AERO MODELLER

NOVEMBER 1952

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1/6

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

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

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Hlsat Blog Free Plans and Articles.

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AeroFred Gallery Free Plans.

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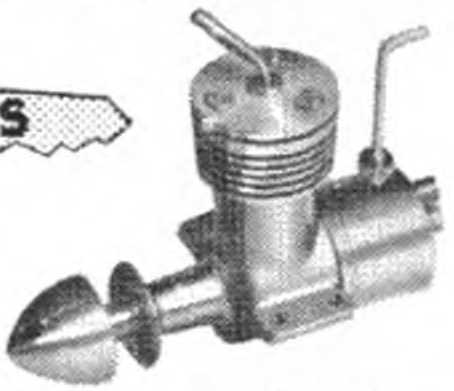

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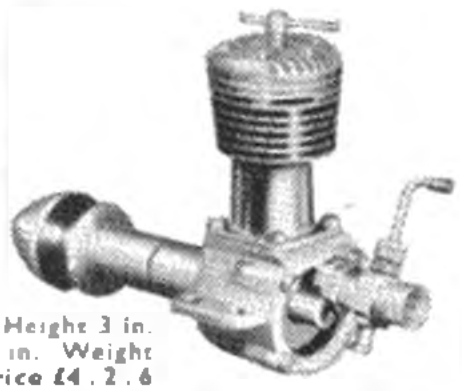

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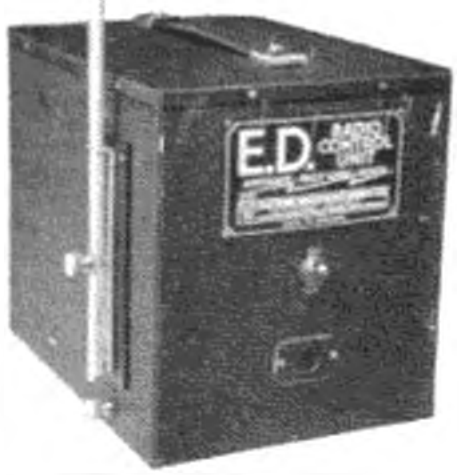

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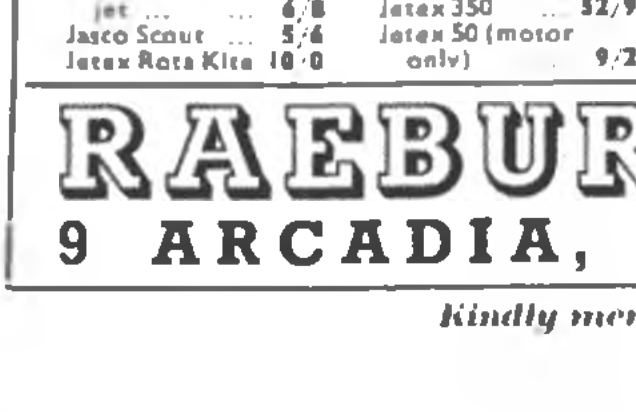
BILL BAILEY—Free Lance Trawler (*right*). L.O.A. 27 ins. Beam 6 ins. Attractive scale type model electric powered and intended for radio control or free sailing. Scale speed approx. 3 m.p.h. Simple construction suitable for beginner. On one sheet size 40 × 25 ins. Price **5/-**

ADMIRAL'S BARGE (*below*). L.O.A. 33½ ins. Beam 8 ins. A scale Naval Pinnace built specially for radio control by ex-coxswain R.N.V.R. enthusiast from authentic lines of prototype. Suitable for diesel 2–2½ c.c. On one sheet size 40 × 38 ins. Price **10/-**



DEGLET NOUR (*right*). One tenth scale replica of prototype Cabin Cruiser prepared from the designer's drawings and the actual full-size craft. On three sheets, covering general arrangement, hull lines and a final sheet of deck fittings and other details to make this 36-in. craft eminently suitable for radio control. Complete set of three comprehensive full-size working drawings Price **15/-**

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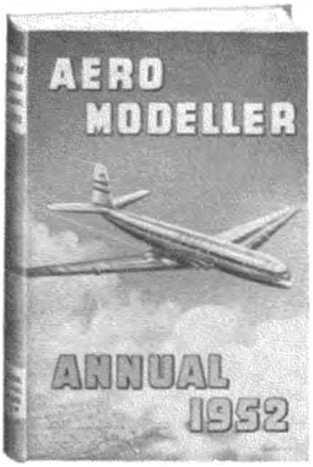

AEROMODELLER ANNUAL 1952

In fourteen days the fifth AEROMODELLER ANNUAL will be on sale—advanced to November 1st because so many readers wanted it good and early. Be sure you have ordered your copy from your local model shop or bookseller—and make certain you go in and get it right away. That's sound advice because a lot of people were disappointed in 1951; we are printing more this year, but you never know. We think you will like the 1952 ANNUAL even better than the others—we have tried to give you all the things you have asked us to put in—have a look at some of the principal contents and see what value you are getting.

160 pages, size 8½ × 5½ ins., bound in cloth and card, gold blocked spine, three colour dust jacket of Comet. Over 150 plans, pictures, drawings, etc.

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★ *November 1st the Day !*

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AERO MODELLER

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Contents

Editorial and Advertisement Offices: 38, CLARENDON ROAD, WATFORD, HERTS. Tel.: 5445

New Rules?

IN all things, progress is to be desired, and invariably denotes an improvement in general standards that is of benefit to all concerned. This is as true of aeromodelling as any other activity, and in our case has meant an all-round advance in the performance of almost every type of model flown, be it duration or speed.

Unfortunately, this higher performance has brought with it many attendant difficulties, the most dangerous being the far larger number of modellers who find it necessary to go outside the boundaries of flying fields in order to retrieve their valued possessions. In earlier days it was the exception rather than the rule to find many models passing beyond the limits of reasonably sized airfields, but today the opposite is the case.

As a result, clubs and individuals are faced with a rapidly increasing number of complaints from farmers and property owners, who—quite naturally—object to uninvited "guests" invading their property in search of missing models. The situation has reached such serious proportions that in many instances use of suitable flying areas has been banned to aeromodellers, and many clubs find it almost impossible to carry on their normal activities.

There seems to be one answer to this difficult situation. Higher all-round performance is an accepted fact, and the logical step is to evolve some means of reducing ultimate performance, *not* by interfering with the efficiency of the model itself, but by imposing some form of restriction on launching. To this end, we welcome a proposal by the Council of the S.M.A.E. to try out a system in the 1953 programme that should produce at least a part-answer to the problem, for unless the situation is tackled immediately the movement as a whole must suffer.

To date, gliders have been launched from lines with a maximum length of 100 metres (328 ft.), and it has become obvious that even a very mediocre model cannot be contained within reasonable boundaries with such an initial advantage of height. For this class of model the experiment may be tried of reducing the permissible line length to 50 metres (164 ft.), and the law of averages should produce fewer models travelling outside the aerodrome limits.

For power models, the maximum engine run may be reduced from 20 to 10 seconds, and here again the generally shorter durations obtained will serve to contain more models within the perimeter.

It is with the rubber-driven models that snags arise, for it seems impossible to produce some means of a launching handicap that will not at the same time mean alteration to the model specification. Opinions will be solicited on this question, but the best we have considered is to limit the amount of rubber carried on a "percentage of total weight to motor" basis. The chief difficulty is met when the International specification for the Wakefield class of model is considered, and this aspect is bound to cause much heartburning before a logical solution is found.

Finally, it is proposed to lower the maximum duration from its present 5 minute limit to 3 minutes, and where a "three-maximum decider" becomes necessary to impose a 5 minute limit to fourth and subsequent flights. This should inevitably produce a result where absolute consistency pays dividends, and furthermore stimulate still further the art of correct dethermalising, which is after all one of the few remaining means of containing flying models within bounds.

Cover Picture . . . .

At the All Herts Rally, Group Captain John Cunningham, D.S.O. and two Bars, O.B.E., D.F.C. and Bar, Chief Test Pilot of the de Havilland Aircraft Co. Ltd., kindly judged the Concours d'Elegance and is seen here admiring the most ambitious entry. Powered by four R.D. Mk. IV's, this Handley Page Heracles is complete to the last detail and is the work of J. Newton (North Kent).

Surprise at Dubendorf

It is many years since an International contest was won by a proxy flier, our last recollection being the Wakefield win of Gordon Light's model flown by Tommy Ives at the old Great West Aerodrome in 1935. It will come as a surprise therefore to most readers to learn that the 1952 International Power Championships was won by that well known Bradford aeromodeller Silvio Lanfranchi, proxy flying what was apparently an unofficial entry belonging to Barry Wheeler of Birmingham.

We do not propose at this stage to comment on the ethics of a Team Manager flying an entry not authorised by the Governing Body, for we understand that these unusual circumstances are under review by the Council, and we await their findings with interest. We trust that the investigation will also consider the last minute action of the Swiss organisers in raising the team numbers from four to five, for it is reasonable to assume that this alteration actuated largely in the introduction of Wheeler's machine. It surprises us that an event scheduled on the F.A.I. Calendar can be modified in this manner without due reference.

A full report of the contest will be published next month, giving on-the-spot details as witnessed by our reporter Ron Moulton. The following placings and times will suffice to whet your appetite for the complete report later on.

1.	Wheeler, B. (S. Lanfranchi)	G.B.	3 : 29·4	4 : 58·2	5 : 00
2.	Lauchli, H.	Switzerland	2 : 42·4	4 : 43·2	5 : 00
3.	Castiglioni, S.	Italy	2 : 39	4 : 36·2	5 : 00

It is of interest to note that thermals played an enormous part in the third round of the contest, no less than one-third of the entry obtaining maximum durations on their final flights.

Other British placings were : Ray Monks 14th, Max Byrd 18th, Pete Buskell 21st, and Jack North 32nd.

The Rally That Wasn't

A last minute rush to prepare the new Avro 698 four-jet delta bomber for display at the S.B.A.C. show took the wind right out of the North-Western Area's sails by causing the postponement of their popular rally, sponsored each year by the "Manchester Daily Dispatch". Some inkling that such a happening might occur was made known to the organisers quite early in the year, in fact an earlier date was refused because the secret bomber was scheduled to be tested about that time. But a month's notice was promised if the aerodrome was to be needed for test flights.

So all went well with the committee; programmes, almost £100 in prizes, coaches, catering and the many little etcetera's were organised, clubs for hundreds of miles around arranged their transport, and pre-entries totalled nearly 700 including no less than 28 for the Eddie Riding Memorial Scale Trophy . . . Then it happened! On the day before the rally the Avro 698 was wheeled out, taxied and flown for the first time. About the same time Kemsley Newspapers Ltd., proprietors of the "Daily Dispatch" were requested to postpone the meeting, and at 12.15 p.m. . . . only twelve hours before the day of the rally, a telegram was delivered to Area Chairman Peter Foulkes.

A hurried discussion followed, then 56 telegrams were speedily despatched to clubs and individual

Outside A. V. Roe's closed gates, brothers E. and F. Sprason are sadly told that the Rally (see above) is off by Area Chairman Peter Foulkes and Secretary Ray Musgrave. They had just completed a 90 mile journey from Birmingham after an early start on their Bantams.

groups, the B.B.C. added an announcement in their Northern Regional broadcast, and committee members sped around local areas to give the bad news. It says much for the quick thinking committee that very few modellers indeed made the fruitless trip to Woodford. As we left the small group at Avro's tightly closed gates on that windy Sunday morning, they were already discussing fixtures for the next meeting.

. . . . And the Moral

There are three major annual rallies held on manufacturers' airfields in this country, and countless other meetings blessed with the courtesy of the Royal Navy, Royal Air Force and civilian flying clubs. The majority of these affairs are go-as-you-please enter on-the-spot galas ; but the " Daily Dispatch " rally differs in that it is an all pre-entry meeting. How fortunate for them—and the modellers who were spared time and money on August 31st ! We shudder to think what might have happened at Handley Page's or Hawker's gates if *they* had decided to close their aerodrome for an emergency such as occurred at Avros.

This " incident " throws light on another aspect in favour of pre-entry.

Another " C "

Dave Willmott of the Belfairs M.A.C. is the 5th Britisher to qualify for the coveted " C " cum International Merit Certificate in this country, and we offer him our congratulations on gaining this achievement - the official indication of the true all-round aeromodeller.

Willmott's times were :—

Power : 19th October, 1951, 3 : 21, 3 : 47, 3 : 41.
Glider : 30th October, 1951, 3 : 09, 3 : 18, 3 : 31.
Rubber : 29th August, 1952, 4 : 05, 5 : 43, 3 : 07.

The consistency of times gained in both Power and Glider classes indicates good D/T assessment, or perhaps the dates when flights were made had something to do with it ! Flights with the rubber-driven model made in " summer " weather show a much wider variation.

Praise where Praise is Due

R. F. Bourne, chairman of the Godalming Club asks us to make it clear that it was the combined efforts of several members that produced the excellent team race lap scoreboards at Gosport. We gave the impression in our Nationals description that Mr. Bourne alone was responsible. We are delighted to point out any example of co-operative effort, which is after all the very essence of a club's existence.

Christmas Fare

We are really proud of the special Christmas Issue now being prepared for readers. For the first time for many years we are able to make it a gift issue in the true spirit of Christmas, with magnificent plans 27 by 18 ins. folded into each copy. These grand plans will appeal in particular to absolute beginners in the case of Bill Dean's design, a new version of that rubber powered favourite the " AM Cabin Monoplane " ; and to the " power beginner " who Vic Smeed caters for with his " Debutante," ably supported by the Rev. Callon's photofeature on its construction. In the normal way of business—that is to say after Christmas—these plans will cost you 5s. 0d., but in this issue they will be really given away !

You will recognise this special issue by the all colour cover painting—yes, as a special Christmas extravagance we have C. Rupert Moore's superb painting of F.E.8's in action. The enlarged issue with its seventy-two pages of text will embrace a wider than ever selection of articles. In particular there will be an illustrated article on Model Rockets, Ron Warring on Contest Analysis, plans of the F.E.8, World Power Championships in Switzerland fully described, Team Racing by a Dutch expert and a host of other splendid features.

Get your copy on order now : as usual price will be 2s. 6d.—and worth every penny of it !

Aeromodeller Annual 1952

Another fourteen days and readers will be able to secure their copies of AEROMODELLER ANNUAL, 1952—available this year a month earlier than usual in response to popular request. A lot of thought and care has gone to make this our fifth ANNUAL even more useful and interesting than before, while retaining those features which have been so welcome in the past. The usual splendid range of plans culled from all over the world have been produced with far more detailed measurements, so that any model so described can be built from the book with a little time and trouble without any necessity to purchase fullsize drawings. A new feature—that has been requested for a long time—is Aeromodellers' Sketchbook, a series of pages of gadgets, " right-way-to-do-it " drawings, covering all aspects of aeromodelling. Another useful section is the Aeromodelling Dictionary in French, German, Swedish and Italian, giving all the popular modelling terms that will never be found in any ordinary dictionary. Then we have articles for solid fans, plans of the D.H. Comet, analysis of model ducted fans principles, powered autogiros, and a host of other special features to please—we hope—nearly everybody. Dust cover represents the D.H. Comet in colour, way above the clouds. Price as last year is 10s. 0d. for 160 pages of real aeromodelling gen : be sure to look in and get your copy while they last.

Better Late than never !

We regret that it has proved impossible to include the promised plans of Bora Gunic's winning A/2 design in this issue as announced in November " Hangar Doors ". Full size plans will, however, be published as soon as possible. A full report on the A/2 Glider Contest appears in this issue.

BROOKS' BIPLANE

DESIGNED BY

B. BROOKS

8/6

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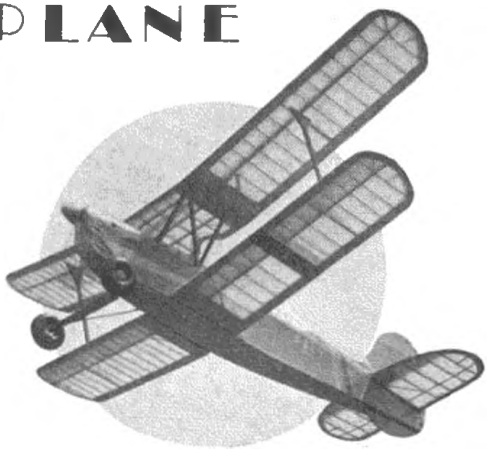


TO many readers Basil Brooks and his biplanes will need no introduction. Over the years this designer and his models have become an accepted part of the scene at our major rallies and no visitor to Radlett, Northern Heights Gala or the Bowden Trophy competition can have failed to see one of his beautiful models giving a consistent performance throughout the day.

Consistency is indeed one of the outstanding features of this latest Brooks' design. The rugged construction coupled with a design that has been progressively improved upon over the years, has resulted in a model of exceptional pleasing appearance, a first class performance and of almost crash-proof construction. The latter statement is emphasised by the fact that the last three biplanes built by Brooks are all still in flying condition. One of the models is four years old and even the latest (described here) has been flying for over eighteen months. This is truly economical aeromodelling.

Secret of these soundly constructed models lies in Basil's long modelling history. He began building models in the early nineteen thirties when silk and spruce were still the vogue. Shortly after he joined the Blackheath M.F.C. when this club was enjoying its heyday.

Fellow club members included such aeromodelling giants as Chasteneuf, Crow, Bullock and Eddie Cosh (who was then club secretary).

Guided by his club associates Brooks soon developed a style of his own and by the time war broke out, he was flying rubber powered biplanes of his own design. With the advent of the small diesel, all his modelling activities were devoted to powered biplanes. The result of this specialization is, in our humble opinion, that he is way out in front of this particular branch of aeromodelling. His attendance at any meeting adds character and atmosphere of the type most needed by the modelling movement.

Now, to look at the debit side of the account. This model will not be everyone's choice. There are few competitions for which it will be suitable (although this model's predecessor placed second in the 1950 Bowden Trophy). You will not be able to complete it in a few hours and it offers quite a challenge to your building prowess.

However, if you do want a model that will give you endless pleasure flying for fun and a model which will fill you with pride every time you take it out of its box—then this is for you.

Certain minor details have not been shown on the plan. For example, the cockpit of the original model is fully detailed with instrument panel and four bucket seats (built from 1/32 in. sheet balsa) placed one behind the other. This type of detail is left for the individual builder to invent for himself if so desired.

In the same category, the air intake on the bottom engine cowling has a complicated " bird cage " built up of 3/32 in. diameter bamboo. The designer suggests that it would be a simple matter to redesign the cowling to have a smaller intake and dispense with the cage altogether.

The model is powered by an E.D. 2·46 racing engine using 11 × 6 in. plastic propeller. This is just about minimum power and an E.D. 3·46 or similar is recommended as being equally suitable.

Removing the engine after installation presented some difficulty at first. This was overcome by slightly filing down the length of the exhaust ports.

Balance point of the model is (at the centre section of the top mainplane) two thirds of the chord back from the leading edge. It will be noted that there is a full inch back and forward movement on the lower wing. Trim is effected by this, also by packing under the tailplane.

Aged 39 B. Brooks is a poster writer by trade and a member of the N. Kent M.A.S. Has no other hobbies considers aeromodelling a creative art.

A 58 1/2" SPAN LIGHTWEIGHT CONTEST GLIDER.

WOODFORD SPECIAL

DESIGNED BY

R. FIRTH

4/6

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED

-DATA-

SPAN	58-1/2" INS.
WING AREA	292 SQ INS.
TAIL AREA	80 SQ. INS.
LENGTH	33 INS.
WEIGHT	6 OZS.

-MATERIALS REQUIRED-

STRIP BALSA 3' LONG	SHEET BALSA 3' LONG	SOFT BLOCK FOR WING TIPS,
3 STRIPS OF 1/16" x 1/16" MED.	1 SHEET OF 1/32" x 3" MED.	4" OF 22 SWG. WIRE
18 " " 1/8" x 1/8" "	2 " " 1/16" x 3" "	6" " 1/8 " "
2 " " 1/4" x 1/4" "	1 " " 1/8" x 3" "	1/8" " 1/4" DOWEL
1 " " 3/16" x 3/16" "	MISCELLANEOUS	6" " 1/16" "
2 " " 1/8" x 1/2" "	1 SHEET OF 1/16" PLY 3" x 6"	4 SHEETS OF MODELSPAN

WING SECTION R.A.F. 32

1/8" SQ. ADDED AFTER COVERING

LAMINATE NOSE BLOCK FROM 1/8" SHEET

1/16" SHEET

C.G.

1/16" SHEET

LONGERONS & SPACERS 1/8" SQ.

1/16" SHEET LET IN

1/8" PLY SKID

16 SWG. TOW HOOK BIND TO BLOCK

22 SWG. LOOPS 22 SWG. TRIGGER

NYLON THREAD AUTO RUDDER LINE

1/16" SHEET LET INTO TOP

STRETCH BAND IN SLOT BETWEEN PIN & RUDDER HORN

1/16" SHEET

PIN

TAPE HINGE

1/16" PLY RUDDER HORN

1/8" SHEET TAILPLANE PLATFORM

WEIGHT BOX

1/16" DOWEL

1/16" SHEET LET INTO BOTTOM RIB

1/16" DOWEL

#4 SQ.

FIN OUTLINE 1/16" SHEET

1/16" SQ SPARS

PIN

-TAIL RIBS-
5 OFF 1/16" SHEET
2 " 1/8" "

THE 3 CENTRE RIBS ARE CUT TO THIS LINE

-WING RIBS-
38 OFF 1/16" SHEET
CUT HOLES FOR DOWELS IN R RIBS ONLY. DOTTED LINES SHOW SHAPE OF PLY REINFORCEMENTS

DIHEDRAL BRACE 4 OFF 1/16" PLY

-FIN RIBS-
R1 & R2 1/32" SHT
R3 1/16" "

FORMER (A) 1/8" SHEET

1/8" x 1/4"

PINS FOR DIT

1/8" x 3/8" L.E.

NOTCH 1/16" FOR FIN

1/16" SQ SPARS

1/8" SHEET GUSSETS

PIN FOR DIT

3/8" x 1/32" T.E.

DIHEDRAL 3" UNDER EACH TIP.

NO DIHEDRAL ON INBOARD PANELS

1/4" DIA. DOWELS

C.S. SHEETING OMITTED FROM THIS DRAWING TO SHOW CONST'N.

1/8" SHEET GUSSETS

1/4" SQ. L.E.

CEMENT GAUZE TO DIHEDRAL JOINTS ON BOTTOM

IN ROUGH WEATHER WINGS CAN BE BRACED WITH THREAD TIED BETWEEN PINS PUSHED INTO WING TIPS. LOOP THREAD ROUND TOW HOOK

1/32" SHEET OVER CENTRE SECTION

DIHEDRAL BRACES

ALL WING SPARS OF 1/8" SQ.

SOFT BLOCK WING TIPS

1/8" x 1/8" T.E.

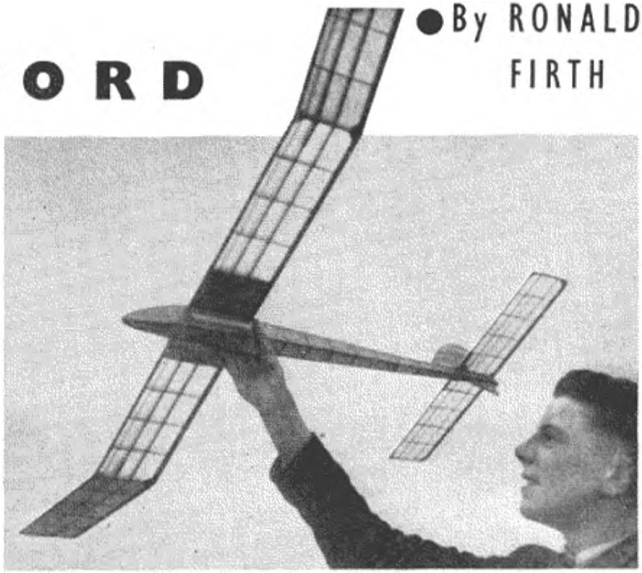
PUBLISHED AEROMODELLER NOVEMBER 1952

THIS IS A 1/4 SCALE REPRODUCTION OF THE FULL-SIZE PLANS WHICH ARE AVAILABLE, PRICE 4/6, POST FREE, FROM THE AEROMODELLER PLANS SERVICE.

The WOODFORD Special

LIGHTWEIGHT GLIDER

● By RONALD FIRTH



● **About the Designer . . . Aged 23, Medical Laboratory Technician. Vice Chairman, York M.A.C. Married, one daughter aged 18 months. Interested in all free flight aspects except R/C; 1/144 scale solids enthusiast. No hobbies other than aero-modelling.**

THIS lightweight glider was designed specifically for the open glider event of the 1951 Woodford Rally, organised by the "Daily Dispatch" at Manchester. Designed for rapid building, easy trimming and to be big enough to be kept in sight for five minutes under average contest conditions, the original was built in 12 hours and performance was quite up to expectation. Average time from 100 metre line, and still air is three minutes plus, and its slow glide makes it ideal for finding thermals on contest day. The model can be made to turn in extremely small circles without any danger of a spiral dive—a useful trim for windy days. This is a model that can be flown safely in high winds providing the wings are braced with cotton as recommended on the plan. For normal flying, the wings are of ample strength and should have no "folding" tendencies!

Also suitable as a first contest model for any beginner, this is a cheap model to build, material should not cost more than 7s. 6d.

Construction

Fuselage. Build the fuselage by the normal slab-sider method and when removed from the board fill in where shown with 1/16 in. sheet. Add ¼ in. sheet cross-grain and carve nose block. Cement nose block and sand to fuselage contour. Add ⅛ in. plywood skid. Bend the tow hook from 16 s.w.g. wire and bind securely to a length of ¼ in. square hard balsa. Cement in centre of fuselage. Sheet in the panel with 1/16 in. sheet below the tow hook position. Add the underfin and arrange the auto-rudder.

Fin. Construct the fin by first pinning the 1/16 in. sheet outline directly on the plan. Slot ribs in place and cement when lifted from plan. Then add 1/16 in. square spars.

Wing. The wing construction is straightforward, but two ply templates of the ribs and make 28 ribs of 1/16 in. sheet by the "Sandwich" method. Cut ¼ in. diameter holes in 8 ribs in the position shown and reinforce with 1/16 in. ply. Sand leading edge and trailing edge to shape and pin to plan. Insert the ribs in position, add top spars, remove from board, then fit the other spars and lower spars. Divide the wing at the dihedral joint and add the dihedral braces to the inboard panel. Add the rib at the dihedral joint. Add 3/16 in. sheet tip. Cover the centre section with 1/32 in. sheet and add gussets.

Tailplane. Construction follows that of the wing but is simpler. Cover with lightweight "Modelspan" and give fuselage and wings two coats of dope. The fin and tailplane should require only one coat.

Trimming. The model should be made to balance at the point shown on the plan by adding weight to the weight box. Hand glide and pack tailplane if necessary until the model stalls very slightly, when the rudder is central. Apply turn till the stall disappears. Tow the model up on a short line and note whether there is any tendency to turn or weave on the line. Any turning tendency can be cured by placing a small trim tab on the main fin and adjusting to cancel any turns whilst towing. When satisfied with the tow a full 100 metre line can be used, but don't forget the dethermaliser if you want to keep your "Woodford Special".

