AERO MODELLER

JUNE, 1952

IN THIS ISSUE ● HAWKER HIND F/S POWER ● CONSUL LOW WING SPORT MODEL ● FULL SIZE JETEX PLANS ● FEATURES ON TEAM RACING—RUBBER MOTORS—GIRO GLIDER—TRADE REVIEW AND A NEW ENGINE ANALYSIS

1'6

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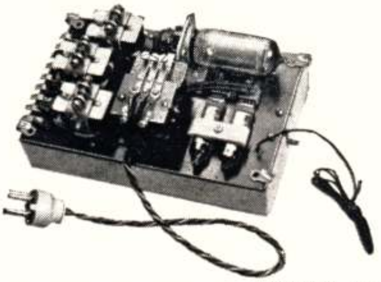

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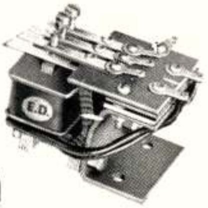

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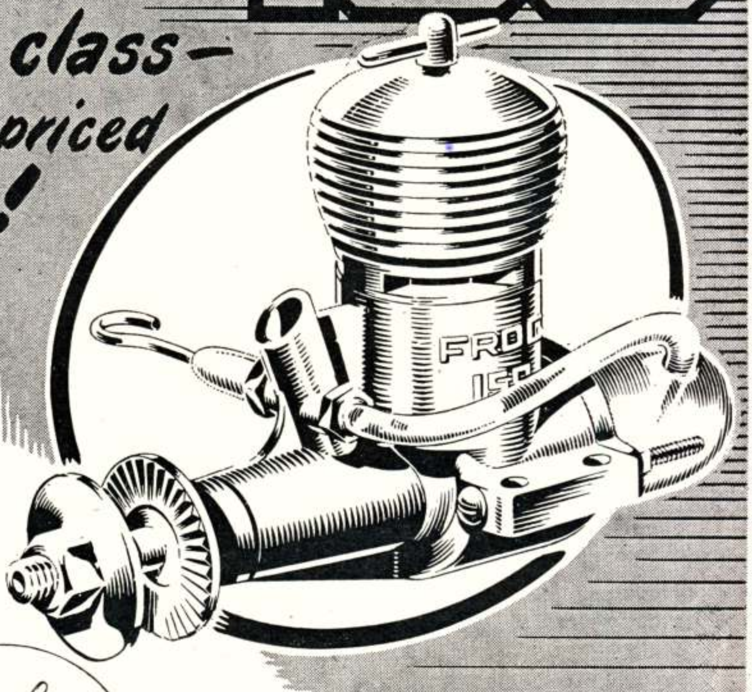

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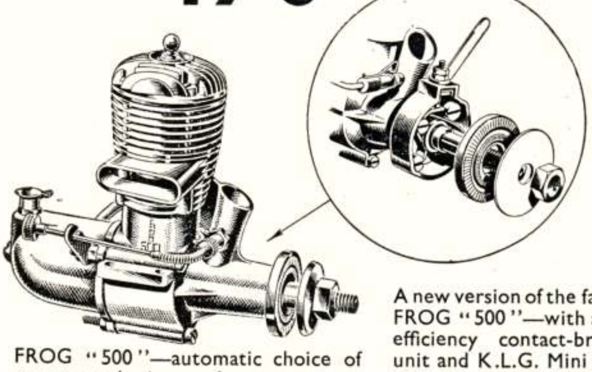
49/6



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- II—OPEN POWER.
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Allbon Dart, ·5 c.c. Diesel ...	65/2
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Mills P ·75 c.c., Diesel ...	60/9
Mills S ·75 c.c. Diesel ...	66/9
E.D. Bee, 1 c.c. Diesel ...	57/6
Elfin 1·49 c.c. Diesel ...	59/6
Allbon Javelin 1·5 c.c. Diesel	68/2
Frog 150 1·5 c.c. Diesel ...	49/6
Elfin 2·49 c.c. Diesel ...	70/–
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E.D. 246 Racer Diesel ...	82/6
E.D. 346 Mk. IV Diesel ...	82/6
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Elf King 1·5 c.c. Stunt ...	12/6
F.W.190 Scale Stunt ...	25/6
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Philibuster Class "B" T.R. ...	28/8
Spitfire 22 Scale Stunt ...	33/7
New Junior Monitor ...	23/6
Mk. I Team Racer Class "B"	22/4
Mk. II Team Racer Class "A"	17/6
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Vanfire 5 c.c. Stunt ...	29/6
Ambassador 2·5 c.c. Stunt ...	21/–
Scout Team Racer Class "B"	27/6
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Chief A.2 Sailplane ...	22/8
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Norseman A.2 Sailplane ...	24/9
Marauder A.2 Sailplane ...	17/9
Prince 60" wingspan ...	25/–
Diana 36" ...	9/–
Fortuna 48" ...	15/–

— RUBBER —

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Senator 32" span ...	6/9
Ajax 30" span ...	7/4
Witch 36" span ...	12/9
Goblin 24" span ...	5/6

— RADIO —

Skyscooter 48" span ...	30/6
Junior 60, 60" span ...	48/3
Southerner 60, 60" span ...	48/11
Falcon 108" span ...	131/5
Stentorian 72" span ...	84/11
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Aeronca Sedan scale ...	69/6
Radio Queen 72" span ...	85/6

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E.D. Mk. IV 3·46 c.c. Diesel	50/–
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38, CLARENDON ROAD, WATFORD, HERTS.

ESTABLISHED 1935

AERO MODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR

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Contents

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38, CLARENDON ROAD, WATFORD, HERTS. Tel.: 5445

A GOOD START

SO far, 1952 seems to be giving aeromodellers a better deal from the Weather Man, a state of affairs both very welcome and unexpected in this land of notoriously fickle meteorological conditions. To say that aeromodellers as a whole have taken full advantage of this "windfall" is an understatement, and the results of National contests held to date are a clear indication that interest is just as keen as ever, and the Winter hibernation of many has come to an abrupt end.

We naturally hear oftener from the somewhat more vocal competition modeller than from his more numerous—but nevertheless equally keen—contemporary, the "back-yard-flier", and we make an earnest plea to the many thousands of aeromodellers who fly on the purely "Fly-for-Fun" principle to make known their activities and likes and dislikes, for we aim to cater for the movement as a whole, and not for any particular section thereof.

Which brings to mind a circular just received from the S.M.A.E., instancing as it does many advantages placed in the way of the non-club or competition modeller, as the following extracts indicate :—

"Few aeromodellers, whether members of the S.M.A.E. or not, realise to what extent they are indebted to this Society for the simple fact that they are able to fly at all. This applies not merely to contests, of which the S.M.A.E. and its Areas organise a great number, but also to normal 'week-end' flying, the so-called 'flying-for-fun'.

"In many parts of Britain, model flying is necessarily taking place to an ever-increasing extent on R.A.F. and other aerodromes. Negotiations for such purposes must invariably take place through the Governing Body and suitable indemnity provided. The amount and great value of this work deserves to be more widely known, for it is certain that without these efforts the sport and hobby of model flying would cease to exist as we know it in this country.

"Official figures provided by the Air Ministry show that the Society has negotiated and completed more than 100 individual Agreements on behalf of Clubs and Area Committees. At least another 100 have been negotiated with the Ministry of Civil Aviation and the Admiralty. These are not all; the Society's main Policy and Area Policies have also been extended to indemnify approximately 50 Borough Councils who are permitting the use of parks and open spaces for the flying of model aircraft. Finally, the contest "fan" will be interested to know that, to date, in addition to those mentioned above, no less than 118 extensions of the Society's Policies have been arranged to cover Rallies, Area Meetings and similar events.

"Very many non-members of the S.M.A.E. take advantage of these facilities, but it is noteworthy that there is already a trend (particularly in the London Area) for such facilities to be restricted to bona fide Club members. The figures may also give members cause for thought as to whether the ½d. a week which the Society receives from them is perhaps unreasonably low when compared with the services received."

Cover Picture . . . .

John Knepper, assistant of the renowned Jim Walker, is seen in action launching the latter's famous model which won the 1951 American Radio Control Championship. This 84-in. span model, chord 14 ins., and weighing 8½ lbs., has a single channel receiver with high speed selector control, developed by Arnold Muller. As in this country, it would appear that hand launching is the current vogue in the U.S.A. for radio control flight.

Belgian International Meeting Changes

As we go to press we are advised that the Fourth Championship of Europe and Second World Speed Championship for control line models has been transferred from Knokke to Brussels. This move has become necessary in view of the importance of the contests and the difficulty of securing adequate take-off space at Knokke that would conform with F.A.I. recommendations. The new venue will be at Melsbroek Aerodrome, Brussels (not to be confused with Evere Aerodrome, where an International free flight meeting was held several years ago).

Two-take-off circles will be available, covered with a rubberised surface that will reduce the effects of forced landings. Contestants will be accommodated in the Air Force Barracks adjoining the airfield, where accommodation will also be provided for MALE supporters at an inclusive price of 300 Belgian francs. Those wishing to stay at an hotel in Brussels can obtain meals during the contest at 200 Belgian francs.

We understand that American Occupation Forces in Germany will be taking part, and it is hoped to inaugurate their participation in Belgian events with a U.S.A.F.–Belgium match on June 1st, when a new control line arena will be officially opened at Etterbeck Aerodrome.

In consequence of a Royal visit to Namur, that contest will now be held on 10th August.

We would remind interested readers that official translations of the rules are available from these offices on receipt of a stamped addressed envelope. Please mark letters " Belgian Rules." Rules as finally approved do not differ from those already sent out as " Knokke Rules " except that the use of duly processed 30 c.c. tanks in the Team Racing event has now been officially incorporated in the rules, and a note has been added that the maximum length of stunt lines is limited to 16 m.

Aeromodeller Plans Service

The complicated machinery that works so hard to produce for you the vast range of A.P.S. Blueprints is now well established at our new Watford address. To those whose orders were delayed during the awkward moving period, we tender our apologies. The customary 3-day service is back in full swing, and the new bumper illustrated catalogue, as advertised on page 324, can give you full details of the latest prices and additions to the range. Scale enthusiasts should note that our popular range of solid plans no longer includes 1/72 scale.

Essential (Radio) Control

Radio-control enthusiasts using the ever-popular Fairlop Aerodrome—both expert and novice—are urgently requested to observe certain courtesies when flying from that venue in their own and others' interests. In recent months considerable interference and unnecessary damage has been experienced by modellers using this field as the result of the somewhat indiscriminate setting up of radio transmitters at varying locations.

R/C fans are therefore asked to particularly note that modellers with similar interests are wont to gather at a recognised spot—the intersection of the two main tarmac runways—and they are urged to co-operate with others in mutual interest. Most people know the spot, but newcomers should enquire at the " tea waggon ", from whence they will be directed to a very good crowd of enthusiasts ready to help the inexperienced if necessary. It does not need us to enlarge on the difficulties (and dangers) of flying with an unknown number of transmitters crowding the ether.

Engine Analysis

It is now six years since we started this well-known feature during which time our old friend and contributor Lawrence H. Sparey has tested no less than 50 engines. Many gallons of fuel have flowed through the neoprene, and much information has been collated for our readers in the course of these tests, which were the first of their kind to be published in the aeromodelling world.

It is therefore with particular regret that we must announce that " L.H.S. " is unable to continue as author and tester owing to heavy commitments in other spheres. As a free-lance engineer and journalist he had found that his engineering activities occupy an increasing amount of his time, so much so that he is unable to continue this most popular feature.

As in the theatrical world "the feature must go on", so we have secured in his place the knowledgable aeromodelling writer R. H. Warring. We have known Ronny Warring personally for many years—who in aeromodelling has not? But we wonder how many aeromodellers realise the extent of his technical writings.

He has contributed to some sixty technical journals both at home and abroad, and has even had his works translated and published behind the Iron Curtain! Not the least of his contributions are in the engineering sphere, and he assists annually in the preparation of such well-known works as Molesworth's Handbook of Engineering Formulæ and the Aeronautical Engineer's Pocket Book. First-class engineering knowledge, plus an intimate knowledge of aeromodelling itself, make him ideally suited for the job in hand, as readers will undoubtedly agree when they see this month's article on page 346. The engine on test is the new E.D. ·46 c.c. "Baby", a motor for which we have had many requests and which we understand is now coming into the model shops in increasing quantities.

Incidentally, these small motors are the most difficult to test owing to their relatively small power output. Such minute torque readings must be taken with infinite care, for any error tends to be magnified. They raise problems in many directions, particularly in their manufacture. Extremely fine engineering limits must be adhered to for efficient operation, hence the apparent anomaly of the smaller engine costing as much, if not more, than its larger counterpart.

Old "Gabee" on show

Received a surprise phone call the other day from a Mr. I. B. Leno, who is a member of the syndicate that owns Avro Avian G-ABEE. He had seen the article by Ray Booth on the flying scale model of this historic machine in the April AEROMODELLER, and mentioned that the original machine could be seen at Denham Aerdrome of a weekend. Interested readers who have built the model and would like a close study of its prototype should contact Mr. Leno at 192, High Street, Uxbridge.

Our thanks to Mr. Leno for his consideration and thoughtfulness will be echoed by readers everywhere, particularly flying scale enthusiasts who rarely enjoy such opportunities as this.

R/C weekend at Blackpool

On August 16th and 17th, 1952, the International Radio Controlled Models Society will be organising contests for both aircraft and boats at Blackpool. The boat contest will be held on Saturday 16th August and that for model aircraft on Sunday 17th August. The latter event will be held at Stanley Park Aerodrome, Blackpool, commencing at 10 a.m.

XFG1 No Extra!

Owing to an unfortunate type-setting error in the May, 1952, AEROMODELLER, the price of the well-known Hivac XFG1 gas thyratron valve was given as 176/- plus Purchase Tax! This should, of course, have read 17/6 plus Purchase Tax. Our apologies to Messrs. Hivac Ltd. for any inconvenience caused, and at the same time may we offer them a hearty vote of thanks for their initiative in producing the XFG1, a valve that has enabled many thousands of radio control enthusiasts to enjoy comparatively inexpensive flying.

Dutch "Still Air" Wakefield Elims

After some discussion, it was decided that the Dutch Wakefield Team for Sweden and the team for the F.N.A. Cup contest in Italy will be selected on the "still air" principle this year with flights made late in the evening and early morning. The first of these contests was held at Terlit—the Royal Dutch Aeroclub soaring centre—during the Easter holidays.

Though Terlit is noted for its thermals, none were encountered during the three rounds of the eliminator, which took place between 6.15 and 7.45 p.m. and 6–8 a.m., and there was a complete absence of wind, thus providing Jamijarvi 1950 conditions. Organisation was perfect, and everyone agreed that Holland had never had a more interesting and successful contest.

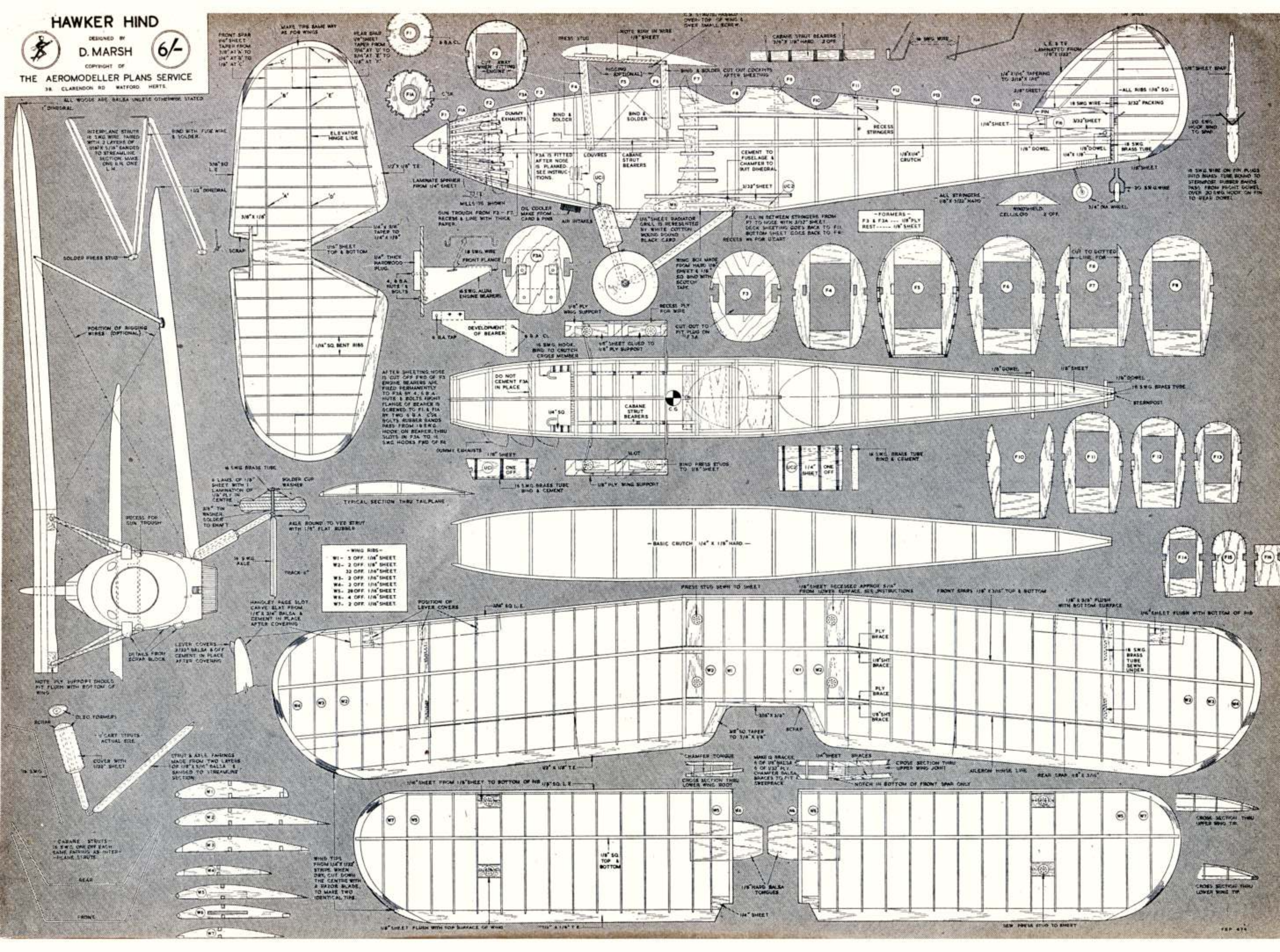
Winner was G. Dykstra (Dordrecht) with the fine aggregate of 12 : 23, one flight being a maximum of 5 minutes. His model is a straightforward single skein job, in comparison with the second placeman, Peter Seton, also of Dordrecht, who was using a geared design on Ellila principles plus a folding prop. Seton's time was 10 : 18 with a best round of 3 : 55. Third came J. Thomas of Breda with 9 : 51.

Ballast It!

We witnessed an extraordinary incident at the Midland Area meeting at Bramcote on the occasion of the first Wakefield Eliminator. Ray Monks—well known for his grand showing in last year's A/2 contests—had scored a maximum in the first round with his new Wakefield model, and was quietly confident when winding for his second try. Using a tube rear motor fixing, winding technique is to pass a thin screwdriver through the tube to give greater purchase for the holder.

Great was the consternation—and the surrounding air a deeper tinge of blue!—when it was discovered that the model had been launched with the screwdriver still *in situ*. After a period of stalling and general instability, the model proceeded to flatten out, caught a riser—and returned another 5 minute maximum! When retrieved, the unwanted ballast was still in place—which brings us to wonder if that urgent chasing after the absolute minimum weight is all that necessary.

Ray went on to score a third maximum—first time this has occurred in the Midland region.



HAWKER HIND
DESIGNED BY
D. MARSH
6/-
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
38, CLARENDON RD. WATFORD. HERTS.
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
ELEVATOR HINGE LINE
DUMMY EXHAUSTS
BIND & SOLDER
CABANE STRUT BEARERS
LOUVRES
RECESS STRINGERS
CEMENT TO FUSELAGE & CHAMFER TO SUIT DIHEDRAL
1/8" X 1/4" CRUTCH
1/16" SHEET
3/32" SHEET
1/8" DOWEL
18 SWG BRASS TUBE
ALL RIBS 1/16" SQ.
3/32" PACKING
ALL STRINGERS 1/8" X 3/32" HARD
WINDSHIELD, CELLULOID 2 OFF.
3/4" DIA WHEEL
-FORMERS-
F3 & F3A --- 1/8" PLY
REST ------ 1/8" SHEET
AIR INTAKES
OIL COOLER MADE FROM CARD & PINS
1/16" SQ. BENT RIBS
DEVELOPMENT OF BEARER
DO NOT CEMENT F3A IN PLACE
STERNPOST
TYPICAL SECTION THRU TAILPLANE
-BASIC CRUTCH 1/4" X 1/8" HARD-
-WING RIBS-
W1 - 5 OFF. 1/16" SHEET.
W2 - 2 OFF. 1/8" SHEET.
32 OFF. 1/16" SHEET.
W3 - 2 OFF. 1/16" SHEET.
W4 - 2 OFF. 1/16" SHEET.
W5 - 28 OFF. 1/16" SHEET.
W6 - 4 OFF. 1/16" SHEET.
W7 - 2 OFF. 1/16" SHEET.
POSITION OF LEVER COVERS
PLY BRACE
AILERON HINGE LINE
CHAMFER TONGUE
CROSS SECTION THRU LOWER WING ROOT
CROSS SECTION THRU UPPER WING JOINT
NOTCH IN BOTTOM OF FRONT SPAR ONLY
CROSS SECTION THRU UPPER WING TIP
CROSS SECTION THRU LOWER WING TIP
1/8" HARD BALSA TONGUES
SCRAP
POSITION OF RIGGING WIRES (OPTIONAL)
SOLDER PRESS STUD
RECESS FOR GUN TROUGH
DETAILS FROM SCRAP BLOCK
OLEO FORMERS
FRONT
REAR

BY POPULAR REQUEST . . . . A BIPLANE SCALE FREE-FLIGHT

HAWKER "HIND TRAINER"

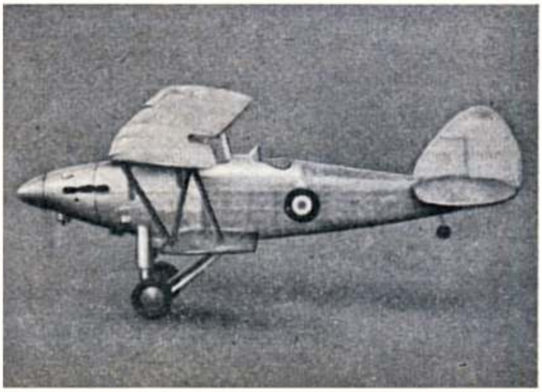
FOR ·5 — ·87 c.c. MOTORS

BY

D. MARSH

THE DESIGNER . . . Aged 28 years and still a bachelor. Secretary of Crosby Model Aero Club . . . manages local model shop . . . Has been aeromodeller for 18 years. . . . chief interests Free Flight Scale and Radio Control.

THE Hawker "Hind Trainer" was one of the many derivatives of the Hawker Hart, and it was used extensively for advanced training in years just prior to World War II. When Dave Hughes sent us a photograph (page 180, March issue) showing a free flight model of this biplane, we were attracted by its possibilities. Enquiries brought forth confirmation of an excellent performance, so we have no hesitation in presenting this answer to many of our readers' demands. The model is exactly to scale except for tailplane area, which has been increased for stability. No bracing wires were fitted on the original model, their positions are shown on the plan, and may be added if desired.



Construction is straightforward but owing to the large number of parts (there are 16 formers in the fuselage and 77 ribs in the wings), this is *not* a model you can put together in a week's spare time!

Flying

The model has been flown with an Amco 0·87 and is currently fitted with Mills 0·75. With these engines, about an ounce of weight is necessary in the tail to get the C.G. in the correct position as shown on the plan. If the new 0·5 c.c. engines are fitted, not so much weight will be required. A 9 × 5 in. prop. is recommended.

Test glide over long grass, if possible. Adjust for diving or stalling with tailplane incidence. Adjust to fly straight by moving the fin; remember you are moving the whole fin, so it will require very little movement to have quite a big effect.

Try the model under low power, R.O.G. is best; adjust power for downthrust and/or sidethrust by adding packing between 3A and 3 formers temporarily; later adjust engine on mounting to suit.

The original has 3° downthrust and no sidethrust. Fly in large left hand circles.

Complete building instructions are included with each full size copy of the 1/5th scale plan opposite, available price 6/–, post free from Aeromodeller Plans Service. . . . Note the new address!

AN ALL-PURPOSE CONTEST GLIDER WITH A PEDIGREE

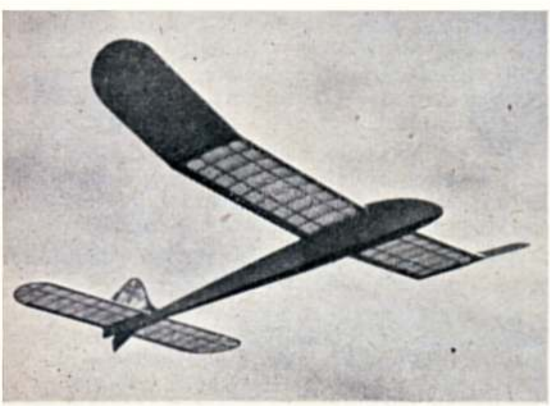
By DON BUTLER

Secretary, Surbiton & DMFC .... Civil Servant .... Single, 26 .... famous for his "Fugitive" design .... now concentrating on A/2's .... an Aeromodeller for fifteen years .... also a motorcyclist, with other interests in cats and pubs!

GETTING tired of building "Fugitives", Don Butler decided it was about time he got down to a relatively simple design that would give a good account of itself under average British weather conditions.

That the "Jader 60" loses nothing by its simplicity is, we think, proved by its wins at the 1951 Lasham, West Essex, Old Sarum and Northern Heights Galas, all with maximum or near maximum flights. These successes were achieved by various members of the Surbiton Club.

An A/2 version with a N.A.C.A. 6412 section, 26½ ins. × 5 ins. tailplane and heavier construction, has also done well and placed sixth in the 1951 A/2 finals. The average lightweight version scales around 9 ozs., but the heavier they are, within reasonable limits, the better they seem to go.



The Jader continued its long line of 1951 wins into this seasons activities with a well-earned first place in the open Glider event at the Croydon Gala, Easter. Although not strictly a Jader as presented here, the winning model, known as 'Goolite', is a late development of the Jader with squared-up appearance.

All who have enjoyed the high performance of the Fugitive will be sure not to miss this opportunity of building its worthy successor.

