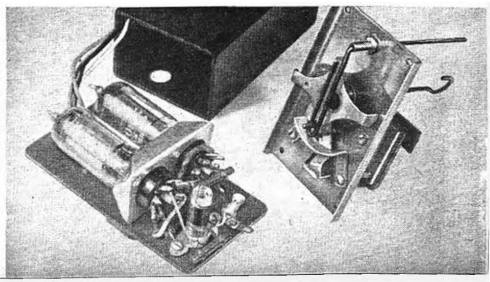
control-line type stunting—with more altitude and a bigger motor it will do every aerobatic manoeuvre required, including consecutive barrel rolls—it will outmanoeuvre conventional ships in R/C combat flying—it will not break propellors—it will not get messy with oil from the exhaust—it cannot stall under power. It is an excellent beginner's model and yet a spectacular expert's model—and if any English Aeromodeller has his doubts, I'm prepared to come over with the original model and prove it—(provided he pays my fare!).

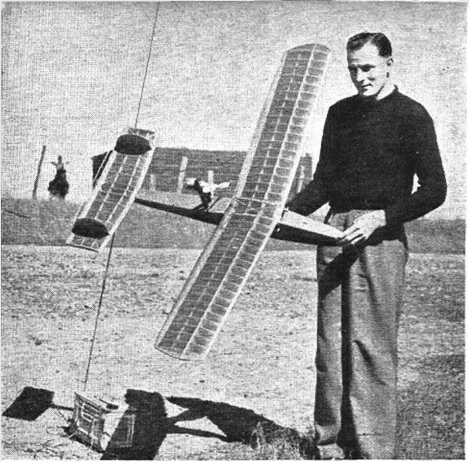
I have no hesitation in stating these facts because I think it reasonable that any aeroplane designed without left over free flight inhibitions and specifically for general purpose radio-controlled flying, should have this performance. I do not claim that R6-B is *the* answer to such a specification but it is *one* answer that has proved successful and as such will perhaps serve to stimulate others to get out of the rut worn by our free-flight ancestors.

In the design stage, the whole conception of a satisfactory aeroplane centred around the need for utterly reliable radio equipment without which the more spectacular varieties of flying could not be attempted. This was provided by the new H.M.V. gear which after six months of hard concentrated flying has not yet been inspected since its original installation in the model. The only servicing it has received has been the

Pictures below show the Receiver removed from its protective case, and the Relaytor. The valve bracket provides a friction fit in the case, the hole in the latter giving access to the tuning slug. Note the neat panel layout of the receiver, the transformer being inset, and the valves fully protected through being laid horizontal. The Relaytor has a laminated core which extends to the frame







The R6-B.

A 5 feet span Functional Radio Control design for motors from 1.3 c.c. to 2.5 c.c.

By Allan Rowe

Frank Bethwaite, a New Zealand airline pilot, well-known to all aeromodellers as the holder of the World Radio Control Sailplane Record, was recently in Melbourne Australia, where he impressed the Aussie modellers with this R6-B borrowed from Les Wright for the occasion. Note the authentic touch provided by the "Digger" on horseback in the background

replacement of batteries as required and the winding of the "Relaytor" rubber. The model, now six months old, has been in the air every week-end as well as frequently during lunch hours and in the evenings after work.

The need for a strictly functional machine, simple of construction, repair and maintenance influenced amongst other things the placing of the motor and the absence of conventional undercarriage.

It seemed both an unnecessary and expensive bow to convention to place a valuable engine in the nose which is normally the point of impact in the event of pilot miscalculation. Furthermore, such a position apart from ensuring an aeroplane continually messy with exhaust oil, precluded the use of a highly efficient airscrew (paper-thin highly polished blades are hard work and break easily), increased fuselage drag due to slipstream velocity, introduced undesirable twisting forces requiring critical thrust-line adjustments and prevented a clean entry at the most aerodynamically important point of the fuselage. Possible alternative placings for the motor included the rear of the fuselage and the top of the fin, but the arrangement shown was finally adopted. Specifically, the advantages of this engine position in actual practice are:

1. The angle at which the motor is set is immaterial because the slipstream has no intruding surface on which to react. Hence no critical adjustment of thrust-line is required and it is sufficient to line up the motor by eye.
2. All exhaust oil is blown clear of the model passing over the tailplane and between the fins. As a result, the model lands in a perfectly clean condition after 30-40 minute flights.
3. Because the slipstream does not have to create drag pushing past obstacles such as wings, fuselage, engine, etc., all the available thrust is used for its proper purpose. Consequently, big results are obtained with small capacity engines with a resultant economy of operation. When several hours flying are packed into each afternoon outing, this question of fuel consumption becomes a very real consideration and the efficient use of a small capacity engine is a useful contribution to overall economy.

As most of our flying in this country is carried out from rough fields, the only justification for the retention of a conventional undercarriage has been its value (doubtful) as a propellor protector on landing. The skid finally adopted for R6-B fulfills its function as a landing device but its replacement by a bicycle undercarriage with wheels inset and the rear wheel say ½" forward of the C.G. would permit take-off from reasonable ground.

R6-B was originally flown with an inverted Mills 1.3 (thinned and polished narrow blade 9" x 4") fitted with a 20 minute streamlined tank.

In this form and with moderate rudder movement precision manoeuvres may be carried out with flat skidding turns.

With the same motor, but with maximum rudder deflection, the model becomes moderately aerobatic, instantaneous control response (and recovery) permitting "ground attack" methods with perfect safety particularly in view of the model's non-stall characteristic. In this trim tight turns as low as 3-4 feet from the ground may be safely performed by the key blipping method (microswitch essential) and recoveries from wing overs at the same height are also O.K. in reasonable weather. In this trim also, the model has quite a useful rate of climb and can be used for combat flying or just flying for fun—thermal hunting for the free-flight boys, cloud chasing, etc. The model's biggest advantage in combat flying is its ability to "hang on the prop" in a vertical climb and gradually ease off to its regular climb angle without any stall as speed diminishes to normal. Thus from a position alongside an opponent a peel off and climb under his tail is possible without any penalty of lost flying speed.

With full rudder deflection and fitted with an inverted gravity fed FROG 250 (thinned and polished wide blade 10 x 7), the model is fast, with a rapid rate of climb and is highly aerobatic. For continuous aerobatics a model must combine a rapid rate of climb with a clean plunging spiral dive which initiates immediately control is applied and is as near a straight vertical plunge as possible. A tight fluttering spiral or a slow developing spiral is useless. R6-B combines these desired characteristics and as the gravity fed FROG runs steadily in all positions, smooth non-stop aerobatics are possible. A dive of approximately 100–150 feet gives sufficient speed for consecutive barrel rolls but one turn of spiral dive is usually sufficient for all other manoeuvres possible by remote control. Combat flying is this trim is not recommended in view of the increased collision risk due to greater speed and the violent effects of momentary over control, but if you like it that way—well go to it.

Full size drawings of the R6-B., as per fifth scale reproduction opposite, are available from the Aeromodeller Plans Service, Price 6/-

See Zaic Yearbook 1955-56
p. 8 to 15

'R 6 - B'.

DESIGNED BY

A. ROWE.

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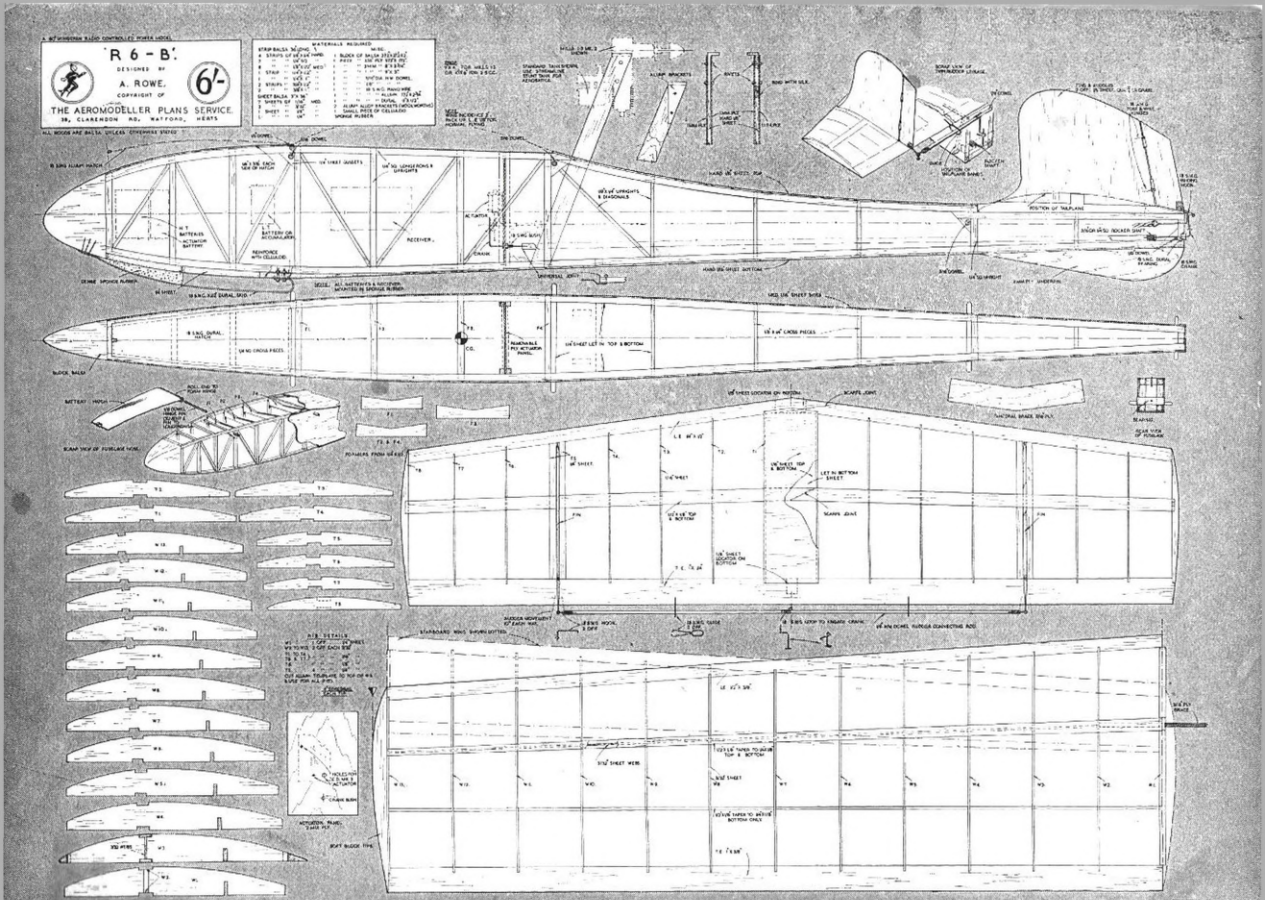
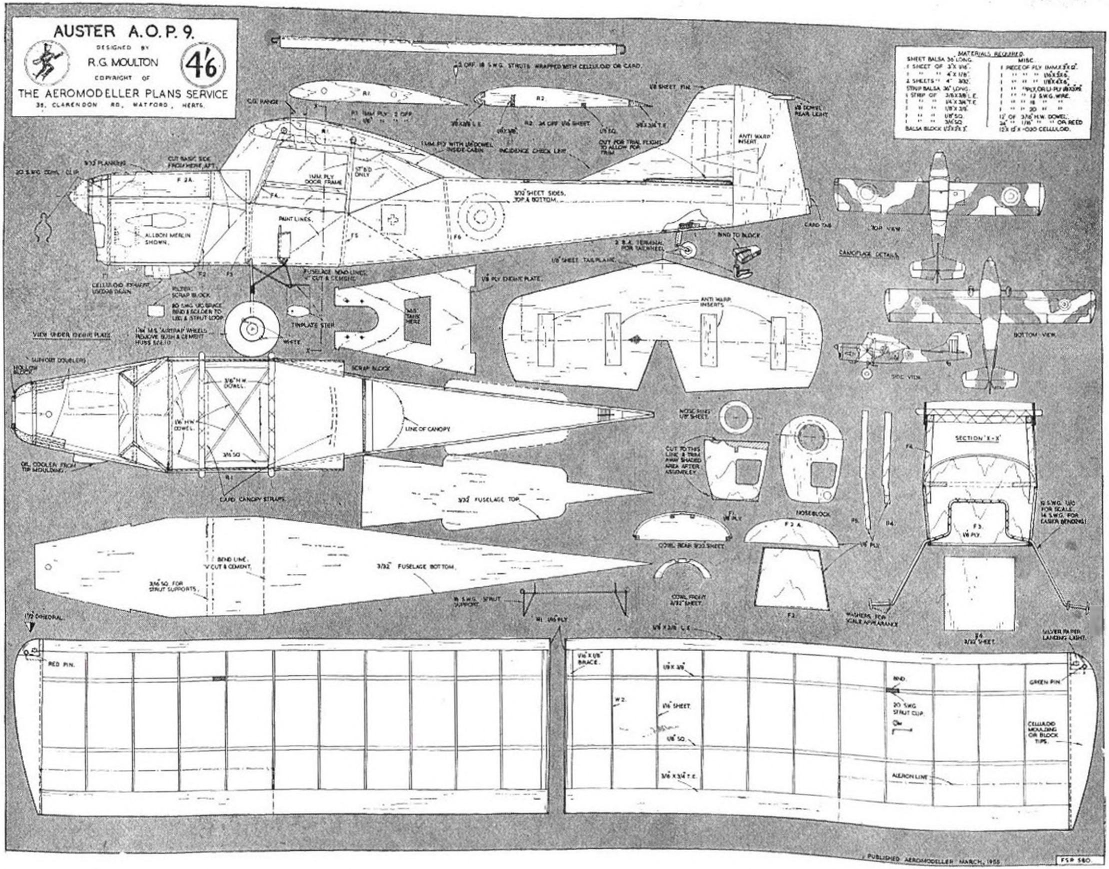
6/-





AUSTER A.O.P. 9.
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4/6
MATERIALS REQUIRED.
SHEET BALSA 36" LONG.
1 SHEET OF 3" X 1/16".
1 " " 4" X 1/8".
2 SHEETS " 4" 3/32.
STRIP BALSA 36" LONG.
1 STRIP OF 3/16 X 3/8 L.E.
1 " " 1/4 X 3/4 T.E.
1 " " 1/8 X 3/8.
1 " " 1/8 SQ.
1 " " 3/16 SQ.
BALSA BLOCK 1 1/2 X 2 X 3.
MISC.
12" OF 3/16" H.W. DOWEL.
12 X 12 X ·030 CELLULOID.
3/32 SHEET SIDES, TOP & BOTTOM.
ALLBON MERLIN SHOWN.
PAINT LINES.
1/8 SHEET FIN.
ANTI WARP INSERT.
INCIDENCE CHECK LINE.
CARD TAB.
TOP VIEW.
CAMOUFLAGE DETAILS.
BOTTOM VIEW.
SIDE VIEW.
1/8 SHEET TAILPLANE.
ANTI WARP INSERTS.
1/8 PLY ENGINE PLATE.
VIEW UNDER ENGINE PLATE.
LINE OF CANOPY.
CARD CANOPY STRAPS.
3/32 FUSELAGE TOP.
3/32 FUSELAGE BOTTOM.
BEND LINE. V CUT & CEMENT.
SECTION 'X-X'.
NOSE BLOCK.
NOSE RING 1/8 SHEET.
COWL REAR 3/32 SHEET.
COWL FRONT 3/32 SHEET.
WASHERS FOR SCALE APPEARANCE.
SILVER PAPER LANDING LIGHT.
RED PIN.
GREEN PIN.
1/16" SHEET.
1/8 SQ.
3/16 X 3/4 T.E.
AILERON LINE.
CELLULOID MOULDING OR BLOCK TIPS.
20 S.W.G. STRUT CLIP.
PUBLISHED AEROMODELLER MARCH, 1958.
FSP 560.

36 inch scale model with simple construction flies like a sport job

AUSTER A.O.P.9

by Ron Moulton

NO OTHER aircraft company can claim the distinction attained by Auster Aircraft Ltd., of Leicester, with its specialisation in light-planes and Military Air Observation Parts. Each one of the Auster breed is given a mark number or name—we have the Aiglet, the Autocar, the popular V and the A.O.P.6, yet they are all known to John Public by one name—Auster. Only small distinction serves to split these types: but the latest of the line, the Mk. 9 joins the fleet as an entirely new design and deserves something more inspiring than a number to credit its proposed lines and high performance. Doubtless the Army, with its famous laxative pill of same Mk. Number will soon find nomenclature suitable for this aeroplane that is sure to get things moving.

Modellers with scale inclinations will already have appreciated the way Messrs. Auster Ltd., have simplified their outline, shortened the tail moment, enlarged the tailplane and reduced the struttery to make the "9" a "perfect subject". It bears sport design proportions, allows tough construction and is delightfully inherently stable. Like the full-size it can be overpowered for performance with a flair for aerobatics or it can fly on minimum power at stooge speed on low level circuits.

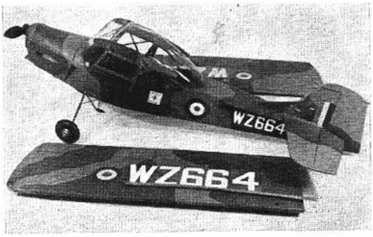
Shortening the tail moment of the Auster series—even though by only a slight degree, means that a sheet fuselage is possible as weight can be afforded at the rear to balance a lengthy nose cowling. Thus the 1"-1" scale version presented here is a sheet simplicity job, suitable for beginners or expert and calculated to give a maximum of fun for a minimum of repair work.