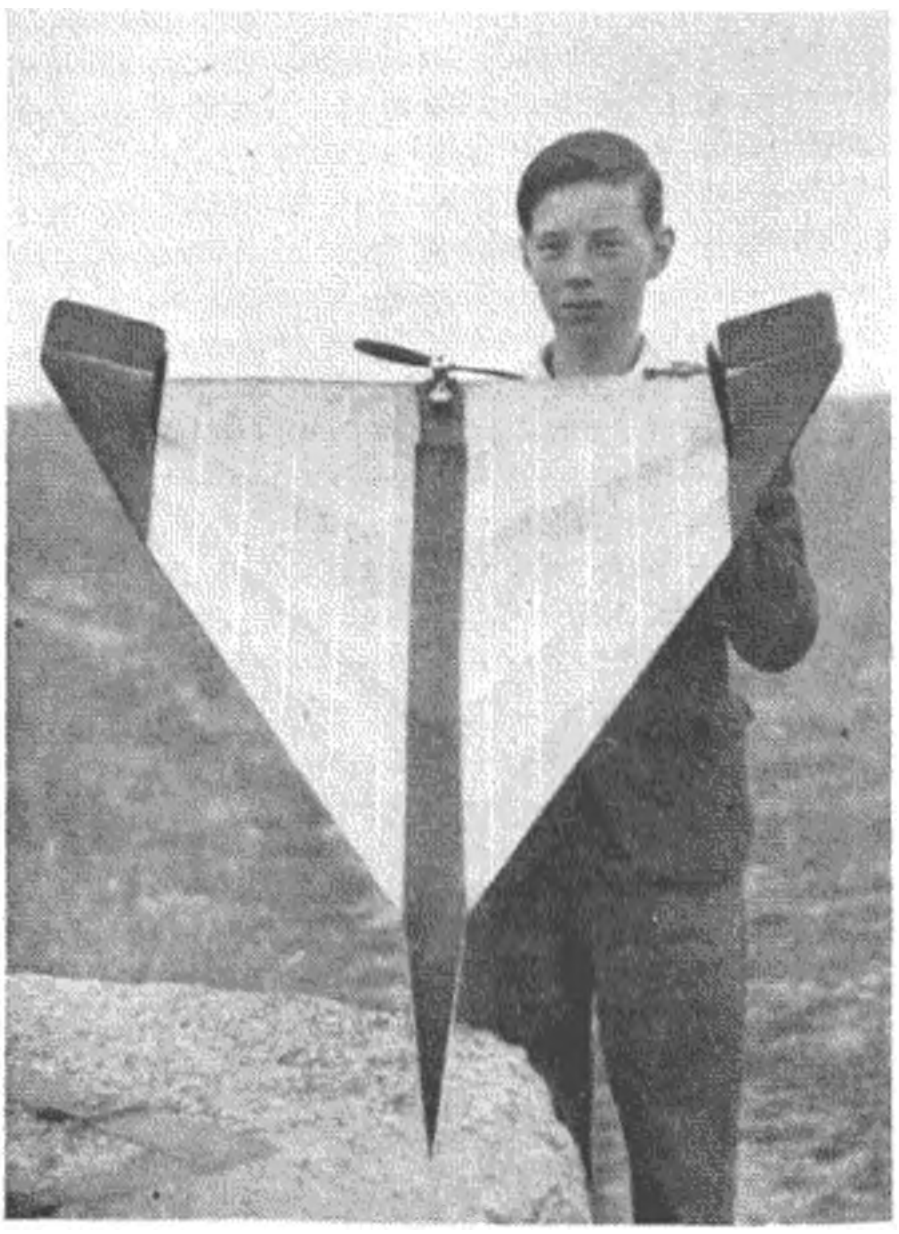
Build this 465 sq. inch Delta for the Mills ·75

Designed by J. R. LANCASTER

Member of Dartford M.F.C. . . . . modelling for four years . . . deplores pylon jobs . . . . prefers the unusual.

DELTA'S are in fashion this year, the Gloster Javelin, one of this countries most potent fighters, the Avro 707's, the Boulton Paul's, the little Fairey, lately the magnificent Avro 698, and now this interesting model—all demonstrate the advantageous speed range and manœuvrability of the flying triangle. Delta 1, is the result of a desire for the unorthodox, and represents creditable success for its schoolboy designer who had nothing but good sound common sense to provide him with design facts. Unusual construction is employed, and we can vouch for its extreme rigidity which will withstand any serious and sudden contact with *terra firma*.

Side-port motors are advised, so that an ordinary prop. can be fitted back to front, and the engine run clockwise. Rotary valve engines will need specially carved pusher props. to run in the normal anti-clockwise manner.



Construction

Pin the twenty-one strips of $\frac{1}{8} \times \frac{1}{8}$ in. hard Balsa over each rib position, and cement the $\frac{1}{8}$ in. sheet trailing edge in place after the rear edge has been rounded. Then add the leading edge in the same way, and whilst drying, cut out the three pairs of spars. These are cemented in place next, making sure that all butt joins in the centre are pre-cemented and strong. When thoroughly set, the spars will be rigid enough for the upper surface $\frac{1}{8} \times \frac{1}{8}$ in. contours to be curved over and cemented at front and rear. The top curve of the centre rib is cut away to take the 1/16 in. and $\frac{1}{4}$ in. sheet engine platform, on top of which, the $\frac{1}{4}$ in. sq. hardwood bearers are Britfixed in place. Part of this platform, and the trailing edge, should be cut away for the engine crankcase and tank.

Once removed from the board, the tip dihedral can be cranked just outside of the double ribs for the fins, which are fitted next, then the trimming tabs. Cut the fuselage sides and formers F1, 2, 3, 4, from $\frac{1}{8}$ in. sheet and assemble on to the centre section, with diagonal cross bracing as shown. Wire skids for landing are securely attached at nose and dihedral cranks, then the whole model is covered with lightweight Modelspan. One coat only of clear dope was used on the original, which bore an exclamation, that can be seen in the photograph, and might well be heard regularly wherever the Delta is flown.

Trimming

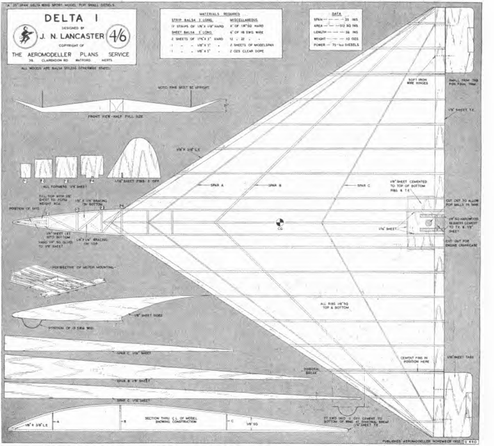
Correct balance is important, and a ballast box is provided in the nose so that final adjustment can be made after construction. If a Mills ·75 or

similar side-gear reduction motor is used, fit the propeller on back to front, and flick start in a clockwise direction.

With the engine running at "medium" revs. launch gently by holding the trailing edge just inboard of the dihedral, and supporting the wing with the flats of the hand. Launching angle should be at about 10 degrees, and the correct turn should be to the left under power and opposite on the glide. For both glide and climb, the two trim tabs can be deflected in unison; if one is deflected more than the other, a turn will result. Stall recovery of the Delta is amazing, it is almost worthwhile stalling purposely just to see the result!

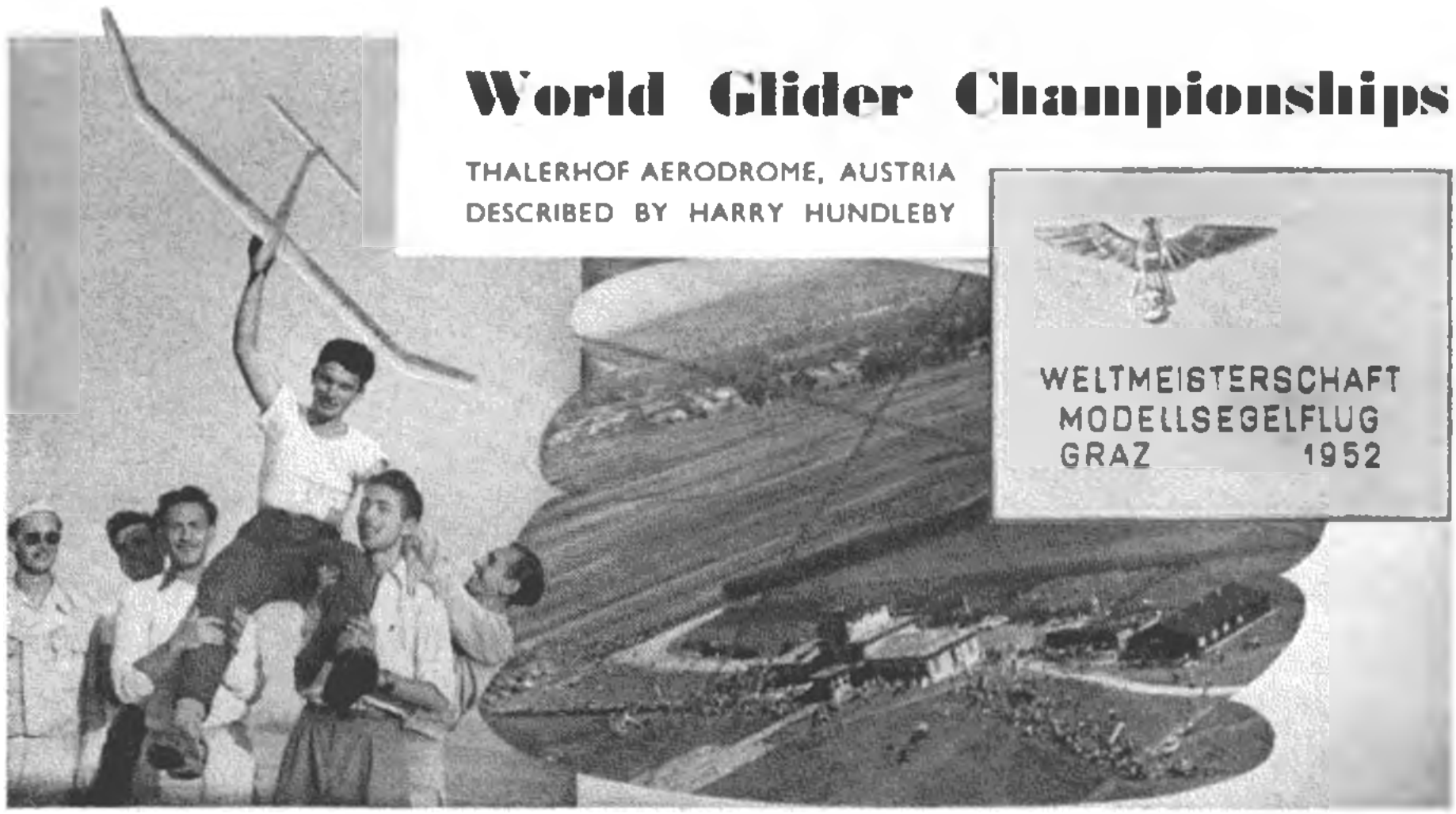
Complete building instructions are issued with each full size copy of the ⅛ scale plan below, which is obtainable price 4/6 post free from the Aeromodeller Plans Service.

The Avro 698, the Delta of the year superbly photographed by Cyril Peckham, courtesy of the Hawker Siddeley Group.



World Glider Championships

THALERHOF AERODROME, AUSTRIA
DESCRIBED BY HARRY HUNDLEBY



IT has been my good fortune to attend this contest since its inception in 1950, and although each year the standard of flying has risen, so far prevailing thermal conditions have influenced the final positioning of the top men. I do not belittle the performance of first class fliers such as Steve Bernfest and "Ossie" Czepa by stating this, in fact I am sure they would be the first to agree that Lady Luck has played more than her allotted part in these contests prior to 1952. I do indeed detect the hand of "Ossie" Czepa in the round timing of this years contest, which was outstanding in that it ensured the closest approach to non-thermal conditions that I have ever seen.

But to begin at the beginning, when ten aeromodellers set forth from Victoria Station resplendent in blue team blazers with national emblems on the pockets. The somewhat larger party than the official British team of four and team manager was accounted for by the presence of a New Zealand proxy team, made up of enthusiasts prepared to pay their own expenses, who ensured that the New Zealand models were flown to their fullest advantage. In addition there was Geoff Lewis and the writer, who performed a triple role, acting as proxy-flier-cum team-manager for New Zealand, and of course AEROMODELLER reporter.

Forty hours of Third Class travel, across the Channel, through Belgium, Germany and Austria were made endurable by magnificent scenery and conversation such as only aeromodellers enjoy! After meeting up with the German team, who boarded the train at Munich, we finally arrived in Graz late on the evening of Wednesday 13th August. Waiting to greet us was our interpreter, thereafter known as "Eddie", who proved invaluable, not only on the flying field but on other more social occasions. Provision of interpreters for all participating nations was one of the many excellent services provided by the organisers.

All visiting teams were housed in the Hotel Weitzer, and I was soon renewing old acquaintance with aeromods from all quarters of Europe and Scandinavia.

A brief sleep, and then up at 4.30 a.m. on the Thursday for practice flying at Thalerhof aerodrome at 5 a.m.

Arriving in the cold light of dawn I noticed the smoke from cottage chimneys ascending vertically, to spread in inversion layers at approximately 200 feet. Not a breath of wind disturbed the damp air, and dew lay heavily on the ground. Thalerhof drome lies in a flat plain with mountains on three sides. It is a grass drome with surrounding terrain typically mid-European in character; tall maize fields, potato strips and pinewoods provided recovery hazards, which, as it subsequently turned out could be discounted.

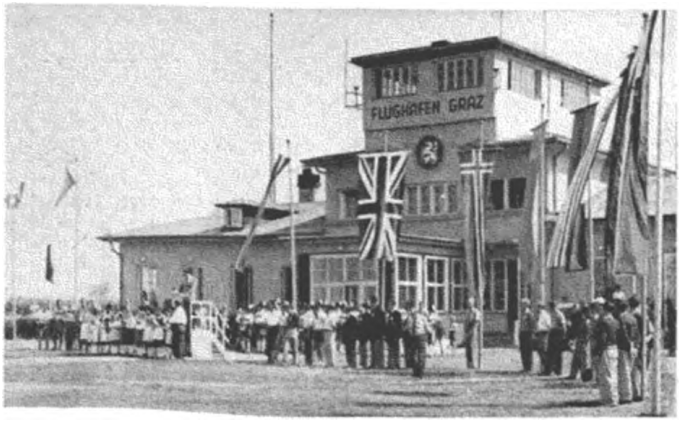
Our little group unpacked British and New Zealand models and very soon ardent test fliers were running across the field in all directions. Flying under such conditions was a very new experience for we Britishers, and it very soon became apparent that the trim of several models would need drastic alteration. At least three machines would not tow at all, but merely chased their perspiring launchers down the aerodrome, flying themselves lazily off the line a few feet from the ground. New towhook positions were improvised by Dave

Walters (Johnson, Ernie Farrance (O'Brien) and the writer (Penniket). Johnnie Lamble (Choy) was happiest among the New Zealand team, whilst Max Byrd, Bill Farrance and Mick King of Great Britain all managed to trim without undue difficulty. Peter Royle was having trouble with towline instability, and it was brought home to all us Britishers that flying under such unusual conditions is very different to what we had grown accustomed to at home. The same could be said for the New Zealand models, which very obviously are normally flown in a wind; however, by the end of the test flying period most of the British contingent had ironed out their troubles with the exception of "yours truly". With a model 9 ozs. overweight I was really in trouble, and furthermore, shifting the towhook resulted in the model becoming inherently unstable on the line.

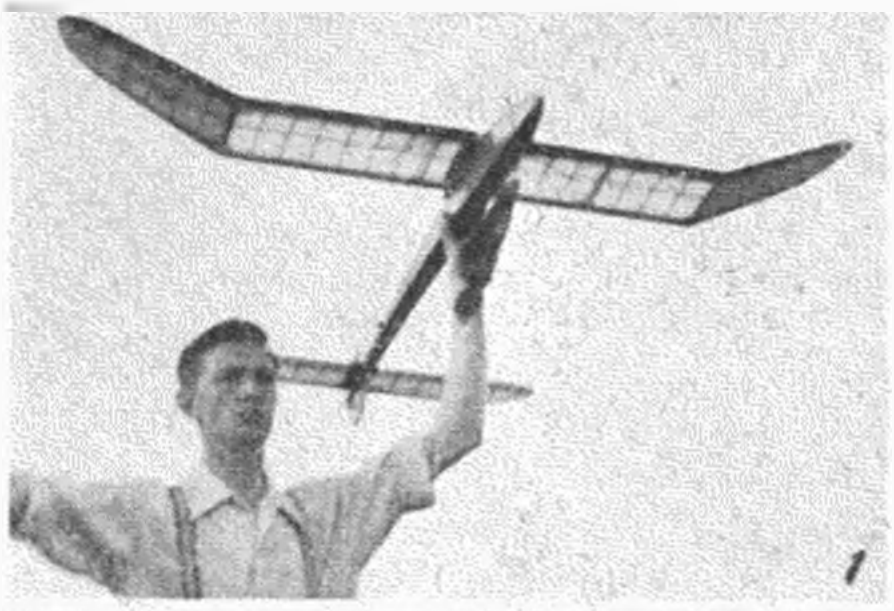
At 10.00 hours ensued the official opening, with all the teams arranged under their national flags in the traditional manner, whilst each competitor was presented with a spring of edelweiss by small girls in national costume. Teams were welcomed by Dr. Ernst Kolb, Austrian Cabinet Minister, together with many other notables, including a representative of the British High Commissioner, Sir Harold Caccia. After this impressive ceremony Bob Gosling and myself retired to the pre-contest conference and briefing, attended by team managers from twelve nations. Entries were received from Belgium and the U.S.A., but did not materialise. The Dutch boys were also absent though having attended all previous events. Their absence was in protest at the unusually high entry fee of £7 per contestant, although I should say from personal observation that the cost per entrant to the Austrian Aero Club must have been approximately double this figure. Certainly the overall organisation was absolutely first class, and undoubtedly cost money. There may also be something in the point of view put forward by the Treasurer of the Aero Club, that Austria is still under Allied administration and national finance for semi-official occasions such as this non-existent.

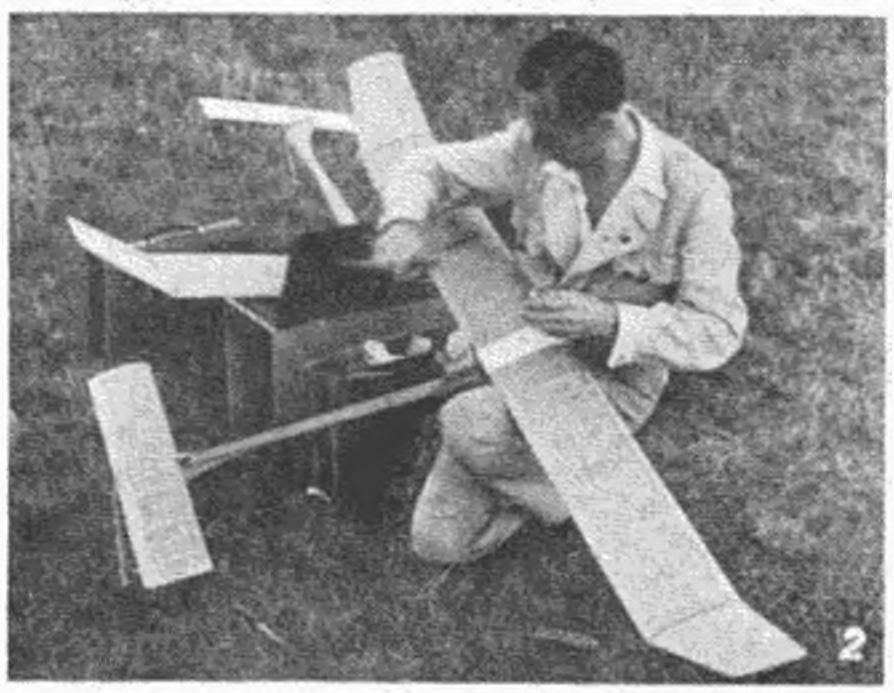
Field organisation was arranged rather differently to past events, the various nations being divided into four groups on a linguistic basis. In our particular group were Great Britain, New Zealand and Israel. Accounting for this latter anomally was the excellent English spoken by our old friend Arthur Guttman, who distinguished himself by flying "toothpicks" that even out-did the Austrian models in span and length. Four contest sites were established on the aerodrome arranged as "corners" to a quarter mile square. The groups then drew lots as to which site they flew from in each round, and as it so happened everyone flew from a different site in each of the three rounds. Each group then drew lots again as to the order of flying amongst the Nations in the group, and finally it was left to the team managers to decide individual flying order.

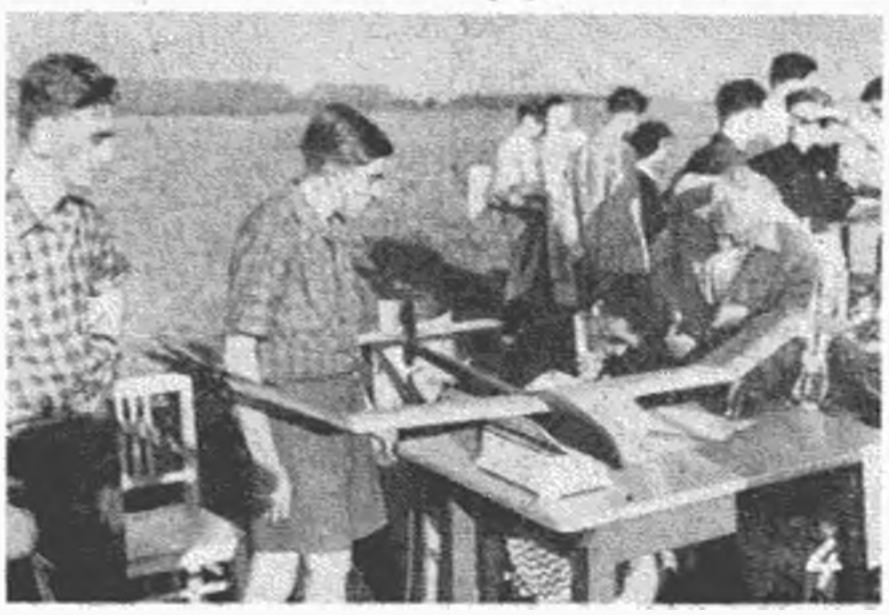
Processing continued throughout the day, and in the afternoon test flying was resumed by those who still had bugs to iron out. As one of these I very soon had the assistance of the gen boys from both the British and New Zealand teams. All our efforts were of no avail. With the tow hook in its original position Penniket's



Heading montage features Bora Gusic borne aloft in triumph by fellow Yugoslavs after his victory had been announced. Centre is an aerial view of the aerodrome taken by the author during the contest. Plaque as illustrated was given to all competing teams. Bottom left, British and New Zealand teams in borrowed plumage. Back row, left to right: Bill Farrance, Max Byrd, Bob Gosling, Pete Royle, and Mick King. Kneeling, Harry Hundleby, John Lamble, Dave Waters and Ernie Farrance. Above, processing room in airport building. Large scales were for weighing luggage not models! Right, this was the impressive scene at the opening ceremony with the various teams lined up under their national flags.







model would not tow up, and with a more rearward position of the hook it would veer off the line either to left or right irrespective of directional trim. Reducing fin area by removal of the trim tab helped, but my only real hope was a strong wind during the contest, as the faster the tow the more stable the model.

Round 1.—5 a.m. to 6 a.m. Friday.

"Strong winds" were remarkably conspicuous by their absence when we assembled on the aerodrome at 4.30 a.m. the next morning. Rising at 3.30 a.m. I began to realise the tremendous physical strain imposed on the modern aeromodeller! Over the field lay a thick ground mist which the local boys assured us would lift by 5 a.m. the allotted starting time. Actually they were 10 minutes out in their calculations, for it was at 5.10 a.m. that the mist finally lifted, starting at one end of the field and looking for all the world as though an invisible hand was peeling it off like a length of sticking plaster.

Bill Farrance made a good start with a truly overhead launch clocking 3 : 47 in the absolutely still air. Max Byrd was a few seconds behind with 3 : 31. The top seven men in this round all exceeded 4 mins., a remarkable achievement in view of the conditions.

Without making excuses for our team, it was apparent that many of the Continental and Scandinavian fliers had a tremendous advantage in that they were, in many cases, flying in this International event for the third time. The average British glider exponent has no

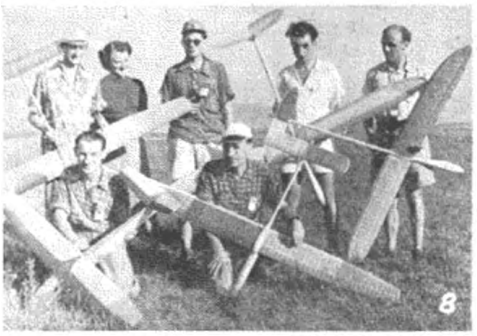
1. Ernie Farrance launches brother Bill's model. 2. Emil Frei who placed sixth prepares his model for the last round. 3. Friedle Metzgr, official interpreter to the Italian team makes an attractive picture with Lustrati's beautiful model. 4. John Lamble and Dave Waters have Johnson's New Zealand model check weighed between rounds. 5. Timekeepers lend atmosphere in traditional Austrian costume.

ROUND 1

1.	Christensen, O.	Denmark	5:00
2.	Hansen, A.	Denmark	4:31·4
3.	Gunic	Yugoslavia	4:24·4
4.	Stolzmüller	Austria	4:20
5.	Fresl	Yugoslavia	4:17·6
6.	Samaan	Germany	4:12
7.	Hacklinger	Germany	4:07·4
8.	Hansen, B.	Denmark	3:59·4
9.	Farrance	G.B.	3:47·1
10.	Odenman	Sweden	3:39
11.	Byrd	G.B.	3:31·4
12.	Sandberg	Sweden	3:29·8

ROUND 2

1.	Gunic,	Yugoslavia	4:44·4	9:08·8
2.	Hacklinger	Germany	5:00	9:07·4
3.	Hansen, A.	Denmark	4:12·7	8:44·1
4.	Samaan	Germany	4:10·5	8:22·5
5.	Hansen, B.	Denmark	4:18·6	8:18
6.	Stolzmüller	Austria	3:39·2	7:59·2
7.	Fresl	Yugoslavia	3:40·4	7:58·2
8.	Byrd	G.B.	4:07·4	7:38·8
9.	Farrance	G.B.	3:35	7:22·1
10.	Odenman	Sweden	3:36·2	7:15·2
11.	Schabel	Switzerland	3:27·7	7:05·3
12.	Sandberg	Sweden	3:29·8	6:59·6



Top left, Yugoslavian team with interpreters and Arthur Gultman of Israel who is kneeling second from right. 6. Oasie Czepa, his lady friend and Josef Schober chat with Geoff Lewis. 7. Ing Nino Frachetti, Italian team manager is "stacked up" by playful team-mates. 8. German team, left to right, Samaan, Mrs. Samaan, Jung (Team Manager), Hacklinger, Schoenauer. Kneeling, Benzin and Pegel. This team placed top on overall team results. 9. Borge Hansen, left, and Arne Hansen right, watch their team-mates Iffe Christensen and Ore Christensen in action (who would be a model reporter!). 10. Gradimir Rancin launches Gunic's model on its last round flight. 11. Alfred Mayer of Switzerland uses tip fins on this clean looking design. 12. Marc Cheurlot launches for fellow Frenchman Benoit Lapierre.

conception of the conditions prevailing at these contests, or the tremendously high standard of the opposition. He has after the event of course, but so far no one has made the team two years running, and with our present method of holding eliminators, is not likely to.

After my own flight I visited the other take-off areas and noted that some of the Swedes were still using steel towlines although many people have changed over to nylon. Nylon is definitely superior to ordinary line when one is flying in dead calm, its light weight being a distinct advantage.

Round 2.—6 a.m. to 7 a.m. Friday.

Weather conditions were almost identical to Round 1 although there was just the faintest suggestion of drift which hardly earned the title of wind. As in the first round, models were mostly landing within the aerodrome boundaries, to be rapidly and efficiently retrieved by the Boy Scouts employed for that purpose. British hopes centred on Max Byrd and Bill Farrance, the former improving on his first round time by topping the 4 minute mark whilst Bill maintained his steady average. Hacklinger, the German, managed a maximum thus gaining second place. Christensen the Dane, the only man to gain a maximum in the first round, came a cropper and fell out of the running, whilst Gunic of Yugoslavia, by dint of beautifully consistent flying, took the lead from Hacklinger by a mere second. As the round closed it was apparent that the contest was still open but our suspense had to remain until 5 a.m. the following morning.

Round 3.—5 a.m. to 6 a.m. Saturday.

