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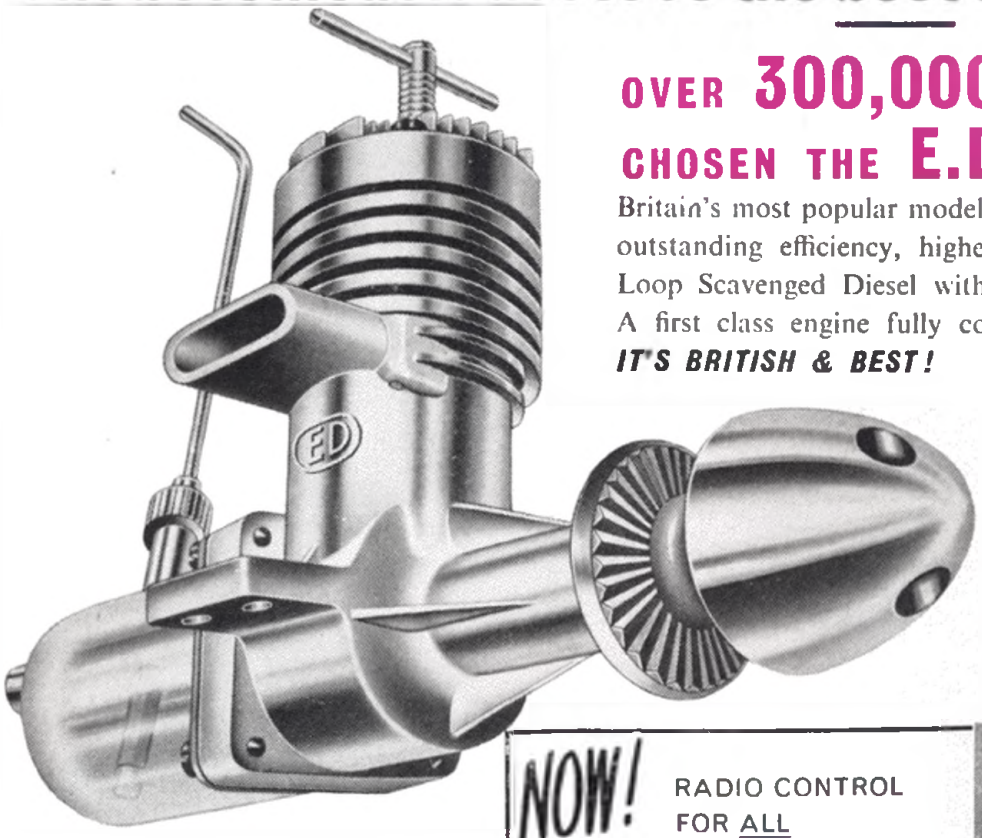

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AERO MODELLER

MAP HOBBY MAGAZINE

June 1962

VOLUME XXVII No. 317

contents

cover

Frank Lee Warburton of Bolton with two of his semi-scale control-line stunters. The **Stampe-Renard Monitor,** *resplendant in orange with black trim has been his favourite over the past year. It is decorated in memory of Leon Biancotto the French ex-aeromodeller aerobatic ace who tragically lost his life at the 1960 World Aerobatic Champs in Czechoslovakia; but not in this aircraft,—which was his favourite mount. The Monitor is to be found detailed on pages 294/5 of this issue. Creeping into the foreground is Frank's* **Picchio** *(in American style decoration), both models being created for .35—.40 cu. in. engines.*

next month...

Scale modellers who may have wondered why we have "skipped" the solid-scale plan for a couple of issues this year will appreciate the reason when they see July issue. AEROMODELLER'S renowned scale plan contributors have been engaged on some most difficult subjects and have established for the first time in each case, the true lines of the full size machine. July carries the first of these "time-stealers",—the *Etrich Taube* and Peter Gray has unearthed some remarkable detail. A Taube model will appear in natural colour on the cover. *How to run a model club?* This pertinent question is answered by what is recognised by us as one of the most successful clubs in Great Britain,—at Leicester. There is a lot to be learned from what this large group has to say. More *Modelling in Glass Fibre* by Kevin Lindsey, a resume of recent *World News*, another *Full size Plan* for a really novel free flighter and many other design surprises are in store for July edition. *On sale June 15th.*

other modelling angles...

Tight for space? Many a modeller finds that his working area is restricting his activity. Also, the accumulation of bits and pieces tends to over-run the household capacity. June issue of *Radio Control Models & Electronics* provides an answer that we have seen "in action". It is the Pete Holland "Carrylot"—and it really is just that. Packaway your trouble cures in one home constructed portable workbench cum store and you take the modelling room with you wherever you want, even to the flying field. It is much more than a gimmick and most useful for all radio controllers. In the same issue there's more gen on Transistor trends, an interesting feature entitled "Why use radio?", details of radio installation in a Destroyer kit for the nautical fraternity, more war on Gremlins, Gadgets illustrated and latest servo reviews.
The Marine Cameron 15 engine is tested in June issue of *Model Maker and Model Cars*, and to suit the 3.5 c.c. engine owners there is a forty-inch long power boat plus two outboard runabouts, one for electric power and the other for the glow-plug outboard units. More gen on radio in boats and a new Marblehead yacht design will give marine readers plenty to digest. The Ferrari Super Squalo in Prototype Parade series of scale plans leads the car side with plenty of support from latest news of track developments in electric car racing.

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CORRESPONDENCE anticipating a reply to addresses within the United Kingdom, must be accompanied by a stamped and self-addressed envelope. News reports should be submitted to arrive not later than the 15th of each month for publication in the next immediate issue. Photographs should be accompanied by negatives where possible and can only be accepted for use on an exclusive basis for British copyright.

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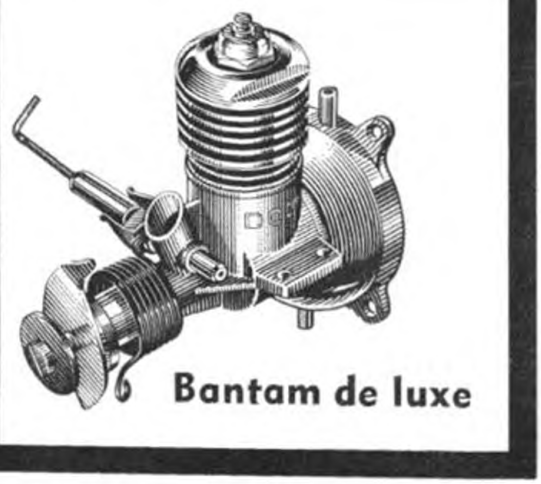

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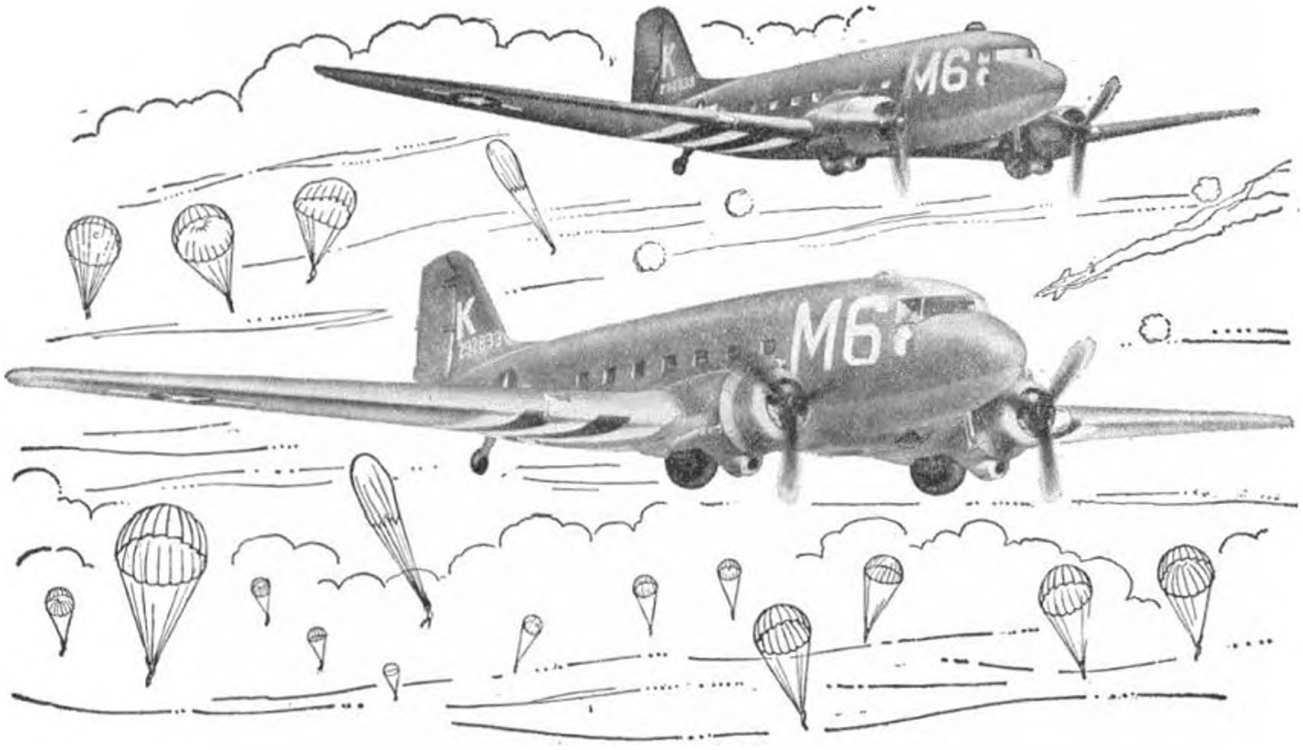

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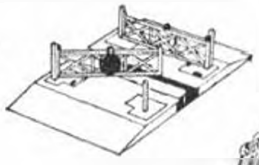

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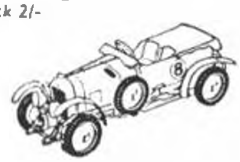

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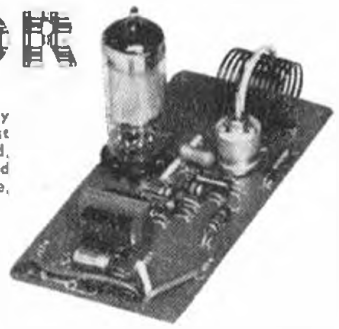

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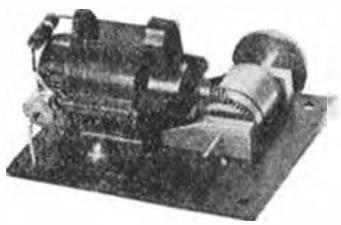

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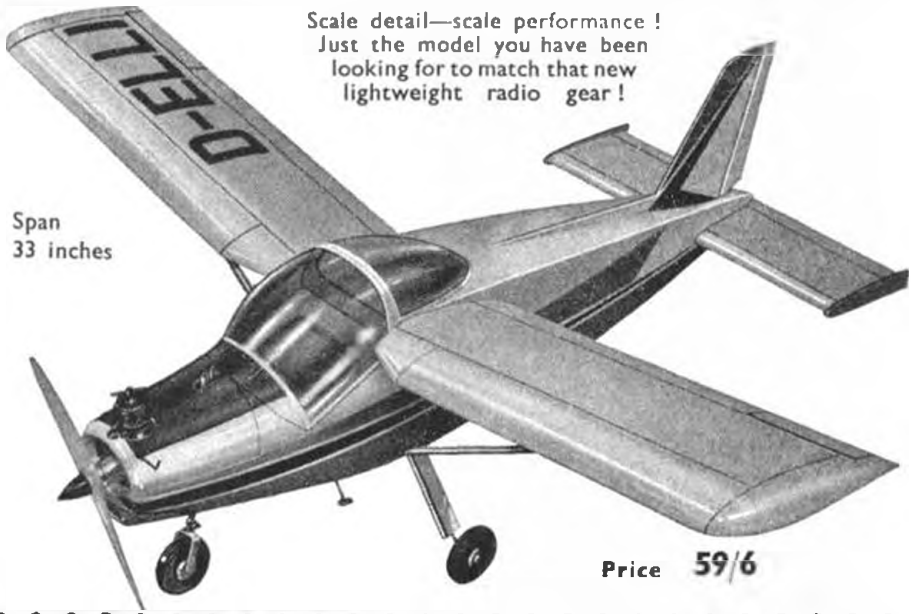

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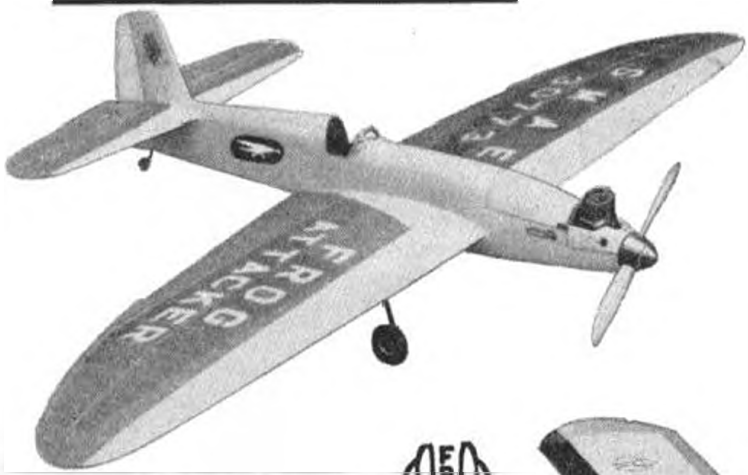

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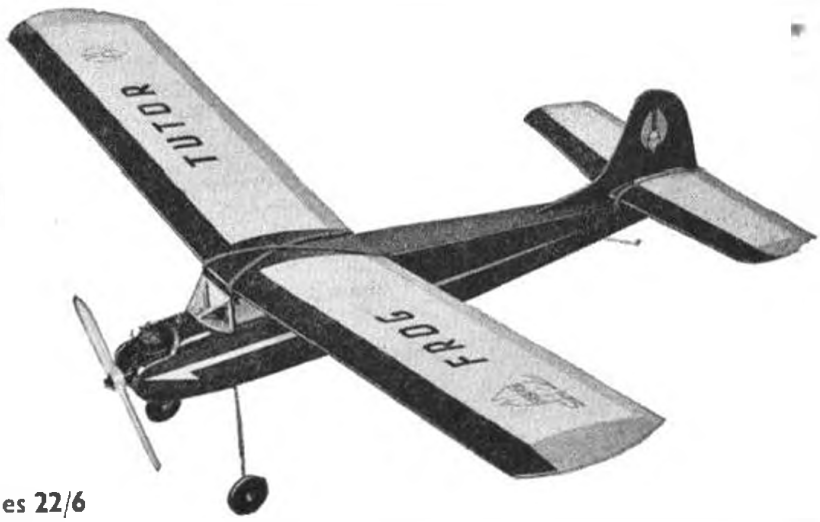

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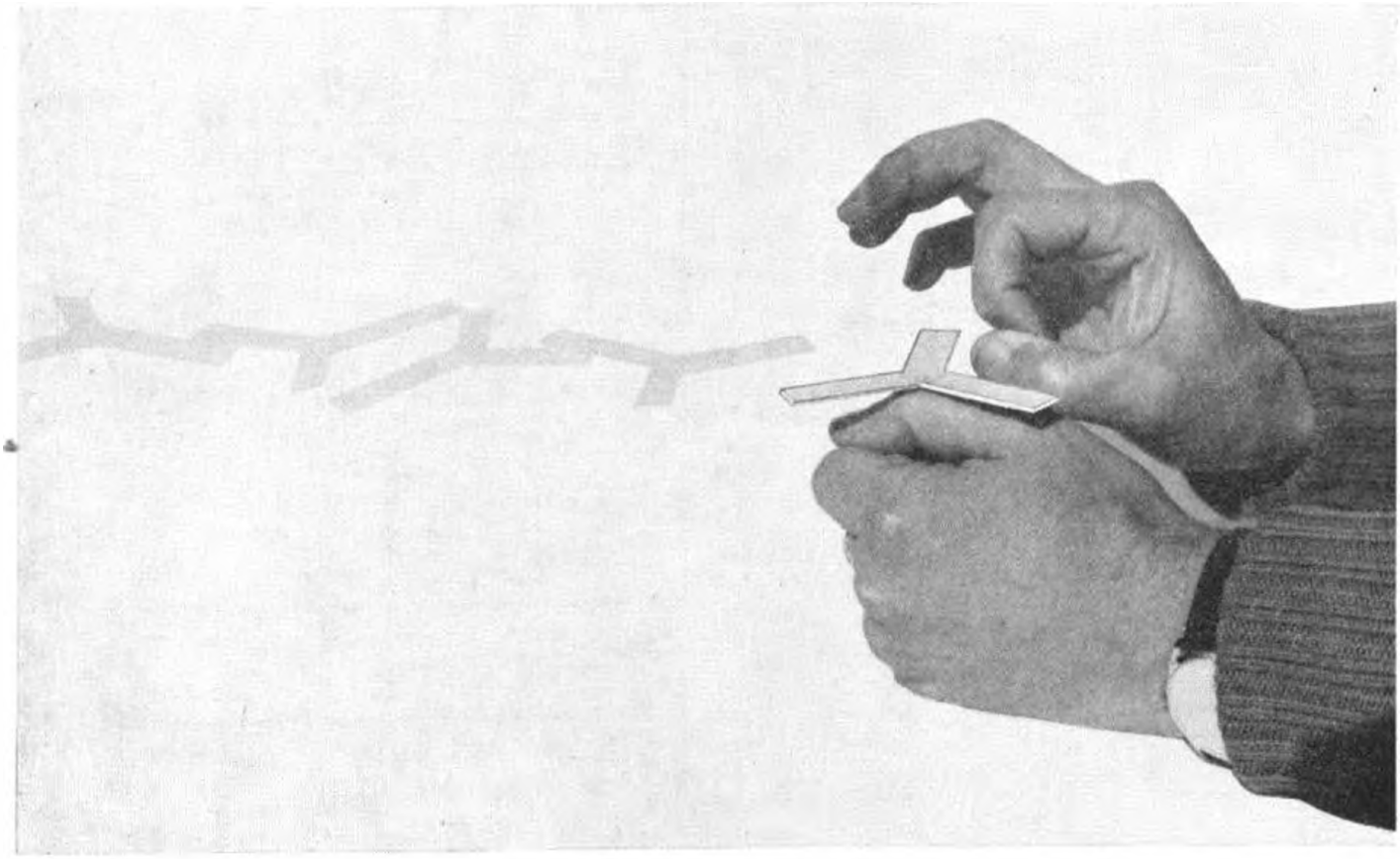
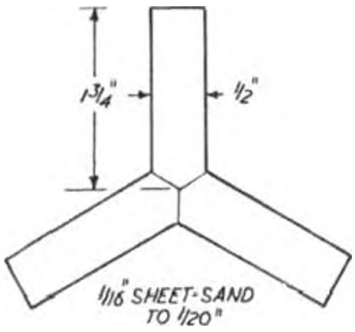


BALSAWOOD...



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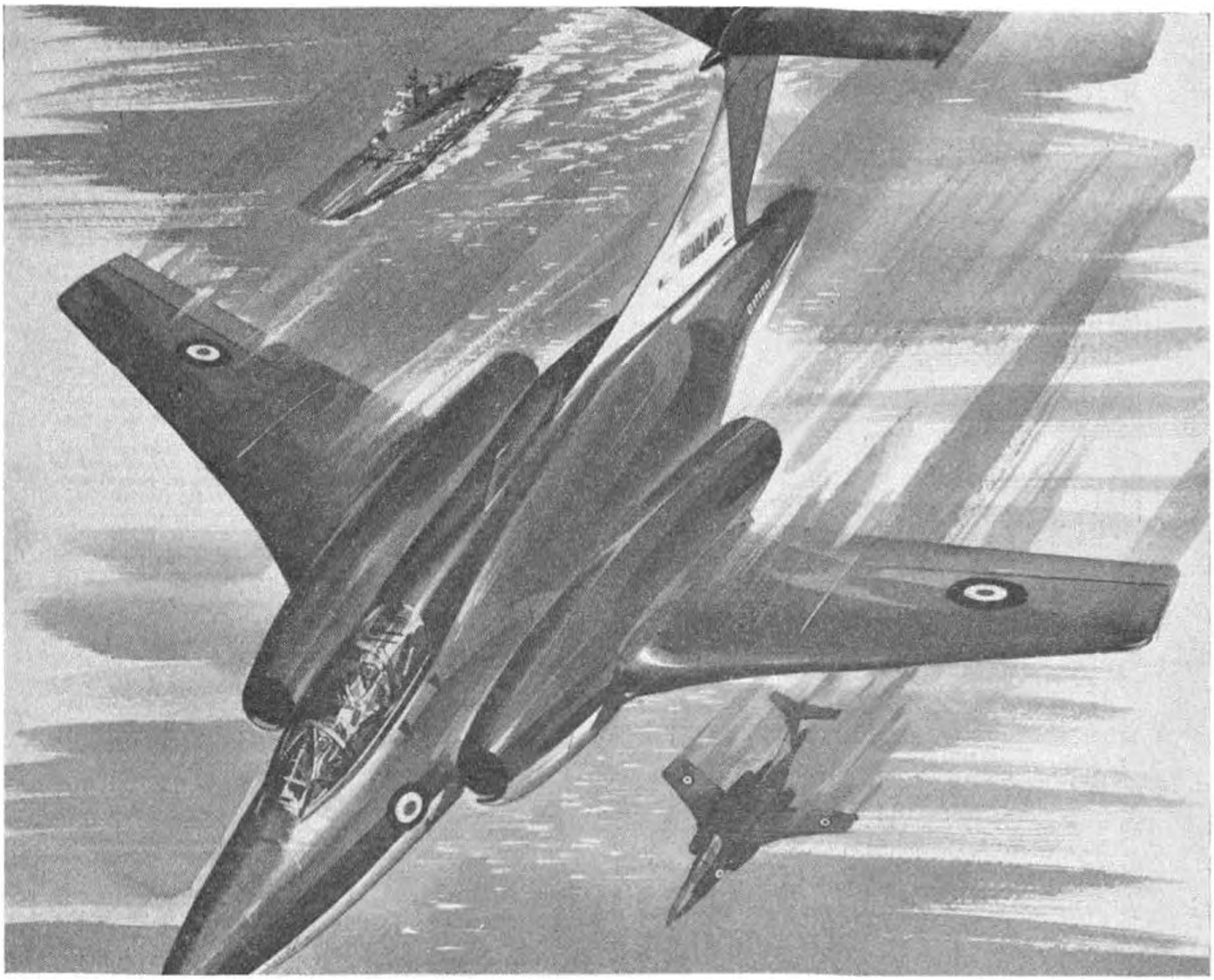

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ADDRESS _____

FAA.23

On 13th May 1962 the Royal Air Force celebrates its 50th anniversary of activity as an independent service. To commemorate the occasion there will be a number of displays at Stations throughout the country and, of course, the September "Battle of Britain" displays will have emphasis on the anniversary and veteran aircraft. Of particular interest to AEROMODELLER readers will be the exhibition at the Imperial War Museum, South Lambeth, London, to be opened on May 11th by the Air Minister and which will contain many hitherto unrevealed items in connection with early days of the Service and the Royal Flying Corps.
One very famous aircraft still happily flying around and to be seen at many displays the very last Hurricane to be constructed and in this photograph, taken at Bagington, Coventry, we see it in its current camouflaged scheme and carrying the unusual distinction of civilian registration G-AMAU as well as its service serial PZ865

Coupe d'Hiver Clobbered

The vagaries of British weather are always a mystery to visitors from overseas, but we expect that this report on the results of the British side of the Anglo-French challenge contest will create even greater mystification.