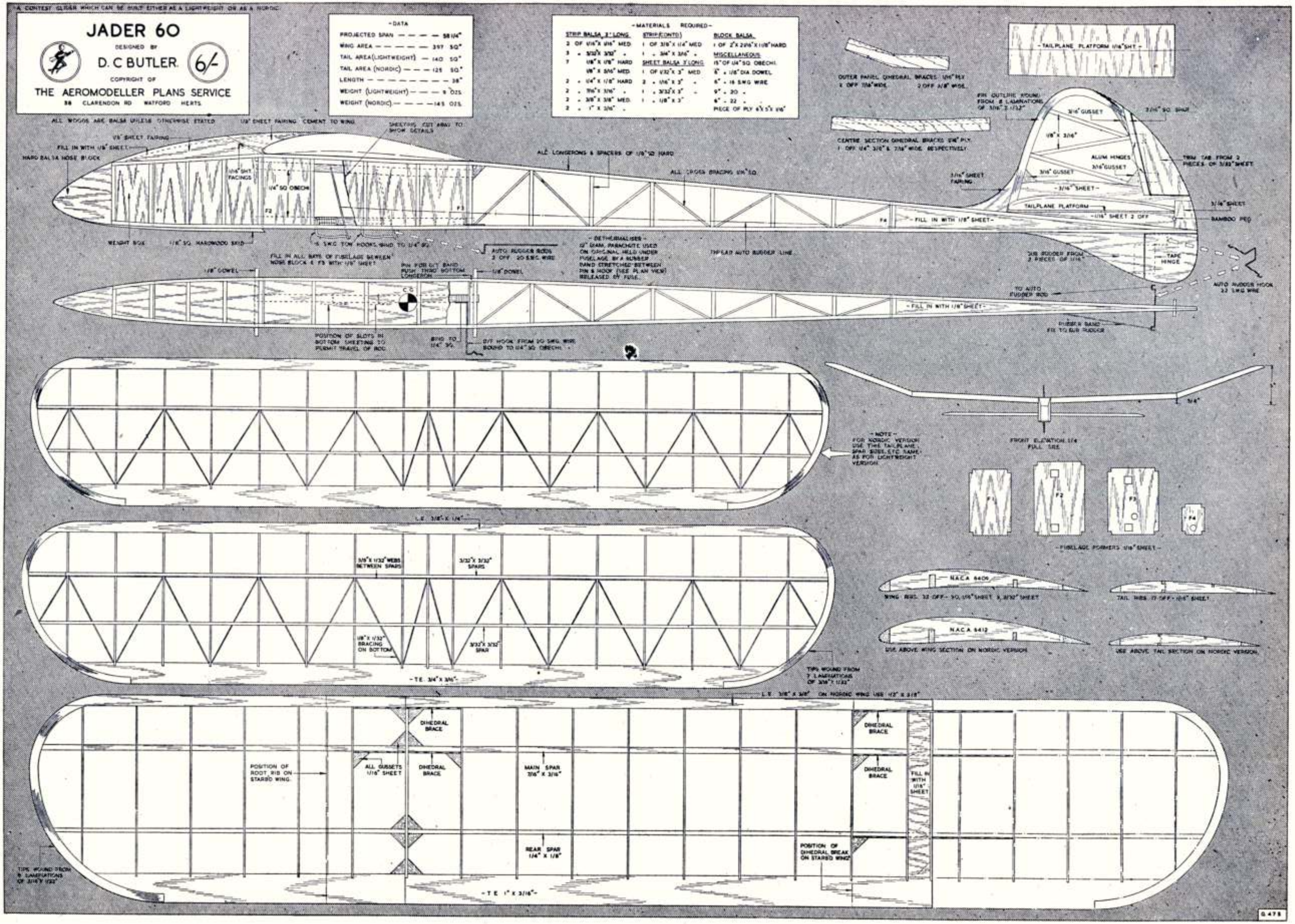
Trimming

Add nose weight in the form of lead shot, until the job balances on the rear spar; this should give a fairly pronounced stall when in straight flight. Now try a tow on about 100 ft. of line, using the rear hook, and observe the flight. If the turn is tight enough, this should be sufficient to counter the stall; if not, either tighten the turn or add a small amount of nose weight. Get the job as near the stall as possible without actually doing so, and also circling as tightly as possible consistent with safety, remembering that a thermal usually tightens the turn considerably.

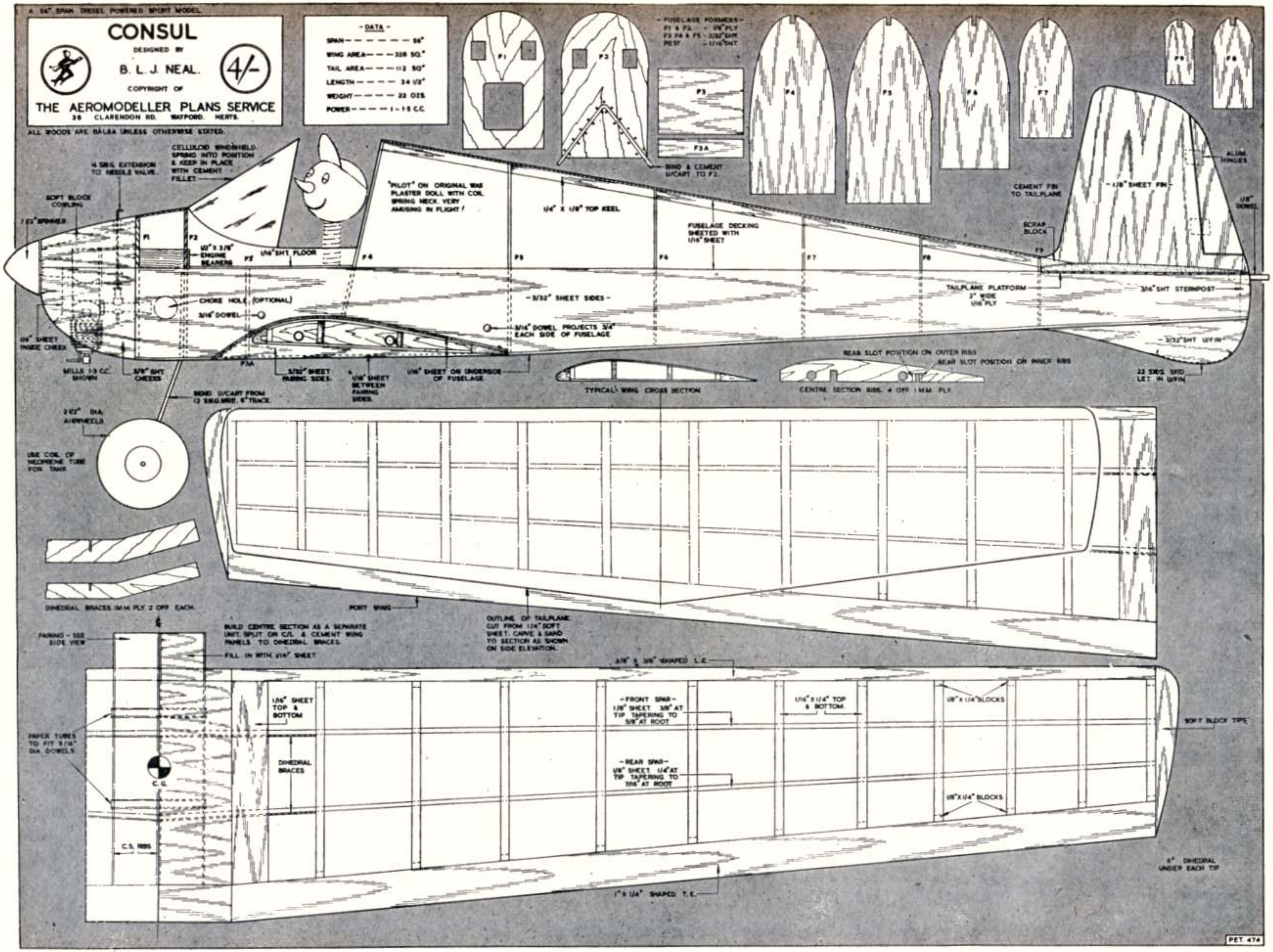
The amount of auto rudder used can be decreased by inserting small pieces of 1/16 in. sq. in the slot for the auto rudder rods.

When correctly trimmed, flights of 3½ to 4 mins. can be expected from a 328 ft. line under calm evening conditions. Notice, and here we quote Butler, "I do not mention 'still air', as I've come to the conclusion there is no such animal, at any rate, on Epsom Downs!"

Complete building instructions are issued with each full size copy of the ¼ scale plan opposite, which is obtainable price 6/- post free from the Aeromodeller Plans Service. Note new address!



A CONTEST GLIDER WHICH CAN BE BUILT EITHER AS A LIGHTWEIGHT OR AS A NORDIC
JADER 60
DESIGNED BY
D.C BUTLER.
6/-
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
38 CLARENDON RD WATFORD HERTS.
-DATA
PROJECTED SPAN — — — — 58 1/4"
WING AREA — — — — — 397 SQ"
TAIL AREA(LIGHTWEIGHT) — 140 SQ"
TAIL AREA (NORDIC) — — — 125 SQ"
LENGTH — — — — — — — — 38"
WEIGHT (LIGHTWEIGHT) — — — 9 OZS.
WEIGHT (NORDIC) — — — — 14.5 OZS.
-MATERIALS REQUIRED-
STRIP BALSA, 3' LONG.
2 OF 1/16" X 1/16" MED.
3 " 3/32" X 3/32" "
7 1/8" X 1/8" HARD
1/8" X 3/16" MED.
2 " 1/4" X 1/8" HARD
2 " 7/16" X 3/16" "
2 " 3/8" X 3/8" MED.
2 " 1" X 3/16" "
STRIP (CONTD)
1 OF 3/8" X 1/4" MED
1 " 3/4" X 3/16" "
SHEET BALSA 3' LONG
1 OF 1/32" X 3" MED
2 " 1/16" X 3" "
1 " 3/32" X 3" "
1 " 1/8" X 3"
BLOCK BALSA.
1 OF 2" X 2 1/16" X 1 1/8" HARD
MISCELLANEOUS
15" OF 1/4" SQ. OBECHI
6" " 1/8" DIA. DOWEL
6" " 16 SWG WIRE
9" " 20 "
6" " 22 "
PIECE OF PLY 6" X 5" X 1/16"
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
1/8" SHEET FAIRING CEMENT TO WING
SHEETING CUT AWAY TO SHOW DETAILS
1/8" SHEET FAIRING
FILL IN WITH 1/8" SHEET
HARD BALSA NOSE BLOCK
1/16" SHT FACINGS
1/4" SQ OBECHI
ALL LONGERONS & SPACERS OF 1/8" SQ HARD
ALL CROSS BRACING 1/8" SQ.
WEIGHT BOX
1/8" SQ. HARDWOOD SKID
16 SWG TOW HOOKS BIND TO 1/4" SQ.
AUTO RUDDER RODS 2 OFF 20 SWG WIRE
-DETHERMALISER-
12" DIAM. PARACHUTE USED ON ORIGINAL HELD UNDER FUSELAGE BY A RUBBER BAND STRETCHED BETWEEN PIN & HOOK (SEE PLAN VIEW) RELEASED BY FUSE.
THREAD AUTO RUDDER LINE
FILL IN ALL BAYS OF FUSELAGE BETWEEN NOSE BLOCK & F3 WITH 1/8" SHEET
1/8" DOWEL
PIN FOR D/T BAND PUSH THRO' BOTTOM LONGERON
POSITION OF SLOTS IN BOTTOM SHEETING TO PERMIT TRAVEL OF ROD
BIND TO 1/4" SQ.
D/T HOOK FROM 20 SWG WIRE BOUND TO 1/4" SQ OBECHI
FILL IN WITH 1/8" SHEET
OUTER PANEL DIHEDRAL BRACES 1/16" PLY 2 OFF 7/16" WIDE 2 OFF 3/8" WIDE
CENTRE SECTION DIHEDRAL BRACES 1/16" PLY 1 OFF 1/4" 3/8" & 7/16" WIDE RESPECTIVELY
-TAILPLANE PLATFORM 1/16" SHT-
FIN OUTLINE WOUND FROM 8 LAMINATIONS OF 3/16" X 1/32"
3/16" GUSSET
3/16" SQ. SPAR
1/8" X 3/16"
ALUM HINGES
3/16" GUSSET
TRIM TAB FROM 2 PIECES OF 3/32" SHEET
3/16" SHEET FAIRING
-3/16" SHEET-
TAILPLANE PLATFORM
-1/16" SHEET 2 OFF
3/16" SHEET
BAMBOO PEG
SUB RUDDER FROM 2 PIECES OF 1/16"
TAPE HINGE
AUTO RUDDER HOOK 22 SWG WIRE
TO AUTO RUDDER ROD
RUBBER BAND FIX TO SUB RUDDER
-NOTE-
FOR NORDIC VERSION USE THIS TAILPLANE, SPAR SIZES, ETC SAME AS FOR LIGHTWEIGHT VERSION
FRONT ELEVATION 1/4 FULL SIZE.
3/4"
-FUSELAGE FORMERS 1/16" SHEET-
N.A.C.A 6409
WING RIBS. 32 OFF- 30 1/16" SHEET, 2 3/32" SHEET
TAIL RIBS 17 OFF- 1/16" SHEET
N.A.C.A. 6412
USE ABOVE WING SECTION ON NORDIC VERSION
USE ABOVE TAIL SECTION ON NORDIC VERSION.
L.E. 3/8" X 1/4"
3/16" X 1/32" WEBS BETWEEN SPARS
3/32" X 3/32" SPARS
1/8" X 1/32" BRACING ON BOTTOM
3/32" X 3/32" SPAR
-T.E. 3/4" X 3/16"-
TIPS WOUND FROM 7 LAMINATIONS OF 3/16" X 1/32"
L.E. 3/8" X 3/8" ON NORDIC WING USE 1/2" X 3/8"
DIHEDRAL BRACE
POSITION OF ROOT RIB ON STARBD WING.
ALL GUSSETS 1/16" SHEET
MAIN SPAR 7/16" X 3/16"
FILL IN WITH 1/16" SHEET
REAR SPAR 1/4" X 1/8"
POSITION OF DIHEDRAL BREAK ON STARBD WING
TIPS WOUND FROM 8 LAMINATIONS OF 3/16" X 1/32"
-T.E. 1" X 3/16"-
G 475



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

A PERT LOW-WING SPORTS MODEL FOR THE MILLS 1·3 c.c. OR ANY SIMILAR CAPACITY ENGINE

Consul

About the designer . . . Aged 27 . . . Senior Draughtsman . . . member West Middlesex M.F.C. . . interested in all aeromodelling . . . also a keen photographer and motorist . . . is hoping for an aeromodelling spouse.

DESIGNED BY
B · L · J · NEAL

AFTER reading our "It's Designed for You" feature on low wing power models, Brenton Neal decided to try his hand at this somewhat neglected branch of the hobby, and met with immediate success. The "Consul" literally flew "straight off the drawing board," and has provided many hours of pleasant sport flying.

It is a model that any contest flyer can build for spare time sport flying as a relaxation from the launch and chase procedure which is so much in vogue these days.

Simple construction is a feature of the "Consul," the fact that there are only four actual wing ribs and that the tail unit is from solid sheet balsa makes building time much shorter than normal. Study the cap strip rib system, you will find it highly warp resistant and with those two deep spars, very strong. Some readers may also detect a strong similarity between this and the American full size light plane known as the "Mooney Mite," particularly in the upper photo, where R. Mather is seen holding the prototype.

Built from oddments collected in the Neal workshop, including a well tried and highly trusted Mills Mk. I (of which there must be thousands, in a similar stored state) the "Consul" has a novel pilot with a gyrating coil spring neck to provide improved realism. Complete building instructions are issued with each full size drawing.

Trimming and Flying

Common sense is the best advice here—wait for a calm day, and while waiting, check c.g. position, line up of surfaces, and ensure that your motor will run easily. Make sure your tank will only give a max. of 20 seconds engine run. Test glides need plenty of speed behind them and to be over long grass where possible. Your first power run, hand launched at medium or half revs. will give the best indication of trim, especially for glide. The prototype used no motor off-set, only right rudder giving 100-ft. circles to the left under power and to the right on glide. Damp out glide stalls with positive on tail or extra rudder set off. Looping or too steep a climb under power must be cured by motor downthrust.

EASTER PARADE

Ron Moulton reports with pen and camera on the Croydon Gala, Battersea Team Race Rally, and new models seen at Fairlop over Easter.

MAGNIFICENT flying weather blessed the London area for the first public holiday of the year, and London clubs were quick to take advantage of the improved " restricted " conditions now at Fairlop.

Team racing took place on the Monday, and attracted 25 entries for Class A, and 16 for Class B. Heats in both classes proceeded without undue event throughout the afternoon, culminating in contrasting finals. Steward's ETA 29 ' Syfuyfa ' —you work it out !—made exceptional time in winning its class B heat in 3 minutes 45 seconds, making an average of 80 m.p.h., including a pit stop, and his class A entry provided a similar sparkling performance to carry off the honours in an exciting Class A ten mile final.

In the B final, a melée of lines and discarded handles spoiled the race. Surely a case for enforcement of Team Racing rule 13.

Above : " Rhubarb " (ETA 29) won the Class B finals for W. Stabler of Slough. Left : Pilot Taylor and mechanic Steward compare noses.

Close-up of " Flash-Perce ", Class A winner, seen with West Essex owners above.

Above : With long stick type fuselage and small tail to give large wing area, this A/2 by J. Brookes, Hatfield Club, entered Croydon Gala. Right : Power winner Vic Jays, S.M.A.E. Country Member, totalled 14 : 24s with three flights with his Arden 19 Jaylbird. This design closely follows the current trend in the U.S.A.

Above : O. E. Hemsley of Bushy Park entered the Glider event with his radio controlled six-footer. The model weighs 27 ounces complete. On the Right : Unusually high aspect ratio makes R. V. Dawkins', also Bushy Park, the largest A/2 yet. Span is 94 in.

Right : G. D. Byewaters and his smart all-red Fokker D.R.1 Triplane Control line model, equipped with Frog 500 glow plug engine.

Left: Bob Copland aired his 1952 Wakefield on Easter Sunday evening, and surprised a good many onlookers by producing this geared slab-sider. Right: An A.P.S. Polish R.W.D.8 by S. G. Lawes of Belfairs. Power is an E.D. 3·46. Below, right: A. Ricks of Willesden won open rubber with triple maximums.

Efficiently run by club members and flexible to the extent that take-off points were moved to suit wind changes no less than three times, Croydon Gala was very well supported with a high standard of flying. Those two all-rounders, Gorham (Ipswich) and Fuller (St. Albans) battled for Gala championship, Gorham finally clinching the issue by fitting a towhook on 'Lil Aud and making three commendable "Glider" flights! Oddly enough, each of these all-rounders had their Wakefields smashed while at rest by landing power jobs. The victors of each event were presented with Savings Certificates, results being as follows.

OPEN CHAMPION:
J. A. Gorham Ipswich 9 flt. total—26 : 42

JUNIOR CHAMPION:
D. Rumley Kentish Nomads 6 flt. total—17 : 07

RUBBER:		3 flt. total
1. A. Ricks	Willesden	15 : 00
2. R. H. Warring	Zombies	12 : 15
3. P. Brown	St. Albans	12 : 09

GLIDER:		3 flt. total
1. D. Butler	Surbiton	14 : 15
2. A. Swale	Streatham	14 : 01
3. W. Henderson	Grange	13 : 10

POWER:		3 flt. total
1. V. Jays	S.M.A.E. C.M.	14 : 24
2. A. Brooks	Grange	13 : 08
3. G. Fuller	St. Albans	10 : 29

Above: Mr. Knight, Snr., Kentish Nomads, releases his Wakefield for a steep climb in the Croydon Gala.

Above: This Mills ·75 powered 40 in. span F.E.8 by V. King of Thames Valley made many realistic and consistent flights through the week-end. It represents a triumph over several C.G. problems. Left: Ron Warring, placed second in rubber with his geared Wakefield.

Left: Valerie Payne proudly retrieves father's low-wing design for the Mills Mk. 1. Mr. Payne is a member of the Browning M.A.C. Right: Semi-scale Biplane by John Walker of Belfairs weighs 2½ lbs.

We Visit The CLUB

Ernie Harwood, winner of the 1951 Gamage, holds a 1952 model Ghost for John Gorham as he piles on 1,120 turns for a 6 min. 10 secs. flight.

REMEMBER last year's Gamage day ? " In most places ", reported Clubman, " it was a complete 'blow-out', with models swept away from sight ". That was everywhere, except at Ipswich, where Ernie Harwood and John Gorham made good times in fine weather at their Easterly flying ground.

Ipswich is farther East than any other British club of comparable size, and in the expectation of a likely repeat on the part of the weather man for this annual day for bluster and damage, we journeyed there to see what this leading club is proposing to do in '52.

Stepping into John Gorham's workshop we found ourselves surrounded by clocks of all shapes and sizes. A pair of stopwatches were being synchronised accurately for the following day, miniature precision lathes, balances, cleaning apparatus and an electronic oscillograph caught the eye ; but nary a model was there to be seen ! John, you will have gathered, is a skilled watchmaker ; he once made his own clock to prove the point, and everything that this British Champion of 1951 could show us, left the impression that it is his precision in construction which brings him constantly at the top of the list. " Where's the modelling room ", we enquired. " This is it ", came back to us, and slowly the plot unfolded.

A large box was pulled from under the bench, and the stock for the season's comps. was soon covering that neat workshop. Within a minute the place looked like a modeller's den, and the timepieces took a very rearward seat. We began to appreciate Mr. Gorham's obvious view that the room was large enough for either the profession or the hobby, but not both at the same time !

Half a dozen Wakefield wings came to light first, all of them to standard shape of constant chord with curved tips, then a selection of fuselages, all with the cabin type wing mount, tails to match, and an assortment of feathering props. On the latter, we note that the blades are not allowed to go into " fully feathered " unless the thrustline is not offset. (This has saved many a spiral glide through forward rudder effect, and could be the answer for many another puzzled user of the featherer). In all, a collection of four complete " Ghost " Wakefields, ready for the first comp., the Gamage. " Where's the 1952 design ", we asked, expecting to see something on the new line of long fuselages, or at least, knowing John's trade, a real eye-opener of a geared job.

" There it is ", said Johnny, indicating the cleanest of the all-red Ghosts. " No change from last year, and just the same as my first Wakefield. Airframe weight is 3¼ ounces, which allows us a nice 5 ounce, 72-in., twelve-strand Pirelli motor, and we get a 2 min. 15 secs. motor run off 1,120 turns to bring us as close to the five minute average as possible ". On gears, there was a blue fuselage Ghost, slightly longer and boasting a motor run approaching four minutes, but that, said Johnny, " is strictly for fair weather ". On early morning tests, the newly built " straight " motor Ghost had still air near-maximum averages, and on one Sunday early this season had made every flight an over five minute D.T.—so the reason was obvious why John should stick to the old formula model.

An old A/2, short fuselage and high aspect ratio, that had lodged itself in the '51 A/2 Trials but no further, and a slightly enlarged wing on the faithful " Lil Aud ", completed the stable. Prototype " Lil Aud " had been stolen by downwind ruffians at the last All-Herts rally, and all that the Court could recover was the specially fast Elfin 1·49. (The culprit got away with a 10/- fine and costs !) So a new model was essential, yet John adhered to the '51 design. How many other aeromodellers would repeat last year's models ?

Tapping the Caton (Barometer) Trophy, we had great hopes for the following Gamage day, and visible evidence of the Ghost's high performance.

Tables were turned, however, for although the early morning was good enough for an o.o.s. D.T. flight with the new Ghost (early at Ipswich is 6.30 a.m.), brisk wind, constantly changing in direction, and a continual area of downdraught made Nacton's Airport, Ipswich, the most unfavourable site, while the rest of the country apparently enjoyed plenty of lift. Nacton is only a few miles from the town centre, and readily accessible by public transport. This alone is a great influence on the interest in the Ipswich area, giving the encouragement so necessary to a club

# of CHAMPIONS

A promising junior member of the Ipswich M.A.C. is Brian Mays, seen here with modified Nord sailplane, appropriately designated Mark III. Main difference lies in the wing-tip profile.

capable of producing every possible Senior Individual Champion in one season.

By 10.30 a.m. a group of very active clubsters, supplemented by some of the nearby Felixstowe R.A.F. M.A.A. club members, had started preliminary tests of their Gamage and Pilcher entries. A.P.S. designs predominated among the gliders; Lulu, Nord, Satu, Windrush, Leprechaun and the Quickie were all there, and putting up good flights.

Pete Wyatt, last season's Senior Champion, was away serving in R.A.F. blue and unable to get home for the week-end. Pete Jacobs, last season's Power and Glider Champion, had just been presented with a more novel model by his wife and was too involved with nappies, so the club was fielding two experts short. Reg Atkinson, second in last year's Weston and Model Aircraft cups, was flying a reserve Ghost, the first choice having suffered with a bust motor, and Ernie Harwood, last year's winner of the Gamage, had a brand new lightweight specially built for the day. An early spin on test turns succeeded in reducing all of Harwood's hopes for a second Gamage win, and we turned to Gorham to make the first contest flight of the day.

Last season's backchat concerning this and other leading clubs biding their time and waiting for passing thermals was soon dispelled. At 10.55 a.m. Gorham made his first flight, a long flat climb to 300 or 400 ft., the prop feathering at 2 min. 12 secs., followed by an obviously overfast rate of sink to land at 3 min. 14 secs. "Too bad, Johnny", was the sympathetic cry, and we were swiftly informed that this was not the day for high times. Wind was reaching the field after blowing across the nearby wide stretch of river, and all possibility of thermal lift could be forgotten. Ten minutes after Gorham, Reg Atkinson launched his Ghost with 1,500 turns on its 78-in. twelve-strand motor. A faster climb than Gorham followed, the prop feathering at 2 mins. 15 secs., but again that rapid sink and a way below par return of only 3 mins.

Half an hour later, Gorham caught a solitary patch of lift to carry the Ghost out of the field for a 6 mins. 10 secs. D.T. onto an iron girder for his second flight, yet only ten minutes earlier, clubmate Atkinson was up and down in 3 mins. 5 secs. Third flights were made after lunch, but the unwelcome area of sink increased its bounds and pulled Gorham down for 2 : 47 (perhaps due also to the effect of the iron girder on the tail incidence), and Atkinson for 2 : 26. The consistency of these shortened times alone indicates that it was the atmosphere and not the Ipswich fliers, that was off form.

Glider times were even more affected by the unfavourable air, and although we were entertained to a very pleasant day of good, crash free flying, practically all of the flights terminated within the airport's wide boundaries.

Ipswich M.A.C. is a thirty-member club with its fair proportion of "keener-type" members. It is a contest minded group, and led by the successful Gorham, Wyatt, Jacobs, Atkinson and Harwood senior "hard-core", it has several very promising juniors in its ranks. Colin Pizzey, who placed 5th in the Lady Shelley last season, and Brian Mays are among these, and when once they have assumed the natural confidence of their seniors, they should go to make this very enthusiastic club a strong challenger for the Plugge.

Before leaving this large Suffolk town (pop. 102,000), we were hospitably refreshed at the Gorham homestead, and on parting, took one more peep at the workshop. But nary a model was to be seen! All meticulously packed in their proper places, no damage to repair, no adjustments to make, the Ghost, the A/2 and "Lil Aud" were stowed away ready for the next competition and benches were cleared ready for business. Neatness is the Gorham keynote, and precision his metiér, the last example of which came with his parting accurate estimation of 15th place in the final Gamage results.

A club is indeed fortunate if it has a leading figure to which members can turn for guidance or expert advice. To Ipswich John Gorham is that figure, and a report on Ipswich activities must necessarily include a fair proportion on this outstanding all-rounder who had played a great part in bringing his club to top-line standard in but two seasons.

R. G. M.

Team Racer Suggestions

offered by Cyril West

Demonstrating the form of construction he advises in this interesting article, Cyril West shows how the upper fuselage " lid " of his Class B racer detaches to reveal engine, tank and bellcrank detail. Motor is a Frog 500 mounted radially on a ply bulkhead.

THE incorporation of functional requirements into a clean semi-scale airframe seems to present some difficulty to the majority of designers. How far can realism be taken without hampering performance ?

In seeking the answer the author has developed a style of design and construction which has proved to be rugged and efficient. At the same time it is simple and economical in materials and building time. Furthermore, the system offers a wide scope in variety of design and will take a good finish easily.

To deal first with the design aspect, there are a number of factors which must be co-related before the actual structure can be fully considered. These are largely performance requirements and will have some influence on shape and proportion, the very points which we aim to improve upon.

Speed and range being desirable features, a major part is played by using wing loading plus sensible streamlining. In considering the airframe design it is advisable to assume that engine performance and operation are a constant quantity, since a fault in these factors will not be compensated by any amount of good design.

Upon wing loading depends an efficient flight attitude to a considerable extent, and it is common knowledge that an overloaded machine will fly " hanging on the prop. ", thus creating a large amount of unnecessary drag. The only thing which can pull a machine out of this condition is more power, and since we are limited in this respect then we must design our aeroplane to avoid these circumstances.

It must be obvious from these considerations that there is a maximum wing loading for team racers which seems to be at around 19 ozs. per sq. ft. This leaves two courses open :

(*a*) The total weight must not exceed 16½ ozs. if a model having 125 sq. ins. is required.

(*b*) More wing area must be added if structural strength and engine weight demand that the model should be heavier.

Landing, take off, acceleration and manœuvrability will all be improved if these conditions are fulfilled.