Celebrations on the Friday evening lasted well into the early hours on the Saturday, and quite a few of the officials and competitors went straight from the night spots of Graz to the airfield. I made the mistake of going to bed at 3 a.m. and it took the entire efforts of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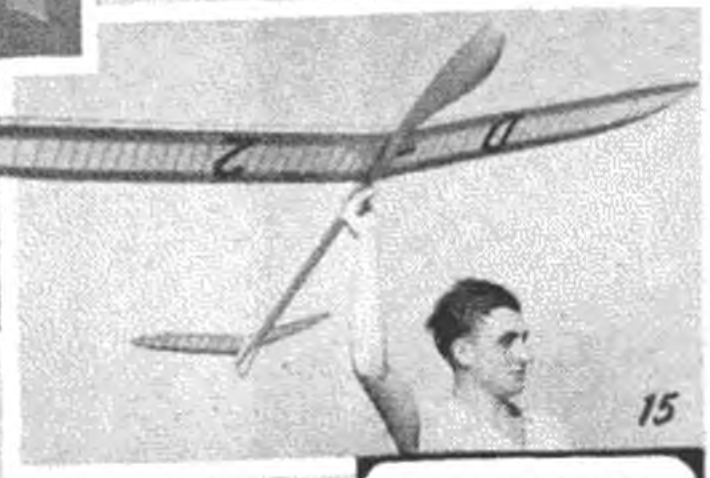
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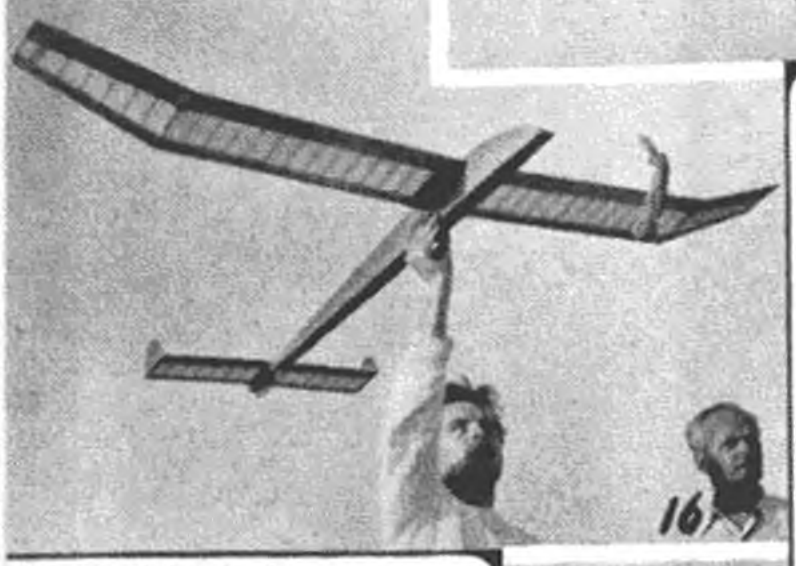
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13. Uffe Christensen of Denmark uses celluloid leading edge covering. 14. Ossie Czepa with toothpick belonging to his Austrian team-mate, Gerald Skalla. 15. One outstanding model of the contest was this "banana" design by Hacklinger of Germany Its most novel feature was a model interrupter made of rubber strip stretched in front of the leading edge.

16. Mokry holds aloft Templier's slabsider, the most successful of the French models. 17. Rune Andersen with a typical Swedish short moment arm design by Kurt Sandeberg. 18. Borge Hansen with Ove Christensen's model. 19. Max Byrd waits for Pete Boyle to run out his line. 20. A good one in a Graz biergaten featuring left to right, Bob Gosling, Mick King, Eddie Mayer our interpreter, the author and Bill Farrance. 21. Mocke lights up an enormous length of D.T. Fuse for Fresle.


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both British and New Zealand teams to awaken me for the bus at 3.30 !

Arriving at the airfield I detected something different. No ! It couldn't be ! But wind it was. Personally I really appreciated that wind which gently blew the previous night's cobwebs away and enabled me to get Penniket's model to a reasonable height for the first time. Having made my flight I turned my attention to Bill Farrance, who in ninth position at the end of the 2nd Round was, next to Max Byrd, our main hope. Then started the first of a series of misfortunes that removed any hope of a British victory.

Bill ran his line out, but between the time it took for him to look back and see if his run was clear, and to give the signal to launch, a small Scout retriever laid his bicycle in the way. Before any of us could stop him Bill came a frightful purler, broke his line and generally shook himself up. The line was replaced but with the wind on the increase, the subsequent tow was too fierce and the wings parted company. His reserve model was then brought into play but lacking in trim produced a very mediocre flight. Watching Pete Royle in action I saw him commence his tow at a fair speed. Then to my amazement the model almost stopped, and floated lazily off the line at about 150 feet. I saw similar episodes at the other take off points. Cause of these peculiar happenings was an upper level of wind blowing in exactly the reverse direction to the ground wind. Once a model reached this height it was then towing *downwind*. Johnnie Lamble ran practically the length of the aerodrome to beat this tricky phenomenon, finishing his tow in a maize field !

Max Byrd was beset by a special variety of gremlin. He was away to an excellent launch in spite of the "double-trouble" wind, when after three minutes duration the model hit a violent bump causing it to spin to earth. This was particularly heart-breaking as it spoiled what would have been a certain maximum.

As the round drew to its conclusion Hacklinger of Germany was leading his stable mate Samaan by only 8 seconds, the latter securing a maximum on his final flight. Interest then centred on the Yugoslav, Bora Gunic who was the last man to fly in the round. Leading at the end of the Second Round he needed approximately 4¼ minutes to beat Hacklinger.

The suspense was acute as he commenced his run, and I noticed with dismay that he was launching downwind before realising the supreme strategy of this manoeuvre. Running like a hare he took the model through the lower wind strata to finish his launch in easy style as the model towed up into wind, once it reached the upper wind level.

Tactics such as this are deserving of success, and the model released from a perfect overhead launch, went on to earn a maximum. Gunic, a somewhat shy and unassuming young Yugoslav was born aloft by his team mates and tossed in traditional style, all the while besieged by photographers.

It seemed queer finishing such a notable contest at 6 a.m., in fact breakfast was a positive anti-climax in spite of the beer we had with it. With the rest of the day before them the teams were taken on a bus trip to ascend the local mountain, the Schockel, by cable car. At the summit was a tiny landing strip barely one hundred yards long by ten yards wide and we had the rare experience of watching a glider land on the mountain for the first time. Towed from Thalerhof by the old P.O.2. the pilot cast off high above us, making a somewhat breathtaking approach over pine trees, rocks

THE MAN... BORA GUNIC... aged 23 years ... architectural student... modelling since 1945... member of Technical High School Aero Club Belgrade... holds "C" glider certificate, "B" Parachute Jumping Certificate... placed 17th last year... meticulous builder... uses nylon line.

THE MODEL ... B.G.44 ... finished 1 month prior to contest ... very clean design... no external bands... orthodox auto-rudder... very short nose moment... necessitates 2¼ ozs. of ballast... MVA/301 section... rigging, tail-plane +1°, mainplane +5°... construction all balsa ...wood from Trieste... dope from Sweden ... "Modelspan" from England ...averages 4 : 43 in still air... nuff said!

and finally a fence, for a perfect touchdown. At one stage a vicious downdraft took him lower than his landing point and he was forced to close his spoilers, diving to gain speed, so as to climb again!

In the evening a most impressive prize-giving ceremony took place at the historic Graz Burg followed by wining and dining that went on until the early hours. Our Austrian hosts were models of hospitality and the same could certainly be said of the whole contest organisation, which was absolutely first-rate.

Summing up, I say without hesitation that this was the best international free flight event that I have attended. A study of the top places in the round by round results reveals how closely the event was contested, and proves conclusively that the top men were there by virtue of first class models flown to perfection.

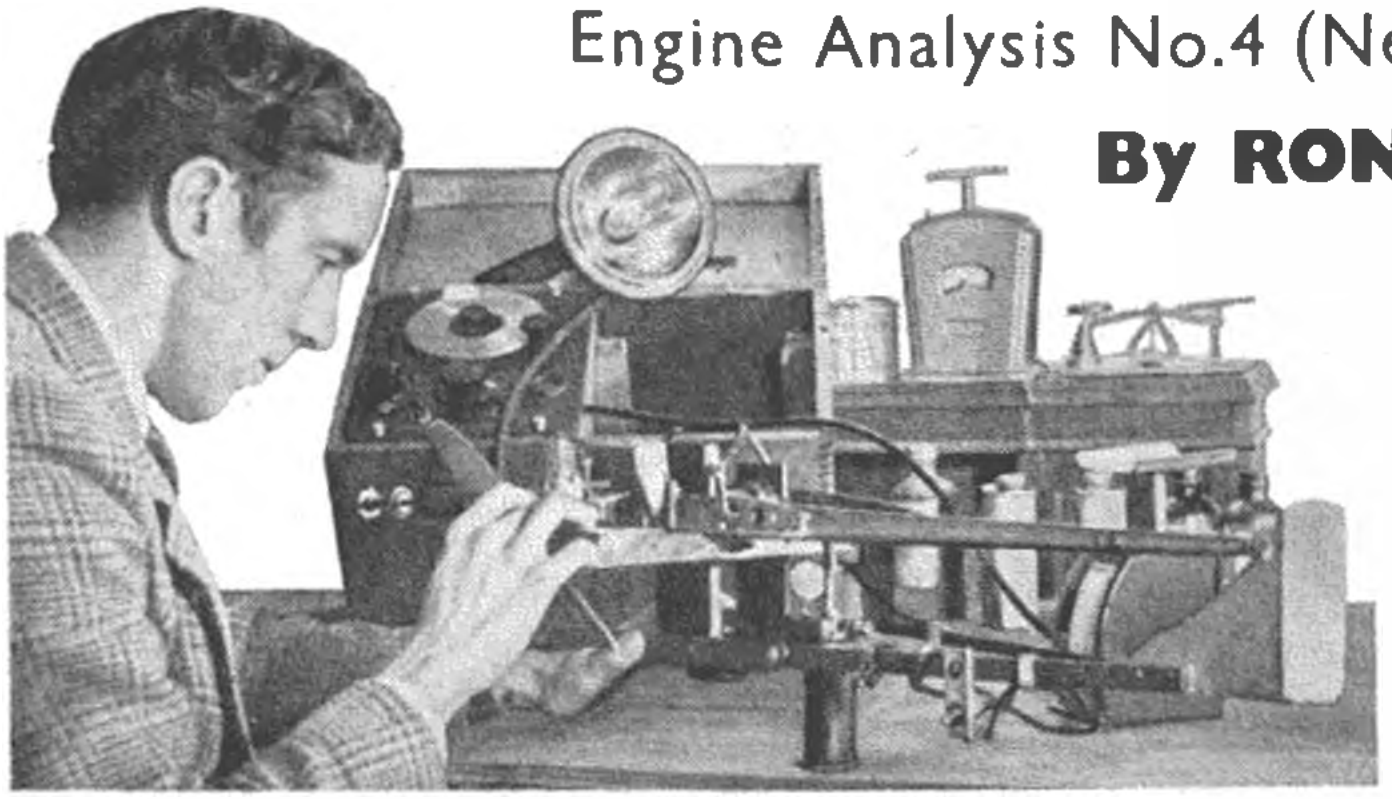
ROUND 1				14. Christensen, O.	Den.	3:26·2	10:04·6	28. Czepa, O.	Austria	4:29·5	7:21·4
1. Gunic, B.	Yugo.	5:00	14:08·8	15. Schnabel, H.	Switz.	2:45	9:50·3	29. Johnson, R.	N.Z.	1:27·9	6:57·7
2. Hacklinger, M.	Germ.	4:23	13:30·4	16. Choy, W.	N.Z.	4:57·6	9:32·9	30. O'Brien, J.	N.Z.	2:18·2	6:47·3
3. Samaan, G.	Germ.	5:00	13:22·5	17. Sandberg, K.	Sweden	2:29·7	9:29·3	31. Cavatera, O.	Italy	1:56·4	6:09·1
4. Hansen, B.	Den.	4:28·9	12:46·9	18. Skalla, G.	Austria	2:22	9:15·5	32. King, M. A.	G.B.	:50·4	6:06·5
5. Stelzmuller, J.	Austria	4:12·5	12:11·7	19. Farrance, W.	G.B.	1:26	8:48·1	33. Christensen, U.	Den.	4:19·8	5:26·8
6. Presl, E.	Yugo.	3:30	11:28·2	20. Schober, J.	Austria	1:55·8	8:26·4	34. Mayer, A.	Switz.	1:26·2	5:21·5
7. Templier, P.	France	5:00	11:11·4	21. Lustrati, S.	Italy	1:22	8:19·2	35. Piazza, P.	Italy	2:25·2	5:17
8. Odenman, R.	Sweden	3:48·1	11:03·3	22. Denzin, K. H.	Germ.	3:16	8:13·5	36. Royle, P. J.	G.B.	1:15·4	5:09·3
9. Schoder, W.	Switz.	4:00·4	10:59·6	23. Schenker, R.	Switz.	3:17	7:37·9	37. Haug, E.	Norway	:46·8	4:14·8
10. Tasic, T.	Yugo.	4:52	10:47·5	24. Lapierre, B.	France	3:06·7	7:33	38. Cheurlot, M.	France	:30	4:03·6
11. Byrd, M.	G.B.	2:58·6	10:37·4	25. Boscarol, C.	Italy	4:17·7	7:28·9	39. Nesic, L.	Yugo.	:00	2:51·6
12. Hansen, A.	Den.	1:36·3	10:20·4	26. Andersen, R.	Sweden	3:21·5	7:27	40. Penniket, J. R.	N.Z.	1:31·4	3:33·4
13. Pagel, H.	Germ.	5:00	10:07	27. Mokry, P.	France	1:29	7:24·1	41. Guttman, A.	Israel	:44·8	1:59·6

DETAILED RESULTS

AUSTRIA					ITALY				
Stelzmuller, J.	4 : 20	3 : 39·2	4 : 12·5	12 : 11·7	Lustrati, S. (Kannenworff)	3 : 28·6	3 : 28·6	1 : 22	8 : 19·2
Skalla, G.	1 : 53·5	5 : 00	2 : 22	9 : 15·5	Boscarol, C. (Piccini)	2 : 01·8	1 : 09·4	4 : 17·7	7: 28·9
Schober, J.	2 : 40·1	3 : 58·5	1 : 55·8	8 : 26.4	Cavatera, O. (Meixner)	1 : 25	2 : 47·7	1 : 56·4	6 : 09·1
Czepa, O.	1 : 14	1 : 37·9	4 : 29·5	7 : 21.4	Piazza, P.	: 10·8	: 41	2 : 25·2	5 : 17
DENMARK					**YUGOSLAVIA**				
Hansen, B.	3 : 59·4	4 : 18·6	4 : 28·9	12 : 46·9	GUNIC, B.	4 : 24·4	4 : 44·4	5 : 00	14 : 08·8
Hansen, A.	4 : 31·4	4 : 12·7	1 : 36·3	10 : 20·4	Presl, E.	4 : 17·8	3 : 40·4	3 : 30	11 : 28·2
Christensen, O.	5 : 00	1 : 38·4	3 : 26·2	10 : 04·6	Tasic, T.	2 : 22·5	3 : 33	4 : 52	10 : 47·5
Christensen, U.	: 35	: 32	4 : 19·8	5 : 26·8	Nesic, L.	1 : 22·4	1 : 29·2	—	2 : 51·6
FRANCE					**NEW ZEALAND**				
Templier, P.	3 : 27·8	2 : 43·6	5 : 00	11 : 11·4	Choy, W. (Lamble)	2 : 08·5	2 : 26·8	4 : 57·6	9 : 32·9
Lapierre, B.	1 : 28·8	2 : 57·5	3 : 06·7	7 : 33	Johnson, R. (Waters)	2 : 35·5	2 : 54·3	1 : 27·9	6 : 57·7
Mokry, P.	3 : 03·4	2 : 51·7	1 : 29	7 : 24·1	O'Brien, J. (Farrance, E.)	2 : 15·3	2 : 13·8	2 : 18·2	6 : 47·3
Cheurlot, M.	1 : 33·2	2 : 00·4	: 30	4 : 03·6	Penniket, J. R. (Hundleby)	: 27·2	: 34·8	1 : 31·4	2 : 33·4
GREAT BRITAIN					**NORWAY**				
Byrd, M.	3 : 31·4	4 : 07·4	2 : 58·6	10 : 37·4	Haug, E. (Neumann)	2 : 05·2	1 : 22·8	: 46·8	4 : 14·8
Farrance, W.	3 : 47·1	3 : 35	1 : 26	8 : 48·1	**SWEDEN**				
King, M. A.	2 : 30·3	3 : 12·8	: 50·4	6 : 06·5	Odenman, R.	3 : 39	3 : 36·2	3 : 48·1	11 : 03·3
Royle, P. J.	2 : 33·9	2 : 20	1 : 15·4	5 : 09·3	Sandberg, K.	3 : 29·8	3 : 29·8	2 : 29·7	9 : 29·3
GERMANY					Andersen, R.	2 : 03·3	2 : 02·2	3 : 21·5	7 : 27
Hacklinger, M.	4 : 07·4	5 : 00	4 : 23	13 : 30·4	**SWITZERLAND**				
Samaan, G.	4 : 12	4 : 10·5	5 : 00	13 : 22·5	Schoder, W.	3 : 20·3	3 : 38·9	4 : 00·4	10 : 59·6
Pagel, H.	2 : 42·2	2 : 24·8	5 : 00	10 : 07	Schnabel, H.	3 : 27·6	3 : 37·7	2 : 45	9 : 50·3
Denzin, K. H.	2 : 19·9	2 : 37·6	3 : 16	8 : 13·5	Schenker, R.	1 : 37·6	2 : 43·3	3 : 17	7 : 37·9
ISRAEL					Mayer, A.	1 : 32·6	2 : 22·7	1 : 26·2	5 : 21·5
Guttman, A.	1 : 14·8	: 44·8	1 : 59·6						

Engine Analysis No.4 (New Series)

By RON WARRING



THE Super Tigre G.20 S is a speed version of the 2·5 c.c. G.20 reported on in *Engine Analysis No.* 34, appearing in the April, 1951 issue of the AEROMODELLER. Apart from some slight modifications to the external shape, the main difference between the two engines is that the G.20 S is fitted with an additional (front) ball race for reduced running friction at high speeds.

By comparison with the usual British racing engine of the same capacity, the Super Tigre seems tiny. Yet the same internal size is there all right. It is just that all parts have been designed down to the minimum external dimensions, still leaving a strong, robust power unit. Total weight, less propeller and tank, is just four ounces. If engines are to be designed for " crashproofness " then only the rather long crankshaft housing (1¼ in. to the back of the propeller) can be considered as a possible weakness. This is a light alloy casting of fairly thin wall thickness, rigidly braced by four external webs.

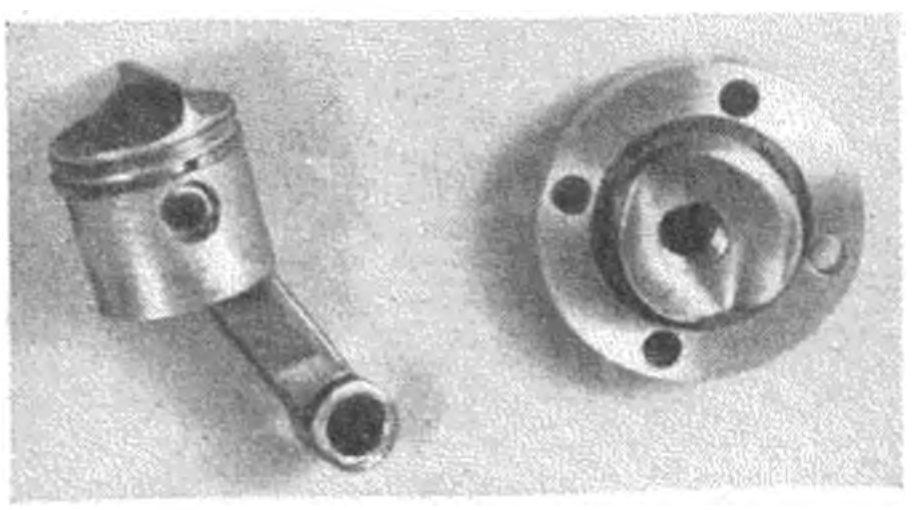
Experience has shown that such a crankshaft bearing can be bent or distorted in a really bad crash, but it is a debatable whether excess weight added to strengthen this part is worthwhile. In the case of the G.20 S, however, a shorter crankshaft could have been employed. However, the whole crankshaft unit is readily detached from the main crankcase casting, for replacement if necessary. In this respect the engine follows accepted American practice.

It would be trite to criticise the layout of the engine in any more detail. The design seems to express many of the ideals of a racing engine — light weight, without sacrificing necessary strength, compact size (a feature which is still not commonly realised in many engines), and ready accessibility of the controls. It is far harder to design *down* to small size and light weight and in this respect the G.20 S must take top marks.

As regards accessibility, the air intake is located in front of the cylinder and is readily reached by the finger for choking. The needle valve, extending well to one side, is also quite easy to handle. The glow plug stands proud of a " bald " cylinder head, which if nothing else makes it very easy to change the plug. Since the Super Tigre glow plug supplied with the engine burnt out almost at once when starting the test runs, this factor was appreciated. A finned head may look neater, but the cooling effect of such fins is usually problematical. At best they add weight of metal to the complete engine and, usually, make it more difficult to change the plug. In fact, appearance is probably the only justification for using a finned head on an engine of this size.

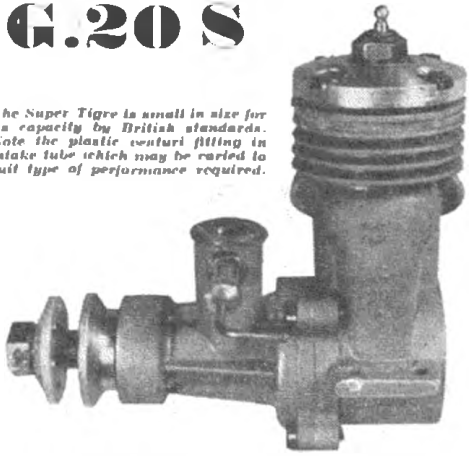
A feature of the Super Tigre, unusual to British eyes, is a detachable plastic venturi which fits inside the large diameter intake tube and is located by the spray bar assembly. Three alternative shapes of venturi are provided, identified by colour coding. One red venturi is supplied for " speed " ; a black venturi for " stunt " ; and a white one for free flight. We tried all three as a matter of interest, but all tests were subsequently carried out with the " speed " venturi.

Constructionally the Super Tigre is of interest in that it employs a piston with two rings. The piston is a light alloy casting and has a prominently domed head machined away on one side (opposite the exhaust) to form a rectangular baffle. The detachable cylinder head is similarly shaped to receive the top of the piston. The complete piston-connecting rod assembly weighs less than



Piston and rings fitted to Super Tigre G.20 S. Note domed head with baffle, and detachable cylinder head shaped to receive. Picture is approximately full-size.

Super Tigre G.20 S



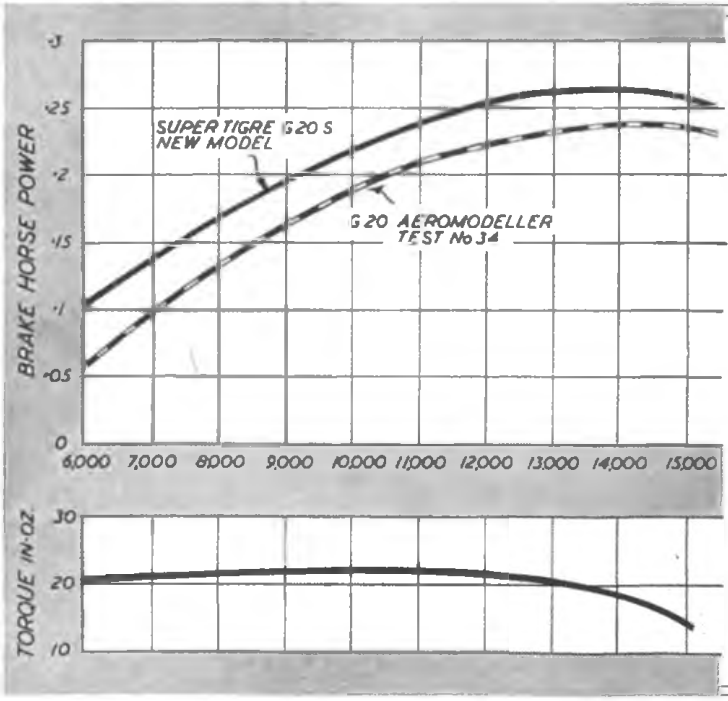
The Super Tigre is small in size for its capacity by British standards. Note the plastic venturi fitting in intake tube which may be varied to suit type of performance required.

one quarter of an ounce which, with an overbalanced crankshaft, made for absence of vibration at high speeds—a feature appreciated on test.

For starting purposes the Super Tigre has a funny "feel". There is an almost alarming lack of compression and one can spin the motor over several turns easily with a flick. Ability to start from cold varied considerably with the different venturis. With the "speed" venturi, starting properties were not particularly good as long as hand flicking was employed. Unlike most other glow plug motors the Super Tigre did not appear to like being over choked. Spun over with the fingers it would sometimes run slowly and die out instead of bursting into life as the prime charge was burnt up. Spinning the propeller fast, however, produced almost instant starting after four choked turns or a prime through the exhaust. Starting was more normal with either of the other two venturis, although again the apparent absence of compression tended to give a lack of confidence.

In all fairness, however, it must be pointed out that all tests were made with a K.L.G. Miniglow plug which has a slightly different filament position in the head than the original Italian glow plug.

During the running tests the extreme stability and consistency of the high speed running was remarkable. Most engines have a tendency to "float" somewhat about an average r.p.m.



Super Tigre G.20 S

Displacement : 2·47 c.c. (0·150 cu. in.)

Bore : 15 mm. (·59 in.).

Stroke : 14 mm. (·55 in.).

Bore Stroke Ratio : 1·07

Compression Ratio : 8·5 · 1.

Bare Weight : 4 ozs. (excluding propeller and tank).

Mounting : Beam.

MATERIAL SPECIFICATION

Crankcase : Light alloy, pressure die cast.

Cylinder : Special iron lapped sleeve.

Cylinder Jacket : Die-cast light alloy.

Cylinder Head : Light alloy, screw fixing.

Piston : Light alloy, two steel rings.

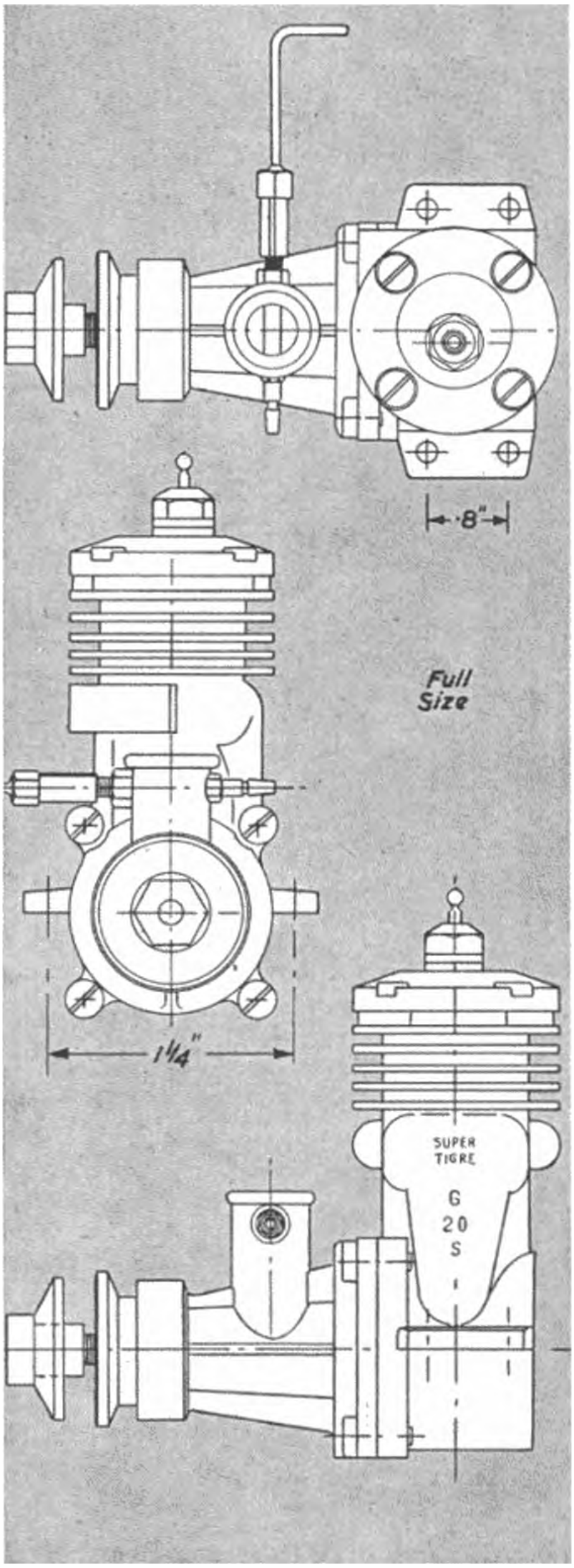
Bearings : Ball races at each end of crankshaft.

Glow Plug : Super Tigre.

Manufacturers : Micromeccanica Saturno, Bologna, via Fabri 4 Italy.

Recommended Fuel : Methanol 2·5, Castor Oil 1, Nitromethane 1.

Fuel used on Test : Mercury No. 7.



