AERO MODELLER

ANNUAL 1951

AEROMODELLER ANNUAL 1951

Festival Year brings another grand selection of models from far and near to interest or enlighten. Our fourth *Aeromodeller Annual* covers as wide a range as ever with over sixty plans of models from Russia, Japan, Jugoslavia, Hungary, Czechoslovakia, Poland: from other European countries including Norway, Belgium, France, Holland, Italy: from the United States and from aeromodellers in this country. Certain new aspects of aeromodelling, such as the increased interest in multi-engined scale control-liners, the development of scale Jetex powered jet models, and the establishment of radio-control as within the reach of any average enthusiast, all these have received the attention of experts with informative articles. Team racing again comes under review, there are the usual " potted " Engine Analyses of the year, Contest Results, International Contests. New features in the news such as geared Wakefields and Flying Wings have their section. Every aeromodeller will treasure a copy for constant reference and assistance in the design and operation of his models.

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AEROMODELLER ANNUAL - 1951

A review of the year's aeromodelling throughout the world in theory and practice; together with useful data, contest results and authoritative articles, produced by staff and contributors of the *AEROMODELLER*

Compiled by
D. J. LAIDLAW-DICKSON

and Edited by
D. A. RUSSELL, M.I.MECH.E.

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MODEL DIESELS

CONTROL LINE MODEL AIRCRAFT

AEROMODELLER ANNUAL - 1948

AEROMODELLER ANNUAL - 1949

AEROMODELLER ANNUAL - 1950

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MODEL OF THE YEAR.—Peter Holland's flying scale control line version of the Brabazon can fairly claim to be the best known model of Festival Year, 1951. Our picture shows him flying the model in the Sports Arena at the Festival Site, one of the many occasions during the year when, together with his essential band of "mechanics" he demonstrated to an ever-interested public the skill, science and thrills of aeromodelling.

INTRODUCTION

Festival of Aeromodelling

AEROMODELLERS can look back on Festival Year with every confidence that they have played their full part in providing exciting public displays of their skill on every occasion that has offered. In consequence very many more members of the general public have been given, at any rate, an elementary education in aeromodelling, and forced to abandon any odd notions they may have cherished that this is anything but a highly skilled hobby and science.

Builders have shown a proper appreciation of the type of model that may best be demonstrated to an inexpert public, and have concentrated on scale designs, with a growing emphasis on multi-engined aircraft. It is in this class of model that the future of control-line flying may lie, for only now with the development of the necessary skill, allied to adequate reliability of engines, has it been possible to bring dreams to practical reality.

Two models will long be remembered in this connection—Peter Holland's magnificent Brabazon and A. Briggs' equally entrancing Fortress. These two four-engined aircraft have, perhaps, done more for the aeromodelling movement in general than any other propaganda activity of the post-war years. It would be a gracious gesture if the governing body should decide to make some special recognition of their services, and would certainly have the approval of the main body of their members. Mention should also be made of P. Donavour-Hickie, who, with his less sensational but hard worked twin-engined Sea Hornet, devoted much of his leisure to public demonstrations both at the South Bank and elsewhere. Nor indeed, must we fail to pay tribute to that indefatigable performer Johnny Nunn, with his Dynajet powered scale Vampire, which gave seventy-three public performances before meeting its gallant end in flames at an R.A.F. Display.

The year is notable also for the staging of the first aeromodelling meeting at Wembley Stadium. That public attendance was so moderate as to render any immediate repetition unlikely is greatly to be regretted. This, alas, is one of those events where the Society failed to appreciate the possibilities and allowed a grand opportunity to pass by almost unheralded and certainly unsung.

In the International Contest field Great Britain was able to send teams to the Wakefield in Finland, to the World Speed and European Stunt Championships in Belgium, and to the first post-war meeting in Jugoslavia for the Swedish Glider Cup. Their outstanding successes at Knokke, where all but one of the trophies are now in our keeping is some compensation for the grand efforts which failed to gain either of the other contests. Without in any way belittling the victors, it is fair to say that our teams could have achieved a clean sweep had things fallen their way such a very little more. Tubbs in the Wakefield and Monks in the Swedish Cup were always within striking distance of the leaders . . . well, next year will give them the opportunity to try again.

It is a pity that international radio control events have not received the same official support. It was left to the enterprise of private individuals to attend the F.A.I. approved international event in France. More praise that they were able to come home victorious!

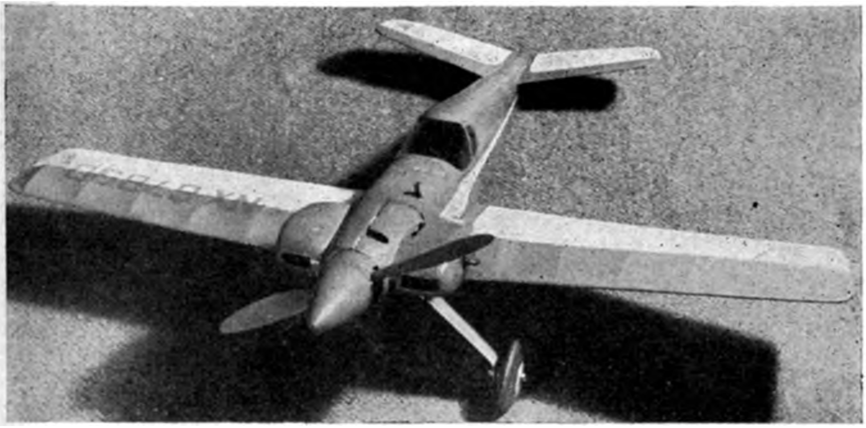
Radio control flying has perhaps shown the greatest advance of all branches during the past twelve months. Adequate support by the trade has provided ever lighter equipment, so that the early mammoth models have been largely replaced by designs of more modest size little larger in wing area than a Wakefield. This has encouraged an ever-increasing number of enthusiasts to try their hand, until all-round skill has risen to the pitch of presenting some problems to organisers of contests. As usual, the Clerk of the Weather has intervened on the side of the judges and prevented what might have been multiple ties for first place.

In the whole field of aeromodelling this year, we are happy to feel that experiment and new ideas have been the keynotes of progress. Even in that highly developed class, the Wakefield model, we have seen the introduction of gears to a large number of machines—an idea that had been tried in a cruder form many years ago and abandoned for want of pursuing it to finality. The new formula has also introduced fuselages of inordinate length—a branch of experiment we would not wholly endorse, if only on aesthetic grounds.

After some struggle against the innate conservative nature of aeromodellers, Jetex may be said to be firmly established as an active and integral part of aeromodelling. Many have developed appropriate contest designs, but its great future seems to be in the realm of scale models of the many new and exciting jet aircraft that are being released. We are happy to have an article by that pioneer of scale jets, Phil Smith, Veron's Chief Designer, to provide practical assistance to the many who will be indulging this bent. We now hear of experiments in America, where a true turbine jet has been evolved and look forward to seeing the first British version of this interesting trend. Readers may remember that Peter Hunt produced just such a model driven electrically for one of our AEROMODELLER Exhibitions at Dorland Hall.

The increasing tempo of our defence programme may have an adverse effect on flying fields available for aeromodellers in the future, though the carefree use of some does little to encourage the authorities to exert themselves in providing more. However, this increasing interest in matters aeronautical should produce in its turn a rising interest in our hobby, and in particular we would welcome the splendid efforts of R.A.F. Aeromodelling Clubs throughout the country. Facilities for aeromodelling in the R.A.F. have never been greater and it is a real pleasure to visit their official meetings, when Wingco and Erk may be seen as part of same Team Race pit crew, rank forgotten in their common zest.

We are happy to thank our many contributors, our contemporaries throughout the world, and our faithful readers for their past support and assistance. We trust that this year's offering will meet with the same friendly approval that has attended our past annuals.



HALF-PINT — TEAM RACER *By* CYRIL SHAW

DESCRIPTION.—Featuring an extremely simple and sturdy form of construction, the Half-Pint, if properly built, is capable of speeds in excess of 60 m.p.h. coupled with great fuel economy. The first time the Half-Pint was flown, we used a 6¾ in. × 9 in. toothpick type prop. The flight lasted about 7–10 minutes. Using 40 ft. lines the speed worked out at a steady 50-55 m.p.h.

Regulation line length, from centre of handle to centre-line of the model is 42 ft. for class A; but don't forget that the connections on the handle and the odd half wing will account for over 18 in., so the actual line length will depend upon the individual handle, and be in the nature of 40 ft. 6 in.

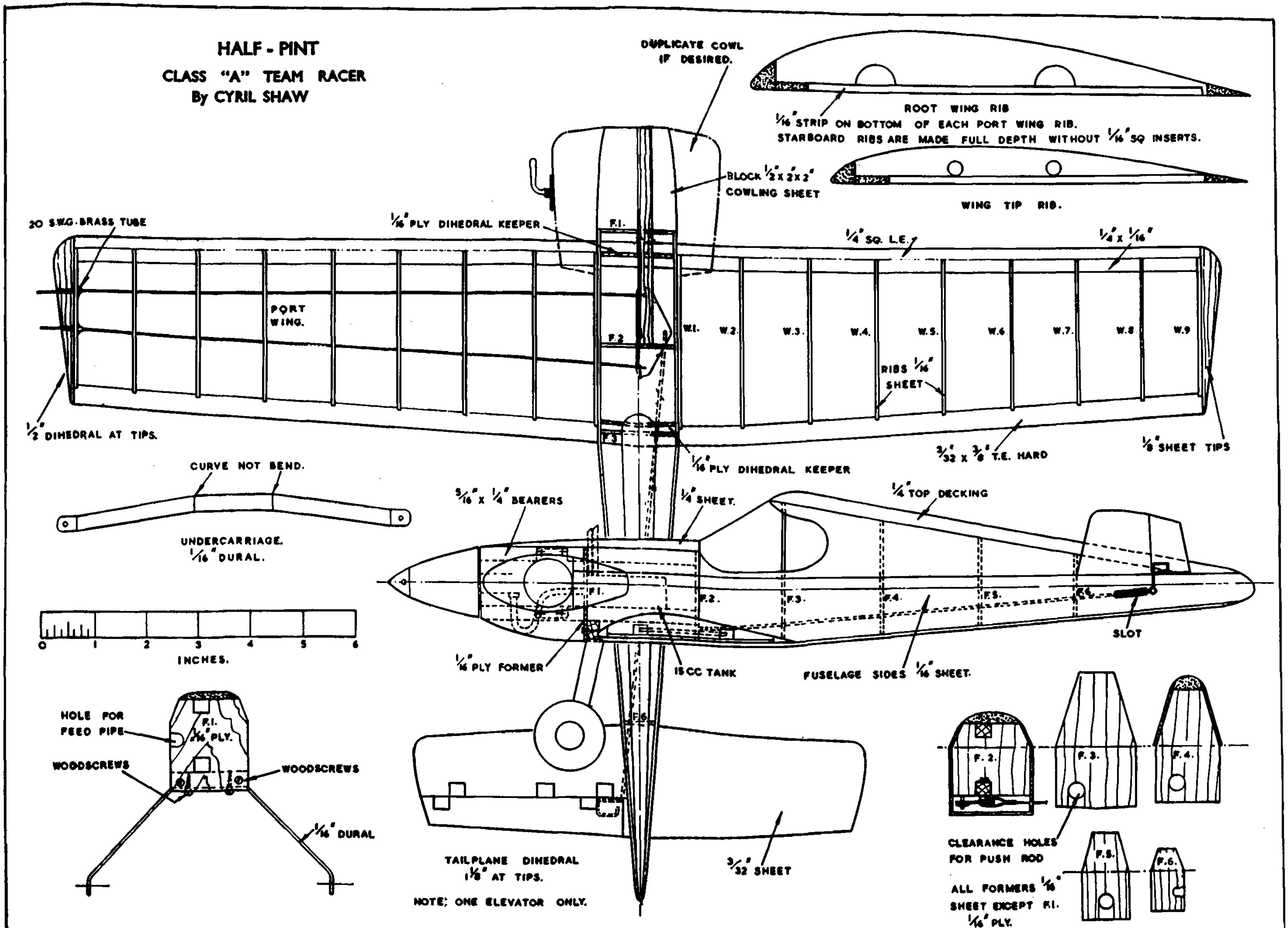
Mounted sidewinder fashion in the prototype, an Allbon Javelin was totally enclosed in the applecheek cowl; if a larger, 2.5 c.c. motor is to be used, both the engine bearer and cowling dimensions can easily be enlarged accordingly. Additional ground clearance will be needed for the larger airscrew, but there will be no need to adjust for the change in weight.

The plans can easily be enlarged to full-size by using the scale shown, the straight-line features of this attractive model make the job a simple task, so why not try this good looker for your class A motor? Conforming with all the S.M.A.E. regulations, we think you'll agree it comes within the " scale or semi-scale " category.

Flying the Half-Pint does not require great concentration as the controls have been worked out to give insensitive response and any slight errors of judgment on the operator's part will not result in violent switchbacks.

Building time naturally varies with the individual, but a general estimate is about three full evenings' building time.

CONSTRUCTION.—Construction of the Half-Pint should present no difficulties. Commence by cutting the two fuselage sides from 1/16 in. sheet and marking off former positions. Cut appropriate slots in the sheet to


HALF - PINT
CLASS "A" TEAM RACER
By CYRIL SHAW
DUPLICATE COWL IF DESIRED.
ROOT WING RIB
1/16" STRIP ON BOTTOM OF EACH PORT WING RIB.
STARBOARD RIBS ARE MADE FULL DEPTH WITHOUT 1/16" SQ INSERTS.
BLOCK 1/2" x 2" x 2"
COWLING SHEET
WING TIP RIB.
20 S.W.G. BRASS TUBE
1/16" PLY DIHEDRAL KEEPER
F.1.
1/4" SQ. L.E.
1/4" x 1/16"
PORT WING.
F.2
W.1. W.2. W.3. W.4. W.5. W.6. W.7. W.8. W.9
RIBS 1/16" SHEET
1/2" DIHEDRAL AT TIPS.
3/32" x 3/8" T.E. HARD
1/8" SHEET TIPS
1/16" PLY DIHEDRAL KEEPER
CURVE NOT BEND.
5/16" x 1/4" BEARERS
1/4" SHEET.
1/4" TOP DECKING
UNDERCARRIAGE.
1/16" DURAL.
F.2. F.3. F.4. F.5. F.6.
SLOT
0 1 2 3 4 5 6
INCHES.
1/16" PLY FORMER
15 CC TANK
FUSELAGE SIDES 1/16" SHEET.
HOLE FOR FEED PIPE
F.1. 1/16" PLY.
WOODSCREWS
WOODSCREWS
1/16" DURAL
TAILPLANE DIHEDRAL 1/8" AT TIPS.
NOTE: ONE ELEVATOR ONLY.
3/32" SHEET
CLEARANCE HOLES FOR PUSH ROD
ALL FORMERS 1/16" SHEET EXCEPT F.1. 1/16" PLY.

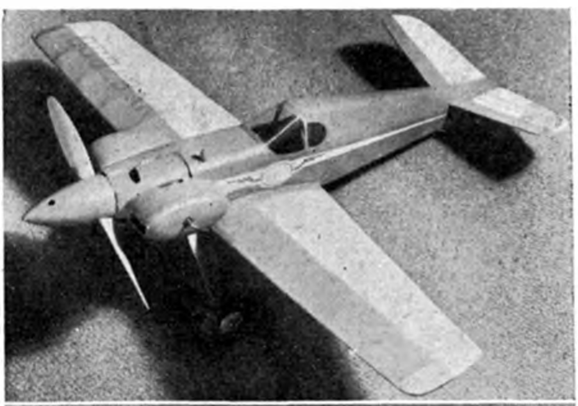
receive the leading and trailing edge of the wing at assembly time. Prop the two fuselage sides upon the flat surface and cement in all the formers. Slide lower engine bearer into formers 1 and 2 and drill hole for bellcrank fitting. The next step is to complete bellcrank assembly including the lead out wires. Wedge a small F.G. stunt tank into place and add top engine bearer. A piece of 1/4" × 5/16" hardwood is cemented and woodscrewed behind ply former 1 and the dural undercart woodscrewed or bolted on to this.

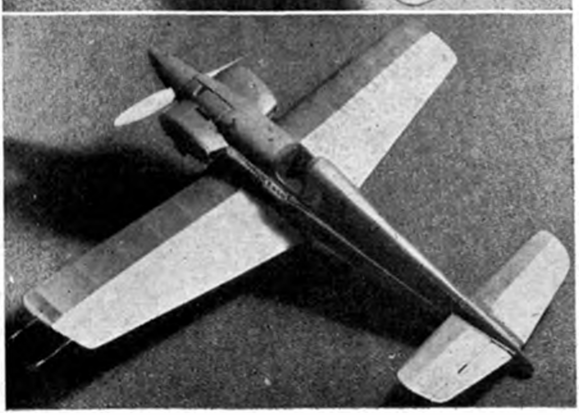
The ¼ sheet top is cemented on to formers 3, 4, 5, 6. Chamfer the the sheet to the ang'e of the formers and then add the 1/16" sheet to complete the top rear half of the fuselage. When dry sand, to section as shown on former 4. Cement windshields in place. The 1/16" bottom to the fuselage is not fitted until the wing is in position and the pushrod has been linked to the control horn on the elevator.

The " Apple Cheek " type of cowling is optional, and several different methods of construction may be used. Perhaps the least complicated method is to carve a soft block of balsa to outline the shape, split it down the middle, then hollow it and fit round your particular motor.

THE WING.—For strength and ease of construction the wing is built in one piece.

The Port half of the wing which is slightly different to the Starboard and is constructed in the following manner.