Further reductions in drag can be obtained by dispensing with rudder and engine offset. Correct relationships between the C.G. and the control plate pivot point will give sufficient pull to keep the lines tight. Reference to Fig. 1 will show how the arrangement works. The positions shown are fairly critical and should not be varied too much or instability may result. If you want an exciting few minutes, try flying a longitudinally unstable

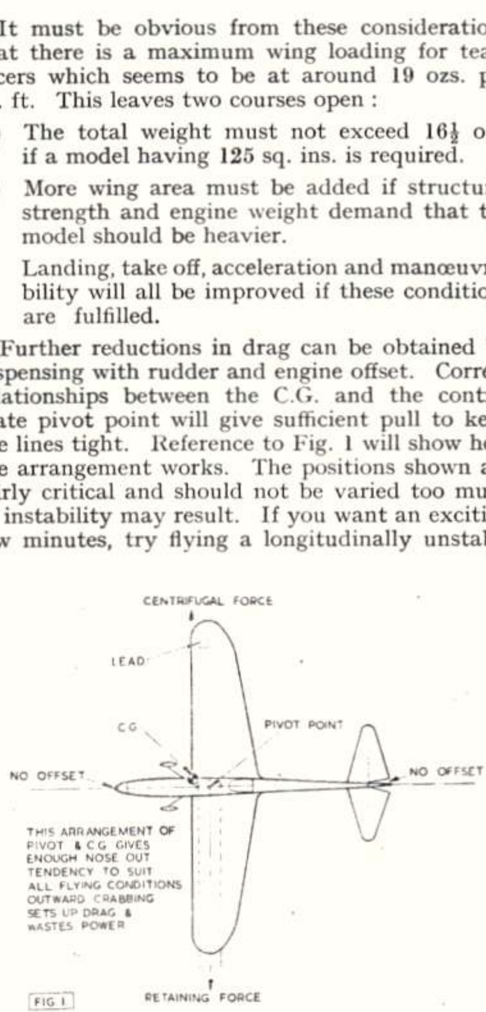


FIG. 1

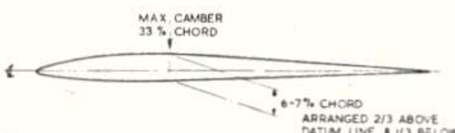


FIG. 2 TEAM RACER WING SECTION

At left, an attractive low-wing Class B racer by Jim Rough of Battersea Club, using an ETA 19. This is another "all-balsa" or solid model, built to withstand the rigours of team racing. At right, the author checks over his Class A model, which is held by his pit man, T. D. R. Redman, while the lap scorer looks on.

team racer and you will soon see what is meant. Tail moment arm may be anything between $\frac{3}{4}$ and $1\frac{1}{2}$ chords, and designers would be well advised to pay more attention to the ratio of movement between the control handle and the elevator.

Standardisation on a well tried scheme is a good way of saving time and trouble on this important little point, and the following dimensions will be found reliable :—

1.	Distance between	lines at handle	$4\frac{1}{4}$"
2.	,, ,,	bellcrank	2"
3.	,, ,,	pivot and pushrod bearings	$\frac{3}{8}$"
4.	,, ,,	elevator hinge and pushrod rear bearing	$\frac{3}{8}$"

No. 1 of course may be made adjustable if desired but this is not essential.

To allow a fair amount of freedom to the bell-crank, make the 2-in. line spacing a maximum ; no rake should be incorporated.

A common fault in racing models generally is the use of a tiny elevator in an effort to reduce drag and sensitivity. This is only applying a wrong cure to a mistaken cause and due regard for our old friend, c.g. position, makes it unnecessary. A generous elevator operating at fine angles will be found much more efficient, giving more positive control with less drag.

The wing, being the important part of any flying machine must be given due attention, and after considerable experiment the author advises a fairly high aspect ratio (about 6), giving a large span which helps to counteract torque at take-off. At the same time, the leverage given to the outboard wing-tip weight makes it more effective ; in fact, part of it may be dispensed with, reducing total weight.

Various sections have been tried and the type shown in Fig. **2** is recommended, being a low drag profile with good stall characteristics. In the latter respect it has a distinct advantage over the flat undersurfaced variety which tends to give "ballooning" when landing into wind.

To round off the design side of the story, it is necessary to collect the features and fit them into a pleasing outline. Here it is important to have an eye for the disposition of head resistance above and below the thrust line.

The arrangement shown in Fig. **3** gives some idea of the kind of thing to aim at and it will be noted that the "butterfly tail", besides being out of the rut, has other, more tangible advantages. If, however, this style is not your "cup of tea", how about Fig. **4**, which incidentally is developed from the main lines of the Italian Ambrosini S.7 light trainer and racer.

On full size aircraft the upright in-line engine is seldom seen nowadays, so why not try an inverted engined job for your next team racer. There is little difficulty involved, it just requires a slightly different approach, and in most cases performance will benefit. Let us also get rid of those fragile, tissue covered, barn door wings, which, when compared with a smooth tapered solid or stressed skin plane look far from realistic.

Solid wings of $\frac{3}{8}$-in. sheet balsa are easy to make and repair. Their weight need not be excessive and they will take an excellent finish. The lead out wires are made from short ends of "Laystrate" flying wire and run in covered grooves cut in the undersurface, a practice familiar no doubt with many speed flyers. Rigid lead outs have the disadvantage of becoming unnoticeably bent at the wing tip in rough landings and locking the controls for the subsequent take off.

Streamlined fuselages are complicated affairs when ordinary methods of construction are employed, but the sandwich system makes it all too easy.

Four vertical laminations are cut from $\frac{1}{2}$-in. sheet balsa and much waste may be eliminated by omitting portions which would at a later stage only be carved away in useless chips. This is achieved by carefully tracing the required shapes from the drawing and keeping an eye on taper and internal hollowing.

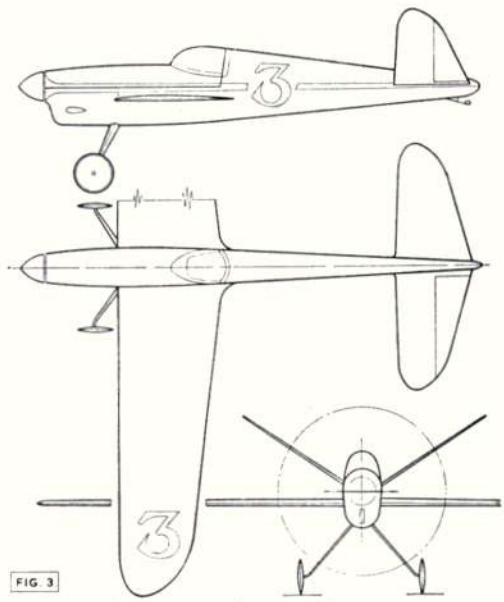


FIG. 3

CLASS 'B' TEAM RACER 'BLUEBOTTLE'

For shaping up, the parts are glued up into main components, which are in turn spot glued together. The main components are later separated for the completion of the internal assembly.

The undercarriage should slope forwards and is mounted on its own small plywood bulkhead to which it should be secured as a partially bent unit before insertion. The parallel legs are pushed through their holes in the fuselage floor and finally splayed to correct shape after the glue has set.

Engine bearers may be glued directly to the fuselage shell and can be strengthened by a small plywood bulkhead just behind the engine.

For engines such as the Frog 500, having the means for radial mounting, a 3/16 in. plywood bulkhead is recommended without beams. This should be tongued into the fuselage sides and bottom, using a good glue. The result is a very strong mounting which leaves more room in the cowl for engine removal. The top forward portion of the fuselage may be used as a lid covering the parts which need to be accessible for maintenance. If the cockpit cover is made integral with the lid, an effective joint may be made where the celluloid laps onto the aft decking. The whole thing is held down secure by a cycle spoke anchored to the undercarriage bulkhead.

Two methods of tailplane construction stand out with equal merit for strength and neatness. One is the simple use of 1/16 ply with the elevator hinged by two strips of silk stitched together down the hinge line. This method is already well known, but few seem to use it.

The second is the author's own idea, and was used extensively last season. A sandwich of two layers of 1/16 in. sheet balsa with a layer of silk or nylon between forming its own concealed hinge.

A good looking tailplane which will stand rough treatment is well worth the trouble.

Finally here are some odd hints which may be of use to the less experienced :—Use a small fretwork plane in rough shaping of wing sections and fuselage blocks. Card templates are necessary for final shaping to ensure a consistent wall thickness, which enhances the strength to weight ratio. See that the undercarriage track is straight and rigid. Wobbly undercarts are responsible for much of the wild ground manœuvring which often loses a race. Do not leave bare wood exposed anywhere ; sooner or later oil will find it. Balsa is very absorbent and the whole structure may become soaked in a short time, with the possible result that the model falls apart in flight.

Two words to remember when constructing a reliable model are : rigidity and accessibility.

So go to it, designers, and keep an eye on the full size look ; if properly handled, it will actually pay off in performance.

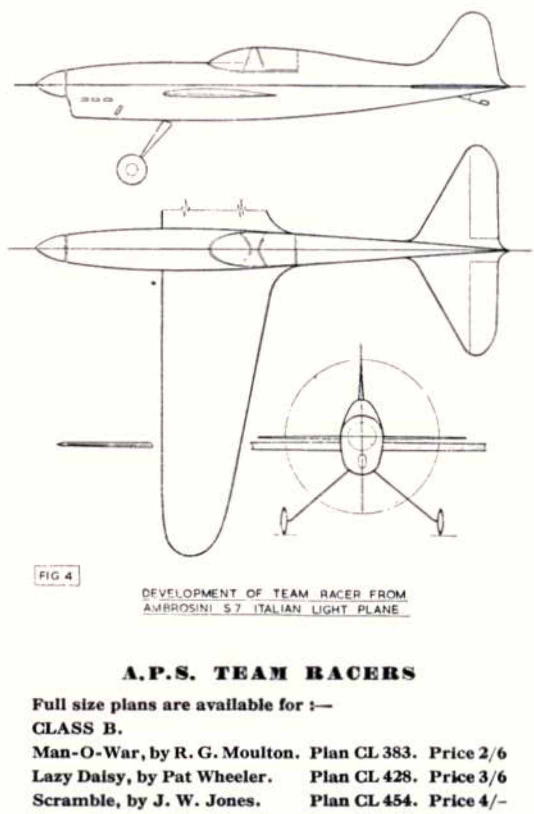


FIG 4

DEVELOPMENT OF TEAM RACER FROM AMBROSINI S7 ITALIAN LIGHT PLANE

ESPECIALLY FOR THE BEGINNER. PART XXVI

Airfoil Selection by VIC SMEED

A SUCCESSFUL model owes its performance to three equal factors—design, construction, and trimming. *Equal* factors. How many beautifully built models of proved designs are seen turning in mediocre performances, and how many well-trimmed, virtual wrecks win contest after contest. Trimming is the answer, every time. Thoughts of airfoil sections prompt these reflections, for it is not unusual for a really experienced modeller to draw out a nice-looking airfoil and, with no real data on it, *trim* his model for top-notch performance every flight. He isn't really striking in the dark when he draws his " zip-zip " section, for he knows what he wants and roughly what shape of airfoil will give him those characteristics, which shows that he has used standard sections and studied thoroughly the results given by each. This means some long experience, and unless you've been designing for several years, it is far wiser to stick to known airfoils with known characteristics. That way you are lessening the " unknowns " about your design and you know that you can repeat the performance with a later design, using the same airfoil.

A lot of fellows get confused, however, with the wide variety of airfoil sections available. They all lift, don't they, and if any one lifts more than the others, why bother about the others ? Well, of course, no one airfoil lifts a great deal more than another, and those which have better lift characteristics usually have drawbacks in other ways. We have to sift through the airfoils available to find the one best suited to the particular purpose we have in view ; a general idea of what type of section will give the required characteristics is obviously the first step.

Sections are usually compared in the first place on their maximum lift, maximum lift/drag ratio (L/D), and drag. Lift and drag are compared by means of their coefficients. A COEFFICIENT is a rather vague but convenient multiplier which " measures some property of a substance (or shape) for which it is constant, while differing for different substances (or shapes) ". The nearest one can get to it in one word is " a criterion " ; in our cases the coefficients of lift and drag are written CL and CD. Thus, airfoil data is dotted about with CL 1·8, CD ·009, L/D 22, or something on those lines. Naturally, lift and drag vary with different angles of attack, so that the coefficients are given as maximums and minimums, and mention is made of the angles at which the figures apply. The same system is of course used for the L/D ratio. These figures need only be taken as an *indication* of performance—we don't propose to bring in any abstruse calculations involving them. Other factors—CL at angle of maximum L/D, centre of pressure travel, spar depth, and so on—are considered before a final choice is made. The accompanying table (1) generalises the basic "features" and is useful as a very rough guide ; for the purposes of a survey, five broad divisions among airfoils have been made, but it should be remembered that some sections are " cross-bred " and that the tabled characteristics may not therefore be accurate in special cases. A few general remarks about these groups of sections may not be amiss, so we will briefly outline points of interest in each.

Bi-Convex Sections vary from the symmetrical to the nearly-flat under surfaces. Their small C.P. travel brings them into favour for flying wing types, and it is in this group that we find the few airfoils with rearward C.P. travel with increased angle of attack. The angle of zero lift of a bi-convex symmetrical section is, by the way, about —1 degrees, and not, as may be imagined, 0 degrees, due to slight compression and other effects.

Flat Undersurfaced Sections are popular because of ease of building and covering. Many original airfoils use flat bottoms, particularly in the U.S.A., where their low drag assists the extremely fast climb favoured over there. The extra height gained in such a climb allows a total duration no different from a higher-drag, " floater " —sectioned model, despite the superior glide of the latter. Such sections do not appear to be critical, since we have had very good results with an airfoil comprising no more than an arc of a circle struck between two trailing edge section spars, giving a thickness of ⅝ in. for a 7 in. chord (Fig. 1) ; " Oily Boid II ", a light model using this section, had a very rapid climb and an astonishingly flat glide. The flat plate proper is used only on tiny models—chords of 3 ins. or less, where it is as efficient as any other section—and as a starting point in the study of aerodynamics.

Undercambered Sections. The effect of undercamber may be generally considered as an apparent increase in angle of attack, with a proportional increase in lift but without the pro-

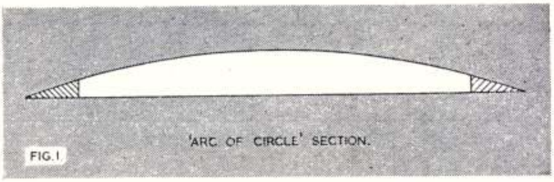
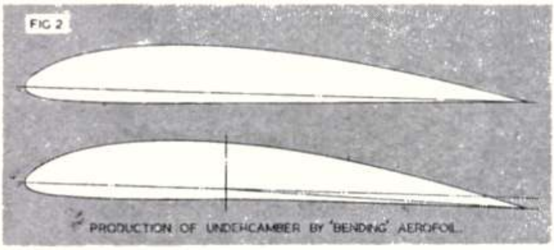


FIG. 1

portional increase in drag that would normally be expected. Perhaps this can best be visualised by imagining, say, Clark Y bent in the middle (Fig. 2). The front half is still working at, say, 3 degrees, but if we have bent the airfoil 2 degrees (i.e., increased the camber of its centre line) the rear half will be working at five degrees. To a point this can be advantageous, since the airstream will be guided by the contours of the front half and will be

FIG 2



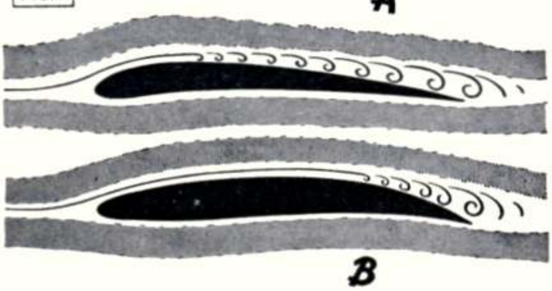
PRODUCTION OF UNDERCAMBER BY 'BENDING' AEROFOIL

in a condition to flow smoothly over the increased angle of the rear. This " preparation " of the airstream is, of course, the reason for our lift credit being greater than the drag debit. Too much increase of camber will naturally lead to separation of the airflow from the airfoil surface, and will eventually give the effect of having flaps down; anyone who has seen a Horsa " gliding " with flaps down will realise that this is a state strictly to be avoided!

Turbulent Flow Sections stem from the curved plate, but have only really come into their own in the last five years. Generally, they are notable for heavy camber, with the undercamber extending from the leading edge to the trailing edge. The point of maximum upper camber is well forward; the airstream flows smoothly to this point but then separates slightly from the wing surface and breaks into slight turbulence (Fig. 3a). This condition, as may be imagined, creates high drag, but also very high lift, and has the further effect of delaying the stalling angle. Large tailplanes are advisable with these so-called " bird " sections, due to their very large C.P. travel; this naturally increases total drag. Since drag builds up as the square of the speed, the high total drag of models using these sections means that low flying speeds are essential for efficiency, and for this reason these airfoils are normally confined to lightweight and ultra-lightweight jobs.

Laminar Flow Sections. Developed especially for model use, airfoils in this category are not highly popular due to the fact that meticulous construction is essential in order to obtain the slight aerodynamic advantages they offer. They may be flat or undercambered, but are all notable for the fact that the point of maximum camber is aft of mid-chord. Airflow separation thus takes place near the trailing edge, so that the airflow over most of the wing is laminar, i.e., one layer flowing smoothly over the next, a condition which produces the minimum of drag. (Fig. 3b.)

FIG. 3.



Airfoil Modifications

Standard airfoil sections are occasionally modified in some way in order to alter certain characteristics. The three main alterations normally found are increase or decrease of thickness, change of camber, and incorporation of a reflex trailing edge.

Increase in Thickness normally has little effect on the particular airfoil's characteristics, but the change is allied with flying speed. A thin section shows to advantage on a fast-flying model,

Type	Lift	Drag	L/D	CL at L/D	C.P. Travel	Spar Depth	Uses	Example	Advantages	Disadvantages
Bi-convex	Low	Low	High	Very high	Small	Usually good	Mainly C/L Speed and Stunt, F/F tailplanes	RAF 30 RAF 34 NACA M6	Small C.P. travel, very small drag	Low lift, esp. at model speed
Flat under-surface	Med/ High	Low/ Med.	Good	Good	Fair	Varies	*All* models	Clark Y Flatplate Originals	Ease of construction, lack of vices	Tend to speedy glide
Under-cambered	High	Med./ High	Good	Fair	Fair/ Large	Usually good	All F/F categories	RAF 32 NACA 6412, 4409 etc.	General all-round efficiency	Slightly more difficult in construction
Turbulent Flow	Very high	Very high	Good	Fair	Very large	Usually poor	Mainly lightweight models	MVA 123 SI 64009 Curved Plate	Very high lift at low speed	High drag with slight speed increase; warp-free construction difficult
Laminar Flow	Med./ High	Low	High	Good	Fair—varies	Varies	F/F	LDC 2 LDC 3M LPO	Good lift + good L/D	Construction must be very accurate

but may show loss of efficiency at a lower speed. Thickening the section allows similar characteristics to be exhibited in the lower speed range. Examples of this are the airfoils NACA 4409, NACA 4412, and NACA 4415, which are all basically the same airfoil with slightly varying thickness/chord ratios. (Fig. 4.)

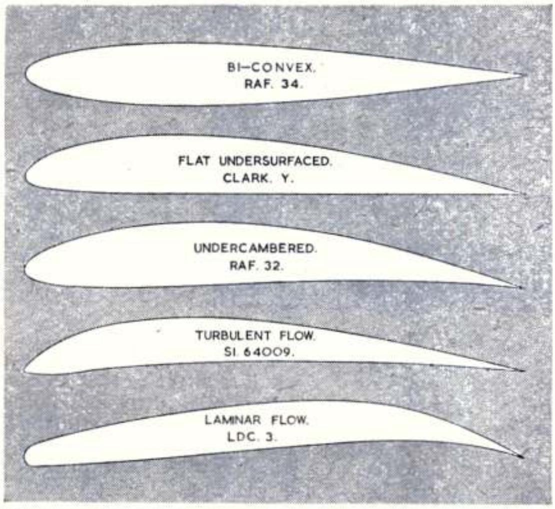
Decrease in Thickness is, of course, the same idea the other way round, although here we often find large reductions in thickness. The classic example of this is Clark Y, thinned variants of which are almost universally employed for lifting tailplanes. A reduction of 40 per cent. in the thickness gives, as may be expected, a handsome reduction of drag; however, the reduction of lift is not by any means so great and all the airfoil's other characteristics—C.P. travel, approach to stall, etc.—remain unchanged. In other words, one retains the good things while greatly reducing the bad. Thickness is also partly tied up with **Penetration,** which is the relationship between forward speed and sinking speed, and is of particular importance in slope-soaring.

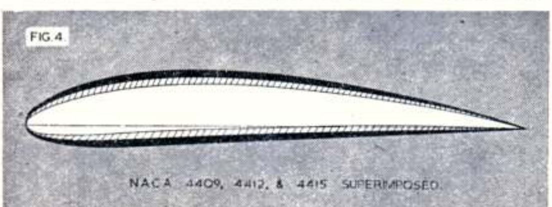
Change of Camber—either increase or decrease—affects most of the airfoil's features, virtually changing the whole section. Decrease of camber may be employed to reduce C.P. travel, but it also cuts drag to a large extent and slightly reduces lift. It is useful when developing one model from another, but otherwise it is advisable to select a fresh airfoil with the desired characteristics from the many available.

Reflex Trailing Edges are used solely to limit C.P. travel, which they do most effectively. Unfortunately, reflexing the trailing edges increases drag and decreases lift to a large extent. An example of this is (once more!) Clark Y; incorporation of a reflex trailing edge (Clark YH) reduces C.P. travel from 10 per cent. to just about zero, but reduces CL max. from 1·24 to 1·12, and increases CD min. from ·0085 to ·0132. However, the stability gained is very well worth the loss of efficiency, especially for flying wings and scale models of aircraft with very small tailplane areas.

Reynolds Number

An obscure factor which usually crops up in discussions of airfoils is the Reynolds Number. The easiest way to think of this is the number of air molecules which pass over the whole wing in a given time. Thus, speed, chord, aspect ratio, area, and air density all affect this number. This is not the most accurate definition, but it is certainly the clearest. The point of it all lies in the fact that R.N. affects the *efficiency* of an airfoil—doubling the R.N. more than doubles the overall efficiency; this is the explanation for the superior performances expected from a large model, particularly if scaled up from a smaller job. Chords of less than 6 ins. drop off alarmingly in efficiency due to their very low R.N., so that it usually pays to use a lower aspect ratio on wings of under 200 sq. ins. area. A variation on this idea is the L.S.A.R.A. sponsored "critical VL number" which relates airspeed with minimum chord for any airfoil.





Thought for Today

When next one of your theorist friends natters about the odd tenths of a degree in the angle of incidence of his latest job, it is your turn to smirk. He will point out that he has set the wing at that angle (assuming he builds that accurately!) to ensure the best L/D ratio and therefore minimum sinking speed. A very worthy aim. He will then proceed to trim the model to glide on the verge of the stall—as do 999 modellers out of every 1,000. However, if his particular section stalls at, say, 12 degrees, he is trimming the job to fly with an angle of attack of 10–11 degrees. Where now is his best L/D? The model will sink faster, despite its slower forward speed. We have proved this on several types of full-size sailplanes—for example, a Kite, stalling at 32 m.p.h., will descend quicker at 33–34 m.p.h. than at 38 m.p.h., the speed at which its angle of attack gives best L/D.

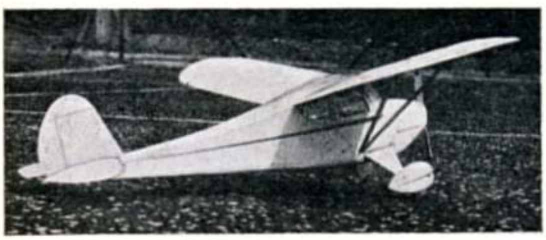
Next month we will return to general theory and look at the various factors affecting stability.

★ TRADE

"51" Special. 4/11 (including P.T.).

In the early days, with the beginning of Balsa imports and the flourishing aeromodelling movement as we know it today, many beginners were introduced to the hobby by the readily available oiled-silk covered stick models, which could be obtained in ready-made form. For many years there has been no equivalent to this ideal introductory model and for that reason we are very pleased to see a new product known as the " 51 Special ", which is marketed by Messrs. Woodside Model Aircraft Supplies, of Croydon. Retailing at a price no more than its 1936 equivalent, the " 51 Special " is an all-balsa job completely preformed, but for the attachment of the tail unit, and obtainable at the very reasonable figure of 4/11.

We tested this little model and had it ready for the first hop within 10 minutes of opening the box. By moving the wing back and forth along the stick fuselage we soon obtained perfect trim, with the wing leading edge 1½ ins. behind the u/c. Distance and not duration was always the measure of performance with these little models, and the " 51 Special " was found to average a distance of 70 feet, although on one occasion it covered over 120 feet with what we suspect to be slight thermal assistance ! We thoroughly recommend the product as a perfect means of elementary introduction to aeromodelling.



Mercury Monocoupe L.7.A. 66/-.

Wing span 64 ins. Overall length 43 ins. Suitable for motors from 1·5 c.c. to 2·5 c.c.

Packaging. Contents of the stout card box are tightly packed, thus ensuring maximum protection against damage. So well packed, in fact, that having emptied our Pandora's box, we had enough for 3 boxes when it came to putting the pieces back.

Quality. Balsa was generally of very high grade, although some of the square strip was rather soft. We have no doubt that if any inferior quality Balsa passes the check during kit packing, the manufacturers would be willing to exchange for material of the correct quality.

Completeness. The kit was complete but for wheels, engine, tank and cement. There is a check list of contents included on the instruction leaflet for those in doubt.

Assembly. Most of the drawings are perfectly straightforward. One part which met with criticism is the motor cowling, which is of block Balsa, carved to shape ; we needed packing to bring the cowling up to the size indicated on the drawing. If the doors are to be used for a Radio Control version, additional strengthening is necessary to prevent the doors warping.

Instructions. A fairly comprehensive leaflet is supplied, and the plans are well detailed. One important point is that the model shown in the leaflet differs in detail from that shown on the drawing. The most noticeable difference is the construction of the centre section, which the photographs show to have dihedral on the top surface, whilst the plan shows it to be flat. This is liable to cause some head-scratching at first. R/C installation is well covered with a separate drawing, and also there are very complete notes on finishing, trimming and flying.

Value. This is one of the expensive class of kit and unfortunately hardest hit by the imposed Purchase Tax. Nevertheless the value of the Monocoupe 64 is first rate, and would be a satisfactory investment for any modeller.

Scale Appearance. First impressions are that here at last is a real flying scale model, but the appearance can easily be spoiled by giving too much dihedral. The tailplane position is slightly different to the full size aircraft and the area is obviously increased. However, we would be the last to say this detracts from the realism of the model, which has already proven its popularity amongst aeromodellers at home and overseas.

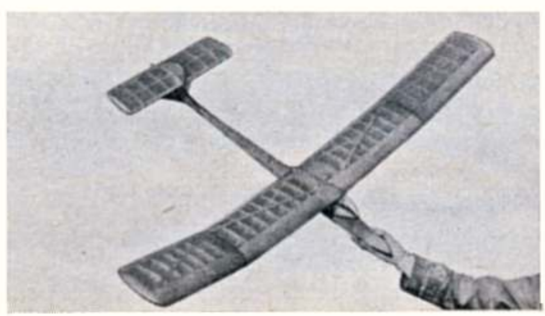
Veron Vortex A/2. 22/7 (including P.T.).

Wing span 66 ins., length 38 ins. Total area 508·75 sq. ins. Cross sectional area 6·8 sq. ins. Our weight without A/2 ballast 13·5 ozs.

Packaging is of the usual Veron standard, with a stout card box and colourful label illustrating the finished model.

Quality of Contents. All balsa in this kit was of the very highest quality, so much so in fact that we checked to ascertain whether it was a selected kit. We are assured that this was not the case and have since found kits " off the shelf " have similar high quality wood.

Completeness. With the exception of cement the kit is complete to the last detail. Tissue paste is



REVIEW ★

provided for covering. The amount of wire for the sundry tail attachment hooks, auto-rudder and tow hook, was only just enough to complete the job, and we would have favoured a little tolerance in length.