(sometimes only a matter of 100 r.p.m. or so), but the Super Tigre excelled in holding constant r.p.m. as measured on the stroboscope at a whole range of speeds about 10,000 r.p.m. Different speeds were brought about simply by using different propellers and thus varying the load on the engine. At lower speeds, particularly in the region of 6,000 r.p.m., running was not so satisfactory, although markedly improved by employment of the " white " or " black " venturi.

In arriving at the brake horse power figures for this particular engine, test figures have been factored to compare directly with the results of the previous AEROMODELLER test on the G.20 version of the Super Tigre. As the graph shows, the curve almost parallels the original curve, but at a higher level. Peak power is obtained at around 14,000 r.p.m., where the figure obtained is slightly in excess of ·26 brake horse power. Again, like the original engine, a markedly flat top to the power curve is apparent. For speed work, therefore, the Super Tigre could be tuned up to about 12,000 r.p.m. on the ground with no fear of going past the peak in power output as the engine speeds up in the air. The Super Tigre should, in fact, be a most excellent engine for control line speed work.

Another pleasing feature is a very reasonable fuel consumption, indicating that the G.20 S also has team race possibilities. Free flight possibilities with the " white " venturi were not investigated as the tests were mainly concerned with obtaining a direct comparison with the earlier engine, using the " speed " venturi.

Circumstances, also, prevented a full range of propeller tests being carried out. Due to the hand starting difficulties mentioned earlier, non-standard air brakes were used for most of the higher r.p.m. tests, where a pulley start could be employed. Again this duplicated the original test conditions. Some propeller tests figures obtained are summarised in the table.

Summarising, the Super Tigre appears to have an outstanding performance in its class. For such a compact power unit it is extremely robust, and undoubtedly very powerful. It would at least give most comparable racing engines of the same capacity a good run. The size and weight factors, in particular, could be cited as an example of what can be done in the design of miniature racing engines.

Propeller Test Data*

Fuel used :— Mercury No. 7

Propeller Dia.		Pitch	R.P.M.
6	×	5	12,700
8	×	3	12,800
8	×	4	12,200
8	×	5	10,450
8	×	6	8,500
9	×	6	6,900
10	×	4	8,100

Manufacturers' recommendations, 6 ins. dia.; 9 ins pitch.

* Constant geometric pitch wooden propellers.

1952 BRITISH CHAMPIONSHIPS

A NORTH-WESTERN Area "scratch" team proved worthy winners of the 1952 British Championships, held under very windy conditions at Cranfield Aerodrome on 31st August, by kind permission of the Principal of the College of Aeronautics. Organised by the South Midland Area, the events were notable for the very high standard of flying, especially in the Rubber class, Tom Dunkley setting top time for the meeting. Many models were lost or smashed, and many Areas were handicapped through lack of full teams.

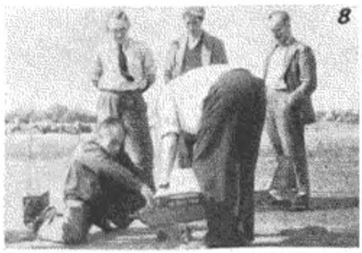
Taplin Trophy R/C contest held at the same time was very much a washout under the conditions, Sid Allen of West Essex being the only entrant to collect any real score.

RESULTS

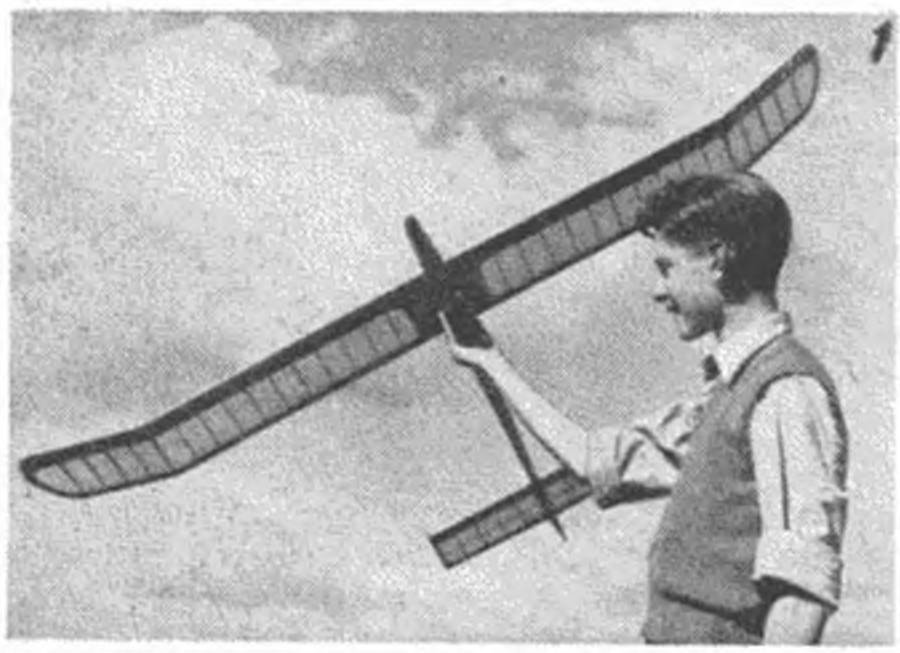
Area	Power	Rubber	Glider	Total points
North Western	20	7	20	47
South Eastern	14	3	14	31
Northern	5	20	2	27
London	10	10	7	
Midland	7	14	5	26
South Midland	4	4	10	18
Southern	3	5	4	12
East Anglian	2	1	3	6
East Midland	—	2	1	3

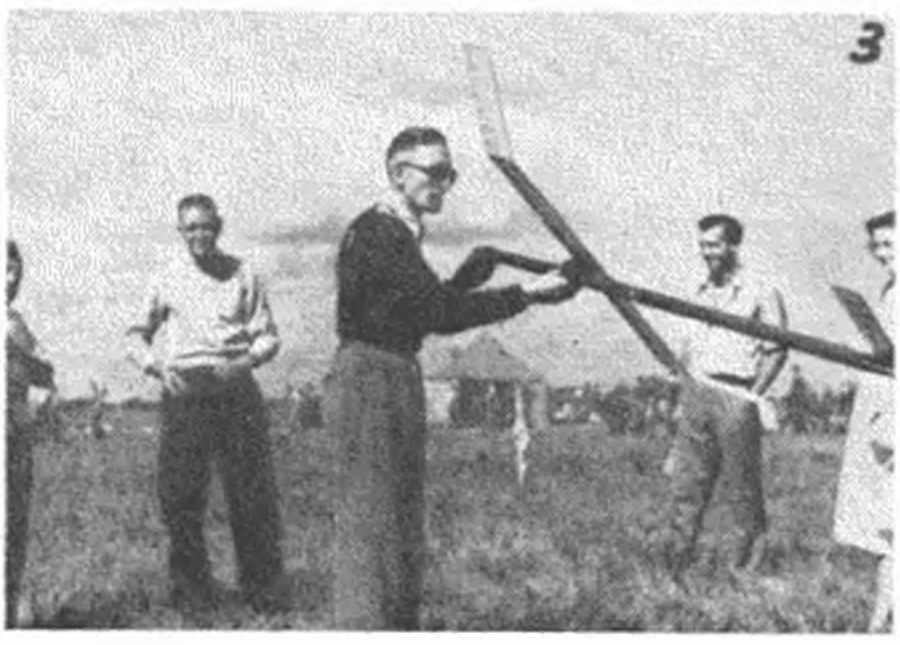
POWER	Buskell, P.	London	10 : 14*
	Lanfranchi, S.	Northern	10 : 07
	Lewis, R.	S. Eastern	9 : 43
RUBBER	Dunkley, T.	Midland	10 : 35*
	Picken, B.	N. Western	8 : 51
	Chesterton, R.	London	8 : 35
GLIDER	Barks, E.	London	8 : 45*
	O'Donnell, H.	N. Western	8 : 41
	Young, F.	Midland	8 : 41
TAPLIN TROPHY	1. S. Allen	West Essex	
	2. S. Sutherland	West Essex	

(*Individual Champions in each Class)



(1) Victorious N.W. Area contingent arrived first at Cranfield for dawn tests. (2) Rubber models did surprisingly well under the prevailing conditions. (3) Unassuming E. Barks (Surbiton) with the beautifully constructed A/2 which won him the Glider Champ. title. (4) Wrigley of Whitefield operates single-handed. (5) Runner-up Silvio Lanfranchi favours tails rivalling Jacob's coat. Model is a Frog 500 powered 'San de Hogan'. (6) Aided by car battery, Trevor London tries a test run. (7) A. E. Reynolds (Flying Saddlers), given d/f laid here by Ray Monks. (8) Radio winner Sid Allen under the watchful eye of Colonel Taplin. (9) Pete Buskell again demonstrated his capabilities, securing Power Champ.





Yorkshire Even

ALL the best weather seems to have been reserved for the larger Rallies this year, and the 2nd *Yorkshire Evening News* meeting was certainly no exception. Rarely have we witnessed such ideal conditions in this country, for an almost complete absence of wind was accompanied by abundant thermals (and attendant down-draughts !), and there ensued a day that will long be remembered by those who journeyed to Sherburn for this deservedly popular meeting.

Unfortunately, what drift there was came from the " wrong " side of the airfield, and the free-flight events had to commence from the opposite side of the field from the static areas devoted to control-line activities. This helped the organisers to a degree by spreading the vast spectator public over a much larger area than last year, but must have complicated liaison between officials, and handicapped timekeeping in some instances with retrievers fighting their way through the crowds.

Contests were conducted in a welcome free-and-easy style, and as far as we could see things went very smoothly, with each class of contest in the charge of individual clubs. Special mention must be made of the Barnsley club's heroic efforts with the Team Racing events, for they were faced with a record entry of over 90, which finally overcame even their experienced personnel. However, the official closing time was ignored for this portion of activities, and machines careered merrily round and round whilst the free-flighters collected their prizes, and spectators stayed on into the cold dusk to watch the finalists.

Over 15,000 people saw 800 fliers make some wonderful flights, and throughout the day the sky was literally full of models, many at terrific heights in the grip of the strongest of thermals. Models picked up height from almost ground level,

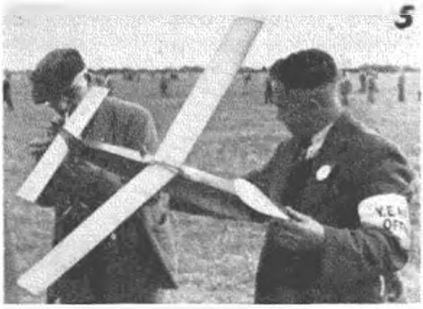
(1) Gordon Mellars of Sheffield with his beautifully constructed Concours winning glider. (2) Team-race tank check by the hard-working Barnsley officials. (3) Jack Owen (Manchester) prepares his 'toothpick' glider under the critical eye of Barry and Mrs. Haisman.

ing News Rally

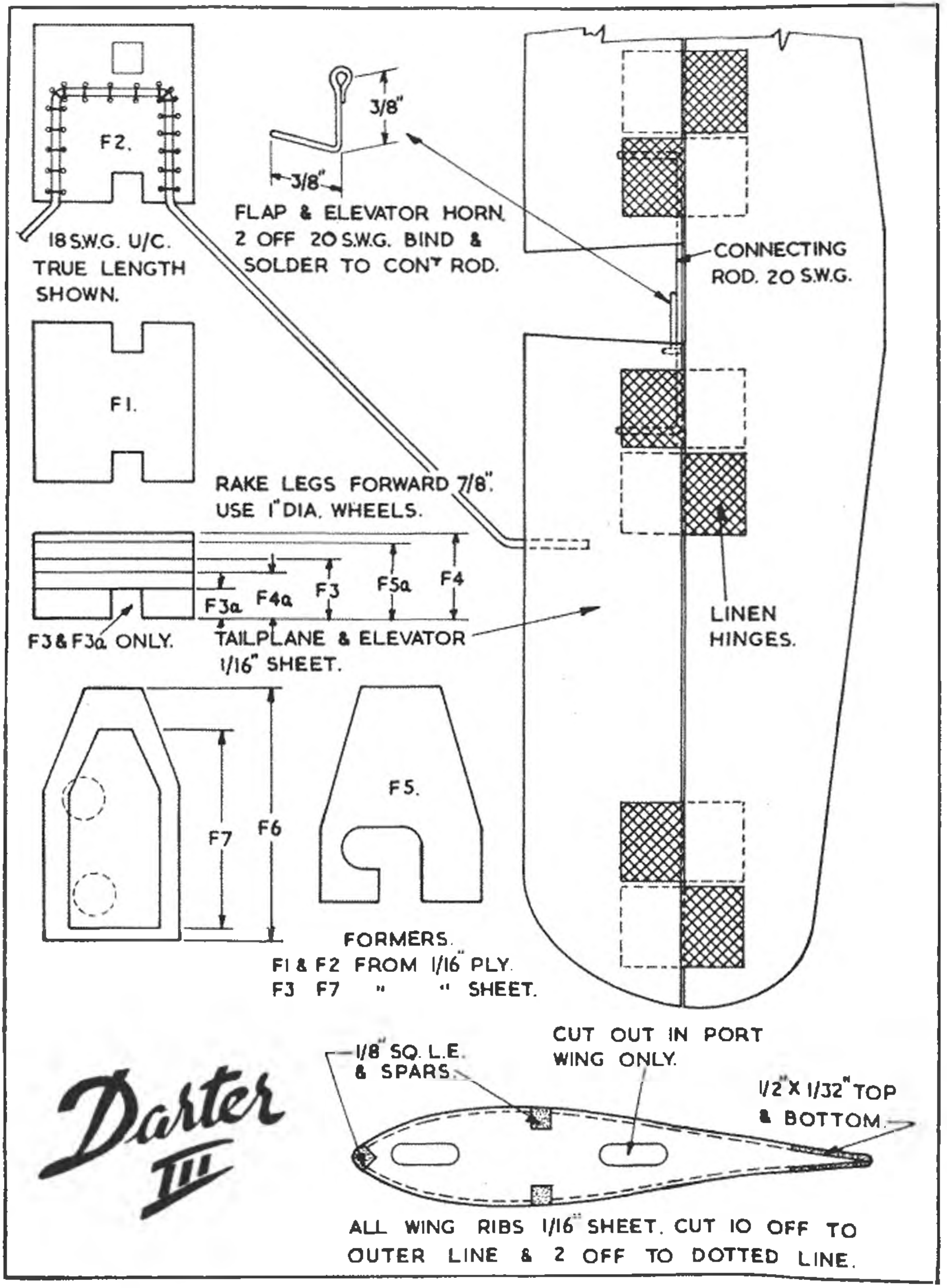
and many a maximum was scored from quite a modest launch.

The organisers are to be congratulated on a fine show; the competitors on some grand models and even better flying; and the Clerk of the Weather for his unusual kindness to aeromodellers, who made the most of his unexpected leniency.

(Full results on page 694).



(4) Mr. Brampton (Bridlington) flew this fine R/C Tiger Moth to qualify for the Scale Concours. (5) Official help for an entrant in the Rubber event. (6) Tom Dunkley, Rubber Champ for '52, sends Old Faithful off on another fine flight. (7) J. F. Armitage of Warrington with his interesting Douglas Invader. (8) Mike (The Arm) Thomas (Bolton) hefts his unusual looking chuck glider. (9) Decca Bennet of Whitefield heares his Wakefield for 5th place.


F2.
18 S.W.G. U/C. TRUE LENGTH SHOWN.
3/8"
3/8"
FLAP & ELEVATOR HORN. 2 OFF 20 S.W.G. BIND & SOLDER TO CONT ROD.
CONNECTING ROD. 20 S.W.G.
F1.
RAKE LEGS FORWARD 7/8". USE 1" DIA. WHEELS.
F3a
F4a
F3
F5a
F4
F3 & F3a ONLY.
TAILPLANE & ELEVATOR 1/16" SHEET.
LINEN HINGES.
F7
F6
F5.
FORMERS.
F1 & F2 FROM 1/16" PLY.
F3 F7 " " SHEET.
1/8" SQ. L.E. & SPARS.
CUT OUT IN PORT WING ONLY.
1/2" X 1/32" TOP & BOTTOM.
ALL WING RIBS 1/16" SHEET. CUT 10 OFF TO OUTER LINE & 2 OFF TO DOTTED LINE.

Darter III

Darter III

A Simple 80 sq. in. Quickie for ·5 c.c. Motors

By T. JOLLEY

17 year old member Humphrey Park Club . . . keen on speed and T/Racing . . . already has two firsts in Contest world.

ON Thursday, 13th March, the gossip at club got around to stunt jobs and exhibition flying. Suddenly someone said " Why not lash a job up and fly at the Northern Models ? " The only problem was that there was nothing below 1·5 c.c. in my stock. Then a pal of mine offered to lend me a recently purchased Dart. Immediately I began to decide what size and shape it would be best to make the job.

At last, after much hard work and sweating it was ready for covering on the following Friday night. This was duly done, and as many coats of dope as possible were applied. On Saturday morning at 7.30 a.m. the last coat of dope was put on the fuselage, and the windshield fitted. The engine was mounted, and we set off for Manchester. Almost as soon as it took off, I knew I had got a good job.

As soon as time allowed, tests were made using longer lines, to be exact 30 ft. On the longer lines, stunting proved much easier and anything could be tried with the knowledge that it would do it, and ask for more. The best prop. is a 5 × 3 or 5 × 4, the low pitch being helpful for acceleration.

Construction

Pin W2 ribs together and sand until they are even. Likewise with W1 ribs but spars, leading edge, and trailing edge to right length, and notch trailing edge. Lay lower spar on the plan and cement the ribs to it. Cement upper spar in place. Add leading and trailing edges, and pin the whole lot down on a flat board to dry. Cement tip blocks in place and add the plywood bell-crank mount, complete with bell-crank. Bend flap joiner, bend flap horn and bind and solder together. Sand flaps to shape and drill holes for joiner. Flood holes with cement and push joiner into the holes. Bind well with silk. Carve tips to shape and drill left tip for lead-out tubes. Instal tubes and lead-outs. Hinge flaps after sanding trailing edge to shape. Join flap horn to bell-crank, and make final adjustments by means of the Z bend. Bend loops on lead-outs. Sheet centre-section, fitting push rod first. Cement formers 4 × 4a to trailing edge of wing. Cement former 3 on top of wing. Bend undercart to shape and fasten wheels on to it. Drill holes in former 2 as shown and sew undercart to it, and cement well. Cement undercart assembly to leading edge of wing. Cement fuselage sides in place (cut slots in sides to allow them to slide over flaps, afterwards filling with scrap). Cement former 1 in place and former 5. While all this is setting, make the tank. Do not make the tank pressure feed under any circumstances whatsoever, because the feed pointing out of the circle serves the same purpose. Cement lower bearer in place and then the tank, making sure the wedge is definitely on the thrustline. Add the top bearer and secure the tank with scrap sheet and tape. Cut a piece of $\frac{1}{8}$ in. sheet to shape and cement to formers 4 and 5. Cement 1/16 in. sheet to top of the sides, formers 4 and 5 and the top, overlapping at the top. The overlap is trimmed off when the cement has set.

Cut out tailplane and elevators. Sand to shape. Join elevators exactly as flaps, except that the horn is underneath. Join the push rod with the elevator horn. The tail is then cemented in place after sliding to the right position, i.e., elevators and flaps neutral. Fill in rest of slot with scrap 1/16 in. sheet. Now cement $\frac{1}{8}$ in. sheet between the formers 1 and 3 on top and all along the bottom. Trim to shape when dry. Cut out fin and sand to section shown. Cement in place. Cut tailskid from plywood and cement in place. Drill bearers.

Go over the whole plane and re-cement all joints and at the same time cement $\frac{1}{2}$ oz. tip weight in place. Sand whole model with fine sandpaper to remove any high spots. Give everything a coat of talcum powder and dope (mixed to a thin paste). When dry, sand well. Cover everywhere with Lightweight Modelspan, using full strength glider dope as an adhesive. When dry, sand sheet parts lightly with worn sandpaper. Apply two coats of ordinary clear shrinking dope all over and then colour to suit. It is recommended that if it is wished to colour the wings, use coloured tissue. Confine colour dope to fuselage only. Decorate with transfers and colour dope to suit. The hardest sheet possible is used throughout, but even so the weight can easily be kept to 4–5 ozs. The Mark III weighs 4–5 ozs. and the Mark I and II weighed 3–4 ozs.

PORT WING 10 3/8"

CELLULOID TUBE.

20 S.W.G. LEAD OUTS.

'A'

1/2" X 5/8" TIPS.

1/16" SHEET FLAPS.

NOTE:
BUILD PORT WING FIRST UP TO RIB 'A', SLIDE WING ALONG UNTILL RIB 'A' IS SET OVER RIB 'A' OF STARB WING & COMPLETE.

TANK OUTLET.

20 S.W.G. FLAP PUSH ROD.

TOP FRONT VIEW SHOWN WITHOUT 1/8" SHEET.

1/16" SHEET SIDES. CUT TO HEAVY LINES.

CUT OUT FOR WING, FLAPS & FLAP HORN.

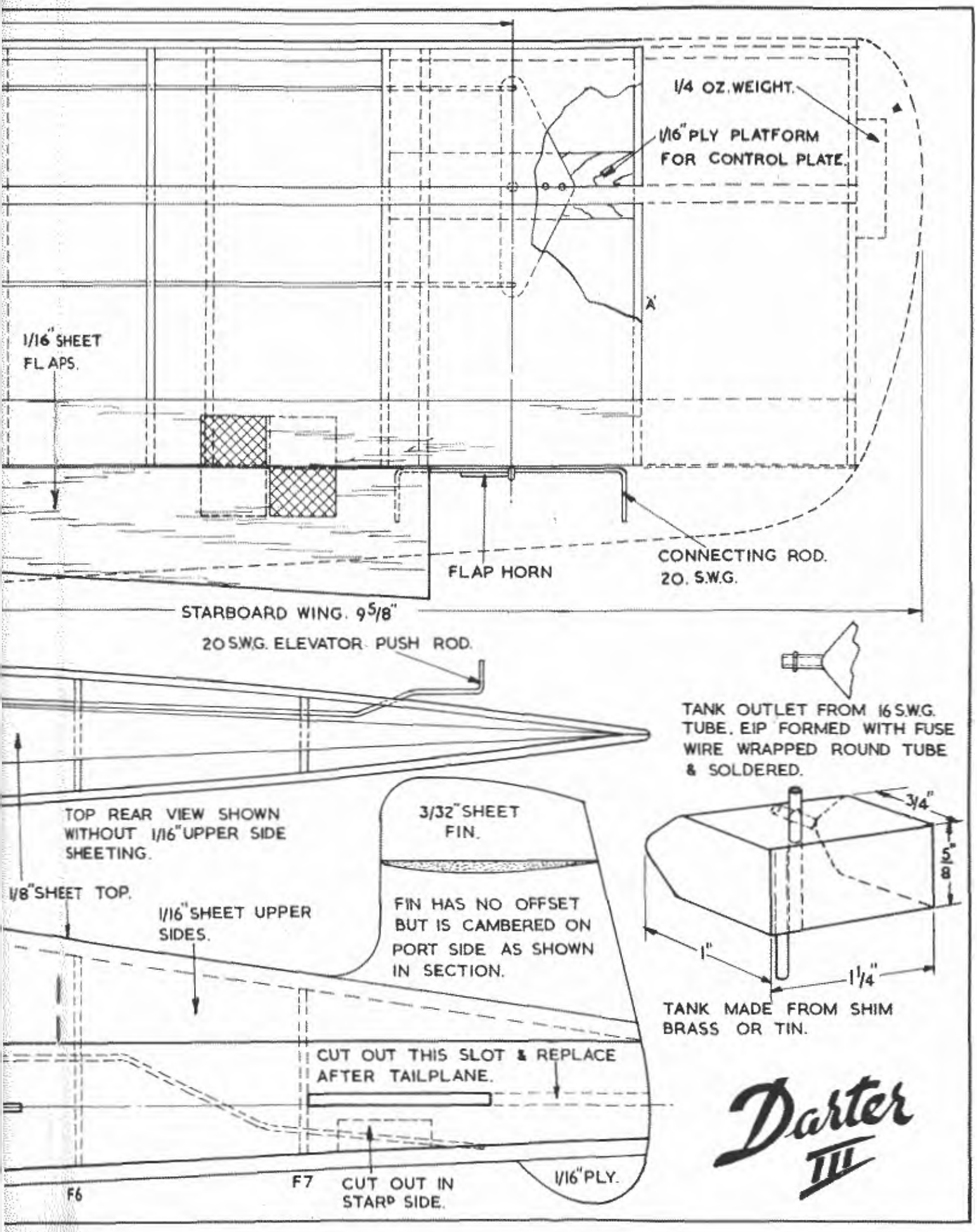
1/8" SHEET

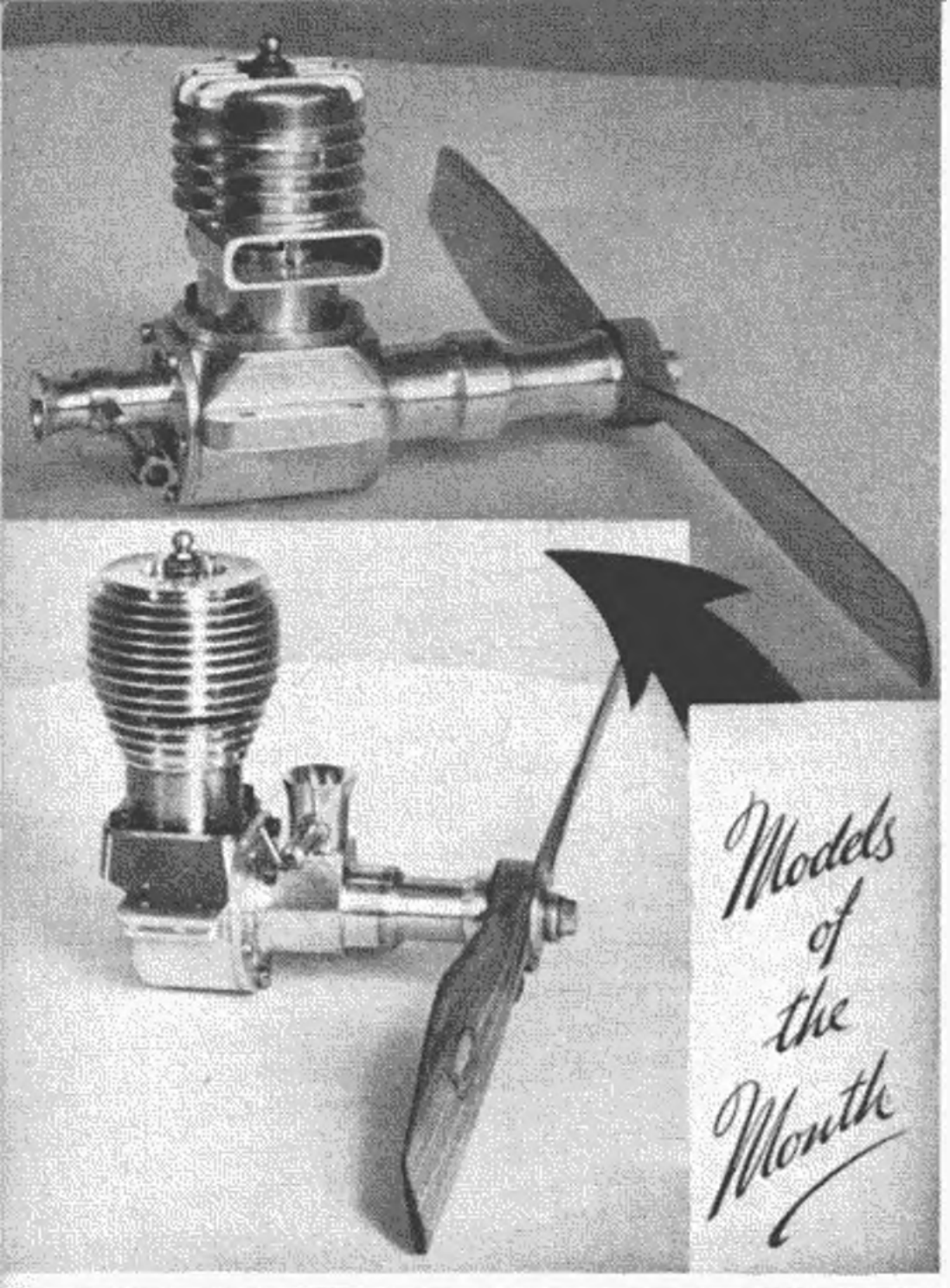
3/16" SQ. BEARERS.

