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APRIL 1962

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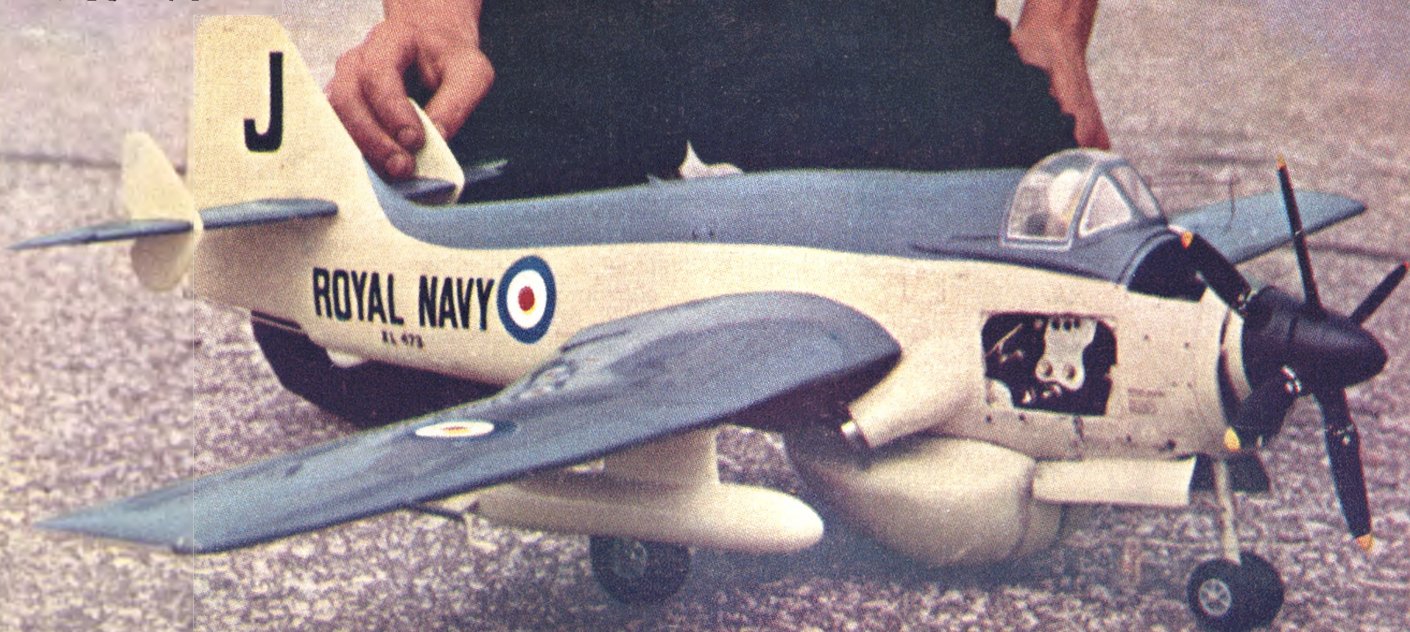
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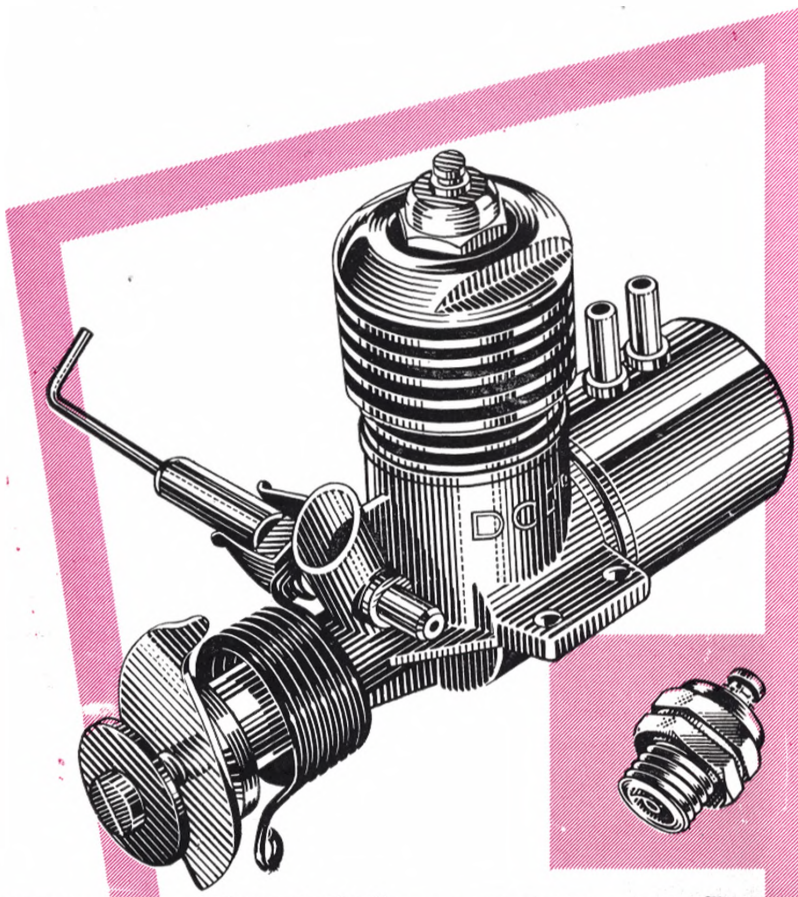
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**Record
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**1962 kits
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**Construction
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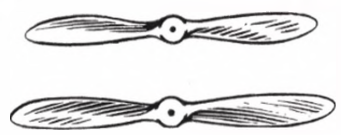
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AERO MODELLER



HOBBY MAGAZINE

other modelling angles . . .

April edition of our companion magazine **RADIO CONTROL MODELS and ELECTRONICS** will contain long awaited information on the 465 Mc/s waveband with constructional details of a wavemeter. New series on trouble shooting will help the modeller de-bug his efforts of those offending gremlins and starts with the **AEROMODELLER'S** main offender in the Min-X 6/Jackdaw/Frog 349 combination,— that of *vibration*. A specially designed vibration monitor that is easily built, will be a handy tool for tests. Unusual models are always of interest, and an R/C "thing" called the "Creep" appears in this issue in the form of a robot vehicle with a tape recorded memory. Gadgets; gen for the novice, the new British and German R/C gear pictured and described . . . plus latest news from all over the R/C World in this issue, now on sale. Next **MODEL MAKER** and **MODEL CARS**, for April has one of G. H. Deason's popular card construction models, this time a working Locomotive. "Beaver" is a 10 c.c. Overhead Valve petrol engine for model engineers to tackle. Yachtsmen will like a new Catamaran, and the latest in model boat propulsion, the turbo-jet, is well supported with a special design. Gen on Deac cells, Prototype car parade, scale features of American Civil War blockade runners and a Cranshaw car add up to a really full issue of the specialist magazine for all model makers— out on March 23rd.

April 1962

VOLUME XXVII No. 315

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cover

One of the most fascinating Control Line scale models we have seen is Bruce Randle's Fairey Gannet AEW-3 which was twin engined, as on the full size. An O.S. Max 35 mounted inverted drives the front propeller by means of an extension shaft running through co-axial gears which are used to drive the rear propeller by a side mounted O.S. Max 15. Front propeller is 4-bladed and the Max 15 is started by means of a pulley and cord. In addition the model has working flaps, throttles and arrester hook. It weighs 4 lbs. and is 38 in. span and was first entered at the British Nationals in 1960. We hope to see more like it at this year's event

next month . . .

Something startlingly new for the sports flyer! A revolutionary scheme for *Tethered Free Flight* which has been flight tested and will be presented complete with plans for a most attractive easy to build, all sheet model. Want to know the revolutions per minute of a model engine in flight? We have an electronic *Audio Tachometer* which has been fully tested and can be built by anyone handy with a soldering iron. Details of the Californian *Old-Timer Meet* for veteran model designs and some interesting information on the *Organisation of the Academy of Model Aeronautics*, plus lots of other interesting features . . . and Laurie Barr's neat Open rubber "Trip-Stick" design which has unfortunately been held over from this issue for which it was promised for unavoidable reasons. PLUS!! Yet another set of full size plans for an attractive sport model design to be built straight out of the magazine pages, On sale April 19th.

Editorial and

Advertisement offices

38 Clarendon Road,
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Telephone: **Watford 32351** (Mon.-Fri.)

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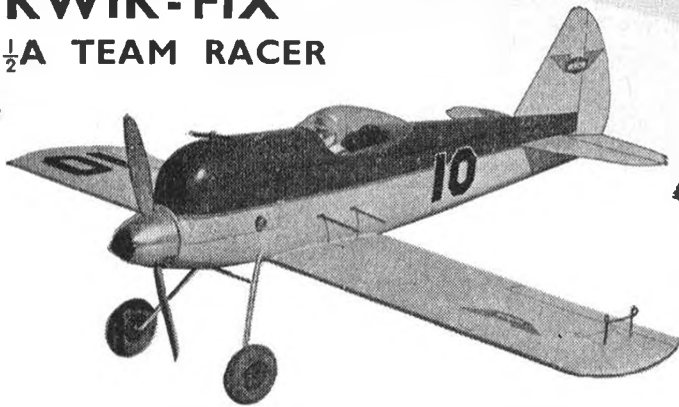
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PINTO on Parade-

Members of the LARKHILL MODEL CLUB and the BOSCOMBE DOWN R.A.F.M.A.A. with their line-up of VERON "PINTO" 1/2A Team Racers at a recent inter-club Team Race held on December 17th. Congratulations on their bubbling enthusiasm under very chill conditions—AND THEIR CHOICE OF "PINTO".

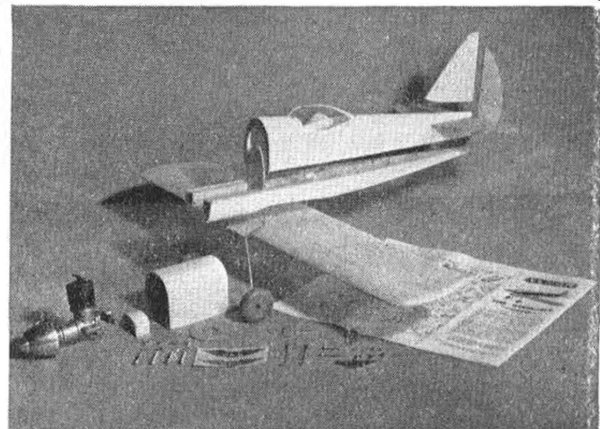


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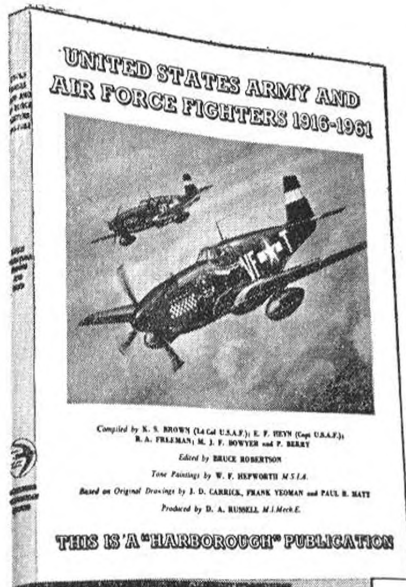
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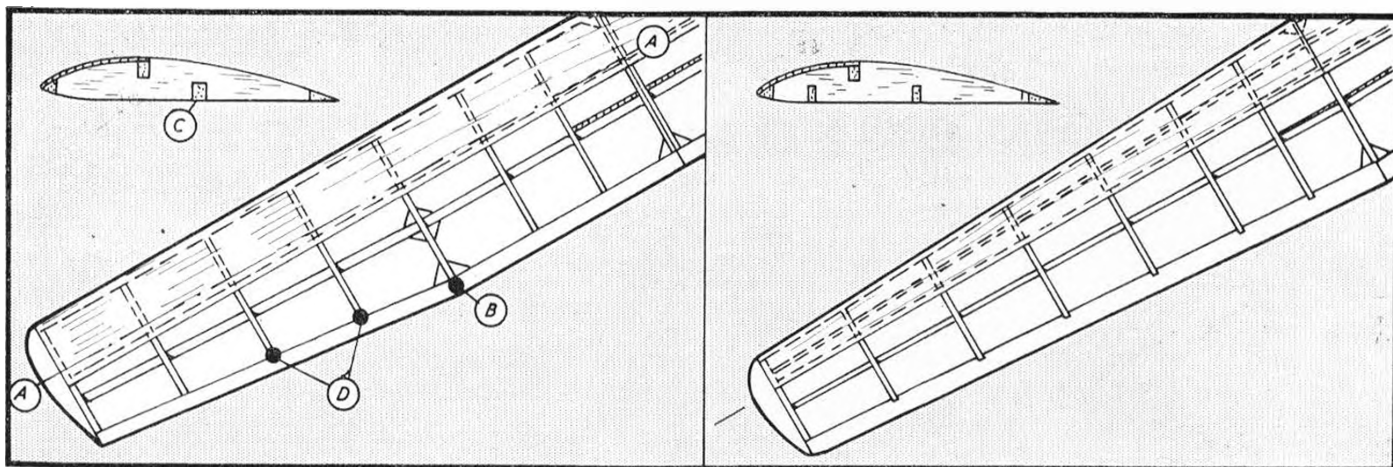
The advertisement for Equado Balsawood features a central world map with a grid of latitude and longitude lines. The map is surrounded by a decorative border of stylized human figures in various national costumes. A banner at the top of the map lists countries: "PARAGUAY · ARGENTINE · PORTUGAL · YUGOSLAVIA · SOUTH AFRICA". A banner at the bottom lists: "THE CONTINENT · INDIA · AUSTRALIA · NEW ZEALAND · FINLAND · MALTA · BELGIUM · ITALY". On the left side, a vertical banner says "HOLLAND". On the right side, a vertical banner says "SWITZERLAND".

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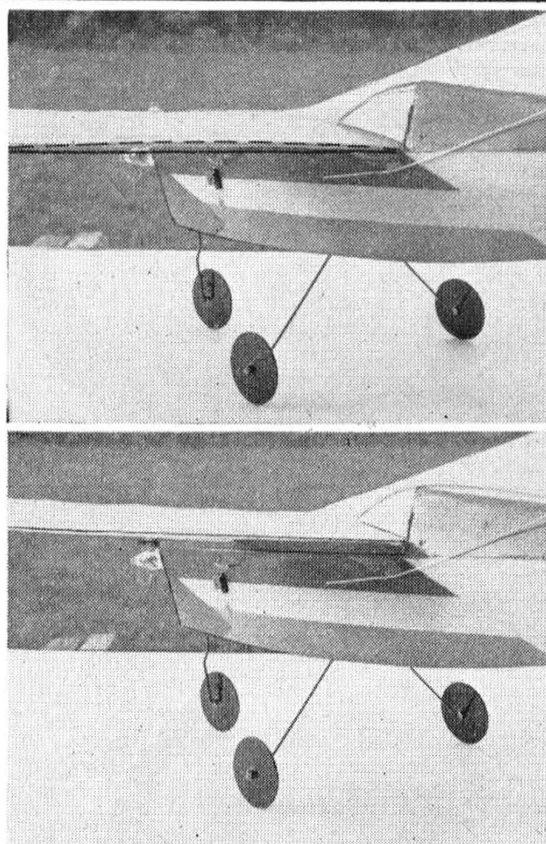
A MATTER OF DESIGN

Wing planform shapes can vary a lot without showing much aerodynamic difference in model sizes. Sometimes a shape is chosen just to *look* different. In other cases the shape is carefully matched to structural requirements or simplicity of building. The main thing, in fact, is to produce an efficient wing *structure*—and select the right grade of balsa for the various members.

Look at the plan shape shown at top left. It appears a practical, attractive shape—but it has several failings. Aerodynamically it is swept *forward* (A-A) because all the taper is incorporated on the trailing edge. The break in the trailing edge (B) means a “weak point” here, which has to be braced with gussets. This shape is also poor since it will tend to warp when covered and doped (see photo on left). Another fault is that the rear spar (C) is too far aft and, with wide rib spacing, gives a very poor lower aerofoil section with the covering sagging between the ribs. Ribs butt-jointed to the trailing edge (D) are also relatively weak.

The top right diagram shows the wing re-designed. The leading edge is slightly swept back to give a “straight” aerodynamic wing. The straight trailing edge has no weak points and two bottom spars give a better balance to the structure. Also the ribs being notched into the trailing edge will provide greater strength. This wing is aerodynamically better and can be made both *lighter* and *stronger*.

The final answer then comes in choosing the right grade of balsa for the various members—medium hard for the spars; medium light “stiff” stock for the trailing edge; light “bendable” sheet for the L.E. covering; light “quarter grain” for the ribs. That is where SOLARBO Balsa scores in being specially selected for aeromodelling use, perfectly machined to size and consistent in quality. There just is no better balsa. SOLARBO Balsa is always the final and complete answer on all matters of aeromodelling design.



- TOP PHOTO—the compound taper wing employed on a radio control model, nylon covered and given two coats of dope. The trailing edge has warped badly, giving uncontrolled “wash-in” which affected the stability of the model.
- BOTTOM PHOTO—the straight taper wing remained absolutely true after covering and doping. Of identical area it also worked out 15 per cent. lighter by careful selection of balsa grade.

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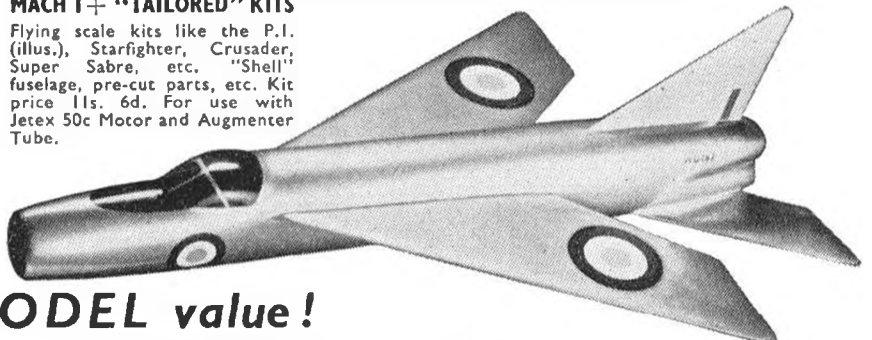
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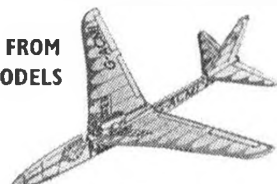
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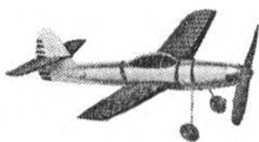
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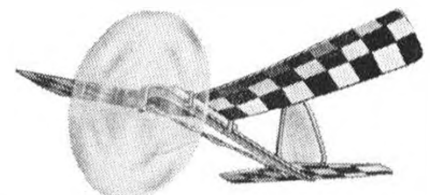
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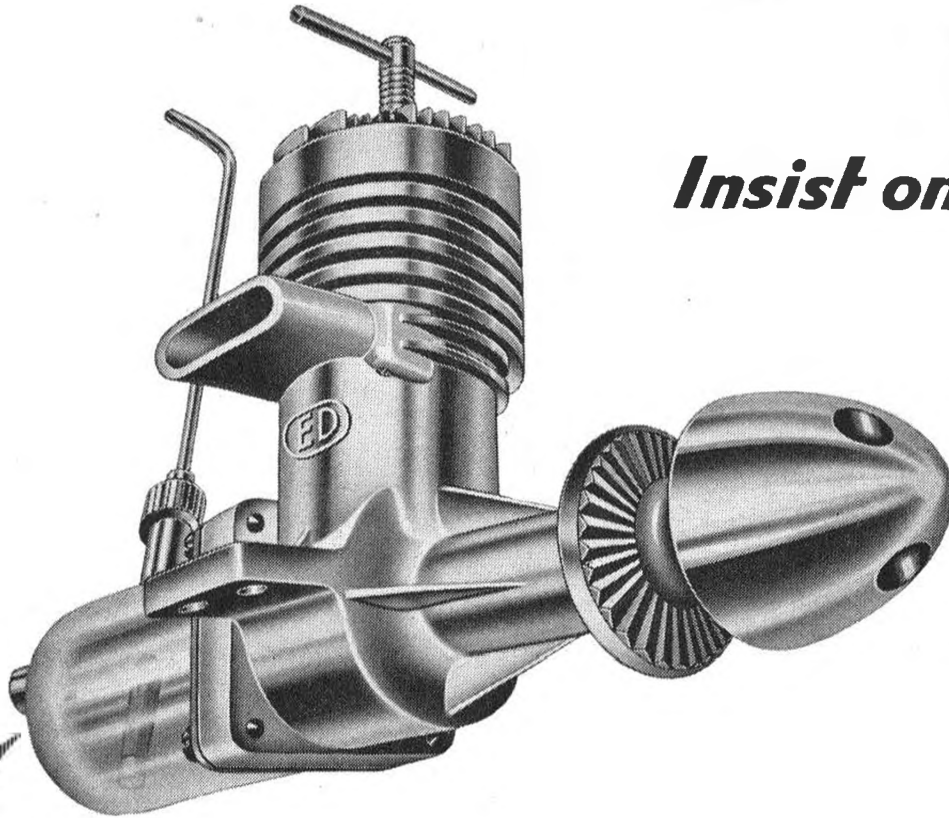
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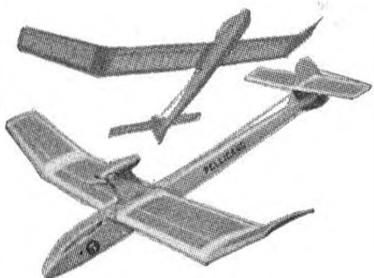
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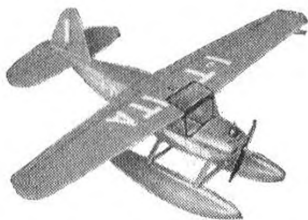
PELLICANO A/2

Radio Control
68 in. Wingspan;
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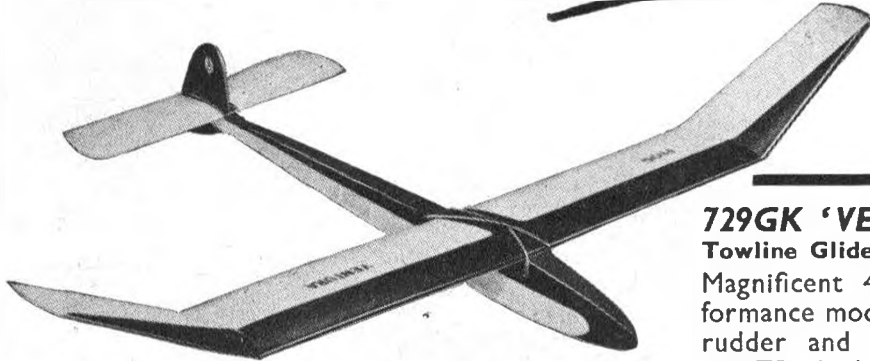
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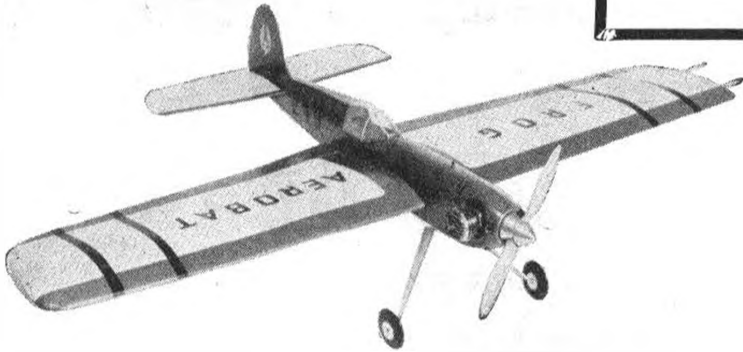