From 70 entries made in the event for models to the *Coupe d'Hiver* specification, we have received only four official results and a lot of excuses!

"*Weather has been impossible—hope you can arrange a further contest*"—B.F., Cheadle. "*Don't have to tell you how cold and windy it was*"—R.F., Sheffield. "*Owing to the exceptionally bad weather suffered in this area, we were unable to make any official flights—will be most pleased to compete in any future events*"—D.C., Canterbury. "*No results due to the continuing gale force winds and rain experienced in the Western Area—hope to be able to enter in your next*"—B.F.B., Bristol . . . and so forth.

Our weather diary indicated that in the London area the four Sundays in the month of March had the following conditions:—

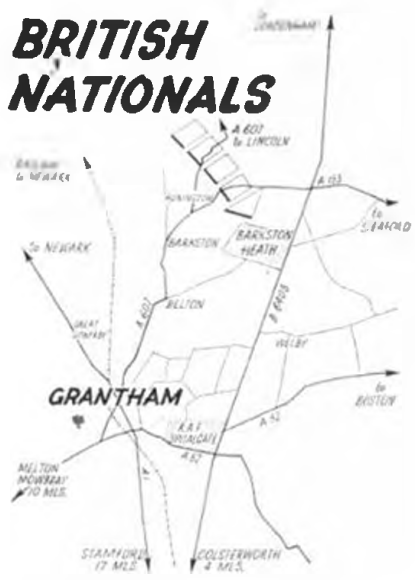
4th—freezing, 5 m.p.h. breeze.
11th and 18th—35—40 deg. F., 10-15 m.p.h. wind.
25th—43 deg. F., 20-25 m.p.h. wind.

There were ideal if not outright perfect conditions with *less* than 5 m.p.h. breeze on the 3rd, 6th, 15th, 17th, 20th, 27th and 29th. On other days the wind was anything up to 50 m.p.h. (under which conditions our cover photo was taken for this month, hence the "dug-in" wing tip on Frank Warburton's Monitor).

So it will be seen that wind, rain and ice took its toll of the entries. Most of the applicants for entry forms were well known names, but happily sprinkled with a few new personalities, although not as many as we would have wished. Several club groups have taken up the *Coupe d'Hiver* class and it is obvious that as with the A/1 glider, the event is just beginning to get a grip on the section of the movement which prefers to fly more for fun on the local field than to attend National competitions.

This was our intention and the rules were purposely left rather open, particularly regarding the number of attempts possible on any one day. This aroused suspicion in some quarters and the rules will undoubtedly need to be more strict for the next occasion. The Rise Off Ground rule is a bone of contention. One group maintains that it was not possible to take-off their field surface, but surely a short length of linoleum would have sufficed, for that was used by the winner who flew in perfect conditions on Sunday, March 17th, on our local flying

The Royal Aero Club silver medal awarded to S.M.A.E. Chairman, Mr. A. F. Houlberg, as reported in our April issue. This long overdue recognition of A.F.H.'s sterling services to the world of aeromodelling is the highest award yet made in Great Britain, although in our admittedly biased opinion a "gold" would not have been out of place!



What's on . . .

June 10th

Thurston Cup (U/R Glider)
Womens Cup (U/R Glider Rubber)
R/C Scale (R.C. qualifying flights)
Gold Trophy (C.L. Stunt)
Knokke No. 2 Trophy (C.L. Scale qualifying flights)
Team Racing (International Class)
Combat (Heats)
Speed

June 11th

Super Scale Trophy (f/f Scale qualifying flights)
Sir John Shelley (U/R Power)
Model Aircraft Trophy (U/R Rubber)
P.A.A. Trophy (Pay Load, Class A)
Ripmax Trophy (R.C. Mono control)
Team Racing (Classes ½A and B)
Combat (Finals)
Speed
Scale classes (Scale judging)

Nationals F.A.I. Team Race (Davies "A") will be run by *Hayes and D.M.A.C.* strictly to current F.A.I. rules, who wish to make the following announcement. We understand that the R.A.F.M.A.A. who are running ½A will be similarly strict.

Two circles will be in operation continually from 10 a.m. onwards on June 10th. Heats will be run every 12 minutes and will have 3 models each. Each entrant will fly two heats, the fastest of these deciding who goes into the 3-model final which will take place at 5 p.m. A clock maintained at B.S.T. will be in front of the control tent, heat times will be based on this and will be rigidly adhered to Entrants (who will be limited to 100 this year) will be supplied with their heat times (rounds 1 and 2) as soon as possible. No late entries will be accepted on the day. It will be impossible to process 100 models completely, but all models will be liable to spot checks.

No whipping, high flying or other misconduct will be tolerated. The timekeeper—lapcounter will be alongside the starting segment. The entrant will be able to check his laps from him if so desired. As last year, the three finalists will have three timekeeper—lapcounters *each* to eliminate possible timing errors.

field, which is probably the most restricted in all the Home Counties, surrounded as it is by factories, canals, electrified railway lines and paper mills. The three winning flights were made consecutively without false attempts.

The results from Great Britain are, therefore, as follows:—

				Total
1. G. Kent, *Watford Wayfarers*	120	106	100	326
2. J. O'Donnell, *Whitefield*	120	102	96	318
3. M. Stainforth, *Pontefract*	78.2	65	81.4	224.6
G.B. team total				868.6
4. M. S. Pressnell, *Essex M.F.C.*	53	66	64	185

Next month we hope to be able to print the official results, including French totals.

Aeromodelling on the map?

"Make a flying start to the season" is the heading for an advertisement which must have caught the eye of many aeromodelling readers of *The Motor* when it appeared in the Rootes Group announcement on March 28th. Heading the page advt. was a well drawn illustration of a typical modelling scene showing Pop adjusting the D/T on his A/2 glider and naturally enough, a Hillman Minx in the background with both doors open. Our congratulations to the artist for his authenticity and to the advertising agents for their enterprise!

Silencers

Still no news we regret to say of silencing development in the model trade, although we are given to believe that some manufacturers are earnestly considering that future products will incorporate silencer adaption. If we wait another year perhaps we shall possibly be able to adopt the winning entry in a Swiss Aero Club competition which has been launched for the best means of silencing a model engine. Results are to be examined in January 1963.

Public Relations

We consider it is largely the good work put in by model clubs throughout the length and breadth of the country in support of local fetes that maintains the best form of public relations for the hobby. On Whit Monday, June 11th, modelling goes into the Surrey County Show ring at Stoke Park, Guildford. Among the displays of farm equipment and produce, from flowers to horses, the Show Committee has set aside a section for the aeromodellers, including demonstrations and a competition. Boat and car modellers are to be similarly catered for and there is hope that this new section in the Surrey show will be an annual feature. We trust that the model clubs will give it their fullest support.

Achievement in Adversity

Regular readers will remember our mention in the March columns of this feature, together with photograph, of the use of aeromodelling for recreational training at Exhall Grange School, Coventry, for physically handicapped and partially sighted children. In the photograph John Williamson, aged 15, was shown with his Contest Kits *Inchworm*. On that ideal day of March 17th (see Coupe d'Hiver paragraph) "Willie" was anxious to try his model after altering the dihedral and made a test flight on about 100 ft. of line. It was the usual story of no dethermaliser fitted and soon the Inchworm was drifting in a thermal to be followed by the lads in great excitement with the duration called out at regular five minute intervals. Twenty minutes passed with it still in sight almost overhead. Alas like Icarus' it soared towards the sun, but unlike the wax which held Icarus' wings, the cement did not yield and gussets held fast.

The total duration in sight was thirty-four minutes and happily the model was recovered from a point five miles away on April 3rd. Such achievement provides a tremendous stimulus for these lads and we repeat our offer to put similar organisations in touch with Exhall Grange School should they wish to exchange experiences.

Winner of the *Aeromodeller/Modele Reduit d'Avion* Anglo-French challenge match for models to the *Coupe d'Hiver* specification, Geoff Kent of Watford Wayfarers with his *Garter Knight* built exactly exactly according to the plan, full-size copies of which were given away with our December 1961 issue. The Garter Knight is proving to be a most popular type even with expert modellers

Modelling with Glass Fibre PART ONE

By Kevin Lindsey

Author at left, seen with George Copeman and their two F.A.I. speed models, using G.F. and epoxy finish.

GLASS FIBRE CONSTRUCTION is gradually gaining popularity as a model aircraft constructional material. A deterrent is that little literature has been available on the uses of glass fibre (abbreviated to G.F. in the rest of this article) for aeromodelling. The author started using G.F. three years ago, using the *Bondaglass* Handbook, since all the work described has been done with Bondaglass products so all remarks apply to this brand although the principles are the same irrespective of brand.

The material consists of a glass-fibre (in the form of cloth, cord, mat or net) base which is used to reinforce a "body material" which is usually a synthetic resin. The resin, in itself, is stiff and hard, but has the property of being a liquid before being cured (by the addition of a catalyst, or by heating, or both). The glass-fibre is flexible and is immensely strong weight-for-weight. The combination of fibre and resin gives a strong, hard, but slightly flexible material which can easily be moulded and worked without the need of special tools or skills. The moulding can be done at room temperature without clamping or any form of pressure generation.

Production of Moulds and Mouldings

The three types of moulds commonly used are:—

(*a*) *Male mould*—the G.F. is moulded *over* the mould.
(*b*) *Female mould*—the G.F. is moulded *inside* the mould.
(*c*) *Matching male-female mould set*—the G.F. is moulded *between* the two.

How to Male Mould

Male moulding is the simplest system. The mould is carved from block balsa or softwood and sanded to a reasonable finish (the sort of finish obtained with fine sandpaper). No grain-filling or cellulose-finishing is needed, but to prevent the G.F. from sticking to the wood, the mould has to be coated with a release agent. A cheap and perfectly satisfactory release agent is furniture wax polish (the silicone varieties are best). The wax is simply rubbed into the wood, allowed to dry, then brought up to a shine with a dry duster (this shine serves no other purpose than to show that there is enough wax near the surface of the mould to permit release).

Moulding: the first step is to cut the cloth to size (or better, cut ½ in. oversize all round). Sharp scissors or a good modelling knife will do the job. The second step is to mix the required amount of resin with 2-3 per cent. of catalyst (say, equivalent to the amount of hardener usually added to fuel proofer). This percentage is not very critical, it merely means a longer or shorter setting time, but the resin and catalyst *must* be thoroughly mixed. Air bubbles inevitably get into the resin-catalyst mix (referred to as "resin" from now on) but these are unimportant so don't bother about them. Stir slowly and avoid air bubbles—it makes for a better laminate.

Step three is to brush a coat of resin on to the mould, say as thickly as you would brush on a coat of colour dope or slightly thicker. Then lay on the first piece of cloth and impregnate it with more resin, using a jabbing action and a stiff brush. Then add more layers of cloth (the number depending on the thickness of moulding required), impregnating each successive layer with more resin. The layers already on the mould should not be allowed to set before more cloth is added.

How long have you got to get all the cloth and resin on to the mould? At normal room temperature (60-70 degrees F) and with 2-3 per cent. catalyst in the resin, the G.F. moulding will start to set in about an hour, so try to get all G.F. onto the mould in half an hour.

The first stage of setting is "gelling", when the G.F. resin turns to a jelly consistency. This gell takes about 24 hours to become really hard, but if you are in a hurry, you could try using 5 per cent. catalyst, which would set the G.F. in 3-4 hours, or, elevate the temperature for faster curing.

If the mould shape is not too complex, the resin-cloth will conform to the mould contours perfectly without having to be held in position. More complex shapes can often be dealt with by the use of simple card jigs or light cotton binding. An example of what can be done with a balsa male mould and cotton binding, is the pulse-jet fuel tank in the photo. The tank was moulded in one piece (two layers of 9 thou' cloth), being lightly bound to the mould with cotton thread during setting, then sawn down the middle when set, the mould extracted and the two tank halves rejoined with resin and a ¼ in. wide G.F. internal reinforcing ribbon. The result weighs only 0.4 ozs. for its 110 c.c. capacity.

A single male mould is not much good for the production of a shape like that of the upper fuselage shell on an F.A.I. team racer. The upper shell, consisting of fuselage top, cockpit and fin, can be moulded in one piece, using a matching male-female mould set.

The other disadvantages of male moulding are:—

1. The G.F. surface has to be finished by rubbing down and polishing *after* moulding.
2. When G.F. sets in air, a sticky layer (about half-a-thou. thick) remains on the surface. This can be wiped off with acetone (about 3d. per fluid oz.) on a cloth, or scraped off with a knife.

Before finishing, the outer surface finish of the male moulding is not like that of the male mould. This is the

reason why it is a waste of time and energy putting a glass-like finish on the male mould.

Finishing the Moulding

The moulding is first rubbed down with a fairly coarse grade of wet or dry paper of 180 grade. Use lots of soap and water. When the surface has been rubbed down to a regular—but scratchy condition, change to a finer grade of paper (280) and then to grade 400. Finish off with metal polish. If you rub through the resin and into the cloth during finishing, brush on a coat of resin then re-rub down and polish.

The moulding is then finalised by trimming off the excess edge (cut $\frac{1}{8}$ in. oversize, remember?). Up to a moulding thickness of 25 thou., a Stanley No. 199 modelling knife can be used. Over 25 thou., a fine hacksaw is the tool.

A few final hints:—

1. The G.F. moulding inner surface will collect a thin layer of wax from the wood mould. This must be removed with Carbon Tetrachloride on a cloth, or with a scraper. If this is not done, anything you try to stick to the inside of the moulding will not properly adhere.
2. This also means that wax has been removed from the wood mould, so it must be given another coat of wax before further use.
3. *Do not* get wax mixed with the cloth or resin before moulding or the G.F. will not set.
4. The resin is inflammable.
5. The brush used for applying the resin can be washed out with strong detergent solution (two teaspoonfuls in $\frac{1}{4}$ pint of water) if the resin has not set. Resin can be removed from clothes with acetone when still liquid. Set resin *will not* come off with any known solvent.

Female Moulds

These can be easily made by first making a male mould as already described, then coating it with release agent, finally taking an impression of it in plaster of Paris. Mix up equal parts of Dental grade plaster of Paris (costs about 5s. for a 14-lb. tin from a chemist) and cold water. Pour this mix into a box (cardboard will do) which is about $\frac{1}{4}$ in. larger all round that the male mould. Push the male into the mix and hold it in position for two minutes, with the top of the male level with the top of the plaster. After two minutes the plaster should be stiff enough to hold the male position. The plaster will set hard in about an hour giving off water vapour in the process. One point here, plaster of paris starts setting very soon after being mixed with water, so try to have the male in position less than $\frac{1}{4}$ minute after mixing.

When the plaster is hard, remove the male, then coat the inside of the plaster female with release agent (wax as before). The finish on anything produced with this female will be *the same* as that of the female mould which is that of the wood male, so the male must be well finished with fine sandpaper, grain-filler and cellulose.

A female G.F. moulding is made in much the same way as a male. Brush a coat of resin onto the inside of the plaster female and allow to set, then add layers of cloth as required, impregnating each one with resin. A female moulding should only need the excess edge trimmed off before use. There will be no sticky layer on the surface and no wax on the inner side of the G.F. Hence the advantage of the female over the male.

Some G.F. users consider they improve on the simple plaster mould by lining it with G.F. This is done by making a moulding on a wood male, then taking an impression of both wood and G.F. in plaster of paris The outside of the G.F. is not coated with release agent (the wood male *is*) so when the plaster has set, the wood male can be removed, leaving a G.F. lined plaster female.

Matched Moulds

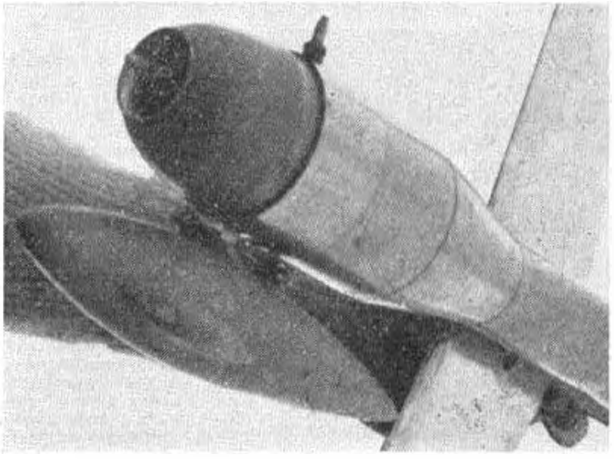
The use of a matching male-female mould set (with the female mould larger than the male by an amount equivalent to the wall thickness of the G.F. product) ensures perfect reproduction of mould contours. Making a mould set is much the same as making a G.F.—lined plaster female, but this time the surface of the G.F. is coated with release agent so that it does not stick to the plaster. The G.F. is thus only used to set the gap between male and female moulds.

Moulding technique is: coat the female and male with resin; lay cloth onto the male, then push the male plus the resin and cloth firmly into the female. Removing the set G.F. usually means a hefty pull on the male. This is made easier by fitting the male with a simple handle (screw it on). If the G.F. will not release, you probably didn't put enough wax on the male or female mould. But don't panic; just get a large hammer and break up the plaster female! After all, you can easily make another one.

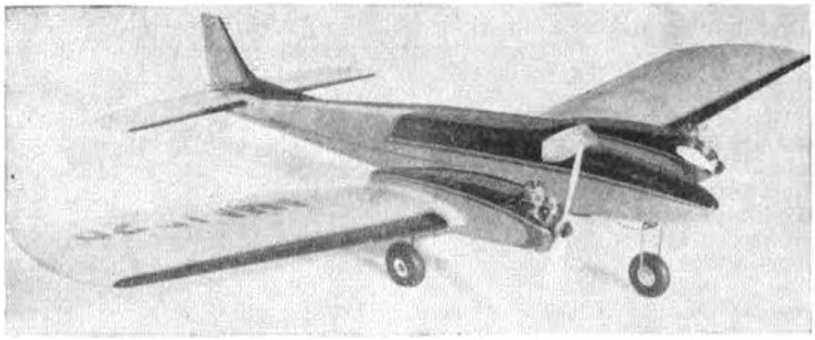
As with the female moulding, the only necessary work on the G.F. before using it on a model, should be edge-trimming. But the inner side will have a coat of wax on it; this must be removed as before.

With Bondaglass, a normal percentage of catalyst in the resin and normal room temperature, the G.F. should be ready for use after 24 hours. You can leave it in the mould for longer though if you are not in a hurry. Mouldings do tend to distort for a week or so after production, but the amount of distortion is very small and is of no importance in most model applications! Moulds should be good for dozens of mouldings.

One word here about materials. The manufacturers market glass fibre cloth (regular weave), scrim (a sort of rough weave) and mat (compressed fibres). I do not like the use of scrim and mat for model work, they absorb a lot of resin and are weaker, weight for weight than cloth. *Some* cloths have a one-way weave, that is, they are very much stiffer in one direction. So if your mould has tight curves, check which way this stiff "grain" goes if you use this cloth. The author has standardised on 9 thou' cloth to prevent accidental mix-ups of various thickness in the workshop which is about as orderly as a Hogmanay Party. *To be concluded, with details of Glass Fibre applications.*



Tank for a Jet model (Vulcan unit) is all Glass Fibre and 110 c.c. capacity for less than a half-ounce weight. Made with balsa mould and cotton binding, see text.