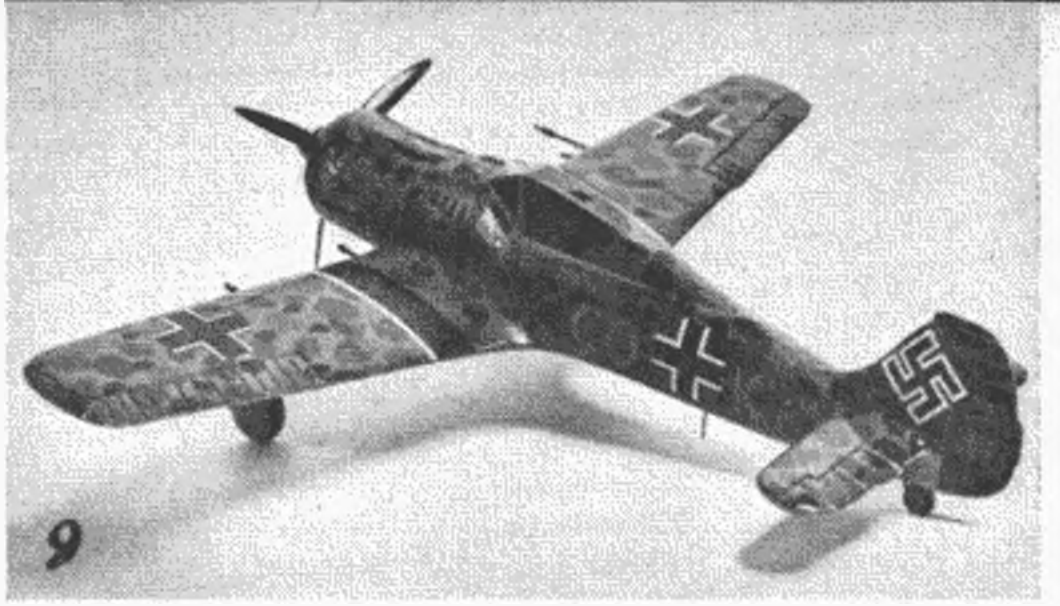
1/8" SHEET TOP.

F1 F2 F3 F4 F5 F6

F3a F4a F5a


1/4 OZ. WEIGHT.
1/16" PLY PLATFORM FOR CONTROL PLATE.
A
1/16" SHEET FLAPS.
FLAP HORN
CONNECTING ROD. 20. S.W.G.
STARBOARD WING. 9 5/8"
20 S.W.G. ELEVATOR PUSH ROD.
TOP REAR VIEW SHOWN WITHOUT 1/16" UPPER SIDE SHEETING.
1/8" SHEET TOP.
1/16" SHEET UPPER SIDES.
3/32" SHEET FIN.
FIN HAS NO OFFSET BUT IS CAMBERED ON PORT SIDE AS SHOWN IN SECTION.
CUT OUT THIS SLOT & REPLACE AFTER TAILPLANE.
F6
F7
CUT OUT IN STARB SIDE.
1/16" PLY.
TANK OUTLET FROM 16 S.W.G. TUBE. EIP FORMED WITH FUSE WIRE WRAPPED ROUND TUBE & SOLDERED.
3/4"
5/8"
1"
1 1/4"
TANK MADE FROM SHIM BRASS OR TIN.
Darter III



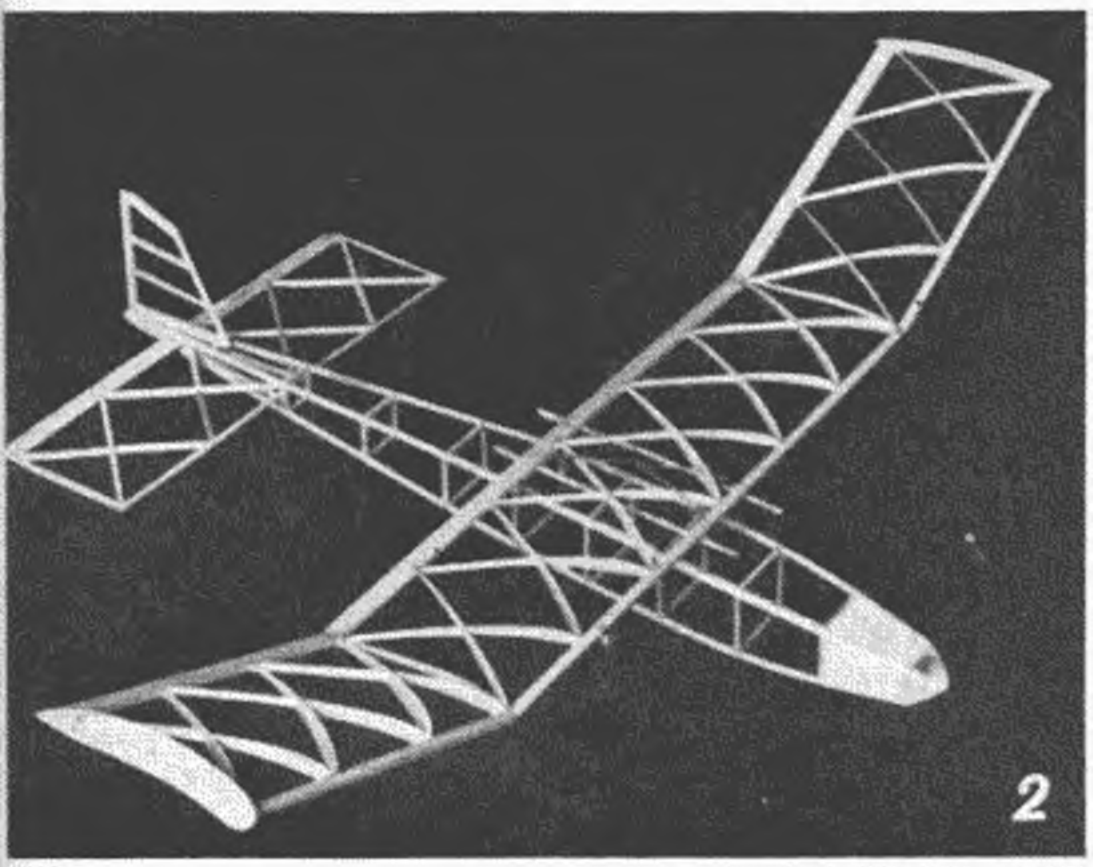


Model News

AN unusual selection as our choice of the month, but nevertheless worthy of highest merit, are the two own-designed racing engines made by Mr. L. Vernon Jones of New Romsey, Hants. Known as Experimental, Mks. I and II, they were especially built for an attempt at a cross-channel flight. The upper engine is Mark I, and it bears distinct resemblance to production motors with its rear disc induction, two ball-race crankshaft bearings and 180 degrees transfer and exhaust ports. Because of its high fuel consumption (capacity is 11·2 c.c.) a second engine was made, as seen in the lower view. This, the Mark II, is a 10 c.c. unit with Arden type 360 degree ports, crankshaft induction and phosphor bronze bearings. It can run either on methanol as a glow-plug motor, or be used with petrol fuel as spark ignition. Mark I is now installed in an A.P.S. " Lazybones " speed model, and the Mark II in an A.P.S. ' Vulcan

Another A.P.S. design, the popular Walthew Glider, appears in picture (2) but this particular one by Michael George of Newbury, Berks, is distinctly different with modified semi-geodetic structure. It was, in fact, built especially to check upon the anti-warp qualities of the criss-cross rib pattern which we have recently boosted, and during covering, water shrinking and doping, neither wings nor tail were pinned down. The result was a perfectly flat and unwarped wing and tail !

Shades of flying saucers and other moonlike objects ! In Number (3), we see a hot air balloon constructed by four founder members of the appropriately named Moonrakers M.A.C., now known as Devizes M.A.C. Photographer C. F. Amor, who had a hand in this project, tells us that on its next outing a record for free-flight R.O.B.



(rise off bucket) Hot Airships will be established! Returning to the orthodox in (4), we have a trim little twin-engined scale controliner by Frank Buckland of Sevenoaks. This Miles Gemini, built to one-twelfth scale, is 36 in. span and weighs 2 lb. It can fly on either or both of its Elfin 1·8 diesels, using 50 ft. lines.

A real whopper of a free-flight scale model is the Fokker Triplane by John Glen of Edinburgh, seen in (5). Powered with an O.K. Super 60, this model is built to the curious scale of 2/9ths, weighs 7 lbs., and has mainplanes totalling about 10 sq. ft. in area. Pendulum rudder and ailerons have been incorporated, and hundred-per-cent "knock-off-ability" all round. The model is stable under power though tests have not been carried through to finality. Early trouble was experienced with u/c axle, but 3 16th in silver steel now fitted is standing up well. Model holder is Alec Beattie, Secretary of Edinburgh M.F.C., photo by builder with a twenty-year old box-Voigtlander at 1/25th.

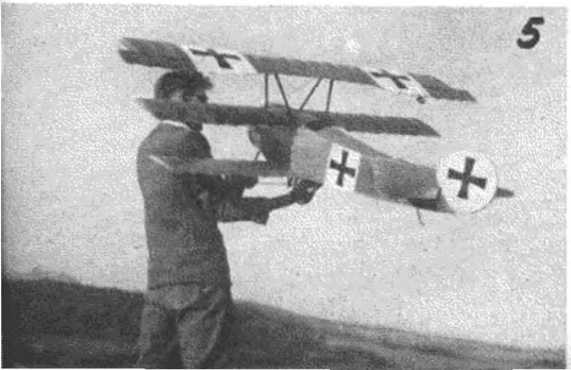
Another big-'un, this time controline, is Number (6), a 70 in. span Douglas A-26 "Invader", designed and built by Dennie Cuss, of Ruislip, Middlesex. Two Frog 500's provide the necessary motive power, and the weight is the same as the Fokker's seen in the previous photo—7 lbs. Interior fittings and engine control are additional features on this job, which, we detect with the aid of a magnifying glass, is nicknamed "Double Trouble".

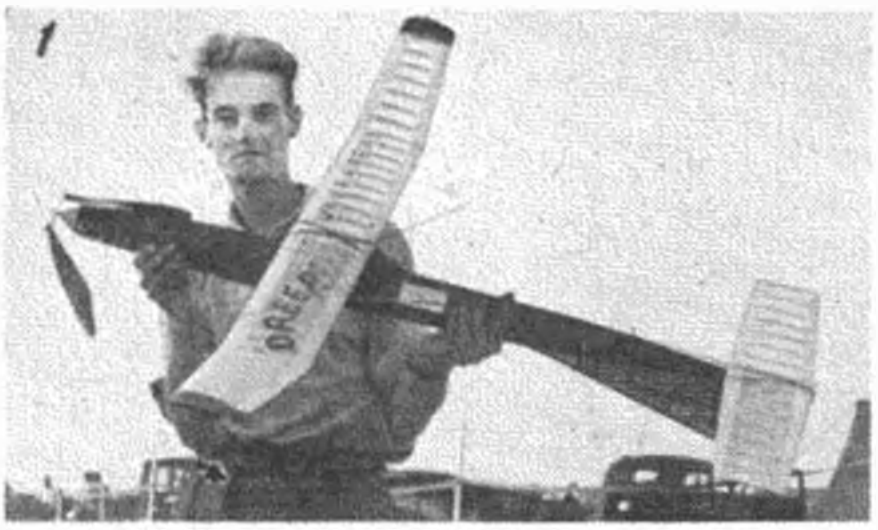
Yet another scale model in (7); but again something different, for this 47½ in. Ambassador is electrically driven and flies round-the-pole. Two, 24-volt ex-R.A.F. blower motors can each give about 3¼ oz. thrust using the scale type four-blade airscrews, and with the total weight at 1¾ lbs., and wing area craftily increased by a celluloid strip along the trailing edge, R.T.P. flight is easily obtained. The tricycle undercarriage is completely retractable, though the scale twin nose-wheels are changed for a single wheel leg for flying. Co-builders of this project are C. Foden and R. M. King of the Chelmsford club. In this Bill Dean photo, clubmate M. E. Curtis displays the model and one of its motors.

From the same club, and by the same photographer, we have number (8) the winner of the East Anglia Challenge Cup, competed for at the Chelmsford "Engineering in Miniature" Exhibition. The model is a Keil Kraft Falcon, equipped with radio control, and many metal extra's, such as dural wing struts, to bring the total weight up to 10¼ lbs. A 10 c.c. Super Cyclone petrol engine is fitted up front. Proud owner builder is E. Mead.

Last, and smallest of this month's miscellany, is number (9), a solid model built by 15 year old L. Brock of Sydenham, and very well photographed by pal Fred Huthwaite. So good is the original print that it does unfortunately reveal two items one might not expect to see on a scale model of the Focke-Wulf 190 A5. On the wingtip there is a notice in *English* for "Lift here" and the fuselage bears a flag of the Royal Air Force. Otherwise, and forgiving the oversize fin swastika, this is a fine effort for an all-Balsa solid, and we are not surprised to learn that a 1 72nd scale (this one is 1/48th) version took 2nd place at this year's Schoolboys Own Exhibition.

Back with more news in views next month, this feature is the one where *YOU* can earn yourself the copyright fee for that photo of your unusual or newsy model. Send us your print or negative, we'll soon tell you whether we can use it or not.





THE EDITOR

THE 1952 ALL

HELD AT RADLETT AERODROME, HERTS. BY KIND

THE larger Rallies seem to be having all the luck with the weather this year, and the 1952 All Herts affair was certainly no exception. August 24th proved to be one of those all too few ideal days for model flying, and the many thousands who journeyed to Radlett Aerodrome made the most of the opportunity.

With no fewer than ten separate types of contest in progress, plus sporadic attempts on control-line speed records, the field was a busy—if somewhat scattered hive of industry from morning till dusk, and it says much for the organisation that things went so smoothly. Very worthwhile innovations this year were the static water tank (four builder's planks plus tarpaulin), which attracted many modellers looking for a change from the ever-present rubber, glider and power events; and the catapult glider competition available to the visiting public at a "tanner a go". (We understand that this event was a real money maker, but came to an early end when the supply of silhouette gliders gave out with busted wings, etc.)

As is usual at such meetings, the glider event attracted the largest entry (170), but it is surprising to note that the rubber entry was larger than the power event, which was perhaps a good thing in view of the scattered nature of the uncontrolled crowd. (Incidentally, a large brickbat to a certain well-known scale modeller who persisted in chucking his fleet of heavyweights into the air without discretion, and succeeded in pranging two spectators in the course of the day!)

Group Captain John Cunningham was a most able judge of the concours classes, demonstrating a knowledge of model technique not usually found in V.I.P.s, and undoubtedly his attendance was most acceptable to the modellers. He was very intrigued with the Radio flying, the entry of 31 making this one of the best supported R/C shows we have witnessed. The weather enabled some extremely fine flying to take place, though the number of models that drifted too far down wind

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(1) Johnny Lambie (Wayfarers) winner of the locally competed Championship Trophy. (2) John Cunningham inspects concours entries under the watchful eye of St. Albans organiser Greening. (3) H. T. Jackson of Watford proudly displays his prize-winning Avro 504K, proven an outstanding model in flight. (4) Jack North dispatches his "Warneford" type floatplane from the Radlett Docks. (5) Radio Corner, with Bill Tickner (West Essex) tuning up for start.

DESCRIBES

HERTS RALLY

PERMISSSION OF SIR FREDERICK HANDLEY PAGE

does not say much for their chances in average British weather, when failure to make any form of attempt at a spot landing can lose so many points !

Two new C/L speed records and a new lightweight seaplane record are claimed as a result of the day's activities, these being 84·72 m.p.h. in Class 1, by Tuthill of Enfield, 107 m.p.h. by Hall of Chingford, and a duration of 5:15 by Phil Taylor of Thames Valley, the winner of the rubber-powered seaplane event.

J. Lamble of Wayfarers won the " Hertfordshire Championship " trophy, having the best performance of the " locals ", but special mention must be made of the Northampton club " double " in winning both the rubber and glider classes, yet another power win for Pete Buskell (Surbiton) and J. Nachtman's (Polish A.F.A.) success in winning the radio event and the duration concours.

The grape-vine tells us that a change of title for this event is contemplated. May we humbly suggest to the organisers that such a move would be a bad thing—the All Herts is a by-word in present day aeromodelling, keep it that way !

RESULTS

Rubber	Revell, H. W.	Northampton	10 : 00
	Tubbs, H.	Leeds	10 : 00
	Holt, J.	Upton	10 : 00
Glider	Bradley, R.	Northampton	10 : 00
	Holland, W. P.	Apsley	10 : 00
	Longstaffe, C.	Belfairs	10 : 00
Power	Buskell, P.	Surbiton	45·5 ratio
	Marcus, N. G.	Croydon	43·9 ,,
	Gould, J.	Northern Heights	41·4 ,,
Seaplane (Rubber)	Taylor, P. T.	Thames Valley	10 : 00
	Bennett, E.	Croydon	8 : 15
Seaplane (Power)	Perkins, G.	Croydon	39·0 ratio
	Brooks, A.	Grange	16·5 ,,
Radio	Nachtman, J.	Polish A.F.A.	310 points
	Allen, D.	West Essex	265 ,,
	Honnest-Redlich, G.	Bushy Park	260 ,,
Team A	Edmonds, R.	High Wycombe	56 m.p.h.
	Butcher, N.	Croydon	
	Smith, T.	South Bristol	
Team B	Butcher, N.	Croydon	66 m.p.h.
	Steward, L.	West Essex	
	Crowe, C.	Harrow	
Tailless (Glider)	Nicholls, A. H.	Southern Cross	5 : 41
Tailless (Power)	Marshall, J.	Hayes	4·9 ratio

(6) Allen of St. Georges Heights club airs his unorthodox all-wing glider. (7) J. Newton (North Kent) demonstrates the size of his beautifully built " Heracles ", not flown pending the M. E. Exhibition. (8) King-size " Hieriot " with proud owner M. T. Mitchell of Northern Heights. (9) Novel catapult launch event attracted the general public, and even practised aeromodellers! (10) P. T. Taylor (Thames Valley) releases his floatplane on its record-breaking flight of 5 : 15. (11) B. Brooks of North Kent aired his large " Hengist " powered with four E. D. Bee's.

ESPECIALLY FOR THE BEGINNER PART 31 **BY VIC SMEED**

Trimming Power Models

Flours Jnr., nine year-old son of Sutton Coldfield M.A.C. Hon. Sec., bears pained expression having rapped a finger on "Ethereal Lady's" prop! This popular Vic Smeed A.P.S. design flies well for beginners of all ages.

THE most frequent pitfall fallen into by the less-experienced modeller is the belief that once a model is built, his work is done. Nothing could be further from the truth, for as much patience and skill must go into the trimming of the model as went into its construction. It is safe to say that 80 per cent. of models flying today would turn in higher performances if re-trimmed by an expert, and consistent high performance is the mark of the man who really knows his subject.

" Words are all very well," we can hear, " But how does one attain proficiency in trimming ? " Well, familiarity is the first step, and much of this can be done in an armchair. Read the adjustment notes for every published model, and you will soon find that there is a pattern of procedure which is repeated over and over again. We shall repeat it here, for seldom does anything new develop in the procedure. Get into the habit of reading trimming details of all models, and if a departure from the pattern shows up, try to reason out why that particular model varies in that way—this is where discussions with fellow modellers prove so fruitful. Once you have absorbed the standard adjustment technique, you will find that you begin to notice things about your models' behaviour that you would previously have ascribed to vagaries of the air, or which would have puzzled you. It isn't difficult to trim the average model—all that you need is to know the procedure, to be able to recognise roughly what is happening to your model, and, above all, to use a spot of common-sense. Odd scraps of balsa and thin ply for packing, Plasticine in case ballasting is required, a patch of long grass, a slightly sloping piece of ground, sufficient familiarity with the engine to be able to control it to a certain extent, and patience, complete the equipment of the man with the new power job.

Let's assume that it is a new power model we have to test—we can deal with gliders and rubber jobs later. There the model stands in all its pristine freshness, nicely built, beautifully finished, and ready for anything. But is it ? It looks wonderful, but turn a critical eye on it. Alignment, steadiness, and warps can be checked before it leaves the house ; Fig. 1 shows the surest means of doing the first of these. Lay the model gently on a level floor or large table, upside down. It should normally rest on the wingtips and fin. The tailplane tips should be exactly the same height from the floor, and the fin should be perfectly vertical. If they are not, something is wrong—perhaps the wing sits one side low or the fin is out of true. Pack the offending item with strip ply until everything is lined up, and cement the packing permanently in place. Re-check. (Fig. 1.)

Now, with the model assembled exactly as you would fly it, hold the body firmly and joggle the wing, tail and fin. The surfaces *must* seat squarely and firmly ; if you have a bump anywhere (such as under the centre-section) that allows the particular surface to wobble in the slightest, either remove the bump or add strips as " runners " each side until the bump clears. Cement these strips in place and re-check the alignment. Tedious ? You spent a lot of time and care putting it together, and these few minutes may make the difference between a wreck and a record-breaker.

Warps must be found and removed. Later, when you are expert, you might be able to make use of " beneficial warps ", but don't risk them now. An electric fire or steam or even a radiator will heat the tissue enough to slacken it ; then, with the warp twisted out, cooling will leave you with a perfectly true surface. We usually look from the trailing edge to the leading edge, slightly underneath the surface, when checking for warps (see Fig. 2), but some modellers prefer to look from the leading edge to the trailing edge, or even along from the tips. Use any of these methods, but make certain there are no warps.

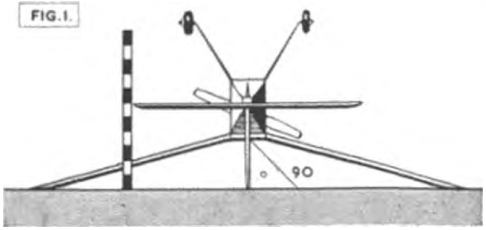
If you have built from a kit or commercial plan, read what the designer says about balancing and flying the model. He doesn't write those notes to fill up space—they represent his experience with that particular design and if you think it's worth building it is surely worth seeing what he has to say about it ? Balance the model about right

before you take it out, and fit the propeller he recommends. If he says " Slight right rudder " with an 8 x 4 in. prop. don't expect the same results with the same settings and a 6 x 7 in. prop. The drag of the prop. will be higher, with consequent greater torque effect, and in this case much more right rudder would be needed. If you haven't the propeller recommended—well, buy one. You've spent money on the model, and you don't want to send it down the drain because you're reluctant to spend another couple of bob, do you ? If your model is of your own design, you should have an idea of where the C.G. should come ; however, for the average cabin model, balancing between one-third and one-half of the chord back from the leading edge will not be very far out.

Nothing more can be done until the flying ground is reached, unless you have a *big* garden. Glide-tests in small gardens produce a shocking mortality rate. Once on the field, assemble the model and check it over. Long grass is always recommended, as obviously it breaks the landing impact ; a puncture or two in the tissue is a better repair proposition than a wing broken in half. Early morning or late evening are the best times to test, since a complete absence of wind is a great help. However, there is almost certain to be a gentle movement of air, the direction of which can be determined by a puff of cigarette smoke or a handful of chaff thrown up. The model must be hand-launched into whatever breeze there is, at somewhere near its flying speed. Practice will give a good idea of the speed required, but if in doubt run into " wind " holding the model in a flying attitude until you feel it lift. Launch at this speed. There are various ways of holding the model, but by far the most common is to grip it lightly under the fuselage well behind the trailing edge with the right hand, supporting the nose with the left. Models *must* be launched very slightly nose down—" Aim at a point roughly 60 feet ahead " is a common maxim. The impetus is given by the right arm, with a smooth, follow-through motion, and the model should leave the hand at or near its flying speed and without a jerk. If everything is as it should be, a long, straight, smooth glide will result, the landing being twenty to thirty feet ahead. If you launch too fast, or nose up, the model will climb, hesitate, drop its nose, and may not pull out in time to avoid diving into the ground. If the launch is too slow, the job will drop and flop down just in front of you. Try again.

Two faults may show up at this stage. Persistent stalls may occur, *i.e.*, the climb, hesitation, and dive may keep happening, or even a modified version of this, when a swoopy, undulating glide will appear, or the model may repeatedly dive into the deck near your feet. In the first case the model is tail-heavy, or in other words the C.G. is too far behind the C.P., and there are four cures. One is to move the wing, and hence the C.P., back. Secondly, decrease the incidence of the wing by packing under the trailing edge ; this also has the effect of moving the C.P. back. Thirdly, increase

FIG.1.



the incidence of the tailplane by packing under the leading edge, which increases the lift at the tail and therefore moves the whole aeroplane's Centre of Lift back. Fourthly, add ballast to the nose, which moves the C.G. forward. These four cures are in the order in which they should be applied ; if the wing cannot be moved (as is often the case), change of wing incidence should be tried. Do not overdo the packing—1/16 in. at a time is enough, and 3/16 in. is the limit. Ensure that the angular difference between wing and tail incidences is maintained. The tailplane packing may be more effective if the stall continues, but remove the wing packing first. Use ballast as a last resort.

In the event of a dive, the opposite of these measures is called for, *i.e.*, move wing forward, increase wing incidence (pack leading edge) decrease tail incidence, (pack trailing edge), or add ballast to tail. The same procedure and limits apply.

Once the model shows somewhere near the proper glide, transfer operations to a gently sloping piece of ground or stand on a small eminence to give the model a longer time in the air and hence a better chance to study its behaviour. It is not often possible to perfect the glide from hand-launches, due to wind gradient, turbulence, and ground effect, but much can be done to ensure that the glide is reasonable. The increased length of time the model is in the air will show any tendencies that were not apparent in the shorter tests, and corrective measures as already outlined can be taken. Some builders of large models conduct early tests by shoving the model along the ground until it hops off ; proneness to dive or stall may be gauged in this way, but longer hand-launched glides are still desirable. When you are satisfied that the glide path is safe and stable, cement all packing in place and secure any ballast so that it cannot move or fall out. From now on,

FIG.2

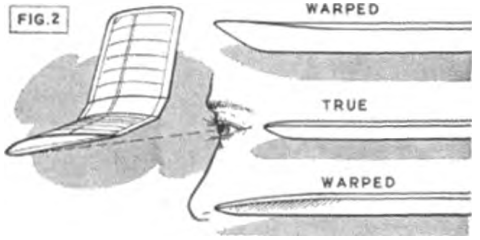
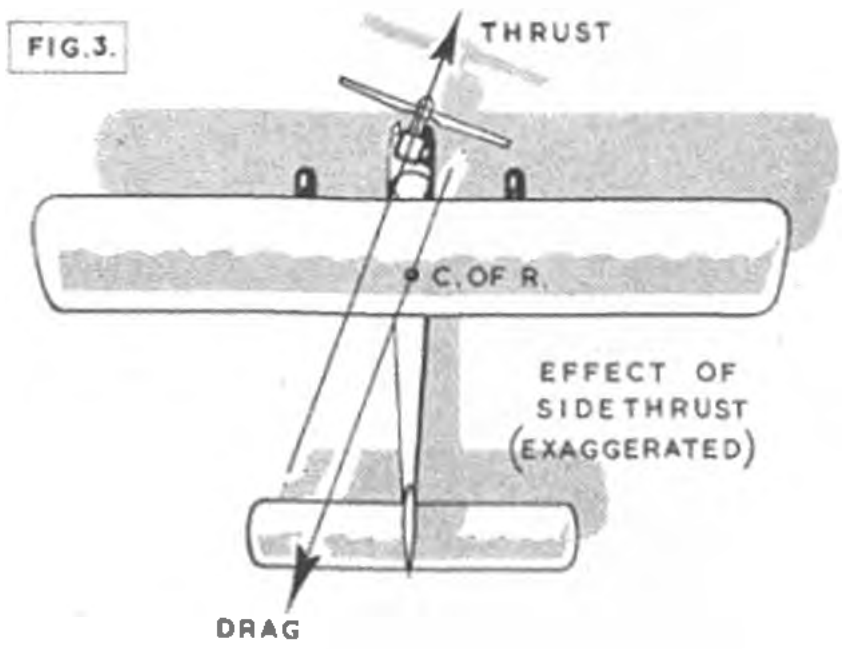


FIG.3.



the wing and tail settings will remain as they are until power flight is satisfactory. It is a help to mark their exact positions or to cement small keys to prevent inadvertent movement.

For initial power flights (if no propeller is recommended with kit or plan) you cannot do better than to use a plastic propeller, which gives more control over the motor (by virtue of its weight) and stands much less chance of breakage. If it is put on back to front, it will be less efficient, thus cutting initial power and aircraft speed, but it will also have more drag and therefore more torque effect, causing more of a tendency to turn to the left, a fact which must be remembered when it is turned right way round. For the first attempt at power flight, open the needle-valve and /or slightly reduce compression until the engine is running as slowly as possible without burping. (It is a good idea to practise this on the bench). The average cabin model can be given slight right rudder—a very little—but if in doubt leave the rudder central. Launch the model exactly as for a hand-glide, with enough fuel for about a ten second run. Note carefully what happens ; it's surprising how many people can't remember which way a model was turning after a test flight! Don't immediately gallop after it, but stand and think a moment : " Now, when I launched it it turned gently to the left, came round over my head, the motor cut, and it glided to the right ", or whatever it did. Having fixed in your mind exactly what happened, retrieve the model and check it over, noting particularly that the wing and tail haven't moved.