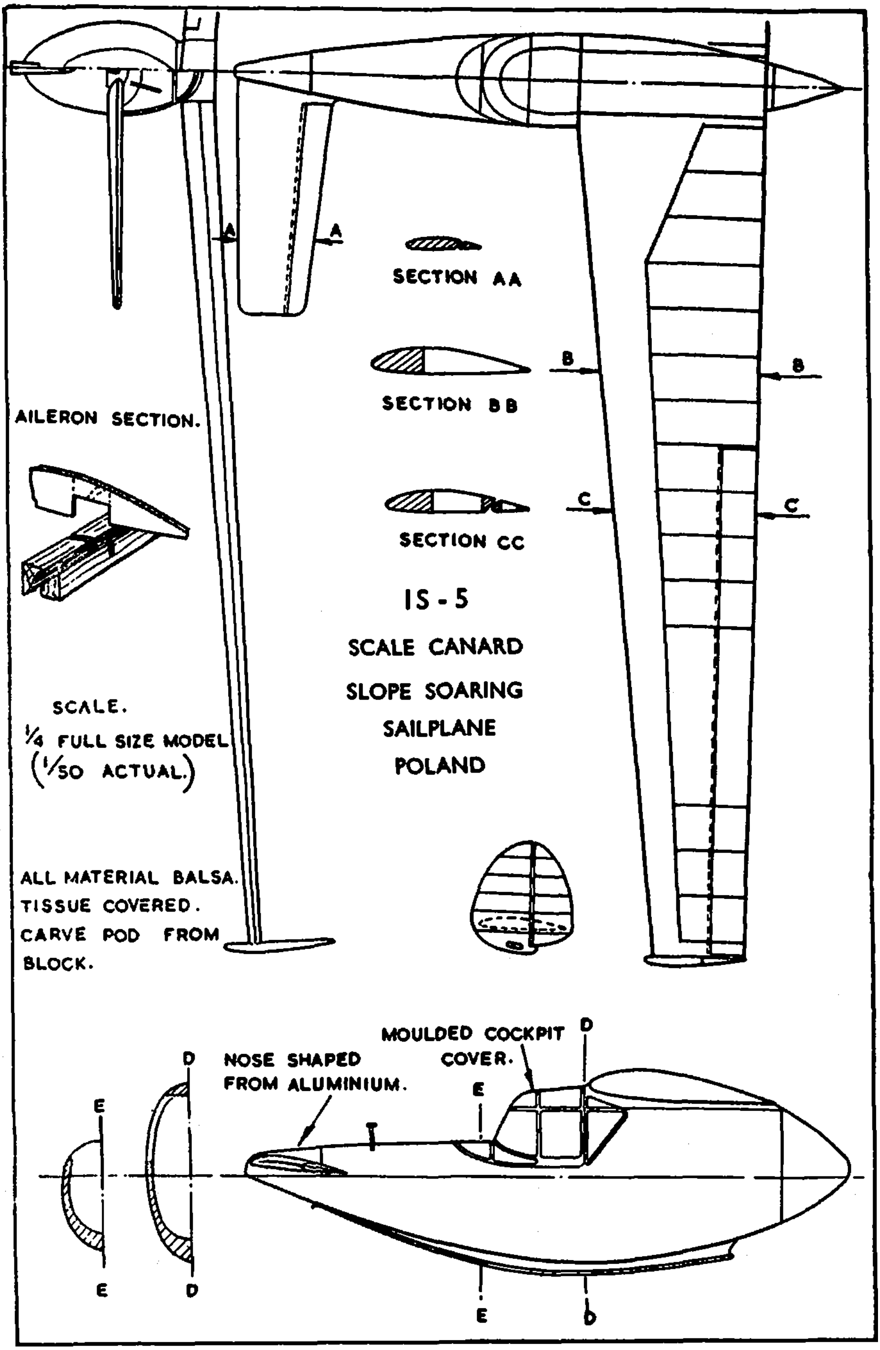


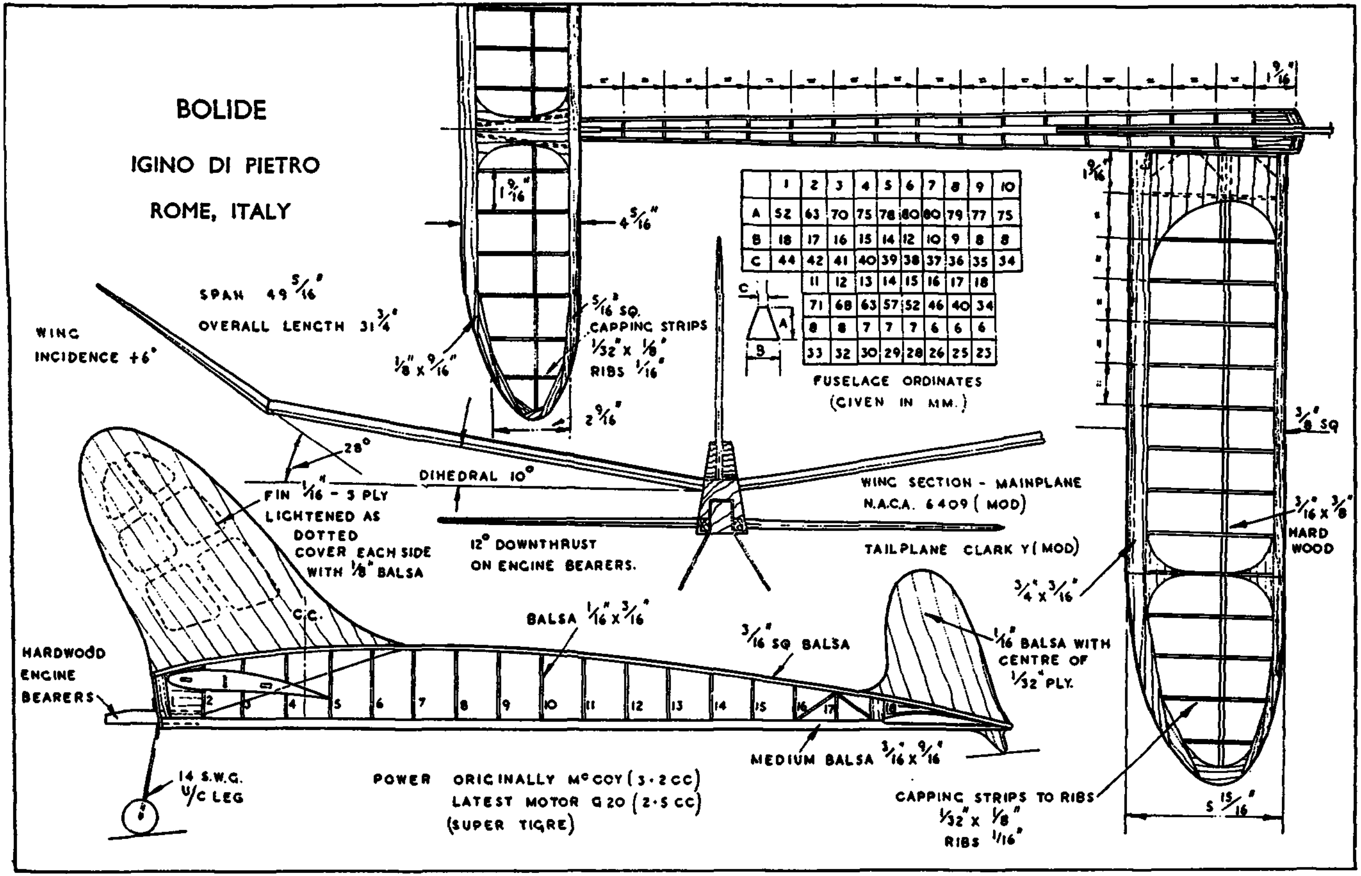


Pin L shaped leading edge and 1/8"×3/8" trailing edge on plan. Join leading and trailing edges with 1/16"sq. strips. Complete construction of the other wing half.

Cement wing to fuselage and lay lead out wires along the top of the 1/16" sq. strips joining the leading and trailing edges together. Check controls for smooth operation and then add rib tops with ¼ circle cut-aways to clear the wires.

All performance figures given were made using an Allbon Javelin diesel. Using an Elfin 1.49 the figures should be approximately the same.


SECTION AA
SECTION BB
SECTION CC
B
B
C
C
A
A
AILERON SECTION.
IS - 5
SCALE CANARD
SLOPE SOARING
SAILPLANE
POLAND
SCALE.
¼ FULL SIZE MODEL
(1/50 ACTUAL.)
ALL MATERIAL BALSA.
TISSUE COVERED.
CARVE POD FROM
BLOCK.
MOULDED COCKPIT
COVER.
NOSE SHAPED
FROM ALUMINIUM.
D
D
E
E
D
E
E
D



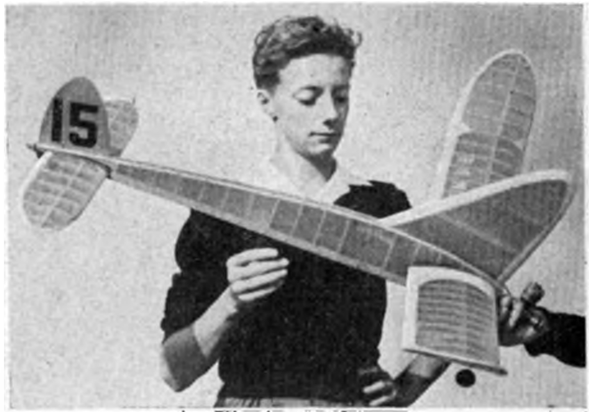
	1	2	3	4	5	6	7	8	9	10
A	52	63	70	75	78	80	80	79	77	75
B	18	17	16	15	14	12	10	9	8	8
C	44	42	41	40	39	38	37	36	35	34

11	12	13	14	15	16	17	18
71	68	63	57	52	46	40	34
8	8	7	7	7	6	6	6
33	32	30	29	28	26	25	23

FUSELAGE ORDINATES
(GIVEN IN MM.)

BOLIDE

By IGINO DI PIETRO

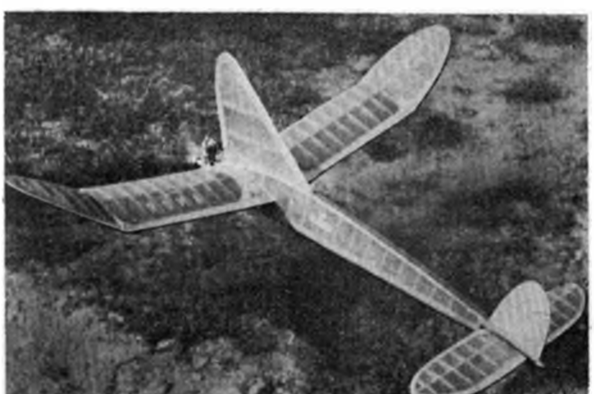


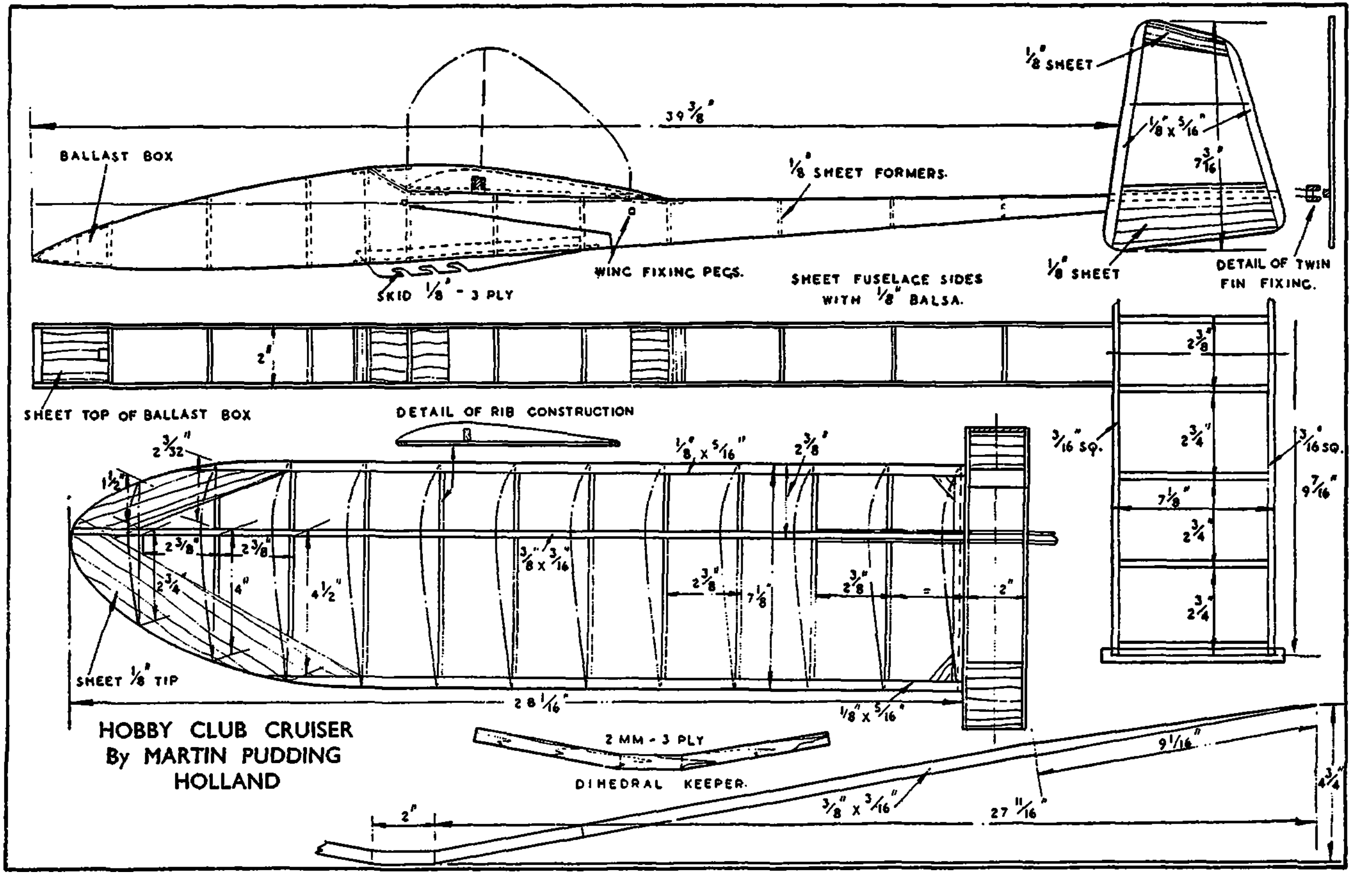
DESCRIPTION.—Any model that escapes from the usual rut is to be commended—and Bolide not only does that, but has an impressive contest record to lift it out of the freak category. The unorthodox high fin located centrally above the mainplane, which is additional to conventional fin at rear, and normal tip dihedral to the mainplane, appears to justify the designer's claims for improved performance.

He maintains that the addition of the forward fin is particularly suited to contest performance, making vertical climb and subsequent peel off less hazardous no matter what weather conditions prevail. While normal Italian conditions may be less windy than our own, it is right to add that a similar model without the special fin gave only moderate results.

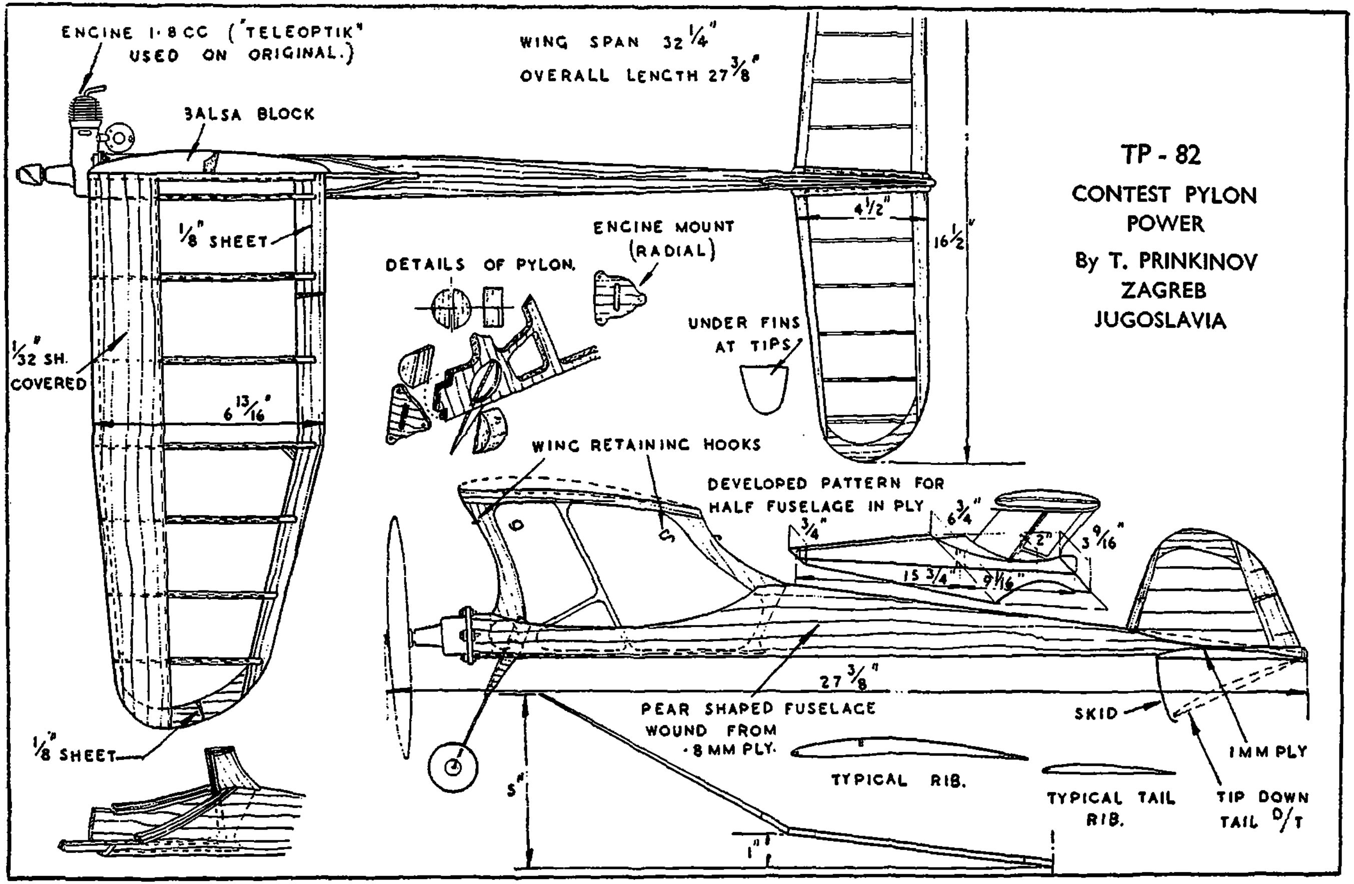
CONSTRUCTION. No unusual methods are employed. Fuselage is tapered slightly in cross-section, but all ordinates are given, and crutch construction presents no difficulty. Ply sandwiched forward fin must be fixed very securely, and accurately lined up.

PERFORMANCE.—Original prototype was McCoy powered, though an earlier prototype had an Arden 199 installed. With either of these units it climbed vertically with a slow left turn. Some downthrust is desirable in adjusting this fast climb. Super Tigre now installed gives almost equal performance and is not so tricky to adjust for best results. Contest successes include placings in Abruzzi Cup and Nationals at Bologna.