The original weighed 11¼ ounces, with a Merlin .8 c.c. diesel and after driving the designer to earth on a first flight loop peaking at 15 ft. altitude and pulling out at scant inches, it was soon tamed for a left hand steeply banked circuit on "recce" over Epsom Downs.

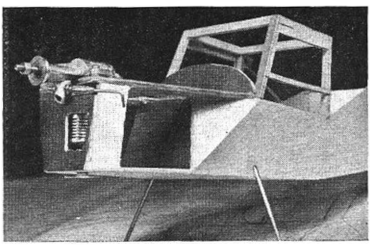
High level flying on a long motor run is followed by a safe and steady rate of descent sufficient to keep the flight within reasonable bounds so that as much as 90 seconds power run is possible in calm to medium wind conditions. And if the motor run is arranged for peak revs during the last steps of the flight, some entertaining loops and etcetera's can be arranged by elevator trim.

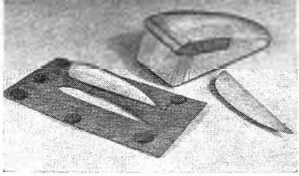
Start with the fuselage sheets, notching at bend lines and applying a cement skin so that sides and bottom approximate the required angles. Assemble F4, F5 onto the 1 mm. ply door frames, noting the difference for the starboard side frame, and fit to sides. Check the incidence against the plan then cement the sides to bottom sheet, after fitting the strut loop wire and ⅛" sq. retainer. Bind the u/c to F.3, using 12 g. wire for scale, or 14 g. if the bends are difficult for you. F.3 on the prototype was made of the new Solarbo "Li-Ply" or ⅛" ply, similarly for F.1 and F.2. Now fit F.3

2 in. and 1 in. Fisher white alphabet transfers give authentic registration over Titanine Dk. Earth and Dk. Green matt camouflage. New K.K. 6 × 4 Trufiex is used

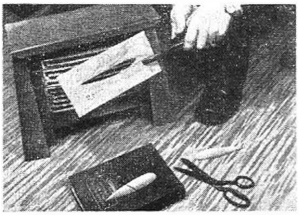


Knock-off wings are rigid in flight. Flexible struts save damage, and moulded canopy adds strength. Below, basic structure showing "Li-Ply" bulkheads

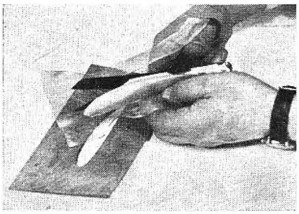




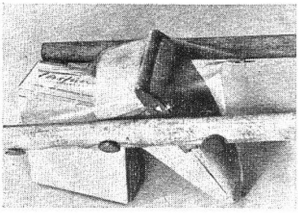
Mock-up for canopy uses part ribs and L.e. section. Tip template has acetate pinned in place with patterns for left and right.



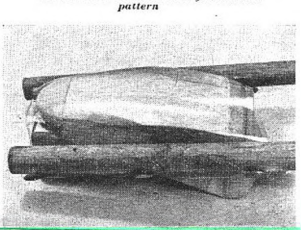
Heat acetate until floppy, with pattern ready for a quick moulding—action must be immediate to take effect



Unpin and trim off excess around pattern, slip over tip rib after removing pattern for final trimming



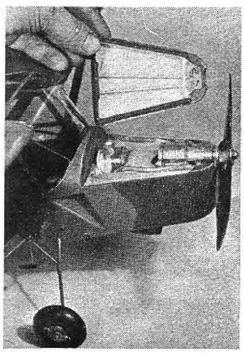
Canopy is moulded in two stages, afterwards joined. Hot acetate sheet between two stout rods is forced over pattern



in place to set the "bow" of the sides which are pulled in to "square" by adding F.6, then the top. Set F.1 at front, check the thrustline and fit engine plate supported by "doublers" each side at front. Add F.2, F.2a and $\frac{3}{8}$ sq. cabin structure with $\frac{1}{16}$" dowels attached. Fit engine, cutting away F.1 to suit, add hollowed noseblock, complete cowl with sides, detachable planked top and cooling exit sides tapering inwards to F.2. The step, cabin ribs $\frac{1}{16}$" dowel or reed cabin struts and 1 mm. ply rear cabin frame, tailwheel and tank detail make the fuselage ready for the canopy and since Wing and Tail assembly is as simple as can be, a special instruction on acetate moulding will not be out of place.

Canopy Moulding

The A.O.P. Mk. 9 Cabin can be made without moulding, but loses its rotund appearance for a series of blunt angular bends. To get scale effect, a block of laminated scrap sheet is carved to actual shape, and the moulding made in two stages. For the prototype, ordinary celluloid with a measured .013" thickness produced good results, though .020" acetate, from some model shops and most handicraft shops is to be advised. To mould the top, cut a sheet of the moulding material approximately 2" oversize in all directions and pin at 2" intervals along a pair of stout sticks. Heat the sheet in front of an electric fire until it becomes floppy and is giving off a steamy vapour. Keep the mould handy and well supported, then, when the sheet is very pliable, force it down in one swift and immediate movement on the mould. A spare pair of hands suitably protected with a rag can force the ends at front and rear. Repeat for the windscreen and join the two with cement.



Cowl is retained with crankcase clip. Wheels and tank are by M.S. (Newcastle)

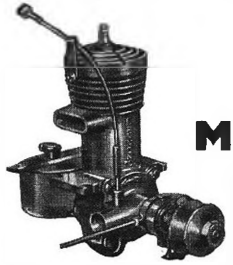
Tips are made in one by heating the acetate on a ply former with a clearance hole cut for the mould. When floppy, the ply is forced quickly over the mould and the acetate in between adopts the tip profile to perfection. Approx: 1/5th the weight of balsa block, and replaceable with minimum bother, moulded tips are advised for all models, including contest types.

To get best effect, only rough trim the tip mouldings before fitting to the tip wing rib, then, when cemented in place, the excess can be cut away. The result is neater, and far easier to accomplish.

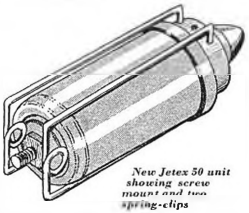
Ideal accessories for the A.O.P. 9 are the M.S. circular plastic tank of transparent material which will just fit in the engine mounting plate hole and their "Airtrap" wheels. Size of the tank is $\frac{7}{8}$" diameter, and the wheels, $1\frac{3}{4}$". The latter are to perfect scale in overall diameter and tyre section; but if 12-gauge piano wire is used for the undercarriage, the hubs have to be modified. Remove the aluminium bush by unscrewing in the normal manner, part the outer plastic hub sides, and smear all faces with a reputable cement. Screw up the bush again to pull everything tight, leave for 24 hours, then remove the bush and retain wheels with a large washer.

Assembly and camouflage in Dk. Earth and Dk. Green on *all* surfaces with white lettering make the Mk. 9 complete. Allow a free movement of $-\frac{3}{4}$" for the tailplane until actual setting is found after test flights, and you'll find yourself with a lively stablemate for the Bird Dog, its American equivalent, published last December.

MOTOR MART



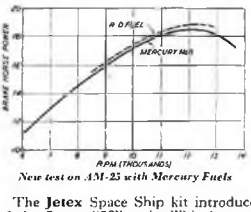
American Cannon 5 c.c. of '44 Vintage had unique carb position



New Jetex 50 unit showing screw mount and two spring-clips

SOME REVISIONS have taken place with the **Allen Mercury 25's** mentioned last month, all being minor detail improvements introduced since this new design went into production. All engines now being turned out have the main bearings packed with graphite greas. These details add up to a slight, but noticeable increase in performance and better handling qualities. Incidentally, there is a marked improvement in performance using R-D fuel, once the A-M 25 is fully run in, equivalent to an r.p.m. increase of the order of 500-750 on normal propeller sizes.

Due to the construction of the A-M 25, it is readily possible, if the motor is taken to pieces, to re-assemble with the cylinder 180 degrees from its original position. Whilst this does not affect the actual porting arrangement, it can result in an appreciable loss in performance. This is because after running in the cylinder definitely becomes "handed" due to the wear imposed by side loads. It must be reassembled the same way round as when originally operated, so if you must take the A-M 25 to pieces, mark the cylinder (not the jacket) first so that you can put it back the same way.



New test on AM-25 with Mercury Fuels

The **Jetex** Space Ship kit introduces a new version of the **Jetex "50"** unit. This is mounted on a single screw fixed to the centre of the bottom of the casing. As a result, the single spring clip cannot be used, so two parallel clips are employed.

All other parts are standard. In fact the end cap is a standard "50" unit re-drilled for the double springs with the original two holes still in it. (That is the only significance of these holes, They are not some cunning by-pass idea!).

The special version of the "50" will be sold separately as a power unit for rocket ships. Price will probably be slightly dearer than the standard 50b, although this has not yet been definitely decided. Nor has the designation yet been fixed, although "50R" seems obvious.

Marine-minded modellers whose pulse rate soared at the sight of last months' **FROG 150** Advt. on page 61 when the price of a water jacket version was announced as 50/- should take note that this was a misprint to the tune of 20/-. Actual price is 70/-, including special head and flywheel.

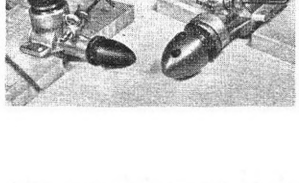
We have an experimental engine of well-known breed in the test shop at the moment and although we are not free to comment on some of its special design features, its geometric layout has sparked off an idea which has been in the back of our minds for some time. Briefly, this concerns the positioning of the intake or choke tube on both crankshaft rotary valve or backplate rotor engines. In the latter case, we have always felt that an intake tube located at right angles to the axis of the engine would be much more convenient, particularly for mounting. It would, for one thing, shorten the mounted length of the engine and make for easier finger choking (since the intake tube would be sticking out to one side).

We see no reason why the same idea should not be adapted to crankshaft valve diesel designs, after the manner of American **Cannon** and **RB49** engines, making the intake tube stick out to the side, instead of being in a vertical plane. This would be a much more natural position for finger choking and would also permit the needle valve to be in a vertical or near-vertical position, again for easier adjustment. Extending the needle valve to the height of the cylinder would then bring compression and mixture controls side by side, as it were. And then perhaps we could dispense with that bent over end standard on so many needle valves and fit a knurled knob instead.

GERMAN DIESELS—Black headed Jaguar 2.48 is .59 in. bore and .55 in. stroke. Superb casting finish to crankcase is equal to best from U.S.A. Output is moderate, starting easy, and good features: angled needle and radial or beam mounts. Sells at 33.50 DM.

Taifun diesels, come complete with mounts for test, are well produced, have instructions in four languages and run fast. At left is the .98 c.c. Hobby, very small in stature for its capacity, and right, the Tornado ball race 2.47. Prices are 31 and 39.50 DM. respectively

The BWM 250D, loaned from Henry Nicholls' stock, is a long stroke with moderate output, ideal for radio or sport. Has black crankcase, neat carb. assembly and comes with tank for 37.50 DM.



1954 F.A.I. model committee report

By A. F. HOULBERG

F.A.I. INTERNATIONAL MODEL AIRCRAFT COMMITTEE MEETING PARIS, DECEMBER 11th AND 12th 1954

PRESENT:

Director General of F.A.I.
President of C.I.M.R.
Secretary of C.I.M.R.

America (part time)	Holland
Austria	Italy
Belgium	Russia (part time)
Germany	Saar
Great Britain	Sweden
	Switzerland

This meeting was called for the main purpose of deciding the International Model Contest Calendar for the 1955 season and the following dates were established subject to final arrangements.

Centralised Olympics

The proposition tabled by Israel, that a centralised venue be arranged for all the Championship events, was discussed at some length and did not meet with universal favour as the countries winning the 1954 Championships were keen to hold the events in their own territory under Clause 5.2.6. of the Code Sportif.

In view of this Clause and the fact that the Code Sportif has been frozen for two years, it was decided that this proposition was not practical at the moment, but worthy of consideration for future action.

Speed changes

The proposition put forward by Great Britain that the World Control Line Speed Championships should be decided on the performance of a team of three, one flying in each class, was considered to be largely a matter for the organising club and their facilities. It also depends on the future regulations for this event which will be on the Agenda for the Annual Conference in June.

The proposition to increase the minimum line length in the 2.5 c.c. class was tabled and it was agreed to increase the line length to 15 m. 92 cm. in view of the high speeds now attained in this class.

Bad Weather and contests

The other proposition put forward by Great Britain concerning the postponement of rounds in case of bad weather, was discussed at some length. The meeting came to the conclusion that it was not practical in view of the vast variations in in conditions and that this should be left as a matter for arrangement between the organisers and the contestants on the spot.

Russian proposals

The Central Aero Club of Russia tabled a number of propositions amongst which was one for the installation of a Centralised World Championship event every two years, covering all classes of models limiting the entry to one contestant in each class, making a national team of four. This was felt to be possible only when the centralised venue principle can be adopted.

The suggestion put forward by the Central Aero Club of Russia that the team should be accompanied by a trainer, captain, translator, and team leader was considered by the meeting, who were of the opinion that the present system of limiting the persons accompanying the team to a single team manager was completely adequate, and that any additional personnel should only be sent by arrangement with the organising club.

Russia also suggested that radio-controlled models and control-line models should be included in the World Championship classes. The control-line speed model is of course, already included. It was agreed to place the question of the radio-controlled models on the Agenda of the General Meeting for 1955.

Russia proposed that no World Championships should be held before August 15 in each year in order to allow the various countries ample time for team selection and preparation. While the meeting felt that this depended on many factors, frequently beyond the control of the organising club, it agreed to this proposition in principle in order to allow the necessary time for eliminating contests to take place.

Russia also raised the question of continuing the timing of models which go out of sight in case they should re-appear. This point has, of course, been discussed at great length in the past and the present rule is the result of long experience. The meeting was of the unanimous opinion that the present rule should stand and be strictly adhered to.

Team Races

The team racing regulations drafted at Frankfurt in 1953 were reviewed in the light of experience in 1954, and amended in one or two respects.

The chief of these was the limitation of a team to the pilot and one mechanic, and the increase of the line length to 15 m. 92 cm. in order to bring it into line with the radius agreed for record and speed attempts.

It was also agreed that only two teams (each of two) could be entered by any one nation for the World Championship event

F.A.I. Contest Calendar

INTERNATIONAL CHAMPIONSHIP CONTESTS, 1955

Date	*Place*	*Contest*
May 29th & 30th	Paris	Control line (2.5 c.c.)
Aug. 27th & 28th	Brunswick	A 2 Gliders (Swedish Cup)
Sept. 3rd & 4th	U.S. Aerodrome in Germany	Wakefield Rubber and F.A.I. Power

INTERNATIONAL AND NATIONAL CONTESTS, 1955

Date	*Place*	*Contest*
May 7th & 8th	Monaco	International Seaplane Competitions (rubber and mechanical motors)
May 21st & 22nd	Germany	King of the Belgians Cup (radio)
June 11th & 12th	Milan	International Control line Speed
June (choice of date other than 11/12)	Not announced ...	Yugoslavia Cup
July (date to be announced)	Saarbrucken ...	Europa Cup
July 22nd-24th	Jami Jarvi, Finland	International Rubber (Wakefield) Glider (A.2) and Class D Power
Aug. 1st	England	International Radio Control Contest (I.R.M.C.S. and S.M.A.E.)
Aug. 15th & 16th	Trentino, Italy ...	Stella d'Italia Cup Gliders (slope soaring)
Aug. 14th & 21st	Yugoslavia ...	National Meeting with International contests
Aug. (date to be announced)	Japan	Eighth National Model Flying Meeting
Oct. 2nd	Brussells	VI Criterium d'Europe. Control line Speed 2.5 c.c. motors and supporting events
Sept. 18th	Monaco	International Control line Speed, Aerobatics, and Team Racing
Nov. (date to be announced)	Australia	International Contest for all classes

Rules—V.T.O.—& Tow-lines

The Royal Danish Aero Club made some propositions for long term planning in connection with the Code Sportif as follows:—

According to previous agreement, there should be no alterations to the Code Sportif for two years; but since the Code was not printed in time for distribution until after 1954, Denmark proposed the extension of the period so that the present rules remain in force until and including 1956. This was agreed unanimously.

Denmark also proposed that any alterations for the next edition which should cover the period 1957-1959, should be completed by the committee not later than July, 1956, in order to allow ample time for printing and issuing the rules before they actually come into force.

This was also agreed unanimously.

Denmark pointed out the need for clarification of the Rule 3.1.1. of the Code Sportif, relating to take-off and three-point undercarriage. It was agreed to publish an explanatory note to make the intention of the rule perfectly clear, particularly regarding vertical take-off, and the Secretary of the Committee was charged with the preparation of the note.

The question of the interpretation of the words "non-extensible" regarding launching cables was also raised by Denmark and here again, it was agreed to deal with the matter by the issue of an explanatory note.

At this point, Sweden raised the question of the use of a small parachute on the cable at the tow-hook end as they find it necessary with steel wire cable in order to obviate kinks in the wire and entanglement after release. After a lengthy discussion, it was agreed to permit the use of such parachutes, provided they were closed and remained closed until after release of the model.