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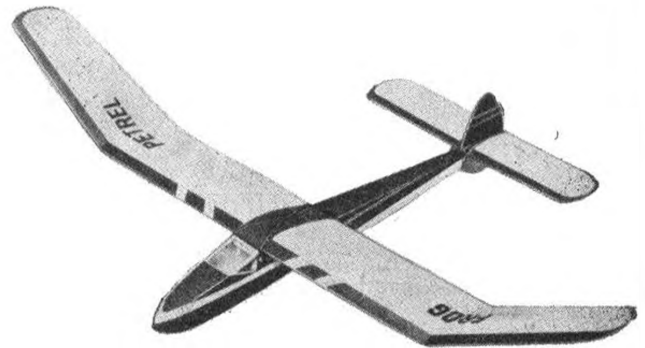
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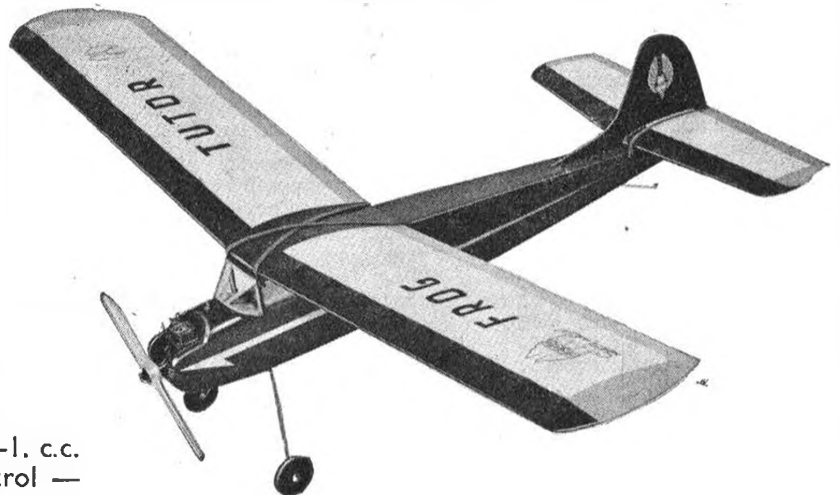
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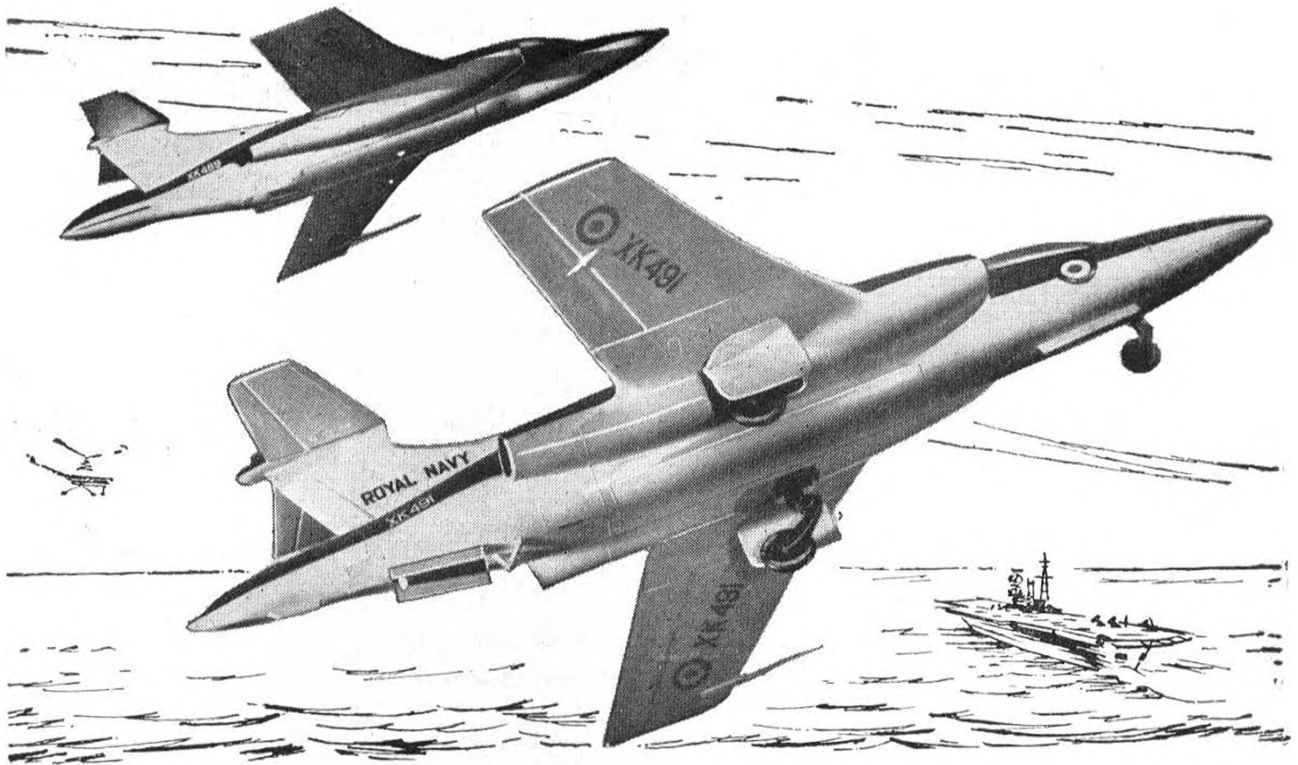
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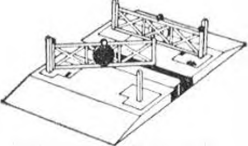
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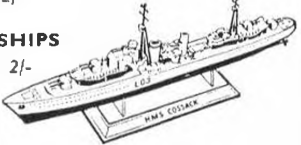


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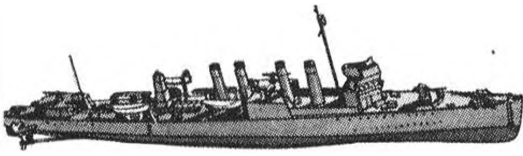
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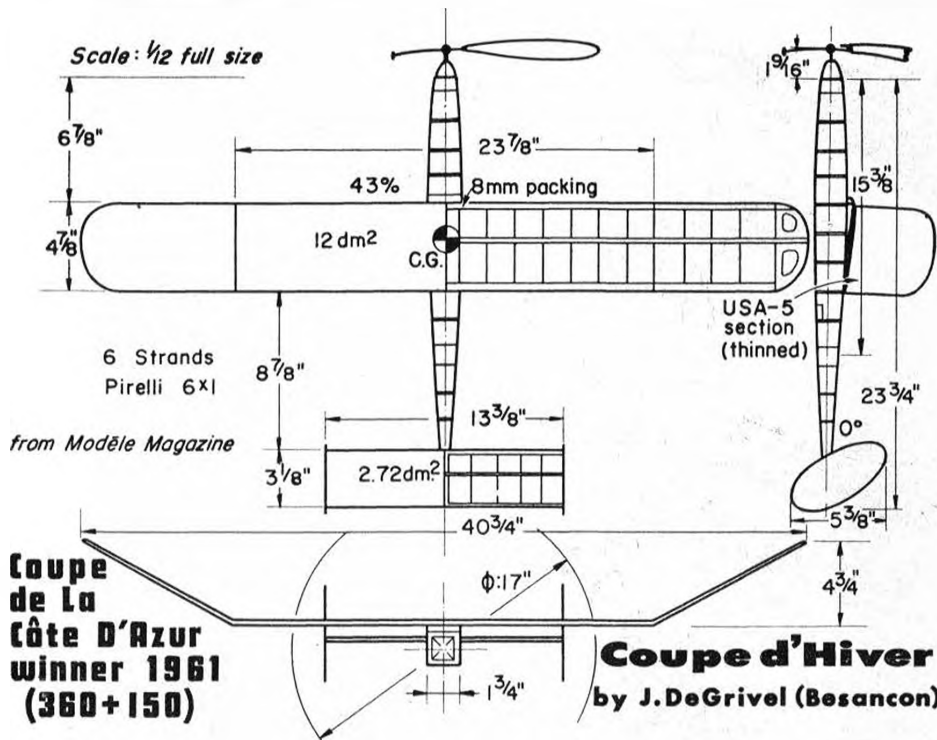
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Coupe d'Hiver is 'on'

AS THIS ISSUE appears we shall be half-way through the 31 days of eligibility for flights to be made in our Anglo-French challenge under the sponsorship of AEROMODELLER and *Model Reduit D'Avion* for models to the Coupe d'Hiver specification. A large and encouraging number of entries was received but we remind readers that those who might have made their minds up at the last moment that there are still a few days left and provided the flights are made on any one day within the month of March, then the entry will be accepted. Official entry forms are only available from the Editorial Offices and application should be accompanied by a stamped and self addressed envelope.

From France the challenge is strong indeed and the plan above showing Joseph de Grivel's winning model in the Cote D'Azur contest held on 10th December near Nice, shows the model which has established best time across the channel. It made three maximum flights of two minutes each during the contest and another maximum of 2:30 in the fourth round fly-off. The extended round system is to be used as in F.A.I. contests whereby 30 seconds is added to each succeeding round.

We are not in any way suggesting that the specification should be adopted for anything but fly-for-fun events and intend it to be used for novice encouragement and to stimulate greater interest in the simple rubber driven model. To judge from the entries received so far, it would seem that we are succeeding in our intention which is most encouraging.

Honour for the Chairman

A Royal Aero Club silver medal has been awarded to A. F. Houlberg M.B.E. for his contribution over 48 years to British aeromodelling. There is no need for us to emphasise the tremendous amount of work involved and goodwill established by the Chairman of the S.M.A.E. in his long service to the Society and we do sincerely congratulate him on behalf of all of our readers on this official recognition of his services. Mr. Houlberg first took up an official post with the S.M.A.E. in 1904 and

was Chairman in 1908. With the exception of the war years from 1940-1944 he has been Chairman ever since. Beside this he acted for many years as British Delegate to the Models Commission of the F.A.I. and is now an Honorary Vice-President.

Wakey-Wakey engine manufacturers

In view of the rallies which are apparently to be cancelled in 1962 as a result of noise complaints, we unashamedly offer this parody on Benjamin Franklin's *Maxim*—prefixed to *Poor Richard's Almanac* about 1780 . . .

"A little neglect may bring mischief . . . for want of a silencer, a field was lost; for want of a field a club was lost; for want of a club a shop was lost and for want of a shop a manufacturer was lost."

"By my Troth"

Attention has been recently focussed in the press and on the B.B.C. on Consumer Association publications which claim to give the only unbiased reviews, with the inference that editorial policy is unduly influenced by advertisement revenue. Nothing could be further from the truth, so far as we are concerned.

If an engine breaks we say so—and the manufacturer makes amends. If a relay proves unreliable, or a Transmitter heavy on dry batteries, then we see no reason why this information should be withdrawn. If a kit proves inadequate in any way we tell the manufacturer first (should he be one of the wise few who supply them for review in advance of full production) and the modeller benefits.

Not generally appreciated is the unique service AEROMODELLER has maintained for the model trade throughout its 26 years of publication. It is no exaggeration to say that over one-fifth of our office time is taken up with trade consultation matters. Our service carries no distinction for the favour of any particular manufacturer, large or small, whether he advertises or not. It is done for nothing and not even the material charges (sometimes considerable) are referred back to the applicant.

Our service ranges from naming a component to assessment of sales potential for a new kit or engine. "Guinea Pig" field tests are made, often to the point of time wasting frustration, more often to a degree of satisfaction that enables the maker to proceed with our suggestions. Thus many products are pre-tested long before they reach the shops and snags eliminated through our advice. In addition we take upon ourselves to lead with promotion of new interests; for example, in the introduction of the diesel, the A/1 and A/2 classes, model helicopters, vane steering, home constructed R/C gear etc. up to the present Coupe d'Hiver promotion and experiments we have in hand for new materials and methods of propulsion.

This is our way of providing the proper communication between manufacturer and reader which may perhaps not be realised by some of the new manufacturers.

An advertiser is entitled to have his say in the space he buys, and we reserve an equal right to express unbiased opinion on everything submitted for review. We could cite cases of reviews that never appeared because the items were withdrawn from sale through our refusal to "doctor" the report . . . but that's another matter!

Straight from the (Comp. Sec's) shoulder

As we have been at pains to point out in past issues, we have a great respect for the contribution made to the model flying movement throughout the world by the lively newsletters issued regularly by the more active contest flying groups. They provide a service for the specialists which cannot be offered by monthly magazines.

Recent bickerings concerning the administration of the S.M.A.E. have had their full share of publicity in the newsletters and in correspondence circulated by one particularly dissatisfied area.

All the more reason, therefore, that we should reprint the following quotation from the current issue of *Northern Area News*. We commend the newsletter for publicising this comment from the Society's Competition Secretary and, whilst it must not be taken as official comment, it certainly reflects an opinion which needed to be expressed:

"I trust I may be allowed to comment on the various points you make in your 'political' article, since by their inference they imply the Council of the Society has not done all it should for the modellers in general. Criticism is generally a good thing, for without it we would never improve, but it must be based on the truth and it must be constructive, otherwise it is absolutely worthless.

"First the case of Mr. Elliott, whom you report to be 'disqualified by the S.M.A.E. from International events for one year.' Mr. Elliott was never disqualified from anything; he was suspended pending receipt of an explanation of his behaviour at the World Championships. It should be noted that the official in charge of the team, Mr. S. Smeed, was most critical of Elliott's behaviour and was supported by two other leading officers of the Society. On the face of it the Council had no other alternative but to call for an explanation from Elliott, but it should be noted that when this was forthcoming, the suspension was immediately lifted.

"Cheadle (the model club—Ed.) thinks the Society has gone mad (they should know, they are part of it!) and questions the right to increase competition entry fees. The only place any fees can be amended is at the A.G.M. whether they be membership, competition or auditors fees. At the A.G.M. in Birmingham in 1960 the members present were told that, owing to the very high cost of

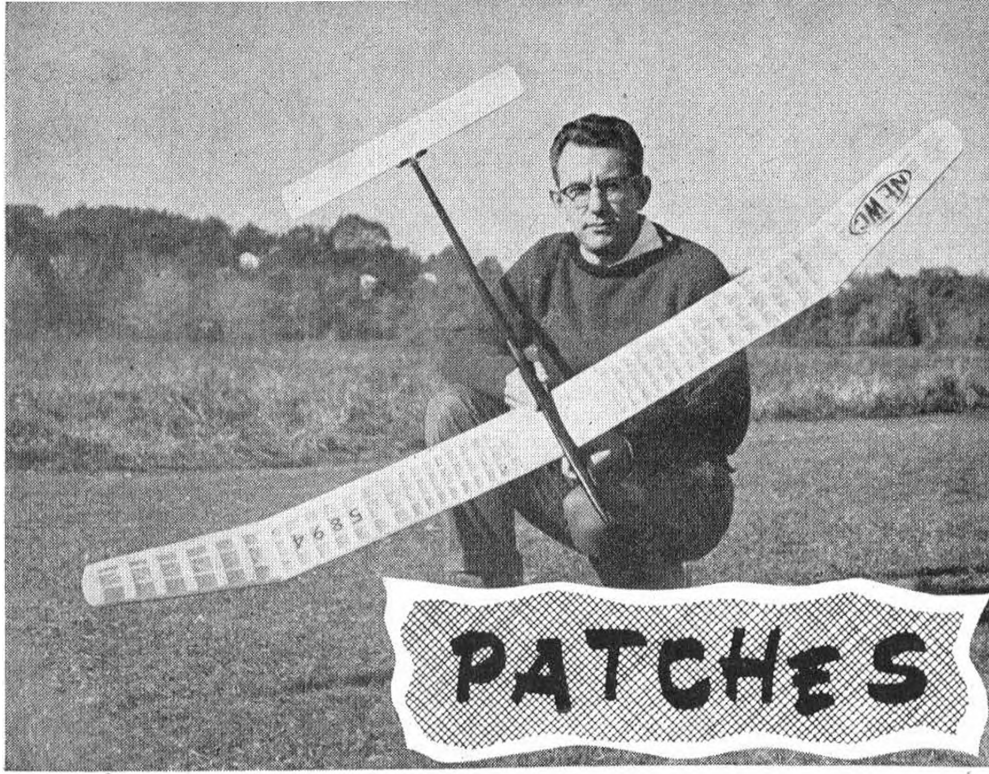
sending teams to World Championships, an increase in the revenue of the Society was not only highly desirable but very necessary. Since much of the increase in expense was for the direct benefit of competitors it was felt they should be the first to help and, rather than an increase in membership fees, it would be more equitable to increase the entry fees to contests. If I remember correctly, this proposition came from a group of leading contest flyers, was voted on and approved at an open meeting, and to me seems quite sound and logical.

"The question to F. (L) A.I. or not to F. (L) A.I. is indeed a question. Speaking and writing to competitors generally I think it fair to say that opinion is divided about 50-50 on this vexed question, so if the Council in their wisdom plump for an all U/R programme, they promptly receive howls of rage from all the F.A.I. group; if they decide on all F.A.I. there is bags of rhubarb from the open flyers. Taking the logical way out and making the programme 50/50 F.A.I. and U/R all the competitors complain. So what would you do? The trouble is that all our members are 100 per cent. democratic provided they can all have their own individual way in everything!

"Speaking of democracy, how much more democratic can your Council be? Your Officers are all well known and freely elected, each Area can send its own freely chosen representative, and everything in Council is decided by open vote. On a full turnout, the delegates outvote the officers and I cannot possibly see how the Council can go against the majority wishes of the members. Criticism of the Society by an Area is ridiculous; they are part of the Society. If they direct their criticism at the Council because the Council has not done what that particular Area wishes, then it can only be because the other Areas have not supported their ideas. I will agree that the system is not 100 per cent. perfect because of the failure of all Areas to take part in the system; some do not send delegates at all, and some send delegates who never say a word from one meeting to another. That however is not the fault of the Council, and the sooner Areas wake up to the fact that they collectively control the affairs of the Society and start to do something constructive instead of sitting moaning, the better.

"I agree too, that communication between the Council and the members could be better. The interval between a Council meeting and the publication of the minutes could be shortened with advantage, and communication between Area Committees and clubs could be improved considerably. The channel from club to Area and Area to Council may be tedious but it is the logical way. For clubs to communicate direct to Council may be quicker, but some clubs can put up some silly ideas and they should be sorted at Area level. After all, if the Area doesn't think much of a club's suggestion it can't be a very good one.

"Finally, I am sure that people like Alex Houlberg, 'Rushy', H. J. N., Harry Barker and one or two others will be delighted to read that they think they are doing their best for the members. These people have given up practically all of their free time handling the day to day affairs of the Society, spent hundreds of week ends organising and running meetings and contests, in some cases neglected their businesses and strained home relations just to help the members. I will go as far as to say without them there would be very little organised modelling in this country. And what do they get? Grumbles, moans, criticisms, belittling remarks and in some cases open abuse. If there are people who can do better, or are even willing to try, let us have them up at the Council table, not sitting in some club room binding. But remember, it's workers not talkers this Society needs. As they say in the States, put up or shut up."—SAM MESSOM.



GLENN C. KINNEY'S U.S. Nats. winner & National record holding A/2 glider

First A/2 glider in our knowledge to qualify for the eighth round in any A/2 contest run to the F.A.I. system of progressive fly-offs, Patches set up the enviable record of 22½ minutes in seven consecutive maximum flights at Willow Grove last July. It introduces many new features to the experienced glider enthusiast and is certainly not for the novice; though study of the design detail in reduced plan below will reward many beginners with ideas for warp free wing and tail structures.

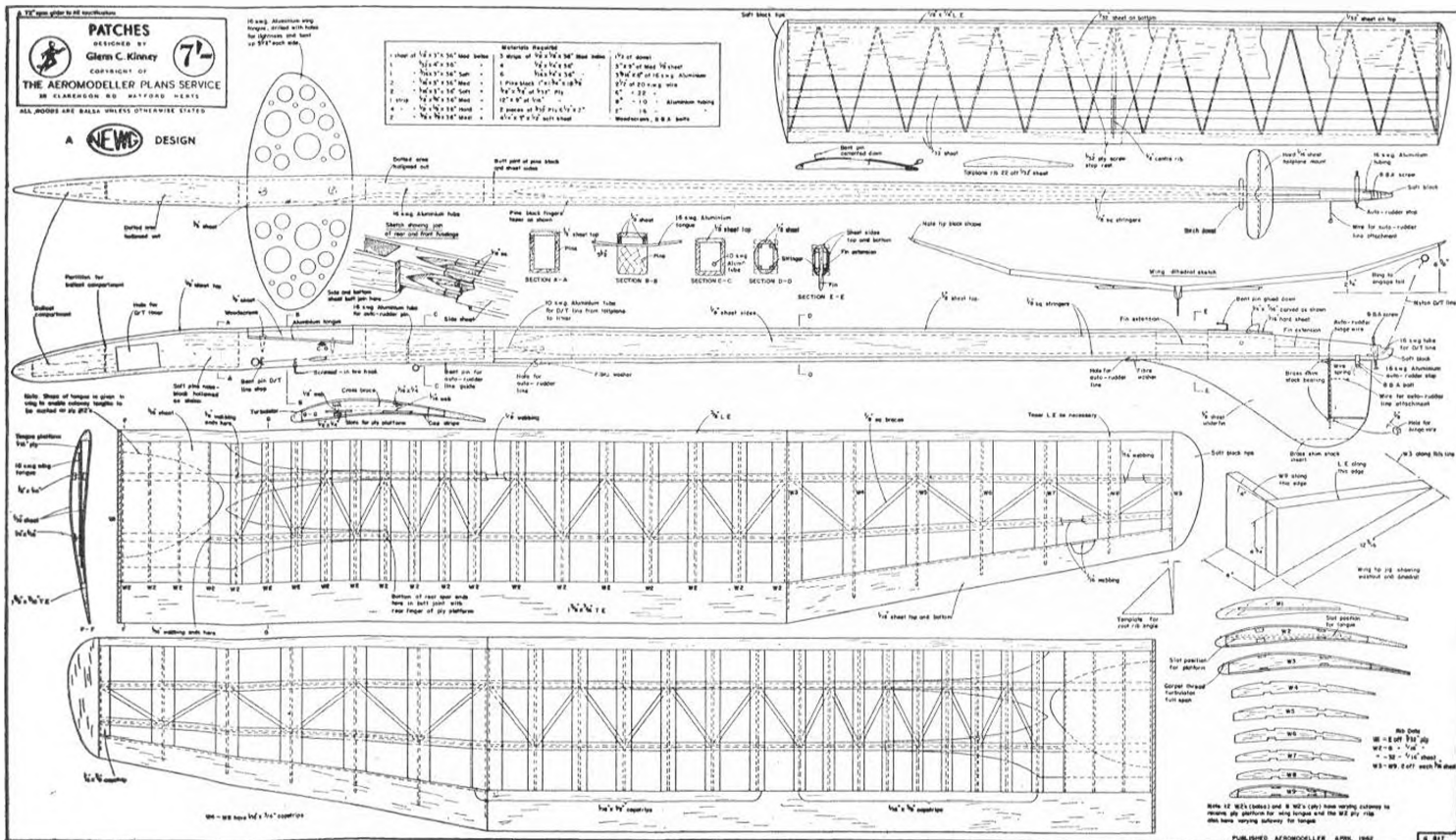
THE PLANFORM AND dimensions of Patches are typical of A/2 designs flown by the New England Wakefield Group (NEWG). Many of its features show the influence of the designer's tutor and flying buddy, Jim Daley, Jr. Wing structure was suggested by Gerry Moss of Luton, Beds., during his visit in the summer of 1960.

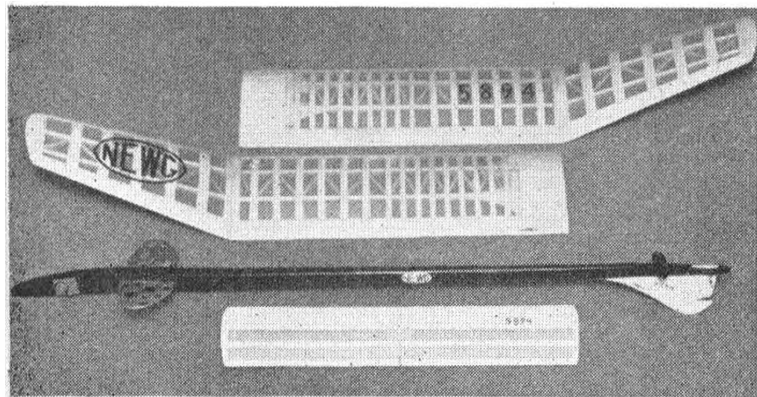
The design emphasises rigidity, strength and flight stability in the hope that the result would hold trim adjustment under rough contest conditions and in spite

of any maltreatment short of actual breakage. That something of this sort was achieved seems evident from its performance at the '61 NATIONAL CHAMPIONSHIPS.

Just before noon the model was given two short test flights in order to check the trim in the hot, windy weather, and to rehearse the flyer and launcher (the latter is Glenn's 12 year old son who two days earlier had taken first place and set a new national record in Junior A/1). During the next six hours, the model was

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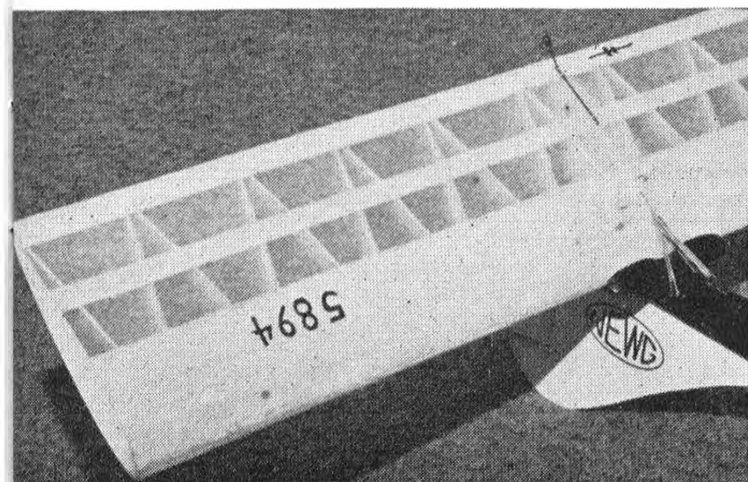


Breakdown of parts illustrates portability of this six footer, and original tail structure with one top surface spar. NEWG stands for New England Wakefield Group and includes many of the more prominent U.S. specialists in F.A.I. contests.

flown to seven successive maxes in a two-man, seven flight fly off, (there were five maxes of three minutes, one of three and a half minutes, and one of four minutes) and was disassembled and retrieved by strangers three times. In every case, the model was simply reassembled, checked visually, and flown for official time. No additional test flights or hand launches were made, and every tow was identically straight and overhead. On the last flight, Patches won over a keen competitor and second place winner, Dan McDonald of Pennsylvania, and was lost in the woods. It appears to be a successful model, and some of its design features and the reasons for their selection may be of interest.

Certain features, such as the simple tow hook and auto-rudder mechanisms, the tailplane design (except, perhaps, for the angled ribs), the D/T arrangement, and several aspects of layout and fuselage design are Daley influences reinforced by personal experience. The double finger, plywood, wing tongue deck prevents sharp bends in the wing under heavy loads, and the wide tongue provides accurate keying of wing to fuselage. Cap stripping yields a smooth profile by keeping the tissue off the spars, and by allowing less unattached tissue, adds to the rigidity of the double I-beam wing structure. The wing layout, with its rectangular centre section and straight taper from dihedral break to tip,

Tail tip detail for dethermalising the glider. A clockwork timer trips the retaining line. See I. Harvey's ideas on following page. Note dip in the leading edge saddle to get good leverage from the elastic bands.



can be easily and accurately jigged for construction. Neither wing nor tailplane warped in months even though they were always stored loose in the basement. They were not pinned down when sprayed or doped (Japanese tissue and thinned plasticized, clear nitrate dope were used).

The fuselage is straightforward, and one need not fuss with exact size of stringers, cross-section, nose shape, etc., since none of these is critical. The rugged boom and 12 gramme tailplane led to a longer nose and the forward mounted timer in order to achieve the 50 per cent. chord balance without prohibitively excessive weight. The pine nose provides a solid mounting for the tongue, the wing, the tow hook and the timer. The very soft balsa blocks for wing and tailplane tips are light, strong and simple. The machine screw stops for tailplane and auto rudder are reliable, adjustable over a wide range, and easy to use.