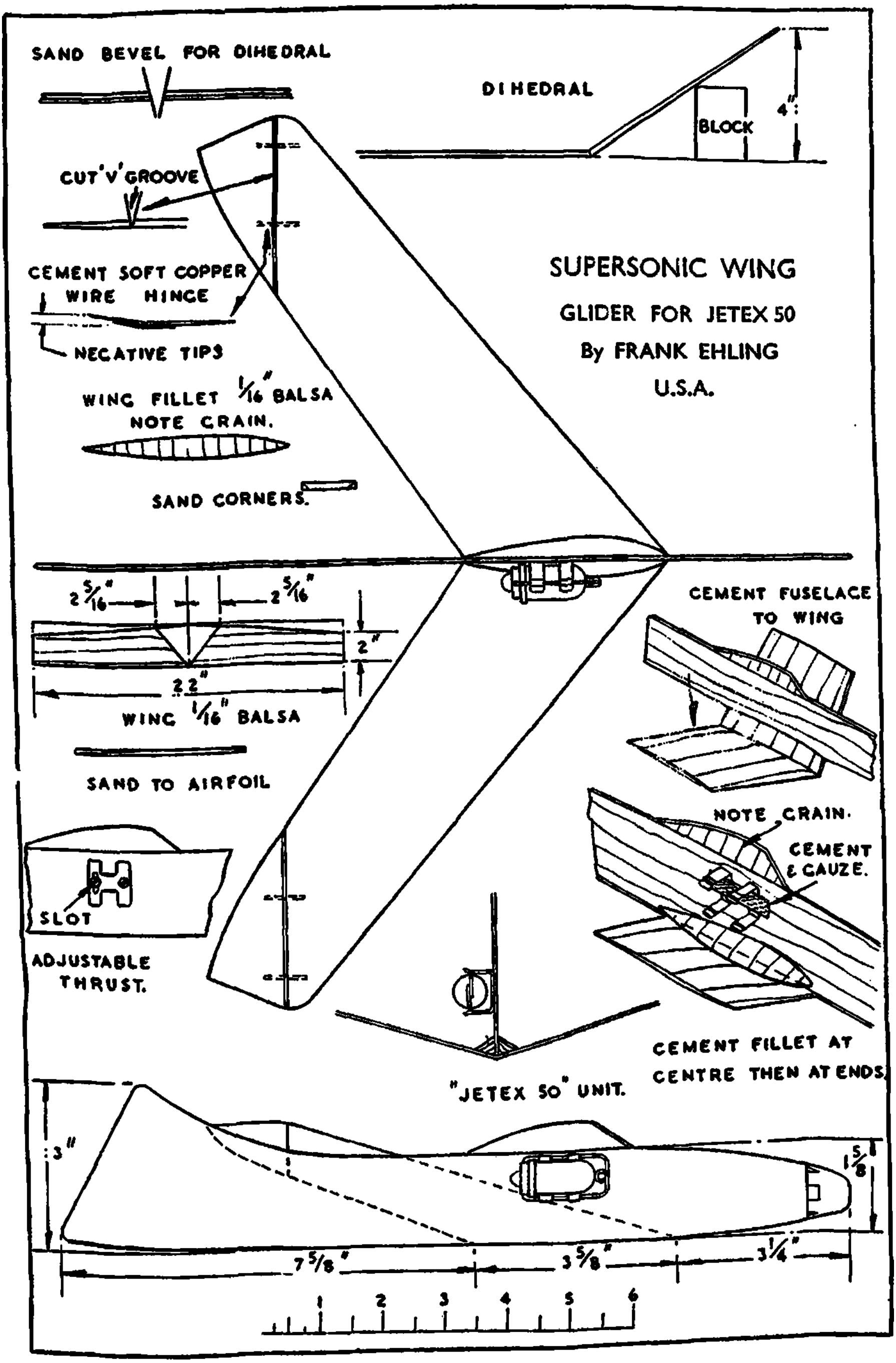


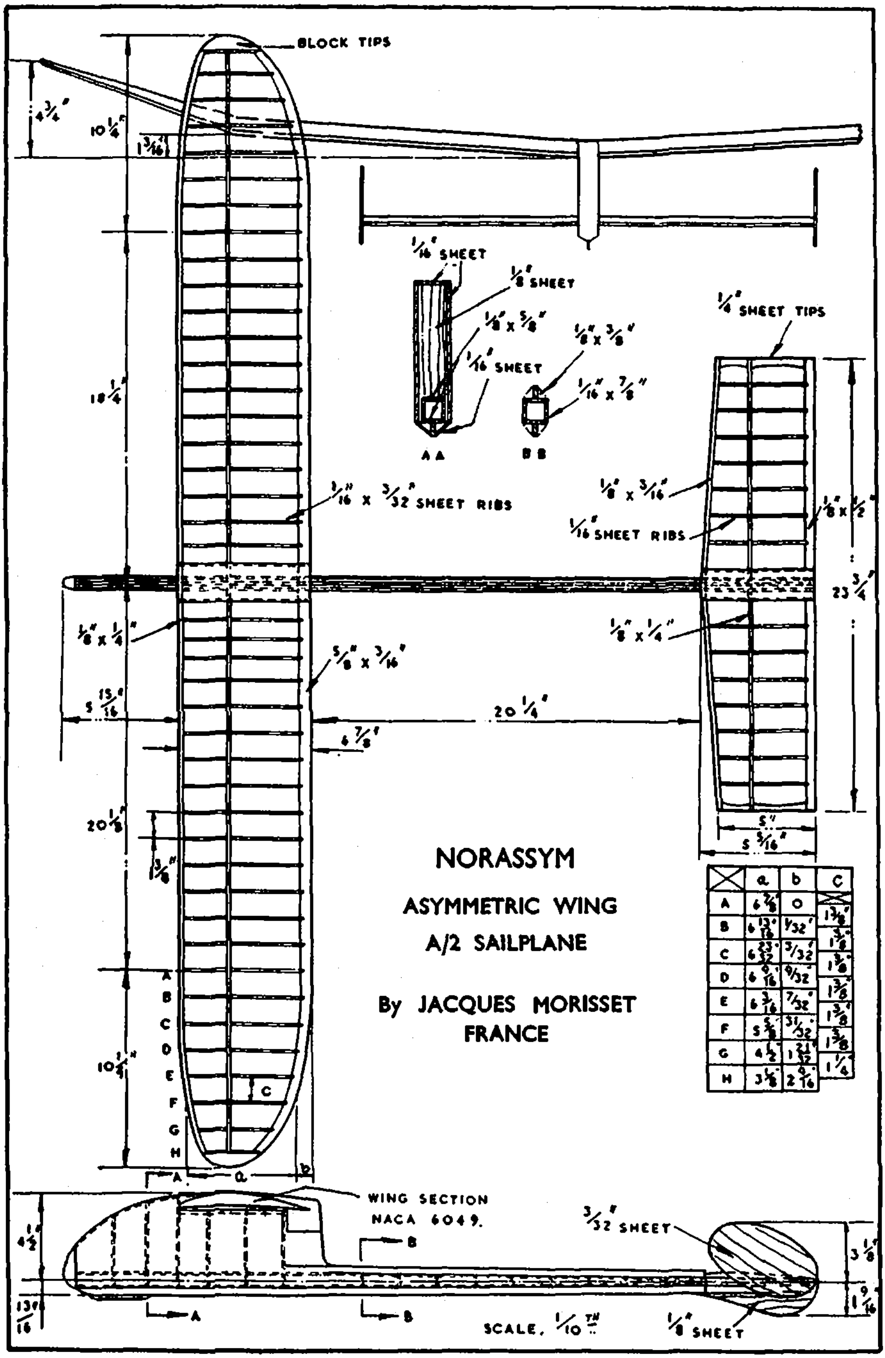


HOBBY CLUB CRUISER
By MARTIN PUDDING
HOLLAND

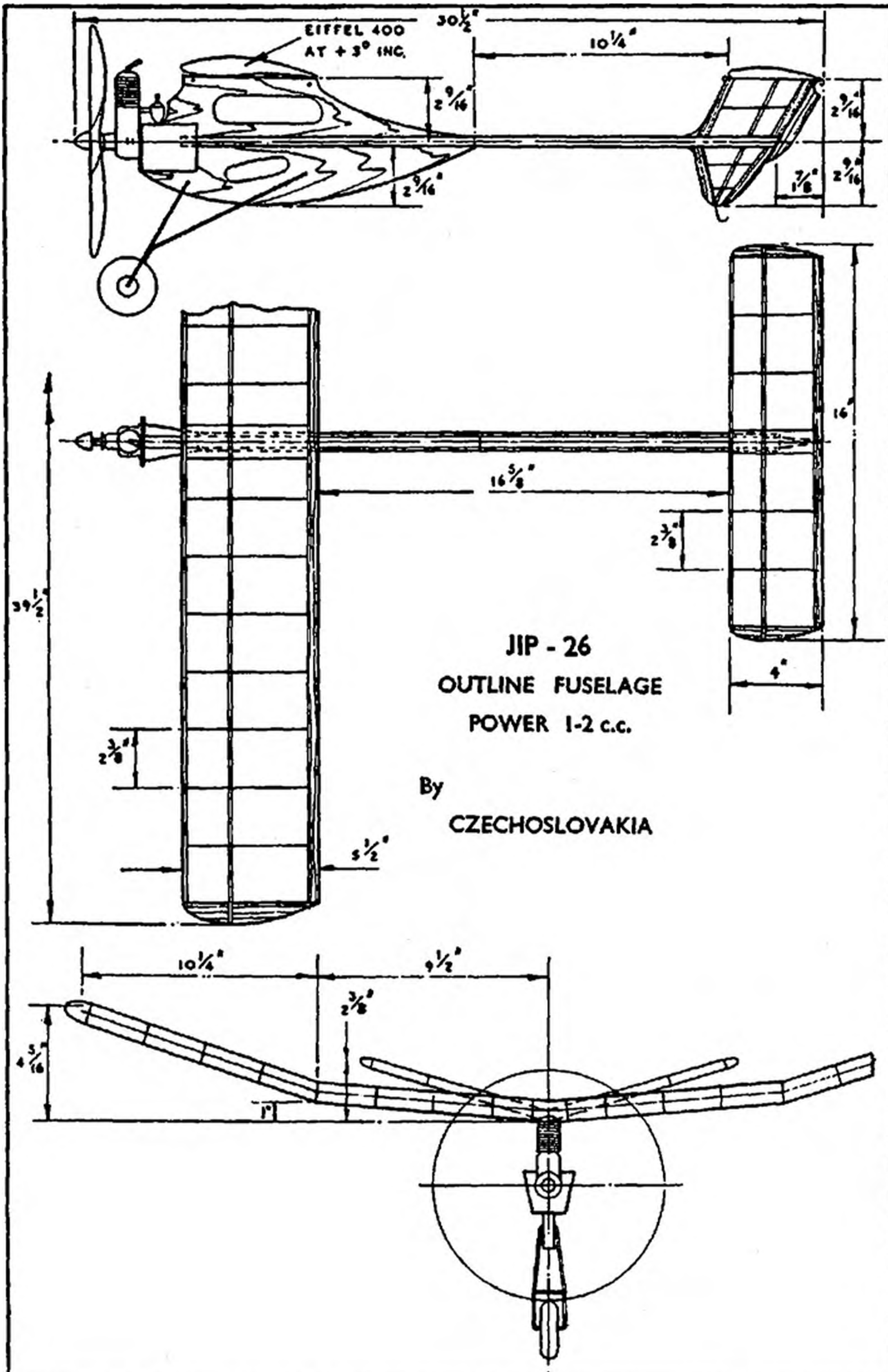


TP - 82
CONTEST PYLON POWER
By T. PRINKINOV
ZAGREB
JUGOSLAVIA
ENGINE 1·8 CC ("TELEOPTIK" USED ON ORIGINAL.)
WING SPAN 32 1/4"
OVERALL LENGTH 27 3/8"
BALSA BLOCK
1/8" SHEET
1/32" SH. COVERED
6 13/16"
1/8" SHEET
ENGINE MOUNT (RADIAL)
DETAILS OF PYLON.
UNDER FINS AT TIPS
4 1/2"
16 1/2"
WING RETAINING HOOKS
DEVELOPED PATTERN FOR HALF FUSELAGE IN PLY
3/4"
6 3/4"
2"
3 9/16"
15 3/4"
9 1/16"
27 3/8"
PEAR SHAPED FUSELAGE WOUND FROM ·8 MM PLY.
TYPICAL RIB.
TYPICAL TAIL RIB.
SKID
1 MM PLY
TIP DOWN TAIL D/T
5"
1"


SAND BEVEL FOR DIHEDRAL
DIHEDRAL
BLOCK
4"
CUT 'V' GROOVE
CEMENT SOFT COPPER WIRE HINGE
NEGATIVE TIPS
SUPERSONIC WING
GLIDER FOR JETEX 50
By FRANK EHLING
U.S.A.
WING FILLET 1/16" BALSA
NOTE GRAIN.
SAND CORNERS.
2 5/16"
2 5/16"
2"
22"
WING 1/16" BALSA
SAND TO AIRFOIL
CEMENT FUSELAGE TO WING
NOTE GRAIN.
CEMENT & GAUZE.
SLOT
ADJUSTABLE THRUST.
CEMENT FILLET AT CENTRE THEN AT ENDS.
"JETEX 50" UNIT.
3"
1 5/8"
7 5/8"
3 5/8"
3 1/4"
1 2 3 4 5 6

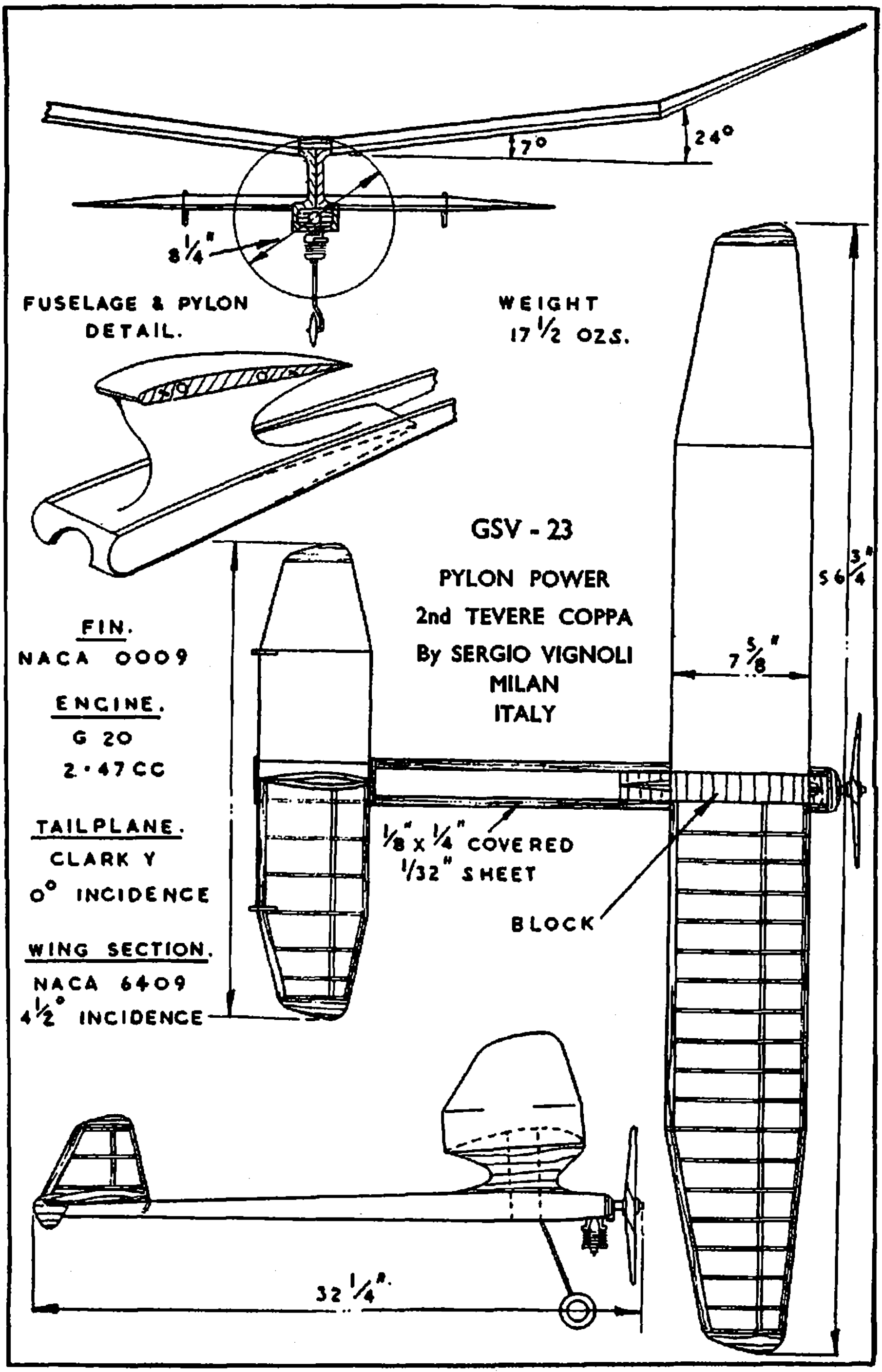


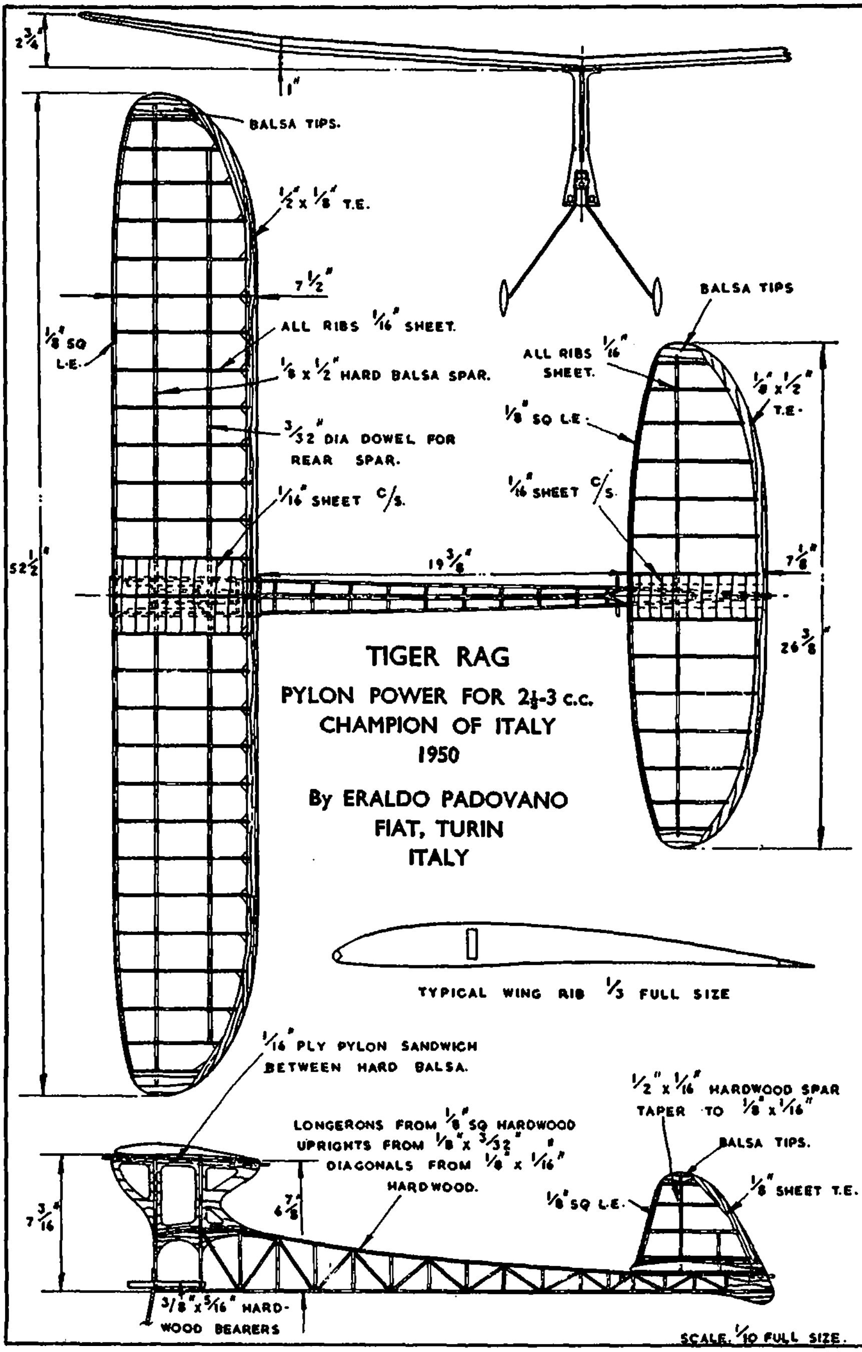
	a	b	c
A	6 7/8	0	
B	6 13/16	1/32	1 3/8
C	6 23/32	3/32	1 3/8
D	6 9/16	9/32	1 3/8
E	6 3/16	7/32	1 3/8
F	5 5/8	31/32	1 3/8
G	4 1/2	1 21/32	1 3/8
H	3 1/8	2 9/16	1 1/4

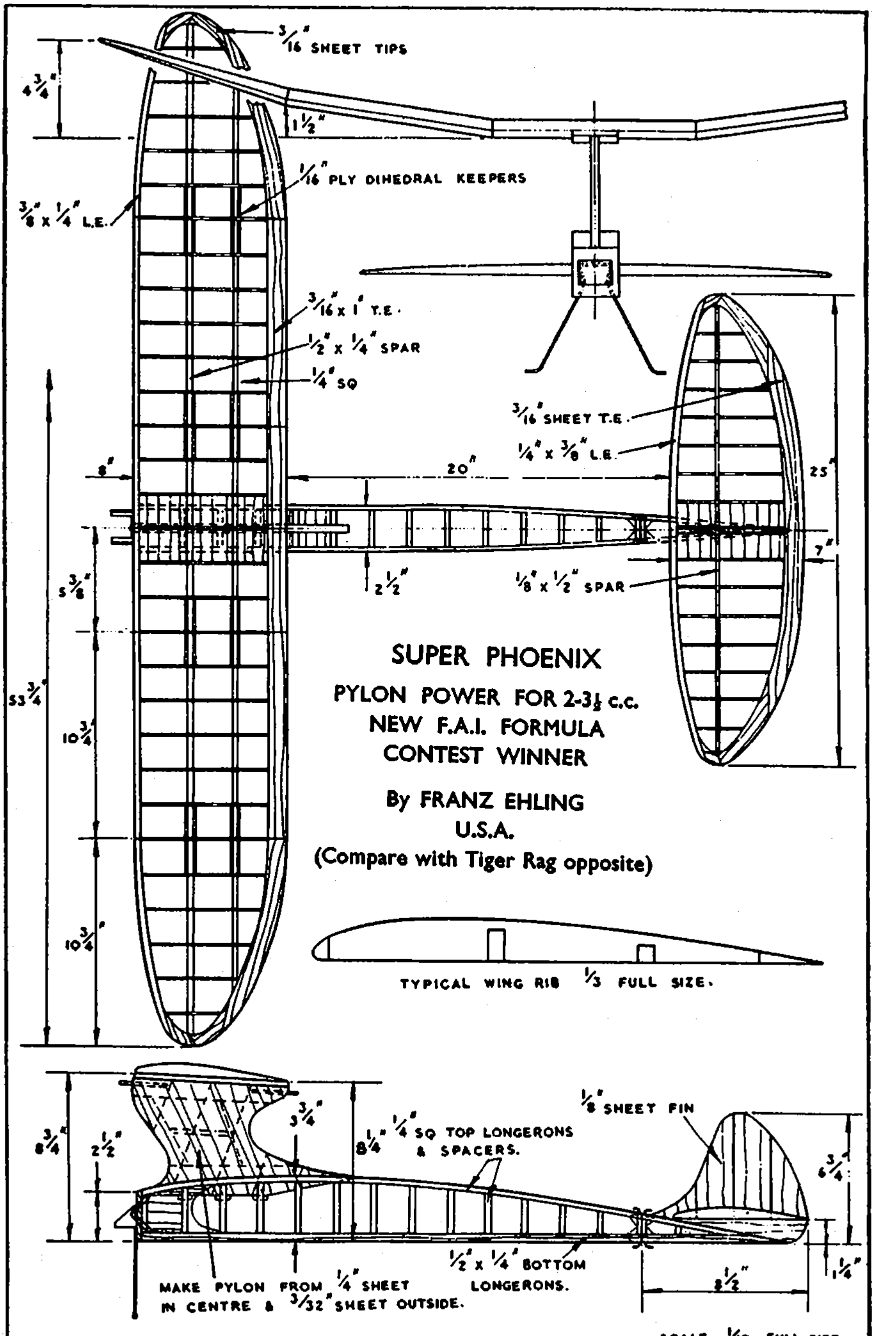


JIP - 26
OUTLINE FUSELAGE
POWER 1-2 c.c.