Ease of Assembly. Ready cut ribs are included in each kit. We observed at first glance that these ribs were abnormally deep, and on checking found them to be 15·5 Thickness Ratio instead of the advertised 12 per cent. (the wing section being NACA 6412). This unfortunate error was due, the manufacturers assure us, to an accident with the master die and the extra thick ribs have been circulated in only a few kits. We continued construction using the thicker wing (now NACA 6415·5) and found little noticeable difference between this " thicker model " and the standard model which we duplicated in the test.

Assembly of the " Vortex " is straightforward and simple enough for all but the rawest beginner. Building time is 25 hours.

Value at 22/7 is very good.

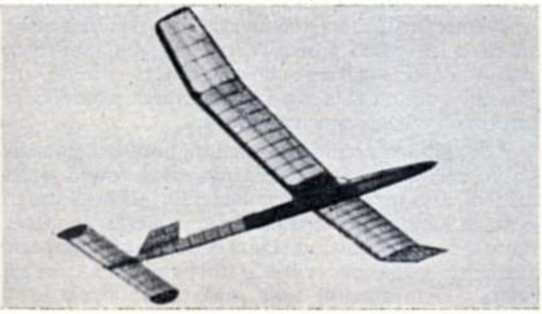
Flying. After increasing the wing incidence by 1½°, the test " Vortex " was tried on full F.A.I. line length at the Croydon Gala. Although premature release on two tows reduced the overall average of three flights to just under two minutes, the average " still air " performance of this model from 328 ft. would appear to be 2 mins. 47 secs. On one thing we would remark, and that is that the " Vortex " is the " easiest to tow " sailplane that we have yet taken up on a line.

Mercury Marauder A/2. 14/6 (plus 3/3 P.T.).

Wingspan 65 ins., length 49 ins. Total area 524 sq. ins. Our weight, without A/2 ballast, 11 ozs.

Packaging, Quality of Contents and Completeness of this kit need no elaboration, for they are all to the high standard we have found in previous Mercury products. Stage by stage instructions are supplemented by concise trimming notes in an illustrated leaflet which goes to make this a most complete " dry " kit.

Ease of Assembly is best exemplified by our recommendation of this kit to any novice who feels he would like to try his hand at a 5-footer with contest performance. Its simple structure, with front and rear half longerons joined by a stout centre fuselage of ⅛ in. sheet, and general lack of fiddly bits, make it a good model for novice or expert.



The tip fin positions can only be ascertained by study of the photograph, and gussets shown in this illustration are not indicated on the plan. For good measure, we strengthened the nose framework with large gusset strips. Building time is approx. 20 hours.

Value is excellent at 17/9.

Flying. First-hand launch tests of the Marauder in calm air were far better than ever expected. The model would " knife " its way at a steady speed and at an exceptionally shallow angle across our newly-found testing ground, giving promise of high performance. Off the line, after easily effected " overhead" tows, the Marauder required more nose-weight to damp out a stall, though the hand-launch trim was still perfect.

Flying in the fierce winds on S.M.A.E. Cup day, the test job folded its wings while on tow (in keeping with many another design on that day) and the subsequent prang also folded the fuselage. Perhaps wing struts would not altogether be out of keeping with the practicality of the design if it is to be used for all-weather operation, and additional gussets, as indicated in the photo on the leaflet at the junction of sheeting and rear longerons, would deter breakage at this point.

Repaired, the test model averaged 2 mins. 35 secs. off 328-ft. line in calm conditions, but being one of the " floating " type, its average performance would be raised by the slightest evidence of lifting air.

Solids

The popularity of solid kits waned considerably after the War and, until recently, interest in this branch of aeromodelling has been limited to very few followers. Jet aircraft, and their impressive performance, have seemingly aroused new enthusiasm for the solid model and we have been pleased to note that three manufacturers are now actively producing ranges of 1/72nd scale jet aircraft.

Bateman Kits, of Walthamstow, are long experienced in producing solid kits for display models, and are well known, particularly in the North London area. Parts are cut from good quality Balsa and Obechi to accurate profile shape; wheels, cockpit cover, brass foil and cement are provided, while the plans are extended to give practical building instructions. Transfers are included, but are not quite as good as they might be, though regarding the cheapness of this accurate range we were quite prepared to overlook this small point.

Unique in the Bateman series are the Avro 707b and Saunders Roe A.1, each a novel subject for a decorative model.

Silverwing Jet solids by Messrs. Halfax are a half crown range of all Obechi models. Parts are shaped for carving, though not in every case accurately to the line; sandpaper and transfers are also included. The plans for these solids are simply drawn with only the essential information indicated, so that a decorative model rather than a super-detail job results. Parts for a shaped stand for display are ready-cut to profile shape.

Veron Tru-Scale kits are, as their name implies, true-to-scale solids with plans packed with detail and data on each subject. Sandpaper, transfers, cockpit cover, wire and wheels are all included with the shaped Balsa parts, while in the case of the MiG 15, Meteor and Canberra, the round section fuselage and engine nacelles are supplied turned. We had great pleasure in making up the MiG 15 and could find no fault with any part of these very low priced kits.

Ron Warring presents Part 1

ENGINE

Featuring the

E.D. ·46 BABY

IN taking over this series of engine tests it was, perhaps, a trifle unfair on the subject that the first engine in the new series was a " Baby ". Due to the fact, too, that time ran short (the stroboscope was only received back from repair within 24 hours of the latest " press " date for the test report), it was not possible to check the results against another engine of similar capacity. Compared with previously published tests for half c.c. engines, maximum brake horse power of ·0285 realised with the E.D. " Baby " appears on the low side.

Certainly this is a true indication of the *least* that can be expected from this new engine. It is certainly not " hot ", as far as performance goes, but after one hour's running in was still subject to r.p.m. fluctuations on test, which would appear to indicate that a longer running-in period would have been advisable. Had it been possible to carry this out, possibly the ultimate performance figures may have been better.

This illustration of the E.D. " Baby " is approximately actual size. Note the 360 degree porting and the swept back needle valve that keeps one's fingers out of the prop.

Two other criteria must also be taken into consideration. The torque balance used is better suited to large than small engines. Where torque of the order of two and three inch-ounces has to be measured a smaller, lighter test apparatus would really have been desirable. Undoubtedly a certain amount of power was lost, too, on account of vibration. The E.D. " Baby " is an unbalanced engine, with no attempt made to balance the reciprocating and rotating elements. If smooth, consistent high speed running were to be produced an unbalanced propeller (or airbrake) would have to be used, positioned by experiment to give the optimum static and dynamic balance conditions.

As to the actual engine itself, this is an intriguing little job, extremely well made and incorporating a number of interesting constructional features. The steel piston-cylinder assembly, for example, is literally a loose fit, clamped in place between the light alloy crankcase and the alloy cylinder casing. Space between the lower part of the steel cylinder and the stub cylinder casing incorporated in the crankcase casting constitutes the by-pass. Thus both transfer and exhaust porting (immediately above the by-pass) is full 360 degrees.

Many baby diesels are temperamental as regards starting. A common feature is that different motors of the same make exhibit different characteristics in this respect. As far as the test engine was concerned, this gave no starting troubles at all when cold, when liberally primed, but failed to retain good starting characteristics when hot. Possibly, again, this is a feature which would have improved with longer running-in.

As regards starting and running, both the needle valve and compression settings were found quite critical, the former particularly so. It was found best, in fact, to leave the needle valve alone at the normal running setting (exactly one turn open) and start by generous priming through the exhaust ports. Compression then had to be backed off

# of a New Series of
ANALYSIS

Breakdown of parts gives an idea of the diminutive sizes involved. The thread on the crankcase indicates where the cylinder head screws down, at the same time locking the cylinder liner in position.

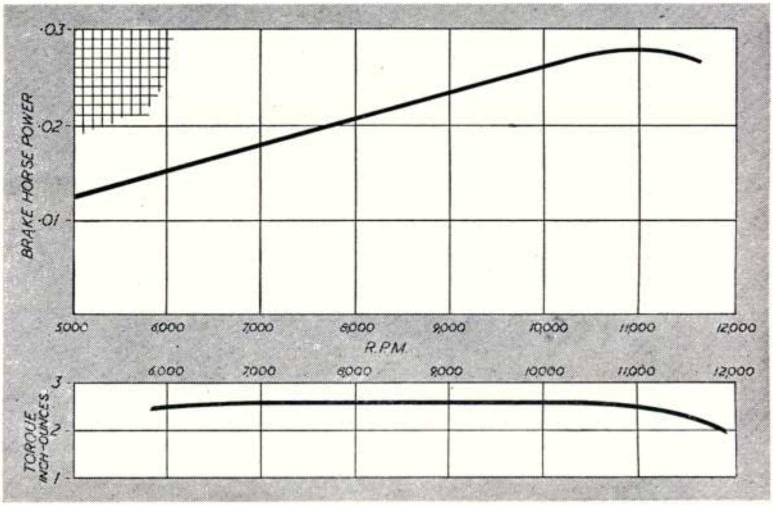
between one-quarter and one-half a turn, when the excess fuel would fire, the engine would commence to run rough, speed up and then begin to miss. Once running fast, but " missing ", increasing the compression back to running setting produced steady running.

This method, even to completely flooding the engine (and perhaps having to back off the compression three-quarters of a turn) never failed to produce starting, provided the engine was not too hot. Starting with both compression and needle valve at running setting, one choked turn to fill the fuel line and two drops of fuel " primed " through the exhaust was inconsistent as a starting technique. Re-starting the hot motor by a choked turn and flicking the propeller was also unreliable.

In particular, the E.D. Baby liked to have the prop. flicked *smartly* over when starting. Hand starting was carried out through the tests and this still followed the same routine, even with the smallest test propeller used (4½-in. diameter and 2-in. pitch). Nor does the engine have a tendency to " kick back " smartly and rap the fingers with the prop., as in many other diesels.

As an engine of moderate power output the E.D. " Baby " would appear particularly suited to free flight where an " ideal " propeller size, indicated by the tests, would be 7-in. diameter by 4-in. pitch. Speed is then of the order of 7,500 r.p.m. and running quite consistent. The highest speed which the engine held with reasonable consistency was 10,800 r.p.m., this time with a 6×3 propeller. All the propellers used were of normal " free flight " design.

To take advantage of the maximum power output of the E.D. " Baby ", which appears to occur at around 11,000 r.p.m., a 6×3 or 4×5 propeller is indicated—the former perhaps for a " Half A " team racer and the latter for a speed model. If the engine is used for control line work, however, a running-in period of at least two hours would appear advisable before installing in the model. At high speeds the test engine, after approximately 50 mins. total running time, had a tendency to slow and stop after some ninety seconds " flat out ". It was then difficult to re-start until it had cooled down again. The makers, incidentally, recommend a 6×3 propeller for the " Baby ", which would appear a little smaller than the optimum for free flight work.



On a full tank of fuel, including starting, duration of run is almost exactly 60 seconds with a 7×4 propeller and some 45 seconds with a 6×3 propeller. This, of course, is on the long side for free flight, but allowing the engine to half empty the tank before release (or counting off some thirty seconds before release if the engine is completely cowled in) will answer this problem. The tank itself is a neat transparent plastic moulding fitted on to the rear of the crankcase and nicely in keeping with the pleasing appearance of the engine.

Leading dimensions are summarised on the general arrangement drawing. The E.D. " Baby " will run equally well upright, inverted or sidewinder and is compact enough to be completely enclosed in a neat cowling, if desired. In such cases provision should be made for priming via the exhaust ports. Bore is 0·312 in. and stroke 0·375 in. Displacement is 0·0285 cu. in. or 0·46 c.c. Weight, with tank (empty), is quoted as 1·4 ozs. by the makers. The test engine weighed exactly this figure.

Summarising, we would say that the E.D. " Baby " is a most attractive addition to the free flight " sports " field, but a motor which may give a little starting trouble to the inexperienced. *Thorough* running-in seems essential and it will probably be noticed that after a certain period of running-in the engine appears to run worse, and be more reluctant to start. Some time later it will begin to settle down again, this time finally. All small motors have an " individual " temperament and you have to get to know them properly to master them.

Propeller tests. (Standard " free flight " blade shape) :

7×4	..	7,500 r.p.m.
6×3	..	10,800 r.p.m.
5×5	..	8,500 r.p.m.

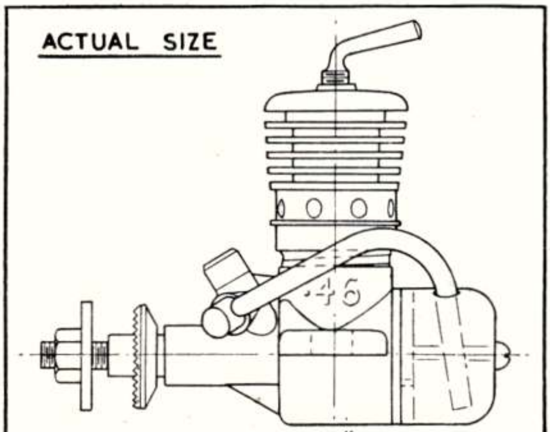
Mercury No. 8 fuel was used on all tests.

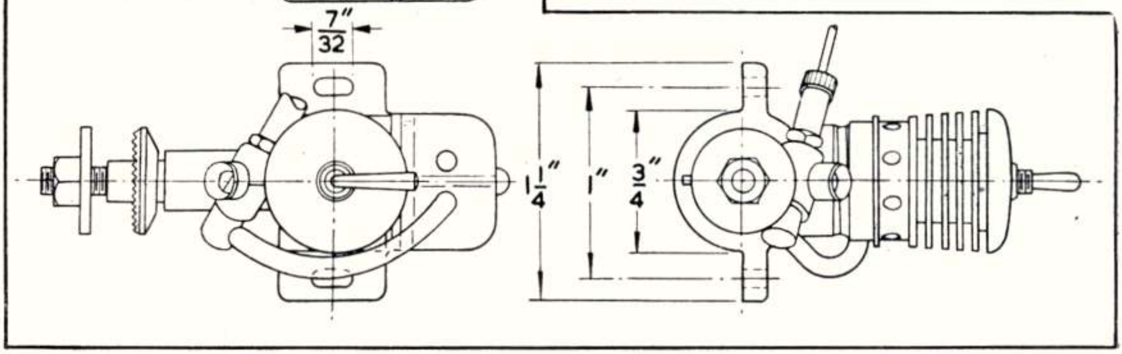
Best liked features : Angled needle valve keeping needle valve clear of propeller disc ; and right-angled spray bar end avoiding kinking of fuel line.

Least liked features : Opaque fuel line. Transparent tubing would have been preferred to see when line was full of fuel. " Needle end " of needle valve not uniform. Needle valve control rather too critical.

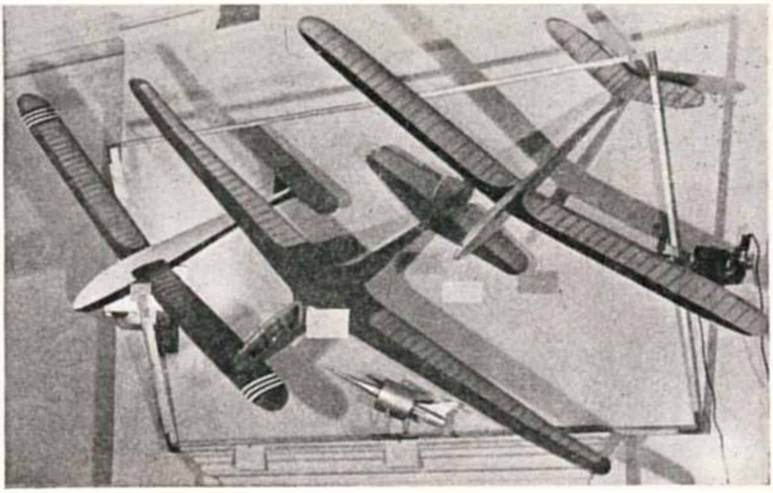
E.D. ·46 BABY

Manufacturers : Electronic Developments (Surrey) Ltd., 18 Villiers Road, Kingston-on-Thames, Surrey.
Retail Price : 45/– plus 10/– P.T.
Delivery : From stock.
Spares : 7 days.
Type : Compression ignition (diesel).
Specified fuel : E.D. Standard.
Capacity : ·046 c.c. (·028 cu. in.).
Weight : 1·4 oz. (with tank).
Mounting : Beam, upright and inverted.
Recommended Airscrew : 6 in.×3 in. (E.D. Plastic).
Flywheel : 1 oz., $1\frac{1}{8}$ in. dia. × $\frac{1}{2}$ in. brass.
Bore : ·312 in.
Stroke : ·375 in.
Cylinder : Steel, case-hardened.
Cylinder Head : Duraluminium.
Crankcase : SS60 gravity casting.
Piston : Cast iron, Conical head.
Connecting Rod : Steel.
Crankshaft : Steel, case-hardened.
Main Bearing : Plain.
Induction : Crankshaft rotary valve.
Special features : Fuel control is placed at 30° for comfortable access.
Compression Ratio : Variable.





POLISH MODELS EXHIBITION



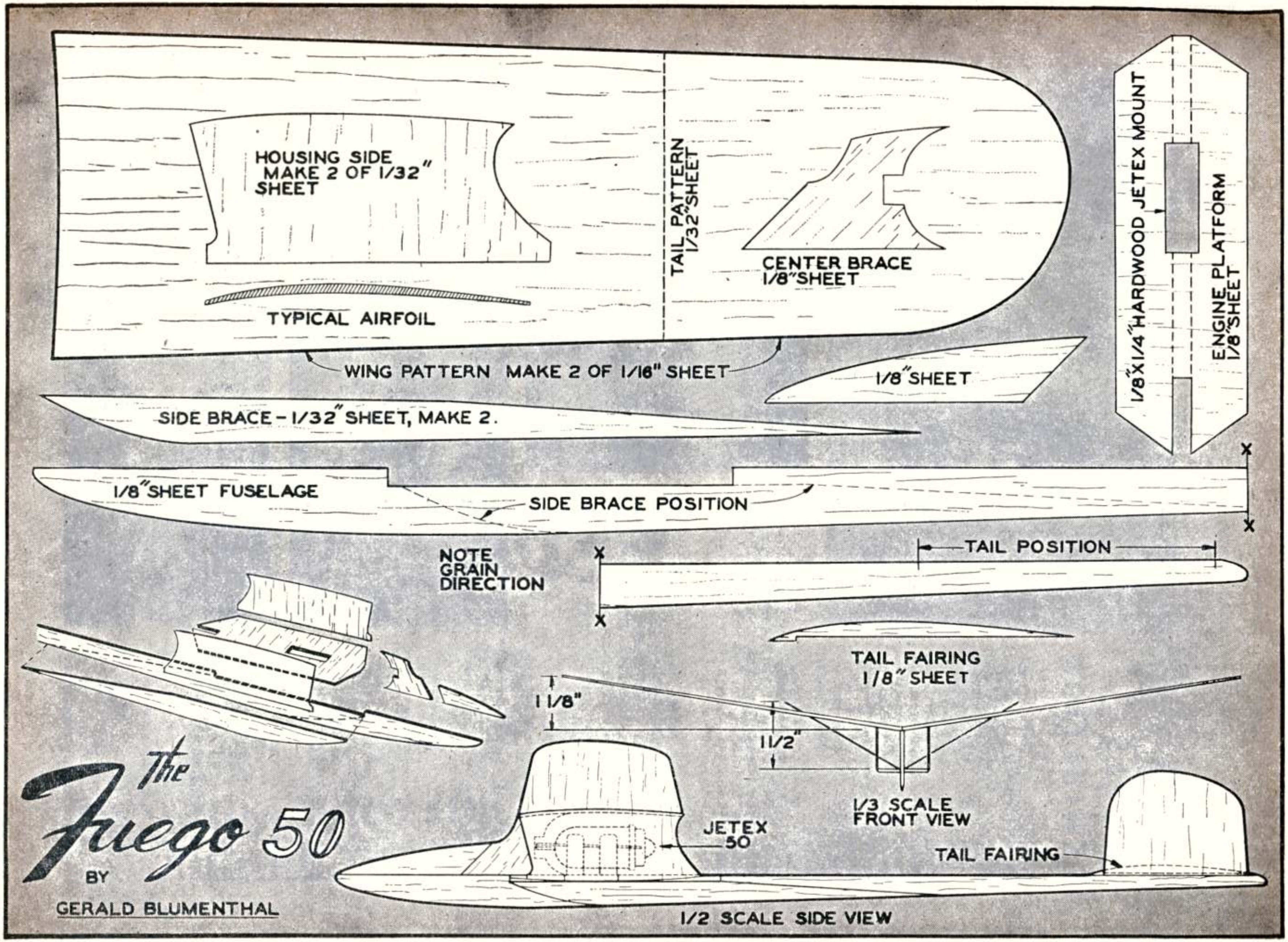
SOME eighteen months ago the Polish Air Force Association formed an aeromodelling club within its ranks consisting of a nucleus of ten enthusiastic and experienced aeromodellers. They concentrated on gliders and flying scale models, many superb examples of which were seen at contests and exhibitions. Readers will remember the magnificent D.H. Beaver by T. S. Natchtman that won the Concours at Hendon and the Northern Heights Gala.

The Club soon realised that if it was to grow, young blood must be introduced, and promptly organised a modelling section at the Polish School for Boys at Botisham, from which to draw its recruits. Two instructors visit the school fortnightly, lecturing and tutoring on all aspects of aeromodelling.

The Polish Air Force Model Aircraft Club recently held an exhibition of models at the club's headquarters in London, where, as a further encouragement to the youngsters, a special Junior Section was introduced, including members up to the age of 18 years. Better proof that the policy of encouraging juniors pays dividends would be hard to find, as can be seen from the photographs on this page. The Polish Transatlantic R.W.D.5 model is to 1/10th scale, powered with a Dart, is the work of 17-year-old M. Skarzynski, for whom it won second place in the contest. The group photo shows W. Owsianka, thirteen-year-old winner of the Junior Class, being congratulated by G/Capt. Allen Dore; watching on the right is Air Commodore S. Karpinski, former A.O.C. Polish Air Force, who is President of the Polish Air Force Association.

The lower photo features a semi-scale radio controlled model by expert T. S. Natchtman, which is believed to be the first Polish model of this class ever designed. Of 70 ins. span, it weighs 3½ lbs. and is powered with an E.D. 2·46. Another radio control model by the same modeller is the Nordic A/2 glider shown on the left in the top photo. Yet another Natchtman A/2 won 1st Prize at the 1951 Model Engineer Exhibition.

With modellers such as Mr. Natchtman, plus the enthusiasm of their juniors, the Polish Air Force Model Aircraft Club can look forward to its third year of formation with every confidence.

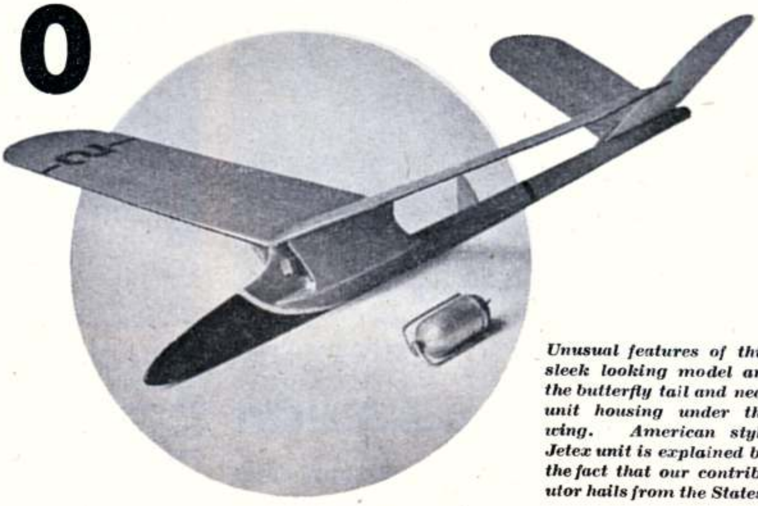

HOUSING SIDE
MAKE 2 OF 1/32"
SHEET
TYPICAL AIRFOIL
TAIL PATTERN
1/32" SHEET
CENTER BRACE
1/8" SHEET
1/8" X 1/4" HARDWOOD JETEX MOUNT
ENGINE PLATFORM
1/8" SHEET
WING PATTERN MAKE 2 OF 1/16" SHEET
1/8" SHEET
SIDE BRACE - 1/32" SHEET, MAKE 2.
1/8" SHEET FUSELAGE
SIDE BRACE POSITION
NOTE
GRAIN
DIRECTION
TAIL POSITION
TAIL FAIRING
1/8" SHEET
1 1/8"
1 1/2"
1/3 SCALE
FRONT VIEW
JETEX
50
TAIL FAIRING
1/2 SCALE SIDE VIEW
The
Fuego 50
BY
GERALD BLUMENTHAL

FUEGO 50

AN ALL-SHEET DESIGN FOR THE JETEX 50 UNIT

BY

G. J. BLUMENTHAL



Unusual features of this sleek looking model are the butterfly tail and neat unit housing under the wing. American style Jetex unit is explained by the fact that our contributor hails from the States.

SINCE my first Jetex job approximately a year ago, I have built about a dozen designs with varying degrees of success. I've tried big ones, small ones, bird wings, flying wings, conventional designs, etc. Finally, I believe I have reached a point where I know what is required in Jetex design. Because of the limited run on these small power plants, the plane must be fast in order to get any altitude. Therefore it must be small, and a small plane, in order to have a good glide, must be light. These considerations brought about the design presented here. Reading the article on Jetex design in the January AEROMODELLER, I found that the force set-up in my ship compared very favourably with that advocated in the article. The plane climbs rapidly to a good height and has a slow flat glide. The full size parts drawings and the all sheet construction will afford fast building.

Construction

Sort out some light wood and trace the full size patterns directly on the balsa sheet with a pin or carbon paper. Be careful to note the grain direction. Cut a small hardwood block to size shown on the plans and screw the Jetex mount in place. Cement this unit into the $\frac{1}{8}$-inch engine platform.

Next, cut out the housing sides and cement them securely to each side of this platform, making sure they remain perpendicular. Trim the $\frac{1}{8}$-inch fuselage to a triangular cross section with the flat top, then cement the preceding assembly in place (see exploded drawing).

The wing is made next. Cut the wing halves from light $\frac{1}{16}$-inch sheet and sand them to a smooth airfoil taper. Breathe on the upper surface and gently bend in a slight undercamber the full length. Join the halves at the correct dihedral as shown on the front view and let them dry thoroughly. Next, cut two tailplanes from light $\frac{1}{32}$-inch quarter grain sheet. These too are cemented together at the dihedral shown. A length of thread cemented along the leading edge of the wing will prevent a number of small dents.

Cement the side braces to the fuselage, one on each side. These braces change the bending moment, preventing fracture of the boom upon impact. Attach the upper nose piece and centre brace and sand the entire nose smooth and round.

Cut a slight " V " in the centre brace to receive the wing and cement the wing in position. While the cement is drying, line up the wing from the front and top. The tail assembly is cemented in place next. Cut another " V " to receive it at the position shown and cement the assembly in place. Cut the tail fairing from $\frac{1}{8}$-inch scrap and cement it in position.

The original plane had two coats of thin orange anilin dyed dope, sanded lightly between. The nose was black with a thin chartreuse stripe. The air intakes were red. The model, when finished, should weigh no more than one ounce.

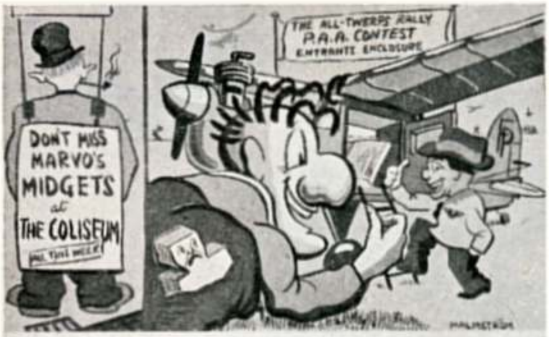
Trimming

Look the model over carefully and make sure there aren't any warps. Slide the loaded Jetex motor into its bracket from the rear and give the model a few hand glides. Correct for stall or dive by adding modelling clay to the nose or tail respectively.

The orginal plane had a jet rudder of aluminium. To be effective, this rudder would have to be mounted very close to the exhaust nozzle. This would make access to the engine difficult, so it was omitted.

The ruddervators are trimmed like ailerons ; *i.e.*, when one side is bent up the other side must be bent down.

Go out some nice afternoon and adjust the model for a gentle left turn. Light the fuse, launch, and get on your horse, because this job can really go.