For the second flight, move the rudder a little (1 /16 in.) to turn the model in the opposite direction to its previous circle. If the first flip was hopeful, don't be tempted to give it full bore, but allow the motor to run a little faster and launch as before. Again, note what happens. Get an idea of the sensitivity of the rudder—that's quite important. If, on the first flight, the model turned and flew into the ground, move the rudder over about 10 degrees ; if it coasted downhill in a power-assisted glide, increase motor speed rather more.

Continue to increase speed on successive flights, altering rudder settings if necessary—but *only* rudder settings. Do not touch the wing or tail. Two faults are likely to appear : (i) the model stalls under power, switchbacking or climbing and diving alternately. This means that the propeller alone has insufficient thrust to climb the model without aid from the wing lift, but that the thrust line is passing below the Centre of Resistance and causing the machine to nose up so that the wing cannot give the required lift. The cure is to pack under the rear engine lugs, which gives downthrust, tilting the thrust line to pass through or above the C. or R. One or two thin washers should be enough ; the model should now hold its nose down and climb smoothly ; (ii) The model requires so much rudder to prevent it from turning into the ground under power that its glide is spoiled by too tight a turn. The answer to this is to offset the motor to counteract the turn it produces—in other words, sidethrust, to cause the thrust line to pass to one side of the C. of R., thus producing a turning couple (Fig. 3). This means twisting the motor on its bearers and usually means a workshop job of enlarging the holes in the bearers in order to move the bolts slightly. One or two degrees " twist " is usually sufficient.

When the model is flying safely on full revs., the propeller may be turned round the right way and a flight tried on reduced power, working up to full power again and adjusting the rudder as necessary. Once power adjustments are complete, attention should once more be turned to the glide. What small improvements can be made will hardly effect the power flight. First aim at producing a flatter glide, using thin packing under the tailplane trailing edge, until a faint undulation appears, 1 /32 in. ply, a piece at a time, is all that should be used. Remove the last piece of ply when the undulations appear, and the trim will then be very close to optimum. Timed flights, using rough ratios (motor run into total time) made in still evening air with slight variations in packing, will show the best possible trim for your model. Remember, if you change the pitch or diameter of the prop., re-trimming will be necessary. All packing should be cemented permanently in place, and when the model is reassembled for future flying all trimming marks and keys should be checked. They should also be inspected between flights. It should be quite possible to take a model out of its box, assemble it, and turn in a perfect flight straightaway.

The golden rule for trimming is " One alteration at a time ", for obvious reasons. Bear in mind, too, that a model with a perfect straight glide will lose height more rapidly in a tight turn, due to loss of lift from the inner wing, and will need very slight adjustment accordingly. For any real peculiarities of flight which may be encountered with an o.d., which are not covered by these notes, see Part XXVII of this series (July 1952), dealing with stability requirements. Finally, may we repeat what we said at the beginning : " As much patience and skill must go into the trimming of a model as went into its construction"—only in this way can you truly call yourself a model *flier* !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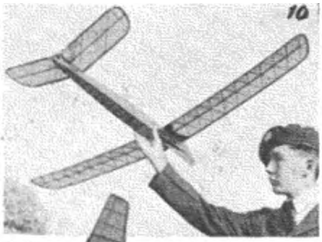
The R.A.F. CHAMPIONSHIPS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HELD at R.A.F. Newton, near Nottingham, over Saturday and Sunday, 6th and 7th of September, these Championships were hotly contested by teams from every Command in the Royal Air Force. Over twenty different contests provided a very full programme for competitors and officials alike, but organisation was good and sportsmanship of a high order. The meeting was conspicuous for cold but fine weather, the high standard of flying and the most amazing collection of unorthodox models we have yet seen. Weather was so good on the Sunday that 17-year-old Cranwell apprentice H. Capel put up a canard glider for 22 mins. 11 secs.! S./Ldr. Verney became Victor Ludorum for the third year running with a collection of superbly finished models that well deserved success, and Technical Training Command won the Inter-Command Challenge Trophy with last year's winners, Fighter Command, in second place.

(1) S./Ldr. Verney with his winning Class "B" E.T.P. 29 powered team racer, presumably wears dark glasses to combat the glare from his chrome-plated undercarriage legs! (2) L.A.C. Pete Royle, winner of the Open Rubber and R.A.F.M.A.A. Thurston Trophy receives congratulations from Mrs. Dickens, who presented the prizes. Left is S./Ldr. Wilson, Secretary of the R.A.F.M.A.A. (3) L.A.C. R. L. R. Meherley watches F./L. Ware check the radio on his winning Mercury Sedan, powered with an Elfin 2·49. (4) F. Sgt. Nichols of Stoke Heath launches his Mills 75 powered R.E.S. (5) Sgt. Bill Smeed of Henlow releases his helicopter in the unorthodox event. (6) Cpl. McHard with an unusual canard biplane that flew exceedingly well. (7) Cpl. Edwards winds his rubber powered channel-wing model, that featured a Jetex assisted take-off and won him the unorthodox event. (8) J. Tech. Burch, winner of the Stunt contest, tanks up. (9) L.A.C. Ian Bucnell uses a "Jetmaster" in his 28-inch span "Arrow 2", that weighs 3 ozs. (10) Cranwell apprentice H. Capel employs geodetic construction on his canard glider, which set up a new British Record. (11) F./L. A. F. Davidson, winner of the R.C. event, with his own design model that features twin fins and a trike undercarriage.


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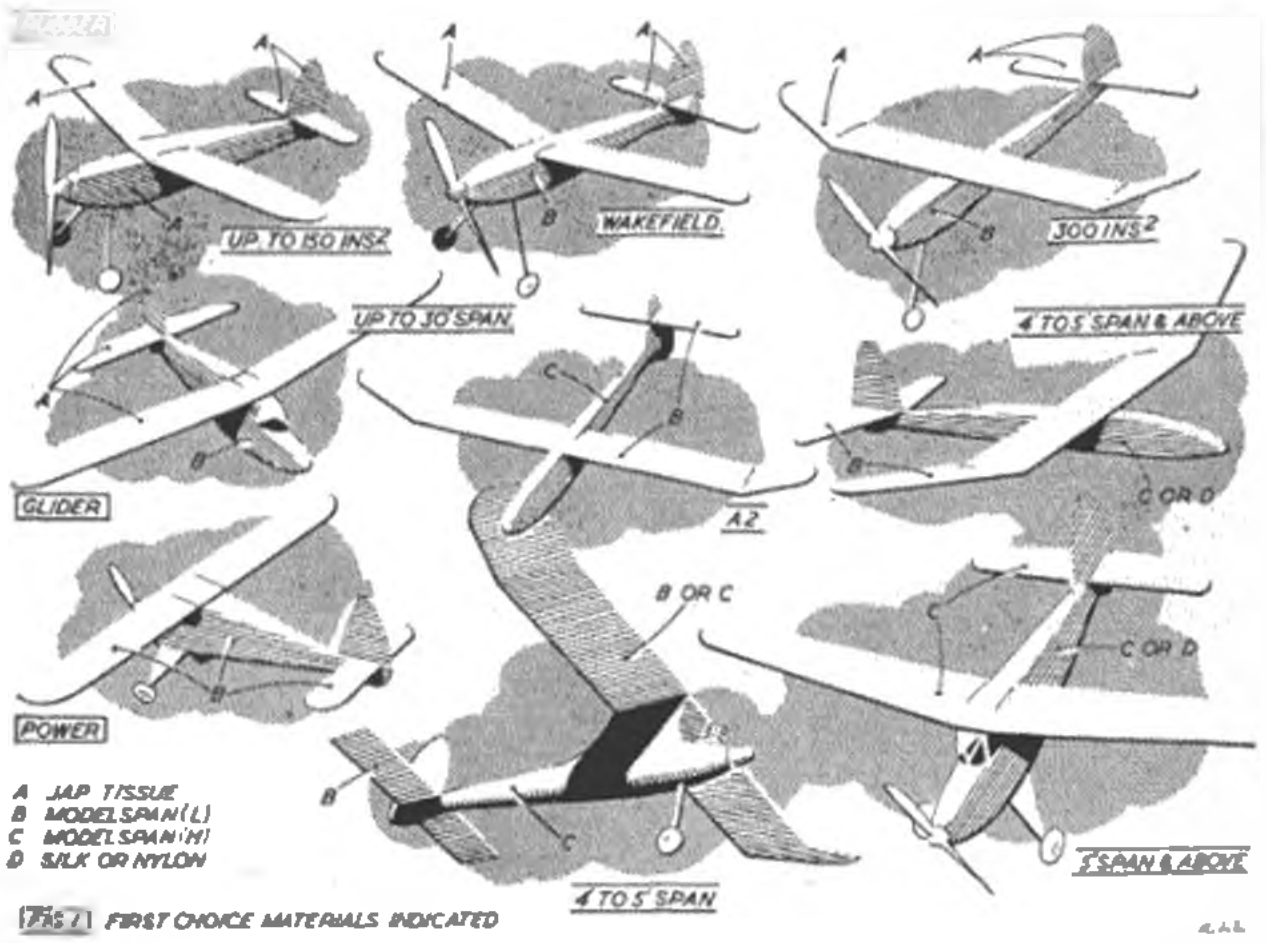


FIG 1 FIRST CHOICE MATERIALS INDICATED

AIRFRAME

PART NINE

COVERING

dope well. Its main disadvantage is that, in its final doped state, it is a relatively brittle material, easily pierced or split by contact with obstructions, or from the shock of a crash landing. Where weight is not so important somewhat heavier, stronger covering materials can be employed to advantage.

COVERING and doping are the last major jobs associated with the construction of a model aeroplane. Both are of vital importance. Both, for example, govern the appearance of the finished product. No matter how good the construction, if the covering is poor, then the model will look " rough ". The general standard of construction, and covering in particular, has improved so much of recent years that to appear on the flying field with a badly finished machine is an open admission of lack of ability—or experience.

Besides making the finished model " look pretty ", as it were, covering is also vital to strength, and performance. Whilst a model may fly with an uncovered fuselage, that fuselage would be pretty weak, using orthodox construction. Wings and tail unit, of course, need covering to complete them as aerofoils. Apart from aerodynamic considerations, however, taut covering adds an amazing amount of strength to a structure for what is really an almost insignificant amount of weight, by comparison.

Where weight has to be cut to a minimum on a model, such as in a contest machine, then the covering is really used as a structural material. Taut fuselage covering keeps the fuselage from twisting under the strain of a wound rubber motor ; prevents the wings from flexing unduly, or from twisting ; and holds the tail unit aerofoils at their correct " control " positions. All this for, on a Wakefield, say, an added weight of half an ounce, using tissue covering.

No other covering material can compare with tissue where light weight and good strength is a main aim. Tissue also has the additional advantage of being easy to apply, tautens up well with a coat of water, allowing to dry out afterwards, and takes

The lightest of all tissues satisfactory for model aircraftwork is Jap tissue, now, unfortunately only available in limited quantities. Jap tissue is made from the pulp of a tree of the Mulberry family, found only in Japan. The fibres in this pulp are longer and thinner than those in other wood pulps. Hence, even in very thin sheets, Jap tissue retains an amazing strength. It is also very light in weight.

When Jap tissue disappeared off the market during the war years several different " substitutes " were tried. Some were quite good, some indifferent, but the rest poor. Arising out of experience of the requirements of the model aircraft trade, however, certain classes of paper were specifically developed for aeromodelling purposes, to be put on the market shortly after the war. These, known under the trade name "Modelspan", are available in two grades and in a variety of colours, suitable for almost every type and size of model. Prior to the war demand for model aircraft covering was too small to justify special productions in this country. All of the needs were met by imported Jap bamboo paper and some imported American papers, along with lightweight silk.

Modelspan is heavier than Jap, tougher and somewhat stronger in general use. It does not water-shrink so readily, but absorbs more dope. Hence care must be taken not to overdo doping, or use too strong a dope, where relatively weak structures are concerned.

As a general rule, small lightweight models up to about 36 in. span, rubber or glider, are best covered with Jap, if available. Wakefields used invariably to be covered in Jap tissue but, even with Jap still available, many modellers preferred to restrict the use of Jap to the wings and tail

CONSTRUCTION

surfaces and use a slightly stronger tissue for the fuselages. This is excellent practice. Jap tissue covering on fuselages is too ready to develop small splits, especially on slabsided fuselages. An early cure was to double-cover with Jap tissue—forming a two-ply covering, in effect. This, whilst adding strength also adds weight. A double-Jap covered fuselage is generally heavier than a similar one covered with a single covering of stouter tissue.

At the present time, some of the experts still cover their Wakefields entirely in Jap tissue. Additional strips of tissue are then sometimes doped on the sides of the fuselage to resist splitting. Most Wakefield experts still use Jap tissue for covering wings and tail units, as far as this is obtainable, but many use a heavier grade tissue, like Modelspan and its American counterpart, Skysail, for fuselage covering. Just to emphasise that choice is as much a matter of personal preference as anything, other leading flyers use lightweight Modelspan covering throughout.

The same remarks can be taken to apply to small gliders. Once a glider gets above 200 sq. ins. wing area, however, and for all power models, weight is far less critical and it almost invariably pays to use a heavier covering material throughout—say lightweight Modelspan if weight saving is still considered important; heavyweight Modelspan on larger structures. Silk or nylon covering may well be considered for large glider and power model wings, and fuselages.

Silk or nylon covering is not often used. Lightweight silk covering compares very favourably with heavyweight tissues for weight and is considerably stronger, but more expensive. Nylon, in "parachute" grade, is heavier still, but very strong indeed. All models with a wing span in excess of about 4 ft. would probably benefit from silk covering, if expense was no object. Large power model fuselages would certainly benefit from a covering of nylon in preference to any tissue. Both silk and nylon covering, however, is more difficult to apply and dope to a good finish. A guide to the selection of the best covering material is in Fig. 1.

Having selected the material, just a word about colouring. An all-white model looks very "undressed" and generally has the appearance of being weaker than it is. White covering, too, soon becomes soiled and dirty. The use of coloured dopes is out of the question for most small contest models. Coloured dopes of any kind should be avoided on all rubber models, to save weight, except for trimming purposes—such as the propeller spinner. Even here it is surprising how weight can mount up, merely using six or seven coats of dope on a spinner to get a really first class finish. An increase of ¼ ounce would not be an underestimation.

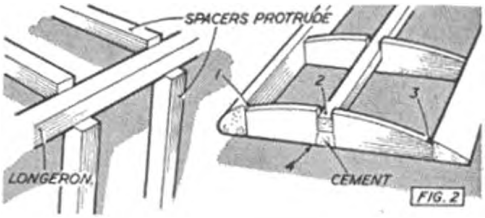
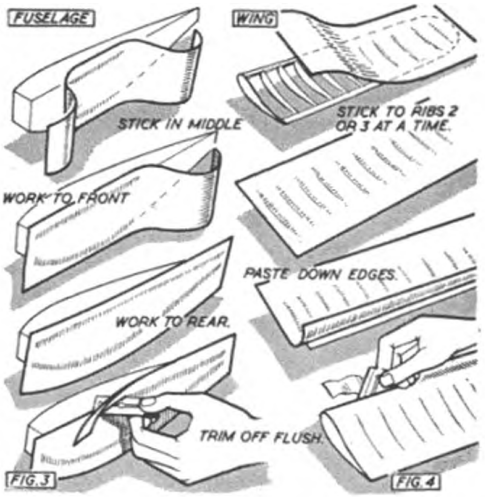


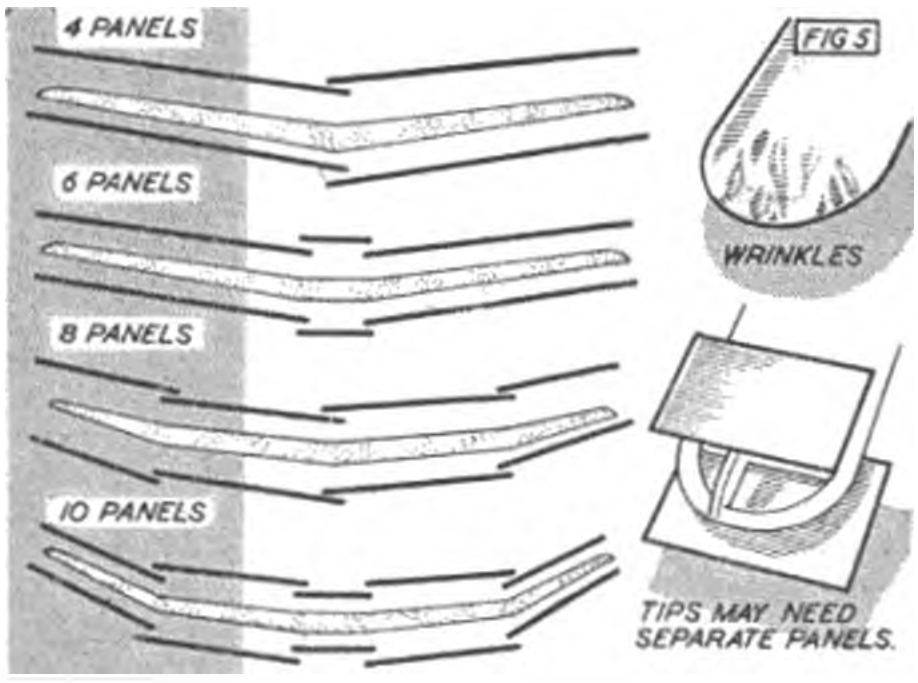
FIG. 2

Coloured tissues, of course, provide an easy answer to a coloured model. Selection of colours then becomes a matter of personal preference. The all-red model was once very popular, and has the advantage for contest work of being a good colour for visibility, but usually two colours are used. Almost invariably this reduces to a dark colour for the fuselage and fine and lighter colours (or white) for the wings and tailplane.

Whatever it may lack in aesthetic value, black is a very good colour for a fuselage. Black is the easiest of all colours to match up and patch, does not show up dirt and grime, or even age as much as any other colour. In other words where the model is to be something of a workhorse and do a lot of flying a black fuselage is a logical first choice. Black, too, fits in with almost any of the lighter colours for wings and tailplane.

Before starting covering itself, the airframe must be gone over carefully to smooth down or remove any protuberances which might spoil the lay of the finished covering. There are so many common faults which could be avoided with a little more care. In the case of a box fuselage, for example, make sure that all the spacers are sanded down flush with the longerons, not sticking out at the top. Such projections show up in the finished covering and may introduce an unsightly wrinkle at this point. Ridges between the ribs and spars





in a wing, or a blob of cement which has run down to the bottom of the rib, are all small features which can spoil wing covering. Make sure, too, that the wing trailing edge member is *securely* cemented to all the ribs and has not broken free during the final sanding. If the joints are uncemented the trailing edge will twist under the tightening action of dope and cause wrinkles in the final covering. Small points like these, as summarised in Fig. 2, can make or mar the covering job.

Almost all tissues are applied in the same way. A panel is cut somewhat oversize with respect to the frame to be covered, stuck down around the outline with a suitable adhesive, at the same time drawing fairly taut and wrinkle-free. It is more important to get the tissue stuck down free from inherent wrinkles than it is to draw it absolutely tight. The overlap of tissue is then trimmed off with a razor blade. A coat of clean water, sprayed or brushed on, then allowed to dry, first expands and then shrinks the fibres of the paper. When dry the whole area of covering should draw up taut between the cemented down outlines. Two or three coats of dope then preserve this tautness against damp conditions which would normally make the tissue slacken off again. Undoped tissue, too, is relatively soft and "dents" easily when fingered. Dope adds a certain plastic strength.

Now whilst that is the general method, there are several ways of going about the job. As a simple example of covering, let us take a slabsided fuselage. The various stages in covering are shown in Fig. 3. First one oversize tissue panel is cut for each side, joining if necessary. Using a suitable adhesive, and here a photographic mounting paste such as Gripfix is recommended for easiest working, stick the tissue down to the longerons in the mid section of the fuselage. Then work from this area forwards, say two or three bays at a time, until the nose is reached. Then repeat to take the covering to the tail end. Pull the tissue taut and free from wrinkles; stick down only to the longerons (and the ends) and do not try to cover too long a section of fuselage at a time.

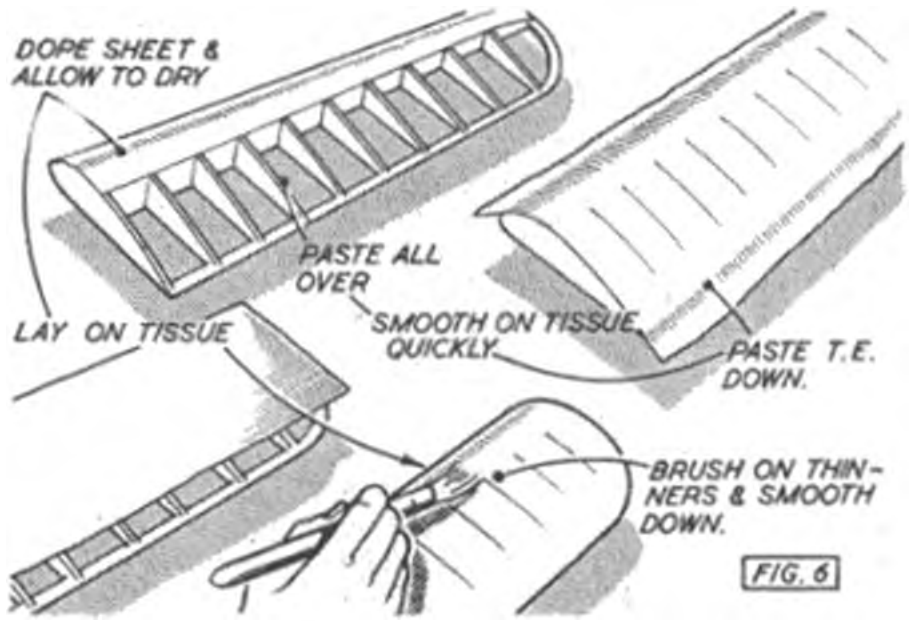
Cover one side of the fuselage at a time, then trim off surplus tissue with a sharp razor blade. After only a few cuts the blade will become dulled, when the edge can be restored by rinsing in a glass of water. Do not use a wet blade for trimming, however, as if water runs onto the tissue it will weaken it and probably result in a tear. When one side has been completely covered, repeat, in turn, for the other sides. Dip a finger in the paste and rub along the edges of the longerons as a final touch to smooth down all tissue edges before setting aside to dry. Actually the fuselage can be water-sprayed at this stage without waiting for the paste to dry, if desired.

Alternative methods consist of sticking the covering strip down at one end, drawing taut end to end and sticking down the other end. Then work along each longeron in turn. Some people prefer dope, banana oil, thinned down cement, or tissue cement, as an adhesive. If you fail with one method, try another. When you find one which gives you good results, adopt it as a standard.

Wings are covered in a similar manner, except that in the case of undercambered ribs, the tissue on the undersurface must be stuck to each rib. Here photo-paste is not generally satisfactory. Some people can use it without any bother. Others find that the tissue pulls away from the ribs when tautened or doped. Thick dope or thin cement is generally best for tacking the tissue down to the ribs as a first stage operation, after which the remainder of the sticking down can be done with photopaste. A typical method is summarised in Fig. 4.

With wings, never attempt to save time by covering past a dihedral break with one panel of tissue. It just cannot be done satisfactorily. Each separate panel must be treated as a separate covering job, with a tissue panel for top and bottom—Fig. 5. Covering will be quicker this way in the long run. In some cases the tips may also call for a separate covering panel. If the tip cannot be covered satisfactorily with the main covering panel, trim off at the last rib and cover the tip with a separate piece.

Many wings have sheet covered leading edges, which tends to aggravate covering difficulties. Any



attempts to economise on tissue paste by simply tacking down the covering to leading and trailing edge will simply produce a series of wrinkles over the sheet portion. The sheeted areas must be thoroughly covered with a thin layer of paste and the tissue stuck down smoothly to this. Avoid excess paste which will " wet " the paper and cause it to tear when drawing taut. Also be sure to draw out all wrinkles over the sheeted portion. Any left in will be permanent.

For best results, work quickly when covering over sheet. As soon as the tissue is impregnated with paste it will begin to expand in size. If you delay laying out the whole panel and pulling in place it will be very difficult indeed to avoid wrinkles appearing in the final job.

Actually, provided you can acquire the knack of working with it, dope is probably the best medium for sticking down tissue covering to sheet. An alternative method is to dope the sheet, allow the dope to dry, then brush on thinners. Whilst still moist, smooth the sheet in place doping down with more thinners, as necessary. It should be attached permanently and smoothly when the thinners have dried again.

This method—dope, dry, and then brush with thinners or brush through the covering tissue with thinners when laid in place—can be used for covering the entire airframe. It needs practice and care to do properly, but once the art is mastered a really first class job is possible. Try it out on an old structure first before attempting to cover a new model by this method.

Finishing off covering when coloured tissue is used also present its problems. The generally recommended technique is to make off one piece of covering around the leading edge, when covering a wing, for example, and overlap the second covering sheet, as in Fig. 7. This can be tedious, especially as the lapped over portion tends to pull away as the second layer is laid down. The area of double covering, even though it is backed by a spar member, will show up as a darker stripe in the final job.

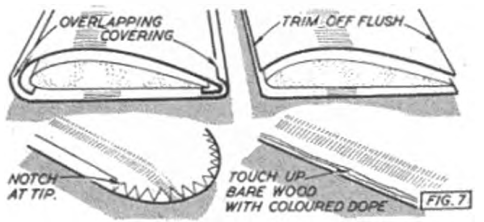
A fairly good job can be done by trimming each sheet of covering off flush at the edge, as in the second diagram. It will be impossible to get an even butt joint between the two tissue sheets all along the edge of the spar. In places it is bound to overlap, and in other leave a gap exposing the bare wood. This method is quicker and, when used, " bare " spots can always be touched up with coloured dope.

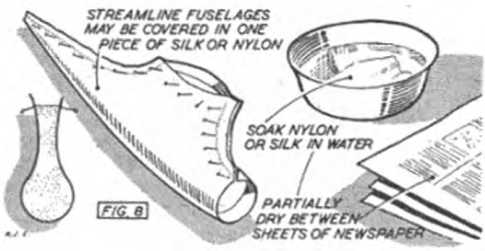
Covering in silk or nylon demands a different technique. Such covering material should always be used in the damp state and drawn absolutely taut when stuck in place over the airframe. Use pins to locate, when necessary. Also try to cover as much as possible with one piece. Wings demand separate panels, as with tissue covering, but often whole streamlined section fuselages can be covered with a single piece of silk or nylon, Fig. 8.

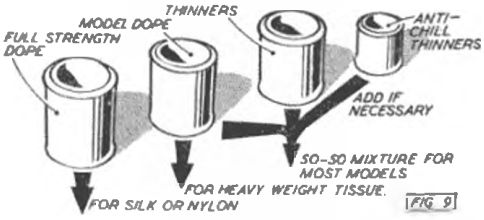
If the silk or nylon dries out before covering is completed it should be re-dampened, *in situ*, by moistening with a sponge. Dry taut silk or nylon will usually slacken off when doped. Damp, taut silk or nylon will dry out with additional tautness to resist the slackening off apparent with the first coat of dope. No wrinkles at all should be tolerated with the original undoped covering. Water-spraying, of course, is omitted. Dope is applied direct after the covering has dried.

Until comparatively recently it was the universal recommendation to pin all wing and tail surfaces down to a flat board whilst drying out from water spraying and, later, doping. With the development of anti-warp structures this is no longer so necessary, except where very fragile structures are involved. Even with orthodox structures, too, it has now become common practice to let wings and tailplanes dry " naturally " without pinning down, on the assumption that it will warp anyway in the long run, so why not now? This method is acceptable, as long as the resulting warps are not excessive. If they are, they can be straightened out by steaming after the final doping.

Doping itself is a subject worthy of a complete article, which will follow later. Fig. 9 gives a guide for the use of model dopes and thinners.







Glider Contests a Farce

DEAR SIR,

Going back 2½ years, just prior to the official adoption of the A/2 in this country when correspondence relating to this class was welcomed by the AEROMODELLER, any letter then published contained some comments on the 328 feet towline and perhaps this may be of more universal interest now. To quote :—

" Why use a 300 feet towline ? I contend that it only increases the potentiality of o.o.s. flights by more than twofold of what would be expected from a 150 feet line, so why use such a long length ? Even if a D.T. is used the proportion of *thermal* flights increases by the same ratio. On 150 feet thermal flights will still be made but the important point is that they will not be made so often and still less will be the chances of getting 3-5 minutes flights and winning a contest on luck ".