The model as shown in the plan is one and a half ounces overweight. If one wished, the best way to save weight, perhaps, would be to use a smaller wing tongue, to punch holes in the plywood tongue deck, to substitute hard balsa for pine in the fuselage nose, and to build a lighter fuselage boom. However, the extra weight probably has a negligible effect on performance, and while the long nose is unpopular, it is harmless. In any event, it seemed wiser at the time not to reduce strength and rigidity.

Aerodynamically, the design choices are more difficult to handle. While personal tastes and prejudices cannot be discounted, some thinking and testing did occur. As was mentioned above, the general dimensions have been satisfactory in several other models. The wing profile is a Davis modified slightly to suit timber sizes. It has been used many times before and seems to be as good as others of comparable thickness. The wing dimensions, dihedral and washout were provided in an attempt to ensure that if the model were upset in flight along any axis, it would be quick to recover with small loss of altitude. The fin is underneath because that's where it ought to be in order to avoid blanking out the airflow to it during all flight altitudes, especially when towing. The fin area was mated to the rest of the model by adjusting it in test flights until it was just large enough to prevent Dutch Roll. The turbulator has little effect in calm weather, but in bumpy weather the model flies much better and trims less sensitively with the thread simply doped on as shown in the plan. The model was trimmed to turn to the right in the glide, but it should fly equally well to the left.

Building the model presents no special problems, except perhaps for the time required by the large number of pieces. The designer builds two jigs out of wooden box ends to prop up the wing tips with correct tip dihedral and washout. The spars and trailing edge are blocked up at proper height from the working surface, and all possible pieces are assembled from the top before the wing is removed from the building board. Correct alignment of all surfaces is easy to achieve, however, and Patches has presented no other problems, other than that of chasing it,—yet!

The fuselage was sanded and clear doped for smooth finish, then painted with black pigmented dope. Fin and rudder were sanded and clear doped for smooth finish, then covered with lightweight, white Japanese tissue. The tailplane was covered with lightweight, white Japanese tissue, given three coats of thinned, plasticized, clear nitrate dope. The wing was covered with standard weight orange Japanese tissue, and given 5 coats thinned, plasticized, clear nitrate dope. The carpet thread turbulator was doped on after the wing was finished.

FIG 1.

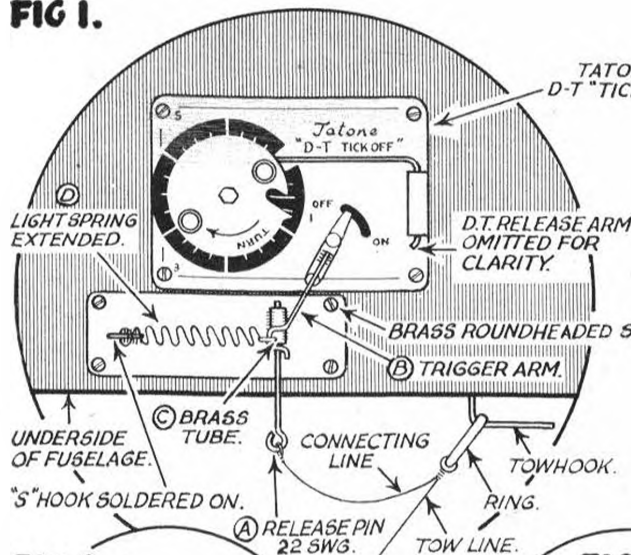


FIG 2

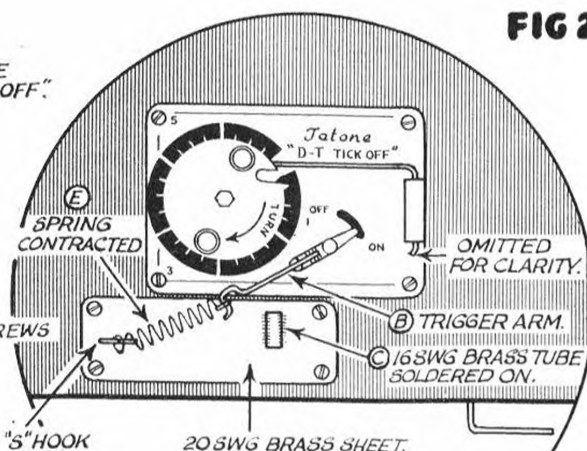


FIG 4.

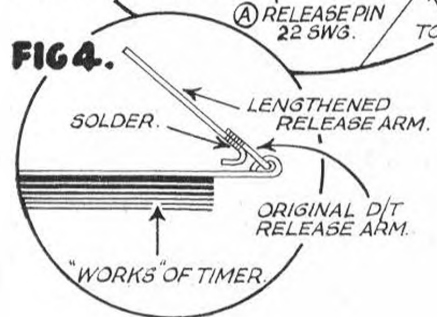


FIG 5.

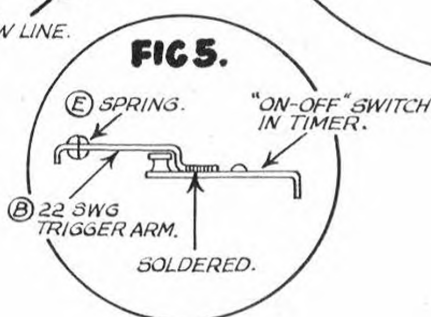
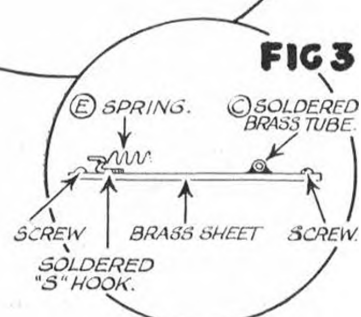


FIG 3



Automatic release for Tatone D/T timer By I. A. Harvey

MANY GLIDER ENTHUSIASTS are still mystified as to how they can employ a clockwork timer to operate a dethermaliser (tip-up tail) as used on *Patches* in this issue. Here are details which allow a timer to be tripped as the model is released from the towline.

The modifications to the timer itself are:—

(a) A piece of 22 s.w.g. piano wire is bent as in *Figs. 2 and 5* (B-Trigger arm) and soldered to the "on off" switch of the timer. To this the spring is eventually attached.

(b) A hook shaped piece of 22 s.w.g. piano wire is soldered to the release arm (B) on the timer (see *Fig. 4*) to prevent the line from the tailplane slipping into the hinge and thus exerting no leverage on the arm. Care must be taken not to have the rubber band (on the tailplane line) too far out on the arm, or the timing disc will not turn.

The base of the automatic release is a piece of thin brass sheet (between $\frac{1}{16}$ ins. and $\frac{1}{32}$ ins. thick) with an "S" hook soldered at one end, (to take the spring, as in *Figs 2 and 3*) and suitably drilled for fixing screws. The brass plate is screwed onto the fuselage below, and slightly in front of the timer (the distance depending on the length of the spring) so that the light spring "E"

just pulls the switch "B" to the "on" position. A pin of 22 s.w.g. piano wire "A" (see *Fig. 1*) is fastened to an extension of the towline. A short length of 16 s.w.g. (inside diameter) brass tubing is now soldered to the brass plate so that the pin "A" (inserted in it, in front of trigger "B") just holds "B" in the "off" position.

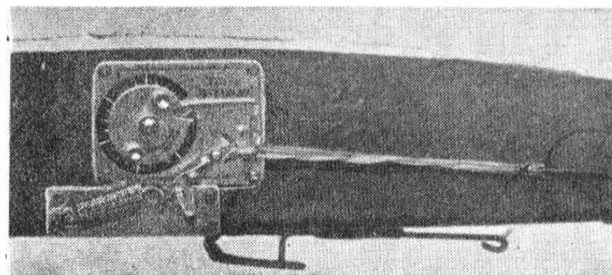
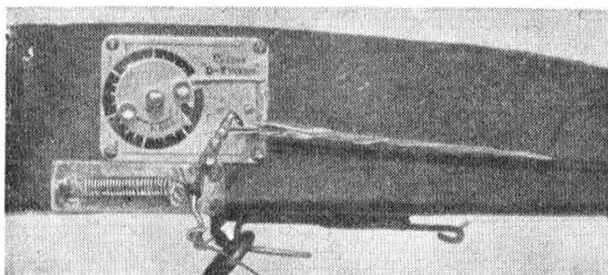
Operation

The ring (on the towline) is placed on the towhook; the trigger "B" drawn back to "off" and the pin "A" inserted into "C" to keep it in position. When the ring comes off the towhook, the weight of the towline pulls out "A", which allows "B" to spring to the "on" position.

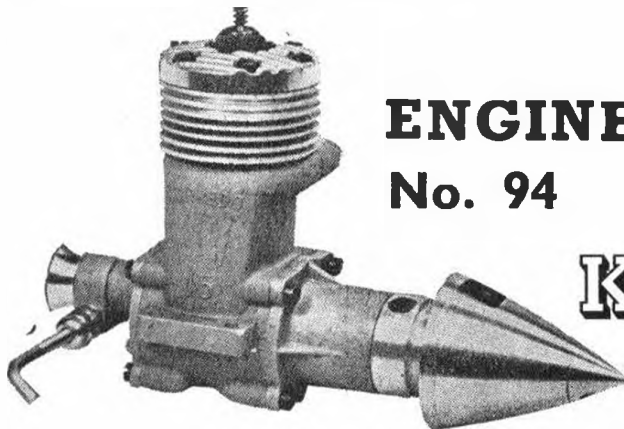
(The pin "A" is much smaller than the tube "C", so that it is held in position only by the pressure of "B". Little force is therefore needed to pull it out, and it will not jam).

This mechanism thus obviates the use of D/T fuse, and the plane can be towed for an unlimited length of time, the timing starting only on the release of the model.

Below from left to right is the sequence of timer action. Left shows the tow ring in position with release pin retained. Right is release position of auto rudder slide and timer.



THIS WISNIEWSKI DESIGN which was put into production as the K and B Torpedo "Series 61", is strictly for the enthusiast. Designed to run on high nitro methane content fuels (the makers specify 40 to 55 per cent. nitro, but higher proportions can be used still further to boost performance) and peaking at around the 20,000 r.p.m. mark it yields a fabulous power output of around .2 B.H.P. per c.c. It can *only* be kept running satisfactorily under all conditions by pressure feed, but starting characteristics remain excellent even on the smallest sizes of propellers and needle adjustments, although fairly critical, is not difficult. In fact, it is an advantage with this type of engine to have a fairly sensitive needle valve control to be sure of getting optimum settings.



ENGINE ANALYSIS

No. 94

By R. Warring

K & B 15R Torpedo

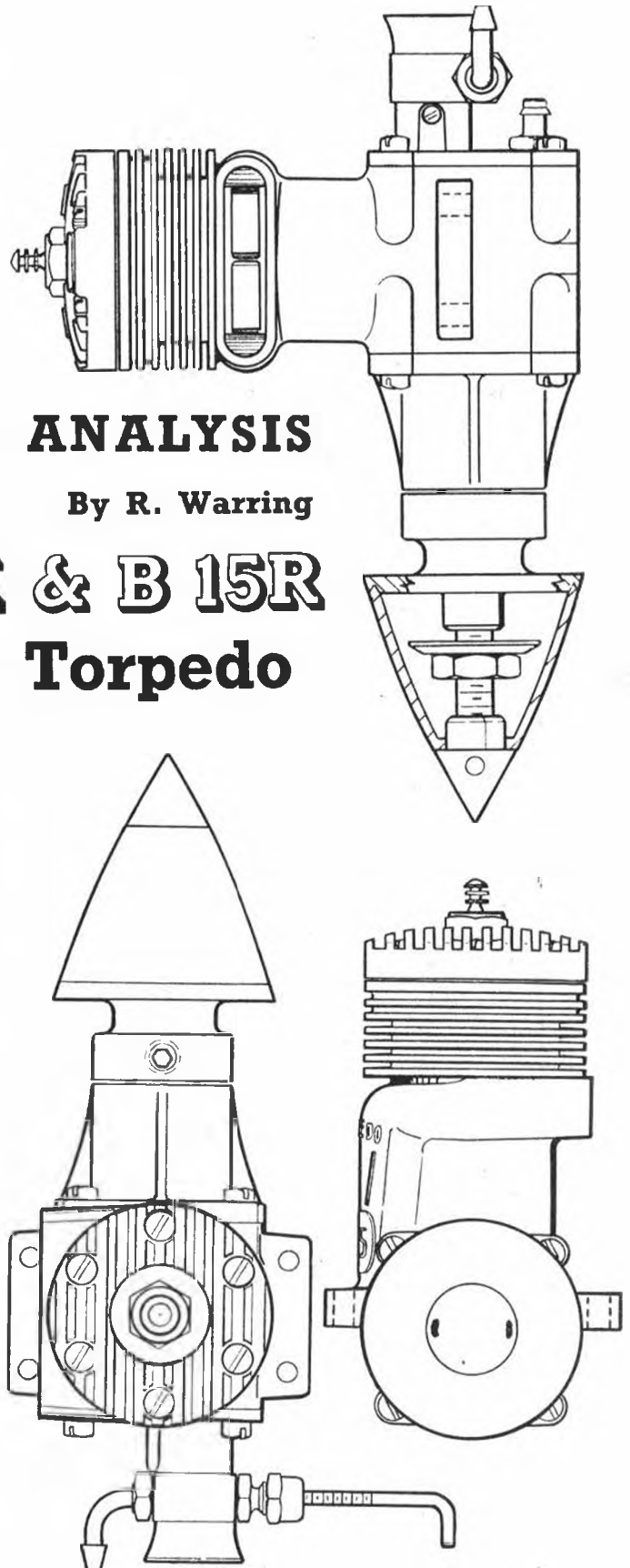
An excellent performance is still maintained on straight fuels or low-nitro fuels, without detracting from handling characteristics. In fact, there is very little difference in performance on a straight fuel and up to 25 per cent. nitro methane—yielding a peak B.H.P. figure of around .36 at 18,000 r.p.m. Anything above 40 per cent. nitro methane however, and the 15R really begins to wind up. More than that, we suspect that there would be an even greater increase in r.p.m. in the air.

On such a performance basis it seems the ideal choice for contest work—control line or free flight. It also leaves scope for further "tuning" or re-working, particularly in the latter of the combustion chamber head shape—and the manufacturers also supply special ball races which we think would still further benefit performance (at the rather fabulous price of 12 dollars per set). Against this, however, must be weighed some drastic limitations.

The limitations are concerned with maximum performance running, meaning a nitro content of at least 50 per cent. and consequently a very expensive fuel mixture (apart from the difficulty of finding sources of nitro methane at all these days in this country). With a high-nitro fuel and operating at speeds of 18,000 r.p.m. and above the 15R then needs virtually one new plug per run. No plug we tried—K and B, KLG old and new types and A-M—stood up for more than two high speed runs and most failed on one. So high-nitro performance seems to mean doubly expensive operation.

The 15R employs a very original crankshaft layout, comprising a hardened main shaft $\frac{1}{4}$ in. in diameter terminating in a circular disc. Two scallop shaped cuts are then taken out of the top of this disc to yield a heavily counterbalanced (overbalanced) shaft, but retaining the circular shape at the walls—see Fig. 1. The crankpin is pressed into a hole drilled in the disc and a thin light alloy or aluminium rim fitted over the disc (the purpose of this merely being to blank off the scalloped out volume and so

Continued overleaf



ENGINE ANALYSIS (continued)

reduce effective crankcase volume. So far all very neat, except that we have little faith in the virtues of a pressed-in crankpin, especially on high-speed engines. The real trouble, however, lies in the fact that only some 16 thou. thickness of metal is supporting the crankpin on one side and 33 thou. on the other. There just is nothing like enough metal there to provide proper support and anchorage for the pin and in the case of the test engine, the pin did eventually break away. Wisniewski's engines have run to 27,000 r.p.m. on load and 22,000 r.p.m. is normal in speed flying, so we may have had a faulty shaft. Nevertheless, manufacturer John Brodbeck, has modified in the light of our findings.

Spinner a standard fitting

The remainder of the crankshaft assembly is also unusual—although in this case quite practical. The shaft is reduced in diameter slightly between the races, hardened and ground over the journals and projects approximately $\frac{1}{16}$ in. in front of the bearing housing. Onto this fits a die-cast light alloy propeller driver (which also acts as a backplate for the spinner), locked to the shaft by means of a socket head grub screw of generous size with a square

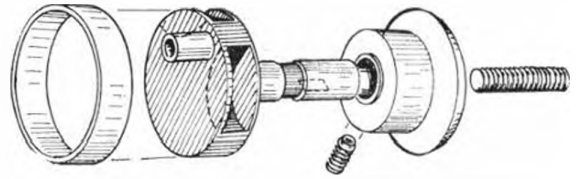


Fig. 1. Crankshaft construction showing cased webs.

head cup point locating on a flat on the shaft. The propeller shaft then simply consists of a length of $\frac{3}{8}$ in. diameter studding screwing into the driver. The shoulder on the propeller driver, however, means that the back of the propeller hub at least, must be drilled out $\frac{5}{16}$ in. diameter to clear. A spinner nut and spinner is a standard fitting and incorporates a unique lock fit with the backplate.

The rest of the engine follows more or less orthodox loop-scavenged "racing" glow motor design, although utilising rear-rotor induction and with the principal exception on the materials used that the piston and crankpin are "electrolized"—which we interpret as meaning hard chrome plated (*i.e.*, deep chromium plating as opposed to normal chromium plating used for decorative purposes which is very thin). The crankcase unit embodies the cylinder jacket and stub exhaust, with separate front (bearing) and rear units secured with screws. Although the cylinder unit can be turned through 180 degrees the engine is intended to be run with the exhaust to the left.

The front unit houses the two lightweight $\frac{1}{4}$ in. diameter ball races, carrying the crankshaft. The rear cover carries the rear-rotor disc and a stub tube on the outside for fitting the induction tube proper. The rotor disc is an injection moulding in what appears to be a graphite-impregnated hard nylon or similar plastic. The back of the disc is substantially relieved to reduce rubbing area and thus friction. The disc itself is mounted on a steel pin pressed into the back cover. The entry port is opened out smoothly to provide a divergent passage swept by the rotor disc. A very small hole near the bottom opens into the pressure tapping point, this hole also being swept by the rotor disc and thus "timed" by it to open over a period corresponding to the generation of compression in the crankcase. A pressure tap fitting is supplied to screw into the back of the crankcase.

The intake tube has a bellmouth entry with peripheral jet holes at the throat fed from an annular space in the surrounding collar. The needle valve operates directly in the end of the fuel feed pipe screwed into one side of the collar, the needle valve housing screwing into the opposite side of the unit. The method of locking—using a domed nut to apply "squeeze" to the split housing—

**Specification
and power curves**

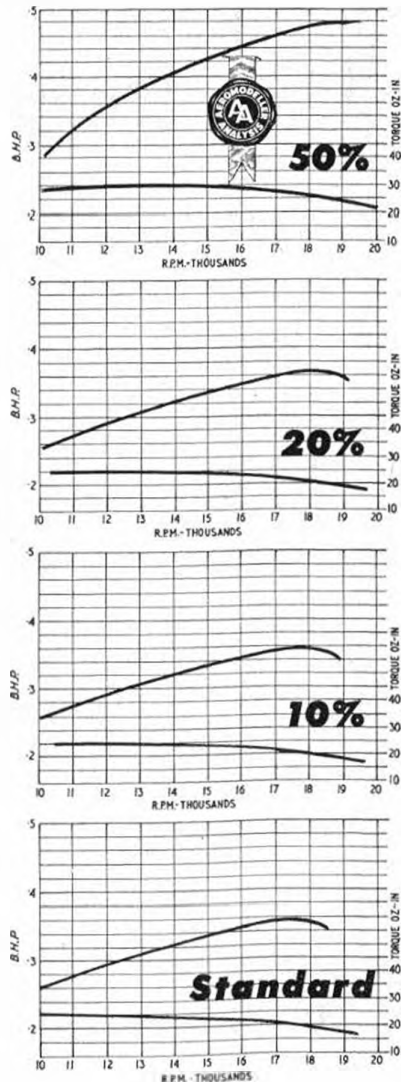
- Displacement: 2.485 c.c. (.1516 cu. m.)
- Bore: .5995.
- Stroke: .537.
- Bore/Stroke ratio:
- Bare weight: 4.9 ounces.
- Max. Power: .355 B.H.P. at 17,500 on straight fuel.
- .36 B.H.P. at 18,000 on 10% nitro methane.
- .37 B.H.P. at 18,300 on 20% nitro methane.
- .48 B.H.P. at 19,250 on 50% nitro methane.
- Max. torque: 26 ounce-inches at 11,000 r.p.m. on straight fuel.
- 30 ounce-inches at 13,000 r.p.m. on 50% nitro methane.
- Power rating: .143 B.H.P. per c.c. on straight fuel.
- .193 B.H.P. per c.c. on 50% nitro methane.
- Power/weight ratio: .0725 B.H.P. per ounce on straight fuel.
- .098 B.H.P. per ounce on 50% nitro methane.

Material Specification.

- Crankcase unit: light alloy pressure die-casting.
- Cylinder liner: Meehanite.
- Piston: steel, hard chrome plated.
- Crankshaft: steel.
- Propeller driver: light alloy pressure die-casting (incorporating spinner backplate).
- Propeller shaft: $\frac{3}{16}$ in. N.S.F. studding, spinner and spinner nut as standard.
- Connecting Rod: light alloy forging.
- Gudgeon Pin: hollow, silver steel.
- Crankpin: steel, "electrolized" (press-fitted to crankweb).
- Main bearings: two $\frac{1}{4}$ in. diameter lightweight ball races.
- Induction: rear rotor disc (plastic).
- Front bearing housing: light alloy pressure die casting.
- Crankcase back cover: light alloy pressure die casting.
- Intake tube: light alloy, peripheral jets, transverse needle valve.

Manufacturers:

K. & B. Mfg. Corp.,
Los Angeles 58, California, U.S.A.
Retail price in U.S. \$19.95.



leaves a lot to be desired for easy adjustment. The method of anchoring the intake in the backplate by means of a small grub screw could also be improved upon. The screw is far too near the end of the stub pipe with the result that it is all too easy to split the casting on tightening up.

The cylinder liner is quite soft, but of generous thickness for a glow motor. It is extremely close fit in the crankcase unit and seats on a flange at the top. Rectangular exhaust and upper transfer ports are milled through the walls, there being some 90 per cent. overlap. Lower transfer ports comprise two 7/32 in. diameter holes side by side registered with similar holes in the piston skirt. The large area transfer passage is cast in the crankcase unit.

The piston is of relatively sturdy construction with good bearing area for the 5/32 in. gudgeon pin. A filleted rectangular deflector is machined on the top and the rubbing surfaces hard chrome plated ("Electrolized"). The gudgeon pin is hollow, fully floating and fitted with one end pad only on the engine received for test. Piston-cylinder fit is good, approaching tightness at top dead centre even after substantially more than the nominal running-in time specified by the manufacturers.

The connecting rod is a very nice forging with the .1785 in. diameter big end drilled with two holes for lubrication. The big end is relatively narrow—3/16 in.—but with very little axial clearance in the crankcase there was still some rubbing on the rod. The bulk of the crankcase volume is filled by the 1/4 in. thick web with its aluminium retaining ring and the 3/16 in. thick rotor mounted on a 7/32 in. deep "plug" on the back cover.

The cylinder head is a conventional pressure die casting, mounting the plug centrally and contoured to form a hemispherical combustion chamber with a slot to clear the deflector on the piston. Some considerable signs of metal "etching" were in evidence after running on high nitro fuels. The head is attached with six screws equi-spaced circumferentially.

Summarising, an engine which offers an exceptional power performance on high nitro fuels whilst still remaining very easy to handle—with instant re-starting without choking. It must be run on a pressurised feed (or gravity feed will do). Whilst it can be started without a pressure feed it cannot be adjusted for continuous running without a forced fuel feed. Performance on straight fuels is as good as most previous 2.5 c.c. glow motors on high-nitro fuels, although the 15R is obviously happiest running on 40 per cent. nitro methane or more. Plug consumption is prohibitive on 50 per cent. nitro fuels.

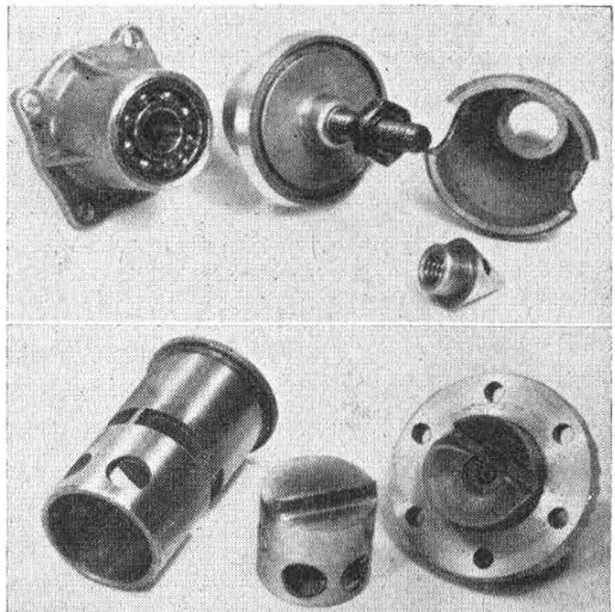
Here is a "stock" engine which is on a level with the best of "tuned" 2.5's—with undoubtedly extra performance to be found over the test figures by striking the right compromise, for a given application, between fuel and plug.