MODEL NEWS

SELECTED ITEMS BY FLIAR PHIL

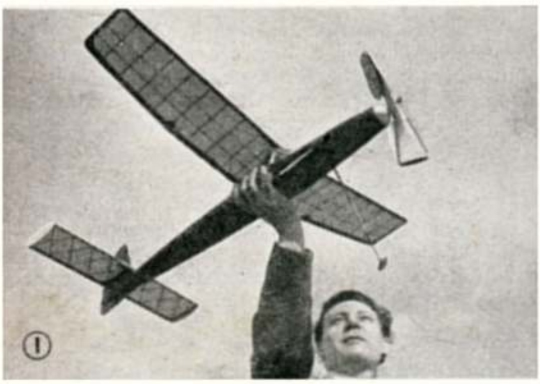
ONE of the most interesting scale control-liners it has ever been our pleasure to actually examine is Captain Cesare Milani's perfect replica of the Hawker Horsley Torpedo Bomber. When a photograph arrived for our consideration, we had no hesitation in accepting same as an immediate " Model of the Month " choice, though this one view does little to reveal the many clever intricacies of the job. Its span is **42** ins., weight **2½** lbs., and the engine an ETA **29**. Metal cowlings are faithfully reproduced in aluminium, the undercarriage is fully sprung and even the torpedo and its rack threaten to work with their realistic appearance. And to answer the question many readers will be ready to ask . . . yes, it does fly and could better many another sport model we have seen on lines.

Kit Carson of Ilford has been associated with several unusual ideas related to rubber-driven Autogiro's, and this latest picture of him (No. **1**) displays his novel Wakefield. The fuselage is of a flat bottomed elliptical section, the base being built on the plan, and formers added. The tail is Warren braced, or pseudo-geodetic, and the wing is comparatively low-aspect-ratio with a span of **37** ins. More interesting is the half-folding free-wheeling prop.

" Chevron " is the suitable nomenclature for **2** which is D. M. Glass's of High Wycombe, **40**-in. span tail-less for the Mills ·**75**. Design data from our " It's Designed for You " series enabled Mr. Glass to attempt this experiment, and we congratulate him on a very striking layout.

With E.D. Mk. III radio and an E.D. Bee for power, J. L. Genlloud of Lowestoft equipped the Sky Skooter in picture **3**. This, we found with our own trade review outfit, to be an ideal combination and we are pleased to see the stout wire struts fitted to this model as a wise precaution against wing collapse. Excellent portraiture is the work of the Lowestoft club photographer, Mr. Hewlett.

W. Adaway of the Slough Club " caught " clubmate R. Fielder in a predicament at Chobham Common early this year, see picture **4**. The model



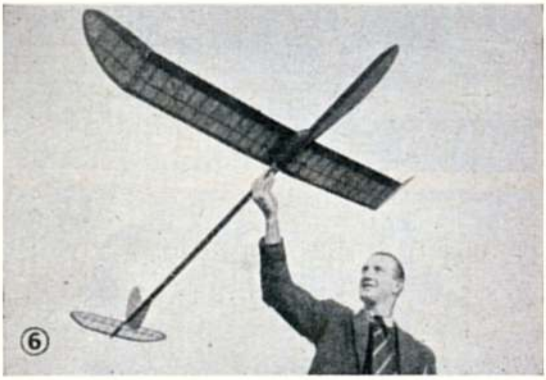
is no midget, being none other than an 11-ft. span A.P.S. Thermalist, fitted with radio control, so the complexity of this situation will be well appreciated by experienced retrievers. Note the reaching figure of Mr. Fielder at left. We trust the wayward Thermalist was brought to earth without too much tissue rending.

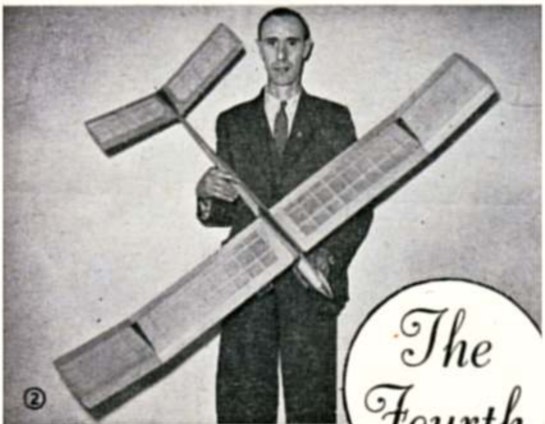
A scale control-liner of a full size racer always was our idea of the best looking Team Racer, and the Ed. Stoffel shot of J. Martin's (Chingford M.F.C.) 18-in. span Percival Mew Gull Class A model No. **5** should stir the hearts of those appealing for better looking racers. But oh! Mr. Martin, there's only just room for one seat only in the Mew Gull, and you have two!

"Czepa" influence on A/2 design after his win in last year's Nordic Contest is obvious throughout the country, No. **6**, shows J. G. Waldron of Wargrave, Berks., with his "Dolphin", which is of course based on the Austrian design. Instead of ply, balsa is used for the fuselage triangular boom, and the fuselage cross-section is brought forward to a more normal position under the wing. Span is 68 ins., so is the length, and designer Waldron reports a performance superior to the more conventional model.

An apprentice photographer, C. J. Naylor of Huddersfield, made a good job of his KeilKraft Piper Super Cruiser kit No. **7** and equipped it with a Mills ·75 diesel. Finished in scale colouring of red and cream, the model would appear to be as well made as it has been photographed. For camera fans, Mr. Naylor adds a few details that may be of interest. Side lights were two 500W. lamps, frontal lights three 300W. lamps, and a spot lamp was used to eliminate shadow. Exposure was 15 seconds at f.23 with Barnet Super-Speed Ortho half-plate film.

And so to round up this month's miscellany with No. **8**, which comes from another professional photographer, Ronald A. Adams of New Eltham, London. Built to the plans of "Minnow", winner of the 1948 Goodyear Trophy race in America, the job has a commendable high gloss finish in light and dark blue, with scarlet numerals. Fuselage is planked, wings are sheeted, and the power is supplied by a closely-cowled D.C. 350 swinging a 9 ins. × 8 ins. propeller.





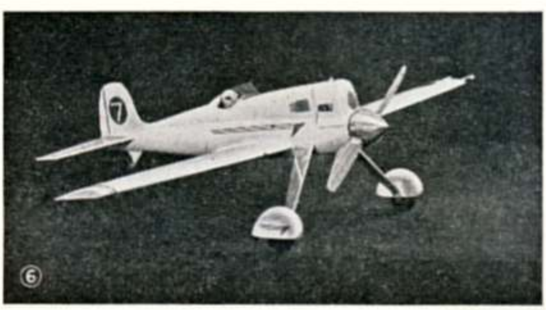
The Fourth NORTHERN MODELS EXHIBITION

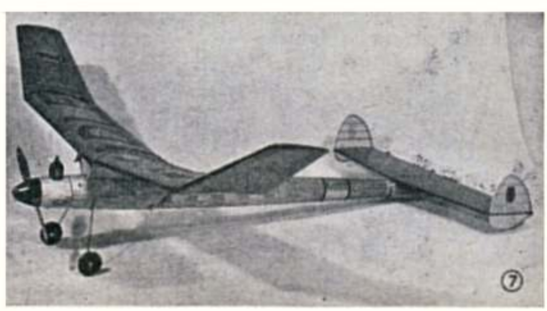
QUALITY, not quantity, was the point most in evidence at this fourth Northern Models Exhibition held in the Corn Exchange at Manchester.

Again a sailplane won the AEROMODELLER Championship Trophy for the best exhibit in the aircraft section, and this time the honours went to A. Atkins of Bredbury for his beautifully finished V-tail Nordic. He is seen in pictures 1 and 2, receiving the coveted award from Lord Brabazon of Tara.

In the Static Scale section, H. Parrish of Audenshaw placed first with his intricate Handley Page 0/400, seen in No. 3, whilst Scale Control Line honours went to D. L. Chatfield of Sale for the Vought-Sikorsky Chesapeake dive-bomber (No. 4). Looking like a control-line model, but definitely free-flight, was the Flying Scale winning entry (No. 5), a Westland Wyvern with buried engine and extension shaft by G. D. Barnes of Sale. A purposeful Class B Team Racer with spatted wheels on its dural undercarriage, seen in picture 6, won the other than scale control-line section for G. Aitken of Ashton M.A.C. No. 7 shows the Arden-powered " Half-pint " streamlined pylon model by A. S. Bailey of Cheadle, winner of the Power section.

It is with special regret that we record the passing of Mr. R. Lawton, Exhibition Manager of this popular Northern event, and who is seen by the microphone in the top photo. Mr. Lawton had conducted this series of exhibitions since their inception and was also Secretary of the International Radio Controlled Models Society. His sudden death has robbed the many organisations with which he was connected of a guiding light that will certainly be missed.





THE wings are probably the most important single component of a model aeroplane. They have to be strong enough to take quite a number of hard knocks, as well as normal flight loads, and must also be built true and remain substantially true throughout their life. Wings which have warped badly, or flex in flight, can wreck a model just as readily as a pair of wings which actually break in flight.

In this article we do not propose to elaborate on the respective merits of various wing shapes and aerofoil sections. Rather we want to know how to *build* wings. But outline shapes and the actual wing section must come into it, from the constructional point of view. For example, wings of an aspect ratio of between 6 and 8 to 1 (aspect ratio being equal to span divided by chord) are about the best as far as lightness combined with strength is concerned. Wings with a higher aspect ratio are prone to twist and may require special stiffening or bracing (usually adding weight), whilst lower aspect ratio wings are more liable to warp. The section is important, for the thinner the section, the less depth there is to accommodate spars, and so the more difficult it is to make a strong wing.

First, however, let us start with the building of a simple wing which dodges most of these little problems. We will assume that it has a single mainspar, which is probably the most popular type for small models and most free flight kit models, and the wing section is reasonably thick with a flat undersurface. The basic parts of this wing will be a set of ribs, the leading edge, trailing edge and mainspar, the tips and the dihedral braces.

Wing construction is normally started by cutting a set of ribs. In kit models the outline of these ribs is usually printed out on sheet balsa—in some, the ribs are actually die-cut, which saves a lot of work. Alternatively the ribs may have to be cut to a given drawing.

Cutting ribs is really quite simple. The main methods are shown in Fig. 1, using a prepared template of the rib section required. Never try to trace a wing section drawing directly onto sheet balsa and then cut out, but paste the drawing onto a piece of thin ply and cut this out to form a template. Cut the template accurately, smooth the

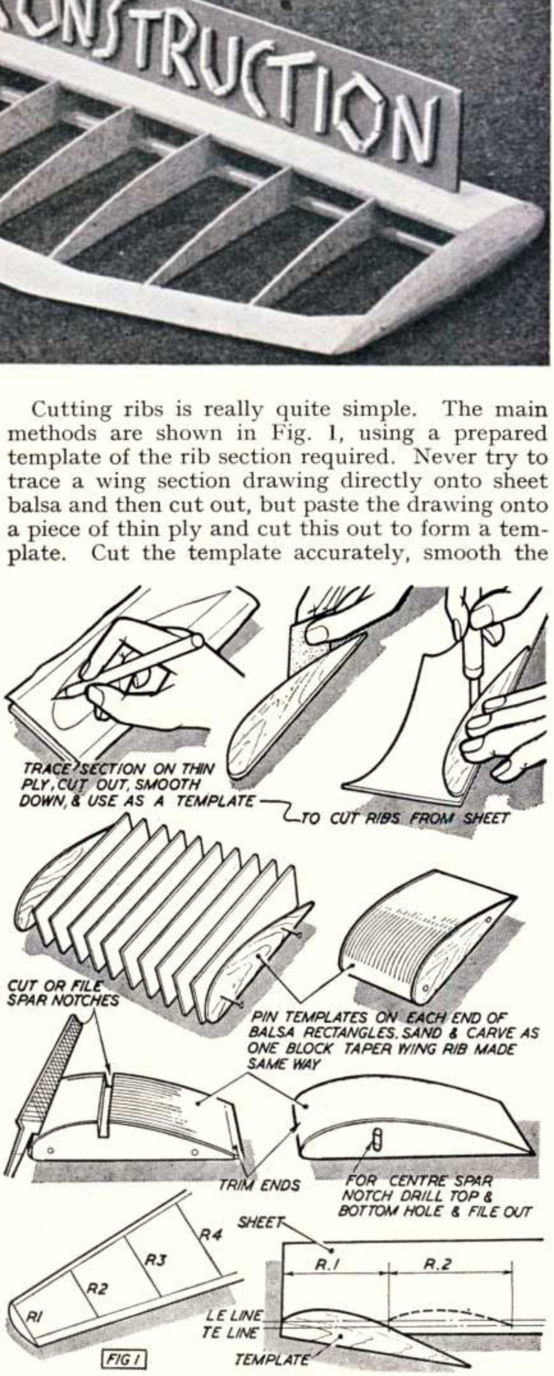


FIG 1

edges with fine sandpaper and you will find it quite easy to cut a whole set of ribs with the template as a guide, each one identical in shape. Work along both edges of the sheet, as shown, for speedy production, and then use up the remaining sheet.

An alternative method is to make two identical templates. Then instead of cutting the ribs individually, cut a number of rectangular pieces of sheet and sandwich between the two templates, the number of balsa rectangles should correspond to the number of ribs required. It is then a simple matter to carve and sand the " sandwich " down, like a block, to the section given by the template at each end. When separated you will have a complete set of identical ribs.

The two-template method can also be used for cutting a set of ribs for a tapered wing. One end template corresponds to the root rib, the other end template to the tip rib section. Sandwich balsa rectangles between them and carve and sand, as before.

It is very useful to have your complete set of wing ribs " packaged " in this manner. Not only can they be sanded to identical shape, but spar notches can be cut far more accurately than if the notches were cut individually in each rib. A file is very useful for notching a set of wing ribs, or the sides of the notch can be cut with a hacksaw or fretsaw and the complete notch chiselled out with a modelling knife. Where the spar passes through the centre of the ribs, then the notch can be cut by drilling through the " sandwich " at the top and bottom of the required notch and then removing the rest of the material with a round file (an abrafile for $\frac{1}{16}$ in. wide notches) or a fretsaw for larger work.

Even if your ribs have been cut separately from printed sheet, it is still a good plan to pin them together in a complete set and smooth off with sandpaper, checking the spar notches for alignment or, better still, not cutting them until this stage. It is very difficult indeed, if not impossible, to cut a set of sheet ribs individually with complete accuracy, even if the original printed outlines themselves were accurate.

Just one other method of cutting tapered wing ribs will be described. This is very useful for making the ribs for the tapered tip panel of a wing, where only a few ribs are called for and the two-template method does not seem justified. The two-template method, in any case, is not really suited to sharp tapers where only a few ribs are involved.

As the diagram shows, taper wing ribs can be cut from the original template, measuring the length of rib required and marking the leading and trailing edge *depth* on the sheet. Line up the top of the template between these points and cut the rib.

Now to prepare the spars for the wing. Contrary to popular opinion, spars *do* need preparing before assembly. You do not just pin down the leading and trailing edge strips and proceed to cement the ribs in place—if you are after best results.

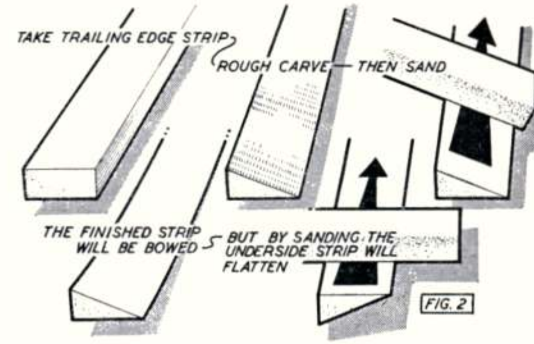


FIG. 2

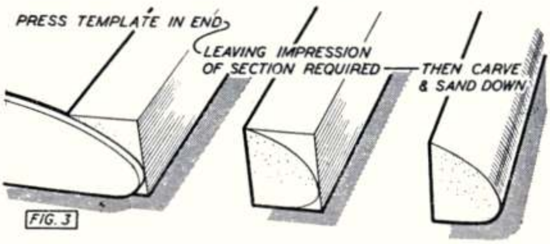


FIG. 3

Shaping L.E. & T.E.

As a general rule, the trailing edge should *always* be shaped to section before pinning down on the plan. The leading edge is not so important. It is generally easier to shape this after assembly.

The trailing edge is invariably triangular in section, cut from rectangular strip, unless you have, or prefer to use, trailing edge stock already shaped. First reduce the strip roughly to triangular shape with a sharp knife and then finish off with sandpaper, as shown in Fig. 2. In sandpapering, hold the strip at one end and stroke the sandpaper block away from the hand. Never rub it backwards and forwards or you will almost certainly break the strip, especially on small sections. Reverse the strip end to end and repeat to finish off.

The finished strip will now have a marked curl upwards. If you had shaped the trailing edge after assembling the wing structure, this curl would have been produced in the completed wing. Since you have shaped the trailing edge member before assembly you can take this curl out by sanding the *bottom* of the strip lightly until it is flat once more.

If you prefer to shape the leading edge also at this stage you can press the ply template of the complete rib section into the end of the wood, as shown in Fig. 3, to give you an idea of the section required and carve and sand down to this. If carved after assembly, however, the ribs themselves will be a guide as to the section required. " Carving " is probably a misnomer for most leading edges can be formed to shape by sandpaper alone.

The mainspar will benefit from a little pre-assembly treatment, too Just round off the edges very slightly with fine sandpaper, as shown in Fig. 4. This will tend to make the spar stronger, as

well as being easier to fit in the rib notches. At this stage, too, you can check that the rib notches are the correct size for the spar. Each strip should slip in position easily, but firmly. If the notch is too big, then too much reliance is placed on the cement joint to hold it securely in place. If the notch is too small, then there is a danger of the rib splitting when forced in place, or, at best, the rib section being deformed, as shown. It is better to have the fit too loose rather than too tight. Another common fault is not to make the spar notches deep enough so that the spar, when finally assembled, stands proud of the ribs. This produces a poor covering job where the spar stands out and produces a ridge, which may also make the wing less efficient.

If the ribs are to be notched into the leading and trailing edge then the ideal tool to form these notches is a file of the same thickness as the thickness of the rib. Mark the positions of the notches carefully, also the depth of the notches, and file each individual notch, Fig. 5. Cutting notches with a saw, knife or razor blade is not recommended as these are generally imperfectly formed and usually weaken the spar. It is bad practice, incidentally, to notch the mainspar.

Wing Assembly

Assembly of the wing can now be tackled. The leading and trailing edge members are carefully pinned out over the outline of the plan—having previously protected the surface of the plan either by covering with waxed paper or rubbing over with the stump of a candle—together with the mainspar. Actually technique will vary with the type of wing being built. In some wings the leading edge is located above the plan itself—perhaps set diagonally in the ribs—or the mainspar has to be packed off the plan to conform to the undercamber of the ribs. The general rule is that at least two, and preferably three main members should be pinned down if at all possible.

If the ribs are undercambered, then the front of the trailing edge may have to be blocked up to conform to the curve of the rib. This is done quite simply either by inserting small packing pieces under the front of the trailing edge, or a strip of required thickness under the whole length of the bottom edge of the trailing edge. The latter is best for the strip will form a support for locating the bottom of the individual ribs accurately in line with the trailing edge member. It will probably become stuck to the wing structure, but is easily removed later.

Fig. 6 shows, briefly, how construction of a simple monospar wing would be tackled. With the spars pinned down, each rib in turn is cemented in place as accurately as possible. Make sure that the spars *are* pinned down flat, particularly the trailing edge, and that the surface of the plan is also flat and not creased or wrinkled. An uneven surface can push ribs out of line. When all ribs have been added then the tips can be cut and cemented in place.

There are very many ways of making the tip. For lightness, which is highly desirable on a rubber model, laminated construction is frequently used. The tip is then actually comprised of a number of layers or strips, cemented together, bent to the shape of the tip outline. The laminated tip can be

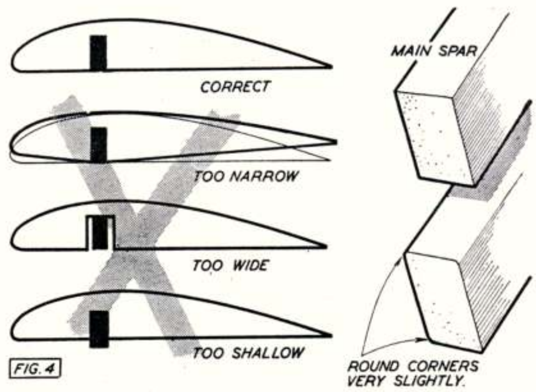


FIG. 4

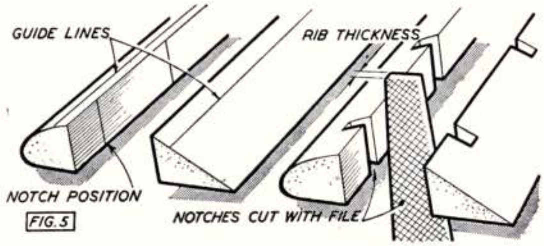


FIG. 5

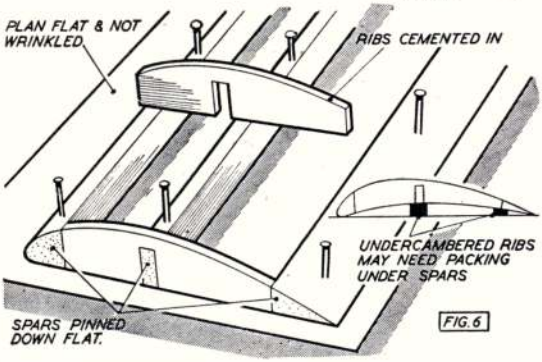


FIG. 6

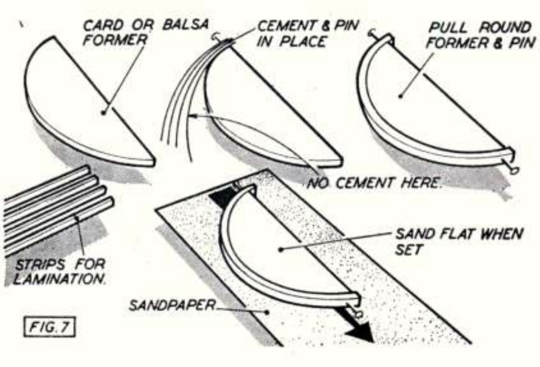
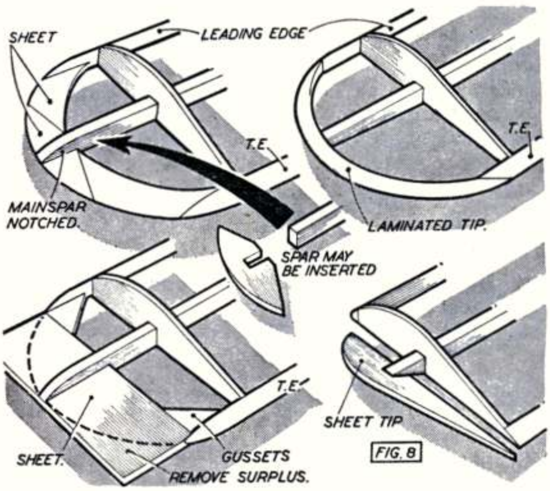
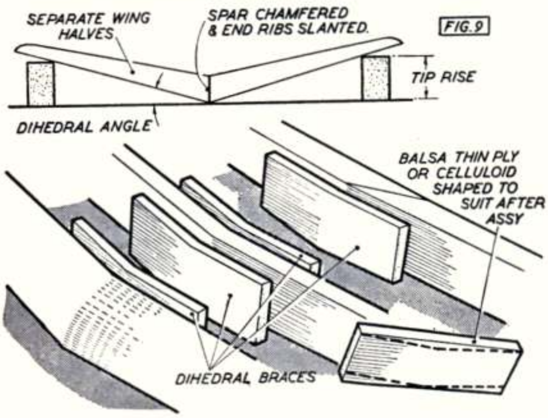


FIG. 7





carved and sanded down, as required, and is quite strong, as well as being very light. However, it is not all that quick to make.

Laminated construction is summarised in Fig. 7. First a template must be made of the *inside* outline of the tip shape required. This template should be at least $\frac{1}{8}$ in. thick, and preferably more. It can be cut from card or sheet balsa with the edges sanded smooth and rubbed with a candle. The separate lamination strips are cut from $\frac{1}{32}$ sheet balsa of stock which will bend readily without splitting. Avoid really soft sheet, however, or the resulting lamination will be weak when sanded down. It will warp under the tightening action of water spraying and doping the covering.

Lay the strips out side by side and coat each one with cement. Bundle together on top of one another, line up one end of the assembly and pin to the template. Then run round the curve of the template, forcing the laminations together, in line and tight against the template. Pin the other end and leave for the cement to set. One side, at least, of the completed tip lamination should be sanded flat before removing from the template.

For wings of up to 250 sq. in., which is about the maximum size for which laminated tip construction is recommended, the depth of the laminated strip wants to be $\frac{3}{16}$ in. Ideally one would wind a $\frac{3}{8}$ in. wide lamination around a single template and split this down the middle for two identical tips. However, winding wide laminations successfully demands a certain amount of experience and special care, otherwise " dry spots " occur in the cement joints, and less experienced modellers would be advised to wind each tip separately from $\frac{3}{16}$ in. wide strips, using two identical templates to save time. Laminated tips should be left to set for at least six hours before being removed from the template to which they are pinned.

The fitting of a laminated tip is shown in Fig. 8. The usual method is a scarf joint at both leading and trailing edges. Cut the tip ends first and use these as a guide for cutting off the same angles on the wing spars, with the tip located in its correct position. The diagram also summarises other, and simpler, methods of tip construction, all of which work quite well in practice.

Laminated construction is probably the best method of producing nice elliptic tip shapes on small wings. Similar shapes built up from separate pieces of sheet cemented together have a tendency to break away along the line of the cement joints. This can only be prevented by making these joints very accurate and double-cementing them. This means that a light coat of cement is given to the mating parts, which are placed together and then drawn apart again. When the cement has dried a second coat is given and the parts joined permanently.

One piece wings are usually made as separate halves which are then joined together at the correct dihedral angle. There are, however, many variations on this principle. Small wings are often built in one piece, cracked and re-cemented at the centre to dihedral. Polyhedral wings or wings with tip dihedral involve cracking and re-cementing the appropriate panels.

Dihedral Joints

Joining two separate wing panels at a given dihedral is generally quite straightforward—Fig. 9. Ideally this should be done on a dihedral board, that is a hinged building board which is set to the required dihedral. This enables the two panels to be pinned down quite flat when they are joined and obviates any tendency to warp as the cement joints set. However, it is usually sufficient to work on a flat board and prop each wing up to the required angle.

The spar ends and the root ribs will have to be cut or set at an angle so that they join correctly when the two panels are brought together and the whole joint is reinforced with dihedral keepers or local braces covering the spars at the joint. Hard balsa can be used for dihedral keepers on quite large wings—having the special advantage of being relatively easy to shape and also cementing

well. Ply is often recommended, but requires more careful cementing. Sheet celluloid can also be used. Some typical applications are shown in the diagram. It is common practice, too, to reinforce the joints with small gussets of sheet balsa, although a good fillet of cement will often serve a similar purpose.

A wing which is built in one piece and then cracked to various dihedral angles should have the mainspar prepared before assembly. In other words, the mainspar should be notched to conform to the dihedral it will ultimately assume, as in Fig. 10, before assembling the wing. When setting the wing to dihedral angles it is then only necessary to trim the leading and trailing edges at the joint.

A very good way of doing this is to pin one section of the wing down flat (preferably the inboard section). Find the corresponding tip or end rise of the adjacent wing panel and cut a piece of strip to this length. Now lever up the outer panel and shape the leading and trailing edges first by cutting right through cleanly at the joint line (if these spars are not already separate) and then working a small hand saw in the joint, continuing to raise the tip until the required dihedral rise has been achieved. Work on leading and trailing edge joint alternately and you will find that the method of trimming with a saw is capable of giving a perfectly matched joint with the minimum amount of trouble. Cement the two panels together and add dihedral braces, etc.