By
CZECHOSLOVAKIA


7°
24°
8 1/4"
FUSELAGE & PYLON DETAIL.
WEIGHT 17 1/2 OZS.
GSV - 23
PYLON POWER
2nd TEVERE COPPA
By SERGIO VIGNOLI
MILAN
ITALY
56 3/4"
7 5/8"
FIN. NACA 0009
ENGINE. G 20 2·47 CC
TAILPLANE. CLARK Y 0° INCIDENCE
WING SECTION. NACA 6409 4 1/2° INCIDENCE
1/8" x 1/4" COVERED 1/32" SHEET
BLOCK
32 1/4"

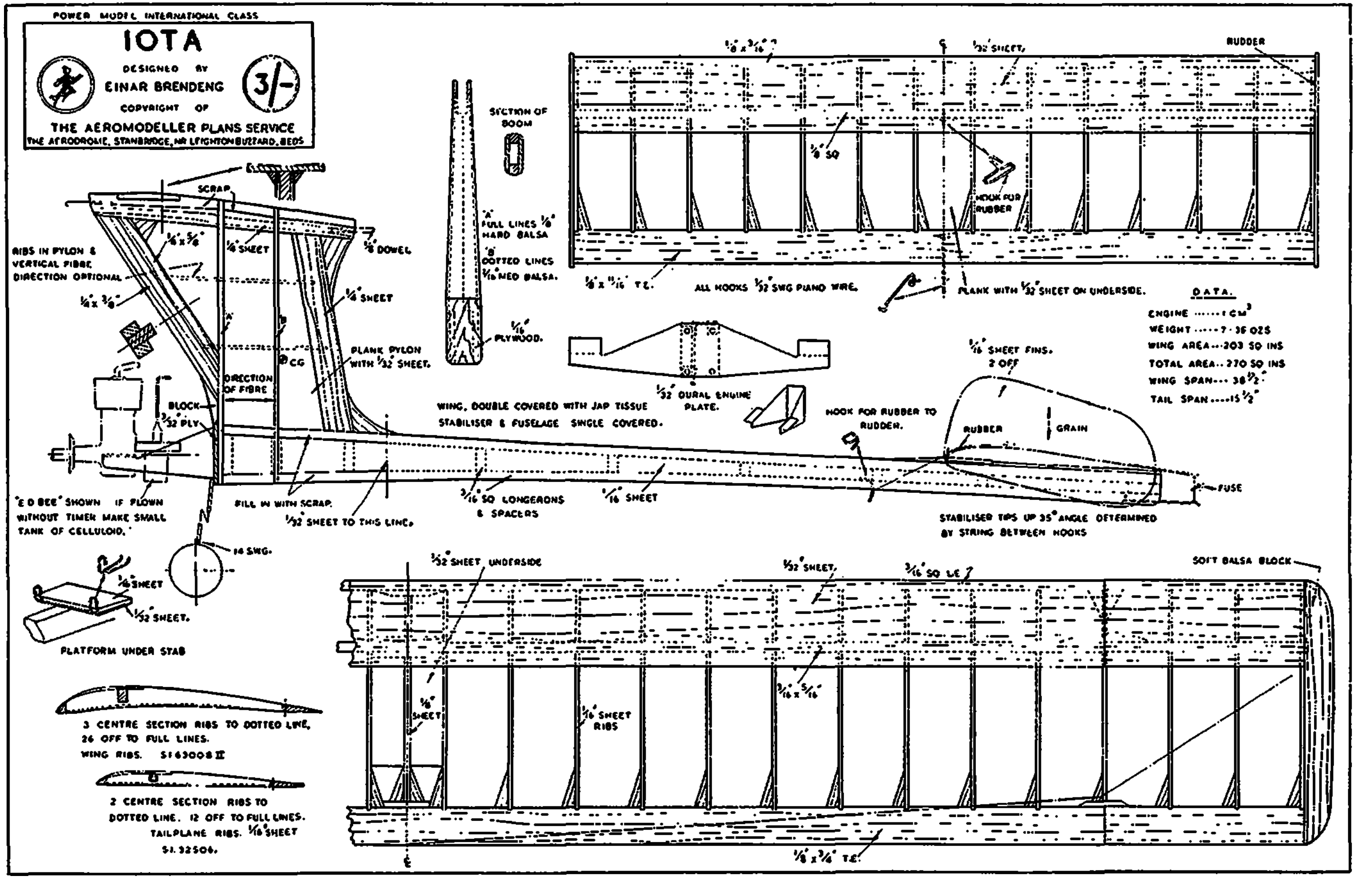

2 3/4"
1"
BALSA TIPS.
1/2" x 1/8" T.E.
7 1/2"
ALL RIBS 1/16" SHEET.
1/8" SQ L.E.
1/8 x 1/2" HARD BALSA SPAR.
3/32" DIA DOWEL FOR REAR SPAR.
1/16" SHEET C/S.
52 1/2"
19 3/8"
BALSA TIPS
ALL RIBS 1/16" SHEET.
1/8" x 1/2" T.E.
1/8" SQ L.E.
1/16" SHEET C/S.
7 1/8"
26 3/8"
TIGER RAG
PYLON POWER FOR 2½-3 c.c.
CHAMPION OF ITALY
1950
By ERALDO PADOVANO
FIAT, TURIN
ITALY
TYPICAL WING RIB 1/3 FULL SIZE
1/16" PLY PYLON SANDWICH BETWEEN HARD BALSA.
1/2" x 1/16" HARDWOOD SPAR TAPER TO 1/8" x 1/16"
LONGERONS FROM 1/8" SQ HARDWOOD
UPRIGHTS FROM 1/8" x 3/32" "
DIAGONALS FROM 1/8" x 1/16"
HARDWOOD.
BALSA TIPS.
1/8" SHEET T.E.
1/8" SQ L.E.
7 3/16"
6 7/8"
3/8" x 5/16" HARD-WOOD BEARERS
SCALE 1/10 FULL SIZE.



SUPER PHOENIX

PYLON POWER FOR 2-3½ c.c.
NEW F.A.I. FORMULA
CONTEST WINNER

By FRANZ EHLING
U.S.A.
(Compare with Tiger Rag opposite)


POWER MODEL INTERNATIONAL CLASS
IOTA
DESIGNED BY
EINAR BRENDENG
3/-
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
THE AERODROME, STANBRIDGE, NR LEIGHTON BUZZARD, BEDS
SCRAP
RIBS IN PYLON & VERTICAL FIBRE DIRECTION OPTIONAL
1/4" SHEET
1/8" DOWEL
1/4" SHEET
PLANK PYLON WITH 1/32" SHEET.
CG
DIRECTION OF FIBRE
BLOCK
3/32 PLY
"E D BEE" SHOWN IF FLOWN WITHOUT TIMER MAKE SMALL TANK OF CELLULOID.
FILL IN WITH SCRAP
1/32" SHEET TO THIS LINE.
3/16 SQ LONGERONS & SPACERS
1/16" SHEET
14 SWG.
1/16" SHEET
1/32" SHEET.
PLATFORM UNDER STAB
3 CENTRE SECTION RIBS TO DOTTED LINE, 26 OFF TO FULL LINES.
WING RIBS. SI 63008 II
2 CENTRE SECTION RIBS TO DOTTED LINE. 12 OFF TO FULL LINES.
TAILPLANE RIBS. 1/16" SHEET
SI. 32506.
SECTION OF BOOM
"A" FULL LINES 1/8" HARD BALSA
"B" DOTTED LINES 1/16" MED BALSA.
1/16" PLYWOOD.
1/32" SHEET.
RUDDER
1/8" SQ
HOOK FOR RUBBER
ALL HOOKS 1/32" SWG PIANO WIRE.
PLANK WITH 1/32" SHEET ON UNDERSIDE.
1/32" DURAL ENGINE PLATE.
WING, DOUBLE COVERED WITH JAP TISSUE
STABILISER & FUSELAGE SINGLE COVERED.
HOOK FOR RUBBER TO RUDDER.
1/16" SHEET FINS. 2 OFF
RUBBER
GRAIN
FUSE
STABILISER TIPS UP 35° ANGLE DETERMINED BY STRING BETWEEN HOOKS
DATA.
ENGINE ...... 1 CM³
WEIGHT ..... 7·35 OZS
WING AREA ... 203 SQ INS
TOTAL AREA .. 270 SQ INS
WING SPAN ... 38 1/2"
TAIL SPAN .... 15 1/2"
1/32" SHEET UNDERSIDE
1/32" SHEET.
3/16" SQ LE
SOFT BALSA BLOCK
1/8" SHEET
1/16" SHEET RIBS
3/16" x 5/16"
1/8" x 3/4" TE.

IOTA
Power-duration model
By Einar Brendeng, Norway

DESCRIPTION.— This model conforms to the new international class for power duration models, if powered with a 1 c.c. engine. The performance with an E.D. Bee is from 3 min. 20 sec. to 4 min. in non-thermal conditions with 20 sec. motor run. The model is trimmed to fly to the left both in climb and glide, with 1.5° left sidethrust and 5° positive incidence to tailplane. Because of this trim and the high pylon there is absolutely no stall or loss of height at the end of the motor run. Iota is therefore very well suited for ratio-contests under windy conditions, when a short motor run is desirable to avoid O.O.S. flights. Because of its great stability, easy trimming and construction, the model is an excellent beginner's model, and can be flown by more experienced modellers with one of the hot 1.5 c.c. engines.

CONSTRUCTION.—The fuselage is very easy to build. The boom is built first, the bulkheads and the skeleton for the pylon are cemented in place, and the pylon planked. The wing and stabiliser are very efficient, due to the thin sections and the planked leading edges. To avoid stalling of the stab. in gusty weather, this is equipped with a turbulator-thread of 1/32 in. nylon. No timing unit for the engine-run is shown on the plan since the original model was flown by metering the fuel in a specially made transparent tank. It should not be difficult, however, to place a timer along the leading edge of the pylon.

Projected wing area : 203 sq. in. Total projected area : 270 sq. in.

Min. weight F.A.I. : 7.35 ozs.

The original model was flown with wooden propeller of 8 in. diam. and 4.5 in. pitch.

PERFORMANCE.—Theoretical ratio is about 11, with rate of climb 20 ft./sec. and sinking vel. 2 ft./sec.

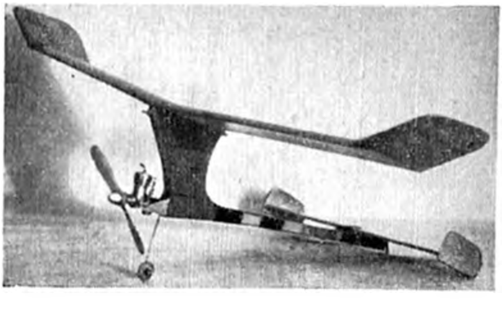
National contest at Skien.

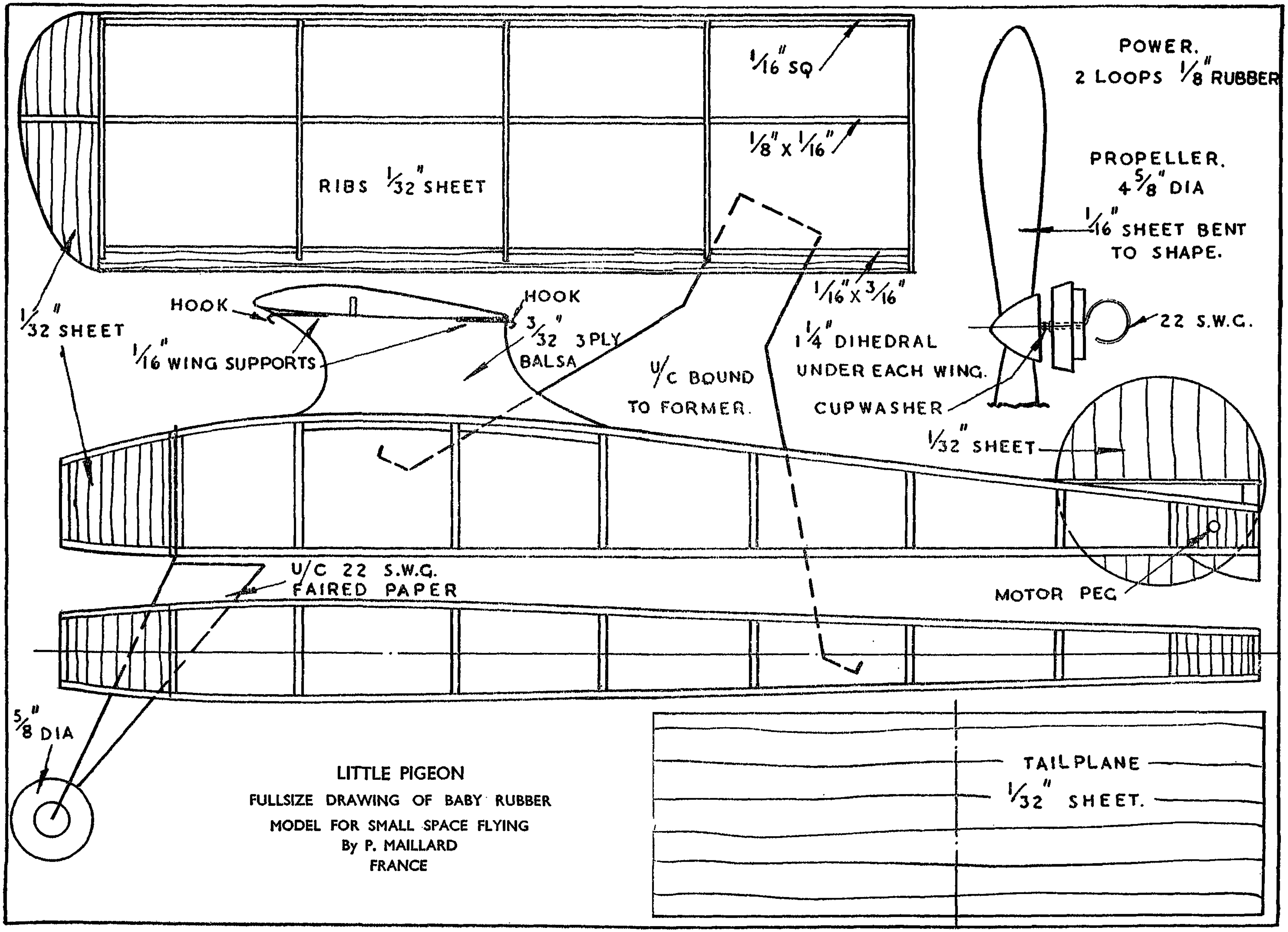
	Motorrun	Total	Ratio
1st Flight	22	230	10.45
2nd Flight	30	221	7.36
3rd Flight	30	263	8.78

The 2nd flight was ruined due to oily snow on the rudder. The contest was held under old 30 sec. rule.

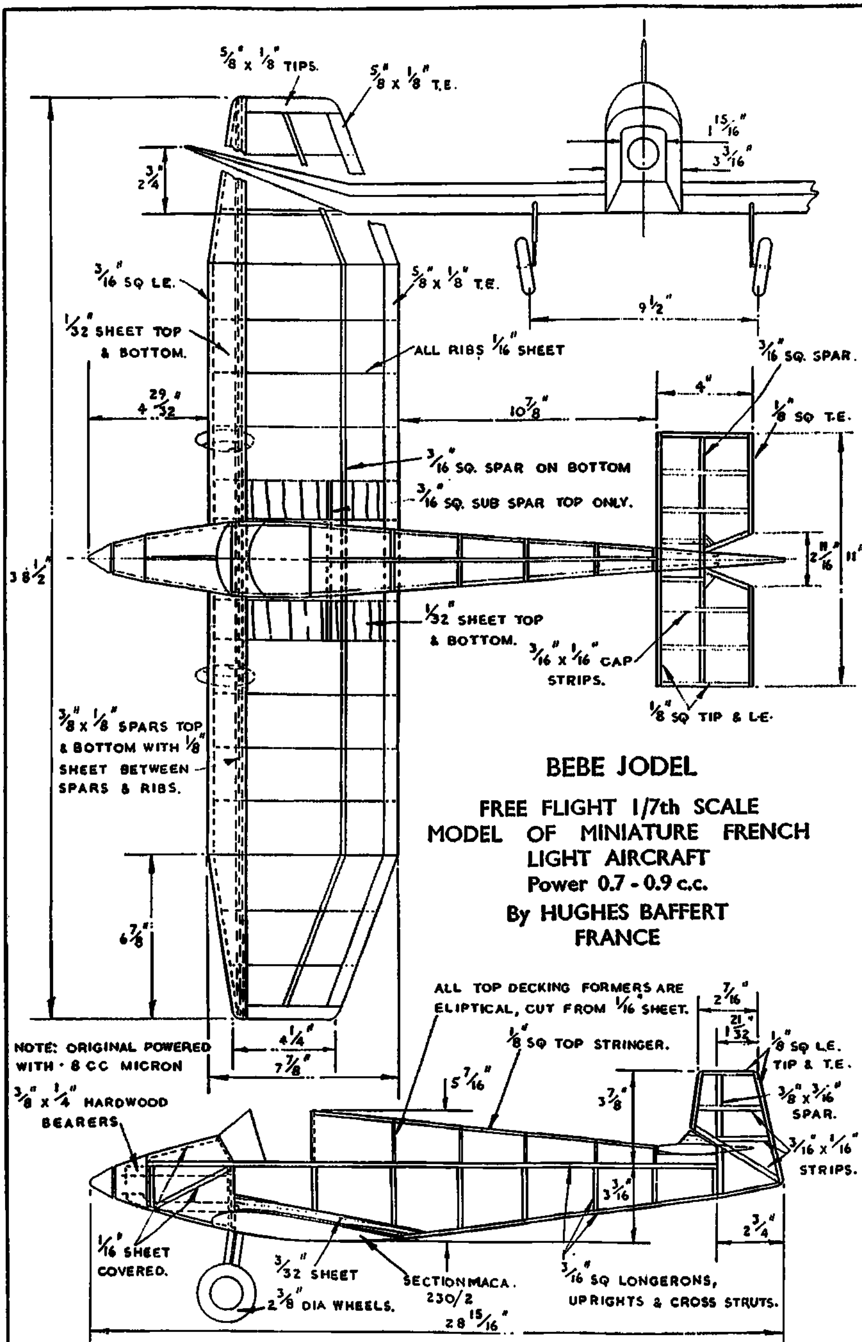
Club contest at Oslo.