Propeller — R.P.M. Figures

Nitro-Methane %	0%	10%	20%	30%	50%
	Frog Redglow ***	Record Nitrex	Castor 25% Methanol 55%	Castor 25% Methanol 45%	Castor 25% Methanol 25%
Top Flite					
7 x 6	15,200	15,300	15,300	15,800	17,400
8 x 4	15,000			15,500	17,300
8 x 6	12,000			13,000	
9 x 4	11,800				
K-K (Nylon)					
7 x 4	17,000	17,000	17,000	18,000	19,400
7 x 6	14,000	14,200	14,200		15,900
8 x 4	15,000	15,000	15,000	16,000	16,800
Frog (Nylon)					
7 x 4	17,000		17,400	18,000	19,000
8 x 4	14,500	14,500	14,800	15,000	16,400
Trucut					
7 x 4	17,800			18,200	20,000
8 x 4	15,500		15,400	15,500	17,200

*** Although Frog Redglow contains no Nitromethane, it is not a "straight" fuel, since it contains a small proportion of other ignition additives.

MANUFACTURER'S RECOMMENDED PROPELLERS
C/L Speed 5 1/2 in. to 5 1/4 in. dia. 10 in. to 1 1/2 in. pitch.
Free Flight 8 x 3 or 8 x 4.



Front end and spinner assembly in upper picture, piston/cylinder and head below. Some speed enthusiasts use a higher compression head with wedge section chamber instead of hemispherical as shown here for production type.

Squadron Markings (continued from page 187)

"C" Flight used letters in white as "A" Flight.

It is likely that in the first place the letters or numbers were allocated in some kind of order—viz:—

"A" Flight A.B.C.D.E.F.

"B" Flight 1.2.3.4.5.6.

but very soon the aircraft were marked to suit individual tastes. Names or nicknames seem to have supplied the initial letters. The following gives some examples:—

"A" Flight

Capt. Mannock (Flight/Commander until 18/6/18) flew "A" Serial No's used by him. C-6468-D-276-D278.

Lt. F. J. "Mike" Hunt flew "M" Lt. G. W. G. Gauld flew "F". Lt. J. Ferrand flew "C".

"B" Flight

Capt. "B. Roxburgh Smith (Flight/Commander from 4/8/18) flew "1".

"C" Flight

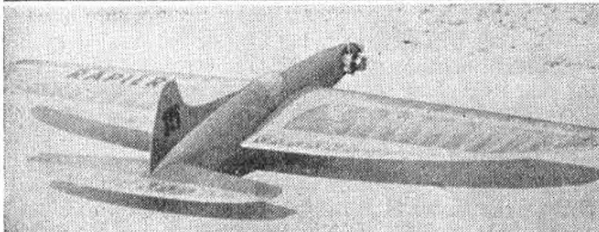
Lt. W. B. Giles flew "L". Lt. L. A. Richardson (wounded 19/7/18) flew "R". Lt. Ira (Taffy) Jones flew "T".

When Major Caldwell led patrols or "joined" them, his usual identification was a coloured streamer on each of the rear interplane struts, two streamers in all.

General Note. The Squadron had six aircraft in each Flight plus one for the Commanding Officer. Flights were not marked with coloured wheel discs or radiators.

Cockades were often partially camouflaged with khaki paint, a novel point for scale modellers.

World News



VLK IN HELSINKI, Finland, has run the first International meeting on the F.A.I. calendar for years. This year was no exception. The date was February 11th, the site a frozen sea bay in Helsinki. To tell the truth this was the second contest in succession which could be called an over-water contest. The ice was covered with 2—5 inches of water, and the amount increased all the time due to rain, at times very strong. Wind strength was 3—5 Beaufort*, and the air was extremely turbulent. Out of 140 entries only 63 started, and 33 of these finished with five flights. Mortality was enormous during the first two rounds in A/2.

The contest was also the first 1962 Finnish Champs Meeting of four to be held this year, the three best counting. It was also a trial for the Nordic Countries Champs in Norway on March 11th. In A/2 many experts broke their models, and the winner was 15 years old Harry Huhta with 568 seconds. He is one of the many promising apprentices of Torsten Strang who placed 8th. Markku Tahkapaa was third and secured a place in the team with Strang. Last year's Champs were decisive in team selection.

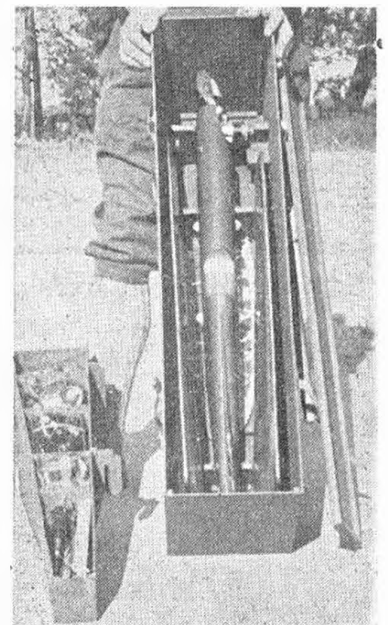
Nils-Erik Hollander from Sweden was the only foreign contestant. He placed second in Wakefield with 647 secs., only four seconds behind Reino Hyvarinen. This contest was very exciting and was still going on at the end of the meeting as the Swede's model was still airborne. His stable model flew into a tree thus deciding the winner. Using a thread turbulator in front of the wing, Hollander's model was suitable for the weather. Hyvarinen flew his *Jeppe* designs fitted with six year old props and wing. In Power Sandy Pimenoff won once again using his "Number 18". He achieved the highest score of the day, 737 seconds followed by Pauli Laxman with 596 seconds. Cumulus club won the team contest with 1808 seconds (for one named man in each class).

Temperatures ranging up to 110 deg. F. coupled with strong winds to 50 m.p.h. and thermals put a premium on tow-line skill and contest tactics at the 15th M.A.A.A. Nationals held at Echuca, Victoria, Australia.

This appears to have been a very well organised Nats and the Model Aeronautical Association of Victoria was enterprising enough to produce a 32 page

* Beaufort 3-5 is 4-28 m.p.h.

Left, at top is Vlad Lustyk of CZECHOSLOVAKIA with unusual delta stunt design for Fox 35. Note the enormous elevator. Next are Don Jehlik and Herb Stockton of the U.S.A. World Champs team with their Eta 15 T/Racers. Cadet Sgt. L. K. Dixit was judged best aeromodeller at the '61 Cadet training camp in INDIA, seen with his Mercury Mallard, powered by Taifun Hurricane. Has done 30 minutes off 25 secs. engine run in strong Allahabad thermals. Bottom left is Adi Meixner's Rapier stunter from AUSTRIA, unique by virtue of its "free-flight" break down of parts as seen at right, for scooter transport. Triangular tool box fills centre



programme which listed all of the entrants in each of the events for the week long contests with just over 200 individuals taking part. The hot weather created a situation where modellers slept outside their tents, leaving the models under cover and when R. F. Kenyon tried to eliminate a warp in his A/2 wings under the hot showers, a voice behind him was heard to say "well now I have b . . . well had it, now here is a bloke giving a model a bath!"

Running through the results Don Harlow won senior stunt with Merco 35 and in F.A.I. speed the Rice/Holtham team from Victoria were top with 106 m.p.h. Jack Finneran of N.S.W. won 5 c.c. speed with 130 m.p.h. and in F.A.I. team race B. Eather led with 5:55, he was also 2nd in stunt. Multi radio went to Tony Farnan with familiar names Jack Bone and Tom Prosser in 2nd and 3rd.

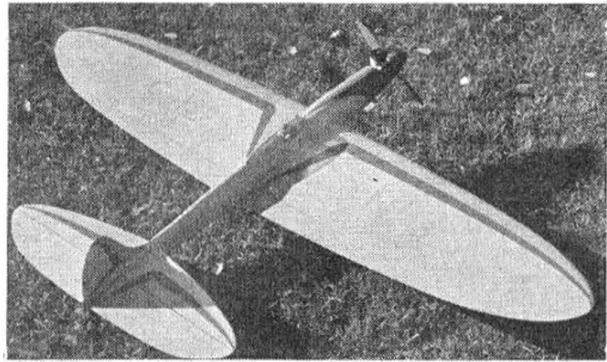
Sean O'Connor, who became Champion of Champions, won A/2 with 677 secs and Wakefield with 875 secs., and Norman Bell using a Cox T.D. led F.A.I. power with a perfect 900 score. Fastest time in 5 c.c. team race was 8:16 by N. Moore and the young Kenyon brothers were 1st and 2nd in Junior Rubber with 853 and 805 secs. respectively. A Bristol Fighter took the honours in control line scale for A. Talbot and as may be well expected at this Aussie Nats, the largest number of entries for any single event was for the hour long scramble which concluded the meeting, D. A. Williams knocking up the highest accumulated time.

We have also received a 1962 Contest Calendar from the V.M.A.A. which is most interesting for there appears to be at least two events per month run through from February to October.

The mail has been delayed from New Zealand, unfortunately preventing us from carrying an illustrated report of the New Zealand Nationals in this issue. We are, therefore, holding over material which has arrived as we go to press so that this feature can appear in full, with pictures, next month. It would seem that this too was a most enjoyable best ever meeting, about 150 modellers taking part with hot weather, moderate wind conditions and an overall improvement in performance with John Sheppard holding his own on home ground to win F.A.I. power, but only by 1/5th of a second! Full details next month.

We do like the story of Allan Rowe who promised he would drop in on the N.Z. Nats by glider from Masterton. He subsequently reported "I was fortunate in being able to gain height to 11,000 ft. over Masterton and duly set course for Feilding. I was not able to see much of the ground on the way because of cloud cover but five hours later according to airspeed indicator and sundial, I had covered 50 miles and should, therefore, have been over the 'drome. With great rejoicing therefore I opened dive brakes and descended, eventually breaking cloud over Cook Straight. It seemed something went wrong because when I eventually made a landfall the farmer said it was not Feilding but a place called Wharekaukau which, according to the map, is 50 miles the other way. Must have had my map upside down! Sorry."

In Austria, Erich Jedelsky has produced three "standard" model designs which have been proven over the last two years in all parts of Austria and are to be promoted for special competitions in 1962. This will encourage beginners for, as may be expected, the designs utilise the all-sheet Jedelsky wing profile and are very simple. They are an A/1, an A/2 and an unconventional F.A.I. Free Flight power model for 1.5 c.c. This resembles a glider with a vertical pylon at the nose carrying a high mounted engine. The fuselage for both the A/2 and the



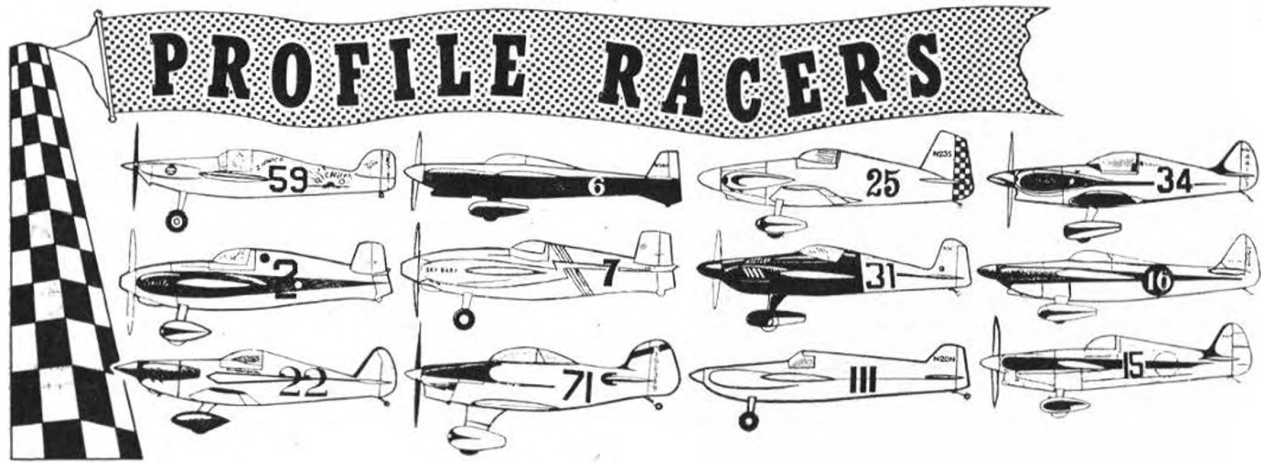
Jens Arnesen designed and built stunter at top to lead Concours d'Elegance at Champs in NORWAY and place third in aerobatics. Kit boxes are from the U.S.S.R., as issued by Dosaaf and are most complete ever seen by Chain Shneurson of ISRAEL who sent the picture. They include everything except the razor blade and an engine. Kits are numbered according to advancement. 7 is a built up glider, 8 a rubber design, 10, a beginners C/L model and 12 a sport controliner

power model is a tube of impregnated paper tubing.

Since our mention in February issue that we have compiled a list of interesting club, bulletins, two examples have arrived which really stand out for reasons of clarity and neat presentation; *Modelling Monthly* is produced by the Oakville M.F.C. of Ontario, Canada by Offset Printing Process and is unique for its printing standards, while *Modellflyg Nytt*, the Swedish modellers magazine contains such a wealth of information it really deserves greater circulation. Articles by Champions such as Kjell Rosenlund on team racing and Oliver Tiger modification (smoothing shaft ports, relieving cylinder and rounding cylinder head) plus comment by Chris Soderberg on control line and a personal portrait of Gunnar Kalen are supported by many model plans ranging from A/2 to radio control.

Our friend Maurice Bayet, editor of *Modele Reduit d'Avion* issues an S.O.S. editorial in his February issue on a very serious matter. In all of Paris and its surroundings there is no longer a satisfactory place for free flight competitions. That this should happen in a City which is steeped in aviation history is ironic, for whilst the aeromodellers have been curtailed and progressively excluded from 'drome after 'drome, light aircraft flying has flourished. We hope that M.Bayet's appeal will be recognised by suitable authority so that our friends in France will have the opportunity of continuing their free flight activity.

Over in British Columbia, Canada, John Niessen and George Longmuir of the Vancouver G.M.C. have a happy combination. John flies his 6-channel radio controlled Privateer 15 flying boat over water and if he happens to miss a spot "landing", George sends out his radio controlled trawler to hook on and recover the model plane. Seems like boat modelling has its uses after all!



IN OUR World News feature for February this year we mentioned the *Thompson Trophy* racing events which are run by the Vancouver G.M.C. in Canada. These are for 2.5 c.c. models, profile or full fuselage to 1/12th scale which race together over 160 laps at 52 ft. 6 in. radius. Object of the event is to provide something of less exotic proportions than the refined team racer, which is easy to build and operate, giving the novices an opportunity for full success.

Why not try a Profile Racer? The Gee-Bee "Z" racer, which follows on the next two pages is a handsome start. Our suggestion is for no particular limited tank size, but a 0.75 c.c. or 1.5 c.c. limit on engines according to the whims of your club. Models do not have to be to precise scale and can fly on a common line length of 30 ft. or 35 ft., according to the space available. A contest can be run on team racing lines with a crew of pilot and mechanic endeavouring to achieve the fastest time over 100 laps or more. Set the rules to suit yourselves.

Build K. Laumer's Gee-Bee 'Z'

Keith Laumer provides us with a very neat little racer which is right in character for a start. Why not try the idea in your club and let us have your suggestions for a specialist set of rules once you have given the event a trial? Some Profiles are to be seen in our heading. These are the Post-War midget racers from the U.S.A. and if enough of you ask for more in this suggested model class we can easily include some 3-views of suitable subjects—name your particular choice if you have one—lets have *your* opinion.

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

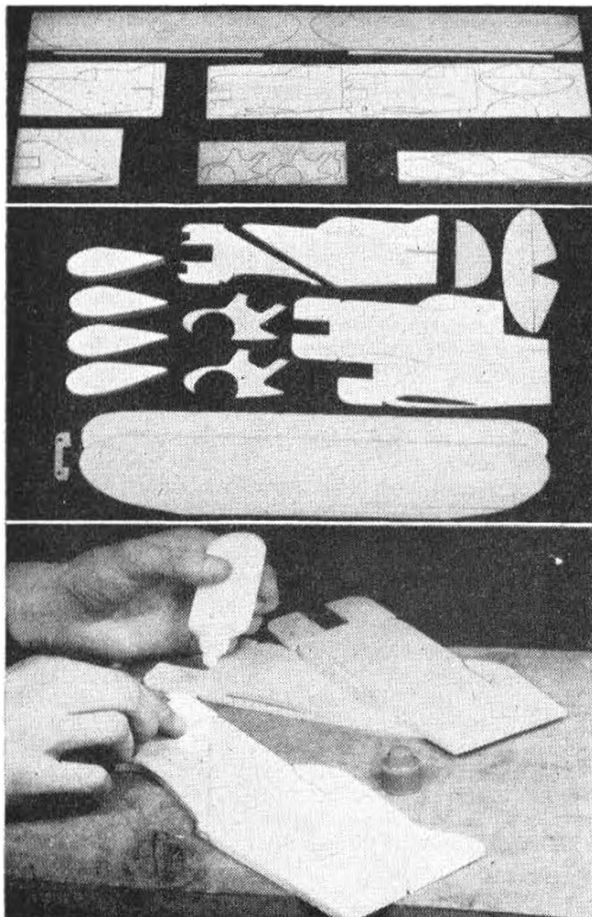
- | | |
|--|---|
| 1 strip $\frac{1}{8}$ in. x $\frac{1}{8}$ in. x 36 in | 1—6 B.A. bolt with nuts |
| Balsa | 4—8 B.A. Bolts with nuts |
| 1 piece $\frac{1}{2}$ in. x 4 in. x 24 in. balsa | 2—10 B.A. bolts with nuts |
| 1 sheet $\frac{1}{8}$ in. x 3 in. x 36 in. | 1— $\frac{1}{2}$ in. Frog nylon bellcrank |
| balsa | Small Keilkraft elevator horn. |
| 1 piece $\frac{1}{2}$ in. x 4 in. x $8\frac{1}{2}$ in. balsa | 15 c.c. Keilkraft fuel tank |
| 1 piece $\frac{1}{2}$ in. x 2 in. x 12 in. balsa | 2— $\frac{1}{2}$ in. countersunk woodscrews |
| 1 piece $\frac{1}{8}$ in. x 3 in. x 10 in. Ply | 4 in. x $\frac{1}{2}$ in. tape |
| 1 piece $\frac{1}{4}$ in. x $3\frac{1}{2}$ in. x 6 in. Ply | Sanding Scaler, Dope, Fuel |
| 1 length 16 s.w.g. wire | Proofer, Transfers. |
| 1 length 18 s.w.g. wire | Balsa Cement, P.V.A. white |
| 1 length 20 s.w.g. wire | glue. |

Trace out the components onto the wood with a carbon paper impression. Cut them out, using a fret saw for the $\frac{1}{4}$ in. ply and balsa fuselage centre core and 1/16 in. ply spat cores. Now bond the two wing laminations. Use P.V.A. white glue for this and other laminates since it dries much slower and is less prone to warp than balsa cement and by the time you could coat the laminate surfaces with cement, the latter would be drying off. Allow the wing joint to dry under pressure, a pile of books will be a suitable weight. Note when making the wing that 3 in. wide balsa does not quite cover the whole wing chord so make up the trailing edge with 3/16 in. sq. strip.

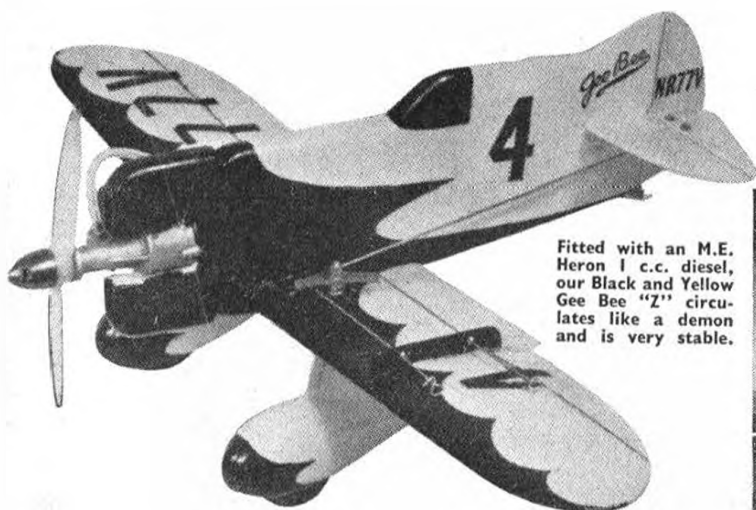
"Pre-cement" the end grain of the joint between the two pieces of the fuselage centre core. If you do not understand this operation, all one has to do is to coat both faces of the joint with cement and allow it to soak into the wood and harden for a couple of minutes. Then cement again and join, flat on your building board.

While wing and fuselage core are setting, make up the tailplane and elevator unit, separating the two down the hinge line. Shape the 20 s.w.g. wire elevator joiner and apply by piercing each elevator half with a joiner prong. Add the tape elevator hinges and join to tailplane in "clothes-horse" hinge fashion.

Now add the $\frac{1}{2}$ in. sheet balsa to the fuselage again using P.V.A. glue, which takes about an hour to dry in a warm room. While this is drying, shape the 16 s.w.g. wire u/c leg assembly and sew to it the two 1/16 in. ply spat cores, piercing these as the plan shows and sewing through the holes. Lock the thread with balsa cement. Hollow the $\frac{1}{2}$ in. balsa half bodies for the spats, (cut oversize to allow hand shaping) to accept the wheels.



Building stages at left show tracing with carbon onto sheet parts, then cut out parts including double wings. Bottom is PVA application on centre core for lamination to make up the fuselage sandwich.



Fitted with an M.E. Heron 1 c.c. diesel, our Black and Yellow Gee Bee "Z" circulates like a demon and is very stable.

Streamlined wheels are to be preferred as they permit greater clearance inside the spat. Now glue the bodies to the cores, first placing the wheels on their axles, then carve to shape.

When set, section the wing using a rasp. Sand and then cut the ailerons re-cementing in position with $\frac{1}{8}$ in. bias to bank the model out of the circle and keep the lines tight. Next cut a "V" down the centreline, crack the wing here and re-cement, packing each wing up 1 inch.

Leave the wing to dry and turn to the fuselage, rounding the edges and tapering the rear to $\frac{1}{8}$ in. at the rudder hinge line with a rasp. Add the tailplane and rudder, and also the tailskid. Drill the motor mount for the bolts and for the screws to mount the tank.

When the wing joint is dry, hole the left wing at the point indicated for the 6 B.A. bolt bellcrank pivot. Slot the wing and add the 1/16 in. ply wire guide. Score the wing underside and cement the whole undercarriage assembly to the wing. Use plenty of cement. Gunstrip over the u/c in the wing groove, or use an overlay of tape. Now to make it secure add the wing to the fuselage, cementing in place and replacing the cut out fillet underneath. Leave to dry. Fix the control horn to the elevator with 10 B.A. bolts, or, if you prefer, sew it in.

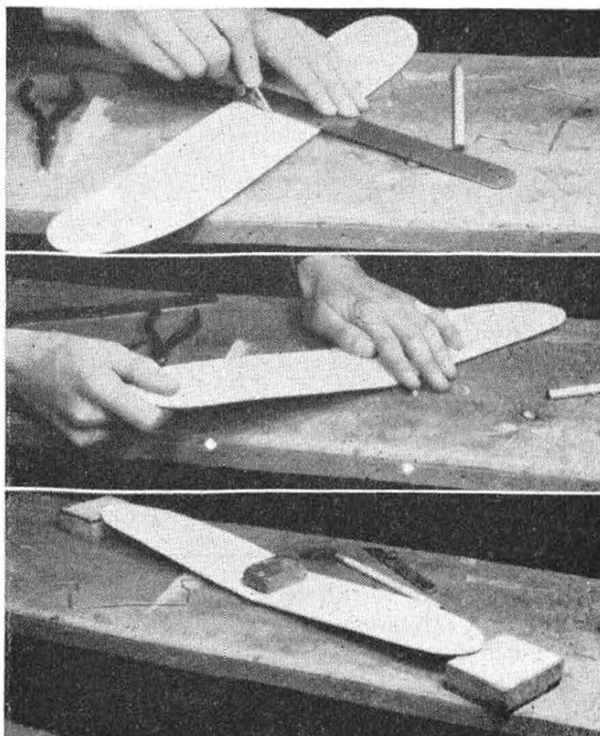
Two coats of sanding sealer, rubbing down after each, will fill most of the grain. Then apply the yellow dope, again two coats, and remember that they should be thin. When dry, trim with black as the plan indicates, including "Gee Bee" on the fin, "4" on fuselage and left wing, and "NR77V" on the rudder. This number can be added to the right wing with *Yeoman* Transfer numerals after the model has received a thin coat of fuel proofer. Accurately shape the 18 s.w.g. wire push rod fitting to the control horn and bellcrank on its 6 B.A. pivot bolt. Shape the 20 s.w.g. lead-outs and fit those. Check your control system to make sure it works freely. The chances are that the elevator hinge will be a little stiff, but a drop of fuel along the hinge line will cure that. Mount the engine, and the tank in the manner the plan shows, add in the plumbing and you are ready to go.

She is a smart performer and don't be worried about prangs, if her joints are strong she'll take it all. Because of the high thrust line she needs a smooth take-off area. For over-grass "Ops." she leaves a hand launch as steady as an arrow—try it—you'll like the Gee-Bee "Z".

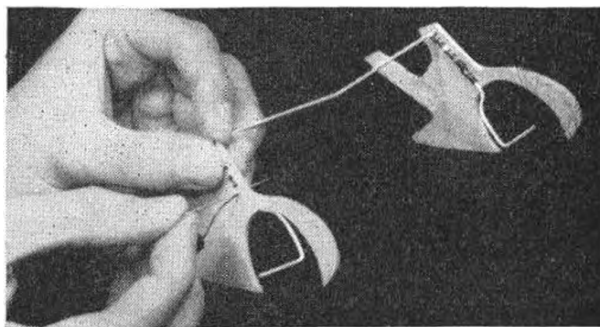
About the full-size

Bob Hall and the Granville Bros. designed and built the "Z" racer in little more than a month! It had a hotted up Pratt & Whitney Wasp engine of 535 h.p., specially loaned for racing and was flown by Lowell Bayles who also had a large financial interest in it. Christened *City of Springfield* and barely 2 months after work started on the airframe, it won the 1931 50 mile Goodyear Race at an average of 206 m.p.h. and the Thompson Trophy at 236 m.p.h. plus other events.