Where the type of wing structures calls for one or more top spars, then generally it is best to build the wing flat with these top spars omitted, set up to the correct dihedral angles and then crack the top spars to fit and cement in place. Care must be taken not to distort the structure when the top-spars are added. If these are of fairly substantial depth, then they are pre-notched to dihedral over the plan, as with the bottom mainspar(s).

When the whole wing structure is complete it remains to sand it down smooth and ready for covering, checking that it is free from any warp or twist. Never rely on covering to correct a twist. Most likely it will aggravate it. The first essential towards building a true wing is a true uncovered structure.

Before actually adding the covering, however, it may be advisable to add local reinforcement. At the dihedral joints on the trailing edge, whether one or more in number, a binding of heavy tissue, silk, or gauze bandage on larger wings will greatly increase strength in these regions. It is these joints which are most likely to become uncemented if the wing gets a sharp knock. Reinforcement at the centre, too, prevents the rubber retaining bands from cutting into the wood—often a troublesome feature when you have gone to pains to produce a nice thin trailing edge on your wing.

Another possible source of failure—although this will not need binding—is the tip sections on a built-up tip. Check all the cement joints between the various parts to see if these have been broken during sanding and, if they have, rejoin with a liberal coating of cement. Check all the cement joints, in fact, especially those of the dihedral braces. If anything is to fail ultimately in the wing it should be a spar member—not a cement joint. Check carefully, as well, that the ribs are still cemented in their trailing edge notches and are not unduly weak at this point. If they are, reinforce with tiny gussets of sheet. Make sure, in fact, that the structure is as sound and true as you can reasonably expect it to be—whether it is a competition model or a sports type free flight model you are building. It does not take very much more time and effort to make sure that things are correct.

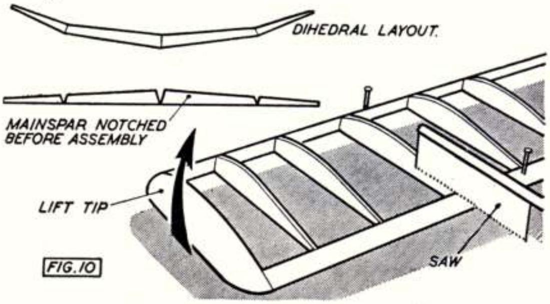


FIG. 10

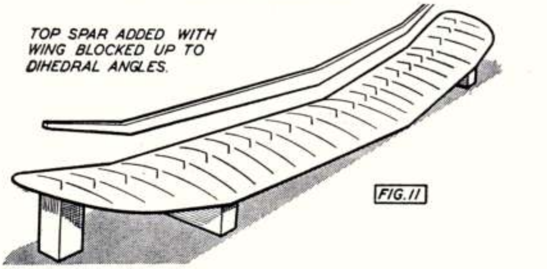


FIG. 11

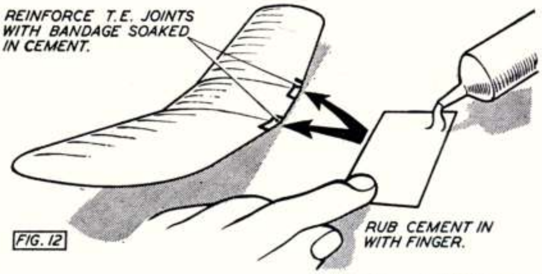


FIG. 12

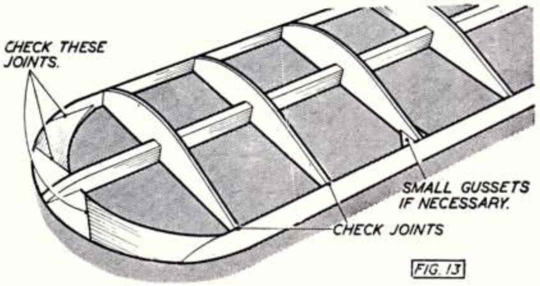


FIG. 13

An Interesting Rotor Glider Experiment by J. O'Donnell

AEROMODELLERS are ever wont to try something different, and when clubmate Bobbie Faulkner pointed out to John O'Donnell the inviting gaps in F.A.I. world record classes headed "Special Aircraft", the grey matter in the Whitefield M.A.C. started working overtime.

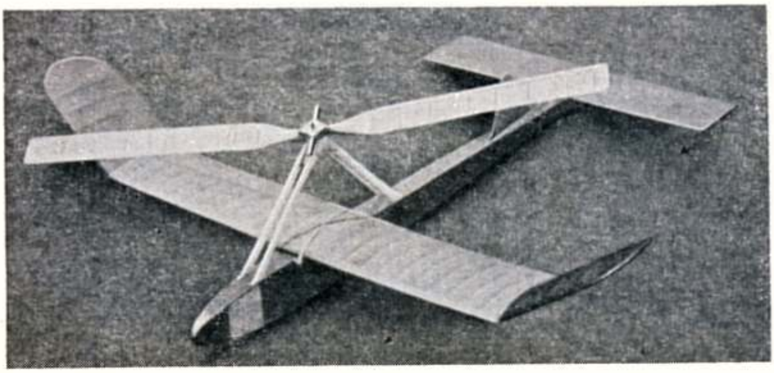
Investigation into rules and regulations showed that wing cum tail areas up to 50 per cent. of the swept area of the rotors was permitted, and a decision was made to attempt to set up a world record for "Special Glider".

Considerable experimentation with rotors commenced and the second model to be produced was the Giro Glider. This model saw many different types of rotor mounting before the final assembly shown on the accompanying drawing was evolved. It is adjustable for angle to horizontal and also for pitch of blades, and is strong enough to survive rough handling.

Early fly-aways with flights of up to 5 mins. were encouraging, and finally on 22nd April, 1951, an official attempt at a world record was recorded of 4 : 20·5 duration, the distance flown being 1·72 km. (1/14th miles). This time and distance have now been submitted to F.A.I. for recognition.

Considerable argument has reigned in the Editorial Offices as to the efficiency or otherwise of the rotors in general. One opinion is that they are nothing more that drag producers and that the glider would be more efficient without them; the opposite view point holds that they do contribute extra lift and increase overall duration. We have purposely refrained from asking Johnnie's opinion based on practical results, as we should first like to hear what readers thoughts and theories are on the subject.

We shall present one year's free subscription to the sender of the best explanation as the efficiency or otherwise of the rotors on the Giro Glider. We shall, of course, publish the winning explanation together with O'Donnell's practical findings and the opinion of an expert aerodynamicist in this particular sphere.



For those people who would like to attempt a Giro Glider for themselves here are a few details of the building and flying of this particular model.

CONSTRUCTION

Fuselage. Build basic fuselage in normal way. Build two sets of rotor struts over plan and then cement to inside of fuselage sides. Add extra spacers, sheeting, fin, underfin, etc.

Wing which uses a Davis A =·93. B.=·17 Section. and is of conventional construction except that the L.E. and T.E. are cut from the same length of $\frac{5}{16} \times 1$ in. sectioned trailing edge stock. This gives a $\frac{5}{16} \times \frac{3}{8}$ leading edge and $\frac{5}{32} \times \frac{5}{8}$ trailing edge. Pack up front of trailing edge 3/64ths from board when building, and use $\frac{1}{16}$ ply dihedral keepers. Wing gussets are not recommended.

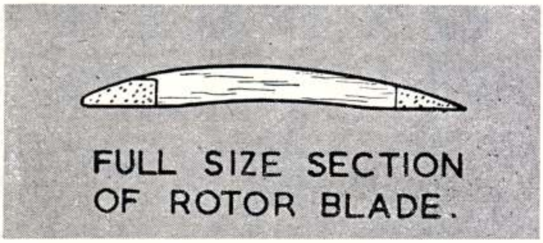
Tailplane. Build in usual way but remember it is necessary to pack up both leading and trailing edges from board in view of the symmetrical 60 per cent. R.A.F. 30 Section.

Rotor Hub. Make the cruciform centre piece from two pieces of $\frac{3}{16}$ dowel cross halved in centre. Drill centre for 16 s.w.g. Add $\frac{1}{16}$ ply squares top and bottom also drilled 16 s.w.g. Fill in between dowel with $\frac{1}{16} \times \frac{3}{16}$. Make " block " from two laminations of $\frac{1}{16}$ ply and one of $\frac{5}{32}$ balsa; drill and fit with 16 s.w.g. bush. Make shaft including ball race, etc., and then drill " block " for 8 B.A. bolts. Drill several holes to permit adjustment to angle of rotor head. Finally bolt block between rotor supports at approximately 15 degrees to horizontal.

Rotor Blades. Build on board similar to wing and then cement in position $\frac{3}{16}$ I.D. paper tubes so as to give 1 in. dihedral at tips.

Covering and Finishing. Cover throughout with lightweight " Modelspan " and dope with a mixture of 50 per cent. thick clear dope and 50 per cent. Thinners. Give two coats over all with an additional coat on wings and fuselage.

Trimming and Flying. Add nose ballast until C.G. is at position indicated and then check line-up and for warps.

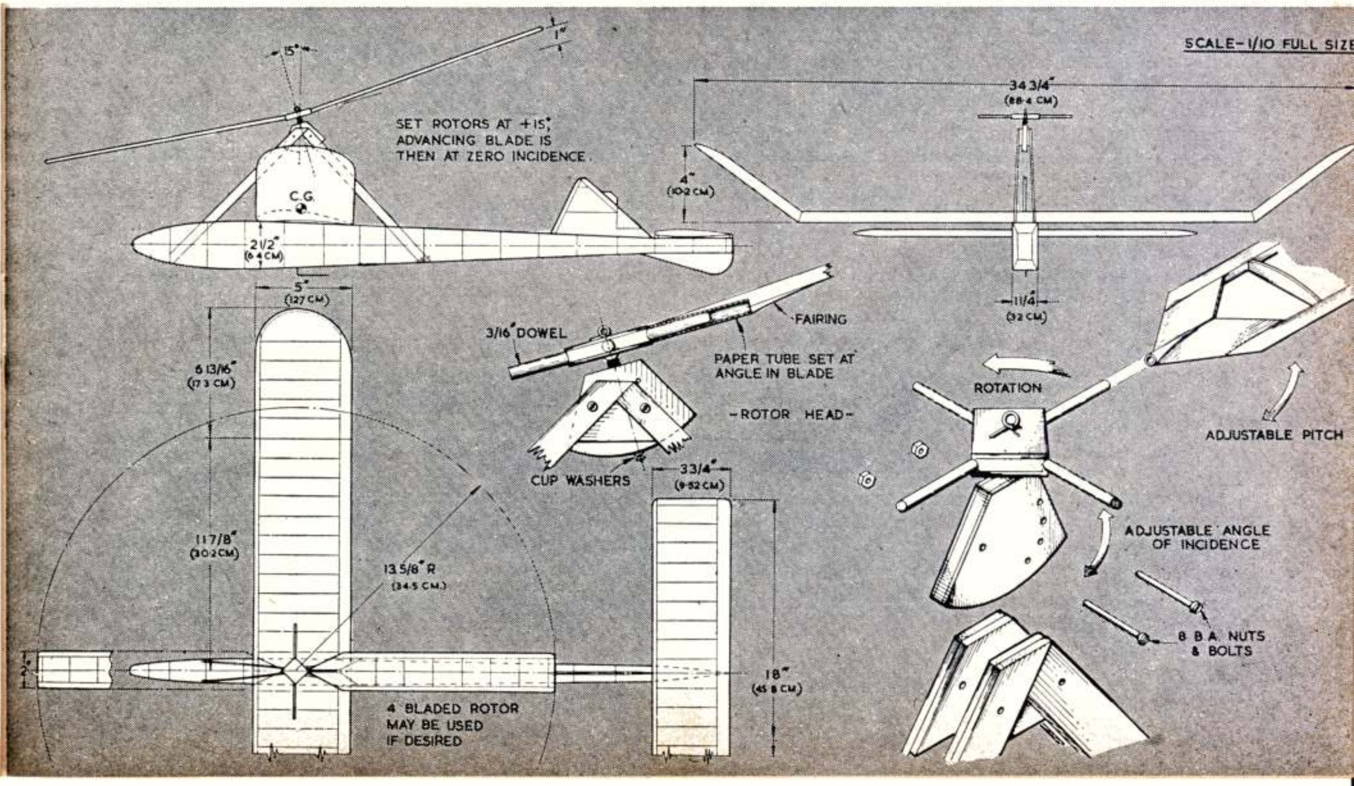


Test-glide model *without* rotor blades in order to prevent breaking same and adjust tail incidence until glide is perfect. Still without rotor blades, trim for tow and 100 ft. glide circle, then add rotor blades. Place of rotation of blades should be at—15 degrees to horizontal; adjust pitch angles to that advancing blade is at zero degrees incidence. Add auxiliary trim tab of size shown with 30 degrees right turn.

Attempt towing and adjust trim tab until tow and glide are O.K. Tow smoothly as jerks affect the speed of rotation with consequent adverse effect on stability. It will be found that the rotor tends to turn the model to port (left) on the line.

A four-bladed rotor can be fitted and was in fact tried on the original, but towing was more difficult.

Well, that is the specification, and below is the general arrangement drawing. Your own opinion of the aerodynamic advantages of the rotor would be welcomed and, as stated on the page opposite, we offer one year's free subscription to the sender of the best explanation of the rotor pro's and con's. Here's a chance for either theory or practice to earn you your favourite magazine free for a year.



GADGET REVIEW

EIGHT gadgets, assorted so that whatever your interest, there is one for your branch of the hobby. Take note of the one that you might be needing on that next model; each is tried and tested, so you may have every confidence in its functioning safe and usefully, just as we describe.

A very simple thought, but for all that an unusual one, with fuel saving potentialities, is idea **A**, from A. Kennedy of Upton M.F.C. Have you ever had a sport free-flight power model over-turn on landing and lose all its excess fuel through the filler hole ? We have; yet by making the tank double depth, and drilling the filler only half way up the tank, we could have saved fuel on every nose-over. If there is room in the next fuselage you build, we recommend this simple idea.

Also very simple, yet surprisingly effective, is the temporary trim tab idea **B**, sent from A. Guttman in Switzerland. Cut from any sheet metal (aluminium is ideal), it is a very handy item to take in the repair kit when testing a new model. In an emergency, the same thing could quite easily be made from an old cigarette packet ; but a metal one is far superior. The slot is for the retaining elastic band, this passing completely around the wing. The tab can be fitted at the trailing edge for banking trim, moved forwards as a spoiler to increase turn, or it can equally well be applied to the tail unit either as an elevator or rudder.

Fuel tanks made from ping-pong balls, Tek toothbrush cases, and sundry other commercial items are frequently received at the editorial offices with the usual claim for complete originality. These ideas are, needless to say, in far too common usage to be included in this feature. But J. L. Genlloud of Lowestoft has gone one stage farther than most as you can see in idea **C.** The first tank is cut from one of the 6-in. Shell lighter fuel tubes. A snip through the celluloid tube at the desired length, a 1/8-in. drill through each of the red cap ends to take the filler and outlet tubing, and a re-assembly with Britfix cement makes this very light and neat tank. From the Shell fuel container, there is a small nozzle cap, and this can be cemented to the half ping-pong ball as an outlet connection. The ball needs no explanation.

Many a time we have been asked to provide something ambitious for the pendulum control enthusiasts, and in gimmick **D** we appear to have a good answer. With a single pendulum, both ailerons and elevators are actuated to correct any deviation from the straight and level. Additional rudder correction, with a separate pendulum as described in the January Gadget Review, would complete the job and should, with careful adjustment provide a modeller's equivalent of " George " the full-size aeroplane's automatic pilot.

The pendulum as shown in **D** is free to swing back and forth to move the elevators and sideways to operate the ailerons. The greatest care should be taken to avoid all unnecessary friction, particularly at the aileron operating rods which have to pass through tubes in the wing. Credit for this idea goes to M. H. Moscardi of Cheltenham.

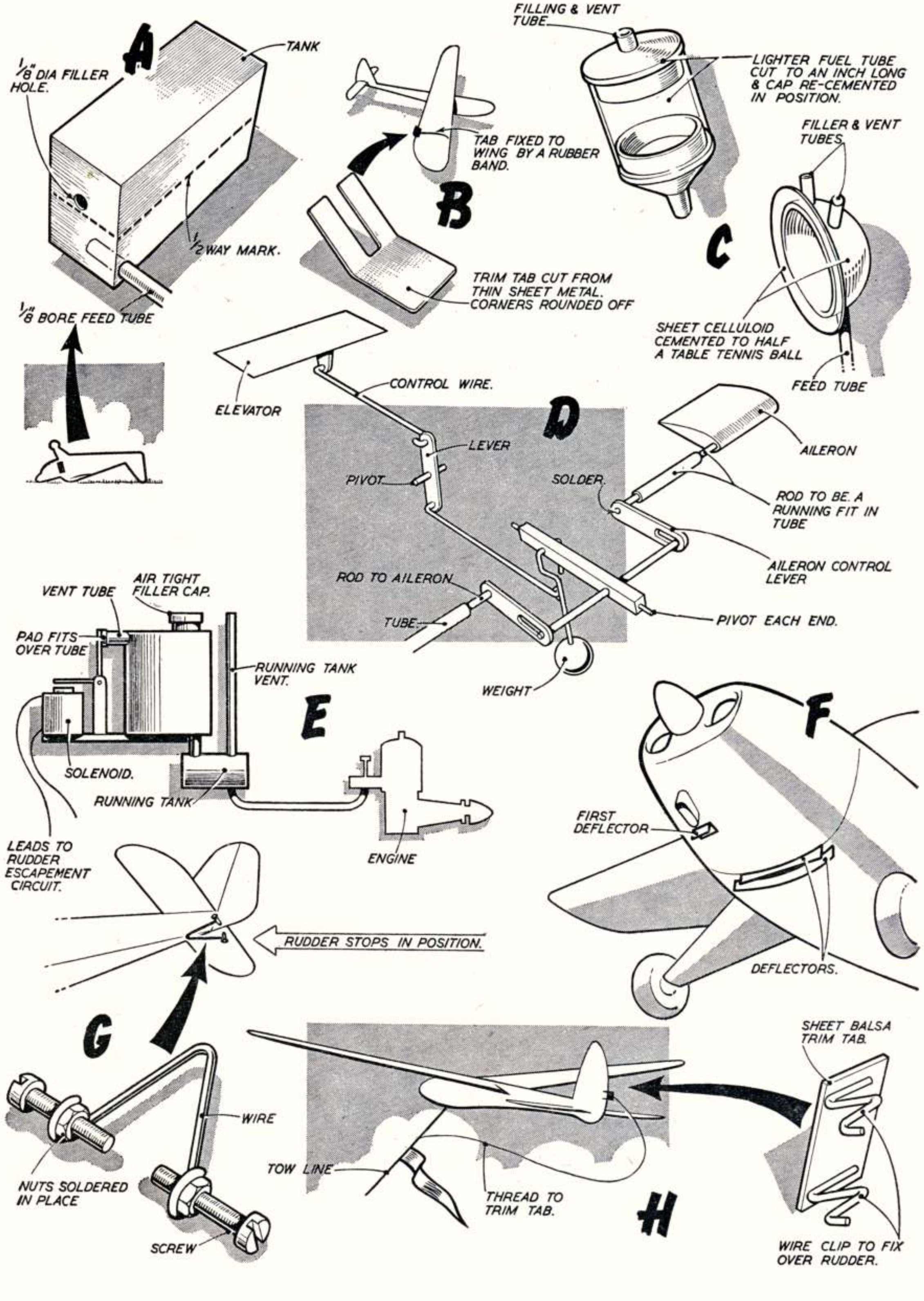
For the radio control fan who is tired of out-of-range flyaways, gadget **E** is known as Leggat's leg saver and hails from H. R. Leggat of Worthing. By means of an extra escapement in the rudder escapement circuit, this double tank idea posseses the ideal virtue of cutting the motor after twenty seconds have elapsed without a signal. So when next your radio job ignores the transmitter and disappears downwind for a long cross country flight, think of this leg-saver.

The main tank vent is closed by a felt pad which " Bostic-ed " to the extra escapement. A rudder signal also opens the vent allowing fuel to flow into the running tank, which is made to give a twenty seconds run. The vent for the running tank must reach higher than the main tank to prevent overflow and if it is made of transparent tube, it can also be a level gauge for main tank fuel. Providing signals are received at least once each twenty seconds, the flow from the main tank will continue to top up the running tank ; but should the signals fail, the running tank will run dry, and replenishment from the main tank will be starved by the shut-off vent.

D. J. Cole of Reading is yet another builder of that popular Mercury Monocoupe kit, his version being radio controlled. But Mr. Cole is also an exacting scale modeller, and like many another, he likes to keep his good-looking model spick and span. Dirty exhaust from a diesel can make a nasty mess of a well finished job, so refer to **F**, which is Mr. Cole's simple deflector system, guaranteed to keep the fuselage clean. They are made from thin celluloid.

Auto-rudder adjustment on sailplanes is usually very much of a hit and miss affair, with odd pieces of balsa wedged here and there, and corrections made by trimming oddments away with the omnipresent razor blade. In idea **G**, sent by G. A. Willett of Welwyn, a length of piano wire is bent to a Vee, the ends rounded to take a 6 BA screw, and a similar threaded nut soldered in place. When the Vee is fitted to the fuselage just in front of the auto rudder, the screws can easily be adjusted to the finest limit for any variance of turn.

For the same auto-rudder purpose is **H**, from C. R. Plant of Middlesbrough, but his idea is strictly for models having no provision for the valuable auto-towing control. An example is the well known and very popular APS Lulu design, and this detachable towing trim-tab should make easy work of a " straight-up " tow. The balsa tab has thin wire clips to hold it to the rudder trailing edge, in *opposite* trim to the natural turn, and it easily pulls away on release of the tow-line. Try it . . . it is the simplest auto-rudder we have seen.


A
1/8" DIA FILLER HOLE.
TANK
1/2 WAY MARK.
1/8" BORE FEED TUBE
B
TAB FIXED TO WING BY A RUBBER BAND.
TRIM TAB CUT FROM THIN SHEET METAL. CORNERS ROUNDED OFF
C
FILLING & VENT TUBE.
LIGHTER FUEL TUBE CUT TO AN INCH LONG & CAP RE-CEMENTED IN POSITION.
FILLER & VENT TUBES.
SHEET CELLULOID CEMENTED TO HALF A TABLE TENNIS BALL
FEED TUBE
D
ELEVATOR
CONTROL WIRE.
LEVER
PIVOT
SOLDER.
AILERON
ROD TO BE. A RUNNING FIT IN TUBE
AILERON CONTROL LEVER
ROD TO AILERON
TUBE
PIVOT EACH END.
WEIGHT
E
VENT TUBE
AIR TIGHT FILLER CAP.
PAD FITS OVER TUBE
RUNNING TANK VENT.
SOLENOID.
RUNNING TANK
ENGINE
LEADS TO RUDDER ESCAPEMENT CIRCUIT.
F
FIRST DEFLECTOR
DEFLECTORS.
G
RUDDER STOPS IN POSITION.
WIRE
NUTS SOLDERED IN PLACE
SCREW
H
TOW LINE
THREAD TO TRIM TAB.
SHEET BALSA TRIM TAB.
WIRE CLIP TO FIX OVER RUDDER.

RUBBER MOTORS ON TEST

Bench tests using an Electronic Counter enable Wakefield expert RON WARRING to give a new slant on an old subject with emphasis on the respective merits of "straight" or "geared" rubber motors.

EXTRAVAGANT claims have been made concerning the respective merits of "taut" and "slack" motors. There has been a certain amount of practical evidence to support the idea that a rubber motor which is supported between hook distances equal to its unstretched length, delivers more power—two typical examples being that a simple helicopter model performs best with a taut motor (a longer motor needing a greater cross section for equivalent performance); and also Wakefields with "taut" motors, either geared or long-fuselage single skein type, apparently have a better performance. In the writer's experience, for example, a geared *Voo-doo* (*Zombie* development) out-performs a single skein *Voo-doo* with the same weight and cross section of rubber. Climb is markedly better, motor run longer and height reached greater. Yet against these practical results is the thought that the same weight of rubber motor, however used, should be capable of delivering the same, or nearly the same, amount of useful work or energy.

Pretty obviously the answer would not come from flight test data alone. There are far too many variables, not the least being the improbability that flight time is an exact measure of true performance at any one time. In other words, flight duration alone is no acceptable standard for comparison, owing to the variable "weather" element. Flight performance is, of course, still the "end product", as it were. If enough flights are made in relatively still conditions it is soon quite easy to judge the still air performance of any particular model. Over, say, five or six flights of an evening, and without altering the trim, a given number of turns should consistently produce the same flight time on the majority of occasions. Any marked differences may be put down to the air sinking or rising at the time of that particular flight. Yet there are some evenings when the air is consistently rising slightly, just as on other evenings the reverse conditions may apply. Thus a *single* evening's test results may be misleading, even if the air is apparently "dead". The more "still air" flying you do the nearer you can get to consistent figures, but the whole business is a very lengthy process.

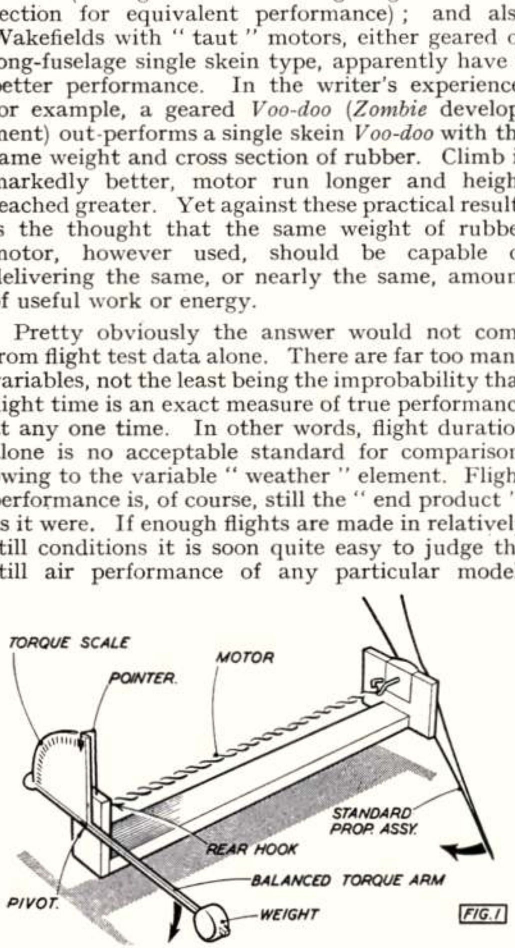


FIG. 1

Consistent test results, therefore, are more likely to come from indoor experiments, measuring the actual power output of the motor instead of the flight performance of the model. The classic method of doing this, of course, is to measure the torque with an apparatus something like that sketched in Fig. 1 which gives instantaneous readings of torque as the motor is unwinding. Some

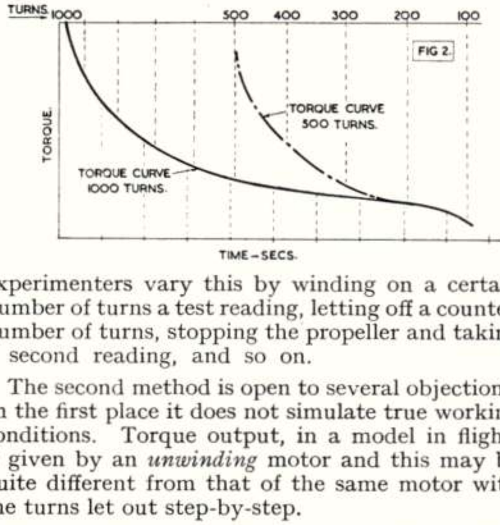


FIG 2.

experimenters vary this by winding on a certain number of turns a test reading, letting off a counted number of turns, stopping the propeller and taking a second reading, and so on.

The second method is open to several objections. In the first place it does not simulate true working conditions. Torque output, in a model in flight, is given by an *unwinding* motor and this may be quite different from that of the same motor with the turns let out step-by-step.

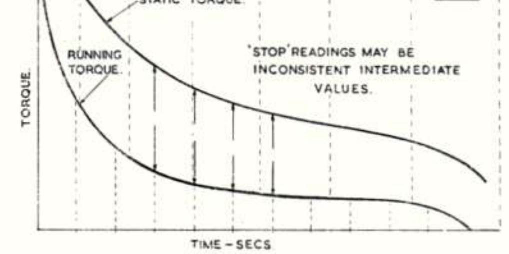


FIG 3.