	Motorrun	Total	Ratio
1st Flight	14	134	9.57
2nd Flight	10	126	12.6
3rd Flight	20	241	12.05





LITTLE PIGEON
FULLSIZE DRAWING OF BABY RUBBER MODEL FOR SMALL SPACE FLYING
By P. MAILLARD
FRANCE

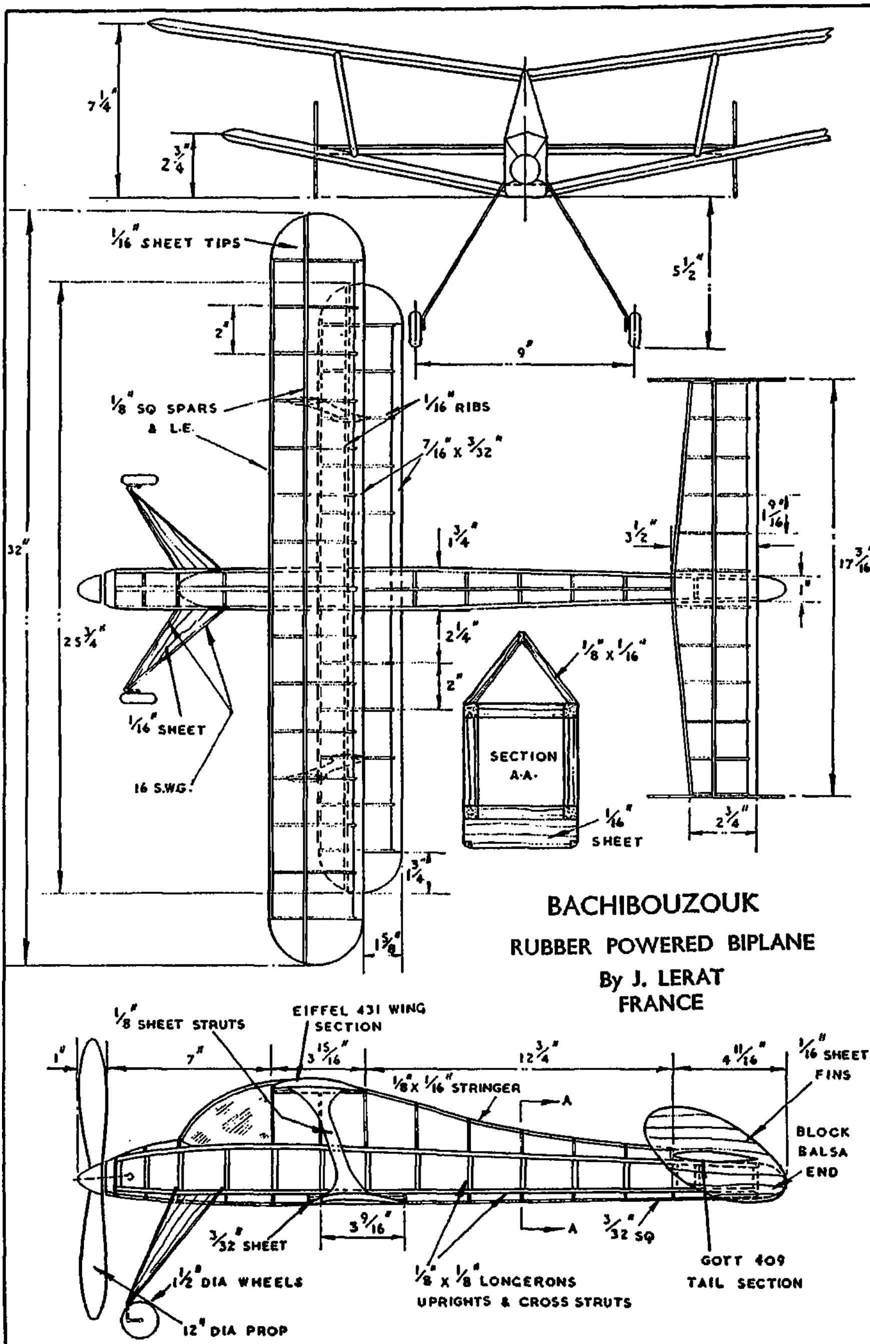


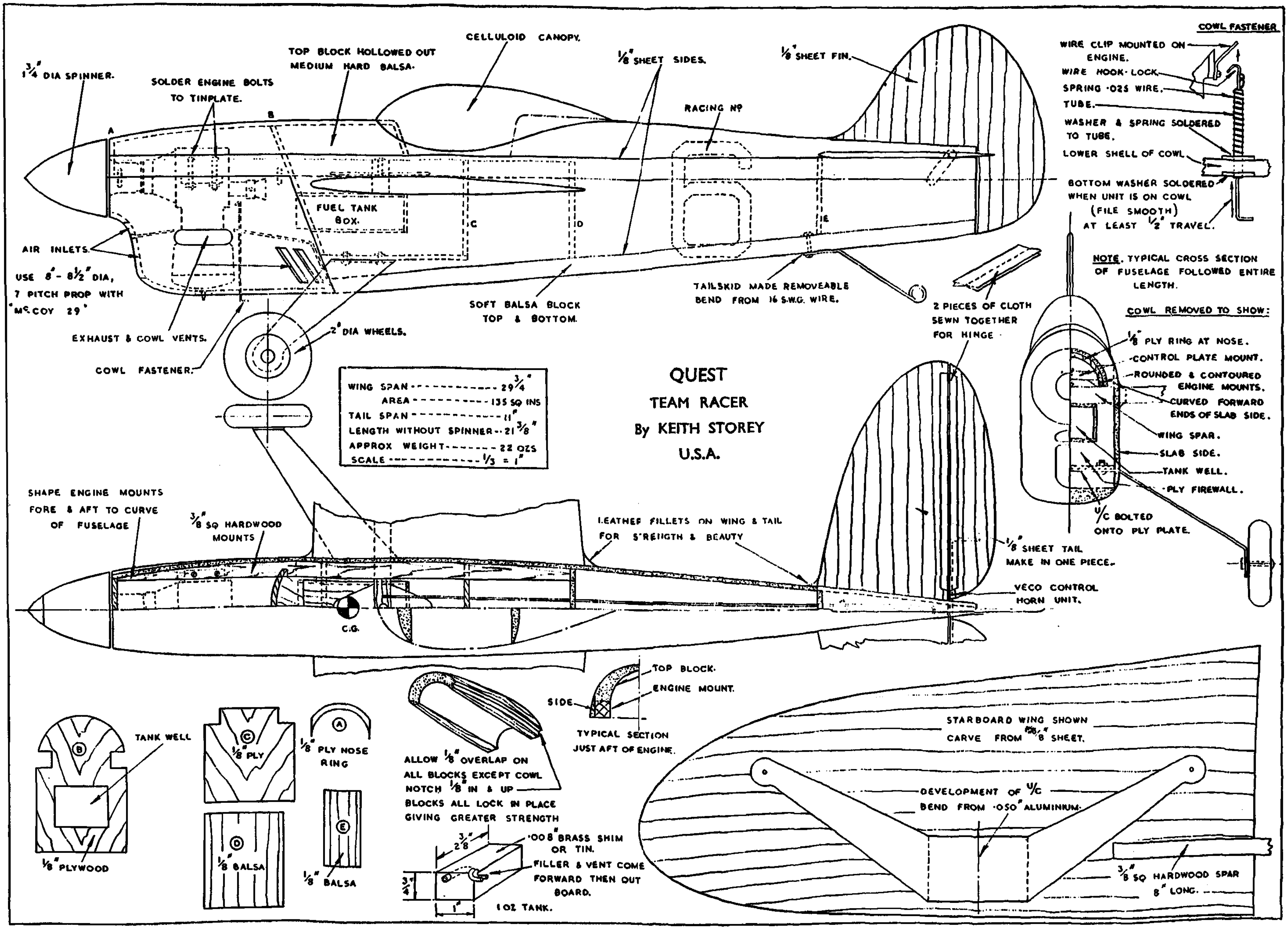
BEBE JODEL

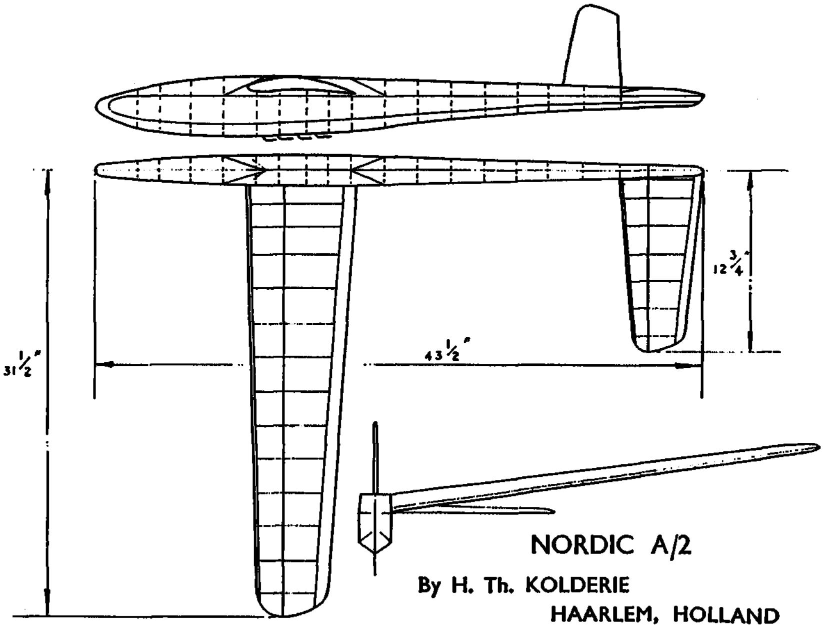
FREE FLIGHT 1/7th SCALE MODEL OF MINIATURE FRENCH LIGHT AIRCRAFT

Power 0.7 - 0.9 c.c.

By HUGHES BAFFERT FRANCE

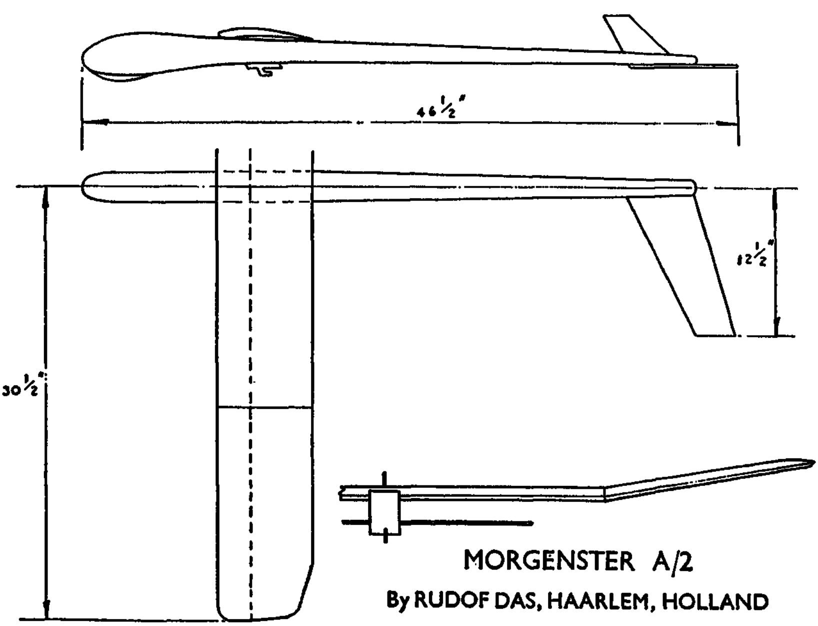

7 1/4"
2 3/4"
5 1/2"
9"
1/16" SHEET TIPS
2"
1/8" SQ SPARS & L.E.
1/16" RIBS
7/16" x 3/32"
32"
25 3/4"
1 3/4"
2 1/4"
2"
3 1/2"
1 9/16"
1"
17 3/16"
1/8" x 1/16"
SECTION A.A.
1/16" SHEET
1/16" SHEET
16 S.W.G.
2 3/4"
1 3/4"
1 5/8"
BACHIBOUZOUK
RUBBER POWERED BIPLANE
By J. LERAT
FRANCE
1/8" SHEET STRUTS
EIFFEL 431 WING SECTION
1"
7"
3 15/16"
12 3/4"
4 11/16"
1/16" SHEET FINS
1/8" x 1/16" STRINGER
A
BLOCK BALSA END
3/32" SHEET
3 9/16"
3/32" SQ
1 1/2" DIA WHEELS
12" DIA PROP
1/8" x 1/8" LONGERONS UPRIGHTS & CROSS STRUTS
GOTT 409 TAIL SECTION


QUEST
TEAM RACER
By KEITH STOREY
U.S.A.
WING SPAN 29 3/4"
AREA 135 SQ INS
TAIL SPAN 11"
LENGTH WITHOUT SPINNER 21 3/8"
APPROX WEIGHT 22 OZS
SCALE 1/3 = 1"
1 3/4" DIA SPINNER.
SOLDER ENGINE BOLTS TO TINPLATE.
TOP BLOCK HOLLOWED OUT MEDIUM HARD BALSA.
CELLULOID CANOPY.
1/8" SHEET SIDES.
1/8" SHEET FIN.
RACING Nº
FUEL TANK BOX.
AIR INLETS.
USE 8" - 8 1/2" DIA, 7 PITCH PROP WITH "McCOY 29"
EXHAUST & COWL VENTS.
COWL FASTENER.
2" DIA WHEELS.
SOFT BALSA BLOCK TOP & BOTTOM.
TAILSKID MADE REMOVEABLE BEND FROM 16 S.W.G. WIRE.
2 PIECES OF CLOTH SEWN TOGETHER FOR HINGE
COWL FASTENER
WIRE CLIP MOUNTED ON ENGINE.
WIRE HOOK LOCK.
SPRING ·025 WIRE.
TUBE.
WASHER & SPRING SOLDERED TO TUBE.
LOWER SHELL OF COWL.
BOTTOM WASHER SOLDERED WHEN UNIT IS ON COWL (FILE SMOOTH) AT LEAST 1/2" TRAVEL.
NOTE. TYPICAL CROSS SECTION OF FUSELAGE FOLLOWED ENTIRE LENGTH.
COWL REMOVED TO SHOW:
1/8" PLY RING AT NOSE.
CONTROL PLATE MOUNT.
ROUNDED & CONTOURED ENGINE MOUNTS.
CURVED FORWARD ENDS OF SLAB SIDE.
WING SPAR.
SLAB SIDE.
TANK WELL.
PLY FIREWALL.
U/C BOLTED ONTO PLY PLATE.
SHAPE ENGINE MOUNTS FORE & AFT TO CURVE OF FUSELAGE
3/8" SQ HARDWOOD MOUNTS
LEATHER FILLETS ON WING & TAIL FOR STRENGTH & BEAUTY
1/8" SHEET TAIL MAKE IN ONE PIECE.
VECO CONTROL HORN UNIT.
C.G.
TOP BLOCK.
ENGINE MOUNT.
SIDE
TYPICAL SECTION JUST AFT OF ENGINE.
TANK WELL
1/8" PLYWOOD
1/8" PLY
1/8" PLY NOSE RING
1/8" BALSA
1/8" BALSA
ALLOW 1/8" OVERLAP ON ALL BLOCKS EXCEPT COWL NOTCH 1/8" IN & UP BLOCKS ALL LOCK IN PLACE GIVING GREATER STRENGTH
·008" BRASS SHIM OR TIN.
FILLER & VENT COME FORWARD THEN OUT BOARD.
1 OZ TANK.
STARBOARD WING SHOWN CARVE FROM 5/8" SHEET.
DEVELOPMENT OF U/C BEND FROM ·050" ALUMINIUM.
3/8" SQ HARDWOOD SPAR 8" LONG.