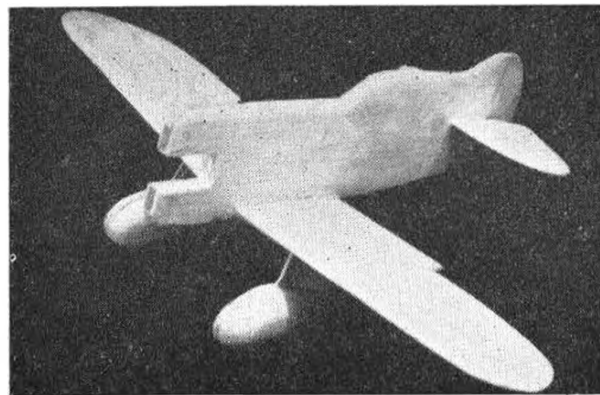
World speed record attempts with a 750 h.p. P. & W. engine followed but only realised 314 m.p.h. on a one-way pass. On December 5th, 1931, a loose filler cap detached, striking the canopy on a low level speed attempt and in the sudden pull-up, the right wing failed. Bayles was killed and the "Z" finished.



After sanding wing to final section, cut across centreline, then crack upwards gently, fill joint with cement and leave to set with a weight at the centre. Not necessary to cut right through wing.

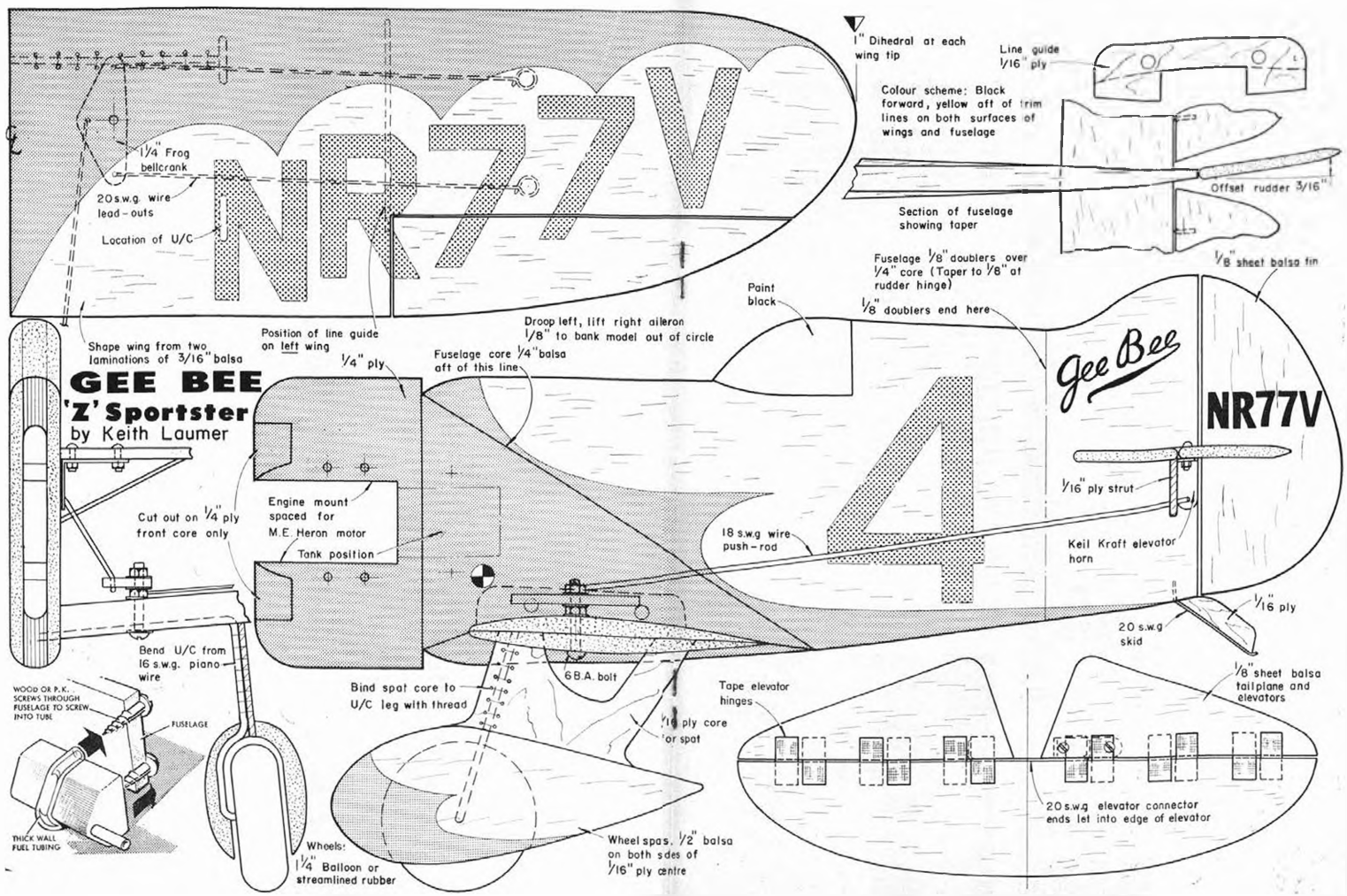


Above, sewing the ply legs to the undercarriage wire. Below, the airframe after coating twice with sanding sealer and sandpapering ready for black and yellow decoration, as seen at top left.



Turn page for full-size plans





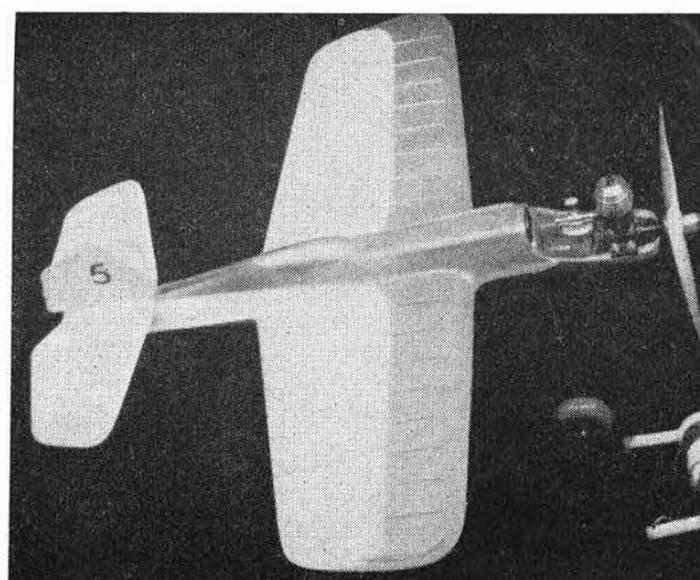
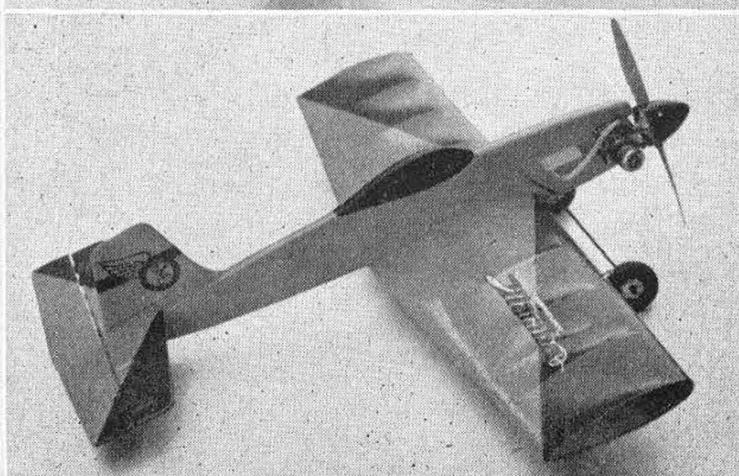
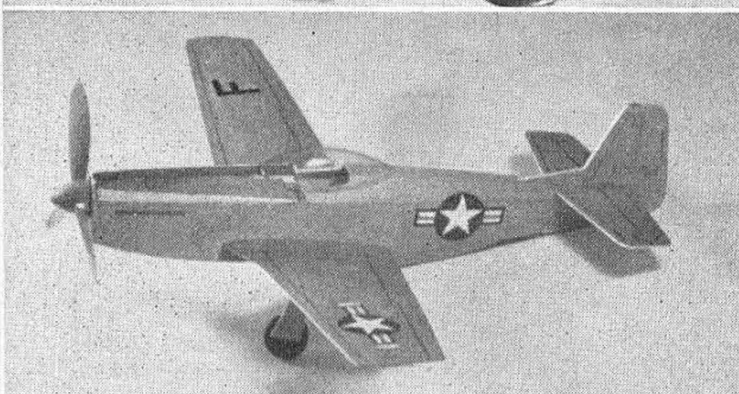
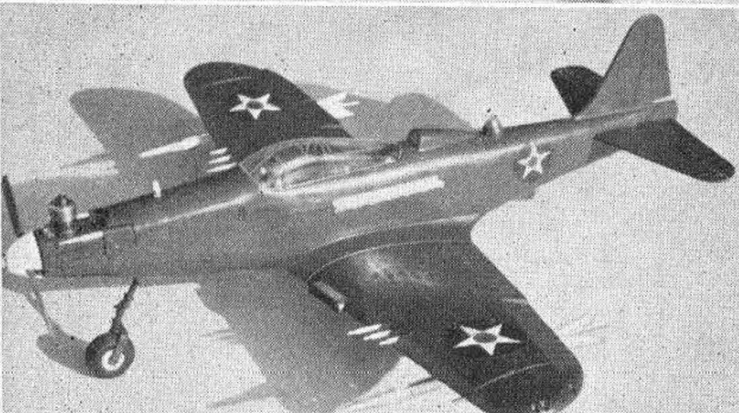
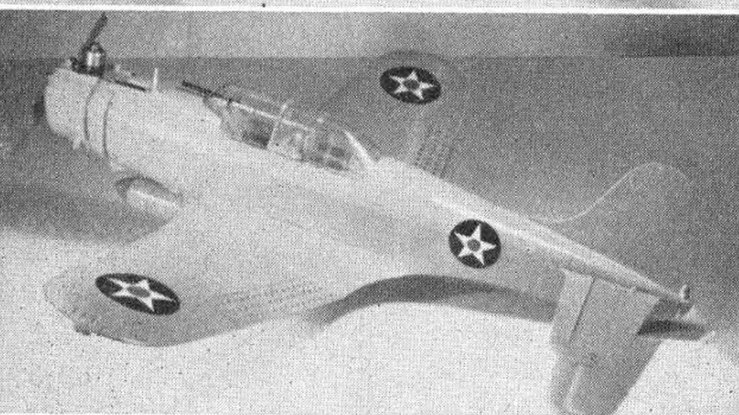
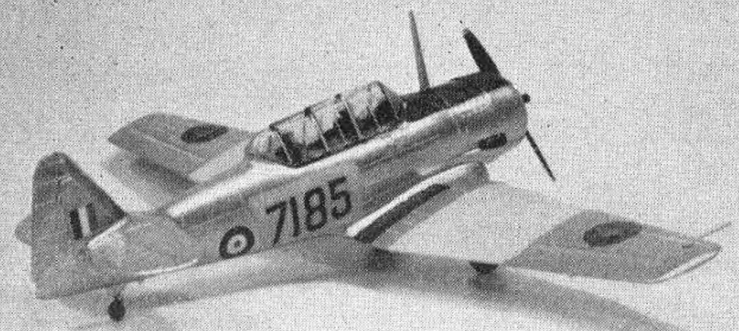
Straight from the

IT IS PRACTICALLY impossible for us to convey the full impression of the three International Hobby Trade Fairs which took place during January/February, but at least we can give this brief resume of what impressed most in the galaxy of new items released for 1962, some of which are illustrated on these pages and a few providently provided advance kits for which have been constructed on the busy Watford work benches.

If one were to ask us for the most vivid impression it would be in the extraordinarily clever application of plastics. From the very accurate new Airfix *Harvard* 1/72nd scale to the expanded polystyrene fuselage for the Graupner 70 in. scale *Weihe* 50 glider, to the most impressive ready-to-fly models by Wen-Mac (to be made in Britain by Keilcraft) and Cox we come to what might well be termed the real triumph of tool making and ingenuity, Monogram's transparent working model of the F-51D Mustang fighter with working undercarriage, props and bombs. Could anyone possibly have envisaged so fascinating a kit as little as six months ago? Monogram are distributed in Britain by A. A. Hales Ltd. and we are sure that they must have taken many orders for this, the most impressive plastic kit of any type, at the Trade Fairs. 142 parts are moulded in five colours so that no painting is required and all the miniature stencils as applied to the full size aircraft are supplied in full detail. It is quite remarkable.

Cascelloid, who pioneered the British ready-to-fly model, have produced the vacuum formed *Speedbird* for faithful Mills .75 diesel and which we have had the pleasure of air testing. It flies well but needs a larger tank as duration is disappointingly brief. The model comes complete with Cascelloid's own propeller and detachable undercarriage. Plastics were introduced for radio designs by Schuco last year and now they have *Hegi* 120 "*Completa*", which is just that . . . a completely finished ready-to-fly 37½ in. expanded polystyrene model for free flight or radio control, to suit engines up

Left: top to bottom, Airfix *Harvard* in Commonwealth Air Training Scheme colours all silver with yellow fuselage and wing panels. A very accurate model which will revive many a fond memory for those who flew in them. Next is WenMac's 3 line control SBD dive bomber, 22 in. span with equipped cockpit and bomb, also appears as the Army A-24 in Olive moulding. Rocket firing *Airacobra* is 24 in., has shock absorbing trike u/c, lifting canopy and engine cowl. Springs fire rockets 50 ft. Mercury 16 in. Mustang is all sheet for beginners, has novel vari-thrust. Bottom is Mercury Mamba stunt/trainer for .049's with profile fuselage. Below: Cascelloid's *Speedbird* ready-to-fly vacuum formed model with Mills .75 diesel, handle and lines at £5.14.6d. Test flown, it has ample power but not enough duration on standard tank



Trade Fairs

NURNBURG
BRIGHTON
CHICAGO

to .8 c.c. Moreover, it looks *right* and carries a very smart swept fin.

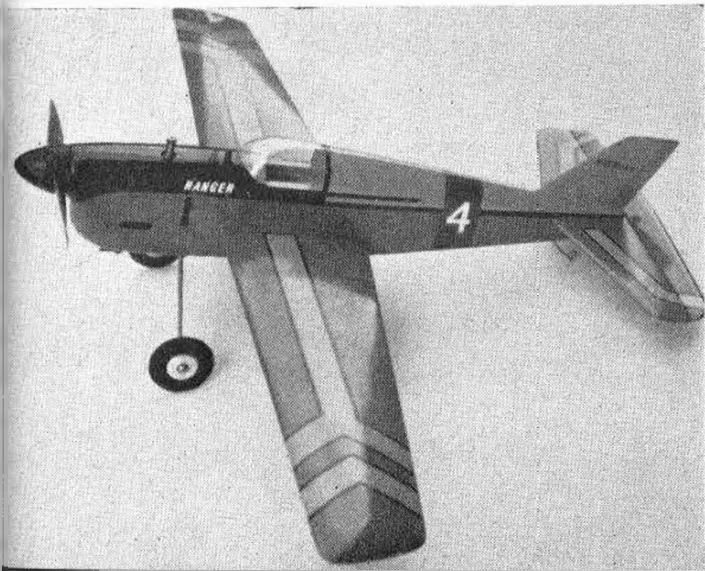
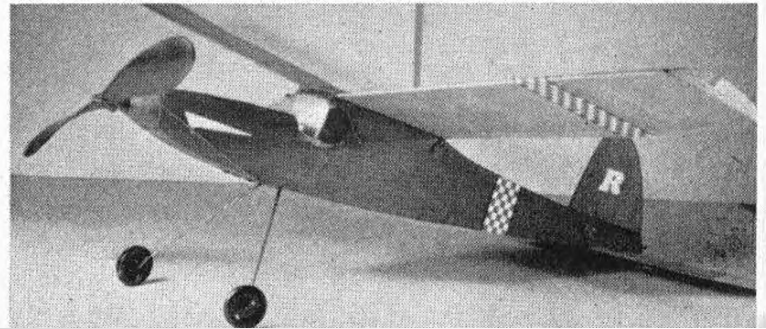
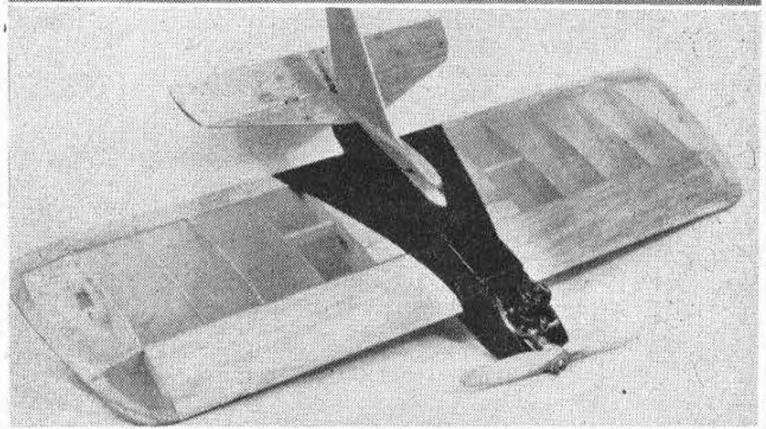
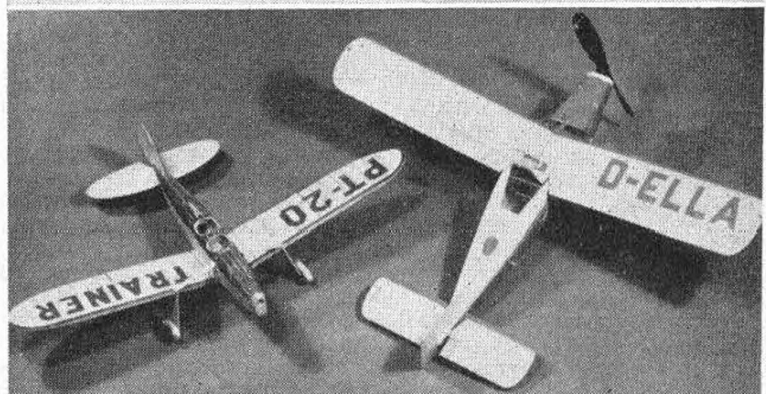
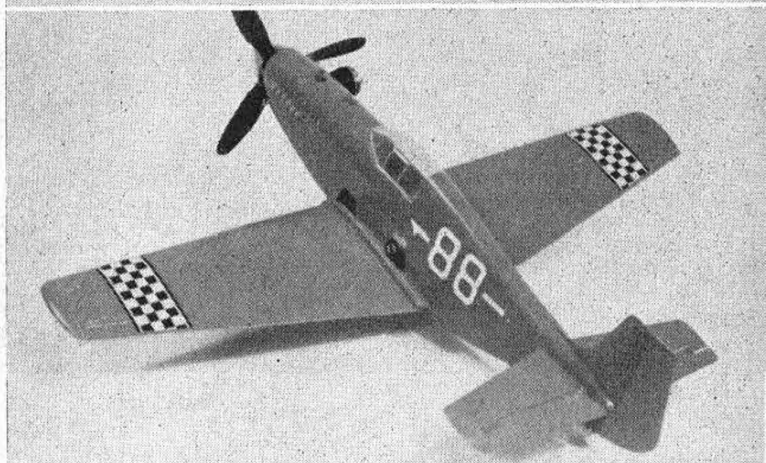
In the balsa and tissue sphere the emphasis in new kits is upon the quickly built all-sheet rubber driven design for the novice. Keilkraft who now market the Mercury line will be introducing the *Eezi-bilt* 16 in. *Mustang* soon with 5 in. 3-way prop and variable thrust adjustment nose button. It will be supported by the *Robin*, a 22 in. duration design from Keilkraft with sheet fuselage and an introduction to built-up wings. The *Ranger* has been revised in lines and structure as a sports or class 1/4A racer, and soon to come will be the Mercury *F.A.I. Racer* of 33 1/2 in. span. Whilst the small *Mamba* 19 in. profile stunt/trainer for .8 c.c. engines is about to be released.

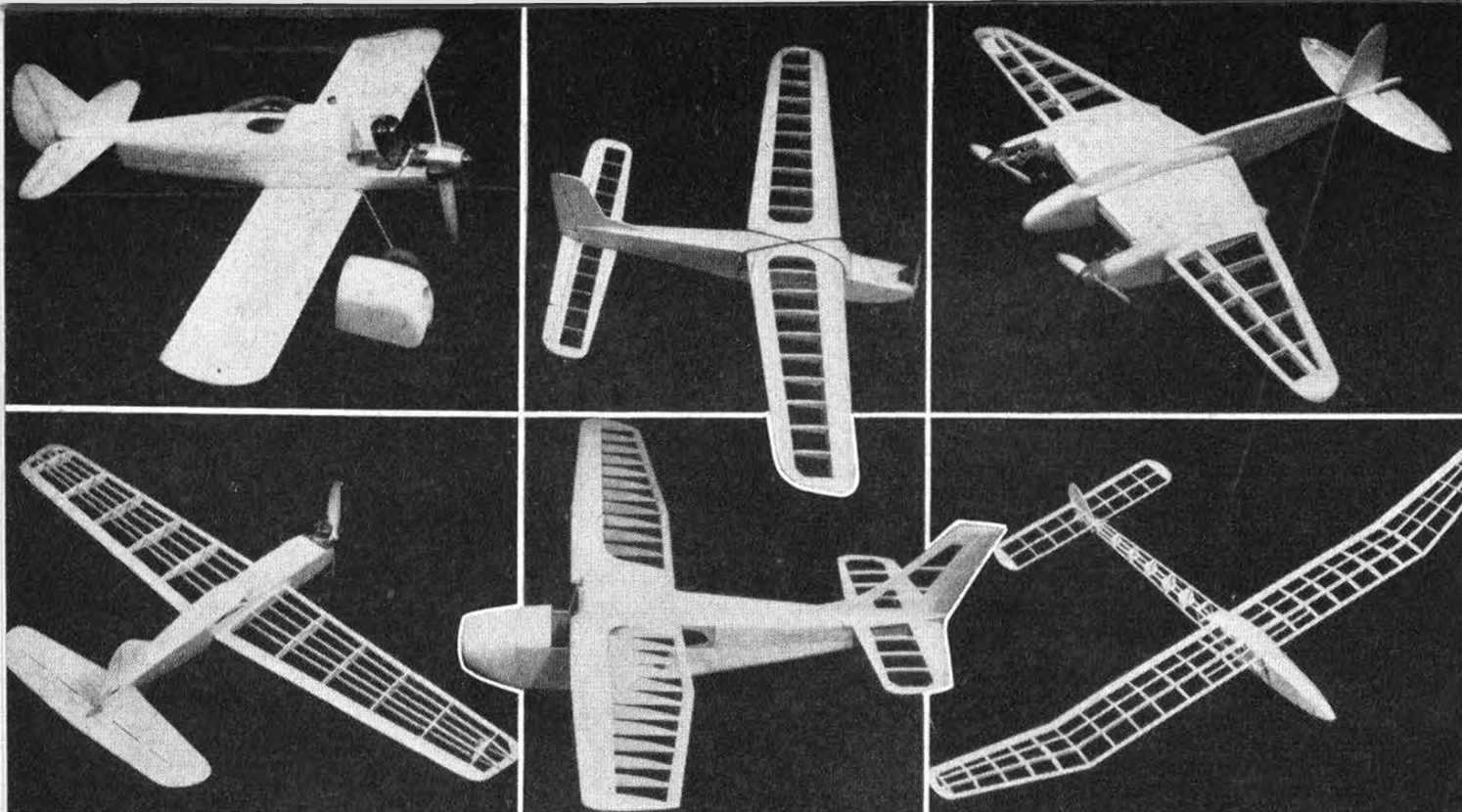
Yeoman *Quickbuilds*, the 5s. 11d. *Ryan PT.20* and 6s. 3d. *Dornier Do.27* are a few weeks old and we find each of them most satisfying to build and surprisingly good fliers. Also off the test bench are structures for the *Veron Skylane* which came out at 36 ozs. with *Oliver Tiger* power before covering but less radio and the very easily built *Pinto* sports racer which has an A.M.15. Phil Smith is working hard on several other new lines which we shall be dealing with next month.

From *International Model Aircraft* we have the *Mosquito* completed at 33 ozs. with 2 AM.25s and it promises to be fast with 180 sq. in. wing for such power. We are strengthening the outboard tips, the only parts fabric covered, with vertical webs between the spars as a safeguard. Also from Frog, the *Ventura* glider, a most handsome design that looks right and we know, flies right. Weight is only 5 ozs. uncovered for its 42 in. span and 236 sq. ins. total area. It makes an ideal A/1.

Performance Kits are using most attractive silk screen printed boxes with bright finishes that should grace any Model Shop shelves. The *Stella* is an all balsa tow-line trainer, *Dynos* is a 32 in. long wing trike u/c rubber model with 7 in. plastic prop and, for control line, the

Right: Top to bottom. Cox 23 1/2 in. *Stuka* has sliding canopies, moving gun, dropping bomb and very clever assembly. Can also take the Cox silencer. P-51 racing *Mustang* is sold as a model of Paul Mantz's Bendix Trophy racer, is 16 in. span, all red and comes complete with fuel, ready to fly. Next are Yeoman PT-20 and Do 27 *Quickbuilds*, most satisfying for the novice and rewarding to fly. Carlo Bergamaschi's Olympic Rocket combat kit from Italy is 15 ozs. with A.M. 25, 32 in. span and a thriller to fly. Bottom is the Keilkraft *Robin* with sheeted fuselage and built up wing to provide transition from all-sheet structures. Below: is the revised *Ranger* sportster/team racer showing racey lines. Has 26 in. solid wing ready channelled to take the lead-out wires





Orbit Sports a 29½ in. fully aerobatic model which comes out at 12½ ozs. with D.C. *Sabre* 1.5 c.c. diesel for about one sq. ft. of wing. This is a nice model but builders should watch the sequence of fitting fuselage bulkheads to avoid interference with the push-rod.