The Central Aero Club of Russia raised a number of points regarding the rules, most of which were rather a matter of interpretation, and explanation, or dealing with jet propelled models which are not recognised for international records or contests by the F.A.I.

The Royal Aero Club of Holland raised the question of bringing the line length and motor run for licence into line with the contest rules. It was agreed to carry this item forward to 1956 for consideration in connection with the next issue of the Code Sportif.

Right: Soviet delegation, Frantisek Echiner (CSR), E. N. Stepanov (U.S.S.R.) with H. R. Gillman, (F.A.I.) and Soviet interpreter.

Heading opposite: At Aero Club de France Dinner, are F. Echiner (C.S.R.), J. Van Haltum (Holland), C. Derante (Sweden), Mme Roussel (Belgium), A. F. Houlberg (G.B.) and Carl Wheeley (U.S.A.)

Holland also raised the question of the rake-off rule and the minimum loading rule in the present Code Sportif and whether they should be maintained. After discussion, Holland agreed to prepare a treatise on their suggestion, which would be circulated to all Aero Clubs for study.

Holland proposed also to modify the loading regulations for flying-wing models. The meeting was not in agreement with this although they had no objection to experimental contests being run on these lines provided this was clearly specified in their announcement.

R/C Committee

The question of radio controlled model contests was also raised by Holland, which resulted in the committee appointing Mr. Meier (Germany) ,Mr. Roussel (Belgium) and Mr. Degen (Switzerland) as a sub-committee to survey the position with a view to submitting draft rules to the General Meeting in June for discussion, when final draft rules can be established for circulation to all Aero Clubs for study and comment.

Beginners—Trophies—& Boxes

Italy proposed at the Hague meeting in 1953, that a beginners' model contest to an international design should be instituted to encourage beginners. Holland again raised this question and it was agreed that Italy would prepare a proposition and model plans for submission to the June meeting.

The Royal Aero Club of Great Britain tabled the question of the responsibility for the safe keeping, insurance, and return of International trophies.

It was agreed that the F.A.I. should undertake the notification to the National Aero Club of the winning nation of their responsibility in this direction and also follow the movements of the trophies.

Great Britain again raised the question of the size of model boxes to comply with International travel regulations. From the discussion which ensued, it became apparent that the maximum size recognised for the transmission of normal goods was 100 cm. by 30 cm. by 60 cm., but that no trouble had been encountered by aeromodellers using boxes larger than this, provided they were reasonable in size. Swiss aeromodellers have boxes 140 cm. by 24 c.m by 24 cm. and have, so far encountered no difficulties with them during their European travels.

The question of a "carnet" for model aircraft movements, was again raised and the F.A.I. agreed to consider this question on receipt of details of all the regulations existing in different countries from the respective National Aero Clubs.

The Director General of the F.A.I. pointed out to the meeting that the F.A.I. Diplomas were now available for issue to winners of the Championship events and that F.A.I. plaques for winners of first, second and third places were also available.

S.M.A.E. 1955 CONTEST PROGRAMME

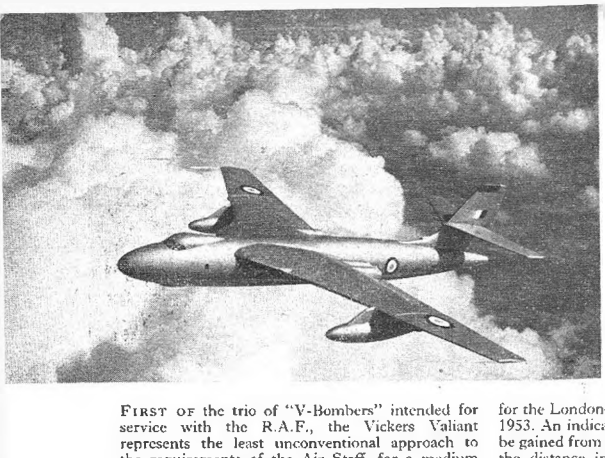
Mar. 20th	Gamage Cup	Unres. Rubber		June 19th	Team Trials		Cent.
	Pilcher Cup	Unres. Glider	D/cent.	July 3rd	Kell Trophy	Power	D/Cent.
Apr. 3rd	S.M.A.E. Cup	2nd A.2 Elim.			Frog Junior Cup	Rubber/Glider	
	*Farrow Shield	Team Rubber		July 31st	C.M.A. Cup	Glider	
	Women's Challenge Cup	Unres. Rubber/ Glider	Area		Frog Senior Cup	Power	
	Jetex Challenge Cup	Jetex			Flight Cup	Rubber	
					PAA 1 c.c.	1 c.c. Pay-load	Northern Gala
Apr. 10th	Control-line Speed Eliminators		Cent.		Team Race "A"	Team Race A.	
					Team Race	do. to F.A.I. Spec.	
Apr. 24th	*Weston Cup	2nd W'field Elim.	Area		Control-line Speed	Speed all classes	
	Astral Trophy	2nd Power Elim.		Sept. 10/11th	U.K. Challenge Match		Cent.
May 8th	Ripmax Trophy	Radio Control	Cent.	Sept. 18th	Gutteridge Trophy	1956 W'field Elim.	Area
	AEROMODELLER R/C Trophy	do.			*Model Engineer Cup	Team Glider	
May 15th	Hamley Trophy	Power	D/Cent.	Oct. 2nd	*K. & M.A.A. Cup	1956 Glider Elim.	Area
May 29th	Thurston Cup	Glider			Halifax Trophy	1956 Power Elim.	
	S.M.A.E. Radio Control Trophy	R/C					
	Davies "A" Cup	Team Race A					
	Gold Trophy	C/L Stunt					
	PAA 2.5 c.c.	2.5 c.c. Pay-load					
	Sir John Shelley Cup	Power	British Nationals				
	Model Aircraft Trophy	Rubber	Cent.				
	Davies "B" Cup	Team Race B					
	Taplin Trophy	R/C					
	Lady Sheley Cup	Tailless					
	Bowden Trophy	Precision Power					
	Super Scale Trophy	Scale					

*NOTE: Events marked * are Plugge Cup Contests*

Area Championships will be decided on results of Thurston cup, Sir John Shelley Cup, and Model Aircraft Trophy events.

If Areas so elect, Eliminators may be conducted on different dates to those shown, but results must reach H.Q. by the appropriate date as if flown on the dates scheduled.

Results of contests flown on other than dates scheduled can only count for Area selection purposes, and not for the Trophy allocated Plugge Cup or Championship points.



AEROPLANES IN OUTLINE

NUMBER 21

by J. R. ENOCH

The Vickers Valiant

FIRST OF the trio of "V-Bombers" intended for service with the R.A.F., the Vickers Valiant represents the least unconventional approach to the requirements of the Air Staff, for a medium bomber capable of high speed, high altitude operation over a long range.

In order to comply with the exacting demands of the Specification issued, (B9/48), selection of the type of wing to be employed was the governing factor. The merits of delta, and high aspect-ratio swept wings, together with the progressively reduced sweep of the crescent shape were carefully studied. The principles of crescent wing design were first investigated by the German Arado Company during the war, and patented by Vickers in 1947. This type of wing, however, was not considered wholly adequate, and the type of wing finally decided upon is a simpler application of the crescent wing, with two degrees of leading edge taper and a straight trailing edge. Highly efficient over the wide speed range, this type of wing does not need complicated high lift devices.

Work on the first prototype, Type 660 Valiant, was commenced in 1948, Mr. G. R. Edwards, who was at that time the Company's Chief Designer, being in charge of the design team. The aircraft, WB.210, was first flown on 18th April, 1951, by the late J. Summers with G. R. Bryce as co-pilot, but was destroyed early in 1952, when it caught fire following a fuel leak from a shut down engine whilst on a test flight.

The second prototype, Serial WB.215, made its maiden flight shortly after the crash, on 11th April, 1952, piloted by G. R. Bryce and B. Trubshaw, and externally it differed slightly from the first prototype. In place of the parallel, grilled slot intakes of the earlier machine, WB.215, had revised air intakes of greater area with airflow guide vanes in the outboard section of the intake only. The under-surface of the engine bay also modified, having deepened fairings for the four engines whereas on the 1st Prototype, only the outboard fairings projected below the bottom skin.

Originally, the second prototype, like the first, had a highly polished natural metal finish, but was later finished silver overall, and with high capacity auxiliary under-wing fuel tanks fitted was entered for the London—Christchurch Air Race in October 1953. An indication of the range of the aircraft can be gained from the fact that it was intended to cover the distance in only three stages, an average of 4,125 miles each. Unfortunately however, the Valiant did not compete, the entry being withdrawn just prior to the event.

From study of photographs lately released, it is apparent that during testing of the 2nd prototype, various minor modifications have been incorporated. The length of the inboard engine tailpipes have been increased slightly so that they project from the wing fairings, and the guide vanes have been removed from the outer section of the air intakes, a central division only now remaining.

Production aircraft with serials in the WP.200 range, (WP.203 being 5th production aircraft), are in Super-Priority production at the Weybridge factory, being first flown from the Brooklands aerodrome to Wisley where they are based for initial testing. The first production Valiant, type 674, flew in December, 1953, and the manufacturers claim that the Valiant is capable of being operated from "standard length" runways, is well substantiated by the fact that production machines have taken off from the comparatively short Brooklands runway, with a run as short as 600 yds., in conditions of only light wind.

The main distinguishing feature between prototype and production aircraft lies in the comprehensively equipped Radar nose of the latter. This section of the fuselage, below the centre line and forward of the ventral visual bomb aiming position, is formed of large di-electric panels, which, as the photograph shows, are of different colour to the remainder of the airframe. To the rear of the bomb aiming station, which on prototypes was apparently unglazed, is the twin nose wheel unit, which retracts backwards, and enclosed within two inward folding doors. The major portion of the fuselage underside is taken up by the

Heading shows the Valiant B.1 as prepared with long range tanks for the London-Christchurch Air Race, and which gave it a range of more than 4,000 miles. Right: The B.Mk.II reveals the special fairings which take the bogie undercarriage for this heavier and longer version. It contrasts with the R.A.F. Service Mk.I, showing longer tailpipes, white nose patch and WP series airframe number.

very capacious bomb-bay, immediately behind which is a large fairing, which, it is presumed, is retracted to fair the open bomb bay, and reduce the considerable drag which would otherwise severely penalise the bomber at high altitudes. The fully pressurised and air conditioned crew compartment, with a normal complement of five, has an entrance door hinged at its upper edge on the port side of the fuselage. Ejector seats are probably provided for the two pilots only, the forward section of the cockpit canopy being jettisonable. Forward of the windscreen, is painted an anti-dazzle patch.

With a thickness chord ratio of approximately 10% the sharply swept inner section of the wing provides adequate space for complete enclosure of the Rolls Royce Avon R.A.14 axial flow turbo-jets of approx. 10,000 lb. thrust each, the tail pipes of these, unlike the prototypes, all project beyond the located above the tail pipe fairings, and at the wing root leading edge, which has a di-electric fairing, is a small circular air intake.

The main units of the tricycle undercarriage are composed of two independent, single wheel, compression legs in tandem, to which is attached a fairing panel. These hydraulically actuated units retract outwards into the thinner section outer wing, a single inward folding door containing them. Boundary layer fences are fitted and at each wing tip is mounted an extended pressure head. It is likely that provision is made for the fitting of underwing tanks of the type employed on the second prototype. Wing control surfaces are of generous area, the ailerons which extend almost half span contribute largely to the high manoeuvrability and handling efficiency over the wide—speed and altitude range. Split-extension flaps, in three sections (including the lower-rear tail-pipe fairings), enhance the slow landing qualities of the Valiant, and provide the excellent take-off characteristics earlier described. Recently released information suggests that air brakes are fitted, located between the under-carriage fairing doors and the centre section of the flaps. Thermal de-icing is utilised with air outlets under the wing and tailplane tips, and on the sides of the fin near the tips. Fuel jettison pipes form the wing tip trailing edge.

The tailplane is of the variable incidence type, with a small area fixed leading edge, and full span balanced elevators. A servo assisted rudder is employed, and a di-electric fairing forms the top section of the fin.

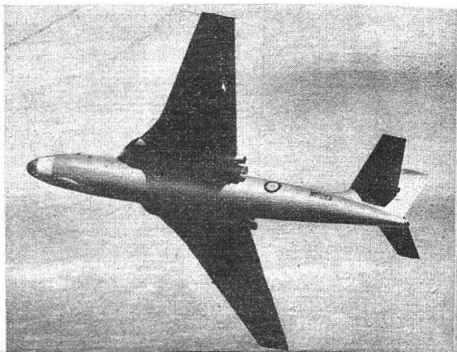
Aircraft are now coming off the production lines in a steadily increasing number, the type entering Squadron service in January, 1955. It is reported that the first squadron to be equipped with Valiant B Mk. Is, is being formed at the new R.A.F. Station at Gaydon in Warwickshire, an aerodrome specially intended for use as a "V-Bomber" unit.

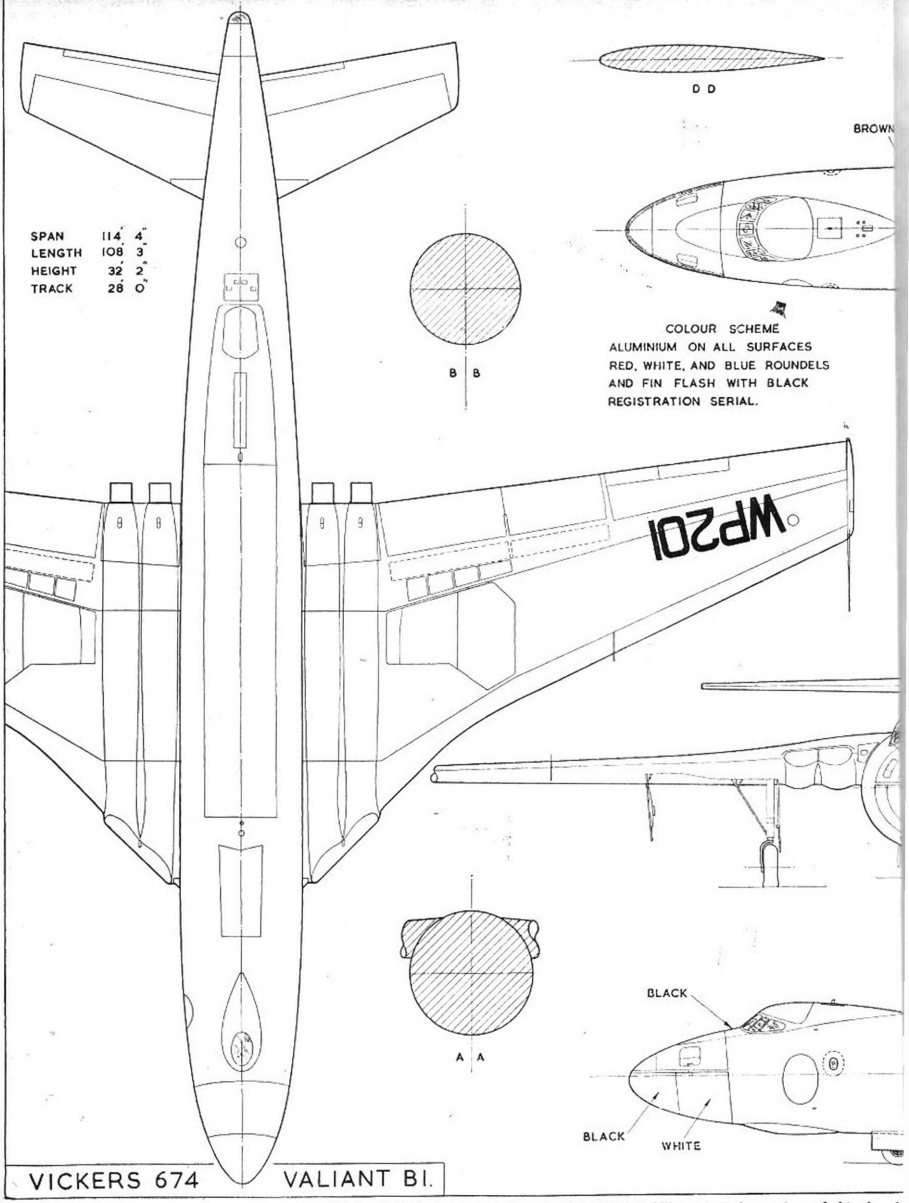
Development of the Valiant meanwhile is continuing, and foreign sources have reported various versions such as a Valiant flight refuelling tanker, and long range pathfinder and photo-reconnaissance versions as the spearheads of a "V-Bomber" force. It has also been suggested that Valiants will be equipped for flight re-fuelling.