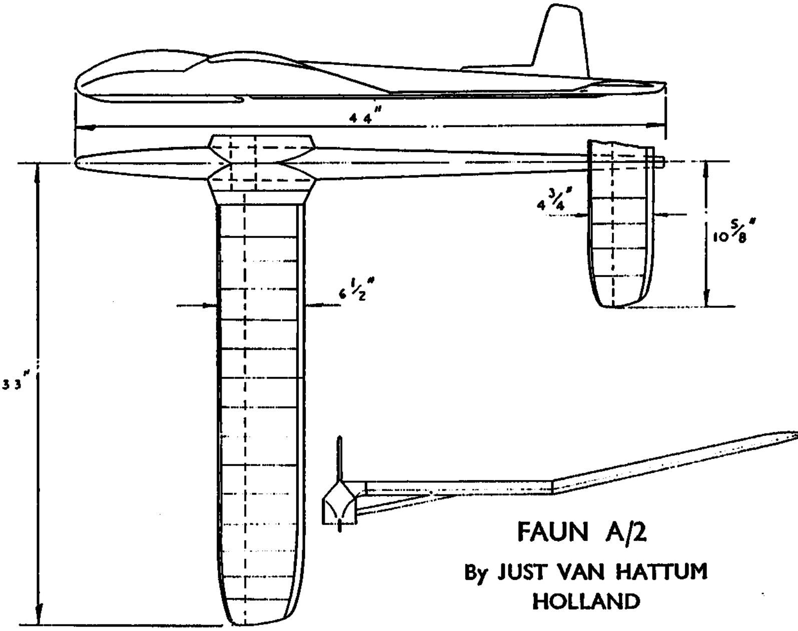
NORDIC A/2

By H. Th. KOLDERIE
HAARLEM, HOLLAND

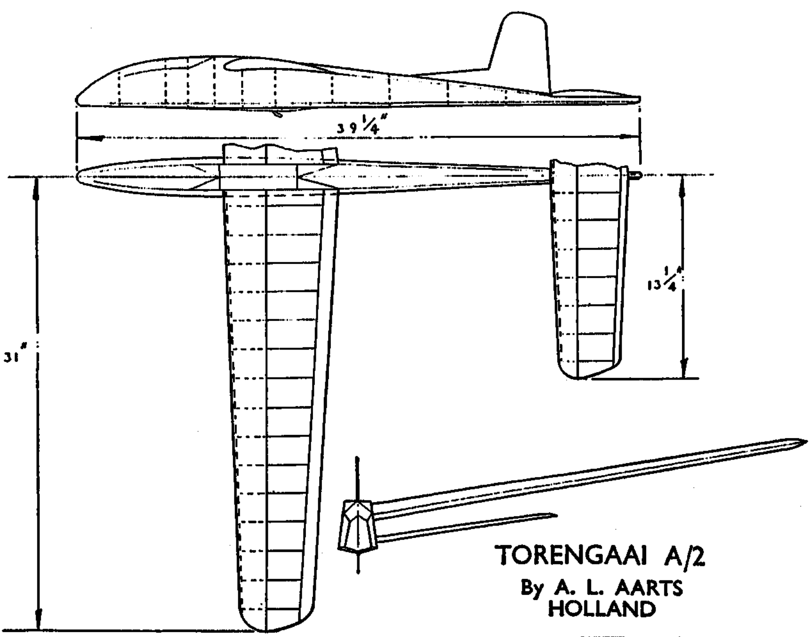


MORGENSTER A/2

By RUDOF DAS, HAARLEM, HOLLAND



FAUN A/2
By JUST VAN HATTUM
HOLLAND



TORENGAAI A/2
By A. L. AARTS
HOLLAND

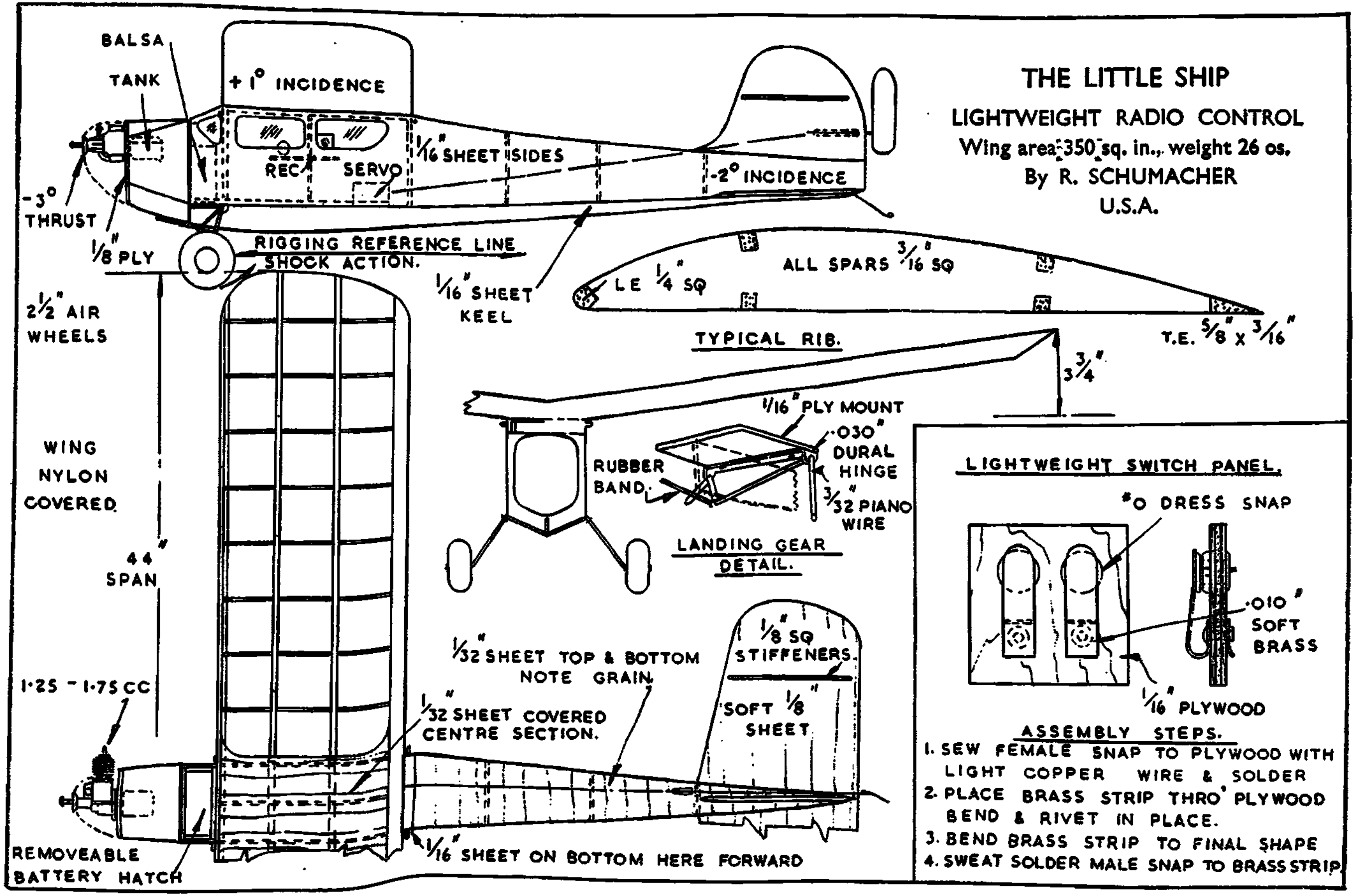
THE LITTLE SHIP

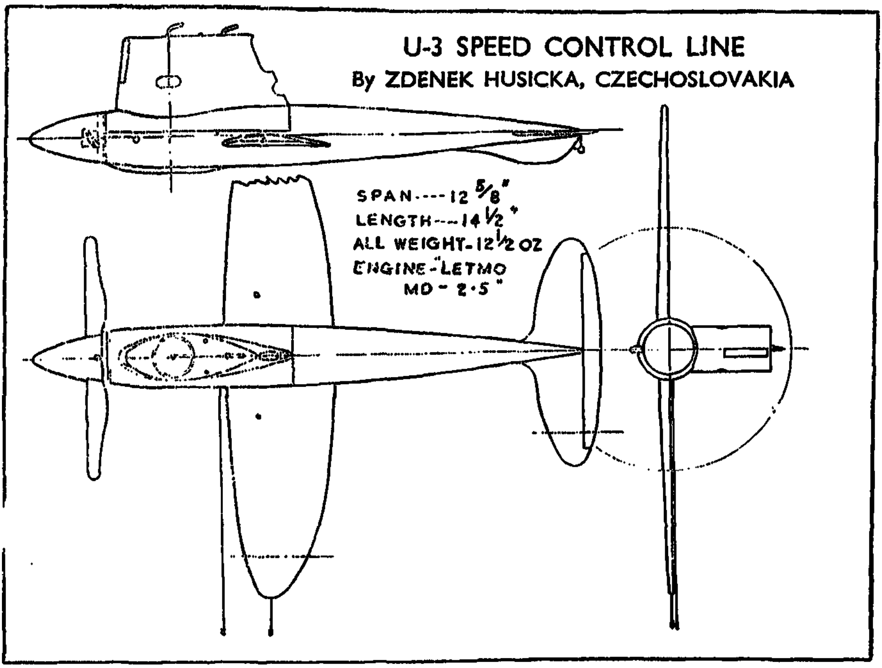
LIGHTWEIGHT RADIO CONTROL

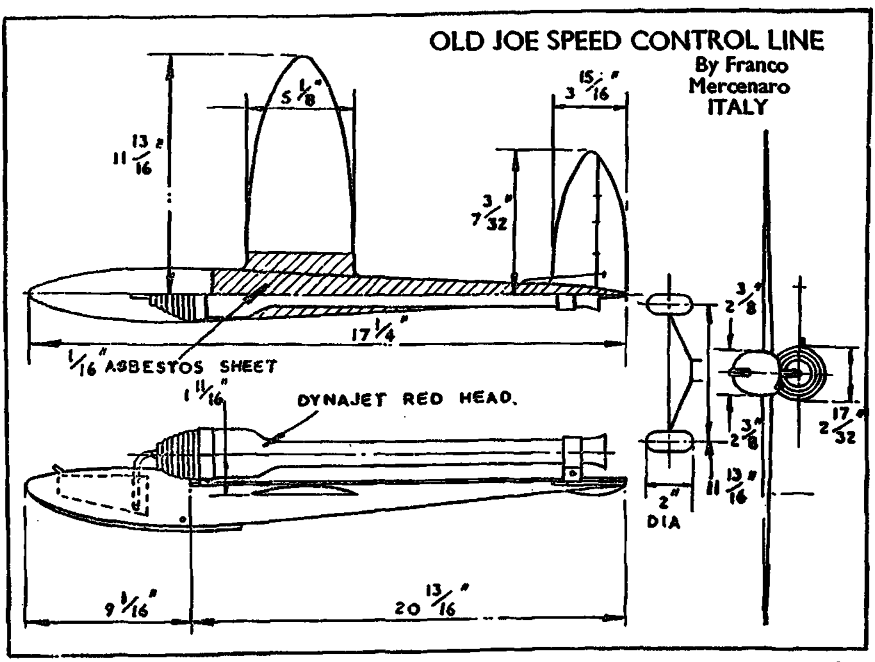
Wing area 350 sq. in., weight 26 os.

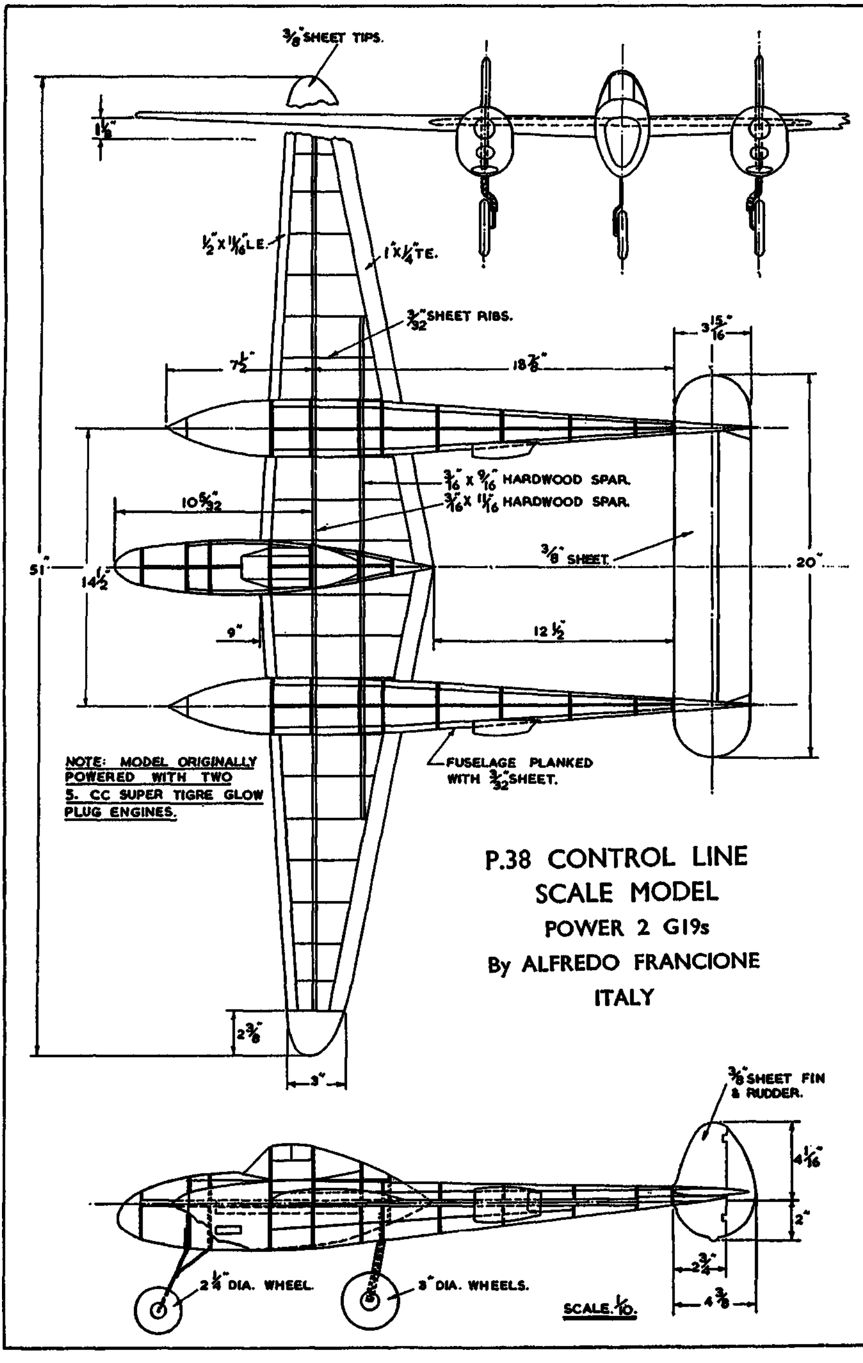
By R. SCHUMACHER

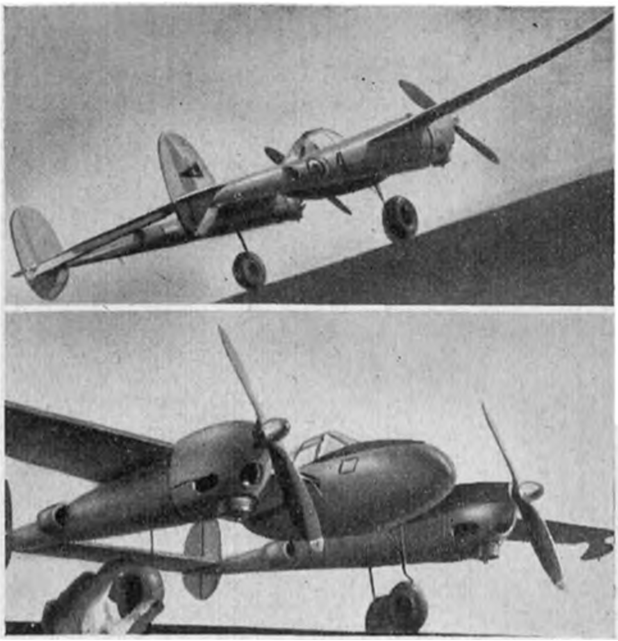
U.S.A.




U-3 SPEED CONTROL LINE
By ZDENEK HUSICKA, CZECHOSLOVAKIA
SPAN----12 5/8"
LENGTH---14 1/2"
ALL WEIGHT-12 1/2 OZ
ENGINE-"LETMO
MD-2·5"


OLD JOE SPEED CONTROL LINE
By Franco
Mercenaro
ITALY
11 13/16"
5 1/8"
3 15/16"
3 7/32"
17 1/4"
1/16" ASBESTOS SHEET
1 11/16"
DYNAJET RED HEAD.
2 3/8"
2 3/8"
2 17/32"
11 13/16"
2" DIA
9 1/16"
20 13/16"


3/8" SHEET TIPS.
1/2" X 11/16" L.E.
1" X 1/4" T.E.
3/32" SHEET RIBS.
3/16" X 9/16" HARDWOOD SPAR.
3/16" X 11/16" HARDWOOD SPAR.
3/8" SHEET.
FUSELAGE PLANKED WITH 3/32" SHEET.
NOTE: MODEL ORIGINALLY POWERED WITH TWO 5. CC SUPER TIGRE GLOW PLUG ENGINES.
P.38 CONTROL LINE
SCALE MODEL
POWER 2 G19s
By ALFREDO FRANCIONE
ITALY
3/8" SHEET FIN & RUDDER.
2 1/4" DIA. WHEEL.
3" DIA. WHEELS.
SCALE 1/10.



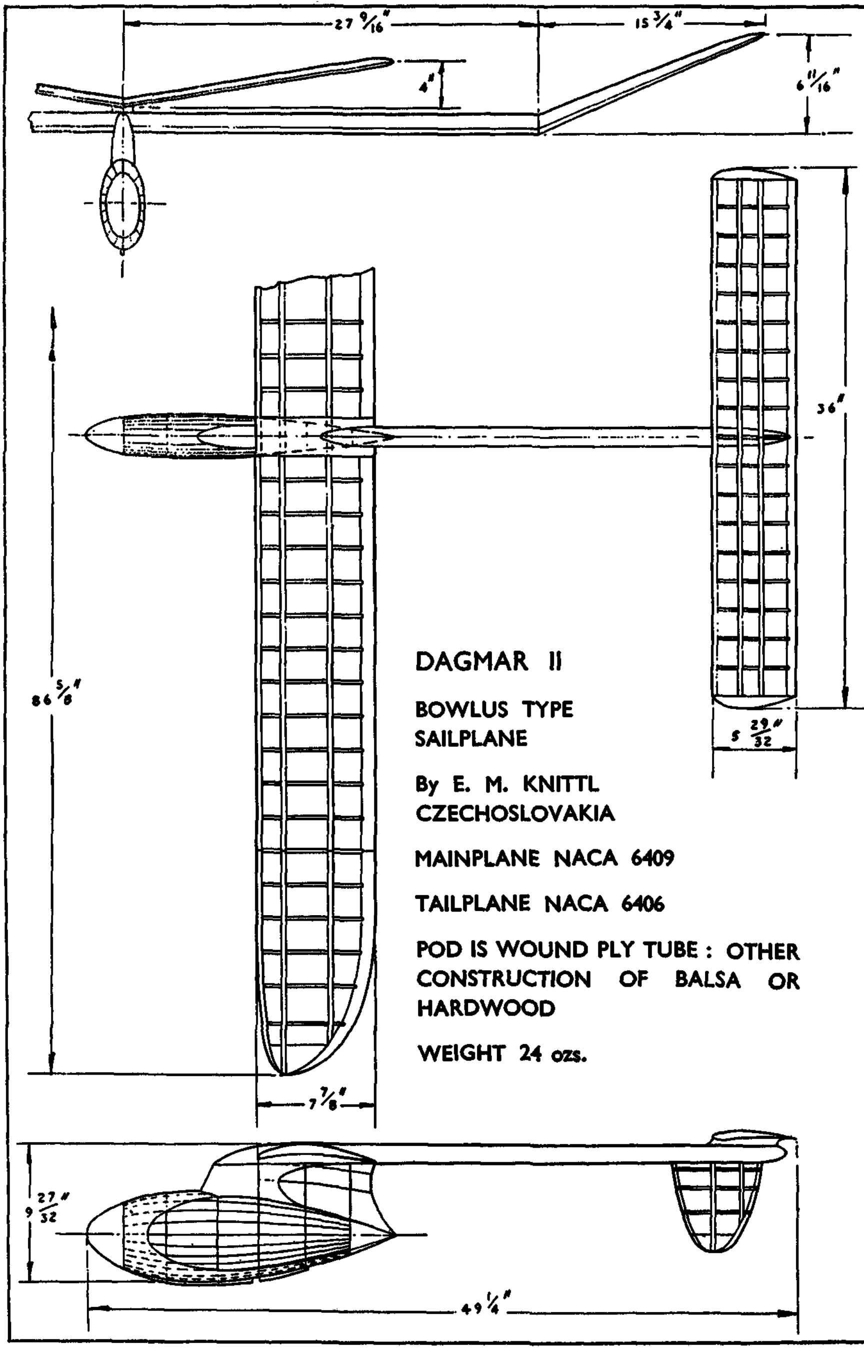
P.38 Lightning. Scale Control Line Model *by* ALFREDO FRANCIONE, Italy.