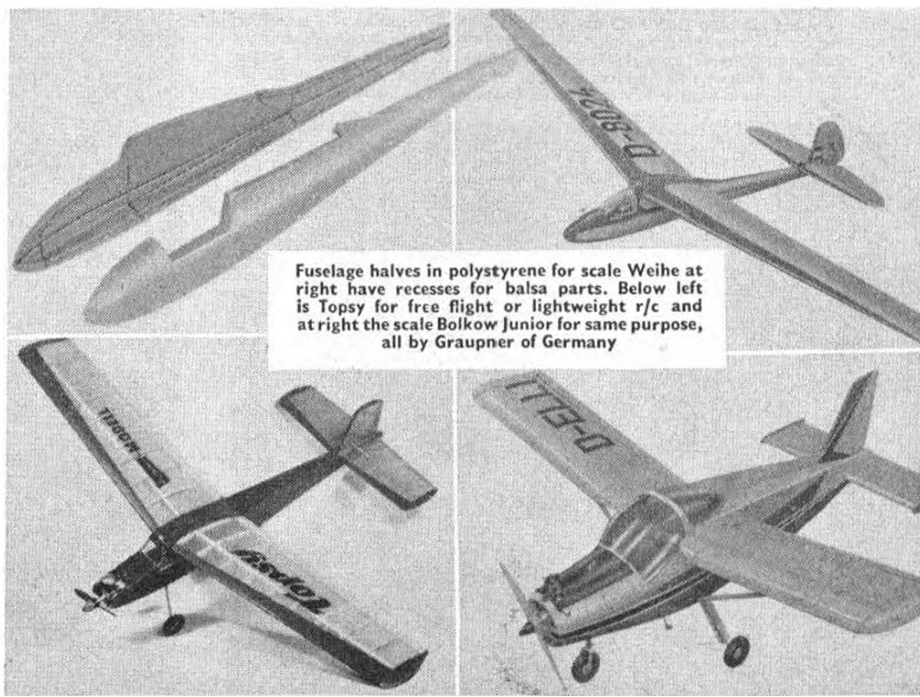
From Italy a really impressive kit by Aviomodelli for *I-Radar* of which we are sure there will be more to see at a later date. The design by A. Castellani introduces so much new thought in so attractive lines that the kit is quite unique in its field. Wing follows full size structure and is immensely strong for its 57 in. span. Wheels are pre-formed u/c are provided and die-cutting is to a very high standard of precision. The fuselage is thoughtfully lined with thin ply adding great strength. Another prominent Italian modeller Carlo Bergamaschi also produces his own *Olympic* kits and his *Rocket* combat designed has proved to be very aerobatic for 2.5 c.c. The plan features step by step structure.

Graupner have produced so much new for 1962 that their supplement to the catalogue is practically as large as those for complete ranges of other manufacturers. Really outstanding is the new radio control manufactured by **Grundig** and is to be known as *Variophon-Varioton*. For advanced conception in styling the cigarette packet size 2-channel units of 5 different colours which can be plugged together to make anything from 2 to 10 channels will take a lot of beating. There is also a new version of the *Bellamatic*, miniature connecting plugs, DEAC holders, a new miniature electric motor and the *Bolkow Junior* scale model of the Swedish designed, German manufactured sports 2-seater. This 32½ in. model is for free flight or radio using .8 c.c. Beside the *Schuco* all plastic R/C model we have already mentioned, they have a scale model *Motorspatz* which is a glider, 80 in. span to take very small engines of about .8 to 1.5 c.c. in the nose for power assistance on the climb then

Fresh from the busy Watford workbenches are, top left, the *Veron Pinto* which comes ready to assemble with minimum effort. Centre top is Aviomodelli's *I-Radar*, a clever design with full depth mainspar. Top right is Frog's profile 36 in. and 33 oz. *Mosquito* fitted with a pair of A.M. 25's. Bottom left, the *Performance Kits Orbit* showing four spar wing and sleek fuselage lines with cabin. Centre, the *Skylane* by Veron, built to lightest weight of 36 ozs. with *Oliver Tiger*. Has 348 sq. in. wing, 54 in. span. Right is *Frog Ventura* of pleasing lines and 42 in. span

allowing the controller the benefit of soaring under radio control just as with the full size.

A designer who has always impressed us for his sleekness of line is **Willfried Klinger**. He is producing **Wik** kits for 4 most attractive radio control designs, the biplane *Olympic* 55 in. span, the *Cherie* 51 in. span monoplane with tricycle undercarriage for 2.5 c.c., the scale *Standard Austria* sailplane designed by **Oskar Czepa** which has a butterfly tail and is 90 in. span, plus the scale *Picchio* 66 in. multi channel design of combined expanded polystyrene and balsa construction. A feature of this model is its rubber bonded undercarriage suspension—as used on the best of modern small cars.



Fuselage halves in polystyrene for scale *Weihe* at right have recesses for balsa parts. Below left is *Topsy* for free flight or lightweight r/c and at right the scale *Bolkow Junior* for same purpose, all by **Graupner** of Germany



No. 74 Sqn. R.A.F.

ON MARCH 30TH 1918 a Sqn. that was to become one of the best fighting units in the R.A.F. left London Colney for France. Under the inspiring leadership of Major Keith Caldwell M.C. and with "A" Flight, commanded by Capt. Edward "Mick" Mannock M.C.

R.F.C. SQDN. MARKINGS

and Bar, the finest Patrol Leader in any of the Flying Services, No. 74 was to destroy 140 EA with 85 out of control in 8 months.

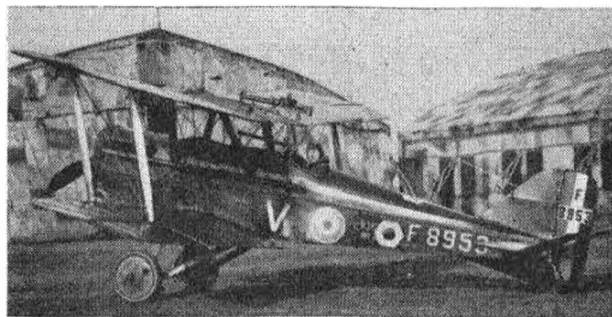
The Sqn. Marking was a white horizontal bar painted on the fuselage sides aft of the cockades. This was generally repeated on the top decking. Marking was used until the Armistice.

Flight and Individual Markings were:—

"A" Flight used letters in white between the fuselage cockade and the Sqn. marking.

"B" Flight used numbers in white painted on the nose below the exhaust manifold. (Continued on page 177)

Lt. Richardson of "C" Flight, 74 Squadron in S.E.5 serial F8990 painted on both fin (in poor hand) and as usual on rudder. (G. Haddow photo)



2nd Lt. S. C. Elliot in the S.E.5 serial F8953 presented by the town of Crieff, Scotland, bearing 85 Sqn. markings. Imperial War Museum photograph Q60567.

No. 85 Sqn. R.A.F.

Went to France in 1918 equipped with S.E.5a's under the command of Major W. A. "Billy" Bishop V.C.

Their Sqn. Marking (carried until the Armistice) was a white six sided figure painted in white aft of the cockade on the fuselage sides and on some A/C repeated on the top decking.

Individual Markings were white letters painted underneath the cockpit and repeated on the upper plane to starboard of the centre section.

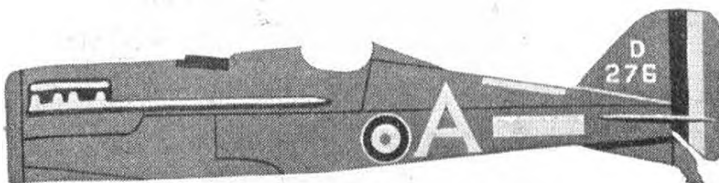
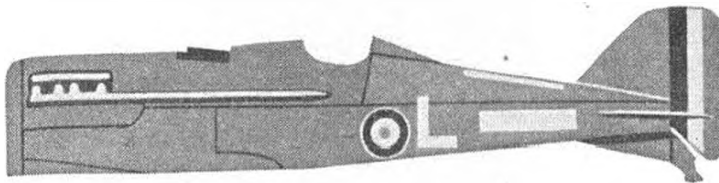
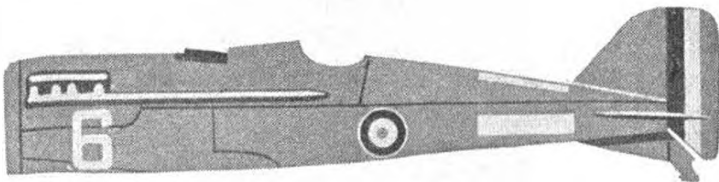
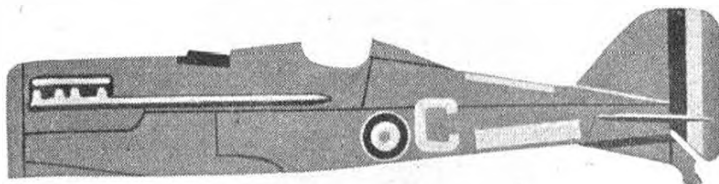
The exact sequence of letters is unknown but they included B.D.F.H.J.K.L.V.W.X.Y.Z., this would indicate that the Flights were marked A.B.C.D.E.F.—G.H.J.K.L.M.—T.U.V.W.X.Y. and Maj. Bishop flew "Z" (C'1904).

On 14.7.18 Capt. A. C. Randall flew "H"—(C'1298).

On 14.7.18 Lt. W. H. Langton flew "K"—(D'6927).

On 14.7.18 2.Lt. S. C. Elliot flew "V"—(F'8953).

PART Described by Leslie A. Rogers
SEVEN Drawn to 1/72nd scale by Ken McDonough



OVER THE WAVES

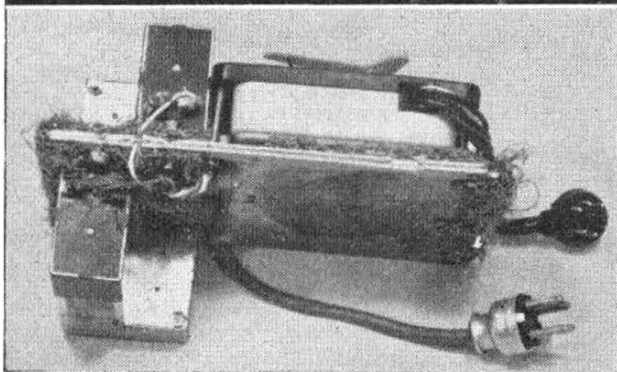
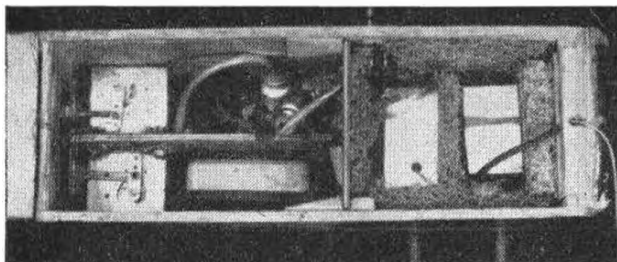
Jackdaw Airborne!

AFTER CONSUMPTION OF two sets of Tx batteries and inspiring our R.C.M. & E. colleagues to invention of a vibration monitor (which they've put into the current issue) we can finally report success with the Frog Jackdaw/3.49/Min-X 6 project.

Not without incident, nor without considerable chiding from others in our establishment who were convinced that our trips to the field were more of a philandering nature than for flying. They may have been right!

Last month we ended up in a judder of vibration. The Mercury Star 9 x 6 or 10 x 4 ins. 3 blade prop. dampens some of the 3.49's airframe-disturbing habits but not enough to make wall mounted servo's immune. Advice was duly taken and George Redlich put us onto the Hairlok Co. who were exceedingly helpful. Samples of thickness ($\frac{1}{4}$; $\frac{1}{2}$ in.) and weight (4-6 lbs. cu. ft.) permitted our choice and the results were immediate. A complete re-arrangement of the gear, taking the triple Graupner servos (two Duomatic, one Unimatic) on to a central, detachable former, and re-packing the Rx and Relay cases with reeds and relays pointing vertically in Hairlok gave the desired result. We now have complete insulation of the entire R/C gear from fuselage sides and bottom. Perhaps this will encourage an enterprising dealer to market Hairlok which is most reasonably priced.

Yet snags were still to arise. Slow action on the rudder servo and Unimatic inspired the thought that our one power supply of 6 v. DEAC 500 DKZ was taking too much of a loading for both servos and Rx plus the Unimatic. Accordingly the Rx was adopted for a batch of four Ever-Ready U-7 (6 v.) cells and the servos left to the Deacs on separated circuits. Mods to the wiring harness (January issue) simply meant detachment of red and black leads from Rx to plug, and refitting them to 2 spare pins for separate supply via double pole switch. This, coupled with the elimination of vibration effects brought our venture into multi to fruition; but not without attendant disappointments. The long series



of bench and field checks exhausted two sets of a Tx batteries before we made a flight, and that was a fly-away! The toll on Tx batteries is a hard fact, not to be taken with a pinch of salt!

Range tests were considered amply satisfactory at 400 ft. The controls worked perfectly. Steadily climbing on its moderate power, the 5 lb. Jackdaw was allowed a little leeway to gain height and then failed to respond! A 6 minute flight, leap-frogging the railway, a large factory and an enormous lake took the Jackdaw into contact with a very robust tree. All we could console ourselves with were the facts that (A) the Jackdaw is tough (B) it free flights beautifully.

The fault was ours entirely as the Rx was $\frac{1}{4}$ turn out of trim on the RF coil. Next time out it went quite well, even to the extent of impudently spot landing at the controller's feet.

The Min-X 6 has withstood a lot of crashery, and more cycles of vibration than we'd dare to estimate. We advise separate power supply if 6 volt servos are to be used. The Jackdaw is every part that Stewart Uwins and main designer Eric Walpole have intended it to be, as a tough resilient and adaptable design. The engine is a vibrator which throttles well but loses power through the exhaust attachment. Anyone contemplating a "multi" Jackdaw would be well advised to consider a 5 c.c. glow motor to offer a reserve of power.

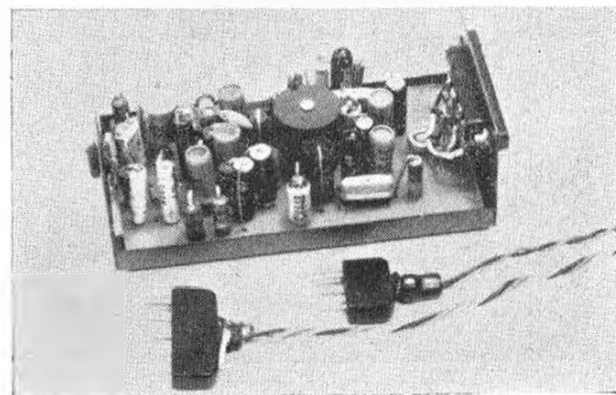
Many readers have obviously been impressed by our black/white/yellow silk decor on the Jackdaw as pictured in February. This was attained with the new Pli Royal economy size aerosol spray, using Scotch brand drafting tape and Sellotape as a mask.

One point that must be made concerns the MK1 Duomatic servo, now reinstalled on rudder in our model. The art of multi flying is to give quick short pulse of control. The Duomatic is however, much faster moving to position than when neutralising, so that it is necessary to make the pause between each pulse of control much longer than the pulse itself, otherwise the servo progresses to full control position, causing vicious response. Another thing that must be emphasised is our use of a multi purpose test meter (ours is an Avo Multi-minor) which we consider indispensable for R/C.

New Elmic escapements

It has been our pleasure to air test the new Elmic Commander compound escapement to complete satisfaction. Representing a departure in design, the compound is suitable for relay or relayless Rx's, and has a 14 Ohm winding specially to cope with the latter. It incorporates

Left: Hairlok insulation for our Min-X/Jackdaw project showing re-distribution of servos and radio. Bottom is the detachable centre former with Hairlok between servos and ply also around ends which slide into fuselage rails. Below: is the "Twin Triple" R.E.P. Rx showing filters in centre and 8 transistors. Plugs have special locating pins. Set should open up new opportunity for the sports flier



clever back contacts for quick blip control to the Corporal (or any other type of 2nd escapement) and has a delay ratchet that governs speed to the extent that it is one of the most pleasing compounds we have ever signalled. One can panic or slur the "blip and hold" yet left rudder always comes through. We like it very much, particularly the compact design by modeller Den Elmes and the way it is robustly constructed. The 2 position, 2 neutrals *Corporal* is bulky by comparison for its purpose. It comes with a silver steel (easy to bend) bridle and clever shock links for throttle operation.

The pair are included in the *Twin Triple* R.E.P. outfit for rudder/elevator selection with option of a second *Corporal* to change engine speed off "quick blip".

1962 R.E.P. equipment

A move to larger premises at Weybridge and general re-organisation of **Radio and Electronic Products** has enabled this Company, which has pioneered so many new ideas in radio control in this country, to produce an entirely *new* line of equipment for 1962.

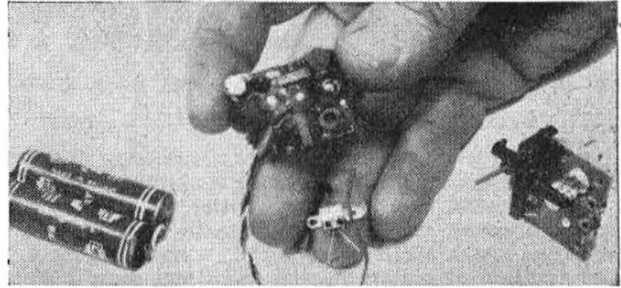
This involves a complete change to all transistor receivers for multi channel and a twin filter outfit of exciting possibilities.

Dealing with the latter first, this new set is to be known as the "*Twin Triple*". In other words it is a 2-channel filter set to which quick blip control is added and so from the three buttons on the transmitter, the sports flyer can get selective rudder operation, plus up and down elevator, plus fast and slow engine. All the advantages of 5-channel, in fact, out of 2-channel, and with a receiver that is relay and reedless calling for no adjustment other than on the radio frequency coil, as is normal with any receiver. Operating on a flat 4.5 volt battery the receiver has eight transistors and two diodes. The transmitter is supplied either with three valves and crystal control or two valves without crystal, but with a harmonic filter, the first of this type in Great Britain and which eliminates unwanted radiated harmonics thus conserving power on the carrier. This is in reality, the next step up for the *Mini-Reptone* operator and we venture to suggest that the *Twin Triple* will become very popular indeed. A lot of research has been undertaken in its development and the entire outfit with *Elmic Commander* and *Corporal* in "unit" form and battery will weigh no more than 10 ozs. in a model.

To satisfy the immediate question which we know will come from many enthusiasts, the receiver will alternatively operate any of the clutch type servos such as the Pike, the Rising and Duomatic mechanical self-centring types.

In the multi field there are new cases for all the R.E.P. transmitters, with battery access through the base, new quick lever switches and the same case used for all types.

Receivers operate on the 9 volt PP.3 transistor power



Otarion Electronics O-21 is a 27.255 Mc/s Tone, 300 to 1000 cps relayless Rx for escapements of 7 Ohms upwards weighing only half an ounce! Complete outfit shown with 2 pencils for comparison and Bonner esc: Measures 1 in. x 1½ in. x 11/16 in. uncased. 20 vertical components on glass fibre P.C. base, include two miniature transformers made in Germany, four transistors and a pea bulb for tuning. Otarion switch is ½ x ¼ x ¼ in. most of it silver for ideal contacts. Loaned by Ed. Johnson it worked most satisfactorily on bench check. Otarion produced first hearing aid within spectacle frames

battery and can be relayless or with a 10 reed bank using relays of a new type. The reed bank is entirely new with a moulded polythene body providing a range of 280 to 520 cycles. They can be supplied for 250 ohms to operate on 9 volts or 150 ohms for 3 volt transistor circuits or 4 K winding for conventional sets. In addition, the reed bank can be supplied with split reeds.

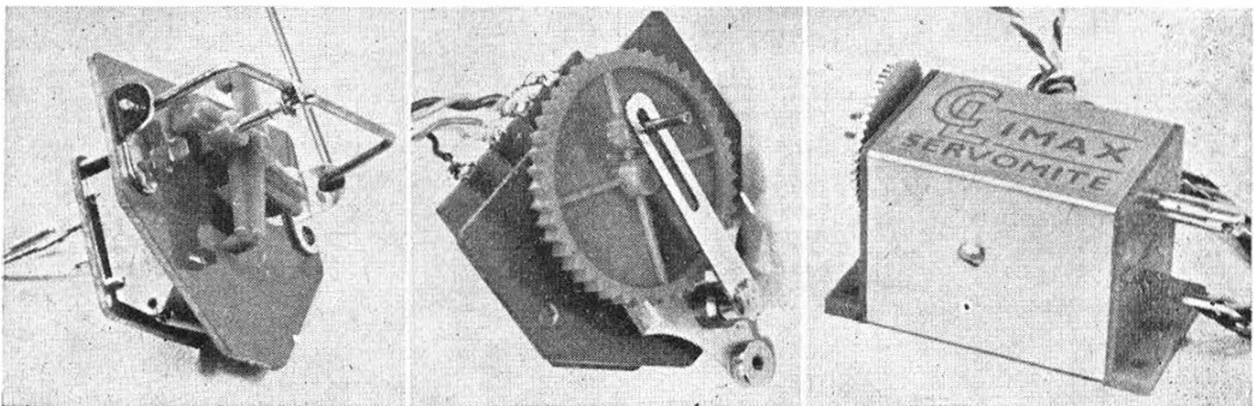
The same 10 reed bank is supplied in all receivers from 4 to 10-channel, giving the modeller the advantage of being able to develop his set as he requires.

In addition to these exciting items R.E.P. have also produced a Superhet for the five spot frequencies established in the U.S.A. with matched Transmitter/Receiver pairs to feed into a reed relay bank, on PP.3 9 volt power. This is a 6-transistor set weighing 3 ozs.

All the new R.E.P. receivers will use the same case size of 1 3/8 in. x 1 1/8 in. x 3 3/8 in. and the 10-channel, which is the heaviest is still only 4 ozs.—great news indeed.

Not to be satisfied with launching these items, R.E.P. also announce their distributorship of the new *Climax* servo, which can be supplied with or without transistor amplification and uses the Microperm motor. The amplifier uses six transistors, two power, one N.P.N., three donkey switching and needs 7.2 volts centre tapped with no bias battery. This 2 x 1 x 1 1/8 in. servo has nickel silver spring wiper contacts and retails at £7 18s. 0d. It weighs 2 ozs. and is detailed in the current edition of our companion magazine "*Radio Control Models and Electronics*", along with pictures of the new R.E.P. gear.

Far left, Elmic Corporal 2P2N esc: for motor control with special bridle. Centre: The Commander with red moulded regulating wheel and torque rod lever. Has quick blip contacts, both escapements designed for relayless Rx's, prices 49s. 2d. and 59s. 2d. inc. tax. Current drain is only 240 Ma at 3 volts. Right the new Climax Servomite in golden case, available for relay or relayless and offering considerable weight saving



GLIDER CONSTRUCTION

by J. Baguley

refinements of wing, tail and fuselage structure

IN THE UNHAPPY event of a model tumbling over on downwind landing it is better that a tip breaks off cleanly at the dihedral break than to shatter. It can then be repaired easily on the field. For this reason, outer dihedral braces are felt to serve no useful purpose but the addition of gussets at each significant spar, leading edge and trailing edge joint with bandage cemented over the leading edge, trailing edge and possibly sheeting joints is the best idea.

This has been proven many times in practice. The addition of extra sheeting at the centre of the wing whether two piece or not is felt to be good for general strengthening against rough handling and severe loading. It is good to face the ends of two piece wings with a ply rib for durability and also to bind them with bandage at this critical point to prevent spars or boxes splitting out. Hardwood should afterwards be used for highly stressed spars.

Various tip forms are shown in *Diagram 113*.

The strongest form, which lends itself well to ideas profounded on tip shape is (e) which is also fairly simple.

Gussets may play a large part in the prevention of

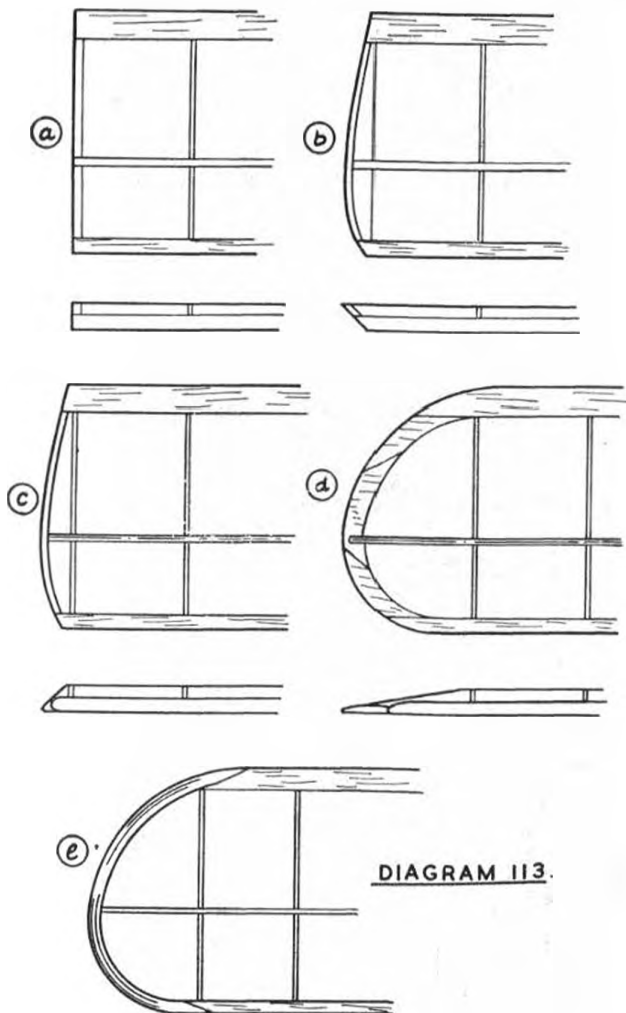


DIAGRAM 113.

warps, especially when used at rib to trailing edge junctions. The latter part of a wing rib is very weak, especially if the trailing edge is wide and shallow.