The normal torque curve of an unwinding motor is shown in Fig. 2, representing, say, the motor wound to 1,000 turns and torque readings taken every 5 seconds as the motor is unwinding all the time. Suppose, now, the same motor is wound to 500 turns and the test repeated. The second curve will not start at the "500 turn" mark on the previous curve, but at a very much higher level, tapering off into the original curve, as shown by the dotted line. Other tests at different turns would give a series of similar curves. The step-by-step method is measuring not the torque output of the motor under working conditions, but a series of initial torques on these various curves—*or some intermediate value between the two*—so that the curve plotted—Fig. 3—is of doubtful value.

After trying gears for the first time in July 1951 and obtaining (apparently) "something for nothing" from the motor, the writer determined to test out this set-up on the bench. The original reason for the adoption of gears was not in seeking a "better" or "improved" power output but merely to eliminate bunching troubles with a 4-oz. motor by halving it taut between hooks. In a fuselage of conventional length, return gears were the logical solution.

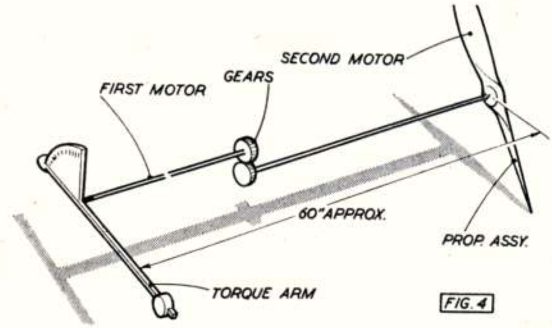


FIG. 4

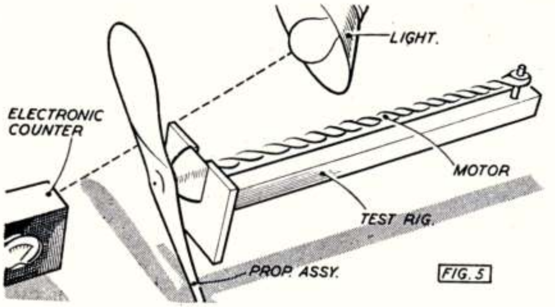


FIG. 5

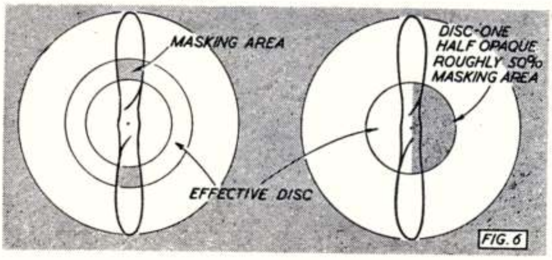


FIG. 6

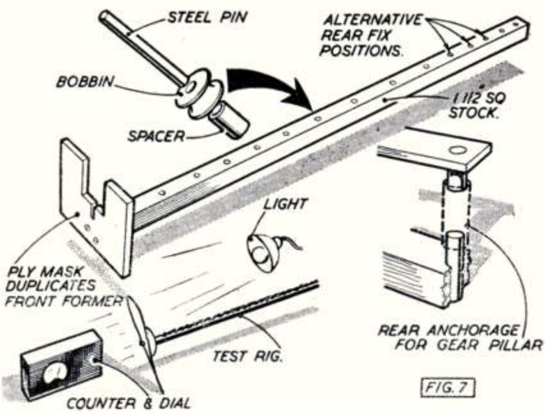


FIG. 7

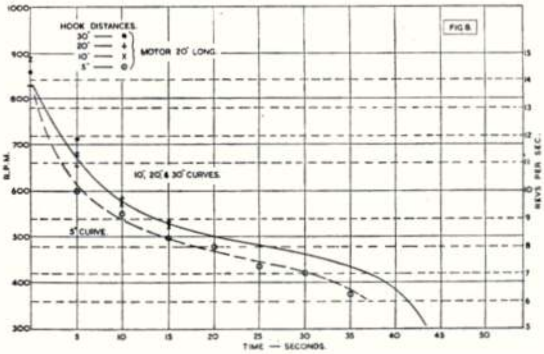
It was fairly obvious that the existing torque-testing apparatus was not particularly suited for dealing with a return-gear system. Hitherto all torque readings had been made off the rear end of the unwinding motor with a standard propeller assembly on the front end of the motor. Adapted for gears the test rig would have to take the form of Fig. 4, which would not necessarily duplicate working conditions with motors in the model.

There was also another aspect of the problem. Gears run in a series of short bursts—not because of their friction but because one end of a rubber motor unwinds differently to the other end. A number of tests with a marker bound in the middle of a rubber motor showed that the centre of the motor unwound erratically—just like the gears burst into action and then stop. The implication was that measuring the torque at the rear end of the motor may not exactly duplicate the torque applied to the propeller shaft, *i.e.*, the force rotating the propeller and generating thrust.

It was finally decided that measurement of the speed of rotation of the propeller was the best solution, since this could be done without putting any load at all on the system by using a light beam and a photo-electric cell. Since the problem had entered the realm of electronics, co-operation of the Hook brothers of R/C fame was enlisted, they assuming responsibility for the design and construction of the electronic rev. counter.*

The apparatus is shown simply in Fig. 5. The counter itself is a small self-contained unit which is placed just in front of the propeller. Behind the propeller is a suitable light source (a torch was satisfactory, although actual tests were made with a 100-watt lamp) shining into the photocell "window". The propeller and motor assembly was quite separate and could be of almost any form—*e.g.*, even a standard fuselage. The apparatus counted the frequency with which the light beam was interrupted by the revolving propeller blades and registered speed as a simple micro-ammeter scale reading. Scale readings were related to actual r.p.m. by a series of check tests with constant speed discs.

* To be fully described in a later article.



Initial snags were numerous. Designed to cover a specific range of speeds (roughly 15 revs. per sec. down, as representative of Wakefield propeller performance), giving a top scale reading at maximum speed and as near as possible a linear scale, both parties forgot, for a start, that at 10 revs. per sec., for example, the actual *time* of interruption of the light beam was extremely small because the masking area—*i.e.*, the blade width—represented only a small proportion of the actual disc area—Fig. 6. As a result the counter became very critical as regards the quality and position of the light source when measuring the higher speeds. If this was not just right, then it registered nothing at all on the dial. A lot of time was wasted trying to overcome this failing until the obvious answer of fitting a small disc to the propeller itself—one half blackened and the other half clear—occurred. This completely cured the original sensitivity and made every part of the apparatus non-critical as regards adjustment. And since the same disc attached to the same prop. was used throughout the tests, any effect this disc had on propeller performance can safely be ignored. In actual fact it probably has no effect at all as far as propeller speed is concerned for static running.

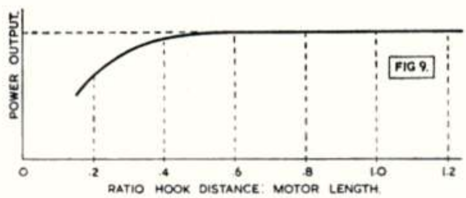
The final test apparatus is then shown in Fig. 7. The beam is marked off with a series of " hook distances ", drilled to take a steel pin at each of these points, to which the rear bobbin of the test motor, or gear assembly, can be located. Speed was read off as micro-ammeter readings and translated into r.p.m. by reference to a calibration graph.

Test Results

The first series of tests have now been completed and make interesting reading. The test motor was 20 ins. long, comprised of 14 strands of Pirelli ¼-in. strip rubber, as typical of Wakefield practice. Power output, as represented by the speed at which it turned the propeller, was determined at hook distances of 5, 10, 20 and 30 ins. Provision was made for testing at closer intervals, but this was not done for reasons which will be obvious.

All motors were wound to the same number of turns, this number of turns being the maximum possible consistent with no fatigue. In other words, well broken-in rubber was used and the test runs used were the highest possible consistent with a control motor on separate tests showing identical power output over a number of tests, wound to this figure, tested, wound once more, tested, and so on. The turns figure possible was 20 turns per inch, *i.e.*, 400 turns on the 20-in. test motor.

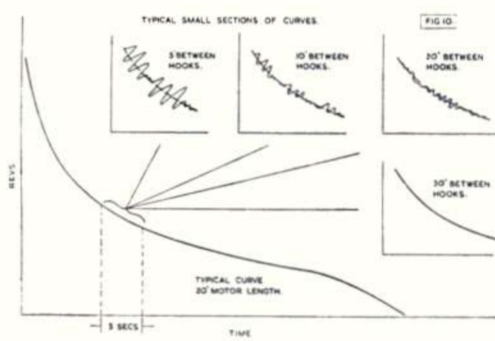
Now the result of these tests is plotted out in graphical form in Fig. 8. Except for one, performance is virtually the same. The exception is where the hook distance is 5 ins. or one quarter the length of the motor. Here the wound motor is so cramped and knotted that a definite slowing up is apparent. Within reasonable limits, however, it



appears that *the power output of a motor is independent of distance between hooks*. This could be represented by another graph—Fig. 9. So much, then, for claims for better power output from taut motors.

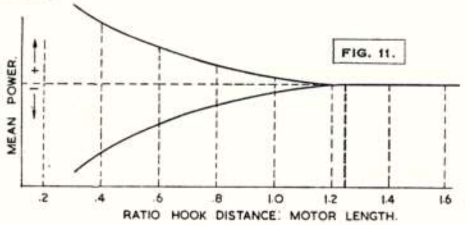
However, these claims are not entirely invalid. Even if the test readings were very similar in all cases, one feature of these readings was not. The electronic eye is most sensitive and any variation in propeller speed, however small, is faithfully followed by the needle on the dial. It was in the observation of these readings that the differences in performance with different hook distances was apparent.

With slack motors (*i.e.*, hook less than motor's length) speed was subject to fluctuation about a mean reading. In other words, the propeller speed was not steady throughout the run. This was not due to any unbalance in the system, for as the hook distance was increased this fluctuation disappeared. Fig. 10.



The taut motor is very nearly smooth running—not exactly so, but much smoother than the same motor on shorter hook distance. When the hook distance is still further increased so that the motor is actually *tight* between hooks, all unevenness eventually disappears. This is realised at a hook distance of approximately 1·25 times the motor length—Fig. 11.

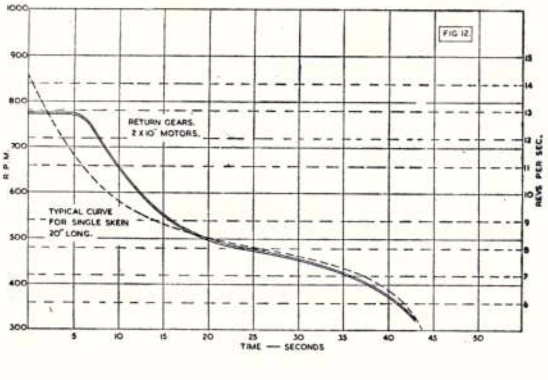
This gives a clue to the answer of the original problem. Any advantages offered by a taut motor are most certainly due to its smoother running characteristics. Power output, as such, is substantially the same. What almost certainly does occur—and this is a feature beyond the scope of the present tests—is that the shorter the distance between hooks the more uneven the unwinding of the motor.

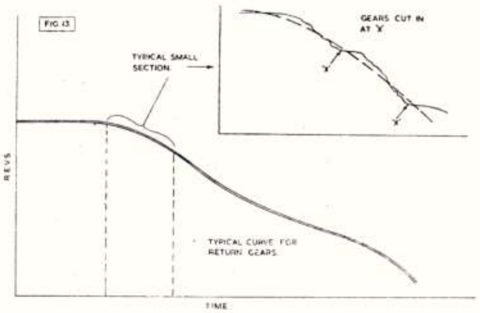


Even if the motor does not bunch in the accepted sense, the same thing appears to take place in a smaller scale all the time with slack motors. This would account for those otherwise inexplicable " peer " performances to which the best of rubber models are subjected at times.

The inference is, of course, that a model with taut motors should be more consistent and the writer's own experience with geared models seems to bear this out. Or, alternatively, the greater the ratio motor length : hook distance, the more care necessary to avoid bunching, such as anti-bunch fittings and very careful winding technique.

The remaining tests were made with a geared motor—the 20-in. single skein motor split into two 10-in. motors with a return gear unit as used in a model, and now wound to 200 turns each, *i.e.*, 400 turns total, as before. This was to give a direct comparison between single skein and return-gear drive performance which was known to be different from practical flying performance.





Perhaps starting with an impression of what was thought would be the difference led to rejection of the first test, but subsequent tests confirmed the initial readings. Fig. 12.

The initial part of the output curve is now completely modified and no longer have we the characteristic " torque curve " which drops sharply, tapers off to a flattish portion and then dies away again. Initial power output is definitely lower and for more than five seconds on every test remained at a *constant* figure. After that the curve drops away again, but slowly, and eventually merges, more or less, with the single skein curve.

Now this is most interesting, for it implies a constant power output for the initial part of the flight, with an initial power of less than that of a single skein motor. In other words, it should be easier to control and also give a most definite improvement in climb over the first fifteen seconds or so. Remember, here, the test motors were short, and if the same curves were reproduced for, say, 30-in. motors, improved climb characteristics for up to fifty seconds might be expected. Towards the end of the power run the geared drive seems to give rather less power than a single skein motor.

It must also be remembered that these tests were conducted with " straight " motors, *i.e.*, the single skein motor was not tested in the corded condition, this being the subject of some further tests. What it does indicate, however, is that with taut motors, geared return provides a better initial power run than the same length of motor between hooks in a long fuselage.

One question the test with the geared drive did solve—the effects of the " spurts " of power as the gears cut in periodically, feeding the bottom motor into the top one. As far as propeller speed is concerned there is no *acceleration*. What happens is that from an initial steady reading speed begins to waver slightly, as indicated by the dial needle. Quite suddenly the gears cut in and immediately the speed is dead steady once more, to repeat the process throughout the power run—Fig. 13. The gear feed does, as previously surmised, produce a " stepped " power run, but no increase in propeller speed as the gears come in. Particularly over the first part of the power run the propeller speed is more appreciably constant than with a single skein drive, and then descends in a series of steps.

AEROPLANES IN OUTLINE—No. 3

THE SUPERMARINE 541 "SWIFT"

BY G. A. CULL

The "Swift" seen with long pitot head and yaw meter test equipment in the nose.

SINCE Schneider Trophy days the name of Supermarine has been one to be respected and the immortal Spitfire rose to a peak of fame during the war. The last Supermarine propeller-driven fighter was the Spiteful, which had laminar flow wings, and these were passed on to the first jet design, the E.10/44, now serving with the Navy.

The swept-back wing is the most distinguishng feature of the modern jet fighter, and to gain experience in this, the Type 510 was built in 1948. Basically this was an Attacker fuselage modified to take the new swept wing *and* tail surfaces which made it the first all-swept British fighter. Further distinction was won when the 510 was fitted with a V-frame arrestor hook, and became the first swept jet to operate from an aircraft carrier. At the 1949 S.B.A.C. Show the 510 was the fastest thing yet seen, and from it the design staff gained a wealth of information and took another step.

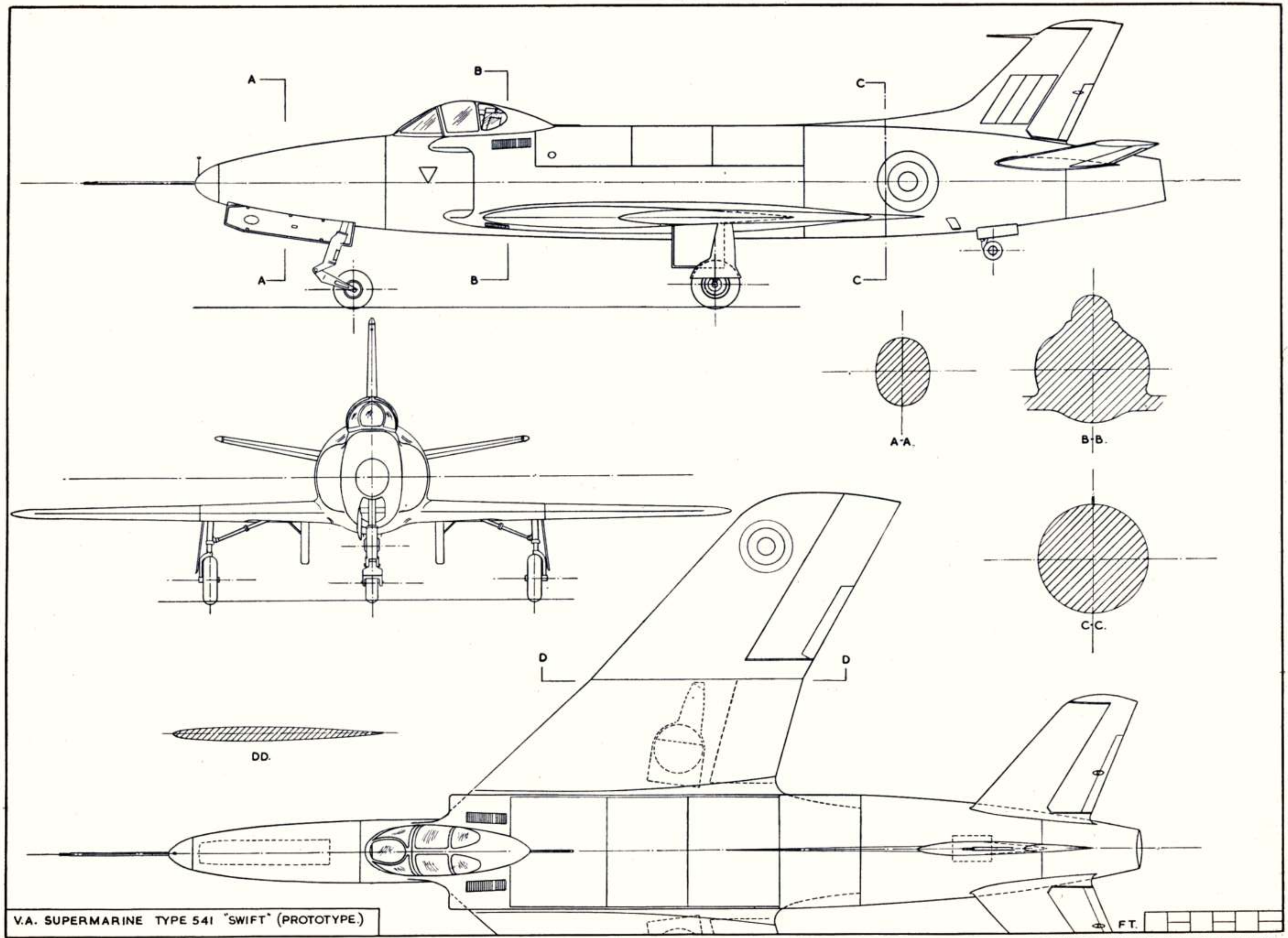
At the next show the new Type 535 excelled its forerunner and showed itself to be a new design. Using a R.R. Nene, like the 510, a Supermarine innovation was evident in the 535, in the shape of a nose-wheel tricycle undercarriage which retained the twin tail-wheels of the Attacker and 510. This long nose fighter mounted, at the time, four cannons in the wing.

Since the Spitfire, no Supermarine fighter had served the R.A.F., but next came the type 541 "Swift," which is now in production as one of the five aircraft to have super-priority over all else. Very similar to the 535, main distinguishing features of the Swift are the rounded wing tips, larger intakes and fin mounted pitot head. Regarded as the first prototype of the Swift, the type 535 is numbered VV119, while the first Swift is WJ960. The Swift is powered by 6,500 lb. thrust axial-flow R.R. Avon engine, with provision for re-heat, and the 535 has the less powerful Nene. A wheels-up landing before the 1951 S.B.A.C. show prevented the Swift from appearing, but the 535 acted as reserve, giving the Swift's counterpart, the Hawker Hunter prototype, a close high speed run for its money. At the time of writing, the Swift is subject to official secrecy, and so no details are available, but, when in service, the R.A.F. will have a hard-to-beat interceptor. Armament will be nose-mounted, and is rumoured to comprise 30 mm. cannon and the A.S. Sapphire may be fitted.

Specification. (Type 535.) Span 31 ft. 10 ins. Length 41 ft. 5½ ins. Height 11 ft. 7½ ins. No other details released.

Colour. Natural light alloy with red, white and blue roundels and fin flash. Serial number below wings and at tail of fuselage, in glossy black.

Photos: Charles E. Brown



V.A. SUPERMARINE TYPE 541 "SWIFT" (PROTOTYPE.)

THIS IS A 1/72nd SCALE REPRODUCTION OF THE 1/48th SCALE DRAWING WHICH IS AVAILABLE PRICE 1/- POST FREE FROM THE AEROMODELLER PLANS SERVICE

IN our November 1950 issue we published George Harrison's very successful " Pegasus " Canard rubber model. Acknowledged to be Britain's foremost exponent of this unconventional form of model flying, George Harrison of Hull has recently claimed a creditable British record flight of 6 mins. 12 secs. R.O.G. with his Pegasus design.

We quote his comments on trimming :—

My earlier models started off with the elevator at 3° positive and the mainplane at 1° positive, and these figures have gradually risen with continuous trimming and flying to the present (and last year at that, too) elevator at 7° and the mainplane at 4° positive, giving real lift from the wing with the tips still washed-out a little. The section is still the same, as this is last year's identical job, only the fuselage having been rebuilt since the plans were made up.

Noticeable also is the ease of launching R.O.G. I have never yet had a faulty-take off, and in consequence I am most emphatic that models should always R.O.G. now. I am excepting the occasion when I wound the motor backwards, forgetting which prop. I was using (I have props. going in either direction of rotation).

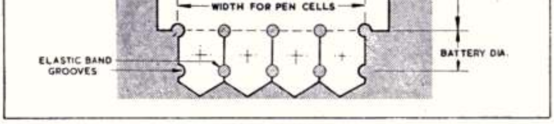
The earlier models flew too fast and the positive rigging used now has slowed down the present model without losing the power. Motor length is now 45 ins., consisting of 8 strands of Dunlop $\frac{1}{4} \times 1/24$ in., lance prewound. I still do not use downthrust, and only moderate side-thrust, and for this particular flight, my third with the same motor in the Gamage Cup, I gradually worked up to 1,150 turns, the most I have yet used.

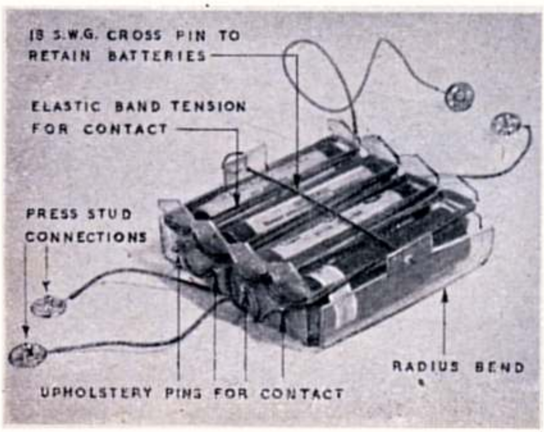
The rubber motor, by the way, is the same one I used at Sherburn last year ; not bad service ! Checking the motor run indoors has shown that the power run is about 80 to 85 secs., with which I am quite satisfied. The longer motor has made a slight change in the position of the C.G. ; this now being 5/16-in. behind the position given on the plan. Only differences then are C.G. and rigging angles."

A NEAT PEN-CELL TRAY *by S/Ldr. N. Sholto-Douglas*

Battery accommodation has always been somewhat of a problem, dating back to the days when all practical engines were coil ignition. For radio control, battery contacts are of the greatest importance, and the novel celluloid tray evolved by S/Ldr. Sholto Douglas, of Kingsbridge, Devon, is worthy of all radio control enthusiasts' study.

Mark out, on 1/16 in. celluloid, the battery " block " size, with allowance for the upholstery pin head contacts. Drill $\frac{1}{8}$ in. holes as shown in the diagram and make a wooden block for the full required internal size, rounding off the bottom edges. A duplicate block is also made, and the celluloid sandwiched between the two and clamped or screwed together through the celluloid. Cut away the unwanted corners and bend the sides up after softening in steam or in front of an electric fire. Remove wooden blocks. and fit batteries to find contact positions. Mark and pierce, then fit the contact pins.





Solder contacts together for desired series or parallel circuits, and attach connection leads with press stud ends. Batteries are held in place by the locking cross-pin and contact is assured by elastic band tension.

North of the Border

According to reports, not many **WEST OF SCOTLAND AREA** clubs flew in the Pilcher Cup, and none in the Gamage ! The two Glasgow clubs combined with the Lanark boys and had a miniature Gala Day, with blustery weather only occasionally brightened with sunny periods.

W. McConachie of Glasgow, flying his own designed A/2, and junior J. Hall of Lanark (flying a double size " Fugitive ") were the only modellers who registered maximums, both planes being lost. Results :—

W. McConachie	**7 : 56 (two flights)**
J. Hall, Jnr.	**5 : 00 (one flight)**
J. McMaster	**4 : 40**

The **S.A.E. CLUB** seemingly spent the first part of the afternoon trying to get a farmer to give them permission to fly on his ground, unfortunately without any luck, and spent the rest of the day retrieving a " Dream Bogey " from a reservoir.

KILMARNOCK S.M.E.E. set out with intentions of competing—but someone blundered, and there were no watches to clock official flights. Result—an easy day flying for fun ! Z. Jardine's " Fugitive " was really impressive, looking for all the world as if it were stuck to the sky with a drawing pin.

The **GLASGOW** boys are putting on a C/L display at the Glasgow White City Speedway on May 21st, models including a scale stunt S.E.5a, Fokker Triplane, Spitfire and F.W. 190. There will also be a class B Team Race, and a 10 c.c. Rowell powered stunter should sound nearly as good as a cinder race. Manager Johnny Hoskins has promised the boys plenty of publicity, and everyone who has the night free should be at the White City at 7.30 p.m. to give the boys a big hand. (Don't forget to take your models too, as replacements may be needed !)

Heathfield on the 24th February saw the running off of three heats in Round 1 of the Team Racing League, and if that day is any augury for the 1952 season we are in for a great time. Not only was the weather perfect, but the flying was of an extraordinarily high standard. Glasgow beat Prestwick, but they certainly hadn't it all their own way, for the manner in which the two Prestwick juniors refuelled and restarted Brian Harris's E.D. 2.46 will long be remembered. It was a pity the engine packed up ! Barnstormers gave a great display against Stewarton, finishing the 10-mile Class A course in a shade over 15 minutes.

West Scottish fixtures for the near future are :—

11th May.—1st U.K. Challenge Match Glider Eliminator.

25th May—Heat 3, Team Racing League (Heathfield).

The final U.K. Eliminator will be held at Balada, Kinross, in the South Eastern Area on August 24th.

Three juniors and a senior have recently increased the ranks of the **BUCKSBURN AEROMODELLING TEAM** from six to ten, and the seniors are busy tutoring the youngsters for the contest season. Outstanding member of the Team is Urlan Wannop, who obtained 8 maximums last season, flying Nordics of his own design. He placed 1st, 2nd and 6th in major Scottish contests, winning the Edinburgh Gala Day open glider event at Balada. Interest in rubber jobs is high, with gliders second and power last. This club raises the question of a roster of Scottish records, and would appreciate the views of other clubs.

With the approach of the contests, a survey of the **LANARK M.F.C.** progress shows the glider group the most active at present. Three 9-footers, including a " Leprechaun, " are on the way, but Nordics are definitely the most popular type at present. Negotiations with the Town Council for the use of the local golf course for Rallies and Area Contests have met with success, and this ground should prove very useful this season. The club Championship is being run on different lines this year, with members qualifying for points through competition in Area and other events, and not from monthly contests as last season. Junior section has been very active recently, mainly in connection with successful attempts to raise the club H.L. records, though flying proved hazardous due to an almost gale force wind.

A new club to come into being in Lanarkshire is the **WEST COATS AEROMODELLING CLUB,** a school group under the tuition of Mr. J. W. McDowall. Numbers are limited to sixteen—the maximum number the clubroom (Science Lab.) can accommodate, and in consequence there is a long waiting list ! Although most of the boys are beginners, and in the 10–11 year groups, standard of modelling is quite high.