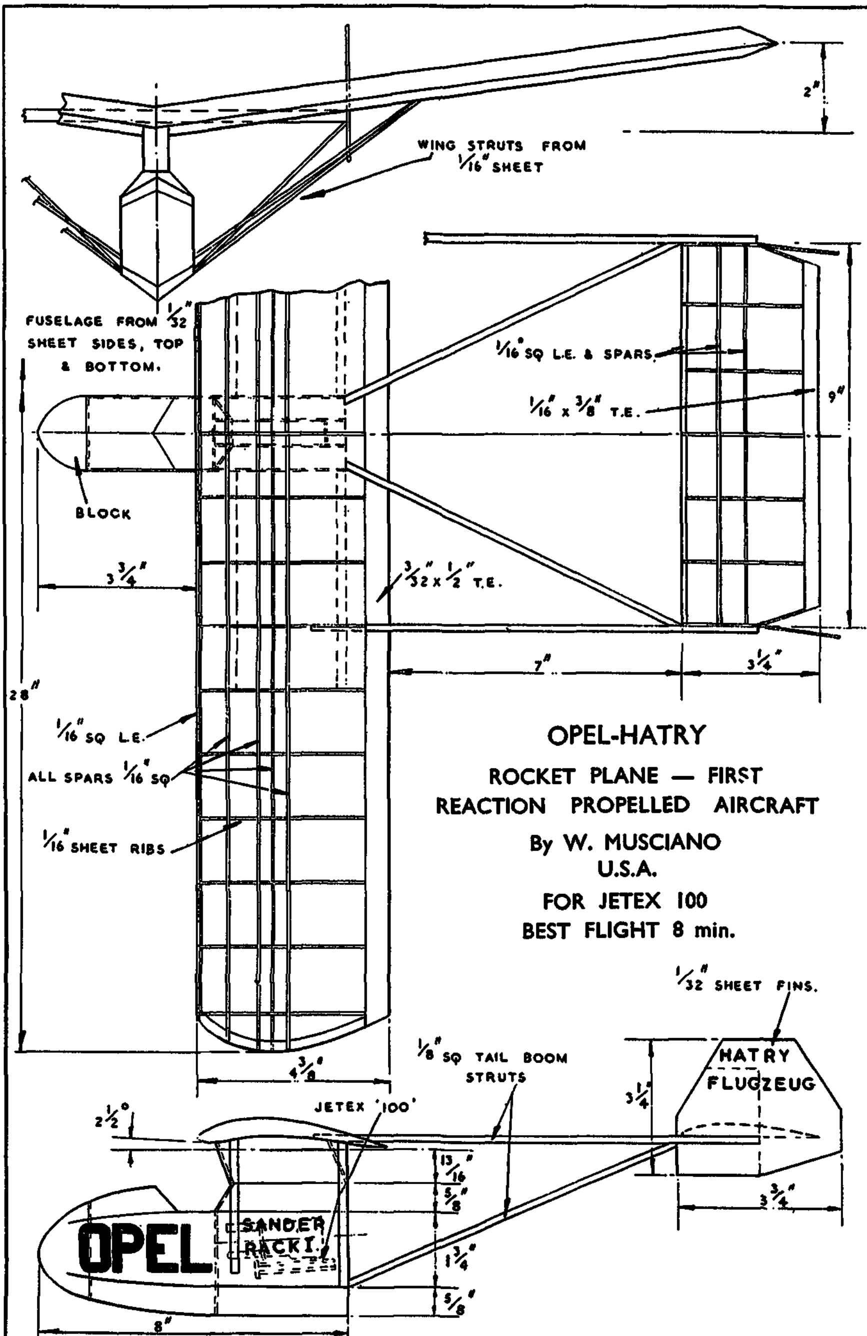
DESCRIPTION.—Faithful scale lines, robust construction, and really vigorous flying, together with a reliable tricycle undercarriage, combine to make this a most satisfying twin-engined model. Power units are two 5 c.c. engines, and we can well imagine that its claimed speed of 75 m.p.h. is no exaggeration. The two G.19s installed drive props of approximately 10 in. diameter by 7 in. pitch.

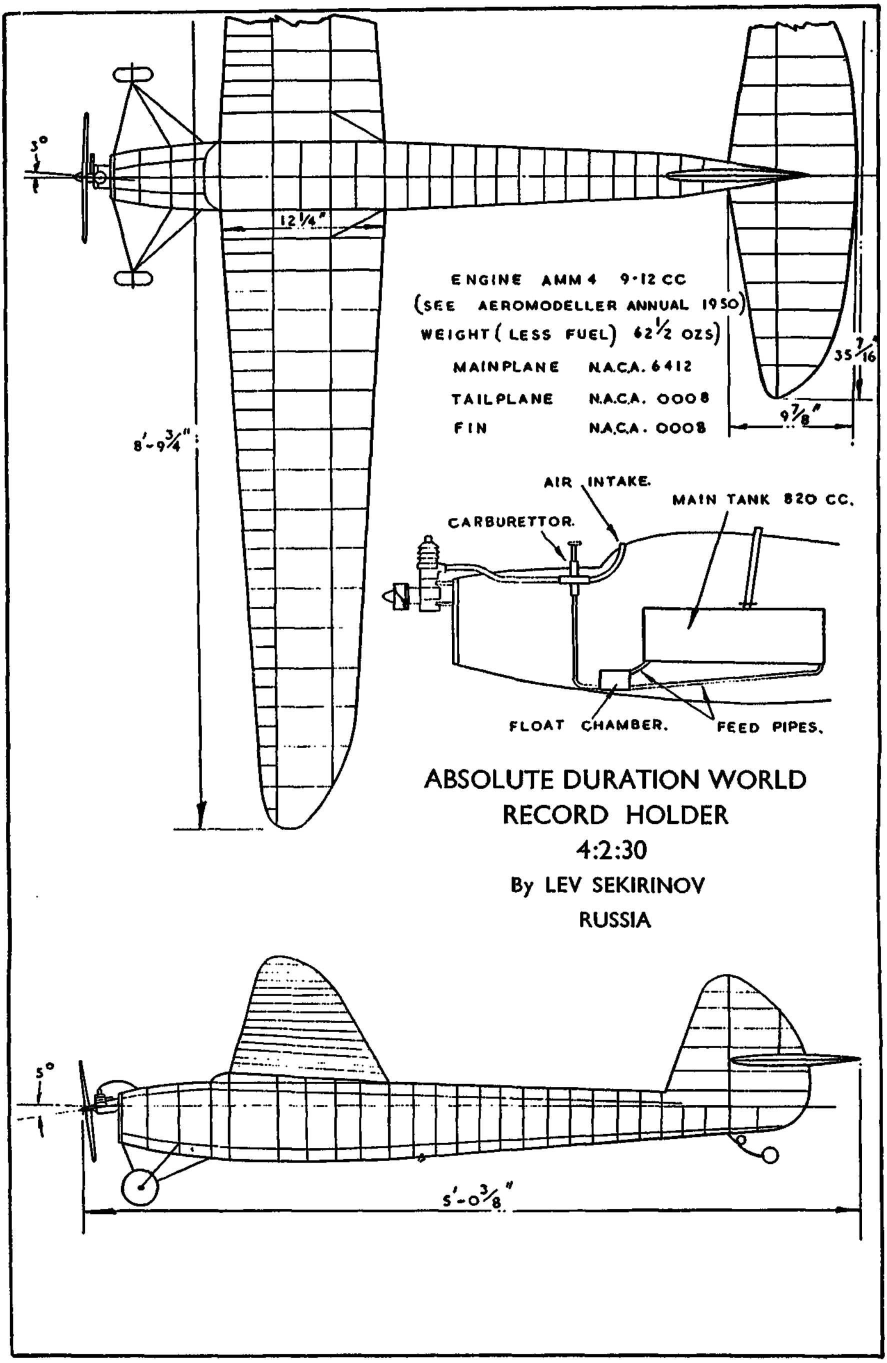
A glance at the illustrations will serve to convince that the builder has produced a model of true scale appearance that is nevertheless sturdy enough to take the hard knocks unavoidable with a machine of this size carrying 10 c.c. of power. In particular the central nacelle and engine cowlings have been well finished. No attempt has been made to imitate a scale undercarriage, but emphasis placed on what he considers practical angles such as the use of air-wheels to ease out landing shocks—a feature dear to the hearts of Continental modellers which has found little vogue in this country. As a matter of fact, they really introduce a potential source of trouble from uneven inflation and tricycle u/cs are tricky enough at the best of times.

CONSTRUCTION.—Hardwood and three-ply are largely used in twin engine booms and centre nacelle. Care must be taken to ensure that 8 degrees of dihedral is built into each wing—and accurate mounting of the fuselages is the trickiest part of the building. Wings are mainly of balsa and sheet covered. Finish is nitro dope in usual aluminium with appropriate insignia to taste. All up weight of the model ready to fly should be about 4½ lbs.—but with 10 c.c. to deal with it this presents no problem.

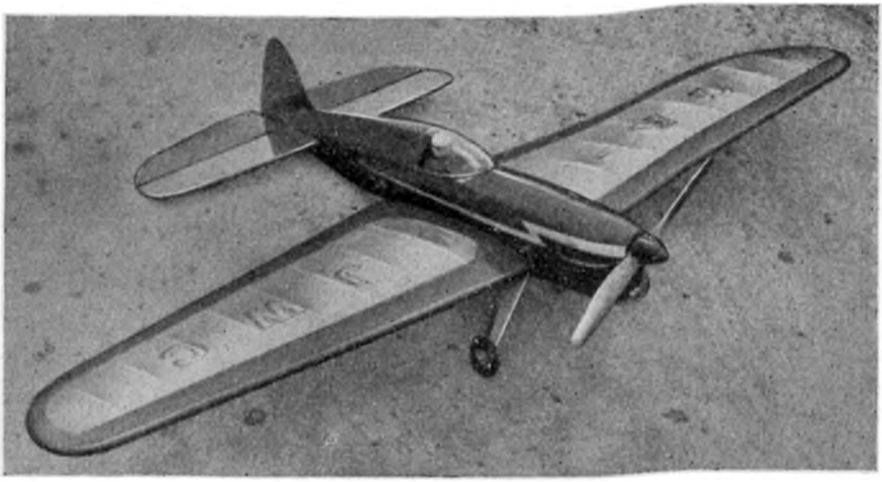
THE BUILDER is a keen modeller of many years' experience, and is a serving Pilot-Captain at Bologna. The model is a faithful representation of an actual machine in service at the Italian Military Academy.


27 9/16"
15 3/4"
4"
6 11/16"
36"
86 5/8"
DAGMAR II
BOWLUS TYPE
SAILPLANE
By E. M. KNITTL
CZECHOSLOVAKIA
MAINPLANE NACA 6409
TAILPLANE NACA 6406
POD IS WOUND PLY TUBE : OTHER
CONSTRUCTION OF BALSA OR
HARDWOOD
WEIGHT 24 ozs.
5 29/32"
7 7/8"
9 27/32"
49 1/4"


WING STRUTS FROM 1/16" SHEET
2"
FUSELAGE FROM 1/32" SHEET SIDES, TOP & BOTTOM.
1/16" SQ L.E. & SPARS.
1/16" x 3/8" T.E.
9"
BLOCK
3 3/4"
3/32" x 1/2" T.E.
7"
3 1/4"
28"
1/16" SQ L.E.
ALL SPARS 1/16" SQ
1/16" SHEET RIBS
OPEL-HATRY
ROCKET PLANE — FIRST REACTION PROPELLED AIRCRAFT
By W. MUSCIANO
U.S.A.
FOR JETEX 100
BEST FLIGHT 8 min.
1/32" SHEET FINS.
1/8" SQ TAIL BOOM STRUTS
4 3/8"
HATRY FLUGZEUG
3 1/4"
2 1/2°
JETEX '100'
13/16"
5/8"
OPEL
SANDER RACK I.
1 3/4"
5/8"
3 3/4"
8"



ABSOLUTE DURATION WORLD RECORD HOLDER
4:2:30
By LEV SEKIRINOV
RUSSIA



PAGAN.

Semi-scale Stunt Model *by* J. W. COASBY.

DESCRIPTION.—This model is a logical development of the designer's Foxstunter, which appeared in *Aeromodeller Annual* 1950. The same aerodynamic set-up is offered, with the simplification that flaps have been omitted, leading to a slight increase in tail area.

It represents an effort to get out of the rut offered by the usual box type of fuselage, and to some extent, also, the ordinary sort of streamliner in the stunt field. As a general prototype group the lines of full-size light and racing type aircraft were considered. The fuselage is virtually an elongated TK4. Undercarriage is of the sprung type, the springing action being provided by the tension of the wing retaining rubber bands.

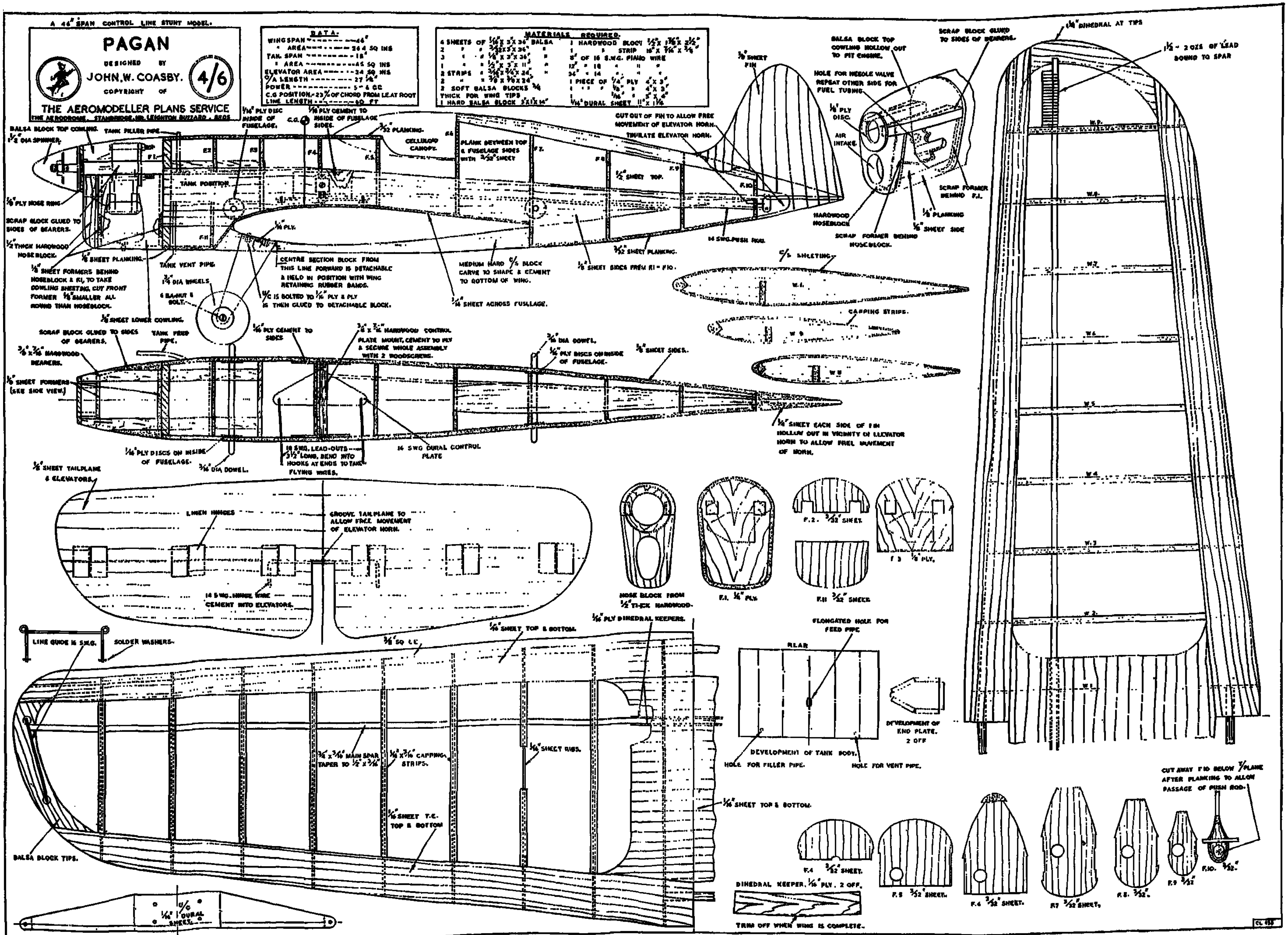
Although the engine component is of the fully cowled inverted type, no overheating of the engine has occurred. The original model was a trifle on the heavy side due to silk covering and seven coats of dope on fuselage, but as the machine was rather fast it did not make any noticeable difference to performance. Even in its heavy coat of dope it will perform all manoeuvres quite satisfactorily—and in somewhat lighter garb, outstandingly.

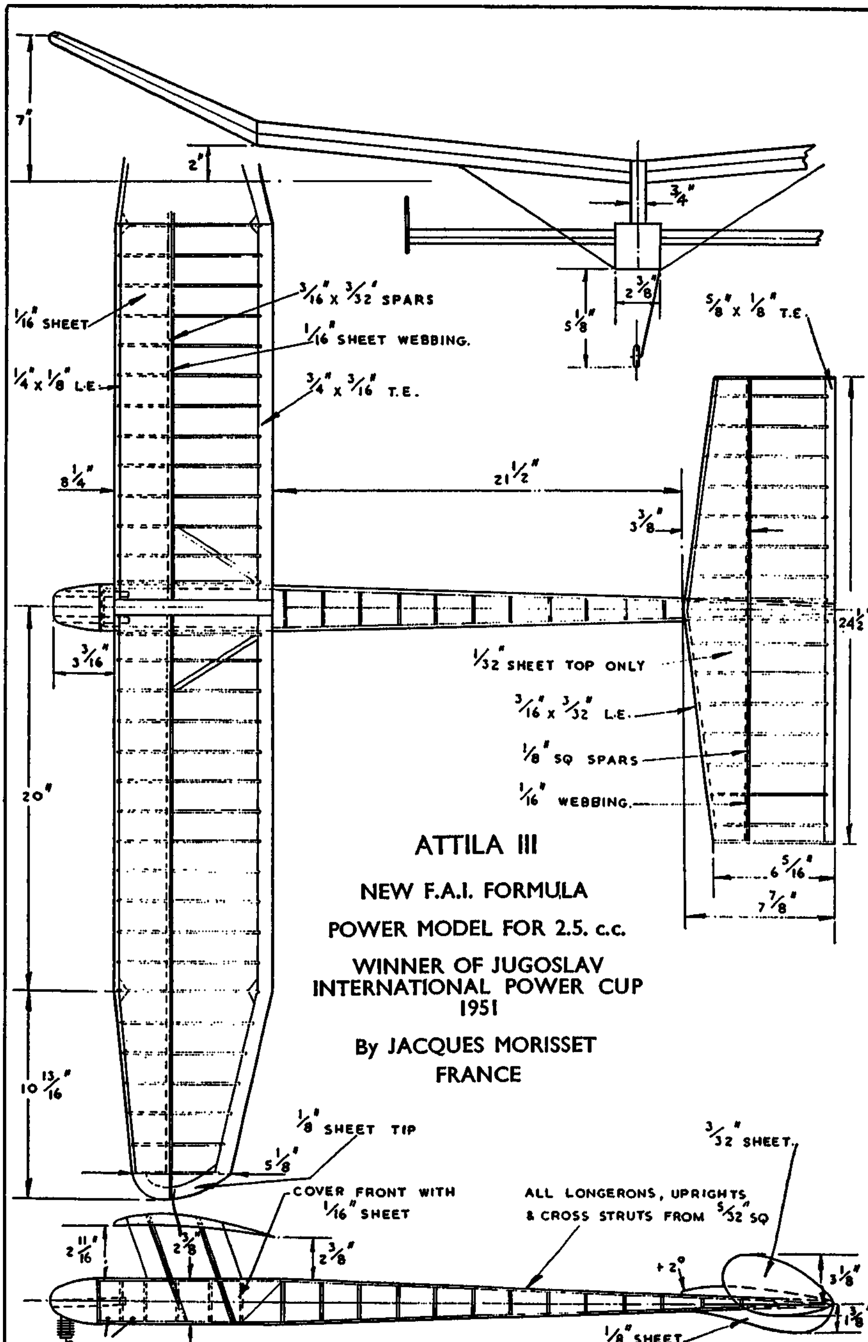
One note of warning is sounded by the designer. Do not have the C.G. any further aft than indicated on the plan, or Pagan will live up to its name and the pilot will find a jiving heathen on his hands.

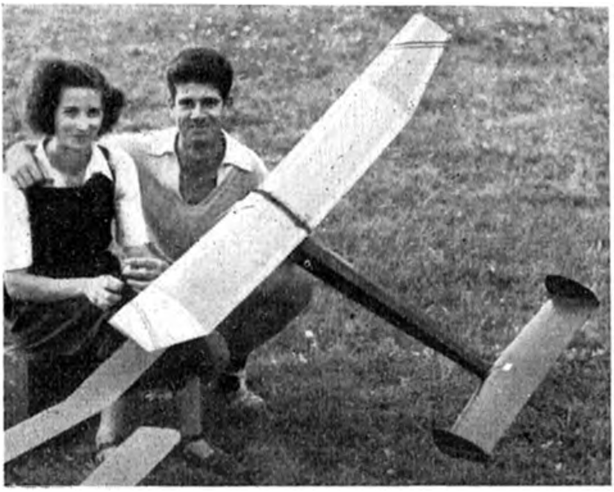
Line length is 60 feet, and although no rudder offset is built in, model maintains line tension to a considerable degree.

Span is 46 in., root chord 10 in., tip chord 7 in., flying weight 30 oz. Original engine was a Fox 35 : it is generally suitable for any good engine of 5—6 c.c.