Thickening the rib all over may prevent buckling at the trailing edge but adds greater weight than may be occasioned by the addition of a simple gusset which is just as effective.

To get good dihedral break joints, it is a good scheme to prop the existing panel up and build the other on to it rather than try to offer the two panels up to each other.

Remembering that the covering provides the majority of torsional rigidity and geodetics merely attempt to prevent any warps caused by covering unevenness etc., always put enough dope onto glider wings. You can get away with lack of dope on a model for years and suddenly be faced with flying a slack model in damp conditions.

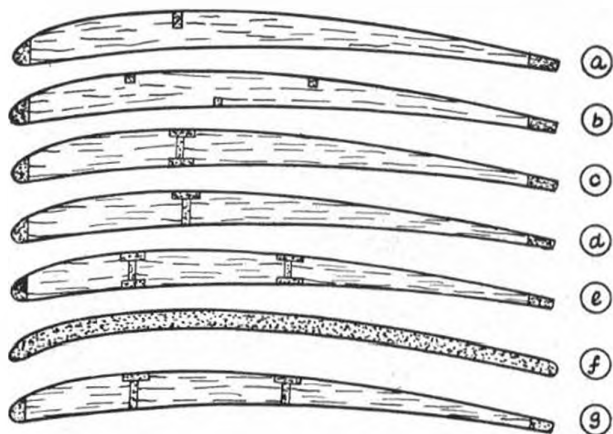
The author learnt this quite recently at the Northern Heights Gala of 1961 by performing stunts on tow!

Tailplanes need to be less complex than wings. They are not subjected to anything like a comparable upward bending moment, their aspect ratio is far lower, they are less likely to have anything like the same "slack" treatment and their efficiency is nowhere near so important as that of the wing. A tailplane must be very light. Due to this lightness we must inevitably use geodetics. We can take the leading and trailing edge sizes to a minimum as the loads are light and the tissue may be of a lighter grade and much slacker.

In fact, we can even use square trailing edge sections with no fears. The remaining feature is spar layout and several suggestions are shown in *Diagram 114*. The author sees no point on an A/2 tailplane in going any more complicated than (a) which with the Union Jack rib formation will almost certainly stay flat and be light and strong. (b) can be used on a larger model but if used on an A/2 the spars become rather small and individually susceptible to damage although the overall strength may be comparable with (a). The only thing against (c) (d) (e) and (f) is the possibility of extra weight added to extra complication. (g) has been used but is quite likely to distort in many ways if light sheet is used. Otherwise weight becomes prohibitive.

The tip construction can be any of those recommended for wings but for simplicity and lightness probably the best is *Diagram 113 (b)* or even plain as *Diagram 113 (a)* where we are not so concerned about vortex formation.

DIAGRAM 114.



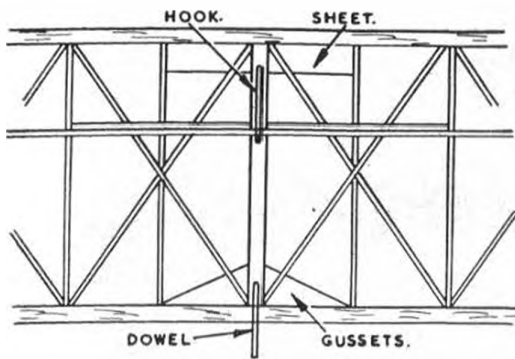


DIAGRAM 115.

The centre of a tailplane should always be strengthened to take the loads imposed by the fixings and dethermalising arrangements. *Diagram 115* gives an idea.

The weight of the fuselage must be kept to a minimum at its rearward extremity to avoid inertia problems.

With an A/2 the weight around and fore of the wings does not matter and much strength can be added here for wing mounting. We are now left with choosing the construction for the fuselage behind the wings in order that we may keep it as light as possible consistent with sufficient strength and minimum distortion. See *Diagram 116*.

Aerodynamically and structurally, the best construction is undoubtedly (a) where it is formed by double wrapping. There is here the disadvantage of having to make a former. The simplest construction which can be entertained is the sheet box as shown in (b) and (c) which readily lends itself to the very simple profile with parallel sides or the tapered sheet box. We can however achieve almost the same result as (a) by the box construction if we modify it slightly by adding longerons to the corners as in (d). If we wish to complicate matters we can also add spacers as in (e) but there is little point in doing this. The longeron and spacer construction can be very light and strong if the spacers are Warren girder and the

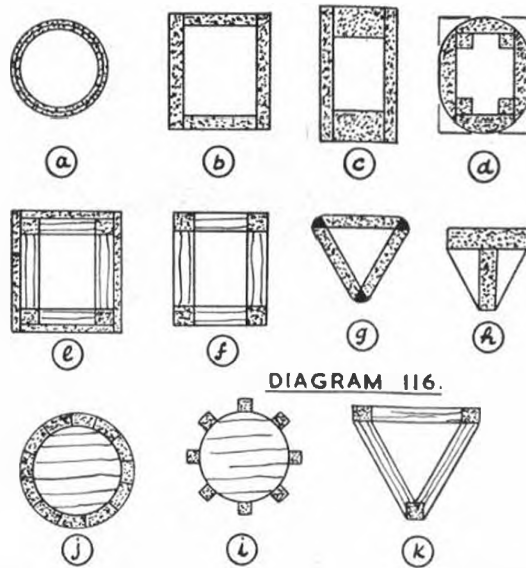


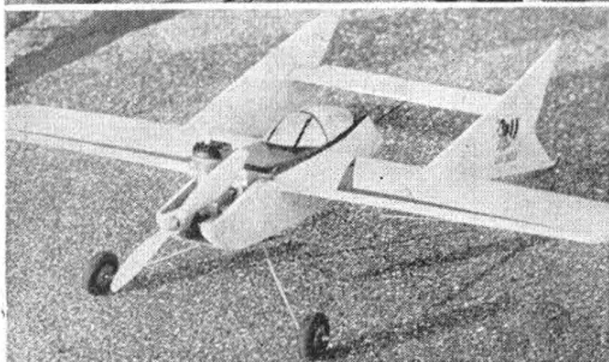
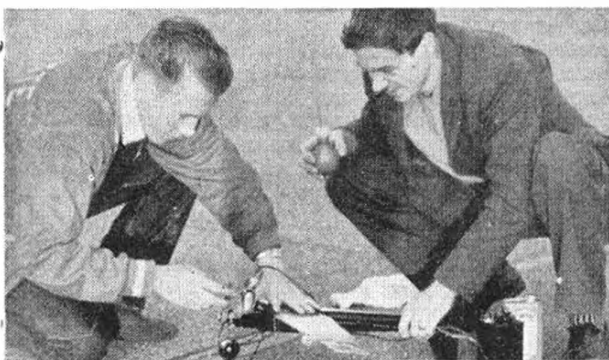
DIAGRAM 116.

cross section is not kept to a minimum as in (f). The most rigid flat sided shape is triangular and the usual way of achieving this cross section is (g) where soft sheet sides are used held together by cement longerons. A variation on the triangular section is (h) as used by Ray Monks where the tissue covering was relied on for torsional rigidity. The old stringer and monocoque constructions as in (i) and (j) are complex and not recommended.

There are further variations such as (k) which is a triangular sectioned longeron and spacer construction.

It is difficult to make a fair analysis of strength to weight relationships but of the practical constructions (a) and (g) give the best result. The author's favourite however is (d) where the longerons may be of hardwood and soon taper off to nothing behind the wing when as the cross section becomes small in relation to the sheet thickness an elliptical shape can still be produced safely.

(To be continued)



RAT RACING COMES TO G.B.

THE "RATS" IN this case were controlled, and appeared by invitation of the F.A.S.T.E. Club, on January 28th last. The meeting, inaugurating Rat Racing to this country, was voted a complete success by both competitors and spectators. Some of whom were heard to remark that they would get their old engines out of retirement to have a go.

Ideal flying conditions attracted an entry of 33 Senior and 12 Junior entrants, who were competing for prizes of engines, kindly donated by Veco, Testor Corp., K & B, and Johnson (Dynamics).

The Finals included Charles Taylor, 7:45—7:15. Ken Day 9:49—9:50. Ian Carter 13:62. Dusty Miller 16:28.

The Junior Finals included:— Bob Johnson 11:37. S. Stenning 12:39. Ian Carter 13:06.

A special Sportsmanship award went to Ian Carter a Junior event entry, who was consistently on the heels of the eventual winners.

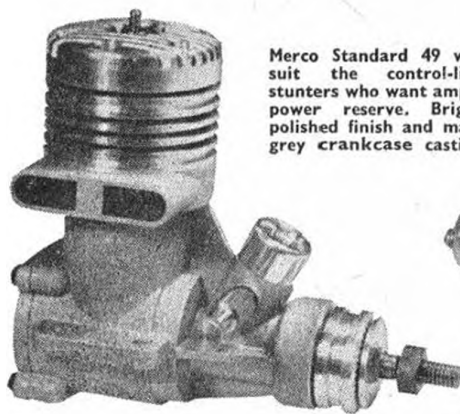
Charles Taylor, who won the Senior event flew a standard Team Racer designed plane with added gear attached, with Ken Day a close second. Day's plane was a small type stunt design with twin booms. Although his top speed was somewhat less than his opponents, his steady flying and good pit stops assured him of second place. Not bad for a stunt man!

The Junior event was won by Bob Johnson (14) of R.A.F. Feltwell, using a plane with a swept-back wing of approximately 150 sq. ins. with a 35 combat engine up in front, which gave him a time of 11:37.

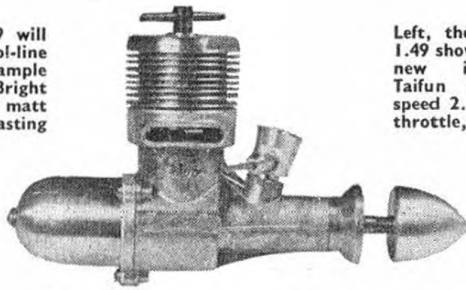
The Consolation race included the 3rd and 4th place finalists and the next highest times, and was won by Capt. Jack Swatek (pit) and Lt. Bob Miller, both F-100 Super Sabre Pilots from Lakenheath.

The R.A.F. M.A.A. are sponsoring a Rat Race on March 25th at Oakington, and this will be open to both R.A.F. personnel and civilians. Engines will again be presented as prizes.

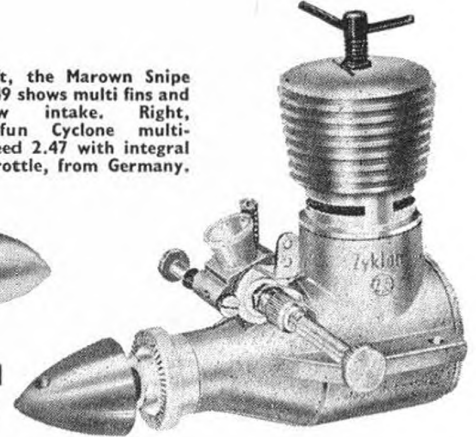
Left: B. Johnson and J. Lambert, Junior winners in 11:37. Bottom is Ken Day's novel ETA 29 2nd place model in Senior with twin booms.



Merco Standard 49 will suit the control-line stunters who want ample power reserve. Bright polished finish and matt grey crankcase casting



Left, the Marown Snipe 1.49 shows multi fins and new intake. Right, Taifun Cyclone multi-speed 2.47 with integral throttle, from Germany.



MOTOR MART

EXAMINATION OF THE new range of engines from L. M. Cox further substantiates our feeling that this Company has an extraordinary high standard of precision engineering. To be able to offer a "Special 15" at a time when the existing engine is already recognised as one of outstanding output is no small achievement. Externally the distinction is confined to a thicker cylinder presenting a more tubby "waist" to the body of the engine. The bore of .591 over the measured bore of the previous Tee Dee 15 at .584, increases capacity to 2.499 c.c., but it is not this factor alone which produces the increase in performance.

Such development is largely a question of "know how" and is not readily detectable. However, Roy Cox has introduced the new *Medallion* series of engines with spray-bar needle valves in all plastic moulded venturi carburettor intakes and examination of the *Medallion 15* gives one an excellent insight into the extra effort made with the "Special".

There appears to be no difference in porting. The cylinder head on the "Special" is distinguished by a knurling which was also present on the earlier Tee Dee and the different metal bore is of a more polished and smoother appearance than on the *Medallion* version.

Pistons are quite distinguishable. The copper brazing involved with the previous Cox trade mark feature of a ball and socket little end to the connecting rod has disappeared and instead the flat crown of the *Medallion* engine is left with a slight centre ridge. On the "Special" this is faced off on a special cast alloy, machined piston.

Moreover the lower cylinder of both the "Special" and the *Medallion* series offer no evidence that the piston has any contact with the cylinder walls!

It is perhaps significant that these same revisions of an engine design applied to the *ETA 15* as of about six months back. Both the Cox and the *ETA 15* started life with every effort made to eliminate wrist pin bearing leakage in the piston walls (the Cox through ball and socket, the *ETA* through an Araldite assembly) and each has returned to the wrist pin in piston walls,— a factor which is largely made necessary by the tremendous increase in power found in these engines.

Cox also introduces the .09 size to their range of Tee Dee and *Medallion* engines, these using ball and socket little ends and offering a capacity class that will be in very heavy demand. In terms of power for weight

the Tee Dee .09 will establish a new high standard.

For the ready-to-fly models there is another *Cox .049* engine with a very clever reed valve carrying backplate, moulded around a filter and with the spray-bar needle valve. This is rectangular in its outer shape so that it clamps between the fuselage nose components of the *Avion P.51* racer and the *Cox Stuka*.

In addition we must commend the new Cox silencer accessory, obviously an adaptation from the *Mercedes* car, and which fits all of the *Cox .049* products.

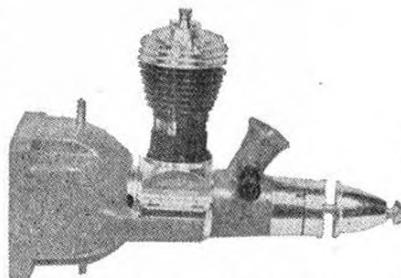
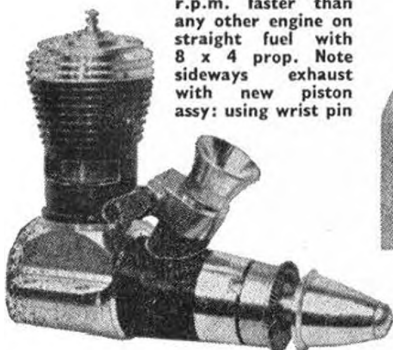
Altogether a most refreshing surprise from a manufacturer one might well have thought justified in resting on his laurels for at least a couple of years. One is almost tempted to wonder what Mr. Cox has up his sleeve for 1963!

News in the British engine trade includes that of a move by well known engine designer George Fletcher from *Frog* to *Electronic Developments*. George has been responsible for a number of top notch sport and contest engines, and we look forward to hearing of new products at the E.D. factory.

Revealed at the Brighton Fair were the first production *Merco 49's* in cleanly die cast crankcases. A few internal changes have been made as the result of intensive flight tests with the prototypes and the result is that Den. Allen has produced a real winner in two forms. The Standard version without throttle will be £10 5s. 4d. and the R/C variant £11 19s. 8d. Considering the specification of ringed alloy piston, twin race shaft and wealth of "know-how" these prices are much lower than we expected for a power unit likely to become the yardstick for comparison of the new flush of large glow engines.

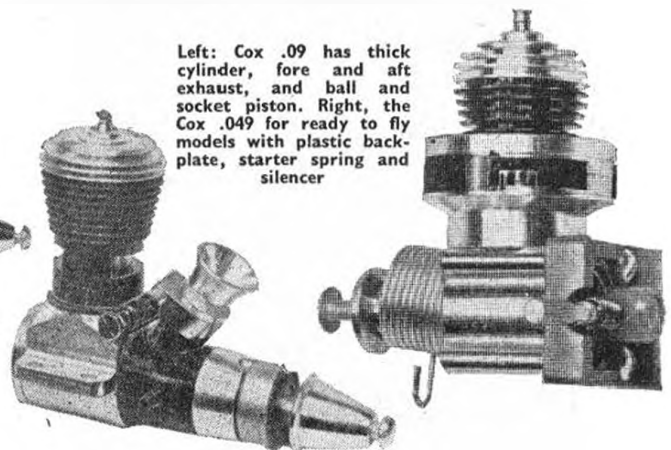
Success of the *Marown Heron 1 c.c.* diesel is indisputable. As an easy starting sports motor it has gained tremendous popularity and now Walter Kendall announces its stablemate, the 1.5 c.c. *Snipe* from his Isle of Man factory. The new diesel has been some time in the course of development, and thus incorporates several new and well tested features. Maintaining the *Marown* "Trademark" of a cast integral mechanical bush for the main bearing for excellent crankcase seal, the *Snipe* has a screw-in intake throat, and "turn-around" fuel feed so that the needle valve can be set to any angle. Tank, head, spinner and induction are red anodised and the price will be around £3.

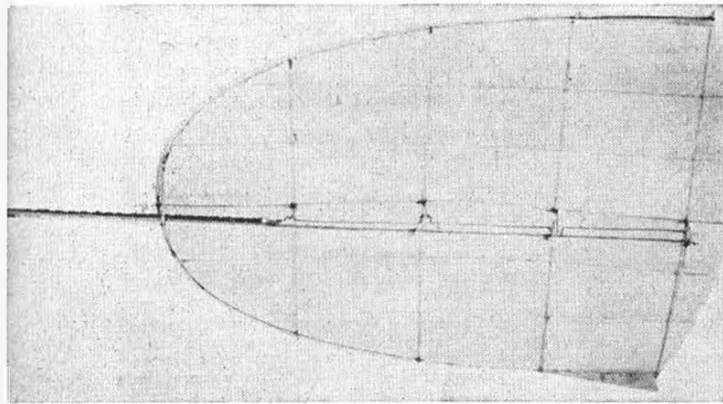
Left: Cox Special 15, on our tests, 700 r.p.m. faster than any other engine on straight fuel with 8 x 4 prop. Note sideways exhaust with new piston assy: using wrist pin



Above: New Cox tank mount in plastic with *Medallion .049* showing spraybar in plastic moulded intake. Tank ideal for F/F, R/C or C/L

Left: Cox .09 has thick cylinder, fore and aft exhaust, and ball and socket piston. Right, the Cox .049 for ready to fly models with plastic backplate, starter spring and silencer





ORNITHOPTER EXPERIMENTS

BY
H. J. MEIER

BEING a dyed-in-the-wool sucker for unorthodox models I was, of course, inevitably intrigued by the Russian rubber powered ornithopter described in the November issue p. 581. A chat with Ulli Stampa, former German record holder for piston engine powered ornithopter models resulted in the building of a simple test vehicle, which for several reasons was modified from the Russian design in its overall dimensions. Instead of front gears the new model utilises direct drive, the rubber motor being installed on the front end of the stick type fuselage, protruding ahead of the wing. The helical wire screw featured by the original design is replaced by rotary wire cranks set at right angles to each other. Whether this is an improvement over the Russian solution is, however, a debatable point.

Construction of the model is quite simple. Bamboo, 3/32 in. by 3/32 in., was used for the wing outline, and for the longitudinal and cross braces (1/16 in. by 1/16 in.) The latter are spaced at regular 6 5/16 in. intervals. Frame width at these stations is 15 3/8, 18 3/8, 19 1/2 and 20 inches, respectively. The wing frame is paper covered, undoped. Fuselage stick is 3/16 in. by 5/16 in. balsa. Front end of stick is 1 1/8 in., rear end 2 3/8 in. above stick. Crank throw increases from 14—20 m.m. (9/16, 5/8, 11/16, 13/16 in.) Total length of Stampa's model is 35 1/2 in., take-off weight 60g = 2 1/2 oz., wing area about 435 sq. in. giving a very low wing loading of 2.1 g/dm². Two small fins of triangular shape, 5 5/16 in. by 1 1/8 in., are mounted near the trailing edge.

Motive power is provided by 4 strands of 1/8 in. flat rubber, 13 in. long. Static thrust produced by the flapping wing is still disappointingly low: a mere 1/2 oz. The distortion of the motor stick under power and the resulting binding of the cranked shaft are no doubt in

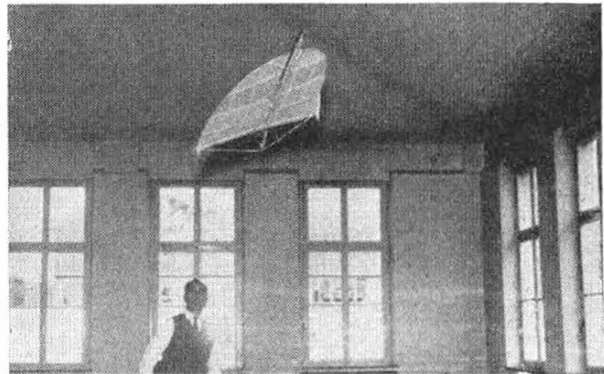
part responsible for this figure, which should, in theory, suffice for sustained flight. But this thrust is available for a few seconds only, i.e. for the initial burst of power.

Flight tests with this model proved nevertheless most interesting. It flies with perfect longitudinal stability with the c.g. 10 3/8 in. back from the leading edge. While the model has not yet been able to achieve level flight for a reasonable distance, the motor length being insufficient, the influence of the propulsive wing is clearly evident by a markedly prolonged glide. The indoor flight shot shows the model apparently climbing at a steep angle, but this is not the normal flight attitude.

The efficiency of the propulsion system seems to be hampered by the lack of damping surfaces, which in turn results in the motor stick moving up and down in flight, thus wasting precious energy. The addition of such anti-wriggle surfaces is contemplated. Improved efficiency

is expected from this measure and from the elimination of friction losses in the drive system, by using a built-up rigid motor stick. These modifications should in our opinion suffice to make this queer propulsion system a definitely practical proposition with most interesting modelling aspects. Helical drive may be more efficient and flexible in operation than the cranking gear.

Experience gained in earlier ornithopter experiments indicates that flapping surfaces act as powerful control surfaces and can either contribute to or detract from the stability of such a model when the power has run out, necessitating the incorporation of devices which stop the flappers in a suitable position. With the Russian design depending on its wing shape for longitudinal stability a tensioning kind of device must be provided to accurately arrest the wing in a pre-determined glide configuration ("S"-shaped airfoil) once the motor has run out.



Q & A a common query in our postbag

DEAR SIR,

I wish to take up International Class Team Racing. Am I right in understanding that this is governed by the F.A.I. Does the F.A.I. deal only with International class Team Racing? I would be most grateful if you would let me have a full copy of all the F.A.I. International class Team Racing rules, I would like to know if I need to be in any movement like the S.M.A.E. to be able to enter for competitions and, if models made to the F.A.I. International class specifications are able to enter in S.M.A.E. organised competitions.

Denton, Nr. Manchester.

P. YEOMANS.

The F.A.I. (Federation Aeronautique Internationale) is the governing body instituted to co-ordinate regulations for all matters concerning aviation, including aeromodelling. It is responsible for stabilising rules which are used for World Championships. The Models Commission comprises of an Administrative and Technical Secretariat with Representatives from each Member Nation and additional technical Sub-Committees who provide considered advice on propositions.

Team Racing regulations are established as of 1st January 1961, with the following basic requirements:—

Maximum engine 2.5 c.c.

Minimum projected surface area (wing and tail) 186 sq. ins.

Maximum fuel tank 10 c.c.

Fuselage cross-section at cockpit 6.045 sq. ins. minimum, 2 in. wide, 4 in. deep. Wheel diameter 1 in. minimum.

You should also familiarise yourself with the technicalities of race procedure which is clearly laid down in the Sporting Code, available to all members of the S.M.A.E. on request price 2s. 9d. at Londonderry House, 19 Park Lane, London, W.1. Membership of the Society is to be thoroughly advised since it will enable you to participate in those events organised by the S.M.A.E. and will provide you with insurance cover and put you in contact with your local club.



S.M.A.E. Contests

March 25th	K.M.A.A. Cup (U/R Glider)	} Area
	Frog Senior Cup (U/R Power)	
	F.A.I. Rubber	
April 1st	Control Line, Speed and Stunt	Centralised
April 8th	Astral Trophy (U/R Power)	} Area
	Flight Cup (U/R Rubber)	
	A/2 Glider	
April 29th	First Control Line Trials	} R.A.F. Barkston Heath
	First Radio Control Trials	
May 13th	C.M.A. Cup (U/R Glider)	} Area
	Gutteridge Trophy (U/R Rubber)	
	F.A.I. Power	

Sheffield Society of Aeromodellers display some of their efforts (including Coupe d'Hiver Garter Knights) at the club A.G.M. They meet 2nd and 4th Fridays at Central Tech Hall, all lone modellers will be welcome to join.

BAGS OF NEWS this month. Much more in fact than we have room for. A.G.M.s and annual dinners, election of new club officers and the like seem to be the order of the day at the moment. Unfortunately much of this is of little interest to those *outside* the particular club concerned. There are also some new clubs announced this month, which brings me to another point. Due to the volume of news we receive, we can now rarely find room to print a list of club secretarial changes. Do not let this discourage you from keeping us up to date for each change is noted in our Addressograph system which enables us to direct any modeller requiring the address of his nearest club, and keeps you informed when trade circulars are issued.

We open up this month with LONDON area news and the announcement of another rally. Wanstead M.A.C.'s Control Line rally is due this year for April 15th, to be held, in conjunction with Dagenham M.A.C. who will be unable to hold their Combat rally at Central Park. They hope to improve immensely on last year's event by including Rat Racing and Stunt as well as the usual "A" and "B" Combat classes. A new feature of the Rally will be free refreshments, a free programme for spectators—Criekey!