ARBROATH M.A.C. is enjoying a new lease of life. From a membership last year of a mere dozen, only a few of whom were active modellers, the club has grown to a present strength of twenty-eight *very active* members. Most of these are juniors, and our anti-junior readers might note that they are all proving valued club members and extremely capable aeromodellers. Most popular types of models are Jetex, the smaller sizes of power duration models, control-line and flying-scale, in about that order of preference. Rubber duration and gliders are also well represented. The Club duration record is held by D. J. M. Webster with a flight of 7 min. 20 secs. made by a tailless glider of his own design.

On March 1st was held a Visitors' Night. Other clubs may be interested in the arrangements. As the club meets weekly in a Church Hall, the function took place there on the usual club night. Members invited friends and families, and a number of invitations were sent to a representative number of interested and public-spirited individuals. A display of models of all types was arranged, including partly-completed models, and also plans, materials, etc., and a group of juniors formed a " live " exhibit by building a small duration model. One end of the hall was set aside for R.T.P. flying. In all, it was an exhibition in miniature staged at virtually no cost to the Club, while a collection taken provided a useful addition to funds.

They appeal to adult aeromodellers in the district to come along and help run the club. It's a job well worth doing and one that will be enjoyed.

CLUB NEWS

D. W. Stenning of Reading M.A.C. puts a maximum effort into launching his entry for the Astral at Kidlington, where the S. Midland area gathered.

WELL, 1952 seems to be giving us a better time than its predecessor, and for once in a blue moon Gamage Cup day did not produce the very worst conditions from the Weather Man's bag of tricks. In fact, reports from all over the country indicate very fair model weather, though blustery conditions were reported from Scotland.

An immediate indication is the fact that no less than four competitors set up triple maximums, and three of these were in a position to make a fourth flight as the contest decider. Commiserations go to W. Keilly of the Regent's Park club, who apparently lost his glider on its third maximum, and was thus prevented from placing higher than fourth in the final Pilcher Cup results.

Gliding is obviously more in favour with the majority when it comes to participation in National contests, and we find that the Pilcher Cup attracted 400 competitors from 110 clubs—an increase of 128 over the 1951 figures. In contrast the Gamage only found 148 supporters in 62 clubs, a decrease of 8 from last year. Truly, quality tells, for it is interesting to note that no less than eight ex-British Wakefield Team members placed in the top 10 per cent. in the Gamage.

Heartiest congratulations to Grahame Gates for retaining the Cup he won in 1951, despite the fact that an almost complete list of " new " names appears in the glider event.

North Eastern Area

This month sees a fresh attempt at an official News-sheet from this Area, the first failing through lack of support from the member clubs. This apathy was commented upon by the retiring Area Chairman at the last A.G.M., and the new Committee trust things will liven up in the new season. Two new clubs, Sedgefield and Tudhoe Cloudusters, have appeared in the North East, and we wish them every success. The Area has been approached by representatives from the Brandon and Sedgefield Shows regarding putting on model shows, and it is hoped by this means to raise funds for the Area benefit.

Through the good offices of Mr. Arthur White, the **CAER URFA (South Shields) M.A.C.** has secured a clubroom which, though it was in a sorry state when taken over, has been well and truly renovated by enthusiastic club members into a meeting place and workshop. Two members are almost ready with R/C models, but main project seems to be a special " junior encouragement " series of contests which should bear fruit.

Having decided to " have a bash " at Merit Certificates this year, the **TYNEMOUTH M.A.C.** members held a very well attended club meeting on the Town Moor, Newcastle, on March 16th. In good weather, three members qualified for their " A "s, highlight being the performance of Nicholson's o/d Wakefield. Featuring medium length fuselage, monowheel undercart, folding prop, large underfin and pylon mounted wing, the model was flown in the Gamage Cup to aggregate 11 : 28 and gain 11th position in the National results. Its last six contest flights have averaged over 3 minutes.

Northern Area

WORKSOP AEROMODELLERS are experiencing something of a revival, and now incorporate a Retford section (Sec.: D. A. Bromer, 15 Dominie Cross, Retford). Interest is chiefly in Worksop's speciality-stunt, and now Class A team racing. Most members show a marked reluctance to enter contests, so a series of " free and easy " contests are being staged. Pete Russell has at last built a new stunt job to replace the old " Monitor ", using a new type D.C. 350. The job is not fast, but is a good looker and very manœuvrable. Other members are practising hard, with Bridget McCann's " Fast Cat " holding a reliable 68 m.p.h. after the winter's going over.

STOCKTON & D.M.F.C. report almost perfect conditions on Gamage day after a rather poor start, and A/2's and rubber jobs were out in force. Best times were recorded in the Pilcher, Ian Mawson, Dave Rennison and Chas. Plant, all recording one maximum in their scores to aggregate 9 : 27, 10 : 48 and 11 : 04 respectively. The club A/2 record was broken by all three during the day, final holder being Mawson with a fine flight of 7 : 56. By comparison Gamage times were low, Stan Broadey topping the list with 5 : 59 with a new Wakefield. Ian Mawson got the highest club score in the first Area A/2 Eliminator with a score of 8 : 22, Plant placing next with a two flight total of 7 : 54 after losing both first and second string models—his tow line also going for a ride when the line broke when launching his No. 2 model. The club has now obtained a permanent room at the rear of No. 2, Spring Street, Stockton-on-Tees, which is open every night except Sundays from 7–10 p.m.

The **BARNSLEY & D.M.A.C.** are in a bit of a quandary over the number of applications being received from youngsters under the minimum age allowed in the club constitution. Therefore Mr. Polding, the club sec., wishes to contact any club which has instituted special classes or other means of catering for these young enthusiasts, as he rightly feels it would be a pity to discourage them from the hobby. Any club—or individual—who can supply Mr. Polding with help should write to him at 2, Samuel Square, Gawber, Barnsley.

HALIFAX M.A.C. report Gamage day as starting off with a very high wind and ending in a flat calm and absolutely dead air. The first Area meeting, held at Rufforth, was attended by several hardy types, but the gale proved too much for the majority. Using Nordics, E. North (7 : 27), Miss M. Copley (6 : 58), A. Nobbs (4 : 02), D. Haley, Jnr. (3 : 51) and J. Magson (3 : 14) were the club's highest scorers. The only entry in the Halfax was E. North with a one flight total of 3 : 06, the model still resting in the York area.

East Anglian Area

CHELMSFORD M.A.C. have been very busy this winter, M/s Peth, Hasler and Kemp successfully experimenting with 9 ft. span sailplanes. Entered for the Pilcher, they soon turned in several maximums. G. Foden and R. King are readying an electric r.t.p. model of the " Ambassador " for the annual exhibition to be held at the Territorial Hall between June 3rd and 7th.

Midland Area

Conditions at Pershore for the first Area contests of the season could have been a lot better, the high wind being Public Enemy No. 1 for the day. Entries for the A/2 event were higher than ever, no less than 127 glider men battling it out for top honours. D. C. Sugden of the Loughborough College group proved the best man, with flights of 5 : 00, 2 : 23 and 3 : 10, other maximum flights being recorded by P. Wilkinson (Northampton), junior T. E. Riddihough of Leamington and K. Oliver of the Foresters. Power entries for the Halfax were way below last year's lists, only 33 stalwarts wielding the bruised digit—27 of these flying models to F.A.I. standards. P. L. Littley of West Bromwich made best aggregate with 7 : 42 (4 : 09, 1 : 46 and 1 : 47).

After some difficulties, the **CHESTERFIELD SKYLINERS** have got under way again, and now meet every Thursday evening for lectures, discussions and building. Gale force winds spoilt the first Spring meeting, " Doc " Lee finding inverted flying anything but satisfactory ! Best results of the day were six crashes, two tree landings—and a superb little " Cadet " that did consistent short hops of 7 seconds duration. Together with the local hooligans, a most interesting afternoon !

WEST COVENTRY M.A.C. had two byes in the Area Winter knock-out contests, and drew against Solihull in the third round. Flown at Sutton Park, the Solihullites were the winners by 32 : 40 against the West Cov. boys' 25 : 39. Solihull's best man was R. Averill with 11 : 24 aggregate, the top Coventry chap being B. Mailns with 10 : 55.

For several years the **NORTHAMPTON M.A.C.** has been noted for its Wakefield successes, and this year they are out to conquer new fields. Four P.A.A. load machines are ready, free flight power is booming, and the A/2 men are quietly confident. March 23rd saw some good flying in amazing weather, although their present airfield is not conducive to high times—several models landed in the River Nene (Ted Evans managing this twice !).

During the past winter, the **DUDLEY DEMONS M.A.C.** has been strengthened by the enrolment of several senior members of the now defunct Dudley & D.M.A.S. First maximum of the year was collected by M. Bradley, who found the grandfather of all risers while testing a new lightweight glider, and clocked 6 : 57 o.o.s. from a 50 ft. line. Another case of an unlit D.T. fnse !

The **FORESTERS (Nottingham) M.F.C.** club hut on Tollerton 'drome is taking shape, with a scintillating wall décor in the shape of a growing

1952 CONTEST CALENDAR

June	1/2.	Centralised. **INT. POWER TRIALS.** Power Trials. **AEROMODELLER R/C.** Radio Control. **C/LINE SPEED & STUNT.** Int. C/L Elim. **SHORT BROS. CUP.** P.A.A. Load Power. **SUPER SCALE TROPHY.** Scale Power.
	7/8.	**WAKEFIELD TRIALS.** **A/2 GLIDER TRIALS.** (Centralised.)
	8th.	**DROGHEDA C/L MEETING** (Butlin's, Mosney, Nr. Drogheda, Eire).
	15th.	**West Essex Gala.** (Fairlop.)
	22nd.	**FLIGHT CUP.** Unr. Rubber. (Decentralised.) **C.M.A. CUP.** Unr. Glider. (Decentralised.) **Butlin's Contests.** All Classes. (Filey, Skegness, Ayr and Pwllheli.)
	29th.	**Clwyd Slope Soaring Contest.** (Clwyd, N.Wales.) **Northern Heights Gala.** (Langley.)
July	5/6.	**IRISH NATIONALS.** (Baldonnell.)
	6th.	**HAMLEY TROPHY.** Unr. Power Duration. **FROG JUNIOR CUP.** Unr. Rubber/Glider. (Decentralised.)
	20th.	**JETEX CHALLENGE CUP.** Jetex. **FARROW SHIELD.** Team Unr. Rubber. **WOMEN'S CHALLENGE CUP.** Unr. Rubber/Glider. (Area.)
Aug.	3/4.	NATIONALS. **THURSTON CUP.** Unr. Glider. **MODEL AIRCRAFT TROPHY.** Unr. Rubber. **" GOLD " TROPHY.** C/Line Stunt. **CONTROL LINE (SPEED).** All Speed Classes. **S.M.A.E. R/C TROPHY.** Radio Control. **SIR JOHN SHELLEY TROPHY.** Unr. Power.
	10th.	**WILTSHIRE DOWNS SLOPE SOARING MEETING** (above " Hackpen ").
	17th.	**International Model Aircraft Contest.** (Blackpool.)
	23rd/24th.	**Irish International Meeting.** (Baldonnell.)
	24th.	**All Herts. Rally.** (Radlett.)
	31st.	Centralised. **BRITISH CHAMPS.** Rubber/Glider/Power. **TAPLIN TROPHY.** Radio Control. **Daily Dispatch Rally.** (Woodford.)
Sept.	7th.	**Yorkshire Evening News Rally.** (Sherburn in Elmet.)
	14th.	**U.K. CHALLENGE MATCH.** (Centralised.)
	21st.	**Butlin's Contests.** All classes. (Filey, Skegness, Ayr and Pwllheli.)
	28th.	**FROG SENIOR CUP.** Power. (Area.) **MODEL ENGINEER CUP.** Glider. (Area.) **South Midland Area Rally.** (R.A.F. Halton.)
Oct.	12th.	Centralised. **DAVIES TROPHY.** A and B Team Race. **RIPMAX TROPHY.** Radio Control. **C/L SPEED.** All Speed Classes.

Clubs are invited to send in details of Special Galas or Open Days for inclusion in this regular Calendar.

CONTEST RESULTS

GAMAGE CUP		148 competitors
1. R. J. North	Croydon	13 : 44
2. E. Bennett	Croydon	13 : 31
3. E. Gravett	Southern Cross	12 : 49
4. I. Harrison	Cheadle	12 : 48
5. R. Copland	Northern Hts.	1 : 38
6. R. Ward	Croydon	12 : 37
7. R. Chesterton	Northern Hts.	12 : 33
8. R. Gamblin	Northern Hts.	12 : 32
9. W. Rockell	Gainsborough	12 : 31
10. J. Royle	Littleover	11 : 35
11. G. Nicholson	Tynemouth	11 : 28
12. R. H. Warring	Zombies	11 : 06

PILCHER CUP		400 competitors
1. G. K. Gates	Southern Cross	19 : 18
2. D. Woodward (Junior)	Central Essex	18 : 50
3. T. Fuller	Grange	16 : 18
4. W. Keilly (Junior)	Regent's Park	15 : 00
5. H. Cope	Barking	14 : 48
6. A. Russell	Kentish Nomads	14 : 44
7. E. Farrance	West Yorks.	14 : 15
8. K. Donald	Southern Cross	14 : 07
9. R. Grasmeder	West Essex	14 : 06
10. A. Brooks	Grange	14 : 02
11. F. Davidge	Southern Cross	14 : 00
12. E. Wiggins	Leamington	13 : 48

HALFAX TROPHY		206 Competitors
1. S. Lanfranchi	Bradford	13·36
2. E. John	Grange	11·21
3. W. Nelson	Sheffield	9·26
4. A. Coleman	Bradford	8·47
5. N. Verney	Swansea	8·19
6. P. Wright	St. Albans	8·18
7. P. Barker	R.A.F. St. Albans	8·06
8. E. Lord	Accrington	7·56
9. P. Littley	West Brom.	7·42
10. G. Byrd	Loughboro' Coll.	7·38
11. R. Bamford	Exeter	7·36
12. G. Illingworth	W. Yorks	7·22

S.M.A.E. CUP		498 Competitors
1. W. Farrance	W. Yorks	13·28
2. G. Aitenhead	Glevum	11·42
3. J. Phillips	Cardiff	10·52
4. E. Farrance	W. Yorks.	10·49
5. D. Sugden	Loughboro' Coll.	10·33
6. W. Dulson	Salford	10·20 (J)
7. M. Verry	Birmingham	10·19
8. J. Rogers	Solihull	9 58
9. M. Hanson	Solihull	9·56
10. C. Exley	Sheffield	9·52
11. R. Calvert	Bradford	9·38
12. E. Teece	Salford	9·36

collection of beer mats! After trouncing Derby by 28 mins. to 15 mins. in the Area knock-out, they had less luck in better conditions when losing by 26 mins. to 28 mins. against Littleover. Some large models are appearing, including Cyril Powell's 10 ft. span twin engined R/C job, with which it is hoped to obtain steering by engine control. Geoff Pike has built a second version of his model described in the April A.M. with independent rudder and elevators controlled by cams. With an all-up weight of 12 ozs. and an Elfin 1·5 up front, hectic flying results.

FLYING SADDLERS M.A.C. flew their Gamage and Pilcher flights at Bentley Common in poor weather conditions, the only flight of note being one of over 6 mins. by "Jetex Jim" James, this creating a new club A/2 record. The model has since been christened NoDT. Best time in the Gamage was set up by junior Ken Hobley, who aggregated 5 : 25 with his "Senator". Club members did not do as well as expected in the A/2 and Power Elims., only James putting up anything like the usual performance after a poor first flight in the Nordic event.

South Midland Area

April 6th provided some shocking weather at Henlow, the wind unfortunately blowing across the short end of the 'drome and causing many o.o.s. flights, average for the first round being only some 2 mins. (Clements of Luton had his model treed, and the farmer, being a religious bod, wouldn't let him touch the model on Sunday despite frantic pleas by Clements!) Conditions brightened during the afternoon and Waldron (Henley) made best flight of the day when his long fuselage A/2 did 4 : 22 o.o.s. This meeting showed up the dearth of good power fliers in the Area—and some of the glider towing wasn't so hot! Waldron did best in the A/2 event with a total of 9 : 28, with G. Stott, Luton, making the best showing in the power contest with 5 : 29. Bronze medal winner at the **LUTON & D.M.A.S.** concours was J. Symond's Mills 1·3 powered scale "Swordfish." P. Gilder has abandoned his 6-ft. Wakefield, and gone back to the more standard 50-in. classification, this being favoured by most of the club Wakefielders. Sid Miller has left his beloved R/C long enough to build an F.A.I. rubber job—other news being that the club has taken the local Grammar School club under its wing.

South Western Area

Failing in their efforts to obtain the use of the disused airfield at Winkleigh, the Area held the first meeting on April 6th at Changford Common in weather far from ideal. In spite of this, P. J. Royle of the R.A.F. St. Mawgan scored a maximum with his A/2 on its first flight, later losing his power entry on its second flip in the Halfax after a time of 3 : 54. R. Bamford of Exeter made the best aggregate in the power section with 6 : 35. In spite of the weather conditions, the new site showed that it has great possibilities, and it is anticipated that maximums rather than minimums should be easy later in the season when better conditions prevail.

Welcome to a new club in this Area. The **BARNSTAPLE & D.M.A.C.,** meet at the South Street School and fly on the Recreation Ground. Permission is being sought to use Chivenor Aerodrome in conjunction with the Braunton club.

London Area

Members of the Croydon club are thanked for the way they organised the Area meeting on April 6th, though many clubs are criticised for not providing their proper quota of timekeepers. Only thing to do is make an example of some of 'em—there is no compulsion on anyone to time people who do not do their whack! Pete Wright of St. Albans did best in the Halfax with a lightweight totalling 8 : 18, Jack North of Croydon again topping an Area event by scoring 9 : 19 in the A/2 Elim.

Good news is that the Fairlop rent fracas has been

STOP PRESS!

WESTON CUP			
1. Monks, R. C.	Birmingham	(4 flights)	16 : 58
2. O'Donnell, J.	Whitefield		15 : 00
3. Marcus, N. G.	Croydon		14 : 58
4. Bennett, G.	Croydon		14 : 09
5. Rockell, W.	Lincoln		13 : 39
6. Gorham, J.	Ipswich		12 : 26

ASTRAL TROPHY		
1. Wyatt, P.	R.A.F. Melksham	14 : 10
2. Perkins, G.	Croydon	13 : 21
3. Waldron, J.	Henley	11 : 39
4. Bickerstaffe, J. E.	Accrington	11 : 27
5. Linford, G. W.	Loughboro' College	11 : 09
6. Brimslow, G.	Cheadle	11 : 03

Now a London resident, Roy Chesterton, Wakefield winner 1949, has joined Northern Heights and flew this new model in the Gamage.

amicably settled, and the clubs are relieved of their worries regarding the back rent business. Much of the credit for this sorting out of a difficult situation goes to the Area Council Delegate.

NORTH-WEST MIDDLESEX M.F.C. have designed a club model for the encouragement of the junior element, tests being quite hopeful. Members have bid a reluctant goodbye to Bob Annenberg on his moving to Aylesbury, though they still expect to see him make his pilgrimages to Fairlop to air his latest high climber.

Congratulations to Jack North of the **CROYDON & D.M.A.C.** on winning the Gamage Cup. He also clocked **10 : 37** in the Pilcher and also topped the London Area A/2 elim. with over **9** minutes—all with machines over a year old. Hard luck was the lot of Ed. Bennet who should have had three max's in the Gamage, but under D.T.'d on two of them. There's a moral there somewhere. Norman Marcus set a new fashion in model retrieving when rescuing his new E.D. 2·46 powered F.A.I. job from the top of a **30** ft. tree. He climbed the branchless trunk with the aid of 6-inch nails and a hammer. Nerve wracking business this, and makes the second nail spiked tree in the neighbourhood, the other being a 60-foot monster which took all morning to master!

South Eastern Area

The Brighton club has offered the Area Committee the South Coast Gala trophies for competition at an Area Rally. This offer has been accepted, and details will be announced at a later date. The 14 clubs represented at a recent Area meeting are a good indication of a reawakening of interest in the Area, another indication being the volunteering of C. V. Christoff for the onerous task of Area Secretary.

During a club attempt on Merit Certificates, John Hawthorn of the **ISLE OF THANET M.A.C.** lost his A/2 job after a flight of 6 : 45, thus setting up a new club record. A contest has been arranged to encourage interest in rubber driven models, the K.K. Senator being the "guinea pig" design which members will build for prizes offered by the comp. sec.

March 23rd was a good day for the **SOUTHERN CROSS A.C.,** the comp. sec. being almost overwhelmed by the entry and the standard of flying. A total of 34 club championship flights were made, out of which there were 7 maximums and 15 over the 4 minute mark. Grahame Gates flew his new 14-ft. span "Halcyon III" and recorded three max's and 4 : 18. Keith Donald and Frank Davidge also did well, as also did Bill Gravett in the Gamage event, as the final results show.

Southern Area

First Area contests for 1952 were held at Andover in rain and wind in almost equal quantities. An improvement took place in the afternoon, but by then most flights had been made! The Grange boys made the best showing, D. Waters scoring 8 : 59 in the glider event, and E. J. John 11 : 21 in the power contest.

Contrary to expectations, "Damage" day dawned bright at Farnborough, and the **GRANGE M.A.C.** members took full advantage of this to record good times in both the National contests. Poor weather on March 30th postponed a three-cornered match between the Grange group, Kentish Nomads and the Howera M.A.C. of New Zealand, and this will now probably be flown off at the Northern Heights Gala. At Andover for the Area events, 1st, 2nd, and 3rd places were collared in the power contest, and the 1st, 4th and 5th in the Nordic class. Jim John's 11 : 20 with his E.D. 2·46 F.A.I. ship was top total of the meet, while Bill Henderson brought out his new long fuselage Nordic to clean up the Area open glider contest.

Northern Ireland

Irish readers are asked to carefully note that the control-line contest to be staged by the **DROGHEDA M.F.C.** will now take place on June 8th at Butlin's Holiday Camp, Mosney, near Drogheda, and not at United Park as previously announced. Entry forms and stunt schedule can be had on application to P. Hughes, 16 Mary St., Drogheda, closing day being May 24th.

Western Area

For the second winter in succession, the Area has held two winter rallies, proving much more successful than similar events held in the summer! First was held at Lulsgate on Jan. 28th, highlight of the day being the Class A team racing. Four started, but none made the distance, the race ending when "Hoppy" Hopkins was literally brought to his knees with three sets of lines round his legs, and having to be cut free with wire cutters. That, plus the fact that three engines finished with broken crankcases, seems to indicate the need for longer lines in Class A. The second rally took place at Keevil, near Trowbridge, on March 9th, when attendance was exceptionally good for the Area. Trowbridge boys took top place in both events held, Robinson winning the Kingswood Cup with his ancient "Mallard", while "Pip" Hewitt took the glider event with his year-old Nordic. But what is wrong with the rubber enthusiasts in the Western

Happy group of clubmen features the Isle of Man Model Aero Club taken during a meeting at R.A.F. Station Jurby.

the space of 30 minutes, with a 2 min. max. applied. D. Rigby, a junior, scored 11 : 32 with his " Lil Aud ", with B. Hutton chasing him to second place with 9 : 22. Rigby followed this up a month later by winning a glider contest with his " Nord II ", clocking 5 : 57. Gamage Sunday saw a flat calm dashing the hopes of many Pilcher entries who just couldn't get their models up under such conditions! Trends in the club are towards A/2 glider and f/f Power of all types, including scale. C/Line has fallen right off, but holds out among a select few.

Area—only two entries for the Weston, and one of these scratched !

Four home comps. and a visit to Keevil have already been ticked off the **SWINDON M.A.C.** programme for this season, and fair placings in Area contests have resulted. The S.M.A.C. A/2 Trophy was flown off at Wroughton Aerodrome in a 20 m.p.h. wind, and it was here that the weathercock stability of the " Nord II " paid dividends, for the first two places were taken by models of the well known A.P.S. design. R. Poole aggregated **8 : 13** against R. Smith's **7 : 41**, M. Greenwood finishing third with **6 : 33**. The Wiltshire Downs Slope Soaring meeting is to be held on August 10th, 1952, above Hackpen, and those who wish to attend are invited to send to Hon. Sec. R. H. Smith, 107 York Rd., Swindon, Wilts., for full details, road maps, etc.

In an effort to bring the mountain to Mahomet, the **BRISTOL & WEST M.A.C.** are meeting each Friday evening on Durdham Downs in order to save the longer journey out to Lulsgate. Little of note has occurred recently other than "Gat" Woolls' successful attempt to break the British rubber-driven Tailless record, which he succeeded in doing by a margin of $10\frac{1}{2}$ seconds despite most of the flight being badly stalled, probably due to a bunched motor. The same individual made the only competition flights in the rubber event at the Area Rally on February 9th, and recorded **2 : 46** in steady rain on $\frac{2}{3}$ max. turns.

With eight R/C models in the club, **SALCOMBE M.A.C.** report good progress, and scale models on the increase. Close co-operation with the newly formed Dartmouth M.A.C. is proving interesting, with a trophy in the offing for the highest individual points winner.

East Midland Area

Although the **CRANWELL APPRENTICES M.A.C.** has been dormant for the past few years, a new spell of activity is evident with membership over forty. At the moment f/f scale seems to find top place in interest, although a large number of small Jetex jobs have been r.t.p'd, and solids appear to be making a come-back. Naturally, being a radio school, R/C gets plenty of attention, though Hassal cannot understand why his receiver picks up Morse when he's nowhere near the button !

North West Area

The **ST. HELENS M.A.C.** have held several contests recently, and enthusiasm seems much higher than last year—a very welcome sign. A free-flight " Scramble " held on Feb. 24th attracted 11 entries, fliers having to make as many flights as possible within the space of 30 minutes, with a 2 min. max. applied.

The **BLACKPOOL & FYLDE M.A.S.** opened the '52 season by running two local contests concurrently with National events, resulting in Cliff Davey scoring **10 : 54** in the Gamage, and T. Smith **13 : 45** in the Pilcher. On the same day J. Morell broke the club open glider record with a flight of **23 minutes.**

WHITEFIELD M.A.C. report Gamage day as the one good day in a fortnight of bad weather, although downdraughts played havoc with durations. Bob Woodhouse scored **10 : 57** in the Gamage, flying a brand new diamond pylon Wakefield, closely followed by A. D. Bennett **10 : 54**, and new member Barry Haisman **8 : 50**. In the Pilcher Hughie O'Donnell did **12 : 09** with a high aspect ratio Nordic, Bennett again collecting a second place with **10 : 30**. Only flyaway was J. O'Donnell's 9-ft. Miolnir, which disappeared into the clouds after being followed for **18 : 30**. Several stick type Nordics have recently appeared in the club, S. R. Targett's 8-ft. long version managing a 28-minute 10 mile plus flight just before the eliminators. Much use of spare models was made at the first Area A/2 elims., J. O'D. making best club time with **9 : 14.**

For a change we end up with a Tall Story, and the following tickled me as I hope it will you. John Brierley of the Oldham M.A.C. tells us of his clubmate who lost a " Rapier " after forgetting to set the timer, only to receive a letter a few days later to the effect that a chap had found the model in the Halifax district. Since the model was inscribed " reward ", the owner was in some doubt what to give the finder, and finally decided on a packet of cigarettes—a gift always appreciated, especially as at that time such things were in short supply. He arrived at the address, cigarettes in hand—to find that the fellow was a Tobacconist !

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Mills P.75	50/0 + 10/9
Mills S.75	55/0 + 11/9
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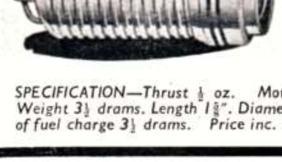

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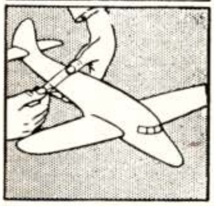

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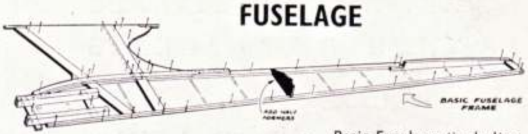

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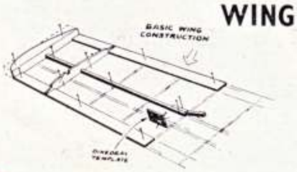

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