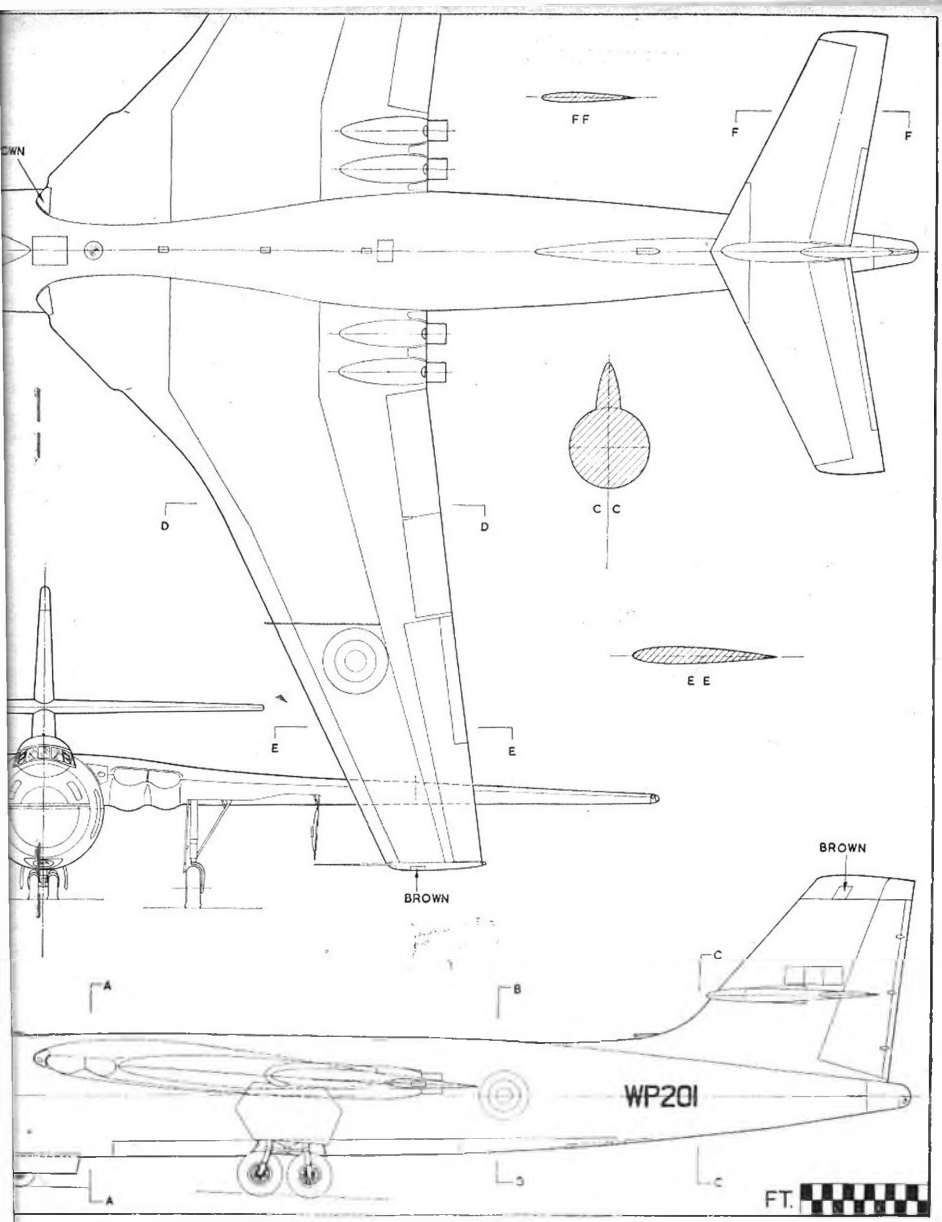
On the 4th September, 1953, a second version of the Valiant, the type 673, designated B.Mk.II (Serial WJ.954) made its first flight from Wisley. Basically similar in general arrangement, this version has a fuselage lengthened by 4ft. 6 in. between cockpit and wings, and due to an increase in all up weight, a revised undercarriage. Retaining the twin wheel nose unit of the earlier types, the B Mk. 2 has four wheel bogie main units, which retract backwards into streamlined fairings projecting aft of the wings. It is rumoured that these fairings could possibly be used to house De H. Super Sprite assisted take-off rocket packs.

Unofficially credited as being a Pathfinder variant, the Mk.2 is finished high gloss black. In addition to the many di-electric panels displayed on Valiant prototypes, it has one such fairing aft of the bomb bay fairing panel, and a second under the fuselage tail-cone. Located between the nose wheel and bomb-bay doors are two circular panels similar to the other di-electric panels. No order has been placed for this type, and it is unlikely that the type will go into production.

A direct descendant of the basic Valiant design is the Vickers 1000, a military transport with larger wing and fuselage of revised form, to be powered by Rolls Royce Conway by-pass engines. A commercial version of this aircraft is also being designed.







ing are available, price 1/- and 3/- respectively from the AEROMODELLER PLANS SERVICE

I ONCE SUBMITTED to an editor a model aircraft which I called "Hermaphrodite" because it was for a dual purpose. We had an argument about the name. He said it was rude but I said it was just a common description of certain things (worms for instance). He won, but he set me thinking about original names.

Very few modellers refrain from naming their creations. Even the die-hard pot-hunting type who hates building models anyway usually gives a name to his functional machine. There is a long tradition of this handed down from ships and full-size aircraft so we can say the un-named model is an exception.

But modellers tend to re-use the same old names; it seems it is too much trouble to be original or perhaps it is just that they do not know any names. If that is the case with you, listen awhile to your cousin Sam. There is a wealth of interesting and appropriate names available. Astronomy, which uses mythical characters, it is a favourite hunting ground, but Neptunes, Venuses and so on are ten-a-penny. Why not try NEREID (satellite of the planet Neptune) or NEREIS (daughter of the god Neptune). Another name is MNEMOSYNE, a large asteroid or "minor planet" between earth and Mars. I'll bet you didn't even know it was there. Other large asteroids in the "asteroid belt" are VESTA and PALLAS.

A lot of these astronomical names come from Greek mythology but here again we have worn out the name Hermes, Zeus and their friends. Why not try another mythology and not the Hengists and Horsas from the far north either. Go west young man, to the land of the Aztecs. Their number one god was QUETZALCOATL. A bit of a tongue-twister this perhaps, suitable only for long fuselage Wakefields. His counterparts in contemporary civilisations were KUKULCAN (Mayan) and GUCUMATZ (Kiche). From the same corner of the world (now known as Guatemala) come some more appropriate names such as HURAKAN the wind god who created the world in Kiche mythology or ITZAMNA the Mayan god of the sky. Their pals were HUN-APHU and XBLANQUE, —believe it or not.

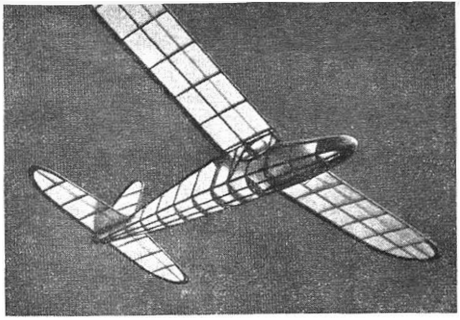
If these larynx-worthy efforts are too much for you we could try some more pronounceable Latin and Greek based names from entymology. A mosquito is known as ANOPHELES. Have you thought of calling your 100 m.p.h. (you Hope!) Team Racer CEPHENEMIA? This is the scientific name for the allegedly supersonic (815 m.p.h.!) deer-bot fly of South Africa. Of course you do not need to use these dead languages for most names. There is to be found in England, a red and black moth called CINNABAR, also the name of a lead-ore (most appropriate if your model comes out over-weight), MULLEIN is another moth. Do you fly your model on Baildon Moor? You could give it the picturesque name of BILBERRY PUG, the name of a moorland butterfly or NORTHERN EGGAR also a butterfly.

Zephyr, Hurricane, Tempest, Mistral are all overworked names of winds. If you called your A2 glider BORA you would not be just acknowledging the first name of the 1952 A2 winner you would be naming it after a cold dry wind which blows on the shores of his country. If you don't fancy a cold wind you could use the name CHINOOK from the other side of the world, it is a warm dry wind blowing down the Eastern slopes of the Rocky Mountains. South America supplies PAMERO Africa SIROCCO, Guinea HARMATTAN, Russia has her BURAN and Switzerland the FOHN. Had enough wind yet?

Mallards fly around us by the score, but there are some much nicer names from the duck family. GARGANEY has blue wings, POCHARD has a red head (not an E.D. 2.46!) grey body and the rest black. A black and white one is SMEW and there are also SCAUP and SCOTER.

PRATINCOLE is like a large Swallow. Other unusual names are PHALAROPE, AVOCET, SANDERLING, which for those who are interested, come under the general description of "waders". WHIMBREL is a small curlew, and there are scores more. I have selected only a few of the names which have not been used for aircraft before. Remember the Armstrong Siddley Siskin? Well TWITE is related to Siskin.

Descending to all-balsa models you might call one CUENCA—TWIG. Cuenca is a place where balsa grows. By the same token that we call an aircraft Brabazon we could name a model STRINGFELLOW. Have you a Gypsy Wakefield that you have modified? ZINGARO is Italian for Gypsy. Do you go for whimsy like Dick Twomey with his Snark? Then SLITHY TOBE will suit you.



Especially for the Beginner

Covering—by Rev. F. Callon

BY NOW you must have learned one important fact about aeromodelling, namely that slow, careful work pays in the end. And this is just as true of covering a model as of building the framework.

As a matter of fact, most beginners are reasonably good when working with balsa and cement, but they very often spoil the effect of a well-made framework by covering it carelessly. And unfortunately it is not just the appearance of the model which is spoilt, for careless covering nearly always means bad warps, so that the finished model will fly badly or not at all.

General Principles

It is always a good idea to know what you are going to do before you start doing it, so here, very briefly, is what happens in the process of covering a model. First of all the entire framework is enveloped in special tissue paper—flimsy, fibrous stuff, which is attached piece by piece to the balsa wood by means of paste, cement or dope. Naturally this covering is very weak to start with, so it has to be tightened and strengthened by being given one or more coats of clear, cellulose dope. The tissue readily soaks in the dope, and as it dries, the tissue fibres shrink and harden until the covering looks like tough, tightly stretched vellum. In effect, the tissue is now the base of a celluloid skin, and for a very slight increase in weight the overall strength has been increased immensely.

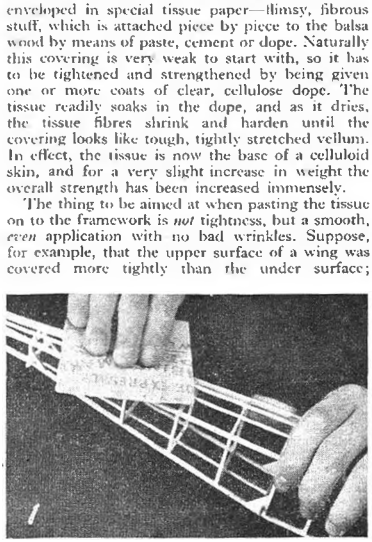
The thing to be aimed at when pasting the tissue on to the framework is *not* tightness, but a smooth, *even* application with no bad wrinkles. Suppose, for example, that the upper surface of a wing was covered more tightly than the under surface; when doped, tissue shrinks a fixed amount, and in this case the upper surface would have a start on the lower one, with the result that the wing would dry out twisted—a very serious defect when it comes to flying. I recently saw a case where this had happened, and the extra tension across the top of the wing was so great that it had pulled the trailing edge up at an angle of about 20 degrees, and in some cases had snapped off the ends of the ribs!

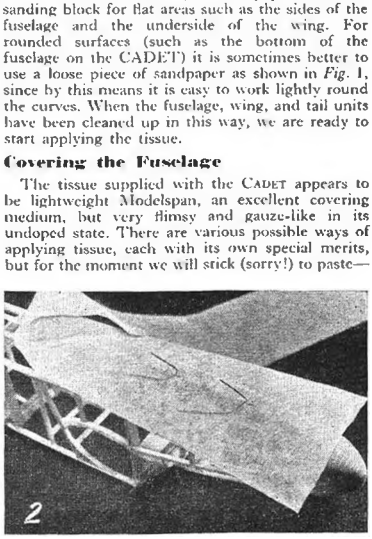
Preparatory Sanding

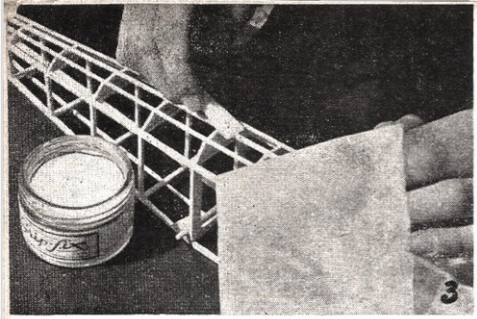
No matter how careful you have been over the construction of the framework, there will almost certainly be a few unevennesses—joints which are not quite flush, blobs of dried cement, etc.—which would stick up through the covering unless removed Cement blobs can be snicked off with a blade, and then the whole framework should be lightly sanded with a smooth grade of paper. Use the sanding block for flat areas such as the sides of the fuselage and the underside of the wing. For rounded surfaces (such as the bottom of the fuselage on the CADET) it is sometimes better to use a loose piece of sandpaper as shown in *Fig.* 1, since by this means it is easy to work lightly round the curves. When the fuselage, wing, and tail units have been cleaned up in this way, we are ready to start applying the tissue.

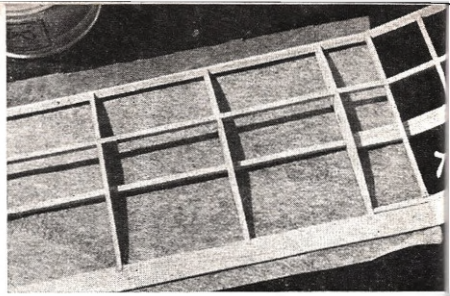
Covering the Fuselage

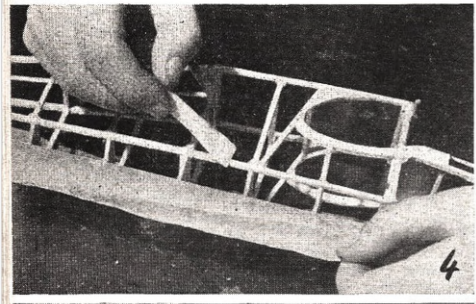
The tissue supplied with the CADET appears to be lightweight Modelspan, an excellent covering medium, but very flimsy and gauze-like in its undoped state. There are various possible ways of applying tissue, each with its own special merits, but for the moment we will stick (sorry!) to paste—

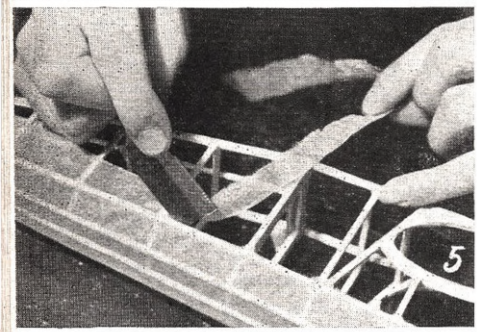


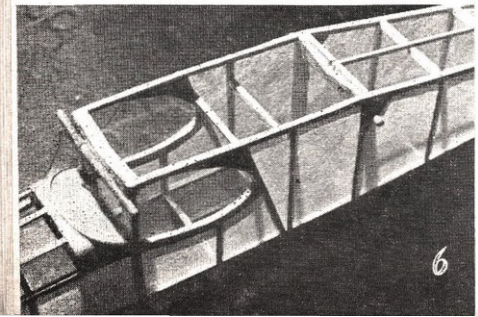












the white, semi-solid, office type.

First of all use sharp scissors to cut out a rectangle of tissue slightly longer than the fuselage and wide enough to cover the underneath part and leave an overlap of an inch or so at each side. Run a line of paste along the middle stringer between the first and last tow-hook, and push the tissue over the hooks (so that they pierce it) and down on to the pasted part of the centre stringer—see *Fig.* 2. The rest of the tissue can be folded back while the remainder of the stringer is pasted fore and aft of the hooks (see *Fig.* 3). The tissue is then smoothed down into place in contact with the entire length of the centre stringer.

Fig. 4 shows the side of one of the lower longerons being pasted, so that the tissue strip can be brought up into contact with it. This is done all along both sides of the fuselage, and the tissue is also pasted against the underside of the nose former.

Now trim away the overlap along both sides against the bottom longeron, using a sharp blade for the job—see *Fig.* 5. Note that it is not necessary to paste any stringers apart from the centre one.

Next come the sides. Another slightly oversize piece of tissue is cut out and laid on one of the sides of the fuselage, and the outline of the cabin window (which will show through quite clearly) is lightly marked on to it with pencil. This outline is then cut out, and the tissue *cemented* into place round the edge of the window; cement must be used here, since paste will not stick to celluloid. Pasting will start from here and work away in both directions along the top and bottom longerons only—not the spacers.

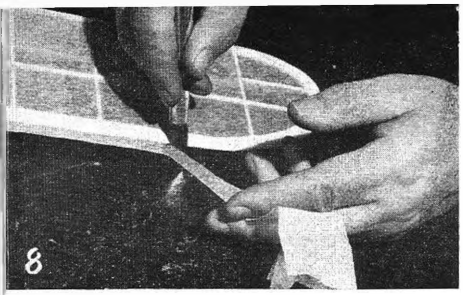
Fig. 6 shows the fuselage with only the top remaining to be covered. Note that the space between the two wing dowels on the top remains permanently uncovered in order to accommodate the "V" section of the dihedral joint of the wing.

Flying Surfaces

Wings and tailplane follow the same general procedure as far as covering is concerned. The stages are as follows:

(i) Cover the underside first, pasting the tissue against the LE, TE and tips, with a good overlap all round—see *Fig.* 7. In the case of the wing, separate pieces of tissue are cut for each half, and the centre edge of the strip should be pasted along the underside of the centre rib.