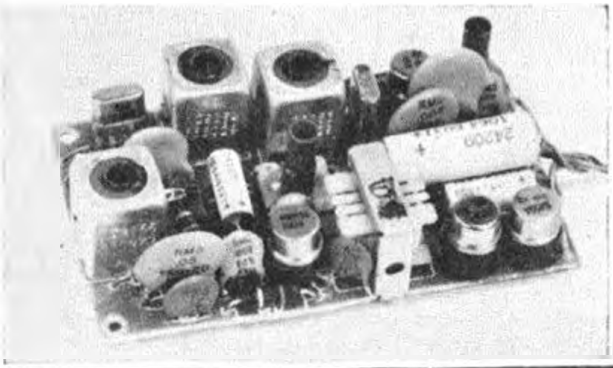
OVER the WAVES

Latest news of radio control activities

EVERYONE CONNECTED WITH our hobby realises that a lot of development can take place within the space of two years; but it took a personal visit by World Champ multi-flier Ed. Kazmirski to bring the fact home to us as far as R/C is concerned. Remember that meeting at Dubendorf practically 2 years back? That saw the introduction of the *Orion* (now indisputable leader in popularity throughout the model World) the transistor amplified servo (*Transmite*). The 45 engine with coupled throttle. The sprung and steerable nosewheel etc., etc. All these items are now accepted as commonplace and available to anyone.

People of Ed. Kazmirski's calibre are hardly likely to mark time so it was only natural that during our brief period with him while changing planes on the trip to S. Rhodesia for a demonstration tour, that we should enquire on the latest state of the art in the States.

The Orion is replaced by Ed's *Taurus*, kits for which are under way from Topflite. Salient differences which produce a slower, more aerobatic and constant speed model are:— 19 per cent. thick wing (NACA 2419). Longer tail moment (3 in.) shorter nose (⅜ in.) smaller elevators on higher aspect tail (1 in. extra span) steerable nosewheel with brakes, larger and more swept rudder, and most important of all, full span strip ailerons 1 in. chord. The model weighs 5½ lbs. with *Orbit* 10 Superhet, 5 Transmites and *Veco-Lee* 45.



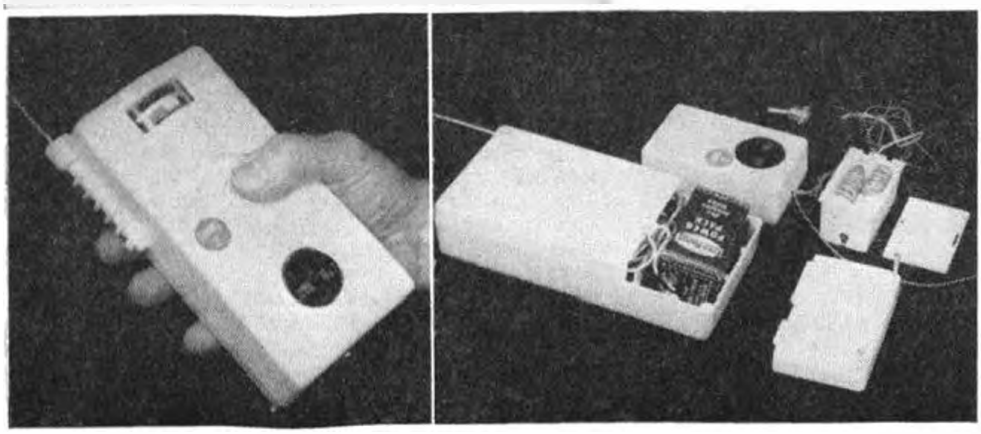
The thick wing stems from Ed's earlier experience of making a Smog Hog wing 17 per cent. thick for strength reasons. It turned out to be better in performance, largely due to the fact that the drag increase in dive manouevres prevent too great a speed build up and also through increased efficiency. The even thicker Taurus section, with large radius leading edge closely follows C/L stunt experience too. Ed. says that a 35 will fly the Taurus easily and his Lee is sleeved down to 0.21in. intake to reduce full throttle power. Strip ailerons have a wide neutral margin operating in the wake of the thick airfoil. They eliminate mass weight at tips, are smoother in reaction and far more simple to actuate from the servo. IBM computer connectors, sold to the model trade as *Kwik-Link* yoke assemblies and a Williams bellcrank modified are all that is needed to move the strip ailerons. (Sketch of Ed's system will appear in a future *R.C.M. & E.*).

"My little jewel" Ed's opinion of the 6 volt transistorised *Orbit* 10 simultaneous transmitter. Smaller, lighter and with "incredible range" according to Ed. It has a charger plug for the Ni-cad cells, meter for monitoring RF output, centre loaded aerial,—and a new Orbit emblem on front. Ed. also showed us a silver deposited nylon spinner from Topflite, new wheels by Les Fruh, chargers and battery packs etc. . . . but to hearten those languishing in jealousy,—he still recommends a wooden prop!

Advice to multi beginners

Ed. Kazmirski has the foresight to appreciate that refined development of multi channel designs can well lead to closing of the interest at novice level. When the hobby gets so specialised there's great danger of it losing its appeal to any but the already successful.

In answer he has produced for Topflite, the 57 in.



Heading shows H. deBolt's twin Viscount with original Fox 25 power now changed to Super Tigre 35 to avoid aileron resonance. Above left: inside the Wen-Mac "ground-air guidance system" Superhet Receiver. At far left the hand held tone transmitter with incorporated power output meter which indicates battery state. Complete set in other view shows transmitter with PP6 power pack, Superhet in case, switch and special plastic Receiver battery box for 2 Pen-cells and one PP3 power pack battery. Outfit worked immediately without tuning, ground range 100 ft. without aerial, over 2,200ft. extreme ground range

Tauri multi trainer for 2.5 to 5 c.c. Ed. has flown it with up to 10 channel gear but the plan is for 6 on rudder, elevator, engine plus steerable nosewheel. Wing area of 530 sq. ins. and flying weight of 4 lb. produce an easy to handle model that appeals both for clever design and appearance. We hope to tell more of it at a later date. "Any novice should have his model checked out by an experienced multi flyer" says Ed. "Too few take trouble to achieve trim, and unequal workmanship on wing panels, especially leading edges is the cause of many errors which are blamed on the design. Extremes of elevator trim should be useable,—one must know what to expect at each side of the trim range (5/32 in. motion at trailing edge). Be precise,—don't trust in lady luck".—all sage words from the World Champ.

Jackdaw Success

Taking advantage of the Easter Holiday, we enjoyed three days of flying with our *Min-X* 6 channel equipped *Frog Jackdaw* now fitted with *O.S. Max* 35. The vibration problem has been beaten with Hairlok and gear has been further rearranged with *Rising* trim servo on motor control, using full 6 channels. The Jackdaw has proved a first class multi trainer. With the larger engine it wallowed a little after stalls caused by slight over-elevation, but adjustment to tailplane and thrust line (three washers under the rear engine lugs for extra down thrust) cured the problem.

While maintaining a cautious eye on the transmitter HT voltage, we had not a single radio bother during the whole period and look forward to many more hours of multi fun.

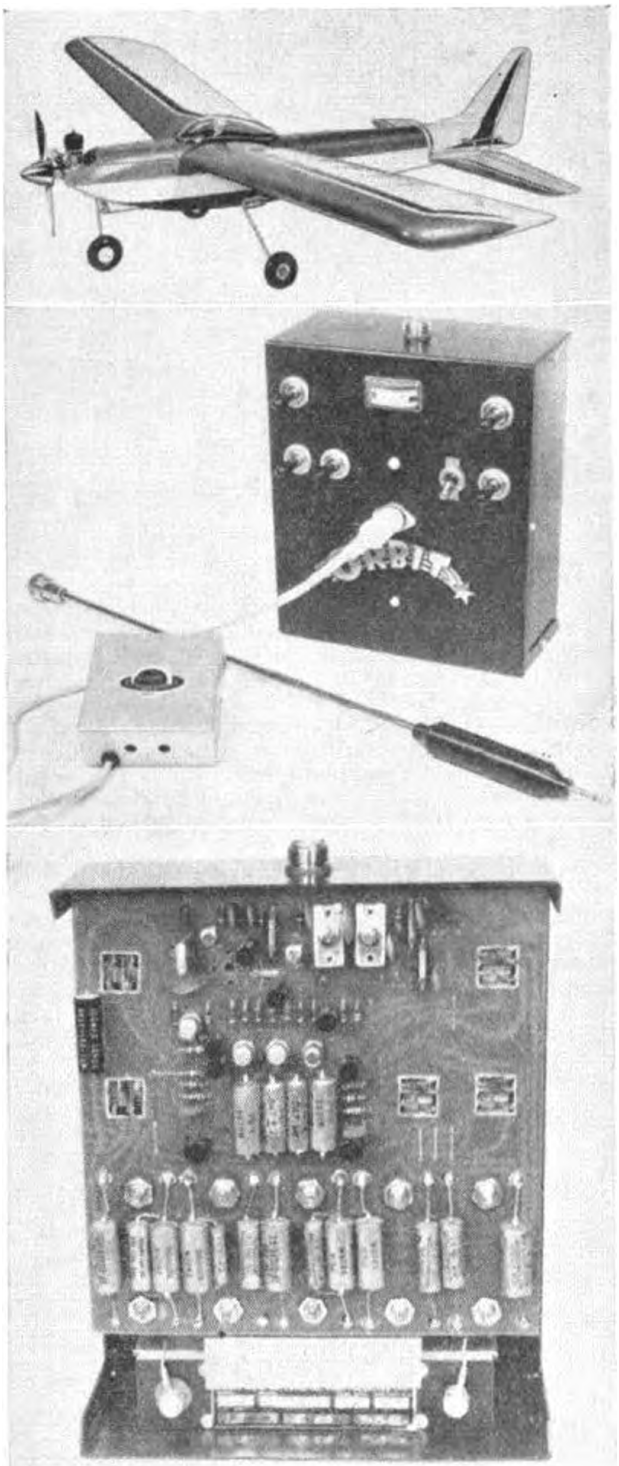
Multi Engined. Multi Channels

Not content with the "new" technique of the fully proportional *Space Control* radio, Hal deBolt has turned to multi engines. His *Twin Viscount* has two Super Tigre .35's for an exceptionally fast climb and an estimated 90 m.p.h. maximum speed, so one can imagine, the 1.2 b.h.p. provided by the engines pulls the 6 lb. model around at quite a rate.

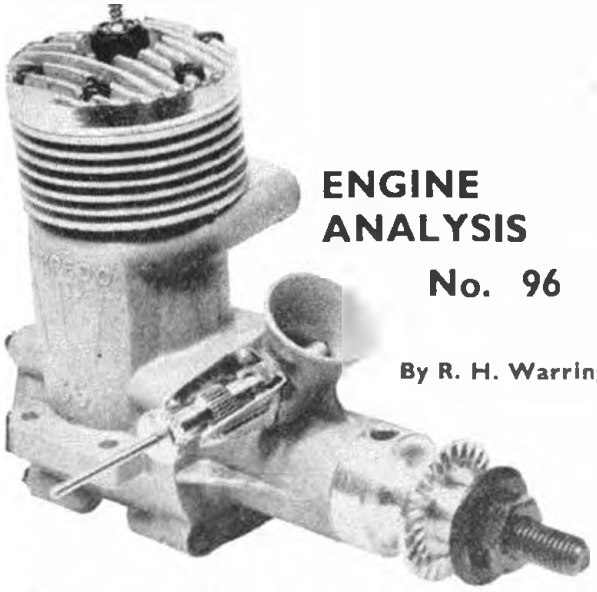
Hal says that there are no adverse torque effects and single engine flight is quite feasible using Space Control radio, steering the model with ailerons, while counteracting the assymetrical thrust with rudder. On the other hand the full power of a single engine will cause a spin, though recovery is effected by throttling back. In general, the flight characteristics are similar to those of a single engine machine, though the roll is faster, due to slipstream effect on the ailerons.

Twins have caught on in the U.S. it seems, for from the Los Angeles Radio Kontrollers newsletter we hear of Frank Johnson's *F-82 Twin Mustang*, built from a Sterling kit from the *P.51 Mustang*. A second fuselage and a 21 ins. centre section are added for a 67 in. span. At 11 lb. it needs two *K. & B.* .45 engines and dummy pilots, instrument panels, and trimmings make it look right. The model has already won a scale competition. it flies well but spins like a top if one motor cuts at full revs, so one must be quick on the transmitter to chop the throttle of the live engine!

Incidentally whilst mentioning the Sterling Mustang kit, we should add that Roland Scott sent along a kit for examination. The actual variant of Mustang which it represents is difficult to establish. Certainly it is *not* the most famous P-51D, but scrutiny and comparison of photographs from reference books would indicate that it bears most resemblance to the P-51H. Wing span is 66 ins. and at the cockpit, the fuselage is no less than 11½ ins. deep. Plan is well detailed and gives an excellent pictorial wiring diagram for ten channel installation using six servos, the motor servo, interconnected with one for the flaps. The cockpit cover is in itself quite an achievement, moulded from 1/16 in. acetate and very very rigid measuring 13½ ins. over its length. British price is £12 18s. 6d.



Top Ed. Kazmirski's *Tauri* design for Top Flite to be kitted very soon shows parallel chord wing, simple tricycle u/c and practical lines for this multi trainer. Centre is the new Orbit 6 volt transistor transmitter with centre loaded aerial and charger unit plugged in for overnight topping up. Bottom pic illustrates glass fibre mounting plate for this new Tx, Ni-Cad batteries in base, 5 lever switches supported in the circuit board and only 7 transistors on our count. A particularly well made and designed unit with ample space between components. U.S. price is $118.50 plus $29.95 for the power pack and charger.



ENGINE ANALYSIS No. 96

By R. H. Warring

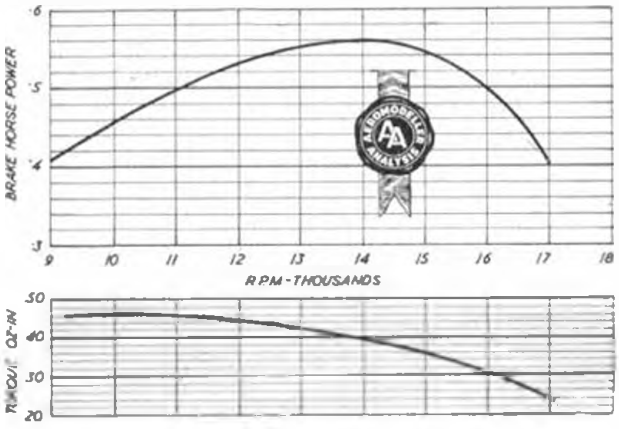
K & B 35 Series 61

THE K. & B. "SERIES 61" range represent a redesign and uprating in performance of their .15, .29 and .35 models with the intention of providing "tuned engine" performance from stock production units. This is backed by first class production technique and quality control, the standard of K. & B. workmanship being, in our opinion, of the very foremost precision engineering quality. The "35" is no exception—in fact we like it best of the "Series 61" models we have handled.

It is a large, powerful engine, designed specifically to give extra power and performance for large combat or stunt models, yet it is one of the nicest glow motors of any size to handle. It looks right, sounds right, and *feels* right.

Certainly starting is no trouble at all with the K & B "35". Finger choking is adequate, although you can prime through the exhaust as well if preferred, and the engine will run strongly over a very wide range of needle setting. From a "minimum" lean" setting there is an appreciable increase in speed obtained by opening up the needle valve, which then slowly falls off again with further opening up until it is four-stroking.

Although designed to accommodate the hotter fuels, we feel that cost of operation is expensive for prolonged control line flying, as this engine is intended for. All tests, therefore, were conducted on straight fuel and thus represents a *minimum* performance of which this engine is capable. The makers specify 40 to 55 per cent. nitromethane for contest work (at a current price of something like £10 per gallon, when obtainable!) and such a mixture would undoubtedly give a substantial increase in maximum power. However, our test figures showed a peak B.H.P. of .56 developed on straight fuel, which should be more than enough for most "35" power applications, and running and handling characteristics were particularly smooth even without "dope".



Layout and main design details follow that of the K. & B. .15 described in AEROMODELLER April 1962 issue. Most noticeable departure from orthodox K. & B. practice is in the use of the Wisniewski developed grooved crank web with pressed in crankpin and light alloy rim. Whereas we criticised the amount of metal left holding the pin in place on the smaller model (April issue) this cannot apply to the "35", which would appear to have ample strength in this respect.

The stepped crankshaft has a main diameter of ½ in. diameter, reducing abruptly to ¼ in. diameter at the front race. The stub shaft emerging from the bearing is fitted with a turned dural driver which is pressed in place and locked with a cup-pointed grub screw seating on a flat on the shaft. The ¼ in. diameter propeller shaft is then simply a length of steel studding screwing into the propeller driver and carrying the propeller washer and nut. This form of composite construction is clever, efficient and, in our experience, troublefree.

Induction hole through the shaft main diameter is ⅜ in. opening into a large rectangular port. The port opening has been machined across square and appears also to have been finished with a vertical tool resulting in slight shaft diameter relief on either side of the centre of the hole. Pin and shaft journal lengths are finished by grinding after hardening. The ball races are lightly fitted in their housings. The rear (½ in.) race, in fact, does little more than locate in the bearing casting recessed to less than half the width of the outer ring. The shaft is an easy sliding fit in the races and also a good "glow motor" fit in the plain length of bearing between the races, to act as an oil seal. The rear race is of substantial proportions but the front race is of the lightweight type.

The front bearing housing, incorporating the intake tube, is a separate casting which attached to the main crankcase unit with four screws. It is possible to assemble the engine with the exhaust pointing to either the left or right, but there is an appreciable loss of performance in our case unless assembled in the designed manner.

The crankcase casting comprises the main crankcase and cylinder with integral stub exhaust and cast in transfer passage. Crankcase bore and cylinder bore are both machined with a high quality boring tool leaving

Specification and Propeller-R.P.M. figures

Specification:
Displacement: 5.78 c.c. (.3574 cu. in.).
Bore: .790 in.
Stroke: .719 in.
Bore/stroke ratio: 1.1.
Bare weight: 8¾ ounces
Max. power: .56 B.H.P. at 14,000 r.p.m.
Max. torque: 46 ounce-inches at 10,000 r.p.m.
Power rating: .097 B.H.P. per c.c.
Power weight ratio: .063 B.H.P. per ounce
Material Specification:
Crankcase unit: light alloy pressure die casting
Separate front bearing housing casting
Cylinder: Mechanite
Piston: chrome plated steel, ground finish
Crankshaft: hardened alloy steel, composite assembly, "electrolized" crankpin
Connecting rod: light alloy forging ("electrolized")
Cylinder head: light alloy pressure die casting ("electrolized)
Spraybar: brass
Bearings: ½ in. diameter ball race (rear) ¼ in. diameter ball race (front)

Manufacturers:
K. & B. Manufacturing Corp., 12152 S. Woodruff Ave., Downey, California, U.S.A. Retail price in U.S.A. $19.95.

PROPELLER—R.P.M. FIGURES

dia x pitch	*r.p.m.*
9 x 6 Frog nylon	13,600
8 x 4 Frog nylon	15,700
9 x 4 Frog nylon	13,500
11 x 4 Top Flite nylon	10,500
10 x 6 Top Flite nylon	10,600
10 x 3½ Top Flite nylon	14,000
9 x 6 Top Flite nylon	12,600
12 x 4 Keil Kraft nylon	10,500
11 x 4 Keil Kraft nylon	11,700
10 x 4 Trucut (wood)	11,700
11 x 4 Trucut (wood	9,400
10 x 6 Trucut (wood)	11,000

Fuel: Frog Red Glow

a particularly fine finish—the crankcase also being marked for withdrawal of the tool in a particular position.

The soft cylinder liner is machined from 1 in. diameter stock Meehanite, reduced to .890 in. overall diameter with a small flange at the top. Exhaust and (upper) transfer ports are rectangular, of identical proportions, diametrically opposed and with approximately 85 per cent. overlap. Bottom transfer ports are a pair of drilled holes 9/32 in. diameter. The liner is ground outside to finish and is a tight "plug" fit in the crankcase casting.

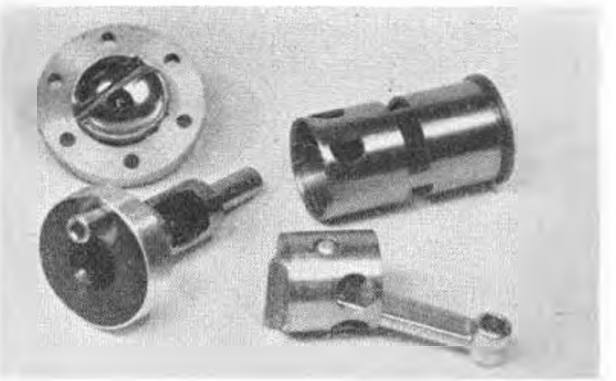
The piston is of steel with a faired deflector, substantial upper section but reducing to thin walls under the gudgeon pin position. The gudgeon pin is .179 in. diameter, hollow, and fitted with aluminium end pads. Upper rubbing surface of the piston, starting level with the centre of the gudgeon pin is "electrolized" or chromium plated. The skirt is drilled with transfer ports matching the lower liner ports.

The connecting rod is a light alloy forging which has been chemically brightened to give a highly polished appearance. Big and little end are reamed to size, the big end being drilled with two lubricating holes. Big end diameter is .217", the crankpin also being chrome plated for a hard wearing surface.

The head is a light alloy die casting, with the seating machined to finish. The combustion chamber is hemispherical, with a slot through to clear the deflector on the piston. Exterior portion of the head and the inside of the combustion chamber has been chemically brightened or electro-polished to a shiny appearance.