St. Albans M.A.C.'s annual dabble in control line, held between Free Flight seasons has been noticeably longer and keener this year. One very windy day saw many line breakages and a fine F/F display by a *Peacemaker* which executed spiral loops over 300 yards. Their first Combat competition attracted eight entries, won by Don Edwards who has just completed a near scale *Splitfire*, powered by a P.A.W. 19-D to give a performance equal to that of the Colt .45 revolver namesake.

A promising omen for the '62 flying season in Hornchurch M.A.C. was the appearance of a brace of top performing Wakefields from the dens of A. Wells and G. Pavey. Both models are high aspect ratio designs, flying on 14 strands, and both made several 3 minute plus flights on a January morning. Technical differences are an oval section sheet fuselage with a 22 in. by 26 in. prop, as against a square section fuzz with a 23 in. by 30 in. prop. Their first comp. of the season was an A/1 warm up. Weather was good for the ten entrants who took the field; only snag being a spot of hanger turbulence, which made kiting up a bit tricky. Nevertheless, most of the lads got through the 5 flight, 3 minute schedule in spite of some crashery, and A. Wells emerged a worthy winner with an 8:31 aggregate.

Members seem to have found their own solution to the silencer problem: rubber and glider.

Cosmo A.C. invite local modellers to their annual prizegiving and open night at 7.30 p.m., April 27th at Hurst Place, Bexley, Kent when John Patterson of "Solarbo" will be guest of honour. In February we mentioned their contest among members to obtain the best club report:— here is an abbreviated version of 15 year old Aubrey Tick's winning entry:—

"A recent lecture, given by Mr. F. Andrews, on the subject of aerodynamics, was appreciated by all members, especially the juniors who now understand fully why an aeroplane flies!"

Twenty members participated in a Club rat-race. The "A" class event was won by A. Howard aged 12, (a junior), and the "A" event by N. Boullier aged 17. The engines of the day were a Rivers Silver Streak and a Frog 150.

Comment of the month from Fred Andrews whilst flying a "Merco 35" "Coy Kat", for the first time, 'I'm not 'appy'."

SOUTH EAST now where, after many postponements, Brighton D.M.A.C.'s Lanes Cup for open duration of all model types was flown on February 4th, resulting in a multiple fly-off. Despite clutch failure which destroyed the fuselage of his Open Rubber model, Fred Boxall topped the Fly-off with a reserve, closely followed by Titch Garner and Dennis Latter.

The SOUTHERN area has a new club in Goshawks M.A.C., based in the Gosport area. Anyone interested in joining should contact M. Johnston, 24 Anglesy Road, Alverstoke, Gosport, Hants. Mr. Norman Dodds M.P. was the Guest of Honour at North Kent Nomads dinner. Naturally in view of his recent connections with gypsies and the name of the club, the two were linked several times in his very interesting speech. . . . Following this, the club staged an exhibition at the local Granada Cinema, which once again brought the movement to the notice of the public. Chichester and D.M.A.C. will hold a Slope Soaring meeting on March 18th, to be filmed by

Southern Television for inclusion in their "Day by Day" programme— should be good publicity.

The EAST ANGLIA area are to organise a *National decentralised* contest on May 27th. It is for the three F.A.I. free flight classes. The organisers wish to donate 50 per cent. of the entry fees to the S.M.A.E. International Contest Fund, for which reason models must be to F.A.I. specification. Lack of space prohibits publication of all the rules, but full details are available from the Competition Secretary, "Maredin", High Street, Balsham, Cambridgeshire. May 26th is the last date for pre-entry at 2s. 6d. per class.

Another new club, this one in the province of the SOUTH MIDLANDS, is Bedford Modern School M.A.C. Interest is shown in $\frac{1}{4}$ A Combat, though much practice is needed to attain competition standard they say. An engine starting register is being kept in an effort to improve the standard of pitting, the times now vary between 25 seconds and about 25 minutes! Control line is the main interest, although a few interesting free fliers have been seen, some unfortunately ending in disaster.

Stevenage M.F.C. area a very lively and active club, if their own magazine *News and Views* is any judgment. They even get away from modelling activities now and again for other recreations such as their "Family Ramble" car rally advertised for February 18th. Plenty of plans and an instructive sketch page of glider detail, in their February edition. Their enterprise is well illustrated in their international postal comp. with Southern California Aero Team, U.S.A. and Upper Hutt Aeromodellers, New Zealand advertised for March 11th and another against Toronto Balsa Beavers, Canada and Tulsa Glue Dobbies, U.S.A. on April 29th. The first is an F.A.I. F/F event and the second is for Open F/F models.

High Wycombe M.A.C.'s Rat Race on February 11th was their first. To allow 1.5 c.c. and 2.5 c.c. models to compete against each other, all models were flown on 46 ft. 8 in. lines. Organised in three sections, a 25 lap sprint, a 50 lap dash with one compulsory pit stop and a 100 lap race involving at least two compulsory stops, the wind took toll of all but P. Morris's entry, romping home first in all three sections. Many members require more all-weather flying experience, but they all enjoyed themselves. The 1962 High Wycombe Control Line Rally may regrettably be cancelled, since the O/C R.A.F. Booker has restricted permission for meetings at the Station. This is tough news to the 75 members of the club (and many other control line enthusiasts we are sure), particularly as there has been little cause for complaint after the last three rallies. It is no longer possible to hold the event at the previous Kings Mead Recreation Ground venue either, through noise. There is no doubt that as time goes on, more flying sites will be lost for this reason. High Wycombe say it is time the motor manufacturers faced this problem and offered silencers to the unfortunate modellers who must reduce the noise of their motors, or cease flying.

WEST now to Bristol Radio Control M.A.C. who, with a membership now approaching fifty, suspect themselves to be the largest specialist local radio control club in the country (confirmed—Ed.). As national competitions tend to be a considerable distance from the West country, they are considering the possibility of holding their own R/C rally. Provisional permission has been given by the O/C R.A.F. Hullavington to use that station, and it is hoped to hold the rally there (one of 5 flying grounds they enjoy) sometime in September. Further details to follow. Multi and scale are their main interests, six Orbit Superhets are on order. Their first superbly finished Mustang (some of which we expect to see at the Nats. this year) by Roy Morris has completed its rather shaky maiden flight.

One can always be sure of "activity" from NORTHERN area's Wharfedale M.A.C. where, at a recent meeting, Vice-chairman Harold Yates read a letter received from a United Nations official at a boys orphanage in Greece. The letter thanked Mr. Yates for a gift of modelling equipment. In response to this letter a collection was taken by members present to send more kits and accessories. A club uniform design has been accepted, this to be a Yellow "T" shirt, yellow socks and black jeans. Interesting models under construction for the new season are an "All Ply" combat model at very acceptable weight and a B-17 by scale expert John Simmance with four engine including variable speed control, retracting undercarriage and all illuminating navigation and landing lights. This year's 1,000 lap

Team Race for Class B racers will include an International Postal Contest open to anyone the World over. Information on this (and please no other correspondence) from Ken Long, 63 Leathley Crescent Menston-in-Wharfedale, Ilkley, Yorks, England. Frenzied building for the new season continues to take most of Baildon M.F.C.'s time. Junior John Penchson, successful in local open events last year, has now decided to tackle F.A.I. Power. M. Jackson brought a fuselage for his new open job to the last meeting complete with O.S. Max .15, timer and propeller weighing just six ounces. Maybe this is due to huge deliveries to the club of American "Sig" (lightweight) balsa.

Alec Craig, new comp. sec. of West Hartlepool M.F.C. had the misfortune to argue with a double-deck omnibus, and collected crutches for his right leg. However, I gather this does not stop his C/L activities though he complains he cannot run fast enough when dashing for a pitstop. Large scale C/L models of the Beaver (60 in.) and Fury (40 in.) for the Merco 35 are a foretaste of what is threatened to be a whole club turn-out for the Nats—have YOU booked up yet?

Over to the MIDLANDS now where Leicester M.A.C. members' interests are particularly varied if this breakdown of votes from their January newsletter is any guide.

Category	Sport Flying only	Prepared to enter comps.	Category	Sport Flying only	Prepared to enter comps.
Open Power ...	43	31	C/L Scale ...	9	11
F.A.I. Power ...	14	9	Team Race ...	3	9
1/4 A Power ...	17	14	R/C Single C ...	17	3
Open Rubber ...	14	14	R/C Multi C ...	11	6
Wakefield ...	—	3	F/F Scale ...	20	14
Open Glider ...	37	31	Precision Power ...	3	3
A/2 Glider ...	14	23	Speed-Jet ...	—	3
C/L Stunt ...	26	26	Slope Soaring ...	—	3
C/L Combat ...	20	34			

The point at issue is whether or not this is representative of all clubs? Entries for Peterborough M.F.C.'s annual Concours D'Elegance event were far superior to previous years, although the number, fifteen, was disappointingly low. Particularly noticeable was the single entry by junior R. Pywell, whose *Lockheed Lightning*, although not of expert standard, was an encouraging effort by so young a member.

A new club has been formed in Sutton-in-Ashfield, 25 strong, affiliated to the S.M.A.E., meeting Wednesdays 7.30 p.m. with contact address at 3, Farndon Road, Sutton-in-Ashfield, Notts. Gee-Dee M.A.C. in Nottingham has a keen combat interest as they should have, for combat really started in their part of the country, but free flight and indoor R.T.P. have taken hold so there's hope yet for 'em! Urmston M.A.C. also combat regularly, last comp. on December 10th went to Derrick Gilbert's *Razor Blade* (Oliver Tiger).

Sad news from the NORTH EAST and Novocastria M.A.S., where, after five years of successful meetings, the 1962 Rush Trophy Gala seems a doubtful event, due to building work now in progress on the Town Moor. As yet no alternative site has been found, though there are possibilities, no effort being spared to find a new venue.

Rare news from SCOTLAND where Dumbarton M.A.C. is in full swing (they say)—hic! Use of a flying field at Strathleven Industrial Estate has prompted much team race activity with speeds up to 114 m.p.h. in class B—they ask where are the other Scots clubs?

Pen Pals

Wanted for 14 year old Neil Jackson of 25 Battery Road, Napier, New Zealand, for 25 year old scale enthusiast Zdenek Rehacek, Nermdova 141, Hradic Kralove 11, Czechoslovakia and for 14 year old William Martin, 322 E.173 St., New York, N.Y., U.S.A.

What a shame! Three Rallies cancelled in one month—and no news of perennials like Northern Heights, Midland Gala, etc?!

THE CLUBMAN.

Rally Calendar

April 15th	Wanstead and Dagenham C/L Rally, Wanstead Flats. Stunt, Rat Racing, A. & B. Combat. Pre-entry 2s. 6d. to J. Franklin, 86 Grove Hill Road, South Woodford, Essex.
May 6th	Woking M.A.C. Rally. Rubber, Glider Power, 1/4 A Power, Chuck Glider Coupe d'Hiver. Chobham Common. Pre-entry 2s. 6d. to P. Newell, 8 Harelands Lane, Woking, Surrey.
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 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. 1/4 A, F.A.I., B, T/R. Combat, Stunt. Venue to be announced.
July 15th	Clywd Slope Soaring Contest, Moel Ffamau, Nr. Mold, North Wales. More details to follow.
August 12th	Devon Rally. Rubber, Glider, Power, 1/4 A, Combat. Woodbury Common near Exeter.
September 16th	South Midland Area Rally. All Classes. Cranfield.
September 23rd	Northern Area "Air League Rally". Venue to be announced.
October 7th	South Coast Gala. All classes F/F, C/L, R/C. Venue to be announced.

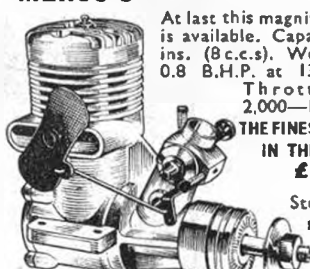
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4 1/2 x 3, 4 1/2 x 4, 4 1/2 x 5 ... 1/9		
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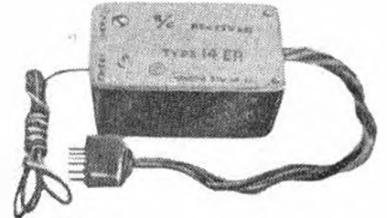
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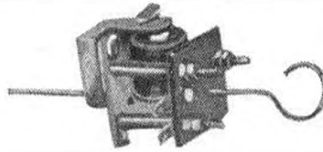


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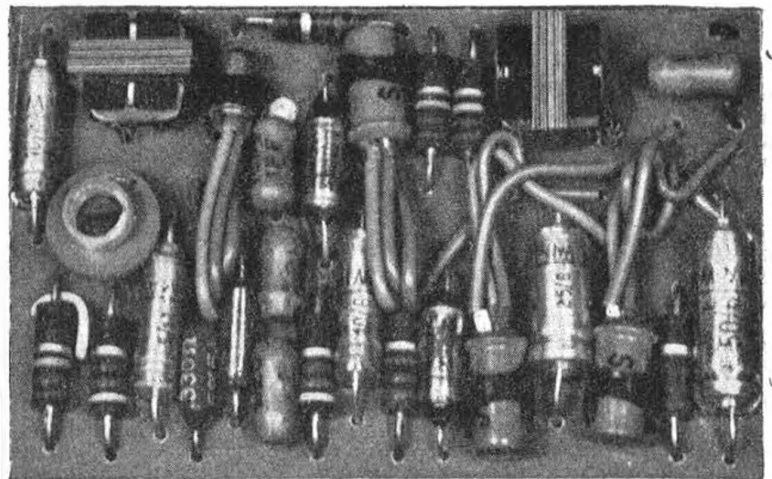
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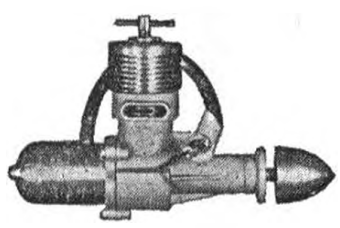
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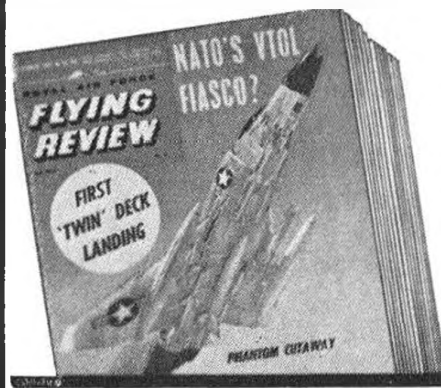
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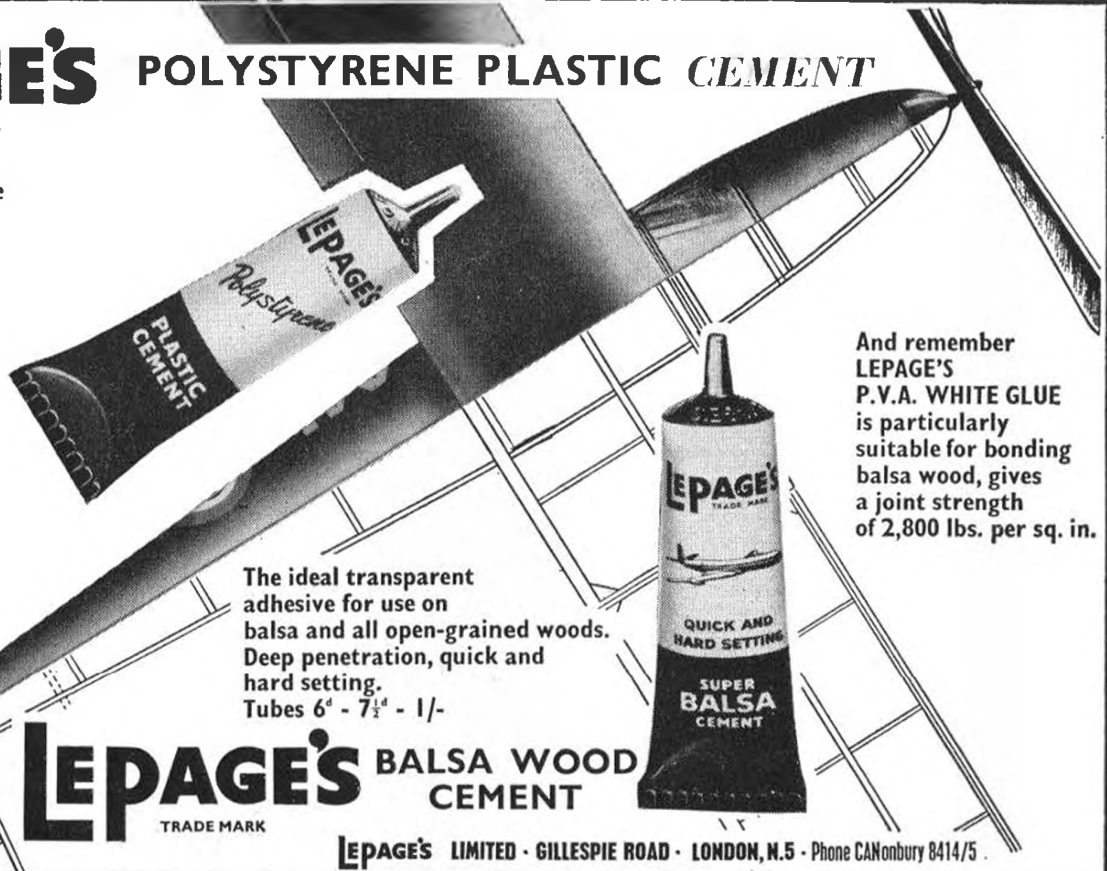
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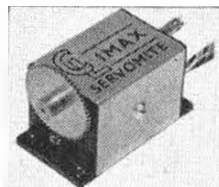
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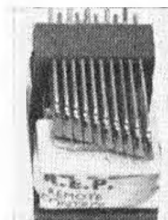
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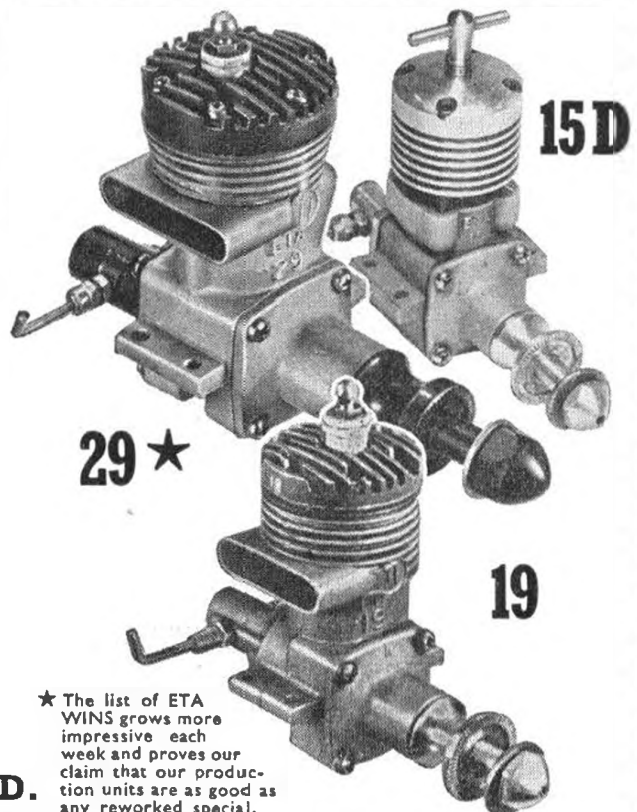
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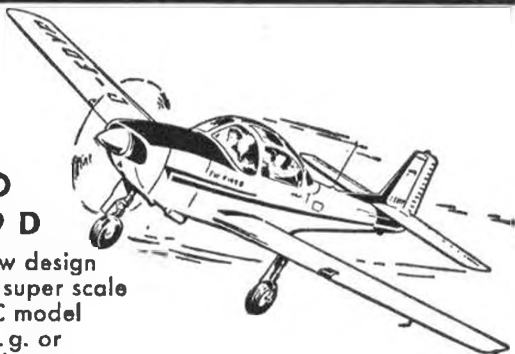
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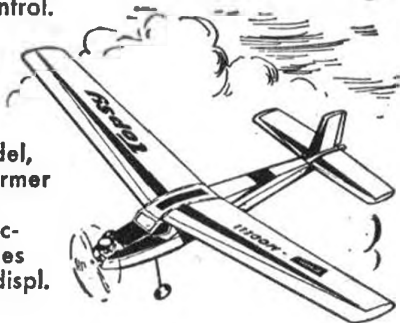
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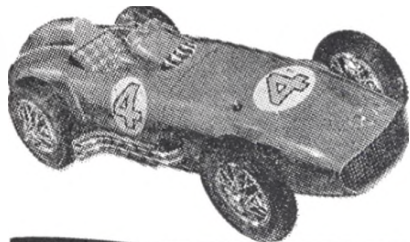


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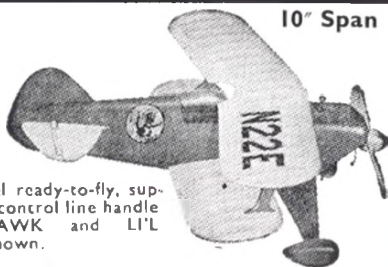
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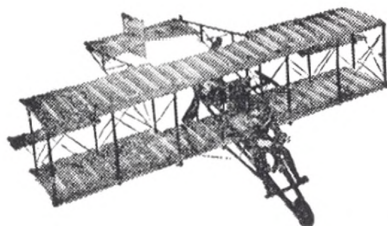
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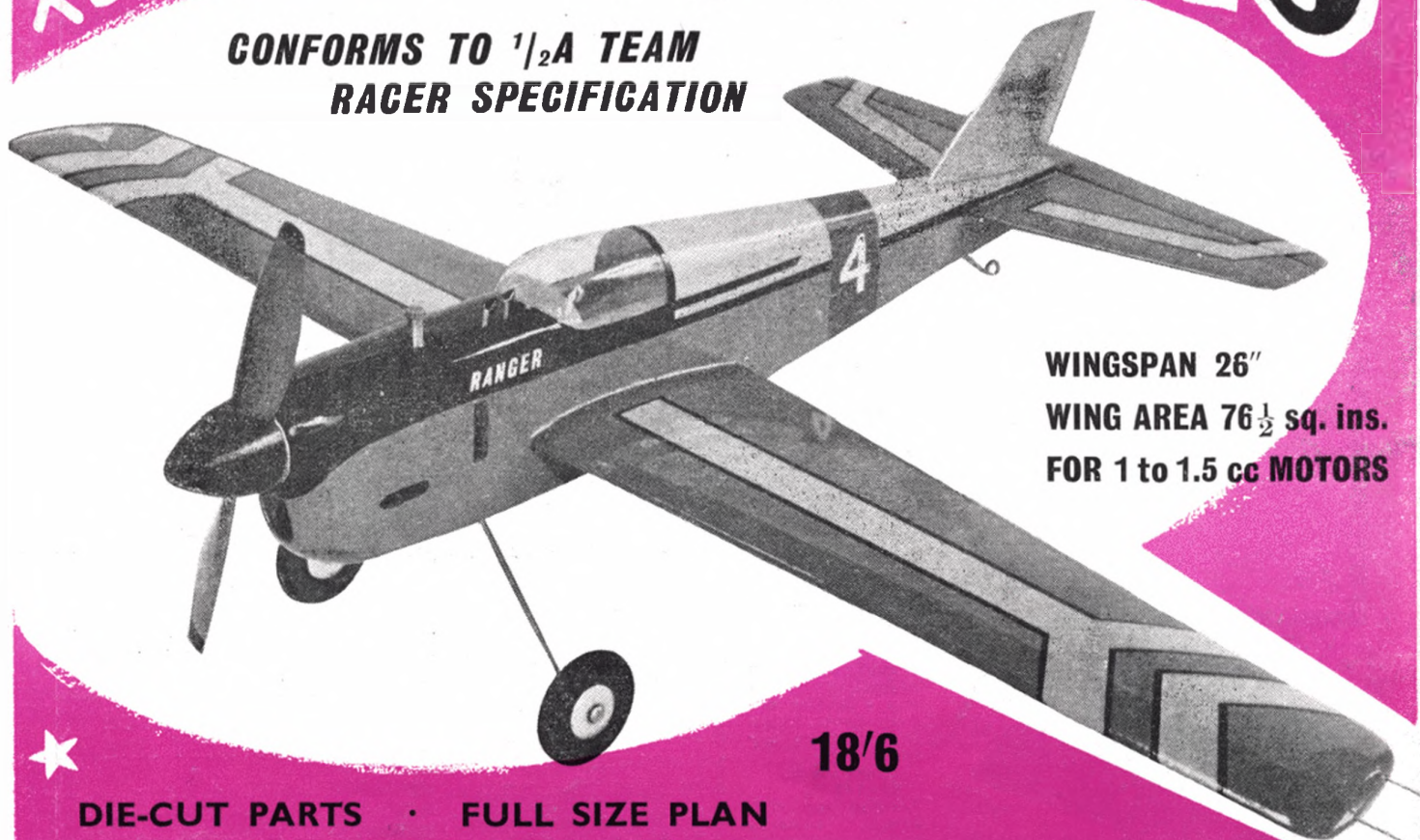
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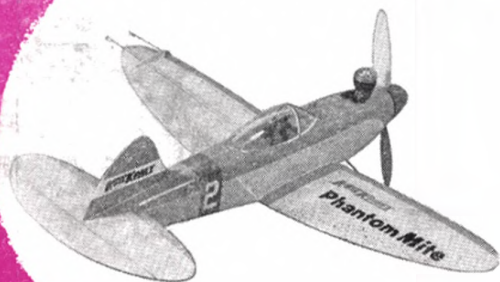


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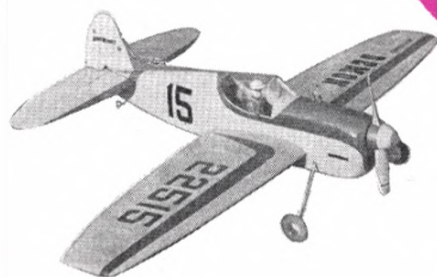
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