(ii) Trim off all the overlap, using a sharp blade for the job—see *Fig.* 8.



(iii) Cover the top with pieces of tissue cut to leave an overlap of about one inch all round. Separate pieces should be cut for the tips (see *Fig.* 9) in order to avoid wrinkles. The top of the wing should be covered in two pieces, the ends of which are pasted to the centre rib and the last rib before the tip, but otherwise only to the LE and TE. One piece will do for the tailplane (apart from the tips) and it too should be pasted only to the two end ribs, the LE and the TE.

(iv) Trim off the overlap to leave a margin about 3/16 in. wide along the LE and slightly wider along the TE and round the tips, where it should be notched—see *Fig.* 10. Then paste and fold the overlap round on to the underside.

Steaming the Tissue

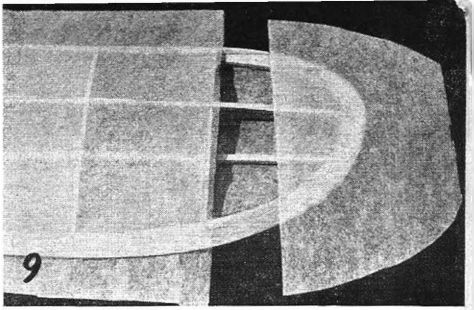
If, in spite of your efforts, the tissue has become wrinkled, the model can be held near the spout of a boiling kettle, so that the jet of steam plays over the affected parts of the tissue and damps them. After half an hour or so in a warm room the tissue will dry out and shrink slightly in the process, thus removing some of the wrinkles. But Modelspan shrinks so well when doped, that unless the wrinkles are bad ones, steaming is not necessary.

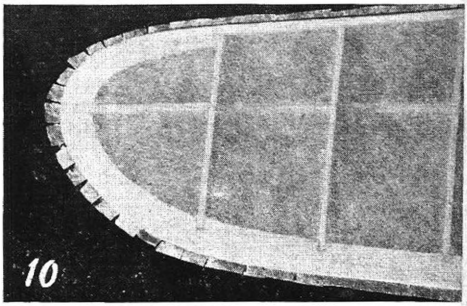
Doping

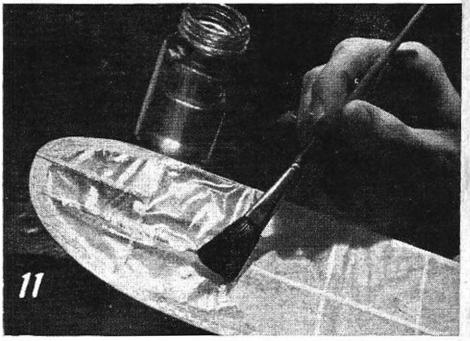
Whether it has been steamed or not, the model should be left for half an hour or more in a warm atmosphere to make sure that the paste is quite dry before doping starts. Use a large, soft brush for applying the clear dope. *Fig.* 11 shows this being done. The tissue goes limp at first, and great care must be taken not to push the brush through it at this stage. As soon as the dope starts to dry the tissue begins to tighten, and when it has passed the tacky stage, the fin, tailplane and wing should be pinned down flat on the workboard, which has been previously covered with waxed paper, as in *Fig.* 12 (although the paper need not have a pattern on it as here!). Obviously only half the wing can be pinned down flat at one time, so this unit must be doped and pinned down in two separate stages.

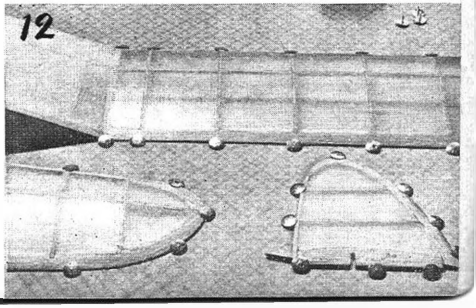
The tightening process goes on for some time after the tissue feels dry, so the units should be left pinned down for a couple of hours—or preferably overnight. After this the fin is cemented into the centre of the tailplane (the right way round).

With such a small, light model as the CADET, one coat of dope all over should be sufficient, but for extra toughness you might give a second coat to the fuselage.









World News

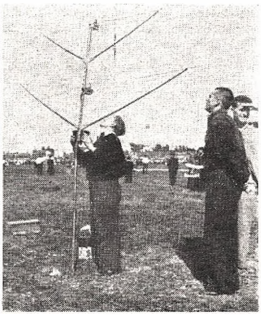
WITH THE International Calendar announced, and no changes made in model specification, modellers are set to go ahead for the '55 season. The A.M.A. in the **U.S.A.** announces a new class for *Proto Speed*. Models to be semi-scale type, fixed u/c, bigger than 20" span and with fully cowled engine. Timed over 1 mile from a standing start it should be exciting—if they allow two or more at a time. R/c is divided into rudder and multi-control sections. A triangular loop is added to u/c stunt plus an outside square loop and bonus marks for spot landing. New National speed record in their class A, for up to .199 cu. in. is 141.23 m.p.h. by Ed. Hicks with a Hornet .19 glow engine.

Writing in *The Flypaper*, Harry Roe Jnr., of Dayton, Ohio, states he is prepared to give up a 145.69 m.p.h. record he holds in 5 c.c. if a new and good method of establishing speed records is established. He wants to see all record claimants substantiate their record flight with another run of within 1 m.p.h. of the high time. On that basis, Bob Lutker has shown (The Hague '54) the proposition feasible for he flew at 137.9 m.p.h. twice for his World record.

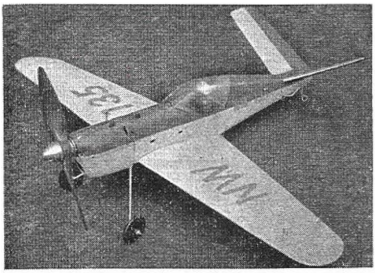
South of the States, **Mexico** has yet to make a name in International events; but there are signs that within a few years, the Mexicans will be placing high in such competitions. One name that will be without doubt in the first half dozen in International Power is Carlos Cosio.

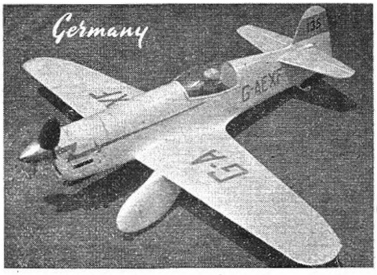
"I was privileged to visit his home and workshop"—writes Phil Guilmant, "and in all the years I have been modelling, I have never seen such high quality workmanship. (Phil is quite a modeller himself, and made an impression with British enthusiasts before he emigrated West). In two years, Carles has produced development models of his "Totot!" design, all to carefully calculated formulas and expertly drawn plans—he is an Architect when not building models. Although he builds mainly power, he also tackles radio, rubber and glider with the same fantastic attention to design and finish that make him, in my opinion, one of the Worlds' Leading Aeromodellers."

The Central Mexican plateau is at 7,000 ft., which brings many problems to Aeromodellers, and models (and the modellers) behave rather differently there. Trimming in the thinner air calls for a change in technique, the thermals are said to rotate in the opposite direction to European and U.S. thermals—and glow-plug engines with high revs. are held in favour over the diesel. Though original designs are lacking, there is no shortage of first-class construction.



Top: AUSTRALIA, where Ron Bird launches Tony Farnan's R/C entry in the 4 mile race across Hobson's Bay at Melbourne. Crash boat in background chased with Tony aboard. Centre: CZECH flatfish A/2 by Zabransky said to use fuselage lift. Left: RUSSIAN e/l stunters look fit for combat flying, use K-16 diesels. Next is maestro Vassilchenko and twin transmitter set up on two frequencies giving demonstration. Tx's are on mast, aerials horizontal power pack on ground





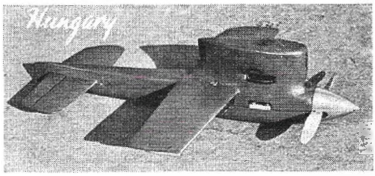
Above: Dr. Helmut Ziegler's team racers for E.D. 2.46. Left, the "IXTL", and right, a semi Mew Gull. Below, Mr. Lim Kin Boon of Penang and 70 m.p.h. Lightning with two Jap OS 29's. Is 5 ft. span

George Benedek writes from **Hungary** after a spell of apparent inactivity to remind us of recent events there. In October, the National c/l events were held in the town park pond. Not with water of course—this was drained out and the concrete base cleaned up for speed flying. (Wonder if the L.C.C. would do the same for us with the Serpentine or such?) In 2.5 c.c., Krizsma won with 109 m.p.h. from his Super Tigre powered model, nearest diesel approach being 101 m.p.h. by Decsey with a Webra Mach 1.

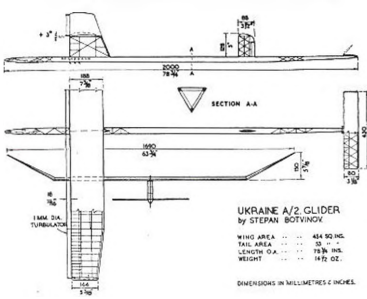
5 c.c. proved a runaway for the only Dooling 29 in Hungary, owned by Kun and flown at 131 m.p.h., 2nd was Decsey, using a McCoy 29 and followed up by Super Tigre fliers. The Italian engines also made their mark in 10 c.c., with speeds up to 140 m.p.h. for 2nd place by R. Beck; but this was beaten by a McCoy 60 model, flown by Berke at 155 m.p.h.

November's A/2 contests were held in fine weather and produced a five flight average of 2 : 51 for winner Sostarich which is even better than the Czech's figure of 2 : 48 at Moscow.

From **Czechoslovakia** we hear of eliminators for the World Championships to take place this month, and plans for the 1955 Soviet States meeting for which they will be hosts. Czech participation in the events at Brunswick and elsewhere in Germany is at last a possibility.



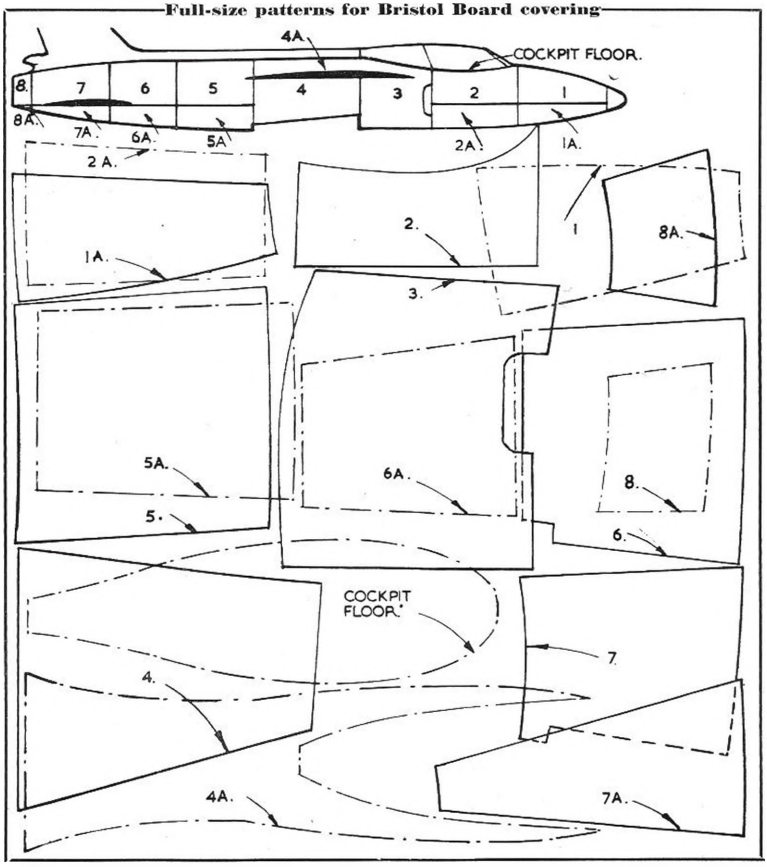
Below: Check the tail moment of this Champion Ukraine A/2! Right: Hungarian Berke has now flown this McCoy 60 speedster at 158.67 m.p.h. for new World Record to be claimed. Below are top fliers Stephen Bard, the renowned Georges Benedek and Georges Horvath with 'ets



A model

Build this 1/24th scale model Jetex 50, or 100, unit. Simple surfaces and card fuselage high-speed sport flier–

Full-size patterns for Bristol Board covering



MIDGE

of the Folland fighter for construction with sheet covering make it a robust by JOHN DARNELL

THERE'S NO doubt about it—the Midge is a "winner" from all angles and as the star of the 1954 Farnborough Air Display, it has already gained great repute though still but a few months old. A preview of John Enoch's concise and very accurate drawing of the Midge and Gnat which was featured as his "Aeroplane in Outline" last month, enabled John Darnell to get one step ahead of "AEROMODELLER" readers and to start on his flying version. John builds at the rate of several models per month, he is one of our chief kit tester's and his total production to date runs into hundreds of designs. But all of his experience was sorely tried in devising a means to reproduce the gracious curves created by Mr. Petter of Follands. Lightness and smoothness of line is difficult to achieve in a model this size—the Jetex "Tailored" kits with pressed fuselage sides being the ideal, and only real answer. After experiment with balsa sheet, which would not take the double curvature, John tried Bristol Board in panels similar to the covering of the full-size aircraft, and the result exceeded expectations. All-up weight of the final model, including an augmented Jetex 50b, and generous coating of Belco Delft Blue, was no more than 2¼ ounces, and the appearance, as these photographs show, is commendably realistic.

A 50b unit was used in the original, and slight ballast needed for trim in the nose. A larger unit will undoubtedly provide an even more sparkling performance but will still require a swift launch after waiting for thrust to build up.

Ready to start? Here's what you will need:

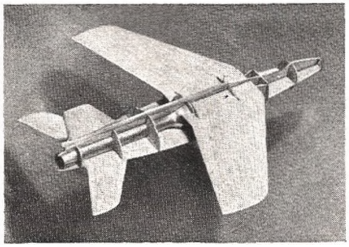
One sheet $\frac{1}{16}$ × 3× 36 in. Medium Balsa
One sheet $\frac{1}{8}$ × 4× 18 in. Medium Balsa
One sheet 18× 18× "thin" Bristol Board
One strip $\frac{1}{16}$× $\frac{1}{16}$× 12 in. Balsa
One Bubble Hood or celluloid to mould same.
Cement, Delft Blue and Red dope.

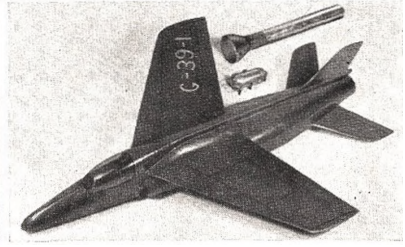
Not much is it? Start by cutting out the vertical keel with cutaway for augmenter tube. Add the half formers on one side, then the augmenter tube, and the other half formers. Fill in with the $\frac{1}{16}$ side keel pieces, and set aside to dry while shaping the wing. Sand this to a lifting type section, then seat on the fuselage and prepare the tail surfaces.

Fit the tailplane on the horizontal keel, ensuring that it is at neutral, then add the fin and $\frac{1}{8}$ square fuselage spine with its tail end fillet. The job now resembles the lower left photo, and is ready for covering. If you dislike the idea of Bristol Board, then stringers are a less realistic but effective substitute. Card patterns, drawn slightly oversize for slight building error allowance, are shown opposite and are arranged to butt join over the formers.

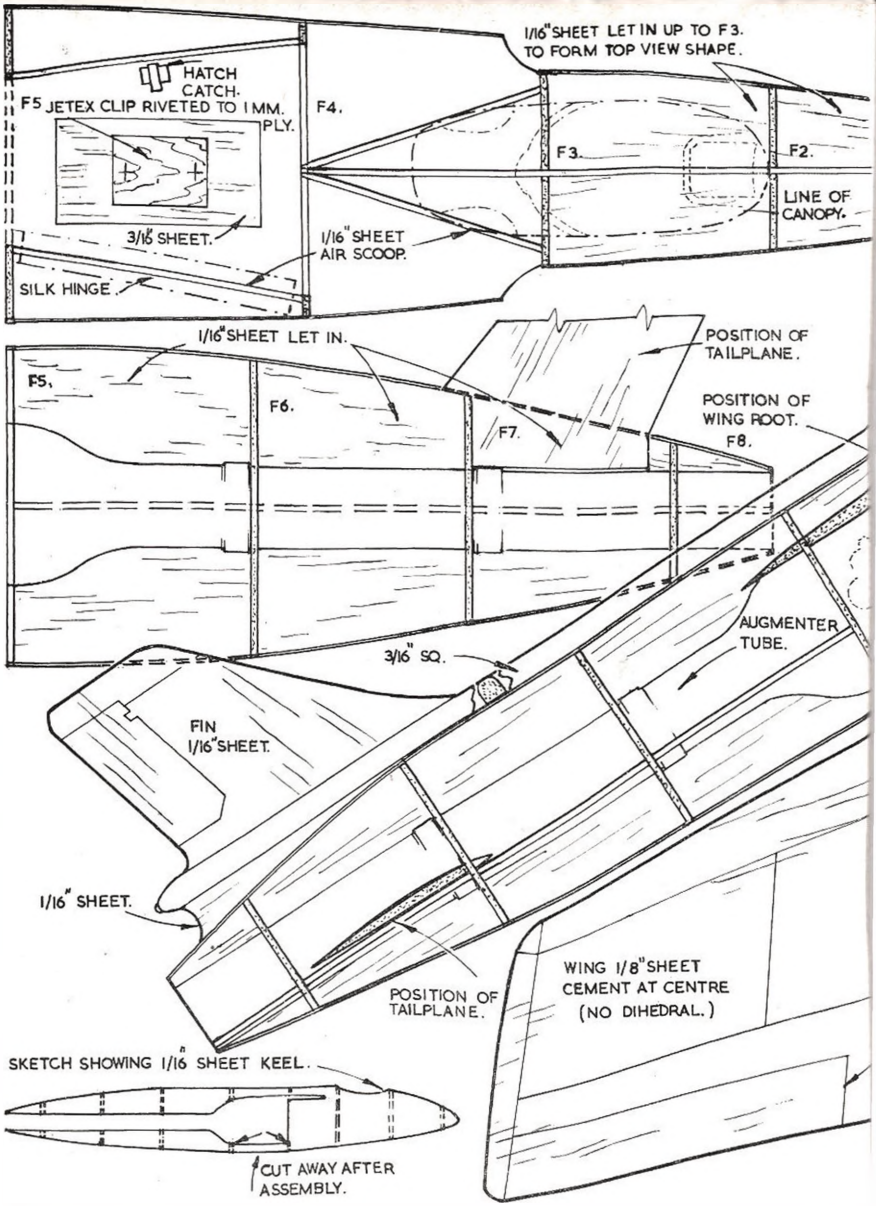
Fit a commercial canopy of nearest size or mould a scale one as described on page 134, and after filling the cracks in covering with a mixture of talc and dope, colour Delft Blue with Red letters.