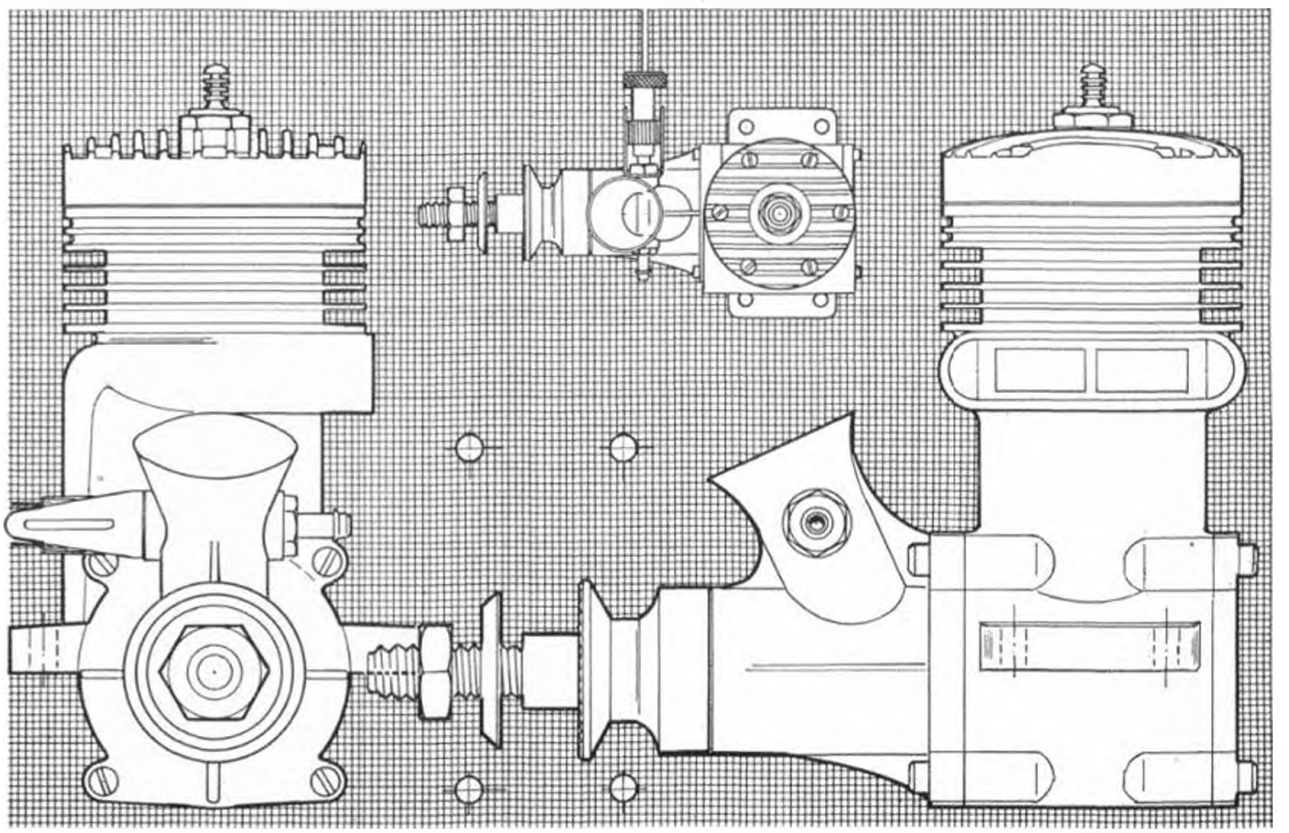
The crankcase rear cover is a pressure die casting, machined to fit the crankcase bore and faced. It attaches with four screws without a gasket. The centre of the cover incorporates a spigot with a blind hole tapped to take a .160 in. diameter screw and then counterbored through with a very fine hole opening into the crankcase. This provides a pressure tapping point by removing the screw and substituting a nipple.

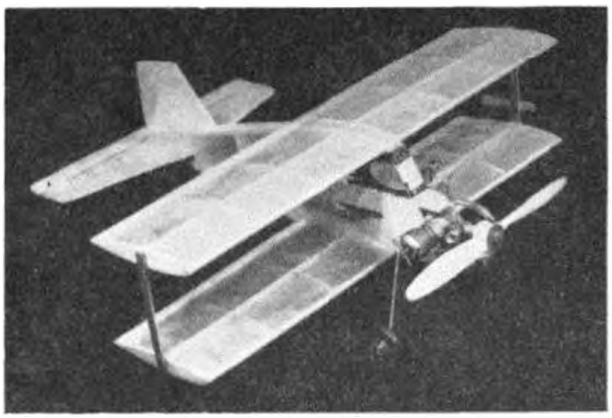
The spraybar is of conventional pattern, in brass, and of robust proportions. The steel needle is fitted with a brass thimble and a steel ratchet lock. Adjustment is easy and positive, with just the right amount of "ratchet" tension. The only worthwhile "modification" is to bend the end of the steel wire up at an angle instead of leaving it straight. Even if the needle is not manipulated by the wire lever so formed, its position is an indication of the setting. We wonder why the manufacturers do not bend the wire instead of leaving it straight—which, incidentally, is about the *only* criticism we can think of on this engine!



Polished head, capping on crankshaft (note large port) and piston/cylinder porting show the extra effort made in producing the K & B series 61

Summarising—a really fine glow motor in every respect. It is virtually impossible to fault it on handling or performance, and it is beautifully engineered as well throughout. Running fits are just about perfect and the compression would do credit to any diesel, yet even a new engine has very little friction drag and needs very little running in. Approximately one hour's initial running on a rich mixture is recommended to complete a "lapped in" fit between the hard piston surface and the Meehanite liner, and take off any high spots that may exist on the plain bearing length between the two ball races. It costs more than some other motors of comparable size, but for "big model" performance we can recommend the K & B Torpedo Series 61, 35 without reservation.





Chubby

A fully aerobatic biplane for .5-.8c.c. engines, specially designed for easy building

by VIC SMEED

FULL SIZE PLANS ON CENTRE PAGES

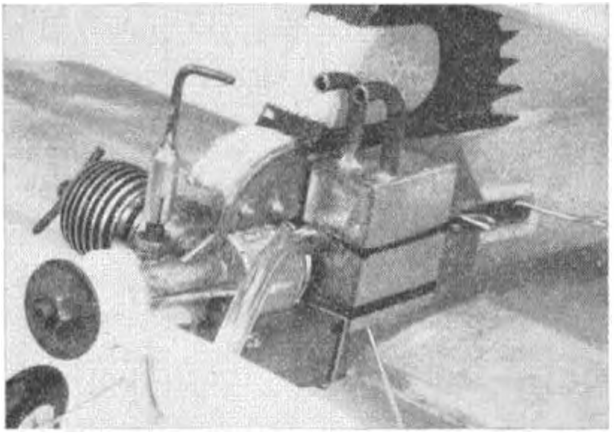
THE ATTRACTION OF a small model capable of stunt manoeuvres cannot be denied—nor can the challenge that such a model offers design-wise. Quite the biggest problem is the relationship between engine weight, model weight, and power output.

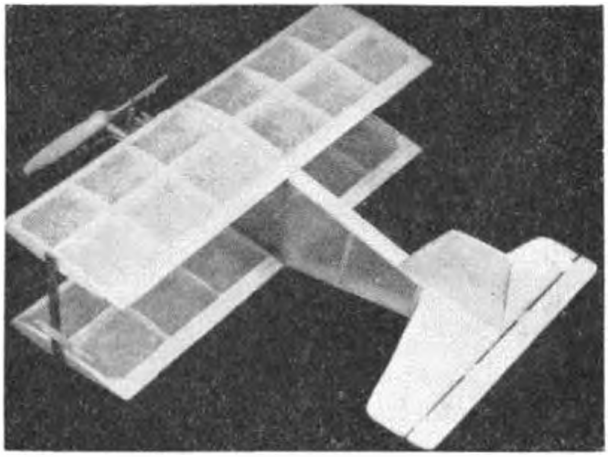
Chubby represents one approach, leaning, if anything, towards the sturdy side but still capable of the simpler aerobatics—loops, etc.—on a .5 c.c. diesel.

Construction is very simple and very quick. If you don't mind stripping 13 in. lengths off, the whole model can be built from a sheet of medium soft $\frac{1}{8}$ by 3 in. balsa and a few square inches of 1/16 in. ply, plus the hardware. If you don't want to strip from the $\frac{1}{8}$ in. sheet, you will need 3 lengths of hardish $\frac{1}{8}$ in. sq., 1 $\frac{1}{8}$ x $\frac{1}{4}$ in. t.e., medium to soft, 1 $\frac{1}{8}$ x $\frac{1}{4}$ in. med., plus the aforementioned med./soft $\frac{1}{8}$ in. sheet and piece of ply.

First cut two main fuselage frames, one from $\frac{1}{8}$ in. balsa and one from 1/16 in. ply. Pin the balsa one over the plan and build the rest of the fuselage framework from $\frac{1}{8}$ x $\frac{1}{4}$ in. Cut a 5/16 in. wide strip from the $\frac{1}{8}$ in. sheet for the piece over the lower wing mount and the front upright. A scrap 3/16 in. wide will be needed immediately aft of the bell-crank.

The ply plate should be cut to fit the motor to be used. Mark the small binding holes, which should be drilled and the head filed off at one side of a 6 B.A. bolt. Slip a washer on the bolt, fit the bellcrank (a standard 1$\frac{1}{4}$ in. commercial, or one cut from 1/16 in. ply) and a second washer, then bind the bolt to the ply plate as in the sketch. When the fuselage main frame is dry, remove from plan and glue the ply in place. Fill between the two side plates with scrap block or $\frac{1}{8}$ in. laminations. If a radial mounted motor is to be fitted, cut and glue the circular bulkhead in place. Fit all gussets, tailplane seating, and cut and fit the fin and skid.





The wings are very easy: pack the l.e. and t.e. off the building board with scraps of $\frac{1}{8}$ in. The tailplane and elevator are cut from $\frac{1}{8}$ in. sheet, sanded round on the edges, and joined with linen tape hinges in the usual way. Avoid getting cement on the centre of the tape.

When dry, sand all parts of the model and cover with lightweight Modelspan. Dope and add any decor that may be desired; a cabin outline, at least, improves the appearance of the model.

Cement the wings in place and add the tip struts, cut from $\frac{1}{16}$ in. ply. Cement tailplane in place. Check that everything lines up square from all viewpoints, and leave to dry out thoroughly.

The elevator push-rod now requires to be fitted, bending so that the elevator is neutral when the bell-crank is central. Lead-out hooks of 20 s.w.g. should be fitted to the crank, as shown in the photograph *(left)*. Check movement is really free. Form the undercarriage and pin and bind in place as drawn. Bind the tank in place. Bolt on the motor and connect up, and the model is complete, looking much like the photos here.

As usual, pick a calm day for first flights. Attach 15-20 feet of line to each lead-out hook and the handle, and adjust so that the handle is vertical with the elevator neutral. Our prototype balanced as shown and looped quite happily on its first flight; its only fault was, that it tended to pull too much on the line and crab slightly, thus losing speed. Reduction of the fin offset, from fully across the fuselage to the angle shown, sorted this out.

You should have many happy hours with *Chubby*, especially since only a very small flying area is needed. Remember, though, that even a small engine running continuously close to houses, etc., can cause complaints, so fly with consideration for others.

R.F.C. SQUADRON MARKINGS PART EIGHT

Described by Leslie A. Rogers

Drawn to 1/72nd scale by K. McDonough

GEN FOR 1½ STRUTTER FANS THIS MONTH

No.3 Wing R.N.A.S.

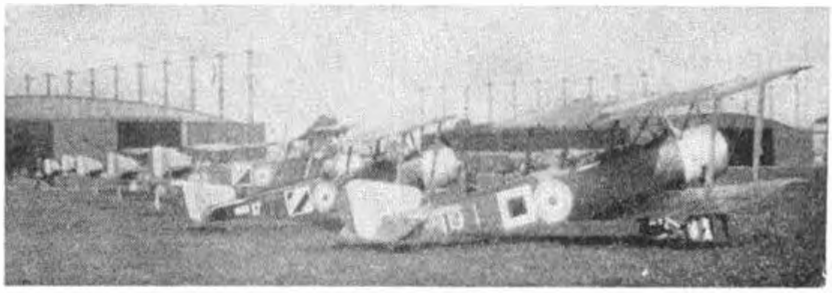
THIS NAVAL WING was first formed as a strategic bombing unit and was based at Luxeuil in May/June 1916. It was originally supposed to have 100 aircraft, most of which were Sopwith one and a half Strutters. Due to assisting the R.F.C. for the Somme battles the Wing never came up to full strength, in fact known strengths were:—

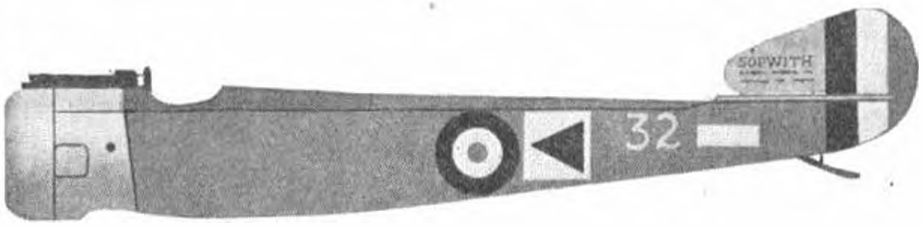
August 1916—22 aircraft,
December 1916—47 aircraft.

The 1½ Strutters were both single seaters and two seaters. These were numbered as a Wing with numerals painted in white just forward of the tailplane, the position of these numbers varied slightly in a vertical line and they ranged from 1 up to at least 43. Some Short Bombers were also on strength but no details of markings of these are known.

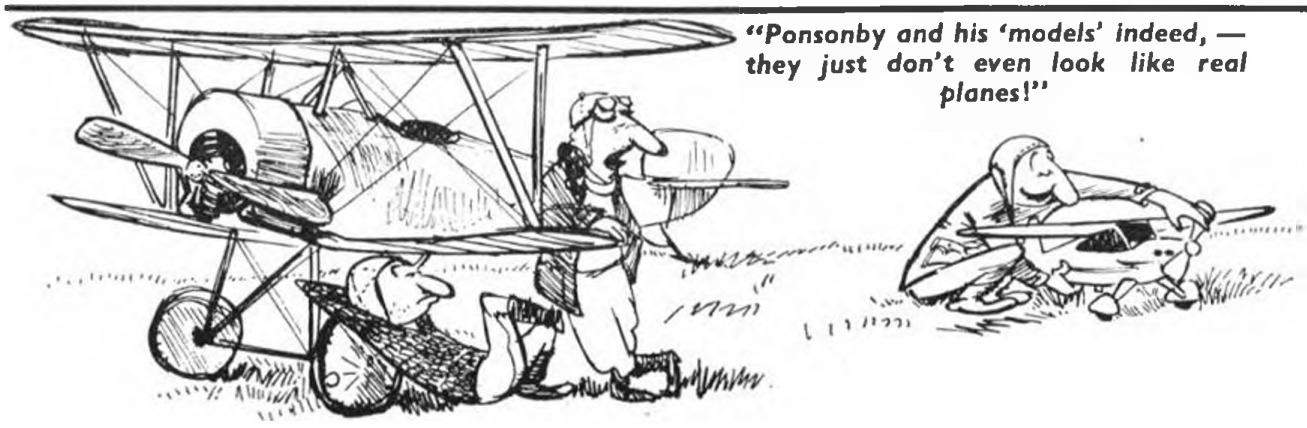
Individual Markings were coloured "Flashes" painted on the fuselage sides behind the roundel and repeated on the tailplane in many cases. The colour of the "Flashes" varied, Red, Blue and Black seem to be the main colours, all on a white ground. It is likely these colours indicated different Flights or Sections.

The Wing was disbanded in April 1917 and had no connection with No. 3 Sqdn. R.N.A.S.

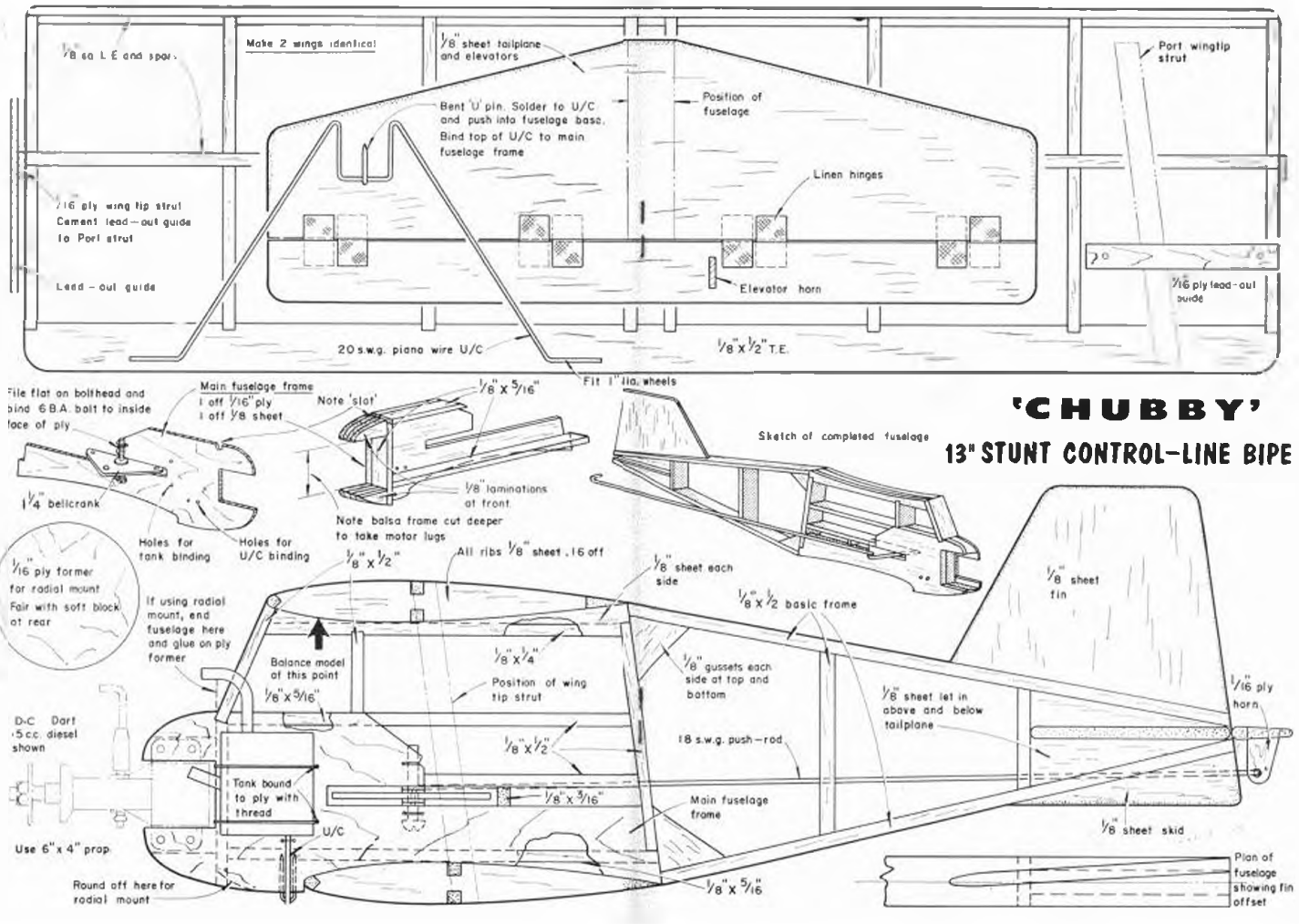




COLOURFUL SOPWITH 1½ STRUTTERS. Photograph at top shows a two seater airborne with individual number 19, serial appears to be N9722 in black on white panel below tail leading edge. (*I.W.M. Photo Q 69457*). Same aircraft is in foreground of the line-up at Luxeuil and clearly indicates the individual nature of the coloured squares behind the fuselage roundel. 19 and 17 are two seaters, numbers 3 and 2 behind are single seaters. (*I.W.M. Photo Q 68079*). The 1/72nd scale drawings show 1916 single seaters with in these cases, a blue triangle on white ground for 32 and blue diamond on white ground for 10- see repeat on tailplane at right. Sopwith trademark on the fin. Serial in black on white panel. This is useful gen for builders of the AEROMODELLER Plans Service 48" control-line 1½ Strutter plan CL/651 price 8/- inc. post



"Ponsonby and his 'models' indeed, — they just don't even look like real planes!"