How true this has turned out to be, especially when one learns that in this year's A/2 trials there were FOUR *triple* maximums !

Before the last war no one dreamed of using more than 100 feet of line, nor was it considered necessary to do so, and glider contests then were far more enjoyable than they are today. During the early war years the Thurston Cup (F.A.I.) was flown using a 100 feet towline and my own second place time in 1940 was 256·6 seconds for a three flight aggregate flown in rain, and my model landed always within the limits of our field ; an important point today when farmers' crops and the like are at stake. From this line length long thermal flights were a rarity and the flight could be enjoyed, especially on a calm day when it would always be overhead.

In 1944 when the line length had started to jump, now 150 feet models were nearer to thermal territory and it was noticed that flyaways were more common and long chases correspondingly more frequent. With a well trimmed job you could get 1 minute 50 seconds to 2 minute flights off this line. Then came 200 feet and now we have 328 feet. When 150 feet was exceeded anyone could come along and win a contest, but on 100 feet, the story was altogether different. Of course thermal flights cannot be ruled out entirely but they can be reduced enormously.

With regard to the limited flight time, if the average high placing A/2 does 3 minutes under existing rules then a maximum flight limit of 2 minutes could be imposed together with a 100 foot line and still be outside the scope of most gliders today and the sporting aspect would not be marred and maximums (2 minutes) would be far less common than they are today.

I contend that a model which will give consistently good flights from 100 feet deserves far more credit than the " long flight " jobs from 328 feet.

Ellesmore Port. IVAN S. CAMERON.

Readers'

Pertinent comments on contest

International Power Comments

DEAR SIR,

After reading " Discussion on the F.A.I. Power Formulae " by F/Lt. Beasley and Bill Winter's " Reply " in the August AEROMODELLER, I find that I can agree with only one point, and that is *re* the maximum engine capacity of 3·5 c.c.

I can't say that I favour the present rules, not so much because of the 2·5 c.c. maximum engine, but because of the power loading. Here, then, are the rules I would like to see for the International Power Duration Contest :—

(1) *Motor :* Any engine up to and including 3·5 c.c. with NO power loading.
(2) *Model :* Preferably no rules at all (no processing necessary), which would not, of course, be acceptable ! ? ! Therefore, I suggest the general F.A.I. specifications regarding loading and areas.
(3) *Timing :* F.A.I. rules as at present.

The reason for any size motor up to 3·5 c.c. with no power loading is to give all the smaller motors (and the youngsters) a chance in the contest ; and to allow this there can be no fixed size model. The power ruling is bad in that only the most powerful motor in the allowed capacity will get used, and up to 3·5 c.c., the K. and B. 19 undoubtedly leads the way (and K. and B. 19 are not readily obtainable this side of the Atlantic). Also power loadings would only restrict the design and the choice of motor. This rule might be compared with a Wakefield only being allowed 3 ounces of rubber ! Not very popular ! !

The model should not be fixed with a minimum weight (at least not via power loading) as the rate of climb depends mainly upon the weight and not upon the size of the model, and surely by the very nature of the contest, a high rate of climb followed by a good glide is the aim.

Now for a few comments on Beasley's article. I think his remarks about overpowering are unwarranted. Surely it is the lack of knowledge in trimming and design which leads to most erratic flying. In our club, 250 square inch wing area jobs powered by Elfin 1·49 c.c. (weight 8 ounces) and a 350 square inch job with a 2·49 c.c. (weight 13 ounces) have been satisfactorily trimmed *with the motor running full speed on an efficient propeller.*

Regarding taking off. I maintain that the rules should be either R.O.G. or H.L. with no ifs or buts. A model that is *stably* trimmed will R.O.G. in *any* weather . . . witness the power trials.

What is the point in introducing complicated motor run rules when the F.A.I. rule at present

Letters

from four leading fliers

covers all eventualities. All that is required is little discretion by the timekeepers: if the motor run is 20 seconds or under—O.K.; if 20·5 seconds—let it go; and if say, over 21 seconds, "scrub" the flight and put it down as an attempt.

And why a 6 minute limit? Surely the time to raise the present 5 minute rule is when three flight totals of 15 minutes are regularly obtained.

In closing, I hope the S.M.A.E. will form a F.F. Power Committee to go into the question so that we will be able to put forward some constructive suggestions at the next F.A.I. conference.

Banstead. N. G. MARCUS.

DEAR SIR,

I should like to make a few points in reply to F/Lt. Beasley's discourse on a new International Power Formulae. Firstly, he does not seem to have grasped the real reason for choosing a formulae which allows a great diversity of size and weight of model, *i.e.*, that it enables modellers with a wide variety of engines *within the most popular class* to design a machine to suit the engine and compete on reasonably equal terms.

Immediately a fixed size of model is introduced the largest size of motor allowed becomes a must, which is by no means true at present. This would not be so bad if the size chosen was one obtainable from a wide range of manufacturers and was already likely to be possessed by competitors.

Very few modellers possess a 3·5 anyway and I consider it highly unlikely that many will be prepared to expend money on a motor for one event only. With a fixed model size it would be pointless trying to compete with a smaller engine, what chance would an Elfin 2·49 owner stand against the lucky owner of a B B Amco.

On F/Lt. Beasley's own statement the larger engine and model already possess a small advantage, why make this many times more by penalizing the owner of the small motor, the only result will be that he just won't bother to compete.

I cannot see how a fixed size of machine has much effect on ease of checking. The areas and cross section must still be accurately checked and 10 seconds with a slide rule gives the relationship between the two under the present system.

This seems a small price to pay to make the event one of popular appeal. Neither can I agree over his proposed engine over run and launch rules. I favour hand launch. Fifteen seconds is quite sufficient engine run, 20 seconds makes it too easy and flight times are already too high.

In the case of overrun I favour a no flight ruling, three attempts per flight, as at present.

This completely rules out any advantage to be gained by overrunning and gives a second chance in the event of the odd timer jade which does occur, despite careful timer maintenance to my timers, even if not to F/Lt. Beasley's.

If we want the Americans to compete, the best plan is to extend the present rules up to 3·5 c.c. leaving us to choose our own power plant and design the best model for it, a far more interesting proposition than building a model which is practically designed for you.

Surbiton. P. R. BUSKELL.

. . . And more on Rubber Contests

DEAR SIR,

Duration flying has now got to such a high standard that it would appear time for emphasis to be laid elsewhere than upon duration only.

At present flights seem to be getting longer and longer, flying fields smaller and smaller, and, due to complaints by farmers (resulting from broken hedges, damaged corn, etc.) farther and farther away. This, plus the fact that the best modeller is not of necessity the best cross country runner, forms a vicious circle which needs to be broken.

May I add the following scheme to the ideas already put forward as a cure for our problem. While it is put forward with mainly "Wakefields" in mind, something similar could, no doubt, be devised for the other classes.

Instead of concentrating solely upon duration, let stress be laid more heavily upon reliability and consistency. To this end, let us scrap the present three-flight, 5 minutes maximum system, and substitute five-flights with a 3 minutes maximum with a rule that the same model must be used throughout. No part to be replaced (except rubber) and the model to be produced at the conclusion of the contest.

A bit drastic? But look at the result. Firstly a 3 minutes maximum coupled with the fact that a lost model would lose the contest for the competitor, would keep the model within reasonable bounds, almost certainly within the average airfield. Thus the farmers are pacified, and those no longer in Marathon condition are not so penalized. Secondly, the five flights together with the no-replacement rule, would mean the development of a model which would have to be reliable.

It is very likely that these considerations would automatically reduce the amount of rubber carried, but a limitation of this to, say 2½ ounces may well be a good idea, probably allowing the present stipulated area rule to be dropped, thus simplifying checking and giving still greater design scope.

Before this five flight scheme is denounced as taking too long to run off, it is contended that the quicker recovery that would occur would offset this, and that the stronger aircraft resulting from the rules would cause little delay due to repair work.

Bristol 7. G. WOOLLS.

RADIO CONTROL NOTES

CONDUCTED BY HOWARD BOYS

SEVERAL readers have sent in details of a control system for operating two separate sequences by push button without any coding, and using only simple carrier operated receiver of the one valve type. The first news of this system received by the writer, came from Phil Such of Birmingham, and this was also the simplest. Fig. 1 shows the electrical connections at the receiver end. The transmitter is pulsed so that the armature with its contact C is in the middle and not making contact with either A or B. One push button on the transmitter will cause contact A to be made thereby operating escapement 1, and the other push button will operate escapement 2. It will be seen that both cannot be operated at the same instant, but either can be operated immediately after the other, and using one cannot upset the sequence of the other.

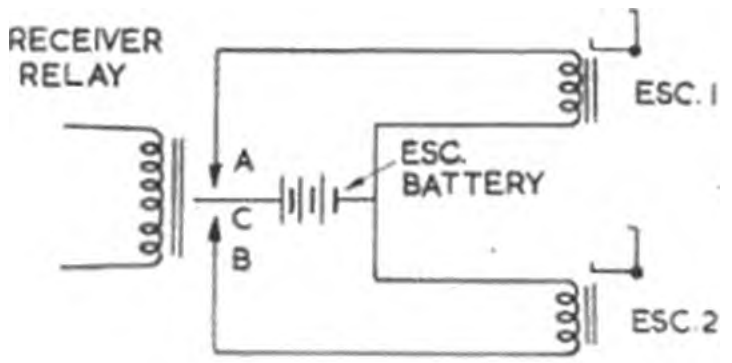


FIG. 1.

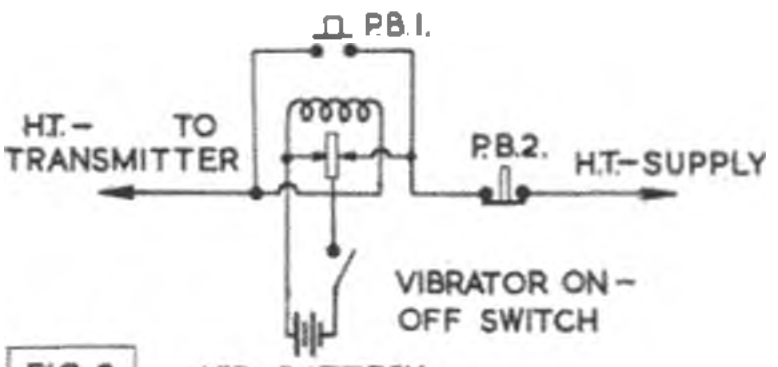


FIG. 2.

The pulsing of the transmitter is by means of a vibrator as used in the usual vibrator pack for H.T. supply. The contacts of this are connected in the H.T. neg. lead from battery to transmitter as Fig. 2. Across these contacts is connected a push button so that when it is pressed it short circuits the contacts and gives continuous signal. Another button is connected in the lead so that when pressed it disconnects the H.T. supply and therefore cuts off the transmitter. Note that the two buttons are different types, one pushes on, the other pushes off. The vibrator switches the transmitter on and off at such a high speed that the relay armature cannot follow it, and therefore floats in between its contacts. Mr. Such is now experimenting to obtain proportional control on one pair of contacts with a sequence on the other pair.

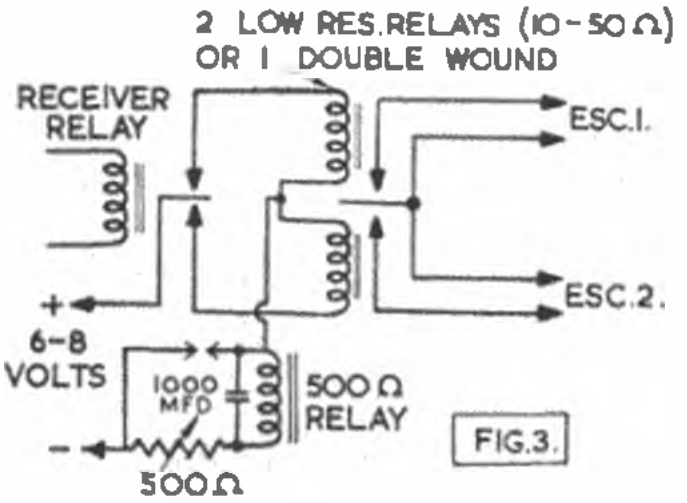


FIG.3.

The writer believes that it will be necessary to use a receiver that gives a constant current change at all ranges, such as the XFG1 or Aeromodeller Hard Valve, as with other hard single valve receivers the reduced change with increasing range would cause difficulties with relay adjustment. With some combinations of transmitter and receiver it would no doubt be possible to keep within the range of the full current change. It would also seem best to use a relay with a well balanced though heavy armature.

This system has been used by various other people to give neutral rudder with pulsed signal, right rudder on one button and left on the other button. The success of this system depends on the vibrator switching the transmitter on and off faster than the relay can follow, and the relay adjustment being just right.

If the transmitter is pulsed at a lower rate, down to as few as ten times a second, a slightly different scheme is needed in the receiver, and a few details of this have been sent by Mr. Mahoney of Liverpool. With the slow pulsing the relay will make contact each side with every pulse, and this would soon unwind the turns on the escapement. To avoid this, two further relays are connected up with a delay device that prevents the magnetism building up sufficiently to pull the armature on, until the relay contact has been held on for half a second or so, see Fig. 3.

By using two receivers, one escapement can be operated by each, and they can be in separate models. This is shown in Fig. 4. One transmitter only can be used.

Mr. Mahoney's equipment was meant for a boat, where weight matters less, but the same scheme can be used for model aircraft. The 1,000 mfd. condensers are the weighty items, and the writer carried out experiments with lighter equipment. A receiver already installed in a model was used and the relay contacts connected up like Fig. 3 model 1. Using a half ounce auxilliary relay with a resistance of 2,000 ohms, a variable resistance of 5,000 ohms,

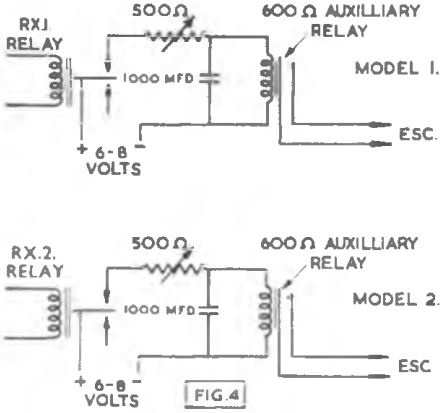
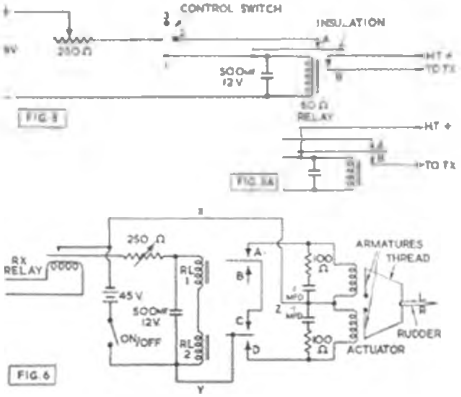


FIG.4

7½ volts and a 10 mfd. 25 volt Picopack electrolytic condenser good results were obtained. The transmitter was pulsed with a P.O. type relay with 200 ohms resistance with 6 volts. It was found that the pulsing could be as low as about 5 per second without operating the escapement, yet it would follow at about 2 per second. A 1,000 ohm relay was also worked in this way, and it is almost certain that a 5,000 or 10,000 ohm auxiliary relay could be used with a 20,000 ohm variable resistance connected to the H.T. battery since the current consumption is very low.

More details of a similar system have been sent by Mr. Bruce Kendall of Western Australia. He believes that only one other enthusiast is operating radio control in that part of the country. Mr. Kendall has had articles published in his local papers, and has given a talk on the A.B.C., the counterpart of our B.B.C.



His pulse unit for the transmitter is made from a relay and the control is a three-position switch see Fig. 5. In the simplest case this gives 1 right rudder, 2 central, and 3 left rudder. At position 1 the relay contact is held down closing contacts B and keeping the transmitter switched on. Position 2 causes the relay to vibrate, pulsing the transmitter, and at position 3 the relay and consequently transmitter are both off. The relay is adjusted to pull on with half the total voltage across it, and the variable resistance adjusted to give positive pull on with switch at position 1. The speed of pulsing is adjusted by the armature tension and the travel. Resistance adjustment will then alter both pulse rate and "mark space" ratio, so that adjustments can be made on the ground. If the relay contacts are not separately insulated, it can still be used as Fig. 5a but it will now be connected directly to H.T. positive, and the whole of the pulsing unit should then be insulated from the rest of the transmitter, and from fingers ! !

The gear at the receiving end looks a bit complicated but is not so bad when you know how. Fig. 6 shows this arranged to give rudder control only, with positive positions, right, central, or left according to the switch position on the transmitter. The auxilliary relays, RL1 and RL2 have a resistance of about 100 ohms. RL1 is adjusted to pull in and drop out at 6–5 m.a. and RL2 for 11–10 m.a. respectively. With no signal from transmitter the RX relay contacts will be open and no current will flow through RL1 and RL2. Contacts A and C will be closed, and current will flow from the 4·5 volt battery through L actuator. With pulsing, RX relay contacts pulse, and a smoothed current of 7 m.a. will flow through RL1 and RL2. This opens contact A and no current flows through the actuator, and rudder stays central. With transmitter on, RX relay contacts close, a 13 m.a. current will flow through RL1 and RL2, opening contacts A and C and closing D, allowing curernt to flow through R actuator. If the actuator resistance is low it would be better to use a separate battery for this, disconnecting the wires X and Y, and adding the battery between Y and Z. The spark suppressor across the actuator, (100 ohms and ·1 mfd.) may not be necessary if the actuator is small. After the 250 ohm variable resistor has been adjusted to give the currents stated, its value can be found and a fixed resistor substituted.

If the rudder shows any sign of jerking when the control is central, it can be cured by adjustment of the transmitter variable resistance.

By changing over connections 1 and 2 on the transmitter control and A and B on receiver RL1, the rudder will be central with transmitter off.

This system can be enlarged upon if desired to give two positions on each of two actuators, such as rudder right and left, and elevator up and down, and the positions can be controlled by a "Joy-stick" on the transmitter. Diagrams for this, the transmitter pulse and control unit Fig. 7 and the pulse decoder relays and actuators, Fig. 8. The pulse unit is again made from a relay of about 60 ohms, and contacts are added at A, insulated from the frame, to cause it to buzz. The contacts marked 33% and 66% must be adjusted so that they are

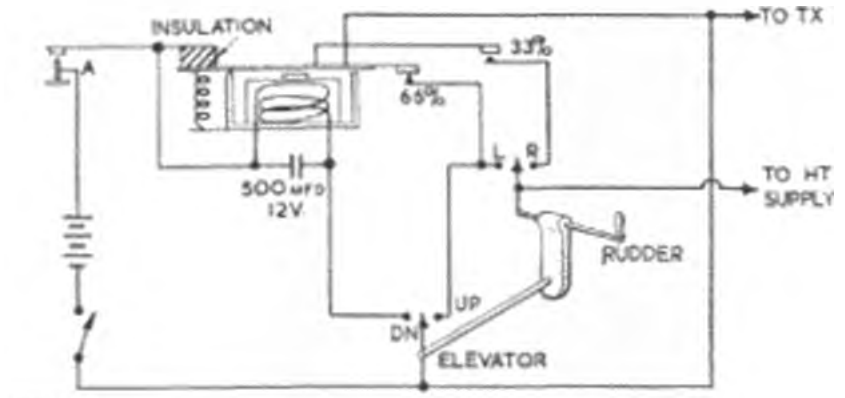


FIG.7

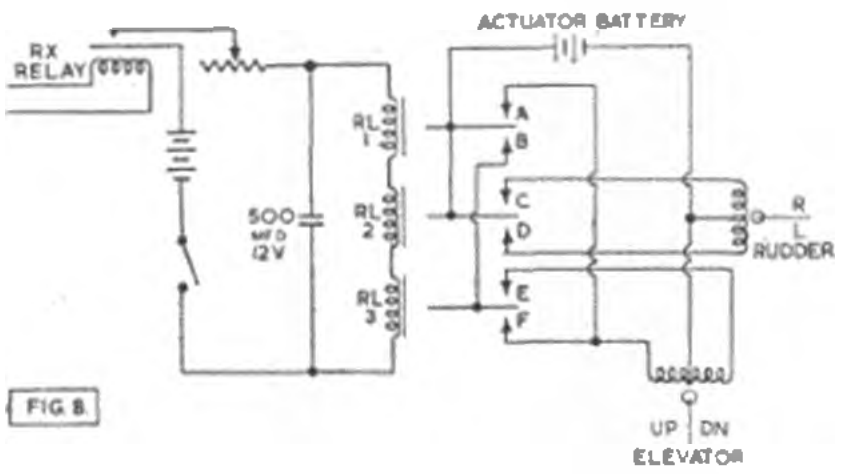


FIG 8.

closed for 33% and 66% of the time of buzzing. Two, two position single pole switches are required, and the one for the rudder can be mounted on a bracket on the knob of the other. The elevator switch can be mounted on the right hand side of the control box, with a lever sticking up from the knob so that it can be pushed fore and aft, for down and up elevator. The rudder control switch can be mounted on the top of this lever, so that it rotates sideways, and from the knob of this another rod is fixed vertically with a handle on the top. See Fig. 9. The pulse contacts are adjusted with the unit connected to the transmitter with a meter in the H.T. supply lead. Put rudder left, and elevator up and note the H.T. current. Put elevator down and adjust contacts to give 66% and 33% of this current with rudder left and right respectively. This may require a bit of patience. The signal put out by the transmitter now will be: up, left 100%; up, right 0; down, left 66%; and down, right 33%.

In the receiver gadgetry there are three auxiliary relays of about 100 ohms resistance each, and the two actuators which can be double acting magnetic of the "Birden" type. The variable resistance should be about equal to the three relay resistances together. The relays are adjusted to close at 15%, 50% and 75% respectively of the total current, and the current flowing should be 100%, 66%, 33%, or 0 according to the transmitter control position. To obtain this in the receiver it may be necessary to adjust the transmitter pulse unit a little.

Here now is an explanation of the working. With elevator up and rudder right, there will be no signal, the 33% contacts remaining open as there is no pulse. In the receiver, no current will flow through the relays so all contacts will be up making A, C and F. Current will flow through the up and right parts of the actuators. If the control is now put to down elevator, still with right rudder the pulse unit starts, and a 33% signal will be transmitted. In the receiver RL1 will pick up, and contacts B, C and E will be closed. This energises down and right actuators. With control at left rudder and down elevator, a 66% signal will be radiated which picks up RL1 and RL2 on the receiver, closing contacts B, D and E, energising the left and down actuators. Setting the control to left and up gives a continuous signal that picks up all three receiver relays closing contacts B, D and F, energising left and up actuators.

As no neutral position is provided, the writer began to think up ways and means to achieve this. This could be done to give both neutrals at the same time by fitting up a 50/50 "mark-space" ratio on the 66% signal, Fig. 10 shows this, but one control will not remain neutral while the other is moved.

Now a handy gadget sent along by Mr. Derek Clayton of Rhondda. This is made to fit the 0–5 m.a. meter which is normally plugged into the receiver circuit on the model. A socket similar to that on the model is fitted onto a piece of ply or paxolin 1/16 in. thick, 2 in. wide by 2½ in. long. Also to this panel are fitted four eyelets or sockets for leads. Between these eyelets and the meter socket are wired resistances as shown on the back. It is then boxed in with ¼ in. sheet balsa. With the meter plugged in you now have a multi-range instrument, just right for checking batteries, etc., on the field. See Fig. 11.

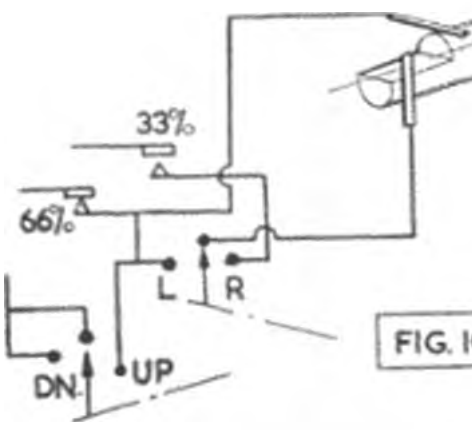


FIG. 10.

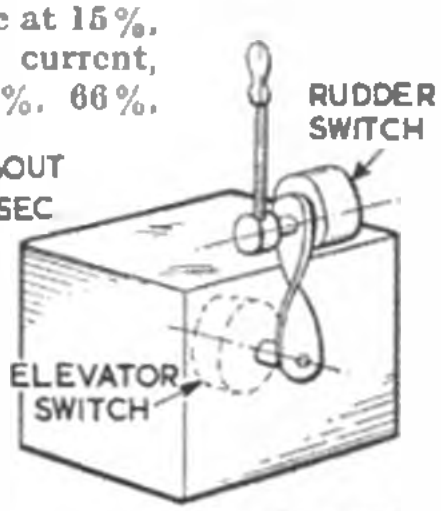
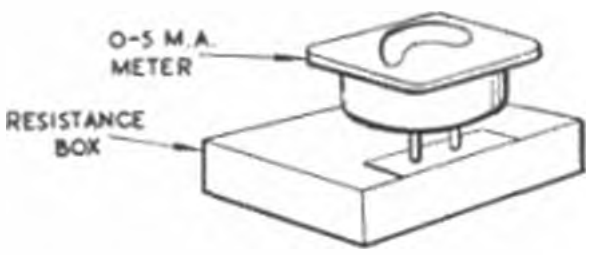


FIG. 9.



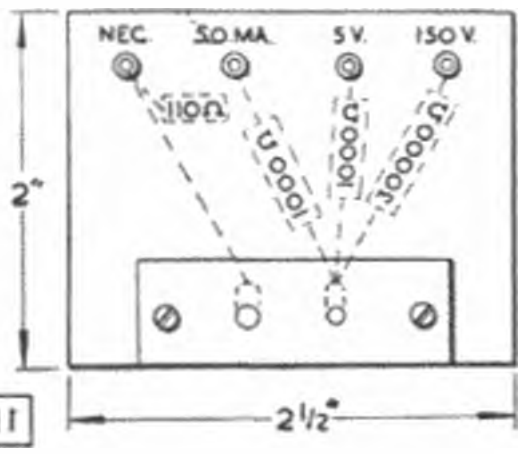


FIG.11

SCOTTISH PAGE

This good-looking Frog 500 powered Bipe, built by Gordon Richmond, Prestwick M.A.C., was flown by him at the Ayr Control Line Demonstration.