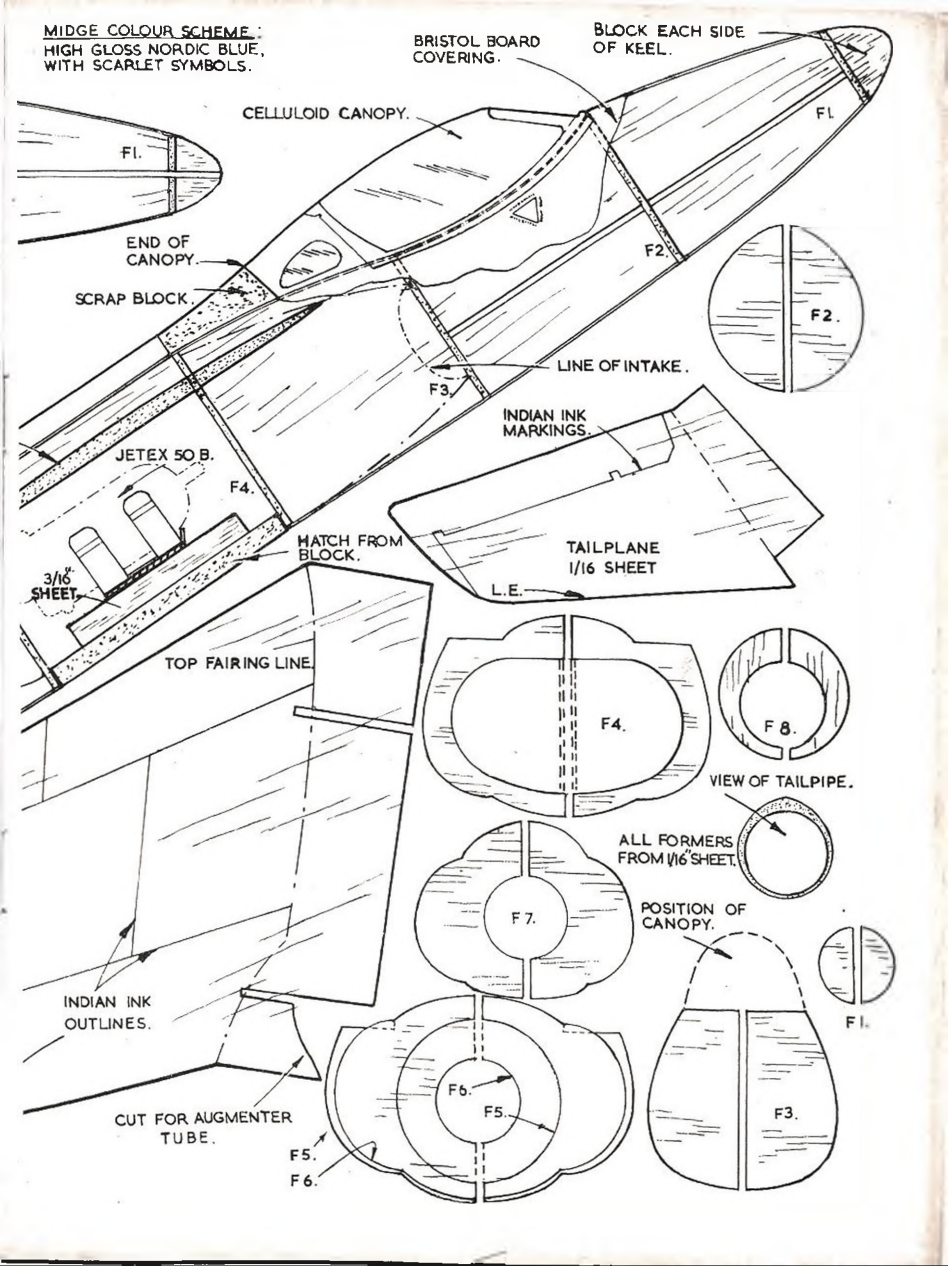
Upper Opposite: Underside, with 50b on opened hatch and Jetex box displayed for size comparison. Above: Designer and his Midge, he need not have looked apprehensive—the tests were quite safe and satisfactory! Below left: Uncovered frame before card covering. Right: The finished job and power unit. Scale air intakes are used for internal airflow





Full-size plans overleaf


1/16" SHEET LET IN UP TO F3. TO FORM TOP VIEW SHAPE.
HATCH CATCH.
F5
JETEX CLIP RIVETED TO 1 MM. PLY.
F4.
F3.
F2.
LINE OF CANOPY.
3/16" SHEET.
1/16" SHEET AIR SCOOP.
SILK HINGE.
1/16" SHEET LET IN.
POSITION OF TAILPLANE.
F5.
F6.
F7.
POSITION OF WING ROOT.
F8.
AUGMENTER TUBE.
3/16" SQ.
FIN 1/16" SHEET.
1/16" SHEET.
POSITION OF TAILPLANE.
WING 1/8" SHEET CEMENT AT CENTRE (NO DIHEDRAL.)
SKETCH SHOWING 1/16" SHEET KEEL.
CUT AWAY AFTER ASSEMBLY.


MIDGE COLOUR SCHEME:
HIGH GLOSS NORDIC BLUE,
WITH SCARLET SYMBOLS.
BRISTOL BOARD COVERING.
BLOCK EACH SIDE OF KEEL.
CELLULOID CANOPY.
F1.
F1.
END OF CANOPY.
SCRAP BLOCK.
F2.
F2.
LINE OF INTAKE.
F3.
INDIAN INK MARKINGS.
JETEX 50 B.
F4.
HATCH FROM BLOCK.
TAILPLANE 1/16 SHEET
3/16" SHEET.
L.E.
TOP FAIRING LINE.
F4.
F 8.
VIEW OF TAILPIPE.
ALL FORMERS FROM 1/16" SHEET.
F 7.
POSITION OF CANOPY.
F1.
INDIAN INK OUTLINES.
F6.
F5.
F3.
CUT FOR AUGMENTER TUBE.
F5.
F6.

Making your own ENGINE

Part four

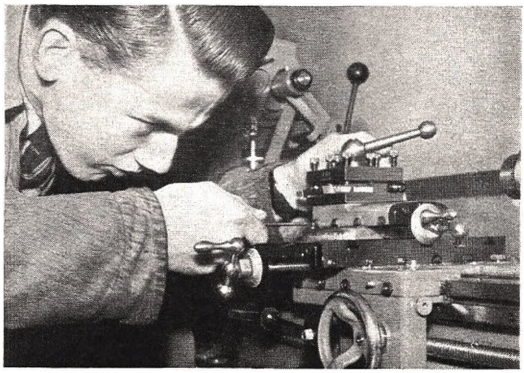
Machinery maintenance

and

useful Data tables

described by

Dave Sugden



Dave Sugden makes a routine check on the topslide adjuster of his Myford ML 7 lathe.

LIFE is made much more enjoyable if the lathe to be used is in good condition as there is nothing more exasperating than, after having spent half of the evening in turning a part, to have it ruined through no fault of your own as a result of some defect of the machine. Human error is too frequently responsible for the spoiling of a part and it is really worth while to see that the equipment is in the best possible condition. The major difference between working with wood and metal is that if a mistake is made, wood can be stuck back. Metal cannot. Thus every step must be taken with complete certainty that it will be correct. To do this a settled state of mind must prevail which can only be assured if there are as few irritants as possible, such things as loose slides, tight nuts which must be turned with a spanner the whole way, and spanners which don't fit anyway.

It is, therefore, well worth your while to spend two to three evenings in overhauling the equipment and putting it into good order. Common faults with lathes, in fact all machines, are loose bearings, sloppy slides, end float in spindles, etc. Since this is the case, manufacturers usually provide some means of taking up these slacknesses.

Loose plain bearings must be taken down, filed on the butting edges and scraped in. This is not easy and the aid of a skilled man should be sought. Some lathes like the Myford merely require special 2-thou. packing shims to be removed from beneath the bearing cap to take up the play. Spindles mounted on roller races will have some means of taking up wear which will also remove end play. Although end float has no effect in most ordinary turning work it can be responsible for poor facing or parting off, to say nothing of the havoc it can play with fins or screwcutting. It should be removed if at all possible.

Slides are easily tightened by means of the screws set into one side which bear on to the adjusting gib plate. It is as well to take slides to pieces to give them a thorough clean out should there be any signs of swarf being embedded underneath. Any burrs which are present must be filed away before the slide is adjusted so that its motion is even along the whole travel whilst being slightly stiff. Slackness in the saddle is taken up by similar means.

Rarely is a lathe found which will turn a constant diameter with the work mounted either in the chuck or between centres. By mounting a piece of 1-in. to 1½-in. mild steel bar with an overhang of about 5-in. in the chuck and without centre, a check on the effectiveness of your work on the bearings and slides, and the ability of the lathe to turn parallel may be made. With a correctly sharpened tool (*see* Part 3) a good 3½-in. lathe should take a ¾-in. cut without chattering along the whole length using automatic feed. This is governed by a combination of r.p.m., feed, and shape of tool, and requires much experiment or skill to achieve. It is possible for an unskilled person to turn the last 3 inches without having to drop the r.p.m. below 200. By taking a final cut of a few thou. the amount of taper present can be checked with a good micrometer. One to 2 thou. taper on the 6-in. length can be tolerated for model engines and for anything much above this figure, resulting from further checks, the headstock should be adjusted with the help of your skilled friend. The tailstock is mounted on slides which are perpendicular to the bed to provide adjustment for turning parallel. To check for adjustment for turning parallel the free end of the previous test-piece is centre drilled and the centre inserted. A small cut is taken and the taper measured. To correct this the tailstock is loosened and tapped in a direction across the bed away from the tool if the diameter is larger at the chuck end, and *vice versa*.

A bent spindle can only be corrected by turning up new back plates for the chucks and facing off the face plate. The former is a rather long job for which you may not have time, but eccentric chucks need not cause trouble provided that in certain cases care in setting up is exercised.

Slackness in belt drives is a common fault which should be rectified to obtain best efficiency. There is nothing so exasperating as to be constantly stopping the machine because the belt drives will not transmit the power. Both tool and belt are spoiled.

Next month we shall get down to the hard facts of "operations," but in the meantime, many readers want to know where the specified material can be obtained. Suppliers who advertise in MODEL MAKER are Messrs. H. Rollet Ltd., 6 Chesham Place, S.W.1 and Messrs. K. R. Whiston, New Mills, Stockport.

Metals for your engine

Material	Specification	Use	Ultimate Tensile strength tons/sq. in.	Colour Code Identification
Mild steel	S.1. ...	Cylinders when case hardened. General lightly loaded parts.	35	yellow.
Case hardening steel	S.15	Cylinders	35	yellow, brown, yellow.
	S.82	Crankshafts	75	green, red, yellow.
High tensile steel	S.96	Cylinders and crankshafts	55	black, red, blue.
Aluminium alloy	DTD 363 ...	Con Rods	38	brown, green, brown.
	DTD 364 ...	Con rods or general	30	green, brown, green.
Aluminium forging alloy	DTD 683 } RR 77 }	Con rods or general	31	blue, yellow, red.
	DTD 130 } RR 56 }	General	26	red, black, yellow.
Aluminium casting alloy	DTD 424 ...	Crankcase	10	
Phosphor Bronze	B.8 ...	Bearings	11	Brown.

Data sheet

cut out and paste on a board for the workshop

Heat Treatment

Tempering Temperatures		*Heat Colours*	
Colour	*Temp. C.*	*Colour*	*Temp. C.*
Pale Yellow	222	Dull red	650– 750
Straw Yellow	238	Cherry Red	780– 800
Brown	254	Bright Red	830– 880
Light Purple	277	Dull Yellow	1,050–1,150
Dark Blue	306	White	1,250–1,300

Screw Threads

BRITISH ASSOCIATION STANDARD

No.	Diameter ins.	Approx. T.P.I.	Root Dia. ins.	Tapping drill
0	.236	25.4	.189	12
1	.209	28.2	.166	19
2	.185	31.4	.142	25
3	.161	34.8	.127	30
4	.142	38.3	.111	34
5	.126	43.0	.098	40
6	.110	47.9	.085	44
7	.098	53.0	.076	48
8	.087	59.1	.064	51
9	.075	65.1	.056	53

WHITWORTH STANDARD

Size	T.P.I.	Root dia. ins.	Thread depth ins.	Tapping drill
1/16	60	.0412	.0107	58
3/32	48	.0670	.0133	50
1/8	40	.0930	.0160	41
5/32	32	.1162	.0200	31
3/16	24	.1341	.0267	9/64"
7/32	24	.1653	.0267	18
1/4	20	.1860	.0320	11
5/16	18	.2414	.0355	O
3/8	16	.2950	.0400	N
7/16	14	.3460	.0457	S
1/2"	12	.3933	.0534	13/32"

BRITISH STANDARD FINE THREAD

7/32	28	.1730	.0229	16
1/4	26	.2007	.0246	13/64"
9/32	26	.2320	.0246	15/64"
5/16	22	.2543	.0291	G
3/8	20	.3110	.0320	O
7/16	18	.3664	.0356	3/8"
1/2"	16	.4200	.0400	27/64"

Drill Sizes

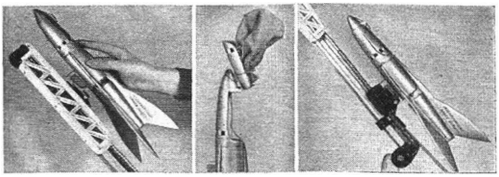
Number and Letter Drill dia.			
No.	Size, in.	No.	size in
1	.2280	52	.0635
2	.2210	53	.0595
3	.2130	54	.0550
4	.2090	55	.0520
5	.2055	56	.0465
6	.2040	57	.0430
7	.2010	58	.0420
8	.1990	59	.0410
9	.1960	60	.0400
10	.1935	61	.0390
11	.1910	62	.0380
12	.1890	63	.0370
13	.1850	64	.0360
14	.1820	65	.0350
15	.1800	66	.0330
16	.1770	67	.0320
17	.1730	68	.0310
18	.1695	69	.0292
19	.1660	70	.0280
20	.1610	71	.0260
21	.1590	72	.0250
22	.1570	73	.0240
23	.1540	74	.0225
24	.1520	75	.0210
25	.1495	Letter Drills	
26	.1470	A	.2340
27	.1440	B	.2380
28	.1405	C	.2420
29	.1360	D	.2460
30	.1285	E	.2500
31	.1200	F	.2570
32	.1160	G	.2610
33	.1130	H	.2660
34	.1110	I	.2720
35	.1100	J	.2770
36	.1065	K	.2810
37	.1040	L	.2900
38	.1015	M	.2950
39	.0995	N	.3020
40	.0980	O	.3160
41	.0960	P	.3230
42	.0935	Q	.3320
43	.0890	R	.3390
44	.0860	S	.3480
45	.0820	T	.3580
46	.0810	U	.3680
47	.0785	V	.3770
48	.0760	W	.3860
49	.0730	X	.3970
50	.0700	Y	.4040
51	.0670	Z	.4130

Wire Gauge

S.W.G.	
No.	Inches
0	.3240
1	.3000
2	.2760
3	.2520
4	.2320
5	.2120
6	.1920
7	.1760
8	.1600
9	.1440
10	.1280
11	.1160
12	.1040
13	.0920
14	.0800
15	.0720
16	.0640
17	.0560
18	.0480
19	.0400
20	.0360
21	.0320
22	.0280
23	.0240
24	.0220
25	.0200
26	.0181
27	.0164
28	.0148
29	.0136
30	.0124
31	.0116
32	.0108
33	.0100
34	.0092
35	.0084
36	.0076
37	.0068
38	.0060
39	.0052
40	.0048
41	.0044
42	.0040
43	.0036
44	.0032
45	.0028
46	.0024
47	.0020
48	.0016
49	.0012
50	.0010

TRADE NOTES

IN RECENT months we have printed pictures and complimentary remarks on and of the JETEX "tailored" scale kits. They are complete, they take every advantage of prefabrication yet they require enough building time to keep any modeller happy for a week. We thought them top of the kit poll—until this Space Ship outfit arrived for review. This is enough to rock even the most hardened of American pre-fab kit builders. The box weighs twice as much as one would expect, and opening the lid is like revealing the proverbial Pandora's box. Everything from injection moulded plastics, shaped hardwood and pressed balsa to a Jetex unit and augmenter tube—is provided in what must surely be the most involved piece of kitting this side of the Statue of Liberty.