Make 2 wings identical
1/8 sq L E and spar
1/8" sheet tailplane and elevators
Port wingtip strut
Bent 'U' pin. Solder to U/C and push into fuselage base. Bind top of U/C to main fuselage frame
Position of fuselage
Linen hinges
1/16 ply wing tip strut Cement lead-out guide to Port strut
Lead-out guide
Elevator horn
1/16 ply lead-out guide
20 s.w.g. piano wire U/C
1/8" x 1/2" T.E.
Fit 1" dia. wheels
File flat on bolthead and bind 6 B.A. bolt to inside face of ply
Main fuselage frame 1 off 1/16" ply 1 off 1/8 sheet
Note 'slot'
1/8" x 5/16"
1/8" laminations at front
1/4" bellcrank
Holes for tank binding
Holes for U/C binding
Note balsa frame cut deeper to take motor lugs
Sketch of completed fuselage
'CHUBBY'
13" STUNT CONTROL-LINE BIPE
1/16" ply former for radial mount Fair with soft block at rear
If using radial mount, end fuselage here and glue on ply former
1/8" x 1/2"
All ribs 1/8" sheet, 16 off
1/8" sheet each side
1/8" x 1/2 basic frame
1/8" sheet fin
Balance model at this point
1/8" x 1/4"
Position of wing tip strut
1/8" gussets each side at top and bottom
1/8" sheet let in above and below tailplane
1/16 ply horn
1/8" x 5/16"
D-C Dart .5 c.c. diesel shown
1/8" x 1/2"
18 s.w.g. push-rod
Tank bound to ply with thread
1/8" x 5/16"
Main fuselage frame
U/C
1/8" sheet skid
Use 6" x 4" prop
Round off here for radial mount
1/8" x 5/16"
Plan of fuselage showing fin offset

SCALE MODEL NEWS

OUR HEADING picture this month is news indeed and scale fans will probably be scratching their heads wondering just what aircraft these models represent. Their aircraft recognition is not at fault however, as only one of these shapes ever took the air as a full-size aircraft. The models are in fact the work of J. W. "Dodie" Dobenhoff a member of the Chance Vought design team, who produces a model for each new design project during the preparatory stage to give the designers a better idea of the shape of their creation. The models are built from solid wood, early in the design study stages. As one can imagine, the shapes change as research progresses and in such cases the models are modified until the design becomes firm when formal display and wind tunnel test examples are built by the factory model shop. From left to right, taking the front row first, we see a private four seater of "Dodie's" own creation which has the unusual feature of a pusher propeller mounted midway up the tail boom. Next is a model of the V-401 which became the *F8U-3 Crusader*, followed by the *V*-451, a "light-light" attack plane for short take-offs and landings. The latter was to have been powered by two lightweight turboprop engines. In the second row we see an advanced supersonic trainer then the *V*-406 attack aircraft with two pairs of pod mounted engines, using full span jet flaps for STOL. A high performance *Missileer* design with two rear, pod mounted jets with a cockpit/nose section somewhat akin to the Douglas Skyknight. Then there are two models of the *V*-433 *Persuader*, a ground support aircraft which one would be forgiven for mistaking for a turboprop version of the Douglas Skywarrior. In the rear is the *V*-434, the tri-service VTOL craft which has now won Chance Vought a development contract with the U.S. Defence Department. Beside this is a high speed fighter bomber with variable wing sweep, another "Dodie" idea, then the *Adem VTOL* craft power package with two jet engines driving ducted fans. Phew! There's a whole lot of "design" there.

Now we pass on to the *Fokker D.R.I.* (A.P.S. plan FSP/453, price 6s. 6d. including post), the work of H. Yates, a member of Wharfedale M.A.C. Resplendent in Von Richthofen colours of scarlet, with white rudder, the machine has a natural metal finish cowl made from a teapot (!) hiding a Webra Winner 2.5 c.c. engine to lift its 5 lbs. mass, which is rather more than recommended on the plan. Mr. Yates says this design is difficult to build, but is well worth the trouble and time involved.

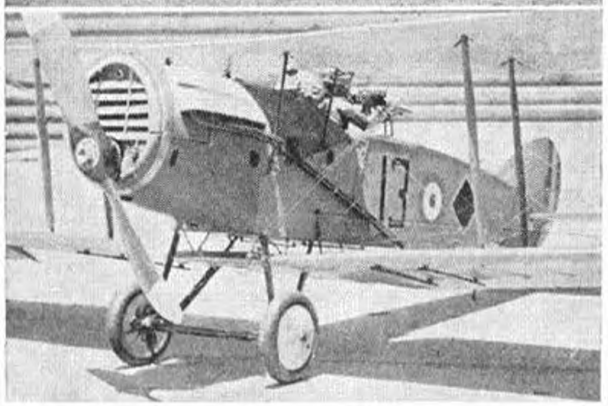
During trimming tests the model stalled on glide, flew inverted, cartwheeled and dived under power to the ground, but survived it all like a typical P. E. Norman design. It is now trimmed and takes off after a 15-yard run.

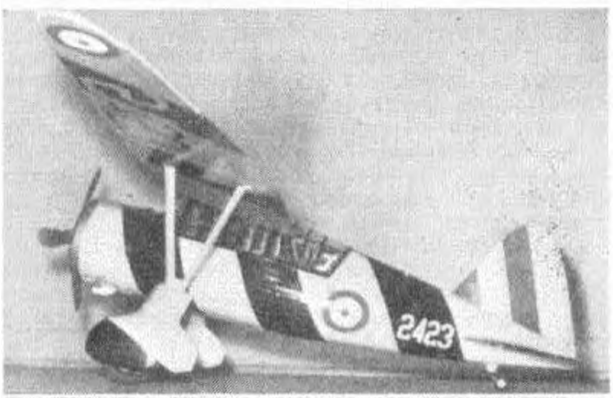
Another A.P.S. design is the control line *Catalina* (Plan CL/606, price 8s. including post) spanning 63 inches, the work of D. Nelson, a Derby Controliners club member. The model is powered by two P.A.W. 2.49's driving Mercury 8 in. by 6 in. propellers. It executes almost perfect wingovers and will fly in gale force winds. The "Cat" is finished in Air Sea Rescue colours, having orange and yellow wings, red engine cowlings and "Vee" trim strip, silver fuselage with red rudder and black de-icer strips. The cockpit and cupola are moulded from 1/32 in. acetate and cockpit is accommodated by pilot and co-pilot with instrument panel to keep them busy. Mrs. Nelson, herself a modeller and flier, is seen holding the model. At top right are the top two control line scale entries at the recent Australian Nationals. Upper picture shows the second placer, a 2 ins. to 1 ft. scale *Nieuport II*, built by Noel Shennan of Campbelltown, N.S.W. and below it is the winner, a Bristol F.2B Fighter of 1 inch to 1 ft. scale by Allan Talbot of Mittagong, N.S.W. Decor is taken from A.P.S. planpack 2692 showing the aircraft in the Imperial War Museum, London.

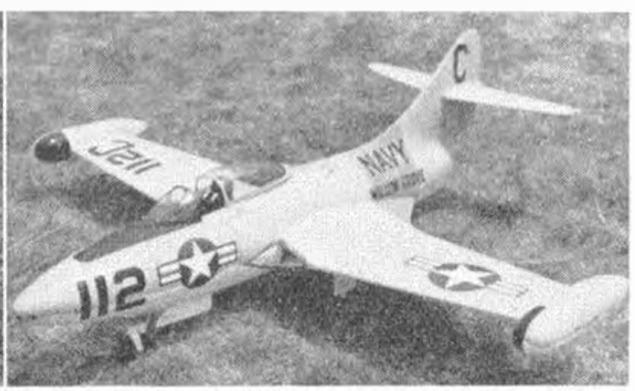
The well known lines of the *Westland Lysander* come next, this one built from A.P.S. plan FSP/160 (price 8s. incl. post) by H. G. Allen of Scarborough, Ontario, Canada. It took a little over nine months to build and the finished model weighs 4 lbs., powered by a 2.5 c.c. D.C. Rapier. The builder says it is a really steady flier, looking most realistic in the colour scheme of an R.C.A.F. Target Tug, with Black and Yellow stripes. Cockpit is occupied by a pilot, instrument panel and machine gun and one of the safety features incorporated is a knock-off undercarriage to cope with heavy landings. This "Lizzie" took first place out of seven entries in the free flight scale event at the Tiger Town meet (Hamilton, Ontario).

George Meyer's *Little Toot* home built lightplane which we featured in our April 1958 edition has attracted many modellers for F/F and C/L. "Taffy" Thomas always a colourful competitor at the R.A.F.M.A.A. Champs enlarged the drawings for an ETA 29 engine and produced the most realistic (and aerobatic) result.

Finally, at the foot of the page are two scale entries from the New Zealand Nationals, reported last month. At left is the third placing *Waco Model C* Biplane by R. Johnson of Palmerston North, N.Z. This pre-war Biplane is an unusual choice, but is a fine replica of the Jacobs or Wright engined cabin bipe. Lastly we have a most ambitious entry, a Pulse Jet powered *Grumman Panther*. N. Dawson built it, but the model was unable to take-off in the contest, owing to the uneven take-off strip, which caused the jet to cut at each attempt.







THE LACK OF suitable summer flying fields, and the truly magnificent standard at 1960 Nordic Champs in Finland in winter were the reasons for the 14th Nordic countries Champs to be held again in winter, this time in Norway, on March 11th. Flying took place over the frozen fjord end at Lillestrom, 20 miles east of Oslo.

Forecasters were noticeably quiet before the contest. The Finns were favourites with due regard to their earlier victories; but Sweden had mobilized her best men. They have often used strengthened "B" teams for the Nordic event, sending "A" teams to World Champs. Norway has improved in standards and enjoyed use of home ground. Denmark had only a full team in A/2, so her chances of other team victories were nil. The famous trio of Hansens were missed!

On the morning of the contest the sun shone from a cloudless sky. Temperature was around *minus* 10 degrees centigrade, and the weak wind offered plenty of space.

Among the first to start was Sweden's well-known Rune Johansson, "Termik-Johan". His Wakefield model climbed well, but sank fast, resulting in only 135 seconds. Almost every flyer noted that there was a large area of downdraught adjacent to the starting place. The **first round** was almost gone, yet there was not a max! This gives a clear picture of the conditions. During the last minutes of the round, however, two maxes were flown by Bulukin, (Norway) and Hyvarinen (Finland). Their models climbed so high that despite fast sinking they just broke the three minute limit. These two led their respective classes. In A/2, Strang (Finland) had 170 seconds, only one second ahead of Hassrod.

Different starting places were systematically tried during the **second round.** Evidently the Swedes found the best position, as they flew 7 maxes out of 9 possible. Their Wakefielders all maxed and they took the team lead. Hyvarinen led individually, with two maxes. All Norwegian A/2 men flew maxes, and they shared the three first places in that class, as well as the team lead. Sverdrup, also from Norway, was first in Power with 312 seconds. Bulukin was 3rd, two seconds in front of Hagel and led Sandy Pimenoff by 7 seconds. Sweden had taken the overall lead from Finland having 2790 seconds, 131 ahead of the Finns.

Due to some 8 inches of soft snow, retrieving was very exhausting, because a three minute flight took the model one mile or more from the starting point. Many

reported by Reino Hyvarinen

spent the ½ hour lunch break in retrieving lost models.

Hassrod flew a max again in the **3rd round,** and he had a lead of 33 seconds over Sweden's Modeer. The 16 years old Pyykko, (Finland), had a 4 seconds less. Norway led as a team, 25 seconds over Finland. Gunnar Kalen (Sweden) 3rd at 1961 W/Champs had a black day. All the possible and even some "impossible" misfortunes had evidently been waiting for this particular day, and now they raged unchecked causing harm and grey hairs to this leading Swedish expert. After a third flight of 86 seconds Kalen was 10th out of 12 contestants.

As to Wakefield, it was Hyvarinen's turn to find a downdraught, and the 150 seconds flight dropped him to the 4th position. Nil-Erik Hollander, (Sweden) now led by 522 seconds, Pentti Aalto, twice Finnish Champ, had 8 seconds less, and only one second separated the '61 Nordic and Swedish Champ., Charles Moberg from Aalto. Sweden led Wakefield team position.

Power saw a real somersault during this 3rd round. The leader and the 6th man changed their positions. Swede Lofvander was now the standard-bearer with 463 seconds. He flew a Super Tigre Jubilee diesel powered A.P.S. PULTERI. Bulukin and Hagel followed near with 452 and 451 seconds respectively. Then came two Finns, Pimenoff and Laxman. Sweden had a strong lead in team and in the overall contest Sweden still had 91 seconds more than Finland.

Kalen's misfortunes seemed to spread within the Swedish team during the **4th round.** Wakefielders, except Johansson dropped far from maxes. Aalto led, Hyvarinen second and Johansson was third now. Finland took the lead also as team. In A/2, the Swedes lost more and more seconds being far behind Norway and Finland as a team. Hassrod flew a max. again, and had 37 seconds before the next, Pyykko. In Power, Hagel's climb was faultless this time, and he took the leading position with 631. Lofvander had 23, Bulukin 26, Pimenoff 29 and Laxman 68 seconds less, so it was to be very exciting during the last round. Finland led now the total contest 167 seconds ahead of Sweden.

Lofvander was among the first to fly during the **5th** and **last round.** He got 128 seconds, so still four men had possibilities of beating him. Hagel was next to fly. His much reworked Super Tigre Jubilee glow screamed at around 21,000 revs.

At left, Wakefielders at the control point during the first round, from left to right, the Finnish team, Aalto, Hyvarinen and Storgards, at right is Simonson of the host Nation, Norway. Right, is the winner of the two last Nordic Championships, Rolf Hagel of Sweden. He was leading again at the 4th round, but a 3-seconds engine run put paid to his 1962 chances. Note the clear snow field over the frozen fjord.

Fine start, and a very high speed even at the very beginning of the climb . . . but the engine stopped after three seconds due to lack of fuel! A couple of stalls, and the model glided very low, but beautifully. It almost seemed that the model defied gravity. However, after 82 exciting seconds the model touched snow thus giving still three men the opportunity to win. Then young Laxman flew only 113 seconds, losing the game.

Meanwhile, in Wakefield, Aalto and Hyvarinen flew their fourth maxes, and took thus two first places with 874 and 870 seconds. Team victory went also to Finland. In A/2 Modeer (3rd after 4 flights) got only 86 seconds. Pyykko and Tahkapaa instead flew maxes, and took the lead.

Towards the end of the last round the wind almost disappeared and with it, the vertical air movements. The conditions were almost ideal, as Hassrod began his last flight. After one minute it was already evident that his SANS EGAL would fly a max. So it did, and resulted in the best score of the day, 889 seconds. Now a glow engine was heard screaming, and Bulukin's red DJANGO climbed very well making a clear max thus deciding the winner. Pimenoff could no longer beat Bulukin, but his flight of 173 seconds gave him 2nd place. Sweden won Power team leading Norway and Finland, but A/2 team victory went to Finland a mere 18 seconds ahead of Norway.

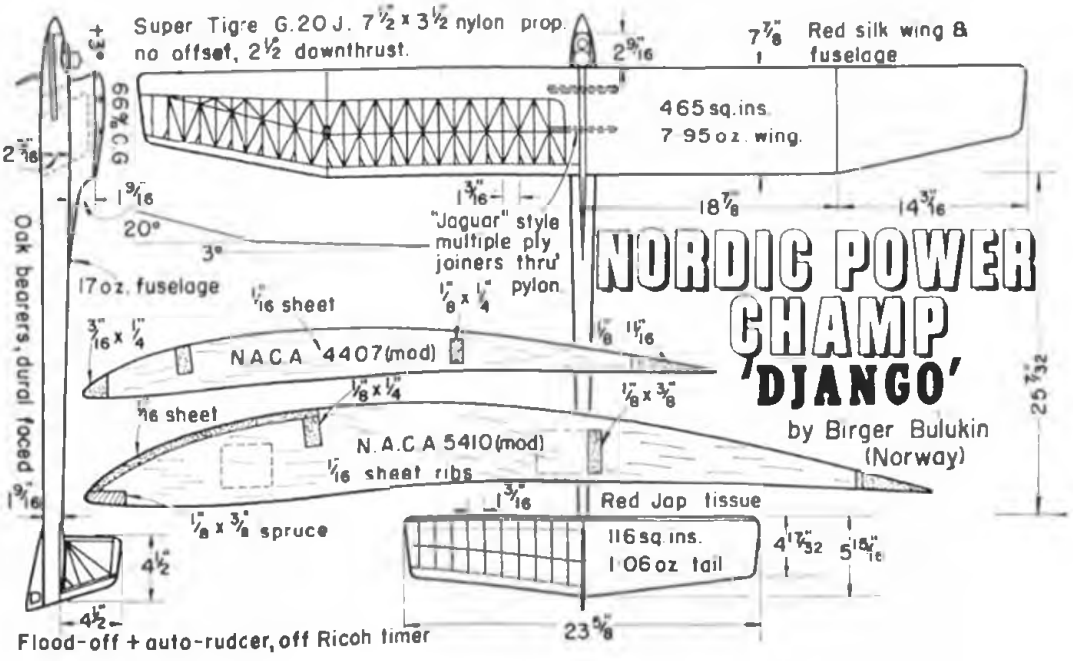
The award of a beautiful and very valuable silver cup, given to the best country in total contest, went again to Finland which has held the cup on every occasion. This time the total was 6947 seconds out of possible 8100, giving an average of 154 seconds per flight. Sweden was second with 6474 seconds, but Norway was not far away with its 6318 seconds. As soon as the Wakefield standard in this country gets higher, it will be a rival "Silver Cup" competitor. Modellers in Denmark are perhaps not used to winter flying, and, at least in light of this contest they have to improve their standard.

As to the models, beginning with A/2, there were not many new designs. Hassrod had a three year old wing on his winning SANS EGAL. Somehow it seems that this design needs an old wing, as even the original had a four year old wing when winning this very same contest four years earlier in Norway! 3rd placer Markku

Photograph opposite, shows the three class winners, left to right, Hassrod of Norway (A/2), Bulukin of Norway (Power) and Aalto, Finland (Rubber). Full results on page 292.

FULL SIZE PLANS for the glider winner, Sans Egal are available from AERO-MODELLER PLANS SERVICE as drg. G/725 price 8/- including post.

At right: Details of Bulukin's power winner showing the unusual wing joining for a fast flyer. Similar design won for G. Dalsig in 1959. Was 9th at World Champs., Cranfield, 1960, for Bulukin. Thin tail is result of three tests with different sections. Flies right — right with 70 degrees climb and 2½ turns in 10 secs. power. Auto rudder anticipates cut-off by ½ sec.

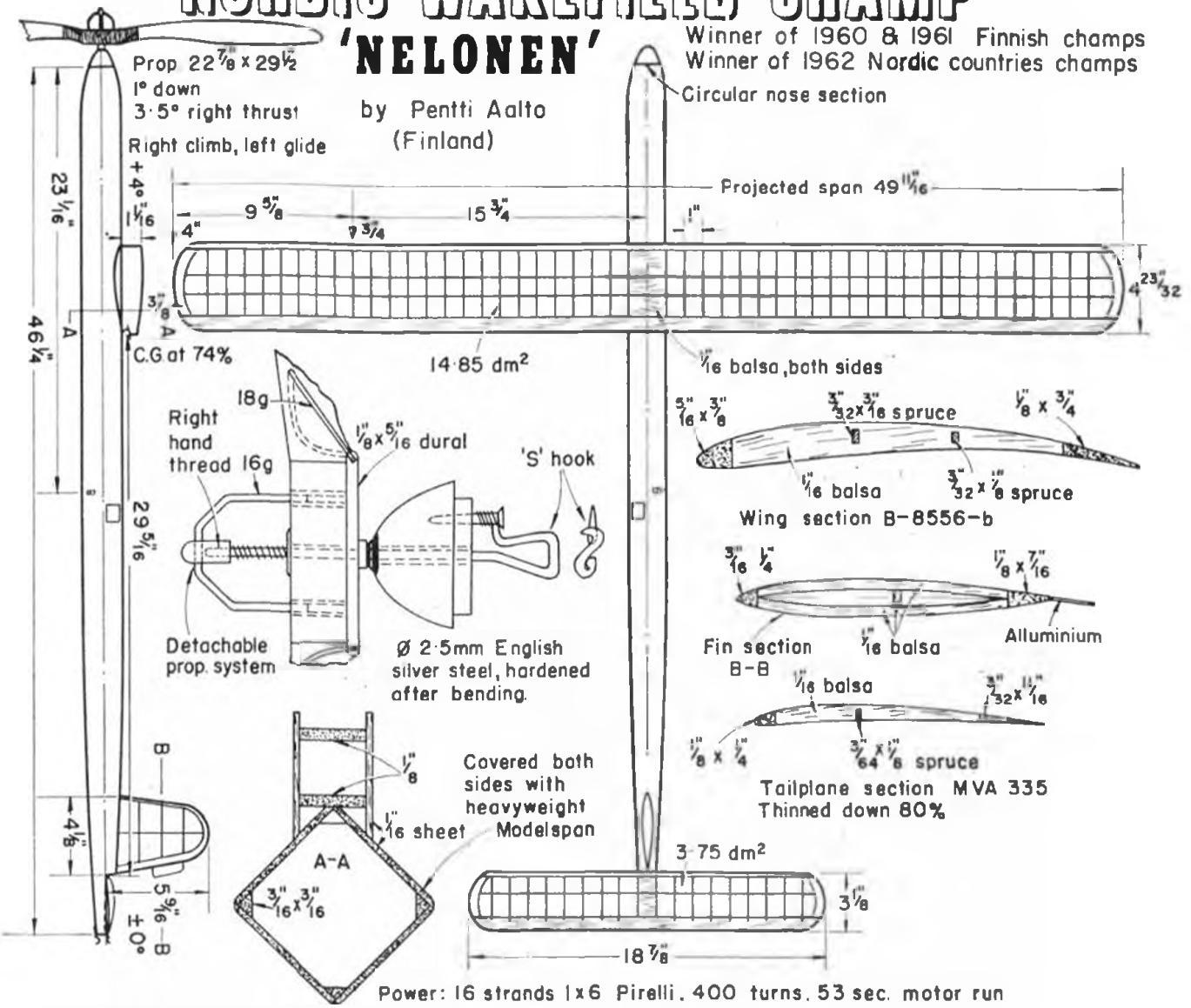


NORDIC WAKEFIELD CHAMP

'NELONEN'

by Pentti Aalto (Finland)

Winner of 1960 & 1961 Finnish champs
Winner of 1962 Nordic countries champs



Nordic Championships *(Continued)*

Tahkapaa has always some extraordinary features in his models, this time they featured U-shaped dihedral at wing tips. Using these models Tahkapaa has won every Finnish contest thus far. One Dane had a Sokolov type model, but he was not fortunate.

The Wakefields were fairly similar featuring mainly 120 mm. wing chord, two or three dihedral breaks. The most common fuselage length was about 1150 mm., and the number of strands varied from 14 to 16 strands Pirelli. Hyvarinen had the shortest motor run of 38 seconds, and together with Johansson (43 secs.) he had the fastest and highest climbing model. Aalto's motor run was about 53 seconds, and it gave his very successful and well-trimmed model a sufficient height for maxes.