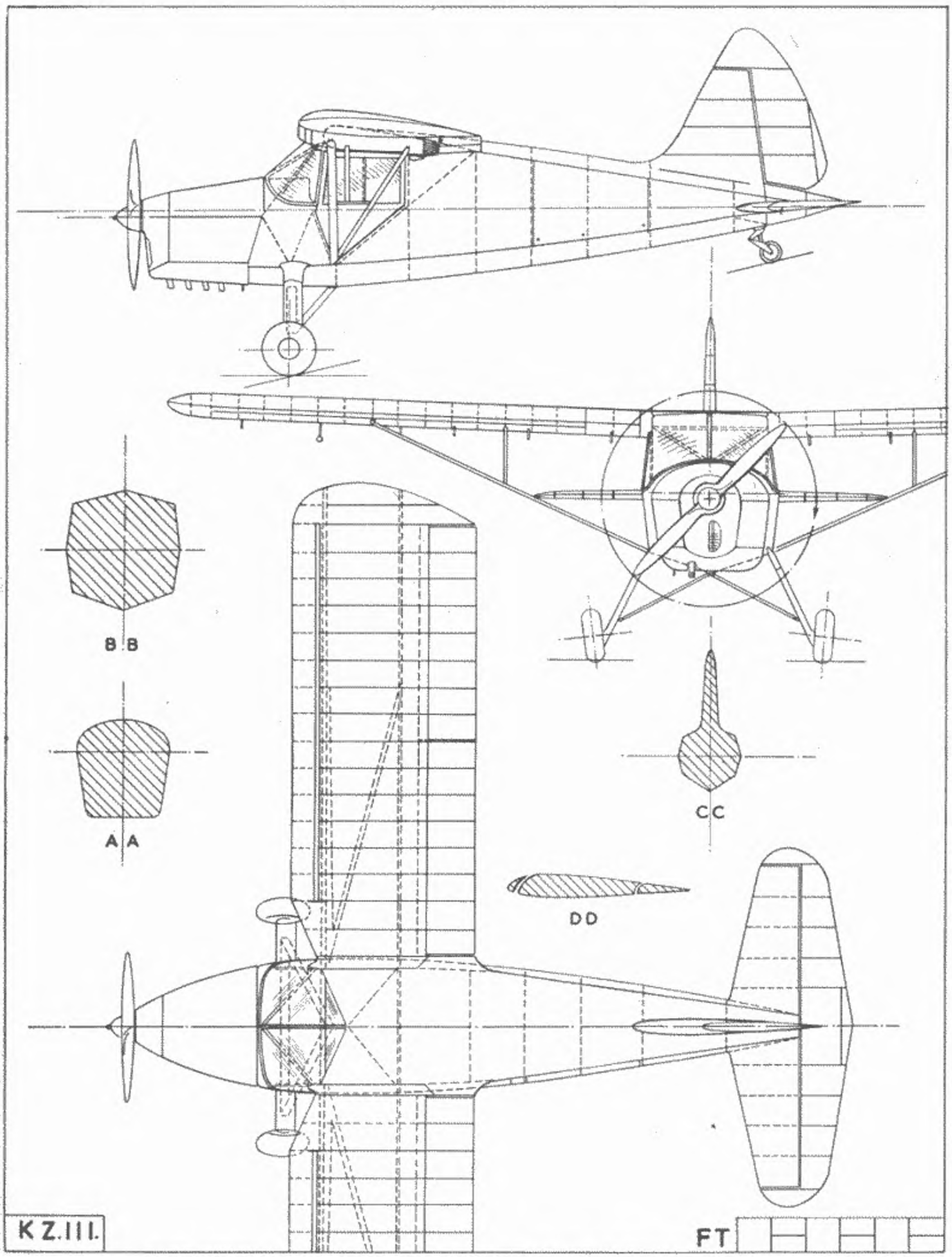
WITH a pretty nearly last minute change of venue, the final eliminator contest for the Scottish team in the **U.K. Challenge Match,** was held at Lanark on August 24th. Top men from the South East Scottish Area, and the West of Scotland Area, flew for selection in the three classes, but interest from the North East Scottish Area failed to materialise.

Although the weather was calm enough, a persistent drizzle made model flying a squelchy business. However, as the afternoon wore on the rain cleared off, and times came in to indicate that it would be a mostly West of Scotland Area team. The notable exception to this state of affairs was in **Stirling M.F.C.'s** expert rubber-power flyer, Jock Finlayson, who aggregated 7 : 01·0 with only two flights. R. Owston, **Glasgow M.A.C.,** was second with 6 : 25·0, third W. McConnachie, also Glasgow M.A.C., with 6 : 23·8, and fourth was the only other East coaster to make the team, George Simpson, **Dunfermline M.F.C.,** who scored 5 : 30·5. Barnstormer Pete Kimantas is reserve.

In the power eliminator, Ian Gilroy of **Kilmarnock M.A.C.,** led with 9 : 20·0, Joe McMaster, Glasgow M.A.C., second with 6 : 55·0, Andy Watson, **Lanark M.F.C.,** third, 6 : 41·0, and Bob Parsons of **Prestwick M.A.C.,** fourth, with 6 : 15·9, S. Howitt, Edinburgh, is power reserve. In the glider class, Willie McGill, Kilmarnock M.A.C., topped the list with an aggregate of 8 : 51·0, MacArthur, S.A.S. M.A.C., second, 8 : 10·0, W. McConnachie of Glasgow, and Big Jim Robertson of Kilmarnock, completed the team, scoring 7 : 24·9 and 7 : 22·6 respectively. Glider reserve is Edinburgh's Wannop.

Now here's a report from Bob Burns, on the latest skullduggery at **Stewarton M.A.C.** Quote : " Recently a group of members were observed gingerly backing out of a barn, in a large circle, facing inwards, on tip-toe. They strained and swayed with hands held high, while three others, armed with a fire extinguisher, blow lamp, and a lump of petrol soaked rag, hopped around at their feet. After frenzied shouts and a lot of swaying in unison, very reminiscent of the very worst form of Ballet, their efforts succeeded, and one of Gilly Wallace's 15-foot hot air balloons rose majestically into the evening sky. They are made of tissue paper, ordinary dress wrapping stuff, and the fire is usually a bit of waste wool in the centre of the three-foot opening underneath. This is one model you can't lose in a field of corn, as after the fire goes out, well up in the air, it settles slowly until it sits like a bubble on top of the stalks. These balloons look like plastic material, are open below, like a jet nacelle, and are lit inside by their fire, so if you hear of flying saucers in Ayrshire, them is us ! The club has come to the end of the first half of the season as the state of the crops on the flying ground calls for an interval. There have been more good Sundays than usual, and the attendance has been from 27 to 18 members most days. A new type of competition is being tried out, on novel lines, for ½ c.c. engines, and details are promised later. A club prize for new models was run off, with up to 100 points for workmanship, and 100 for flying, these being divided into 50 for the model's behaviour, and 50 for duration. Gliders, for example, had to get right up overhead on tow, and fly with stability in glide, to earn full behaviour marks. Power models had to climb correctly (according to type), change from power to glide with no stall, and glide with stability. The winner was George Findlay with 163 points."

With so many of the Scottish team for the U.K. Match coming from the **West of Scotland Area,** the Area travel fund is going to be somewhat drained to pay for the fares in the special bus. The funds are able to stand this though, thanks to the cash raising ability of the Clubs at the control-line demonstrations staged at the Area's seaside holiday resorts. The most recent of these shows were held at Troon, Irvine and Ayr. Worthy of mention is Mrs. Bob Dunlop's opening of the Irvine demonstration flying Bob's little stunt model. Both Dunlops are members of **Irvine and District M.A.C. :** the five plane wing-ding at Troon, consisting of two class A team racers, one class B racer, one stunt job and one scale control-line model. All hammering round the same circuit it looked very impressive. Ian Cochrane of the **Glasgow Barnstormers** had a twin Elfin powered Invader. While on the subject of demonstrations, the newly formed **Mauchline M.A.C.** raised a fiver for their funds with a static and C/L flying show at Mauchline school Prestwich, S.A.S. and Kilmarnock Clubs pitched in to give a hand with the flying.



This 1/48 Scale Drawing is available at 1/- post free from the Aeromodeller Plans Service.

The SKANDINAVSK AERO INDUSTRIE

KZ. III

AIRCRAFT DESCRIBED No. 52 BY G. A. CULL

ONE of the prettiest of modern light planes to be produced in recent years, the KZ.III or Lark as it is known in native Denmark, was designed during the war. The designation is derived from the first letters of the names of the co-designers Kramme and Zeuthen, but although numbered III it is, in fact, their fourth design.

Preliminary trials of the prototype were contrived by it becoming an ambulance plane, complete with Red Cross, in which guise some flying was possible under otherwise impossible conditions. In this way really complete trials could not be carried out, and so the dismantled machine was quietly taken by rail to neutral Sweden and re-erected for further tests. This "under cover" prototype bore the Swedish registration SE-ANY on silver dope and flight trials showed that very little needed modification before the machine could be built in numbers.

With trials completed the new KZ.III went into production at the end of the war and was built until 1947. Like the British Auster, the Lark enjoyed an initial monopoly in Denmark which the war had left denuded of light aircraft. Airframe construction is conventional, and the Lark seats two comfortably in its four-feet wide cabin, although other dimensions are smaller than usual for its class. A central forked joystick and dual rudder bars provide controls for training, in which role the Lark has done good work and its docile characteristics make it an easy, though non-aerobatic, machine for pupils. This is largely due to the slow-flying aids in the form of almost full-span fixed slats and the large slotted flaps which produce a gentle stall and landing speed as slow as 34 m.p.h. It is interesting to recall that when the prototype had been fitted as a glider tug, the glider stalled before the Lark towing it. The British 90 h.p. Blackburn Cirrus Minor II engine is fitted and drives a two-bladed wooden propeller.

A larger version of the Lark, the American-powered KZ.VII superseded the KZ.III in production for military as well as civil use, but not before the Lark had spread throughout Scandinavia and as far afield as Malaya and Australia. In Switzerland a KZ.III is regularly flown on skis and visiting examples from the Continent are occasionally seen in this country.

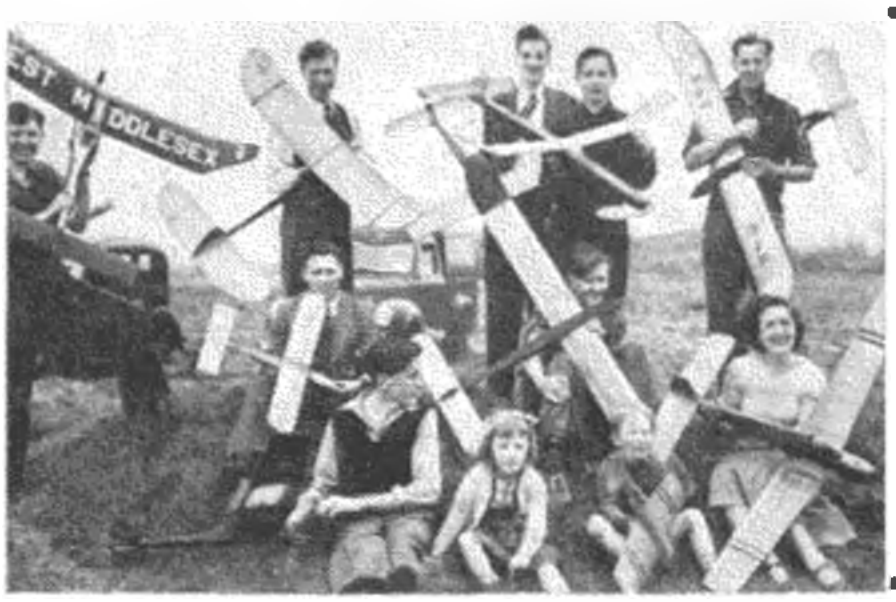
Colour : Larks are doped to owner's taste and specimens seen in this country have been bright red all over, silver and cream, with black, black and green, and green and blue lettering respectively.

Construction : Fuselage is of welded steel tubes with wooden stringers and fabric covering. Wing has two wooden spars with ply ribs. Forward of front spar including slat, is ply-covered, remainder is fabric covered. "V" struts of oval steel tubes brace the wings. Tail unit is of ply-skinned wooden construction with steel tube controls covered with fabric. Undercarriage has coil springs and wheel brakes.

Specification : Span: 31 ft. 6 ins. Length: 21 ft. 7 ins. Height: 6 ft. 11 ins. Wing area: 139·9 sq. ft. Wing loading: 10 lbs./sq. ft. Empty weight: 913 lbs. Loaded weight: 1,435 lbs. Max. speed: 115 m.p.h. (sea level). Cruising speed: 106 m.p.h. Initial climb: 689 ft. per min. Ceiling 13,120 ft. Range: 310 miles (496 with long range tank). Full load take off: 77 yds. Landing run: 55 yds.

Heading photo shows permanent slots, slotted ailerons and flaps of the KZ.III. Left is the larger and more powerful KZ.VII developed from the KZ.III.

(Upper photo, courtesy of the "Aeroplane".)



CLUB NEWS

Members of the West Middlesex M.F.C. at Hounslow Heath. Models include PAA load F/F power, Wakefield, A/2 glider, lightweight rubber, and low-wing scale. Note the club recovery service in the foreground.

WITH the current competition season drawing to a close, it is time to consider affairs for next year, and I ask every keen aeromodeller to seriously study the proposals mentioned in our Editorial this month, for the proper consideration of such matters is bound to have a far-reaching effect on our future activities. It has never been my failing to gloss over defects in the movement, nor to refrain from handing out the odd brickbat from time to time. Therefore, may I ask all who read this to carefully view their own record in the tresspass-cum-crop damage stakes, for it is no use keeping up the pretence that it is always the "other fellow" who does such terrible things. Halo's do get tight you know!

Who lost a mac at the *Yorkshire Evening News* meeting at Sherburn? Whilst looking for a lost model, members of the Grimsby club found a gent's fawn mac, and the owner can claim same on application to Mr. A. G. Balding, 76, Bursar Street, Cleethorpes, Lincs., providing proof of ownership can be maintained.

Still on the "found" column, Mr. R. F. Fairbairn of 52, Hanover Gardens, Kennington, S.E.11 advises us that he has collected a Mercury "Marauder" (Elfin 1.49, black fuselage, yellow wing and tail) from a friend residing in Eltham. Apparently the model landed about 3.30 p.m. on the 12th July, and as the local police refused to do anything about it, the finder approached Mr. Fairbairn knowing him to be an aeromodeller. Owner, please do your stuff—and next time, put your name and address on the model!!

Though billed as an International Contest, the meeting staged by the International Radio Controlled Models Society at Blackpool last August hardly met expected standards. Only eight aircraft took part, including two from Belgium, and it was left to these overseas visitors to really show how R/C flying should be done. Of the remaining entries, two went o.o.s., one was withdrawn, and one was damaged on take-off, and all round it was a case of man (and model) versus wind. The Belgian competitors arrived with a magnificent trailer, on which the transmitter was mounted, and after the contest, won by a big margin by Mons. J. F. Gobeaux, the two Continentals staged an exhibition of two aircraft under control at the same time, using two frequencies with special G.P.O. permission. Full results were :—

1.	Mons. J. P. Gobeaux	527 points
2.	Mons. J. Dubuisson	331 ,,
3.	A. Ingham	300 ,,
4.	T. Rickleton	290 ,,

East Midland Area

Variety is the keynote of the **GRIMSBY M.A.C.**'s activities, and everything from chuck gliders to R/C enjoys a following. In the glider section the "Quickie" and "Jader 60" are proving to be the most popular models for contest work, although a junior member's flying wing has caused a lifting of eyebrows from the gen boys on account of its consistent flying. Team racing enjoys a large following, M/s Balding, Goddard and Mundy sweeping the board at Butlins in June. Although only two members own radio sets, it is surprising the number of models that have fixed up for the destructive device, every sport plane over 5 ft. span being sacrificed to the followers of Marconi.

The **FAKENHAM M.A.C.** is making good progress, free-flight power being the most popular line at present, most members favouring the "Mallard". Big laugh of the month was the club "expert" on Mallards who had been boasting about the climb, glide and wonderful building, etc., etc., on his model until everyone was fed to the back teeth. Said "expert" filled the tank, started up, and—forgetting to set the timer—let it go. Last seen heading into cloud at 1,500 feet!

Midland Area

The Area has been considering limitation of flight times in order to keep within aerodrome limits, and somewhat similar proposals to those mentioned in this month's Editorial were put forward. (We understand that a number of Areas are trying out these limitations in order to gain experience, and we trust all will forward their findings to the S.M.A.E. Council, for it is by such trial methods that the best results can be secured.) A full programme of events is promised for the Area September Rally, and full results will appear in our next issue.

J. F. Edwards of 82, Arlington Road, Warstock, Birmingham 14, is desirous of forming a club in his district, so will anyone interested please contact him without delay.

Organised by the Rotary Club of Beeston, members of the **ZENITH M.A.C.** put on a good exhibition of

models, ably supported by control line demonstrations by chaps from the Foresters. The exhibition was a great success, and models attracted a good deal of attention, and many membership enquiries ensued.

Comprising a number of clubs in the western part of the Area, the **BLACK COUNTRY SUB-AREA COUNCIL** staged a free-flight Rally on Highgate Common, near Stourbridge on September 7th. In spite of the cold, misty weather, about 40 competitors gathered for a day's flying that proved quite enjoyable. A form of precision contest proved very popular, all classes of model being eligible, and requiring four flights of not less than 20 secs. to qualify. Nearest competitor to 180 seconds aggregate was judged the winner. Full results were :—

Power	Barret, J.	(Wolverhampton)	7 : 26
	Hardwick, P.	(Wolves)	7 : 14
	Nutting, G.	(Wolverhampton)	6 : 39
Glider	Lee, T. M.	(Wolves)	9 : 37
	Coxall, P.	(Wolves)	8 : 39
	Walker, G.	(Blackheath)	7 : 07
Nomination	Walker, G.	(Blackheath)	1 second error
	Hardwick, P.	(Wolves)	2 " "
	Nutting, G.	(Wolverhampton)	6 " "

The recent Y.E. News meeting was graced (not disgraced !) by the presence of over 60 members of the **CHESTERFIELD SKYLINERS,** but though maximums were scored, the party came away empty handed. Due to the fact that four planes were lost o.o.s. the party had leg room on the return trip ! Yorkshire folk are congratulated on their honesty in reporting the finding of two of the planes lost, both landing at Goole.

This is the season of fetes, galas, and C/L demonstrations, and by gum, how the " lolly " rolls into the coffers of the **FORESTERS (Nottingham) M.F.C.** The club, amongst others, enjoyed good weather and fortune at the Y.E. News meet, enabling Tom Woodward's E.D. 2·46 Mallard to break the club ratio record with a score of 32·6. Tom placed 4th in the event, and if only he were on A.C. he would be smooth chinned for ever ! Doug. Bolton, Jimmy Weston and Johnny Hales flew their " Yellow Peril " plane to impeccable victory in the Class A Team event, averaging over 53 m.p.h. for the final. The Class B team hurtled their " Hiawatha " through the heat and semi-final in spite of a plug change, but four more plugs failed in the finals, and their placing dropped to 3rd.

Northern Area

The sub-committee on the Y.E. News Rally reported that the meeting had been an even better financial success than last year. 822 entries were made up as follows :—Team race 90, Glider 305, Power 194, Rubber 126, Chuck glider 48, Novelty 31. Seventy-two glider flights were timed to a maximum.

Things are looking up in the **WOODLANDS M.F.C.,** and due to a reduction in membership fees, they now have a fairly good batch of fully paid up members. Main activity is free-flight scale models, so much so that John Bridgewood won the Super Scale Trophy at Fairlop, a well deserved win after travelling 150 miles to the contest. G. Clifton, who has had some good flights from an impeller driven La.17 has now got the plans drawn up for a very ambitious Hawker Hunter. Owing to a lack of junior members, their present lone hand in this class is deprived of the cup for Junior Champ., the trophy have been temporarily diverted to a scale contest !

Those who have flown from time to time on Baildon Moor will like the following verse subscribed by a nature lover, who also lays claim to two large sons engaged in the nefarious hobby of aeromodelling. In the interests of domestic peace, he hides himself under the nom-de-plume of " Indignant Rambler ".

" BAILDON MOOR "

Crouching low upon the moor
Surrounded by adult and toddler
Flips and flips with finger sore
The all-too-common Aeromodeller.

Launching plane with engine popping.
Watching it with vacant eyes,
Chasing it with hair a-flopping
Till it dwindles in the skies.

What can save us from this horror
Spoiling nature's peace and charm ?
Snarling engines, tripping tow-lines,
Raucous noise where once was calm.

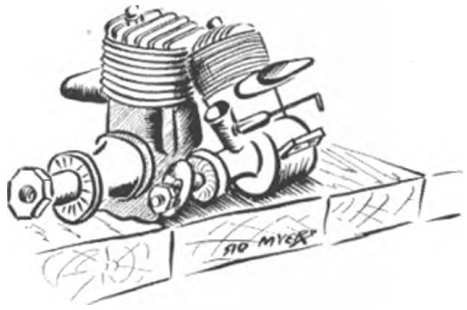
Have we no remote possession
Where they all could be confined
To carry on their strange obsession
Out of sight—and out of mind !

South Eastern Area

The Area is prospecting a new ground at East Guldeford, near Rye, where there exists a very co-operative farmer (surely a museum piece !). It is hoped to stage the Area Autumn Rally there, and it is hoped that members will make great efforts to maintain the friendly atmosphere by observing the rules of aeromodelling relating to crops, gates, fences, litter, etc. Foot and mouth disease continues to make things awkward in this Area.

SOUTHERN CROSS A.C. members made a good showing at the All Herts Rally, Tony Nichols and Keith Donald collecting first two places in the tailless glider section, and Mrs. Doris Hollway got herself a pair of nylons in the Ladies' Glider event ! Only three people have so far qualified in the club's championship, Donald leading with 9·80 points against Bill Gravett's 8·54. Only three entries were received for the Aerobatic contest, held at East Hill Park on the 11th August, and all these were in turn dogged with engine trouble. D. Lane proved the winner by a large margin over the runner-up K. Donald. A glider lost by Ron Smith on June 22nd was returned on August 25th in a much chewed state—having been devoured by a combine-harvester. A 3d. piece used as extra nose ballast was still secure in its compartment !

. . . I think we are going to have a ½ A !



"YORKSHIRE EVENING NEWS" RESULTS

Glider			
Burton, G. E.	(Outlaws)	8 : 00	6 : 47
Wicks, P.	(Northampton)	8 : 00	5 : 57
Sugden, D. C.	(Loughborough Coll.)	8 : 00	5 : 27
Rodgers, J.	(Solihull)	8 : 00	5 : 17
Eckersley, S.	(Bradford)	8 : 00	3 : 34
Sprason, E.	(Solihull)	8 : 00	2 : 27
Power			
Simmonds, R.	(Grimsby)	8 : 00	5 : 27
Griffiths, H.	(Southport)	8 : 00	2 : 36
Crouch, B.	(Northampton)	8 : 00	: 40
Woodland, T.	(Foresters)	7 : 58	
Preston, H.	(West Yorks)	7 : 27	
Woodhouse, R.	(Whitefield)	4 : 24	
Rubber			
Harrison, I.	(Cheadle)	8 : 00	15 : 04
Cartwright, J. K.	(Bridlington)	8 : 00	9 : 22
Rockell, W.	(Lincoln)	8 : 00	8 : 23
O'Donnell, J.	(Whitefield)	8 : 00	4 : 02
Bennett, A. D.	(Whitefield)	7 : 47	
Chuckglider			
O'Donnell, M.	(Whitefield)	3 : 53	
Steel, M.	(York)	3 : 50	
Teamrace A.			
Bolton, D.	(Foresters)	52·5 m.p.h.	
Goddard, R.	(Grimsby)	50 ,,	
Teamrace B.			
Cameron, B.	(Croydon)	44 m.p.h.	
Russell, F. G.	(Worksop)	52 ,,	
Novelty			
Tattersall, H.	(Halifax)	23 sec. error.	
Collinson, R.	(Bradford)	24 ,, ,,	
Concours			
Lees, F.	(Ashton)	Scale.	
Mellar, G.	(Sheffield)	Free-lance.	

In showery weather, five clubs took part in the East Kent division's rally at Ramsgate Airport, and with a high wind, models were crossing the airfield in 1½ minutes. Best flight maintained in sight was 3 : 31, but the general standard of flying clearly demonstrated the lack of practice throughout the Area this year owing to Foot and Mouth restrictions. The nomination event seemed the most popular, no skill or Olympic runners being needed! C. Ashby's "Debutante" landed well downwind o.o.s. after 2 : 09, only to be consumed by very large type pigs. All that was left was the motor and a much shattered fuselage. So ends three seasons of consistent flying with this model.

London Area

It is doubtful if the Area will be producing a News-sheet in the future, as only a few of the clubs are prepared to pay for it, and the Area funds can no longer stand the duplicating and postage costs involved. Attendance at monthly committee meetings becomes steadily worse, only twelve delegates showing up for the September affair. It is pointed out that Area meetings are held on the second Monday of each month at the "Horseshoe Hotel", Tottenham Court Road, and all members are welcome.

R. J. Tuthill of the **ENFIELD & D.M.A.C.** has set a speed of 84·72 m.p.h. with his Class I model, which is claimed as a British Record, and certainly forms a new club figure.

For the sixth year in succession, the **HAYES & D.M.A.C.** has reached the finals of the London Area knock-out competition, and meet Croydon after having put the West Essex boys out in a fierce battle. Wally Callender is rumoured to have sawn his 12 ft. glider into several portable pieces, but its arrival is still awaited at the flying field, especially as he now has a more or less permanent passenger for his pillion. Josh Marshall won first prize at the All Herts for the best power tailless model, whilst Frank Bench proved that he is a good gardener as well as an aeromodeller for winning a first prize with his giant cabbages. (One of these lasted the press sec. nearly a fortnight!)

CROYDON & D.M.A.C. had a pleasant and profitable day at the All Herts do, several float (?) planes making an appearance. The Butcher, Cameron, Martin team did well in the Team Race events, and Norman Marcus came 2nd in the free-flight power class. The British Championships proved a sad day for the club (representing about half the London contingent) with Butch losing his F/F power model, Marcus losing his Wakefield (returned later after being rescued from a chap who had strapped it to his autocycle!). Bennet and Palmer both bent Wakefield fuselages, and Polly broke his gas job wing. Fortunately a few other L.A. fliers had better luck, and the Area placed 3rd. Several members emulated Dick Turpin and rode through the night to Sherburn for the Y.E. News Rally. After suffering down draughts in the F/F events, the club prestige was retrieved by winning the Class B team event at a speed of 66 m.p.h. with their Eta powered "Sorcerer". The class A model, "Sorcerer's Apprentice" unfortunately lost its semi-final by one lap.

North Western Area

The Area offers its sincere apologies to those who were inconvenienced by the last minute postponement of the D. D. Rally, which was of course right outside their control. The meeting will now take place on the 5th October. This Area is another to try out new contest rules, the object being—as they so rightly state—"to provide contests which will be won more on the modeller's flying ability than his retrieving powers."

Formed in May this year, the **SHARTSON & D.M.S.** held its first exhibition at its H.Q. in August, the affair proving an unqualified success, with demonstrations making the public sit up and take notice. With excellent control line facilities right outside the clubroom door, this type of flying is naturally gaining most support.

The **ROCHDALE & D.M.F.C.** have been quiet over the past year due mainly to loss of clubrooms. Flown this year for open power, the Dunkerley Trophy

"I smell burning, Ali."
"It's all right, only my dethermaliser fuse."

was won by Alan Burkes, whose modified "Slicker" returned a maximum on its first flight, its total time of 7 : 09 constituting a new club record.

And so, adios amigos till next month. Yours truly goes to study his winter building programme, which unfortunately never seems to coincide with a summer flying schedule, hence an increasing number of unflown models that clutter up the much reduced workroom! Good building

The CLUBMAN.

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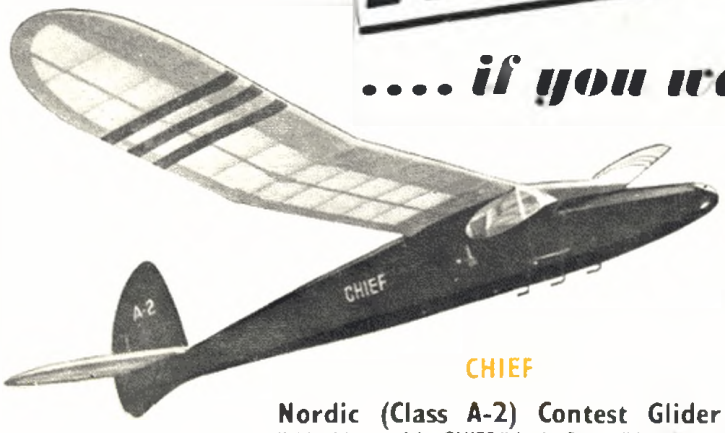

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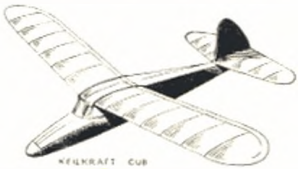
Plug-in wings

PRICE **22/8** INC. TAX

SPECIFICATIONS—Constant chord wing—Span 64¼ ins. Length 39 ins. Wing area 407¼ sq. in. Tailplane area 114¼ sq. in. Weight 14¼ oz. Wing section NACA 6412.

The CHIEF was official New Zealand A-2 Glider Record Holder for 1951, also the winner of the 1951 South African Nationals and numerous club events in various countries.



CUB 20" Span

The perfect glider for the beginner. Straightforward to build and fly. The Cub kit contains plans and parts for both glider and Jetex 50 powered versions. **3/1**

CADET 30" Span

Another good "first model". The Cadet is a larger version of the popular Cub. **4/11**

INVADER 40" Span

A simple-to-build towline glider that has long been a firm KK favourite. The wing features tip dihedral and a distinctive note is added by the twin finned tailplane. Many club records are held by this efficient design. **7/11**

MINIMOA 50" Span

A beautiful replica of the famous full-size sailplane—the MINIMOA features a streamlined fuselage and multi-spar plug-in wing panels. In addition to its good looks, this scale model is also an outstanding performer. A very complete kit. **8/7**

SOARER Series

To cater for all pockets, this cabin design is available in three, four and five foot span versions. Construction is ultra-simple—'box' fuselage and 'V' dihedralled wing—and extremely rugged.
BABY, 36 in. span, 6/1; **MINOR**, 48 in. span, 9/9; **MAJOR**, 60 in. span, 14/1

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