Jetex Spaceship, about to be clipped on catapult seat at ramp top. Centre shows parachute deploying from nose and right, springs compressed and ready to fire

"Birdflite" Sopwith Camel solid

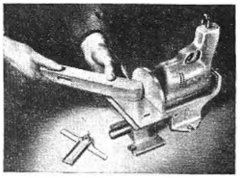
The spaceship, design influenced by Dan Dare the Hulton Press ace space rider, is only part of the kit. A launching ramp, complete with a formidable battery of coil springs and triggers is the other essential half. It has a rotating base, range of inclination and four very necessary "feet" to take the launch reaction. In fact, first operation of the mechanism strikes one rather forcibly as the recoil is akin to a powerful air rifle.

Ingenious Jetex unit mounting on a slider, arranges to lock the parachute hatch while thrust is "on." This is locked too, when loaded on the ramp, and ready for firing. When thrust dies "off," the hatch is free to open, and a rubber band flings open the nose for a 'chute in bright red nylon to let Dan Dare down with a modicum of safety.

As mentioned in *Motor Mart*, the 50 unit is a new one, and we suffered a blowout until we managed to get the springs in their right place—so see that you load up correctly. Red Spot fuel is definitely advised for maximum power—our efforts with standard fuel were of "false start" category, and just in case you are inquisitive and want to see how high it will soar without the Jet firing—*don't*—it will reach all of fifteen feet, the 'chute may not have time to work, and you'll be repairing the nose or fins if it lands on hard ground.

47s. 6d. sounds a lot for this kit: but you really get your money's worth. It needs only one thing to make it better—a polythene nose-cap for' chute failure landings.

Last month we mentioned **Birdflite** Veterans of the Air solids, and commented on the roundels—wishing they were transfers. Truth is that they *are* transfers, and we have made our Camel, cut out the paper roundels and stuck them on with cement! Told so by E. Law and Sons, the agents who sent us the kit, we soaked the surface off our cut-outs and lo and behold, we had what we'd been asking for. We wonder how many other modellers have been taken in—there is nothing to indicate otherwise in the kit.



Wulf sanding beach attachment

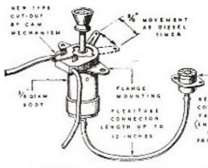
A handy sized tin pack for dopes is announced by Humber Oil Co. Ltd., the **Britfix** people—so many people were going to model shops for dope to touch up the car with or decorate some household item, that demand has made the new pack possible. A serve-yourself counter for this line will be seen in the shops soon—dealers are advised to get in touch with H.O.C. for same.

"Avian" Hawker Tempest solid by reader P. Dowling

Advert. by enterprising export expert, **Arthur Mullett** of Brighton

Latest H.O.C. dope pack

New Zealand's jet unit



New principles in latest Elmic timer to be produced soon

in December issue, included a red panel with details of his "Christmas Voucher" scheme. Idea was like the bookshop arrangement—you give your pal a voucher valued so much, and he can spend it on whatever he needs at the shop. This was mis-interpreted by some hopeful modellers, especially one from over the border in Dumfries, who sent his red ticket to Arthur, clipped from the A/M and saying "please send me an E.D. Hunter 3·46 and Skystreak 40, and p.s., the correct prop—on H.P." The red ticket was apparently expected to take care of a small matter of deposit, etc.! Another wrote that he "would be very grateful for an Allbon Merlin, because he has sent in the voucher." Ah well, you never get anything without trying!

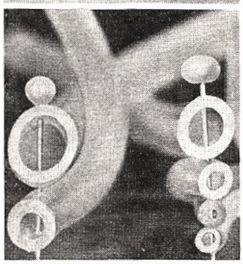
Additions to the useful range of **Wolf Cub** power tools seem to see the light of day with consistent regularity. Latest is the clever planing head with patent conical high speed cutters, and the bench sander which we illustrate. The value of the latter for modelling will readily be appreciated at a glance from study of this photo.

Motor Mart announced the existence of a New Zealand **Velojet** 50 unit last month, and we have now had the pleasure of testing a sample. Price in N.Z. is 13s. for the 50, complete with five pellets, wick, gauze and screw mounting clip, and for export this is reduced to 11s. A 100 unit is 22s. 6d. in N.Z.—and the same price export. Turned from the solid, it has many new features. The safety pressure release is at the front in the form of a disc against a pre-tensioned coil spring, and the screw cap is very easy to re-fit after loading. Constant use and corrosion make the cap difficult to *unscrew* without use of ill-advised pliers. Mounting in an "L" shaped bracket is simple. It is a very powerful, well-made job, manufactured by the **Betta** Model Aeroplane Supply Co., New Plymouth, N.Z.

As readers of the '54 "AERO-MODELLER ANNUAL" will have realised, we have strong feelings on the timer situation. Prolonged tests showed which was most consistant, and though some timers behave well in most conditions, all are susceptible to contest jitters. Den Elmes the pioneer of the slim tube timer and many other features of the modern airdraulic timer, has been on the chase for a dependable valve for many years. At last he is near the answer, and it will be a real timer for the modellers. Remote valve has an entirely new principle and can be set by graduated thumb wheel. The body will be slightly fatter, and mounting by flange. A cam will knip the tubing, and a swing arm be incorporated for simultaneous rudder action, etc.—and there will be no possibility of either failing or working one before the other. Sounds like the power modellers' prayer will be answered at last—this new **Elmic** is due to be ready in a matter of weeks.

Rubber fliers, or rather, those who fly rubber driven models, will like the new grade Pirelli

Ripmax accessories below



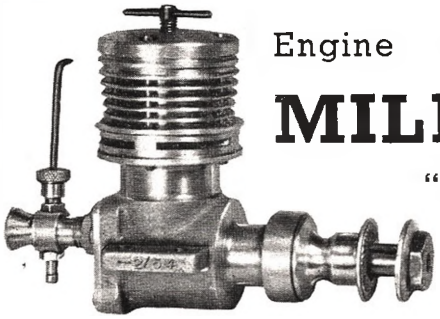
"Bateman" Hurricane solid builds up nicely for home decoration

now in stock at **Ripmax**. Selling at 14s. 6d. per lb. Max has just imported a weighty batch and Ron Warring gave it the works. Modulus figure is up by roughly 6 per cent. on the big stretch and that means greater initial power and better climb. *Perhaps* it was this rubber that John O'Donnell used to get so high in the fly-off at Epsom Downs on the occasion of the Bill White!

Max thinks that his new "Max-Flash" spark coil is the only one available on the British market, and we fancy he is right. A lot of time and trouble has gone into producing a really "hot" spark from a superior lightweight coil, which is economical on batteries, and at 19s. 9d. the spark ignition fans can get the best there is. Matching condenser is a .02 Metalmite, selling at 1s. 8d. We like the touch of putting an ignition circuit on the coil box—it saves so many questions afterwards.

Mystery photo on this page is the macaroni special sandwiched between the new range of Ripmax Dope brushes and the coil. Showing the six new sections of translucent fuel tubing with extra thick walls in almost actual size, this picture of two Ripmax glass-headed pins doing a job of work also serves to demonstrate the rigidity in section of this new tubing. A kink in the fuel line is virtually impossible.

Normally associated with fine diesels, the name of **Davies-Charlton** is now linked with a fine line of accessories. Props designed to match each of the famous "Allbon" engines, fuel, the universal engine test stand—and now the latest addition, a cast control-line handle. Finished in red cellulose, with one line adjustable, the D/C handle also features a spike end for sticking in the ground while running up the engine. The red handle should stand out brightly in the centre as you run to it instead of lying hidden in the grass. Price is to be 4s. 11d.



Engine Analysis No. 9

MILES 5 c.c.

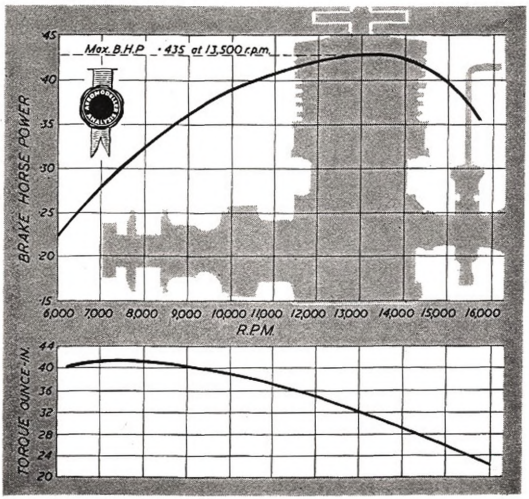
"SPECIAL"

Reviewed by

Ron Warring

LARGEST of the British production diesels, the 5 c.c. Miles is a "Special," in limited production at the E-D works at Kingston, Basil Miles the designer being, of course, chief designer of all the engines in the E-D range. There is a certain family resemblance between the **Miles Special** and the **E-D Racer** and, in many respects, it is rather like a double-size E-D 2.46. As such it could be expected to turn out slightly more than twice the power output of the 2.5 c.c. model (*more* rather than *exactly* twice the power, since the efficiency of miniature engines tends to increase with size).

In point of fact, test results confirmed these expectations. Incidentally, this also leads to a simple method of estimating propeller performance, power required to drive a propeller at any speed being proportional to $(\text{r.p.m.})^3$. Thus with *double* the available power, r.p.m. for any size of propeller should be equal to $\sqrt[3]{2} \times (\text{original r.p.m.})$. For example: On an 11×6, the E.D. 2.46 runs at 6,500 r.p.m. and the calculated figure for the Miles 5 c.c. works out at 8,450 r.p.m. The actual figure of 8,800 is a close enough performance, allowing for vibration, fuel variation, etc.



DATA

Displacement: 4.92 c.c. (.30 cu. in.)
Bore: .781 in.
Stroke: .625
Bore/stroke ratio: 1.25
Bare weight: 10 ounces
Max. B.H.P.: .435 at 13,500 r.p.m.
Max. torque: 41.8 ounce-inches at 7,300 r.p.m.
Power rating: .0885 B.H.P. per c.c.
Power/weight ratio: .0435 B.H.P. per ounce

Material Specification

Crankcase: cast light alloy, DTD 424
Rotor disc: aluminium
Cylinder: Centrifugally Cast Iron
Cylinder jacket: dural
Cylinder head: dural
Contra-piston: Cast Iron
Piston: Cast Iron
Connecting rod: dural
Crankshaft: Steel S.14
Crankshaft bearing: two ball races

Manufacturers:

B. C. Miles, by arrangement with Electronic Developments (Surrey) Ltd., 18 Villiers Road, Kingston-on-Thames.
Retail price: £8 6s. 3d., water-cooled £9 19s. 6d.

Propeller/R.P.M. Figures.

Propeller dia pitch	*r.p.m.*
11 × 8 (Whirlwind)	7,100
12 × 6 (Tru-cut)	6,750
10 × 8 (Truflex)	8,500
10 × 8 (Whirlwind)	8,500
11 × 6 (Whirlwind)	8,800
11 × 5 (Stant)	10,000
9 × 6 (Stant)	12,600
10 × 4 (Stant)	13,000
8 6 (K-K)	14,700

Fuel used: Mercury No. 8.

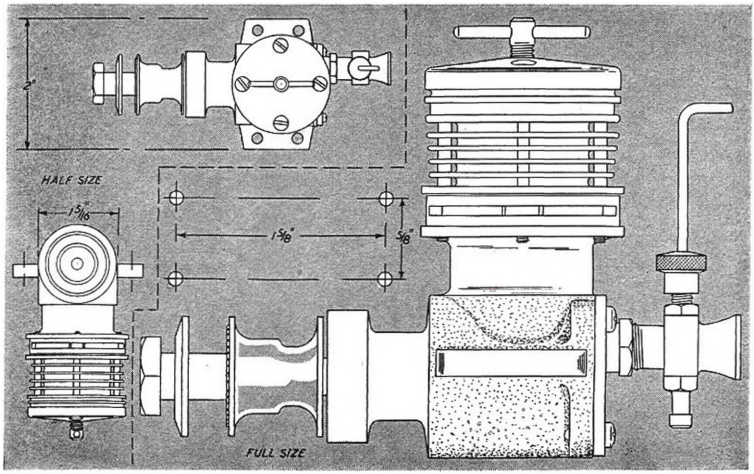
Diesels of 5 c.c. size are comparatively rare. Quite a number of different designs were produced when compression-ignition engines started to become the vogue, such as the Owat, Masco, Clansman, Weston, Vulture and Wildcat in this country; the Micron in France; and the Drone in the United States. All had a comparatively short production life, however. The field of "5 c.c. and over" tended first to belong exclusively to the spark-ignition motors, followed by glow motors.

One of the reasons for this was the difficulty associated with starting large diesels. A diesel propeller has to be flipped over smartly for easy starting and the larger the motor size the more compression and friction (and particularly bearing friction) and thus the greater the tendency for the motor to "brake" itself. As a consequence, instead of starting smoothly, large diesels were more apt to "pop" or just fire once and not "carry round" to the next compression stroke to repeat the firing cycle necessary to give continuous running. The smaller the propeller, the more aggravated this effect, so that finger starting with a small propeller was sometimes both a painful and "impossible" job.

The Miles Special gets round this particular trouble simply by having the crankshaft mounted on ball bearings. At starting speeds, in particular, bearing friction is a major "resistance" factor and with this reduced to a practical minimum, that smart flick-over readily becomes possible, even with a displacement of 5 c.c. At the same time, to be on the safe side, you still have to flip the propeller over *fast*—some people prefer to set the propeller against compression and hit the uppermost blade hard with the fingers, but hand starting is quite feasible, even with small diameter propellers. That, in fact, was one of the most pleasing features of the prop tests which have to be made independent of the dynamometer tests, for we had anticipated difficulties—and bruised fingers!—in even attempting hand starting right throughout the possible speed range. If you treat starting too gently, then the Miles will just fire once and stop, but the precaution we have seen some modellers take of wearing a glove or a fingerstall hardly seems necessary for all the normal sizes of free flight propellers.

Induction

The Miles Special has a venturi-shaped intake tube of generous diameter screwing into the crankcase backplate, intake port timing being controlled by a disc driven by the crankpin. A 90 degree port opening is utilised, starting roughly half-way up the compression stroke. The port then closes completely 180 degrees later, so late, in fact, that there was evidence of "blow-back" through the intake. Although this is by no means uncommon to racing engines, certainly the Miles appears most reluctant to hold a fuel line full of fuel after priming for starting and, in fact, the only true starting troubles we had were in finding the best position for the fuel tank. For easy starting, it seems necessary to reduce the suction head to a minimum, with the top of the tank approximately on a level with the bottom of the intake tube. A



higher mounting position is not advisable as a proportion of the tank fuel will tend to flow into the intake tube under gravity and flood the crankcase.

Best starting technique was found to be one or two choked turns, followed by a smart flick. The compression is backed off slightly for starting from cold. Starting with the engine warm control settings could be left alone and, provided the fuel line was full to the intake tube, flicking the propeller nearly always produced a start. If nothing happened within two or three flicks, a single finger choke was all that was necessary.

Excessive choking is to be avoided. One complete revolution with the intake fully choked and needle valve in the running position or slightly rich, sucks in a considerable quantity of fuel. And it the engine is inadvertently flooded, then it *is* difficult to start. But with a sensible approach, good starting, we reiterate, is one of the outstanding features of this engine. It will not seem so easy if you come over to it direct from a 1 c.c. size diesel, but the knack is just as readily mastered.

Controls we found quite flexible. We could start the Miles with the compression turned right back (mixture rich) and then adjust through more than half a turn, as necessary, to eliminate "missing". The needle valve also offered a marked control—excessively rich for slow, low power running or leaned out for maximum speed with any particular propeller load. As such, therefore, the Miles Special should be a good power unit for the larger radio control models, utilising a choke-type two-speed motor control, or the double-butterfly system originated at the E-D headquarters and demonstrated by Redlich and Allen with considerable success. The needle valve assembly is of the older pattern common on larger engines with a separate jet on one side of the intake tube, into which the needle valve itself is advanced or retracted by screwing, the needle being housed in a separate bush on the opposite wall of the intake. The needle valve, incidentally, turns independent of the knurled brass collar at its base. The latter is a friction locking device for the needle valve itself, packed with a gland to form a sort of stuffing-box—simple, and effective. The intake tube assembly screws into the back plate and is locked with a nut, being adjustable to position the needle valve upwards, sideways, etc.