This contest can be regarded as the final break from the common prejudice that glow engines cannot be used effectively under cold conditions. The best proof of the superiority of glow engines was the climbing altitude with Hagel's, Bulukin's and Pimenoff's models. The two first used Super Tigres, Pimenoff had K & B .15R. It was evident that Bulukin and Hagel had a clear edge in glide with their long spanned wings. Bulukin's winning model features a novel wing fastening (see drawing). The wing of Hagel's model suffered from serious flutter sometimes during the climb. Now he is planning for sheeted surfaces for extra rigidity.

Results

A/2 Glider							Tota
1. R. Hassrød (*Norway*)	...	169	180	180	180	180	889
2. M. Pyykkö (*Finland*)	...	146	166	180	180	180	852
3. M. Tahkapää (*Finland*)	...	139	180	131	180	180	810
4. Å. Skard (*Norway*)	...	148	180	133	180	127	768
5. T. Strang (*Finland*)	...	170	131	180	104	180	765
6. K. Nysaether (*Norway*)	...	140	180	138	114	180	752
7. B. Modéer (*Sweden*)	...	136	180	180	157	86	739

Teams: 1. Finland 2427; 2. Norway 2409; 3. Sweden 1949; 4. Denmark 1678.

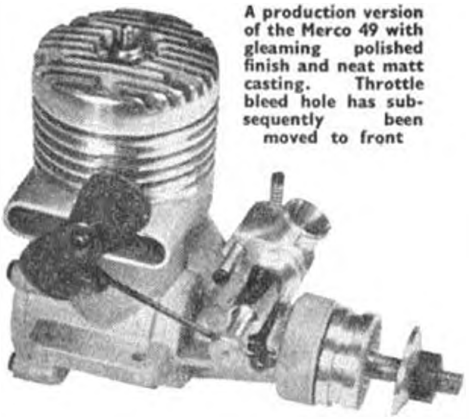
Wakefield							
1. P. Aalto (*Finland*)	...	154	180	180	180	180	874
2. R. Hyvärinen (*Finland*)	...	180	180	150	180	180	870
3. N-E. Hollander (*Sweden*)	...	162	180	180	121	180	823
4. R. Johansson (*Sweden*)	...	135	180	180	180	134	809
5. C. Moberg (*Sweden*)	...	169	180	164	102	180	795
6. B. Storgårds (*Finland*)	...	171	106	161	151	180	769
7. A. Simonsen (*Norway*)	...	115	128	111	180	180	713

Teams: 1. Finland 2513; 2. Sweden 2427; 3. Norway 1837; 4. Denmark 654.

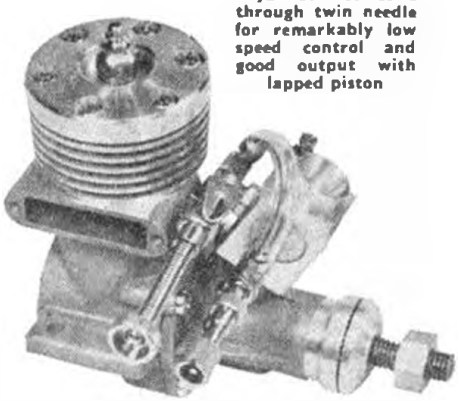
F.A.I. Power							
1. B. Bulukin (*Norway*)	...	180	114	158	153	180	785
2. S. Pimenoff (*Finland*)	...	172	115	135	180	173	775
3. Å. Lofvander (*Sweden*)	...	154	129	180	145	128	736
4. R. Hagel (*Sweden*)	...	112	180	159	180	82	713
5. P. Laxman (*Finland*)	...	140	85	180	158	113	676
6. T. Johannessen (*Norway*)	...	122	95	113	165	180	675
7. L. Larsson (*Sweden*)	...	128	180	84	134	123	649

Teams: 1. Sweden 2098; 2. Norway 2072; 3. Finland 2007; 4. Denmark 623.

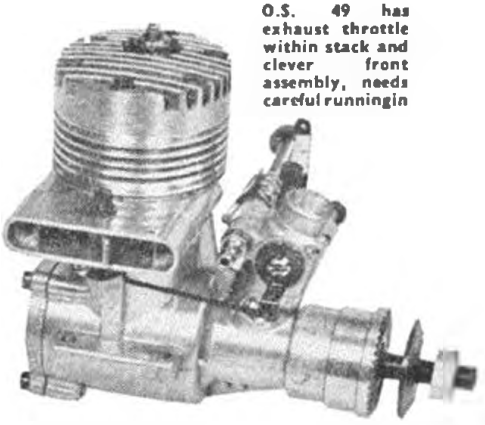
9-men Team Totals: 1. Finland 6947; 2. Sweden 6474; 3. Norway 6318; 4. Denmark 2955.



A production version of the Merco 49 with gleaming polished finish and neat matt casting. Throttle bleed hole has subsequently been moved to front



Enya 45. Distinctive through twin needle for remarkably low speed control and good output with lapped piston



O.S. 49 has exhaust throttle within stack and clever front assembly, needs careful runningin

MOTOR MART

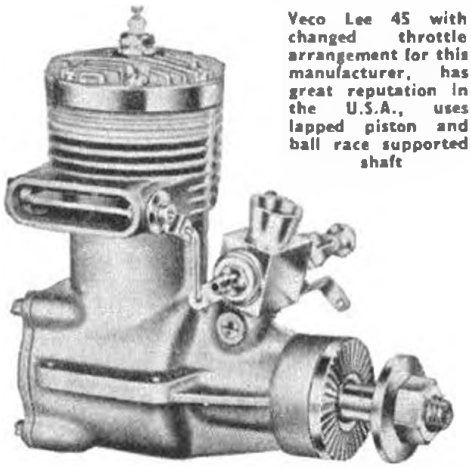
A VERITABLE GALAXY of engines to be viewed in the illustrations this month yet the one which has greatest technical interest among recent revelations has no picture! We refer to the latest Super Tigre 40 R/C. Ed. Kazmirski showed us one (all production seems to be going to U.S. Agent World Engines) and the immediate reaction is "why" when one sees the offset intake. Reason for this move to the right (viewed from above) of the front rotary intake is to offer a better balance in the shaft structure and to smooth vibration. Idea of other than vertical intakes is not original, but Signor Garofali's latest is certainly the first of its position.

The larger radio control engines have appeared almost simultaneously and are all in demand. We can report that the Enya 45 and OS 49 handle specially well on throttle. The OS still possesses a vibration bogey, unfortunately close to 10,000 r.p.m. where it is mostly likely to be used, but this can be overcome with prop position to compensate. Simply play with the heavy blade position relative to the piston. Veco promise a 45 for us to test in June, and our Merco, fresh from the first home production batch is just in hand. Carburetter is changed to have the bleed hole for slow speed facing the slipstream, and this ties up the last small detail mods in what must be the most tested engine yet produced. Talking of modifications, a note by John Hannah in the *Vancouver Bi-Liners'* newsletter tells how he alters Cox Toe-Dee engines. He feels that they could be better for stunt (in our experience we have found both the 049 and 15 very good indeed and even rate the 15 as a motor with great SMAE Combat class potential).

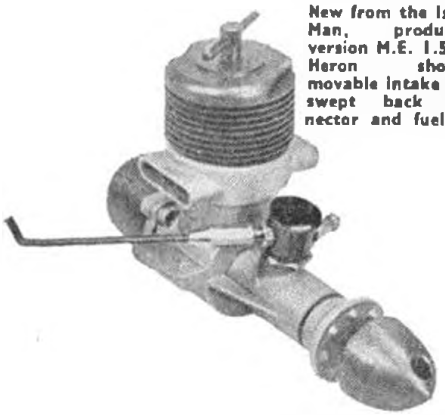
He quotes AEROMODELLER, so we have to listen carefully! Says that the Cox carburetter with its surface jets is stated by us in *Model Aero Engine Encyclopædia* to have limitations and suction less on the walls than in the centre of the tube. True enough. The bore on Cox carbs. has been reduced to produce better suction for this very reason, and current set up is ideal in our view for the Tee-Dee and subsequent series.

However, Mr. Hannah has fitted a Fox spraybar assembly to a T-D 15 with bore of the carb opened to 13/64 in. to compensate for the blockage formed, and apparently it was an immediate success. We repeat that our experience with very manoeuvrable stunters has shown no need for alteration.

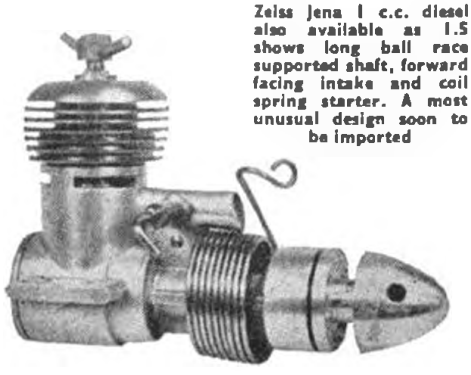
The firm of Micron in Paris is one of the longest established model engine manufacturers in Europe. They produce what is possibly the smallest diesel in current production, the 0.35 c.c. *Moustic*, a simple side port of classic layout and no frills. The side port allows it to run in either direction, the carburetter clamp allows the motor to be inverted without any more to do than swing the tank around. There's a lot to be said for such simplicity.



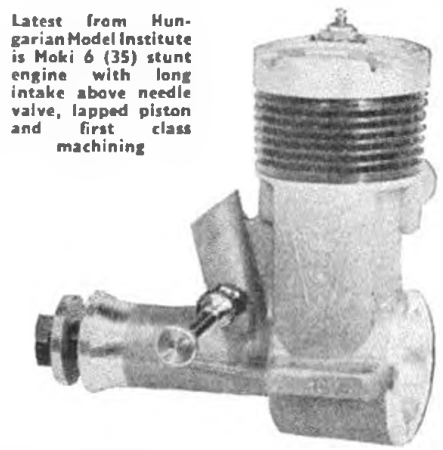
Veco Lee 45 with changed throttle arrangement for this manufacturer, has great reputation in the U.S.A., uses lapped piston and ball race supported shaft



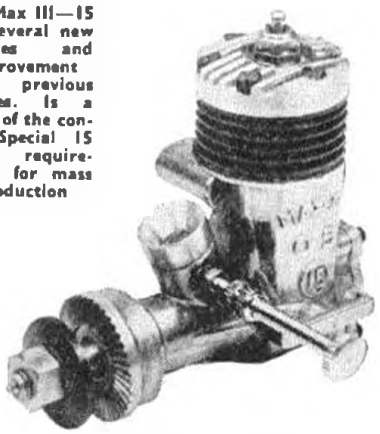
New from the Isle of Man, production version M.E. 1.5 c.c. Heron showing movable intake with swept back connector and fuel-feed



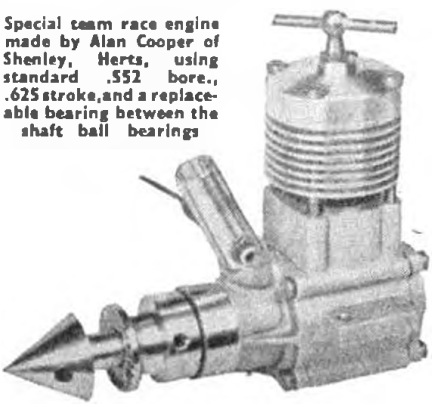
Zeiss Jena 1 c.c. diesel also available as 1.5 shows long ball race supported shaft, forward facing intake and coil spring starter. A most unusual design soon to be imported



Latest from Hungarian Model Institute is Moki 6 (35) stunt engine with long intake above needle valve, lapped piston and first class machining



O.S. Max III—15 has several new features and improvement over previous engines. Is a blend of the contest Special 15 and requirements for mass production



Special team race engine made by Alan Cooper of Shenley, Herts, using standard .552 bore., .625 stroke, and a replaceable bearing between the shaft ball bearings

STAMPE-RENARD MONITOR

MODEL on the COVER!

56 inch span semi-scale control-line stunt model of Leon Biancotto's aerobatic plane.

Designed by F. L. Warburton

FRANK WARBURTON chose the Monitor as a suitable semi-scale subject for stunt for two reasons, (*a*) it can easily be adapted to the correct layout for stunt, (*b*) the real aircraft is fully aerobatic.

With an effective wing area of approx. 610 sq. ins. and a weight of only 47 ozs. (including 5 ozs. for cockpit detail!) a Fox 40, Glow Chief 45, or Merco 35 provide ample power. The combination of nose length and tail moment, coupled with light loading gives a very tight turning radius without the resulting kick that is so common with some designs.

In order to achieve a weight of 47 ozs. and yet still have a good finish the wood must be carefully selected. For such parts as wing ribs, leading edge sheet, tailplane and all blocks, use the softest wood available.

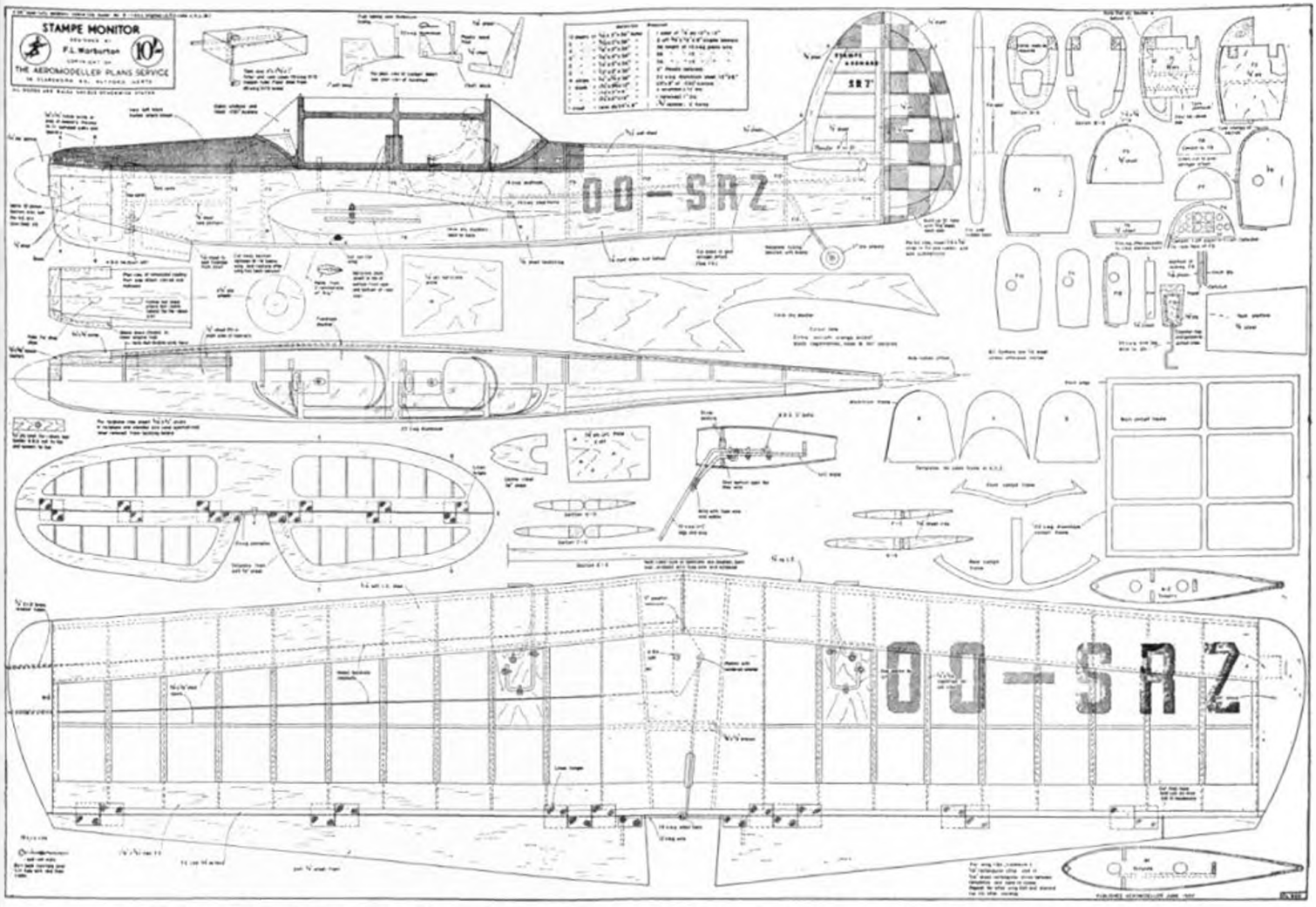
Begin the wing by cutting ¼ Obechi templates for W1 and W12. Sandwich eleven 1/16 blanks and 1 ⅛ blank between them, bolt together, cut to correct length and carve and sand to section. Notch the ribs for leading and trailing edges, mark on spar positions and cut them after parting the ribs. Finally, cut holes for the leadouts. Select a medium straight grained sheet of ¼ in. balsa and cut spars for the port wing. Mark rib positions on the spars, slide ribs in place and spot cement. Add leading edge and then repeat the process for starboard wing but throw away W12 after sanding. Cement wing halves together with braces, and sighting along trailing edge check for alignment. Splice trailing edge pieces and cement in place. Finally add trailing edge cap (very hard ¼ sq.). Glue and pack bellcrank platform and control assembly (complete with leadouts and pushrods) in place. Attach ¼ in. flaps with non-stretch muslin hinges, and connect the pushrod.

Bend undercarriage from 10 s.w.g. wire and fix to ⅛ ply with "J" bolts then cement to spars. Glue leading edge sheet in place with P.V.A., and cement 1/16 cap strips to all ribs. Carve tips from soft block, hollow out, and pack 1 oz. of lead in starboard tip. Solder the elevator pushrod to the flap horn.

Start off the fuselage by drilling bearers and pre-cement them to F1 and F2 after cementing tank to bearers, and tank platform between F1 and F2. Cut sides from ⅛ x ¼ sheet, add 1 mm. ply doublers, then before the cement dries, glue to engine bearer assembly and hold with elastic bands till dry. Pack around bearers with ¼ in. sheet to cut down vibration. Cement in formers F3 and F5 and then join fuselage to wing and check for zero incidence. Reinforce the joint with silk. Bring fuselage sides together with F14 and hold with elastic bands, then add formers F6 and F13.

Carve tailplane from ¼ in. sheet and add 1/16 ribs. Connect pushrod to tailplane and slide up and down fuselage till neutral flap/elevator position is reached, then cement in place. reinforce the joint, and cement

At right, full size machine above, compared with Frank Lee Warburton's successful replica in same vivid black/orange scheme. OO—SRZ was the factory demonstrator flown by French ex Champion aero-modeller Leon Biancotto, one of the World's greatest aerobatic pilots of recent years. Original aircraft was made in France by Farman.



FULL SIZE COPIES OF THIS 1/8th SCALE REPRODUCTION ARE AVAILABLE THROUGH A.P.S. AS CL 820 PRICE 10/- INC. POSTAGE

small block on top of tail. Cover fuselage bottom with soft ¼ sheet and top decking with soft 3/32 in. (note the angled section). Carve top block, hollow out, cement in F4 and cement into position.

The fin and rudder are built in two parts directly on the model. Cut two parts of fin main spar (one ¼ in. ply and one ¼ in. balsa) and cement to rear of fuselage. Next fit ⅜ in. leading edge and ribs and sand to section. The rudder is built in a similar manner and cemented to fin with approx. ¼ in. offset. Build up the cowl from block as shown on plan, leaving plenty of air space around the engine. Cement tie bar in place and pack securely. Seal off the tank compartment with ⅛ to prevent fuel soakage.

Cockpit Detail

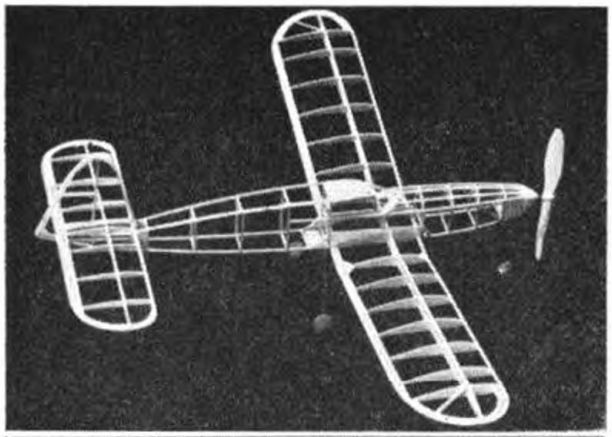
With a model of this type it is essential to have a realistic cockpit interior, and anyway appearance points can make all the difference! The pilot is made from a plastic doll. He will look a little more realistic with a set of arms from a bigger doll, and a dirty face to give an unshaven look. A helmet from rubber compound and a flying suit complete the outfit. Instrument panels are made from 1 mm. ply with a piece of notepaper behind with the dials painted on it (the paper looks very like metal if one coat of black dope is allowed to soak into it). The rest is straightforward work in balsa. The main cockpit frame is made from 22 s.w.g. aluminium with celluloid stuck on the inside with Bostic clear adhesive. To give more gluing surface for the canopy an ⅛ in. sq. strip is stuck on top of the fuselage side. Now weigh the model to determine the weight of paint one can afford to use. Maximum acceptable weight is approximately 52 oz.

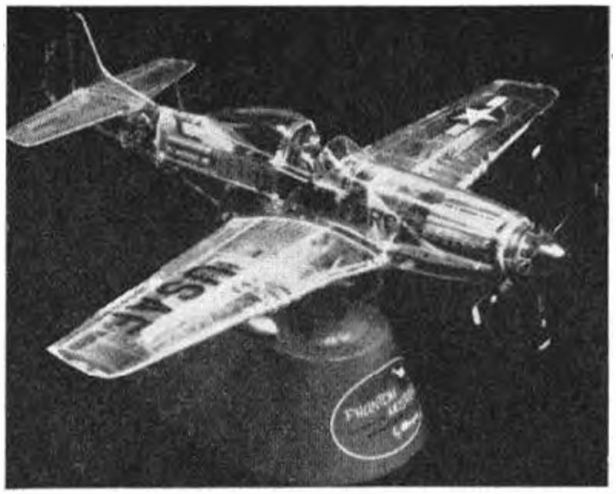
Finish

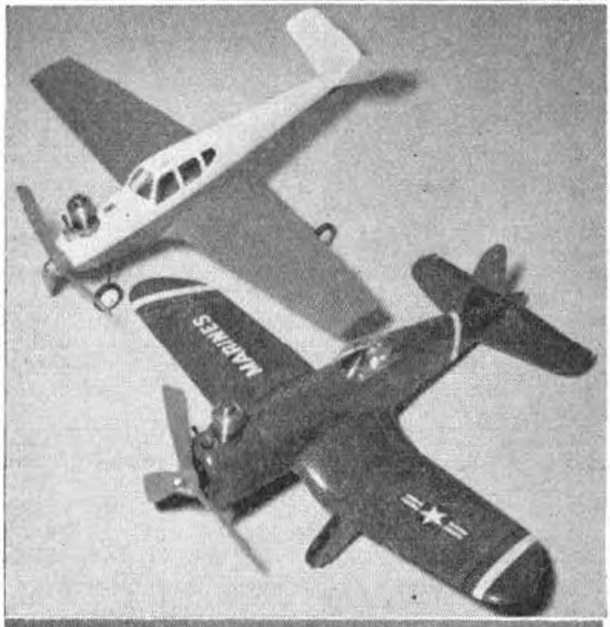
Sandpaper the model and fill with plastic wood where necessary, follow with two coats of sanding sealer to whole airframe and then one extra to fuselage and top of wings, then cover fuselage and flaps with lightweight tissue, followed by 2 or 3 more coats, sanding between each. Cover wings and tail with heavy tissue applied damp, and give at least 3 coats of dope containing a little face powder. Nitro-Valspar Marigold (used for B.M.C. vans) is the nearest colour to scale available. At least three coats of colour are needed, wet sanding between each. Finish with two coats of fuel-proofer, metal polish and finally wax polish.

Flying

Do not be afraid to experiment with different C.G. positions, as this varies with individual models. Any tendency to "come in" should be corrected with fixed portion of outboard flap. The Stampe will do perfect 3 point landings if the controls are left alone when the engine cuts—Good luck!!







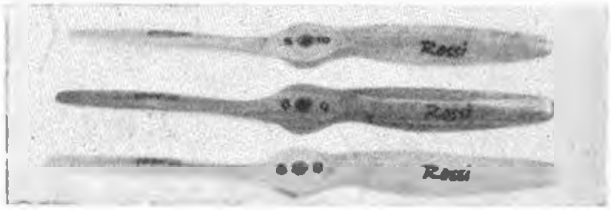
Trade Notes

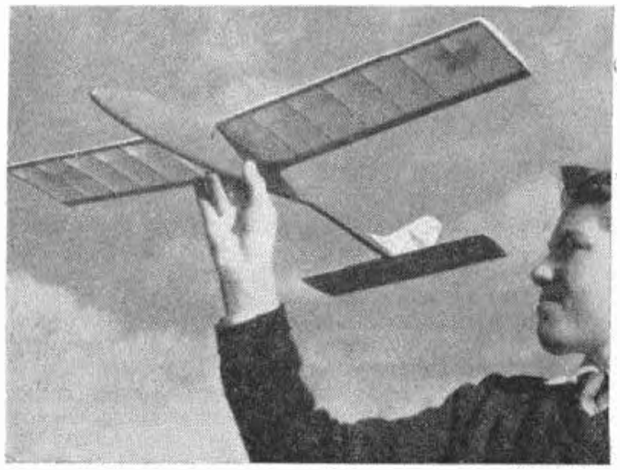
IF YOU WANT to bring smiles of relief on the wife or mother's face,—take home a bottle of **Humbrol** *Universal Cleaner*. The specially developed liquid removes cement stains from clothing without risk of damage and also doubles as a general household stain remover, price 1s. 9d. per bottle.

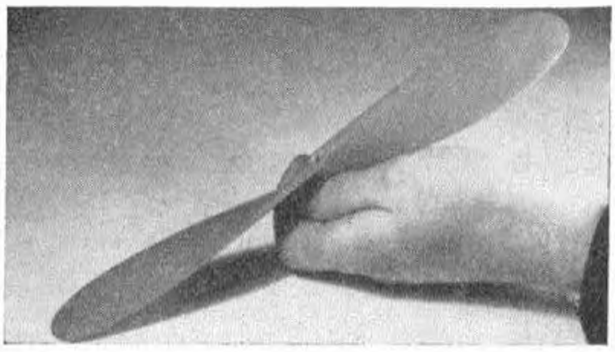
Our test kit for the **Performance Kits** *Dynos* (see pic, top left) is going very well now covered. Tips for builders are—to make positively sure that the undercarriage is firmly cemented in place and to replace the propshaft with a thicker one if you fly over rough ground. This little trike rubber job flies like a bird and looks very fine in the air. Kit costs 14 s.10d. and span is 32 in. Another design which appeals is the latest from Veron designer Phil Smith's board—the *Skyrod*. This is one of the **Model Aircraft (Bournemouth) Ltd.** "Kwik-Fix" series will full prefabrication. Sheet pylon (which takes the high thrustline motor mount) and *Velox* type shaped boom will make assembly both quick and easy. Span is a projected 36 in. and the power range from the Cox .020 to .049. Also from the same stable comes the *Dominette*, a 28 inch span pod and boom glider with die cut and fully shaped parts for quick modelling, ideal for the novice we would say.

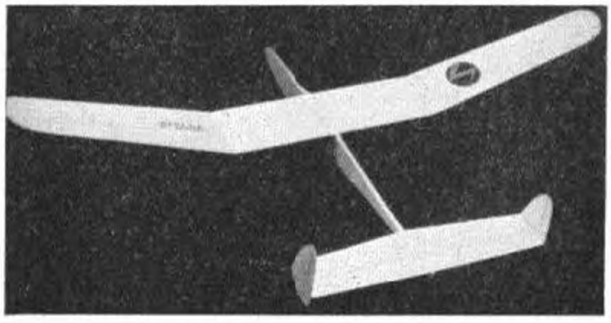
Just in from **Graupner** in Germany, and to be distributed in Britain by **Ripmax Ltd.**, are the kits for the *Weihe* glider and *Bolkow Junior* which we mentioned in April

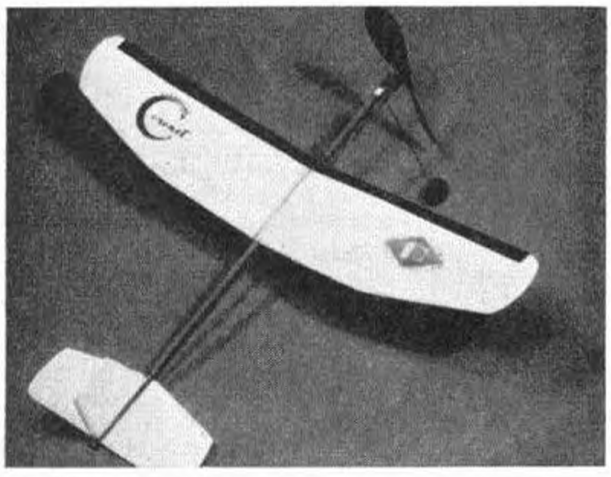
Top left: Performance Kits Dynos low-wing trike, now flying very well. To its right is our test Monogram Phantom Mustang, surely the finest example of plastic kit modelling yet produced, with working parts and all interior detail incl. engine. At left are Wen-Mac plastic ready to fly models which caught our eye at the American Toy Fair in London for their small size. The 14 in. Beech Bonanza and 14 in. Vought Corsair each have WenMac .049's, these are not to be in range distributed by Keil Krafthere but the trike u/c trainer, next, will be. This 16½ in. model has vari-speed prop., spring starter engine and will be ideal for the tyro. Bottom is the Comet Tigershark with side-mounted O.K. engine which may appear in British shops. Below are latest from Rossi Bros of Italy, very well made props for speed and t/r with a super finish. They also supply speed pans and team race engine pans, with spinners

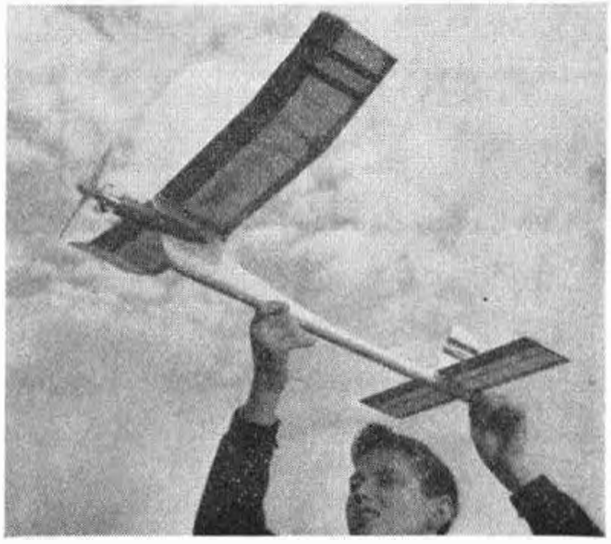












Above, the Veron Dominetta shows off simple lines of the 28 in. glider for novices. Right: the KeilKraft 12 in. plastic prop, a real boon for small rubber models. Below it is the all sheet ready made (apart from sanding and assembling) Performance Kits 33 in. Stella at 8/11.

issue. The expanded polystyrene fuselage for the scale Weihe is a real standard setter. It produces a beautiful fuselage, with adequate strength through carefully designed balsa frame inserts and we fancy that the assembly method will become a standard for quality kits. As for the Bolkow, well, here's a full size machine that simply yelled to be modelled. Its proportions are ideal and the kit is produced to the usual high degree of Graupner thoroughness. All we can say at the moment is. . . thank heavens for our **Burgess** bandsaw when it comes to cutting out the thick parts and the ply!

From **KeilKraft,** the new *Phantom* trainer is finished and ready for test. Ours is camouflaged to look like an invasion Spitfire and is so novel in appearance that many who are familiar with this popular KK control-line trainer have failed to recognise our particular example. With an E.D. Bee or A.M.10 this is an ideal "first-attempt" kit for anyone wanting to learn how to handle a model on lines. Span is 21 inches and price 25s. 10d. On the board, from KK are the new *Ranger*, for sport (and with slight mods for ½A team racing) plus the *F.A.I. Team Racer* in the Mercury range at 18s. 2d. and 32s. 6d.

One KeilKraft accessory which is going to take a lot of the hard work out of modelling for the youngster or novice is the 12 *in. plastic prop* for rubber driven designs at 2s. It suits many of the AEROMODELLER Plans Service designs which are from 30 to 40 inch span.

A number of readers have written the "Where can I buy" letter to us this year. Obviously a number of model shops have cut back on the range of goods they want to retain on their shelves. Answer in such cases for the individual who is far from a shop with large stocks, or cannot obtain what he wants locally is to support the *Mail Order houses* advertising in this journal. We know each of the advertisers personally and can vouch for their earnest attempt to satisfy.

Since practically all of Britain is on an "overnight" mail delivery service, the Scotsman can shop from Devon and the Devonian from Lancashire. Moreover, each house maintains a regular newsletter service and catalogue as a convenient postal shopping guide and reference. This is a service that few seem to be aware of, so if you're "out in the sticks"—send for the lists.

How to start a youngster on the road to aeromodelling? That question is best answered by simple ready to fly types, of which the Cupid and Coronet imported by Ripmax are ideal. Surfaces in expanded polystyrene and plastic prop give good performance and can teach use of wing shift for trim. At right is the Veron high thrustline Skyrod, just coming out and a real boost for the ½A power class

? Which way to F.(L).A.I. ?

IN 1964 THE F.A.I. will be considering free flight new rules to which we will be invited to fly in years to follow. In the past, though made in all good faith, hasty decisions resulted in many hot words. That the changes made have not been half as bad as the critics first made them out to be, is proved by the number of very enthusiastic F.A.I. flyers to be found in England and abroad.

However, a change in rules can only be observed with the greatest concern. In England at least, each major change has been co-incident with a fall in the number of flyers aspiring to International Honours, except perhaps in the case of Glider. Such is the state nowadays that fewer people *enter* the qualifying rounds than used to get to the *final* Eliminator on a top 25 per cent. basis. In other words, three quarters of the field had already been eliminated. Furthermore, many of the enthusiasts of ten or even five years ago have disappeared. Such "wastage" is perhaps natural and in the normal course of events no cause for concern, but in these days when the whole of the movement is contracting, it must be restricted to its very minimum.

Perhaps one good reason for not considering possible rule changes well in advance is because of complexity of the problem. Each change so far has been akin to chopping heads off a monster. Chop one off and you finish with two. Looking at it another way its been rather like patching an old building, fix one side and the other begins to crumble. And most folk can only think of further patching, which is bound to be unsatisfactory.

A new building—or an absolutely fresh start is needed.

Case for the Wakefield

This must be on a good foundation. The writer proposes to consider the case of the Rubber Model only in the words that follow, partly because he does not know anything about the other classes, and partly because he considers this class has suffered most so far. Because of the work involved, the class is less attractive to the modern generation, and more prone to suffer from "wastage"—the premature disappearance of enthusiasts from the field.

WAKEFIELD for the novice and an ideal introduction to the class is O-High-O, a design by experts George Reich and Joe Elgin of Cleveland, Ohio. The AEROMODELLER Plans Service drawing D/726, price 5s. 6d., including post, has extra detail for difficult parts. George is the current World Champ.—see picture opposite.

Before considering a specification the *Essence* or inherent character of the class must be considered. In 1953 "Wakefield" was a word to bring a gleam into eyes, colour into cheeks, and make the oil-burning hours the most attractive of the twenty-four—except of course at weekends. Few people argued against the common view that the Wakefield model was the *Elite* of the model world, and Wakefield fliers were a (super) class apart. The rules in those days were sufficiently difficult to create this aura, and yet the model was attractive enough to appeal to large numbers of modellers the world over.

What is the "Essence" of the rubber model, and how near did the 1948-53 rules come to reflecting it?

First the rubber model is relatively cheap, less important in this affluent age than it used to be, but modern youth still uses the excuse that it can't afford fuel for its Oliver 2.5 when asked why it isn't on the flying field. Secondly, the rubber model can give a good account of itself in its smaller sizes. The present Wakefield is not a big model as such. Smallness leads to quick building, and easy packing. These are important characteristics from an introductory aspect but are dwarfed by the following.

The reduced challenge

The rubber model is attractive because of its problems. There are a few first rate problems, and many minor ones. Its the old story of the "Challenge" but because the problems are of a varied nature it is in fact a wide variety of challenges, which will be taken up by a wide variety and hence number of individuals. The writer suggests that in attempting to reduce performance to the limits of airfields and timekeepers eyesight the problems have gradually been reduced, in particular the *variety* of problems have been reduced, and consequently the class appeals to a reduced number of people. The essential nature of the business is that those who remain will be more enthusiastic than ever, because the problems which appeal to them remain, but removal of other problems actually makes the whole job a little easier.

Now for a quick look at the actual major problems. Lightness is the first. It has been said that nothing can raise the performance of a rubber model so much as adding a little lightness. You can see value for money in adding lightness. Put in ½ oz. extra rubber and one has doubts about the improvement. But save ½ oz. on the airframe, everything else the same, and the climb will show an immediate improvement, in stable air. Of course lightness is not a problem, the problem is to produce the airframe strong enough to do the job, for the minimum of weight.

The power factors come next. Problems:—how much rubber to use, whether to use more rubber and save on airframe, and when it lands—Ugh!! Then of course come all the fascinating problems associated with the propeller, pitch, diameter, fold, feather or freewheel, and one or two blades. Add to that whether to climb fast or slow, spiral or helicopter, and then remember that there is no perfect final solution, and the extent of the fascination can be gauged. Changes in these do not provoke large changes in performance, so these are considered as minor problems. This does not detract

a provocative discourse prompted by failing interest in F.A.I. events due to rule changes—by J. POOL

from their value, it is the large variety, and relative simplicity of problems which used to attract the large number of exponents. The only big major problem left to us nowadays is size—how big? This is an avenue in which, for reasons suggested earlier, there has been very little interest.

Most important has been the effect to produce a model which in some conditions, when allowed to operate efficiently is very attractive; in other turbulent conditions. the model cannot have a sufficiently long and powerful motor run to recover from upsets. So the tendency is towards short motor runs, and models which need an amount of lift to make a maximum. This is easily seen even within England.

I had a "retrieving" chat with a leading Southern rubber flyer at Waterbeach Nationals. While I was remarking about the light wind, he was complaining about its strength. In the days when Ron Warring's Zombie series used to do five minutes in warm evening air, Northern Area Wakefields did something nearer 3½ minutes. Yet when they met at centralized venues they were at no particular disadvantage. It will be appreciated that rule changes which were designed to lower the standards set by the Worlds experts in ideal conditions at Finthen cannot help but produce an unattractive *average* model when flying in less pleasant conditions. And the model produced by the average modeller is important, because it is from these come the specialists and team members, and the "urge" which makes the whole structure of International flying possible.

Variable Rubber quality

A further disadvantage has been the "lottery" of good rubber. Since few modellers are able to design models to suit a particular batch of rubber, then it must be a case of finding rubber to suit a particular model. This inevitably means that the one or two pound a year flier is at a disadvantage.

New proposals must then try *to restore the avenues of experiment*, produce models which are attractive in even the least suitable conditions, and yet produce winners with a performance within the limits of airfields and eyesight. Any proposals which satisfy the first two conditions in England are unlikely to satisfy the third at a midsummer Continental World Championships.

For example, take the case of John O'Donnell's proposed limited rubber rules of early 1961. These were not specifically aimed at supplanting the F.A.I. rubber specifications, but might have made possible a return to 1953 conditions when nearly all rubber fliers flew the International class model. This seems especially desirable now that the total number of rubber fliers, Wakefield and Open, is so reduced. The suggested model had no size restrictions, (a very good point), and hence no processing. The model had to carry removable ballast equal in weight to the rubber. This would allow a P/W ratio of slightly better than .5 to 1, which would allow a respectable motor run, and re-introduce more variation in the "power" factor. An attractive model in fact—and easily converted to Open rules. However this model would be very like the 1954-57 Wakefields, and unsuitable for the World Champs. Or would it?

Basically the same design approach as O-High-O (opposite), this Wakefield by George Reich, typifies the logical process of development of one model, for in this case it achieved World Championship in 1961. Same model had been flown in previous World Championship meetings, stabilised rules encourage such development.

Making conditions harder at the World Champs itself would solve the problem of making a model suitable for both home use and International use. For example, using the O'Donnell model just mentioned, equal rubber and ballast, no other restrictions, a further item of ballast could be added by the processors equal to 10 per cent. of the all up weight of the model. This would entail weighing the model and cutting a piece of lead sheet; not a difficult task. Team members could of course trim up ready with the 10 per cent. extra ballast after selection. Furthermore the organisers could have freedom to add a further say ½ ozs. to every model if weather conditions make a large fly-off likely. Since this would only be likely to happen on a good day check flights would be in order. The second way to make conditions more arduous at the World Champs would be to introduce more flights, possibly on two days, and allowing less time between rounds, making reliability a desirable factor.

This principle of having two standards, one for home and one for the World Champs has been applied to one particular suggested model, but it will be obvious that it can be applied to any model type. It appears to be the only way to produce models which will rouse the bulk of modellers to fly International Class models, and yet produce models "poor" enough for the World Champs. There is no doubt that the 1948 53 models fulfilled the first condition, but they certainly were becoming too good for the second.

This is written in a provocative mood. Discussion now may lead to proposals which will save the Aeromodelling movement in 1964. Aeromodelling in 1964, of the type we've indulged in too often, may yet sound the death knell. Let's hope not!

The models displayed by this group from Ashford M.A.C. show that their greatest interest is in control line flying

AS YOU READ THIS, Whitsun and the British National Championships at Barkston Heath are less than a month away, and arising out of this premier meeting comes one of the most generous modeller-to-modeller offers of which we have heard for some time. Mr. and Mrs. C. W. Green of Mansfield, have offered accommodation over the Nationals period to any one young couple attending. They do point out however, that they live about an hour's ride from Barkston Heath (by car) so their chosen guests *must have their own transport*. They would expect whoever comes, to help out with the extra food bill, but do not mind having a small baby about the house if the parents can bring a carry-cot or similar for the baby to sleep in.

This is a kind offer indeed, and we will have particular pleasure in forwarding applications to Mr. and Mrs. Green, who are themselves aeromodelling enthusiasts.

Now, what's new in club activity? Let's go down to the **LONDON AREA** for an opener, because on March 16th the U.S. Navy called in to give a film show, which **Cosmo A.C.** are still talking about. Members certainly know more about new U.S. Navy committments within the framework of N.A.T.O. and U.N.O. and about the history of naval aviation from the earliest attempts to land an aeroplane on the deck of a ship, to the latest airborne addition to the U.S. Fleet, the N. A. Vigilante. Much more than this was seen too and other clubs who would like the pleasure of the U.S.N.'s company in this manner, should contact C.-in-C., United States Naval Forces Europe, 7 North Audley Street, London, W.1, Box 13, marked for the Attention of Lt. J. S. Cohune, U.S.N.