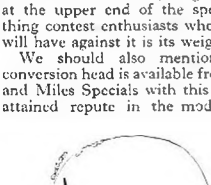
The massive crankcase unit is a sand casting, heavily machined to form the top collar locating the cylinder assembly, and also to form the front ball race housing and lightening "waist" behind it. The steel cylinder is quite massive with a wall thickness of roughly 1/16 inch, with milled slots for 360 degree transfer and exhaust porting. Clearance between the bottom outer cylinder wall and the crankcase forms the annular transfer passage, the cylinder thus being a "free" fit in the crankcase unit. It is located and locked in position by the light alloy cylinder jacket, the bottom flange of which is recessed to fit into the "collar" machined on the top of the crankcase unit. The head is separate, and also turned from light alloy, the whole cylinder assembly being held down by four long screws locating in the crankcase unit "collar."

The crankshaft is $\frac{3}{8}$ in. dia. stepped down to $\frac{1}{4}$ in. dia., mounted in two Hoffman ball races (rear $\frac{3}{8}$ in. bore, front $\frac{1}{4}$ in. bore) and is another massive unit, which is part-balanced on the crank web by reducing the thickness on the crankpin side. A keyway is cut on the shaft to which is locked a light alloy driver unit, with a $\frac{3}{8}$ in. diameter hub screw, the front end being typical of McCoy-style racing motor practice. The crankshaft, incidentally, weighs more than some baby diesels—$1\frac{1}{2}$ ounces.

The connecting rod is machined from hard light alloy (dural), reduced to $\frac{1}{4}$ in. diameter. The piston is strong and machined away as far as possible to reduce weight. The top is conical whilst the skirt is radiused off for clearance at bottom dead centre. Phillips head screws are used to hold the backplate in place with normal cheese-head screws for the cylinder fixing. No gaskets are used throughout, an indication of the extremely high standard of workmanship.

Summarising, a really powerful, robust and well made engine throughout with a good output all through the operating speed range. It will provide very high torque at r.p.m. values in the region of 8,000 for flying heavy sports models, or radio control jobs; turn a high pitch propeller fast for control liners; or give racing performance at the upper end of the speed range. The main thing contest enthusiasts who favour large models, will have against it is its weight—all of ten ounces.

We should also mention that a glow-plug conversion head is available from the manufacturers, and Miles Specials with this ignition have already attained repute in the model hydroplane world.



What's the answer?

That power model of Henry's was a potential contest winner—if only it wasn't so darn sensitive to sidethrust or rudder tab setting. You had only to breathe on the tab to change a left hand turn into a screaming right hand spiral dive.

Actually, that's an exaggeration. But the rudder tab was too sensitive for safe adjustment of the power-on circle. Henry got around that problem very neatly in the end. Have you any idea how?

What would YOU do in a case like this? Think a moment, then twist the page for one solution printed below:—

THE ANSWER . . . Henry adjusted the power-on turn of his model by using propellers of different pitches until he got the correct circling turn. A high pitch prop tends to make a power model fly straight or to the left. A fine pitch prop tends to produce a right hand turn. Somewhere between the two limits was the pitch Henry wanted.

CLUB NEWS

One of 1954's few fine flying days is recalled in this group of modellers from some of the clubs attending the '55 Congleton M.A.C. Rally. Several well-known North-Western faces are "among those present."

JUST AFTER Christmas we received a report from a club not regularly submitting news. On January 17th we received a letter from the P.R.O. taking us to task for not publishing the report. We-ell, we don't know how long some people think it takes to compile, print, and distribute a monthly magazine, but we would assure this P.R.O. that when his report reached us the February issue was already on the presses, and to put a special insert in is altogether too costly a proposition for one club report! To this and other new boys we would say that the 14th of the month is the latest date for copy, and that copy will appear, normally, two months later. In other words, material sent in by March 14th will appear in the *May* issue, which, since it is published on April 15th, means an actual elapsed time of one month. The same character bemoans the lack of acknowledgement of his report; once again, we do not make acknowledgement of club reports. We deal with a tremendous and ever-growing volume of correspondence at these offices, and four or five dozen acknowledgements each month could delay more essential items. Send 'em in, and they'll be published!

Midland

Two 1sts, four 2nds, and two 3rds in five combat comps entered is the **DERBY M.A.C.** record, top man being B. Adamson who becomes first holder of the club's Combat Challenge Shield. Team race is reviving in interest, while free-fliighters are going strong in all fields except rubber. Last year, the *Corsair* was adopted as a club A2 design, and K. F. Leeson won a comp. for this type. Latest power event went to D. Rippin's *Stomper* and a recent excellent flight was 8 : 50 O.O.S. in bad conditions by V. Mill's *Tadpole*.

A new club, **LONG EATON M.A.C.**, is concentrating on rubber and Jetex R.T.P. pending brighter weather, and devotes one club night per month to films. Address is at the end if you're local.

A film show is also being featured by **LEICESTER M.A.C.** on February 21st, and it is hoped that this will be as successful as the club's Annual Dinner, which drew 49 members and friends and showed a small profit.

Another A.P.S. design singled out for club adoption is *Black Chiffon*, a number of whichare being built by **SOUTH BIRMINGHAM M.F.C.** members, paid for entirely by club funds. The idea is that standardisation will bring a higher percentage of wins in forthcoming races. Other activities during the winter are Jetex R.T.P. jobs (meetings Fridays at Turves Green School, by the way) and V. George's boat, which is being used to test out R/C equipment ultimately destined for aircraft.

With the examples of Ray Monks and Phil Read spurring them on, every member of **BIRMINGHAM M.A.C.** has built an indoor job, and some excellent contests have been held. Meetings are held each Friday at the International Centre (opposite West End Cinema). Outdoors, activity is limited, except for unfortunate A. Jones who just can't trim his lightweight glider design—every one so far built has flown away on its first hop, fully D.T.'d! He's thinking of a folding wing D.T., on the theory of no lifting surface—no life!)

North Western

Plaques for Club Champion and top Rubber, Power and Glider scores are awarded annually in **ASHTON M.A.C.** C. B. Jackson collected the rubber in 1954, the others all finishing up on the J. Chadwick sideboard. Times in all comps. flown throughout the season count, which makes flying very keen, and to stand a chance of the Championship more than one class has to be flown. Combat is just getting an airing and a "stated time" event is shortly to be held—minimum 45 secs. and 60 secs. penalty if D.T. is used. Any model may be entered.

Hibernation is widespread in **HYDE M.A.C.** except for some R/C boat work. All ready for a decent day is R. Wilson, who is still hard at it for a radio duration record. Model is 7 ft. o.d., fitted with a 48 oz. tank and wind-assisted actuator.

Story from the recent **WHITEFIELD M.A.C.** scramble—winner B. Howarth's model on one flight contacted a farmer in an appropriate place, while the gentleman was bending over repairing a grate roof. The comments are not recorded, but, well, if they will pop up in unexpected places . . . . ! A subsequent duration event saw E. Horwich's job prang a brick wall; the Oliver Tiger and bearers bounced away separately and landed six inches from a manhole. As the owner aptly remarked, nearly seven quid down the drain! The contest was won by D. Willars flying a Frog 150 lightweight.

Indoor flying with microfilm and tissue has been occupying **BLACKPOOL AND FYLDE M.A.S.** with a great deal of success. A demonstration for the R.A.F. has been arranged in the gymnasium at R.A.F. Weeton, and the larger flying space will offer opportunities of raising club records and even, perhaps, one or two of the lower unorthodox national times. Great activity has led up to the Annual Hobbies Exhibition, which opened on February 5th.

Parents and relatives were invited to **WAVERTREE M.F.C.'s** annual prize-giving and film show, and a display of models, etc., was arranged for their edification. 1954 champion was D. T. Meinert, junior champion J. W. Catzergues. Last year J. Dutton launched his A2 at Clwyd, for a test flip, and lost it. The model has just been found in the Delamere forest, 25 miles from Clwyd, and the club want to know if this is the first glider to fly across the border? A2 is quite the favourite, and latest notion is the adjustable moment arm, which (*a*) allows experiment in trimming and (*b*) means that a long model can be fitted into a short box.

Southern

Slip of the typewriter in the **WEST HANTS A.A.** journal makes the use of metal propellers "prohibitive". Always thought that it was the replacement of wood props which was that! Round-up of the trophies goes like this—best all-rounder, Jetex, and A2, Bob Wheatley. Open Power, Open Rubber, and Concours (senior) S. Taylor, "H" T.R., stunt and speed, D. Seal, "A" T.R. P. Turnell, Open Glider C. Edwards, Concours (junior) P. Crabb. This issue of the journal also lists results of the W.H. R/C Glider Trophy, eventually held on October 4th. Despite bad weather, flying took place, and first three were W. L. Manuel (C.M), L. J. Moulster (Luton D.M.A.C.) and C. A. Rippon (W.H.A.A.). There was no prize for the biggest hole, but had there been, Rip would have had been way out in front!

Big improvements came in '54 for **SWINDON M.A.C.**, culminating in the winning of the Bartlett Trophy at Bristol. Teamwork contributed greatly to this success. Recent activities included a foyer display in a cinema opened by H. W. the Mayor of Swindon and incorporating an audience-judged solid model competition, and the annual dinner, which was also attended by the Mayor and Lady Mayoress. Front page coverage of these events in the local paper should help the club's recruiting drive.

A total membership of 154 is now enjoyed by the **READING S.M.S.** Needless to say, this club is gratified by the resurgence of interest in solid models. The 1955 programme will take in several model contests and a whole spate of aerodrome visits and flying displays.

The **DE HAVILLAND S.S.C.M.E.** is warming up and there is hope that C/L flying will be permitted on the aerodrome adjacent to the clubroom. With several experienced committee-men and encouragement from the company, the future should be bright for this club.

Postponed contests in **BOURNEMOUTH M.A.S.** were finally flown off at the close of the year. "Flown off" is not quite the

expression for the junior rubber and pay-load events, which had to be scratched due to lack of entries. Wakefield was won by A. Yale and both open and F.A.I. power by A. Arnold, flying a *Vapour Trail* type model using *Cumulus* wing and tail on a box fuselage. Three competitors turned up for the Seaplane contest, but trees round the pond upset the models—many of the attempts left the water, only to be forced down again by the downdraught off the trees!

East Midland

Big switch round took place at FORESTERS (Nottingham) M.F.C. A.G.M., only one of the officials remaining unchanged. In the winter comps. P. Ball has collected power, scramble, and chuck glider, R. Puddephatt stunt and combat, T. Woodward glider, and "Snr." Howard C/L speed. R/C and scale have yet to be flown. Sign of the times (?) was the total absence of entries for the junior cup. Wonder if a similar condition obtained for the club's turkey dinner?

London

Scale members of NORTHWICK PARK M.A.C. are most frequent visitors to the flying field at the moment, P. Babbs' *Skyeep* being a consistent and popular performer. The first ducted fan in the club is almost ready for trials, and if successful will be joined by similar models. On the comp. side, George Upson is putting in plenty of trimming time—almost a sole representative—but several C/L circles are in use on Sundays and the R/C fans take advantage of any reasonable weather.

Our Christmas design *Rubberdub* was adopted by more than one club as a one-design class. GRAYS D.M.A.C. ran a comp. for it and had five entries, none of which had flown before. Despite strong winds, winner K. Johnson recorded a 5-flight aggregate of 4 : 48. Membership, which had dropped to 9 three months ago, now stands at 19, largely due to the club moving into a brick hut 15 ft. x 11 ft., kindly lent by a local builder.

The Bill White and Winter Glider contest, held, incredibly, in flat calm at Epsom on January 9th, saw a tremendous fly-off—18 in rubber and 2 in glider! Six of those in rubber were CROYDON D.M.A.C. members, highest placer being J. North. 5th with two maxs. and 4 : 43, while J. Blount won glider with two maxs. and 2 : 43, flying a *Nebula*. New members are welcomed to club nights, Tuesdays at Woodside School, Morland Road (on 197 'bus route).

North Eastern

Bigger and better displays are planned by TYNEMOUTH M.F.C. after a successful year of demonstrations at fetes and the like. The main interest in the club still centres on team racing and C/L stunt.

With the club firmly established, THORNBY PATHFINDERS M.F.C. have branched out into a ladies' section. The girls have been given a separate clubnight which, presumably, will be spent embroidering club emblems on members' T-shirts?? Apart from combat interest (with Eta 29s, no less) squads of competition power jobs on the *Stunt Mist/Eliminator* pattern are being mass-produced; the secretary, an apprentice draughtsman, appears to spend most of his time drawing 'em up.

South Western

Winners of ILMINSTER D.M.A.C. winter concours were, scale branch, *Monocoupe* by A. Peppitt, (2nd *Douglas* 046a by L. Jackson, equal 3rd K. Priest's *Dart Kitten* and R. Sattin's *Fokker D.IV*); miscellaneous section, o.d. biplane *Stumpy* by A. Peppitt (2nd K. Priest's *Quichie*, 3rd R. Sattin's o.d. *Tuxedo*). A A/A team race was won by K. Priest with an Elfin 1.49 *Ranger*. Messrs. Peppitt and Priest thus collect the concours and C/L cups.

Newly formed and anxious to contact nearby clubs is BUCKFASTLEIGH M.A.C. (address at end) which has fifteen keen members but is rather restricted on flying sites. Any enthusiasts in the neighbourhood are asked to get in touch.

Northern

Winner of the first 1955 event in HALIFAX M.A.C., the Chamber Cup, was E. Northwaster, whose glider put up five 1½ min. maxs. for a clear win. The last '54 comp. was flown in a gale and was won by B. Summerscales.

Forty shivering LEEDS M.F.C. members couldn't get into their clubroom for a meeting (no one knew it was going to be locked!) so after a cold wait they repaired to the nearest tavern and met there. This rather restricted indoor flying, especially since F/F has ousted R/T.P. Lots of *Creeps* and modifications thereof are appearing outdoors, and radio and T.R. have their followings. G. R. Thorp has demonstrated that ballasted old-rule rubber jobs are definitely superior to new rulers in which the weight is distributed over the whole structure; he ballasts the u/c and strengthens the wing mounts, which keeps the weight close to the C.G.

Kit models dominated WORKSOP AEROMODELLERS' Boxing Day meet, a *Gnome* winning glider (against several A2's), a *Hot Dog* Jetex, and a *Junior Monitor* the C/L Handicap. P. Russell's 80 in. 4 E.D. 3.46 *Liberator* has successfully flown—130 hrs. building, 7 lb. weight, and clips off something approaching 70 m.p.h.

Spreading over from Halifax, *Creep* influence is making itself felt in BRADFORD M.A.C., and even Arthur Collinson is building one. J. A. B. Pannett's *Super Creep*, for a F/mg 500, is around 10 oz. lighter than his similarly powered *San de Hogan*, so the climb should be interesting.

South Midland

An interesting film of LUTON D.M.A.S. activities over a number of years was shown to the club by J. Emmerton as part of the winter programme, and another, by K. Wingrove, covering the 1954 rallies, is on the schedule. An enjoyable club dinner saw the trophies presented by Mrs. H. G. Hundleby, R. Brown and P. Mitchell being Senior and Junior Champions respectively. The former flew his *Flip Flop* to first place in the winter open rubber comp. recently. Later in the year an exhibition, both flying and static, is planned.

End-of-year comps. were stayed by R.A.F. HALTON M.A.S. and enjoyed by all. Noteworthy models in the club are L/A/A Collins' 75 in. Elfin 2.49 powered sailplane, A/A Cmdr.-Reed's beautiful *Monocoupe*, and A/A Smith's two-Elfin 2.49 *Grumman Skyrocket*, covered in silver wallpaper and quite a looker. A2 devotee A/A Webster is still pursuing his line of Nordics the latest crossing low aspect ratio surfaces and large fillets with a stick body.

East Anglian

New feature of the Area news-sheet is a building hint and tip department which is one of the most up-to-date and constructive we've seen. The feature discusses design trend and reports on results of experiments by fliers in the Area—most useful.

A new club is WITHAM M.A.C., complete with a large hut, and at present 18 members. All interests are catered for, from indoor R.T.P. to radio jobs; Wednesday night is club night, so why not get in touch?

Probationary scheme of CAMBRIDGE M.A.C. came in for some hot discussion at the A.G.M. Must be nice when you've so many potential members you can inflict a probationary period on 'em! The matter has been referred back to the committee for the time being, however.

South Eastern

Roy Panteney, keen radio flier from EASTBOURNE M.F.C., must know his range—he's been selected, with two other G.P.O. engineers, to sort out the far end of the new Transatlantic cable shortly to be laid. This will mean his absence for nine months. . . . wonder if Newfoundland will be seeing a black and yellow *Sparky* zipping about?

Tailless enthusiast Fred Smith of SOUTHERN CROSS A.C. completed a treble in flying wing wins by collecting the club's Swallow Cup with a high-wind aggregate of 5 : 07. Fred also won the club's Victor Ludorum with a narrow one-point lead over joint runners-up K. Donald and R. H. C. Smith. Lots of building activity is evident in the club, F.A.I. power and A2 mostly, with *Swiss Miss* and *Seraph* coming in for mention.

Lastly, Bob McKeon, 16, of 1331, Allerton S.E. *Grand Rapids, Michigan, U.S.A.*, is interested in corresponding with someone his age. He's a rubber and power fan.

Well, that's the 1*!?(=!!=!**%% . . .

Anybody got any typewriter anti-freeze?

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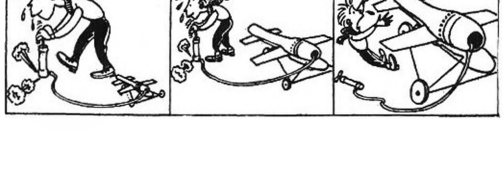
With acknowledgements to the Hungarian magazine "Repules"



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