Just when **Hornchurch M.A.C.'s** fortunes were riding high, among their large, keen membership, enjoying increasing contest successes, misfortune has struck with the loss of Hornchurch Aerodrome as a flying ground. All is not lost however, for they have an alternative for free flight and arrangements are in hand to accommodate the control-line enthusiasts. Following up his A/1 Glider win at Chobham, star performer A. Wells, won the National Wakefield "practice" event on March 25th, though fellow entrant R. Paveley, was dogged by gremlins, which creatures did diabolical things to his beautiful model. C/L fliers are finding the answer to the new ½A Team Racer rules with an 80 m.p.h. racer able to cover 35 laps per tankful.

Richmond M.A.C. are now installed in their new, comfortable club room in the cellar of a local grocer's premises. A recent indoor R.T.P. event produced a crop of near wingless missiles, including a canard that would not fly until the stabiliser was removed! Fastest speed recorded was about 37 m.p.h. for five laps, which kept onlookers pinned to the newly whitewashed walls, subsequently, to discover themselves to be similarly adorned.

Word from **EAST ANGLIA** where the F.A.S.T.E. Rat Race meet at R.A.F. Oakington on March 15th, attracted 25 entries for this competition in conjunction with the R.A.F.M.A.A. Ultimate winner of the Senior event was R. Gould with a time of 8 : 05 followed by Taylor at 11 : 50. Junior event was won by B. V. Waterland in 13 : 05. **Brentwood M.A.C.** ('phone 5150) announce purchase of camping equipment to extend their activities.

Brighton D.M.A.C. made the K.M.A.A. Cup on April 8th, their first meeting of the season, making up seven of the eighteen entrants from the **SOUTH EASTERN AREA**. The club took the first four area placings, best score recorded being that of Ken Winstanley, a new member, flying an A.P.S. *Pelican* for 6 : 34. Second was Dennis Latter with 6 : 10 and Tony Clark was third for 5 : 53.

In the **SOUTHERN AREA**, the **Southern Multi Flyer's** Spring Competition on March 25th, attracted 12 competitors. Winner was Chris Olsen, who scored 3,560 points, using his *Merco* .49, equipped model with home-built receiver. Frank Van den Bergh was second with 3,514, again using a *Merco* .49 and *Orbit* 10 radio. Third placer was Harry Brookes, not far behind with 3,410 points. His motor was a *Super Tigre* .56 and he used F. & M. 10-*channel* equipment.

Latest craze in **Woking and D.M.A.C.** is Outside-the-Circle control line flying on Friday evenings at their club room. Best yet, is Tony Pollock's and Paul Carey's *Cox Pee Wee* powered machines, which can execute ling-overs and loops. They now intend to attempt inverted flight.

Christchurch M.A.C. need new members. They are only a small club, but have one of the best control line flying sites in their area at Stanpit Marsh Playing Field, which is big enough to accommodate 15 or more circles at once. They have unlimited use of this field and feel it a shame to waste these good facilities on their small membership. Come on chaps, join the club at Christchurch and take up their offer. They meet each Tuesday, 8.15 p.m., Christchurch British Legion Hall. More R/C'ing from **Reigate D.M.A.C.**, where D. Palmer's *Matador* recently provided filling for litter baskets on Epsom Downs after it "wound-in" on stuck rudder. He had replaced the *Mini-Reptone* (never had a prang) with a Unitone because, said he, it gave better range. Power gliders are the rage now, four so far built. Power for these ranges from one *A.S.55*, two *D.C. Darts* to a P.A.W. 2.49 or a Forster .29.

Chichester and D.M.A.C. turned out in force on March 18th for a radio control slope soaring meeting attended by Southern Televisions' interviewing personality, John Baguley and cameramen, filming the event for their "*Day by Day*" programme. Some seven radio soarers took the air and the cameraman was able to get some excellent shots. The steep slopes of the Trundle Hill at Goodwood are ideal for this kind of flying. They also filmed the club's control line activities and had some awkward moments while trying to film from inside the circle!

SOUTH MIDLAND AREA'S only news this month comes from **High Wycombe M.A.C.**, who now announce that despite all, their annual rally will in fact, take place at R.A.F. Booker on July 8th, though it will not be the public event it has been in previous years. No spectators will be allowed on the field, but each competitor will be allowed two assistants only. Events include Combat, Stunt, F.A.I. and ½A Team Race, but no Class B race. Combat will be restricted to 64 entries and it may be necessary to place restrictions on other events. Pre-entry is therefore essential to J. Elphick, 102 Suffield Road, High Wycombe, Bucks., price 2s. 6d. per event to full S.M.A.E. members and 3s. 6d. to Associates. In all cases, competitors will be asked to show evidence of S.M.A.E. affiliation and insurance cover before they are allowed to fly.

In the **MIDLAND AREA**, **Leicester M.A.C.** faces the vexing problem of finding a new flying field in the near future as Braunstone Airfield has been purchased for development by the British Shoe Corporation. The situation is all the more worrying coming as it does at the commencement of a new season. Apart from this, Rat Racing is becoming popular and monthly Combat competitions continue. Latest development seen in R/C is catapult assisted take-off, demonstrated very successfully by Mr. Smurthwaite, whose model is also fitted with a parachute D/T actuated upon failure to receive radio signals. The club insurance scheme has been extended, with the maximum claim raised to £50,000.

Sutton Coldfield R.C.M.A.C. announce their 1962 rally, which is to be held as last year at R.A.F. Wellesbourne Mountford on July 8th. Entries are invited for Single, Multi and Scale as per last year's event, but they point out that due to insurance regulations, only full members of the S.M.A.E. will be accepted as entrants. All interested should apply to A. Thomas, 791 Chester Road, Erdington, Birmingham.

Organisation at **EAST MIDLAND AREA** competitions so far this season has been non-existent. This is because the Area Secretary, Mrs. F. Shirt, resigned after remarks were passed about last season's meetings. However, the critics have not seen fit to run the competition themselves. At the moment, **Chesterfield Skyliners M.A.C.** are pressing for an apology and hope that other clubs within the Area will support them to re-instate the area sec. **Grantham and D.M.A.C.** sent along cuttings from their local newspaper (picture included), containing coverage of their A.G.M., held on March 16th. The report afforded the club some favourable publicity and also lets the locals know that the Nationals will be only six miles away at Barkston as last year. So it looks as though we can expect some spectators.

Baildon M.A.C. have suffered from competition blow-outs in the **NORTHERN AREA**. Henry Tubbs being the only man in the whole area to fly in the Flight Cup, and his 1 : 55 duration took his model ¼-of-a-mile down wind. Their hand launch glider event provided an amazing flight by Andrew Brewster's A.P.S. *Aiglet*, which rose from a hand launch straight into wind upwards to a great height before turning and flying out of sight for 6 : 40. A 72-inch span open Power model for a McCoy .60 is on the way (*Yow!* Into orbit?) and D. Goodwin has trimmed out a 400-square inch O/D weighing 17 ounces powered by a ball race McCoy .29. The general opinion seems to be that with the 10-second engine run, a small model with a BIG engine is the answer. Or is it? What will happen when this has overcome the handicap which the 10-second engine power run is intended to impose? Maybe one day free flighters will cease to employ wings in an effort to reduce duration. **Wharfedale M.A.C.** Rally will be held on June 24th at R.A.F. Marston Moor near Wetherby on the B1224. North bound traffic should turn right at the Wetherby by-pass. **Urmston and D.M.A.C.** hold quarterly competitions and on April 8th, Ken Hulme won their stunt event to become current quarterly champ. Next quarter's comps. will be Rat Race, Glider and Combat.

NORTH WESTERN AREA'S Whitefield M.A.C. were in form at Elbington, where J. Parrott, flying his underweight (13-ounce) A/2, a Tee Dee powered *Dixielander*, gave B. Bailey second in Power and John O'Donnell flew his Thermal Hopper Power model to second place in the ½A Power event. An interesting point came out of the Comp. Sec.'s report at their A.G.M. They made 140 entries in comps. over the past twelve months, but only 40 were in the Control Line and Radio Control classes. The next club event will be a *Mini-Rat Race*, for which a Senior member is drawn an hour before the race to assist a Junior, examine the latter's model and equipment and act as pit crew. What a marvellous idea. Efforts are being made to obtain a hard surfaced control line circuit *a la* Esher. The local council seem

S.M.A.E. Contest Results

March 25th, 1962 (Area Centralised).
LONDON WEATHER, Clear, wind gusting 20-30 m.p.h.

K.M.A.A. Cup (Unrestricted Glider).

1. Halford B. ...	Norwich	9.00 +	0.49
2. Burrows M....	St. Albans	...	8.33
3. Giggle P. ...	Stevenage	...	7.59
4. Spencer D. B.	Chester	...	7.57
5. Sladden T. ...	Canterbury	...	7.54
6. Hughes B. ...	Hornchurch	...	7.44

106 entries, 19 returned no score.
1960—169 entries—1961—206 entries.

Frog Senior Cup (Unrestricted Power)

1. Price J. ...	Norwich	9.00 +	1.45
2. Petrie D. L.	Montrose	...	7.50
3. Fuller G. ...	St. Albans	...	7.47
4. Payne T. ...	Northampton...		7.25
5. Harper D. ...	Glevum	...	7.11
6. Dilly M. ...	Croydon	...	6.51

58 entries, 21 returned no score.
1960—130 entries, 20 in fly-off—1961—44 flew

F.A.I. Rubber (Wakefield)

1. Wells A. R.	Hornchurch	...	12.34
2. Anderton A.	R.A.F.	...	10.56
3. J. O'Donnell	Whitefield	...	9.31
4. Nelson W. ...	Sheffield	...	9.14
5. Godden R. L.	Cambridge	...	9.08
6. Willmott D.	Essex ...	...	8.57

21 entries, 2 returned no score.

April 8th, 1962 (Area Centralised)
LONDON WEATHER, Showery, wind gusting to 40 m.p.h.

ASTRAL Trophy (Unrestricted Power)

1. G. Castell	Stevenage	9.00 +3.42
2. D. B. Spencer	Chester	8.52
3. S. Savini	Liverpool	8.25
4. M. Green	Foresters	8.23
5. D. England	Grantham	7.23
6. B. Picken	Wigan	7.08

50 entries, 14 returned no score.
1960—40 entries (F.A.I. Power),

FLIGHT CUP (Unrestricted Rubber)

1. J. O'Donnell	Whitefield	11.37
2. D. Wolstenholme	East Lancs.	9.14
3. D. Fletcher	Timperley	7.10
4. A. Anderton	R.A.F.	6.07
5. E. Thorpe	Littleover	5.50
6. J. Whittaker	Tun. Wells	4.25

21 entries, 9 returned no score.
1960—70 entries. 1961—39 entries.

F.A.I. GLIDER

1. J. Hannay	Wallasey	12.54
2. D. Williamson	Timperley	12.12
3. P. Perry	Birmingham	11.00
4. E. Wiggins	Leamington	10.39
5. H. Worthington	Wallasey	10.13
6. L. Moore	Leamington	9.55

47 entries, 7 returned no score.

PLUGGE POINTS (to date)

1. Stevenage	455.487 pts.
2. Norwich	388.572 "
3. St. Albans	379.048 "
4. Canterbury	378.456 "
5. Brighton	371.197 "
6. Glevum	284.309 "

April 29th, 1962 (Centralised) Barkston Heath.
GRANTHAM WEATHER, Bright periods, wind gusting 20-25 m.p.h.

TEAM TRIALS (First qualifiers only)

Team Racing

1. Edmonds/Smith	H. Wycombe	4.36
2. Long/Davy	Wharfedale	4.43
3. Davy/Long	Wharfedale	4.49
4. Steward/Taylor	W. Essex	5.15

C/L Stunt

1. F. Warburton	Bolton	2372
2. R. Brown	H. Wycombe	2074
3. G. Higgs	Bolton	2058
4. D. Day	Wolves	1932

Speed
1. P. Drewell, 120.4 m.p.h. 2. G. Copeman 114.7 m.p.h. 3. N. Butcher, 114.2 m.p.h. 4. R. Gibbs 113 m.p.h.

Radio Control (Top ten qualifiers)
1. E. Johnson. 2. V. d. Berg. 3. Olsen. 4. Brookes. 5. Rogers. 6. Morton. 7. Walker. 8. Wingate. 9. Knowles. 10. M. Franklin.
Second Team Trials will be held May 27th.

interested, so the best of luck to you chaps. Blackley and Alkrington M.A.C. has been formed and is now affiliated to the S.M.A.E. Anyone interested in joining in the fun should contact the secretary, W. T. Bellerby, 18 Ruthin Avenue, Alkrington, Middleton, Lancs.

In the WEST, Weston Control Liners belie their title and motorless flight is all the rage with many all-sheet slope soarers. Six radio control soarers have been built for their new flying site on the Mendip Hill, but they hope to get "back to normal" to take part in Combat, Stunt and Team Racing at the usual rallies this year.

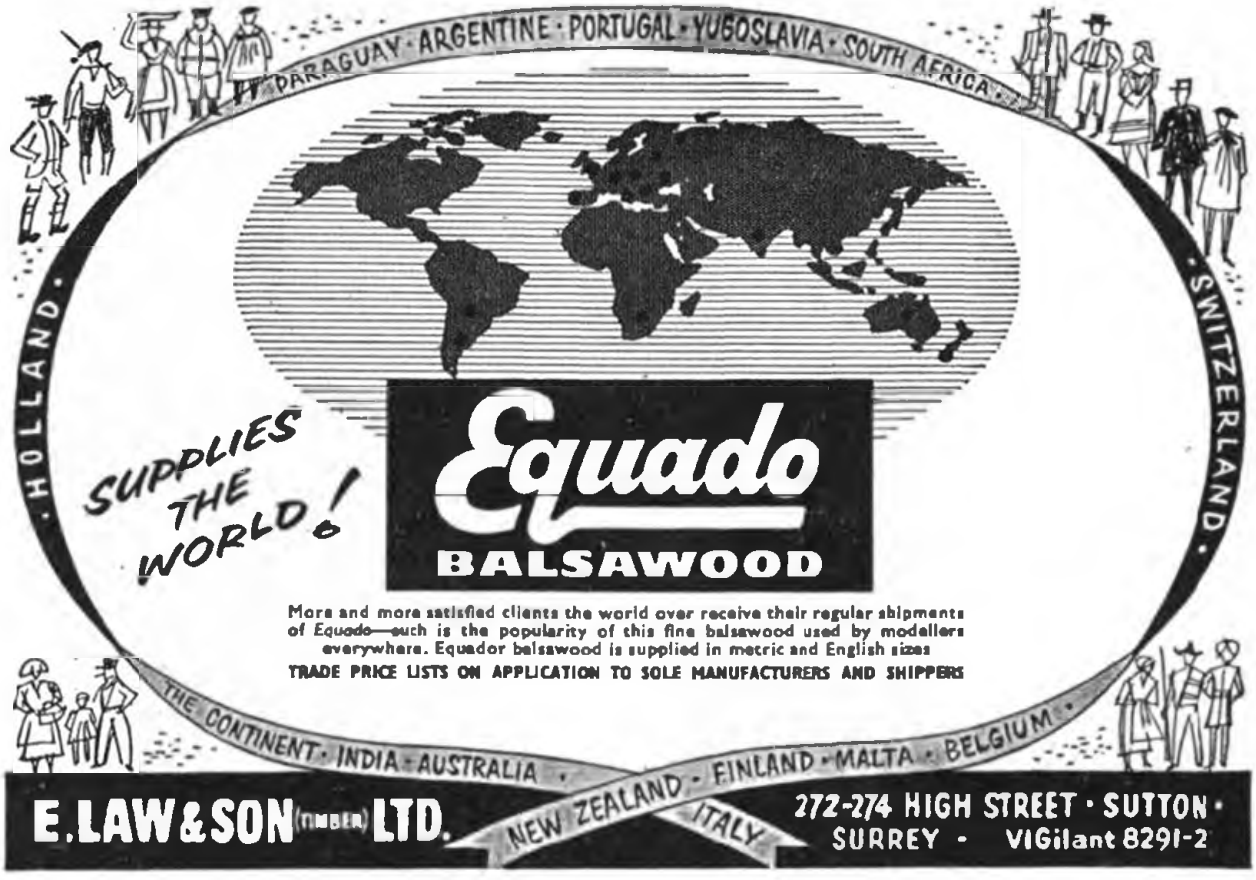
FLASH! Just as we go to press Northern Heights M.F.C. confirm July 1st. as their Gala date at R.A.F. Halton, usual classes, Queen's Cup for F.A.I. rubber.

See *you* at the Nationals!

THE CLUBMAN.

For Your Diary

May 20th	*Woodford Rally.* All Classes F/F, C/L, R/C. A. V. Roe Airfield, Woodford, Cheshire.
May 20th	*Esher F.A.I.* and Stunt C/L at Fairmile Common, Esher. Pre-entry only to 27 Harvey Road, Walton-on-Thames, Surrey.
May 27th	*East Anglia Area National Decentralised F.A.I. Contest.* F/F Details from Comp. Sec., "Maredin", High Street, Balsham, Cambs.
June 24th	*Wharfedale C/L Rally.* ½A, F.A.I., B. T/R. Combat. (R.A.F. Marston Moor). All entries 2/6 to C. Secker, 36 Rookwood Ave., Leeds 9.
June 24th	*Bristol R.C.M.A.C. Rally*, including Mono-Scramble, Scale and Multi, R.A.F. Hullavington.



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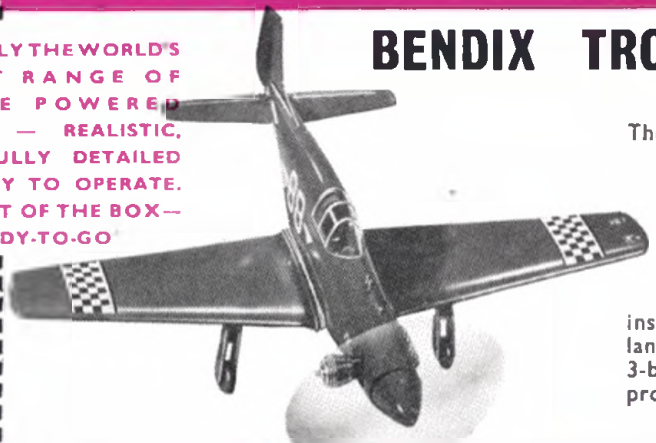

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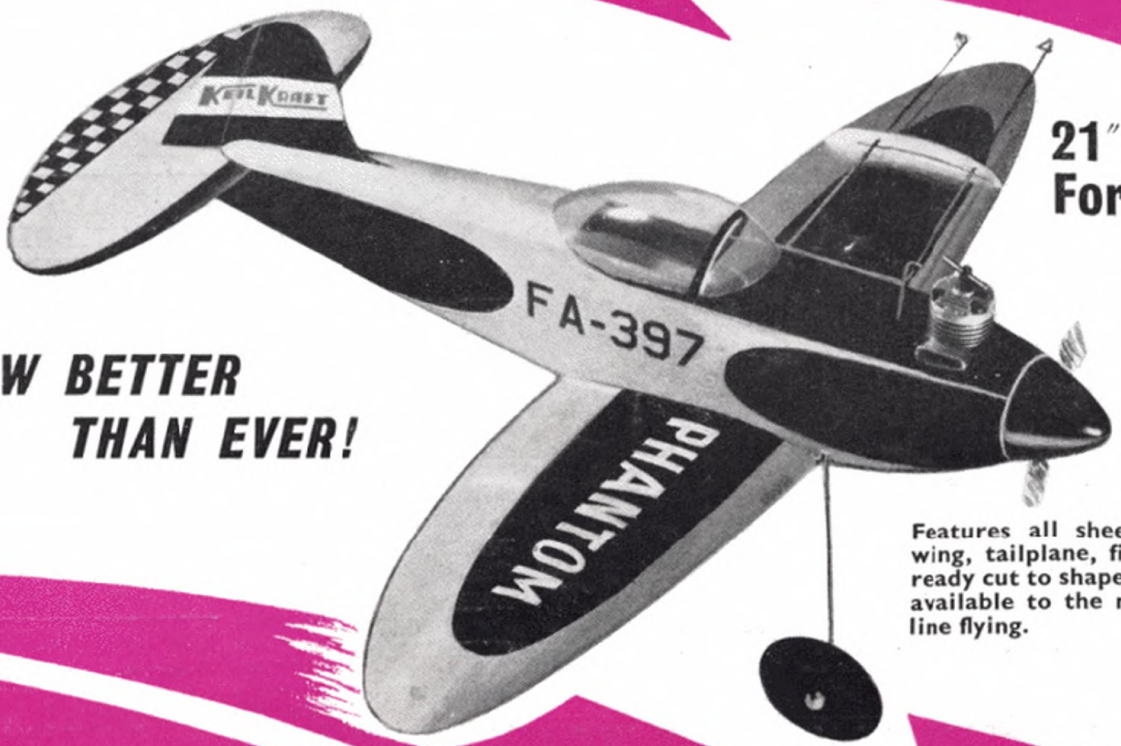

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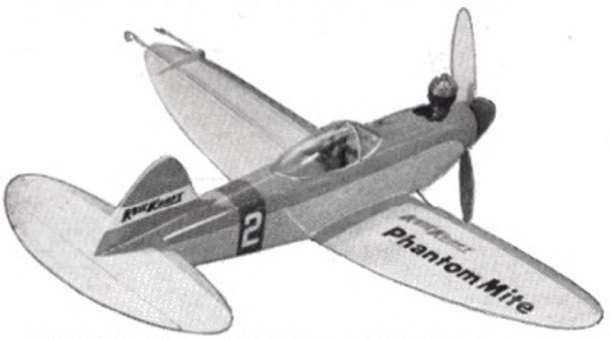

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