In spite of a season's flying, and handling by several inexpert enthusiasts at summer camps, Pagan is still in flying trim, if some of its pristine splendour has been dimmed.


A 46" SPAN CONTROL LINE STUNT MODEL.
PAGAN
DESIGNED BY
JOHN. W. COASBY.
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
4/6
DATA.
WINGSPAN 46"
" AREA 264 SQ INS
TAIL SPAN 18"
" AREA 45 SQ INS
ELEVATOR AREA 24 SQ INS
O/A LENGTH 27 1/2"
POWER 5-6 CC
C.G POSITION.-23% OF CHORD FROM LE.AT ROOT
LINE LENGTH 60 FT
MATERIALS REQUIRED.
4 SHEETS OF 1/16" x 3" x 36" BALSA
2 " " 3/32 x 3" x 36" "
3 " " 1/8" x 3" x 36" "
1 " " 1/2" x 3" x 11" "
2 STRIPS " 3/16" x 3/4" x 24" "
2 " " 3/8" x 3/8" x 24" "
2 SOFT BALSA BLOCKS 3/4 THICK FOR WING TIPS
1 HARD BALSA BLOCK 3" x 1" x 14"
1 HARDWOOD BLOCK 1/2" x 1 3/8" x 2 1/2"
1 " STRIP 18" x 7/16" x 3/8"
8" OF 16 S.W.G. PIANO WIRE
12" " 18 " " "
36" " 14 " " "
1 PIECE OF 1/4" PLY 4" x 3"
1 " " 1/8" " 4" x 3"
1 " " 1/16" " 5" x 4"
1/16" DURAL SHEET 11" x 1 1/4
BALSA BLOCK TOP COWLING.
1 1/2" DIA SPINNER.
TANK FILLER PIPE.
1/16" PLY DISC INSIDE OF FUSELAGE.
C.G.
1/16 PLY CEMENT TO INSIDE OF FUSELAGE SIDES.
3/32 PLANKING.
CELLULOID CANOPY.
PLANK BETWEEN TOP & FUSELAGE SIDES WITH 3/32" SHEET
CUT OUT OF FIN TO ALLOW FREE MOVEMENT OF ELEVATOR HORN.
TRIANGULATE ELEVATOR HORN.
TANK POSITION.
1/8" PLY NOSE RING.
SCRAP BLOCK GLUED TO SIDES OF BEARERS.
1/2" THICK HARDWOOD NOSE BLOCK.
1/8" SHEET PLANKING.
TANK VENT PIPE.
CENTRE SECTION BLOCK FROM THIS LINE FORWARD IS DETACHABLE & HELD IN POSITION WITH WING RETAINING RUBBER BANDS.
1 3/4" DIA WHEELS.
U/C IS BOLTED TO 1/8" PLY & PLY IS THEN GLUED TO DETACHABLE BLOCK.
MEDIUM HARD C/S BLOCK CARVE TO SHAPE & CEMENT TO BOTTOM OF WING.
1/16" SHEET ACROSS FUSELAGE.
1/8" SHEET SIDES FROM F1 - F10.
3/32" SHEET PLANKING.
14 SWG. PUSH ROD.
1/8" SHEET FIN
BALSA BLOCK TOP COWLING HOLLOW OUT TO FIT ENGINE.
HOLE FOR NEEDLE VALVE REPEAT OTHER SIDE FOR FUEL TUBING.
1/8" PLY DISC.
AIR INTAKE.
HARDWOOD NOSEBLOCK.
SCRAP FORMER BEHIND NOSEBLOCK.
1/8" SHEET SIDE
1/8" PLANKING
SCRAP FORMER BEHIND F1.
SCRAP BLOCK GLUED TO SIDES OF BEARERS.
1/8" DIHEDRAL AT TIPS
1 1/2 - 2 OZS OF LEAD BOUND TO SPAR
C/S SHEETING.
CAPPING STRIPS.
1/8" SHEET FORMERS BEHIND NOSEBLOCK & F1, TO TAKE COWLING SHEETING, CUT FRONT FORMER 1/8" SMALLER ALL ROUND THAN NOSEBLOCK.
3/8" SHEET LOWER COWLING.
SCRAP BLOCK GLUED TO SIDES OF BEARERS.
TANK FEED PIPE.
3/8" x 3/8" HARDWOOD BEARERS.
1/8" SHEET FORMERS (SEE SIDE VIEW.)
1/16" PLY CEMENT TO SIDES
3/16" DIA DOWEL.
1/16" PLY DISCS ON INSIDE OF FUSELAGE.
1/8" SHEET SIDES.
1/8" SHEET EACH SIDE OF FIN HOLLOW OUT IN VICINITY OF ELEVATOR HORN TO ALLOW FREE MOVEMENT OF HORN.
1/16" PLY DISCS ON INSIDE OF FUSELAGE.
3/16" DIA DOWEL.
16 SWG DURAL CONTROL PLATE
3/8" SHEET TAILPLANE & ELEVATORS.
LINEN HINGES
GROOVE TAILPLANE TO ALLOW FREE MOVEMENT OF ELEVATOR HORN.
14 SWG. HINGE WIRE CEMENT INTO ELEVATORS.
NOSE BLOCK FROM 1/2" THICK HARDWOOD.
F1. 1/8" PLY.
F.2. 3/32" SHEET.
F3 1/8" PLY.
F11 3/32" SHEET.
1/16" PLY DIHEDRAL KEEPERS.
1/16" SHEET TOP & BOTTOM.
3/8" SQ L.E.
LINE GUIDE 16 S.W.G.
SOLDER WASHERS.
1/16" SHEET RIBS.
1/16" SHEET TOP & BOTTOM.
1/16" SHEET T.E. TOP & BOTTOM
BALSA BLOCK TIPS.
1/16" DURAL SHEET.
U/C
ELONGATED HOLE FOR FEED PIPE
REAR
DEVELOPMENT OF TANK BODY.
HOLE FOR FILLER PIPE.
HOLE FOR VENT PIPE.
DEVELOPMENT OF END PLATE. 2 OFF
CUT AWAY F10 BELOW T/PLANE AFTER PLANKING TO ALLOW PASSAGE OF PUSH ROD.
F.4 3/32" SHEET.
F.5 3/32" SHEET.
F.6 3/32" SHEET.
F7 3/32" SHEET.
F.8. 3/32".
F.9 3/32"
F.10. 3/32".
DIHEDRAL KEEPER. 1/16" PLY. 2 OFF.
TRIM OFF WHEN WING IS COMPLETE.


7"
2"
3/4"
2 3/8"
5 1/8"
1/16" SHEET
3/16" x 3/32" SPARS
1/16" SHEET WEBBING.
1/4" x 1/8" L.E.
3/4" x 3/16" T.E.
5/8" x 1/8" T.E.
8 1/4"
21 1/2"
3 3/8"
3 3/16"
24 1/2"
1/32" SHEET TOP ONLY
3/16" x 3/32" L.E.
1/8" SQ SPARS
1/16" WEBBING.
20"
ATTILA III
NEW F.A.I. FORMULA
POWER MODEL FOR 2.5. c.c.
WINNER OF JUGOSLAV
INTERNATIONAL POWER CUP
1951
By JACQUES MORISSET
FRANCE
6 5/16"
7 7/8"
10 13/16"
1/8" SHEET TIP
5 1/8"
3/32" SHEET.
COVER FRONT WITH
1/16" SHEET
ALL LONGERONS, UPRIGHTS
& CROSS STRUTS FROM 5/32" SQ
2 11/16"
2 3/8"
2 3/8"
+2°
3 1/8"
1 3/8"
1/8" SHEET



Attila III. *By* JACQUES MORISSET, Paris, France.

DESCRIPTION.—A model of almost stick-like proportions with pylon mounted fuselage designed to comply with the F.A.I. Class 0–2.5 c.c. It is particularly happy when powered with a high revving motor, as the whole of the power developed at say 10/12,000 r.p.m. could be utilised! In actual fact, what with relatively low pitch and small diameter to achieve this, it serves equally well to be content with 8/9,000 r.p.m. and a bigger prop. This is a matter for trial and personal taste.

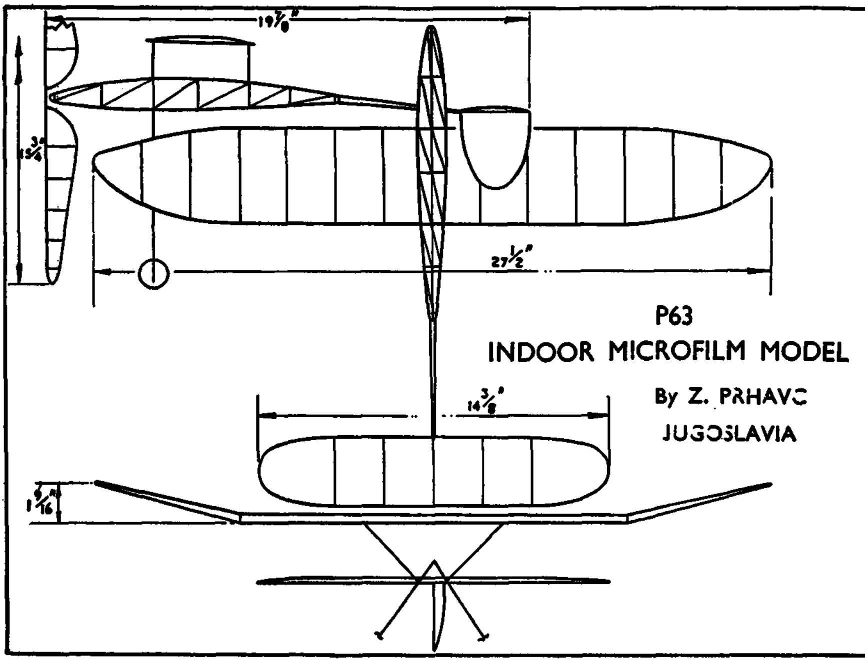
Attila III is a development of Attila II, powered with a 5 c.c. Delmo, which in its turn came from Attila I, with a 4 c.c. Allouchery. It can claim to have a well tried ancestry.

It possesses the characteristic Morisset twin fins—typical indeed of many leading French designs—and the equally typical Continental thread bracing from the mainplane passing under the fuselage.

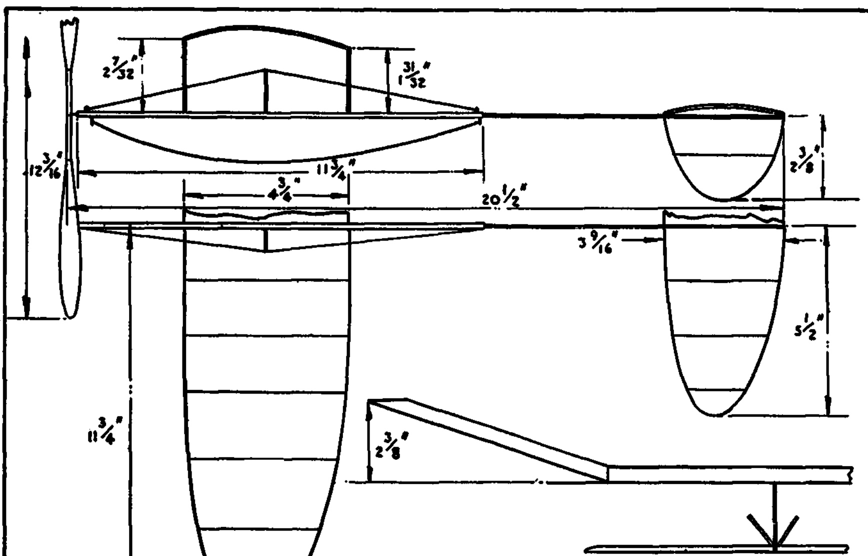
CONSTRUCTION.—Square fuselage with even taper presents no difficulty. Pylon should be stoutly imbedded. Note also arrangement of single wheel u/c, which bends in from its location at the extreme edge of the underbelly, a method which makes for easy strong construction and quick adjustment.

POWER UNIT.—There is plenty of weight in hand under the formula for good strong building when such an engine as the Elfin is used, weighing just over 3 ozs.; even the Micron 2.5, weighing nearly 5 ozs., leaves about 10 ozs. for the airframe, excluding tank and timer. Note that nose of fuselage has been elongated to allow of engine fixing on a detachable elastic held mount. Its position, inverted, upright, or sidewinder, makes no difference—just a matter of choice.

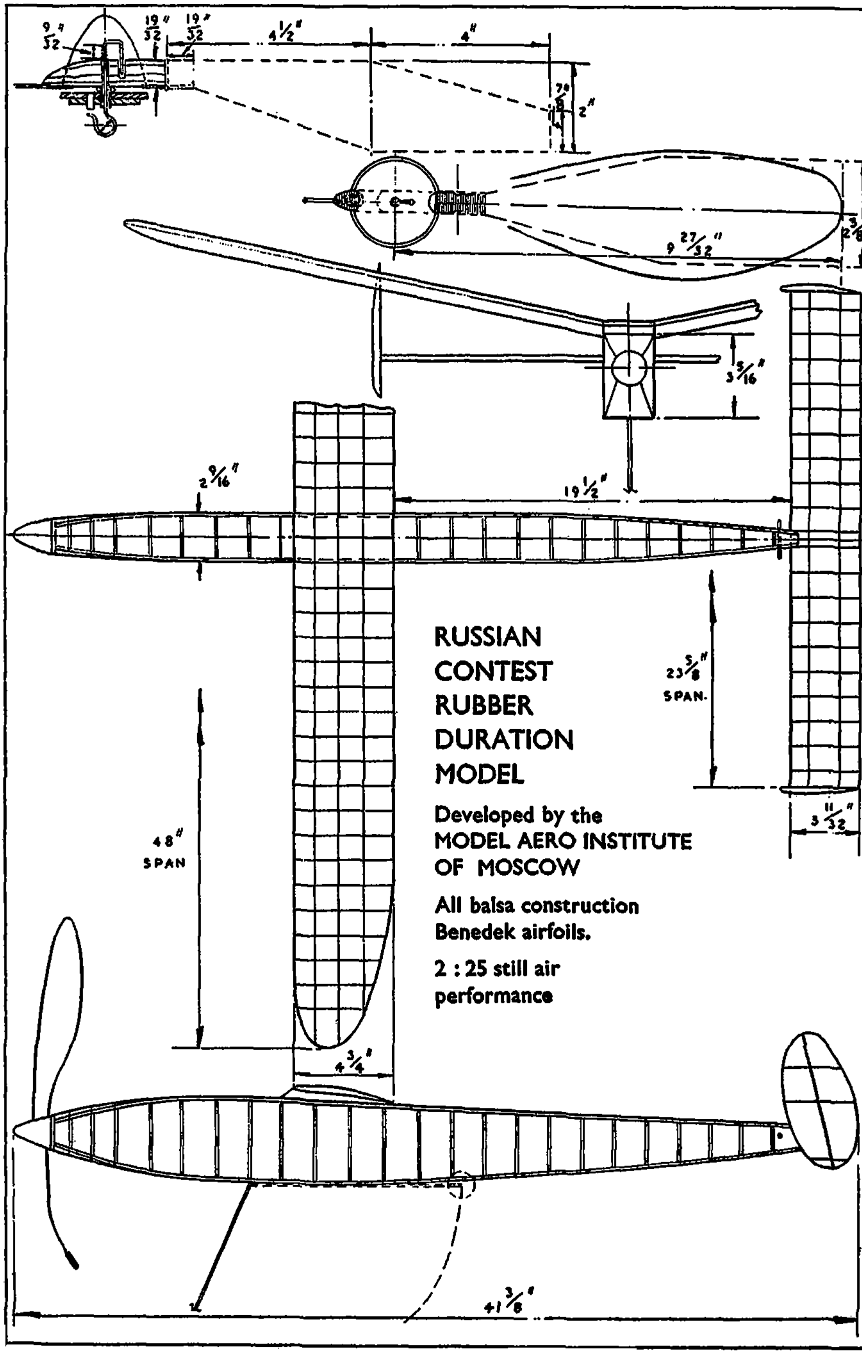
PERFORMANCE.—As the winner of the International Power Cup in Jugoslavia this summer with 183, 203 and maximum of 300—some 86 seconds ahead of local runner-up Freal, we need say no more.



P63
INDOOR MICROFILM MODEL
By Z. PRHAVC
JUGOSLAVIA



MUCHA
INDOOR MICROFILM MODEL
By J. BUZCIAR, CZECHOSLOVAKIA

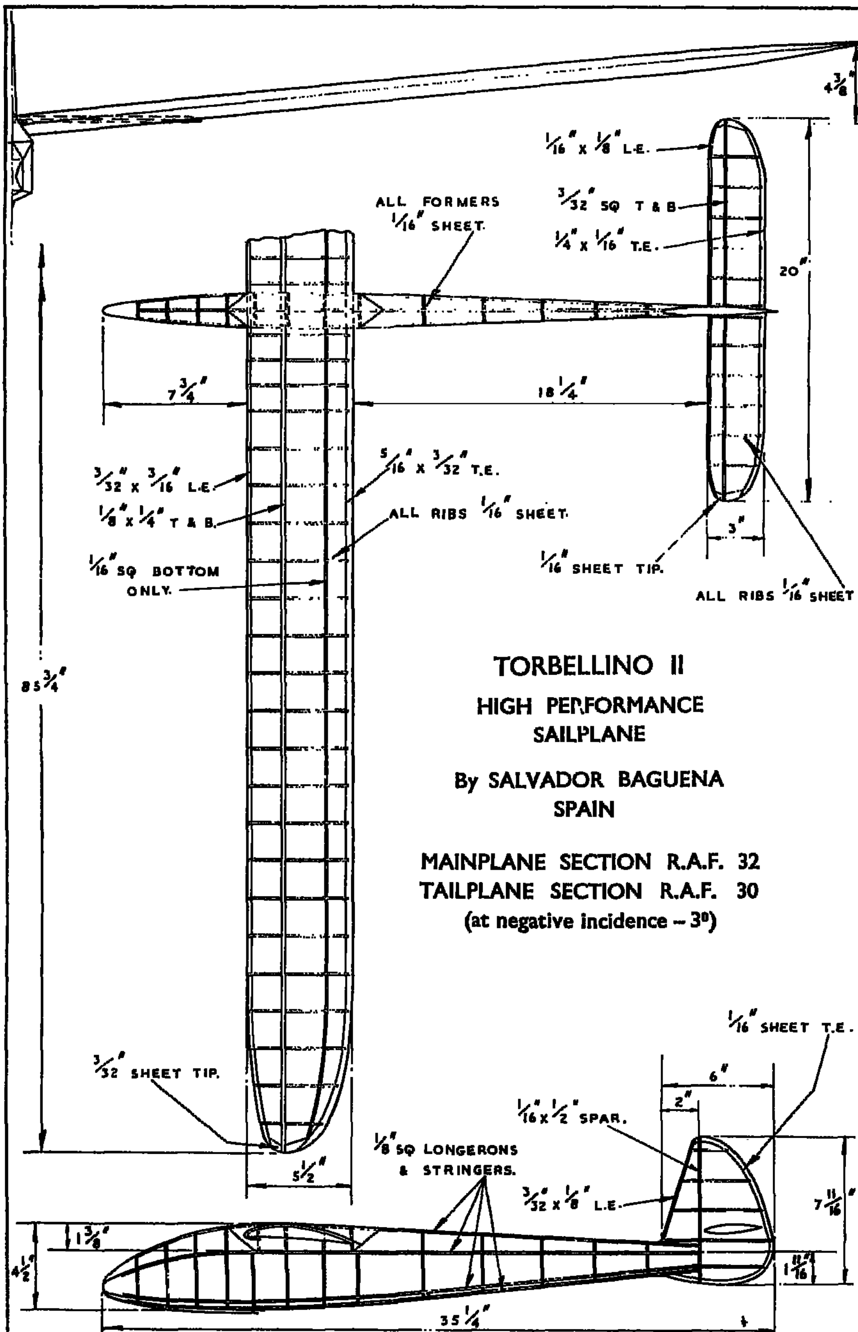


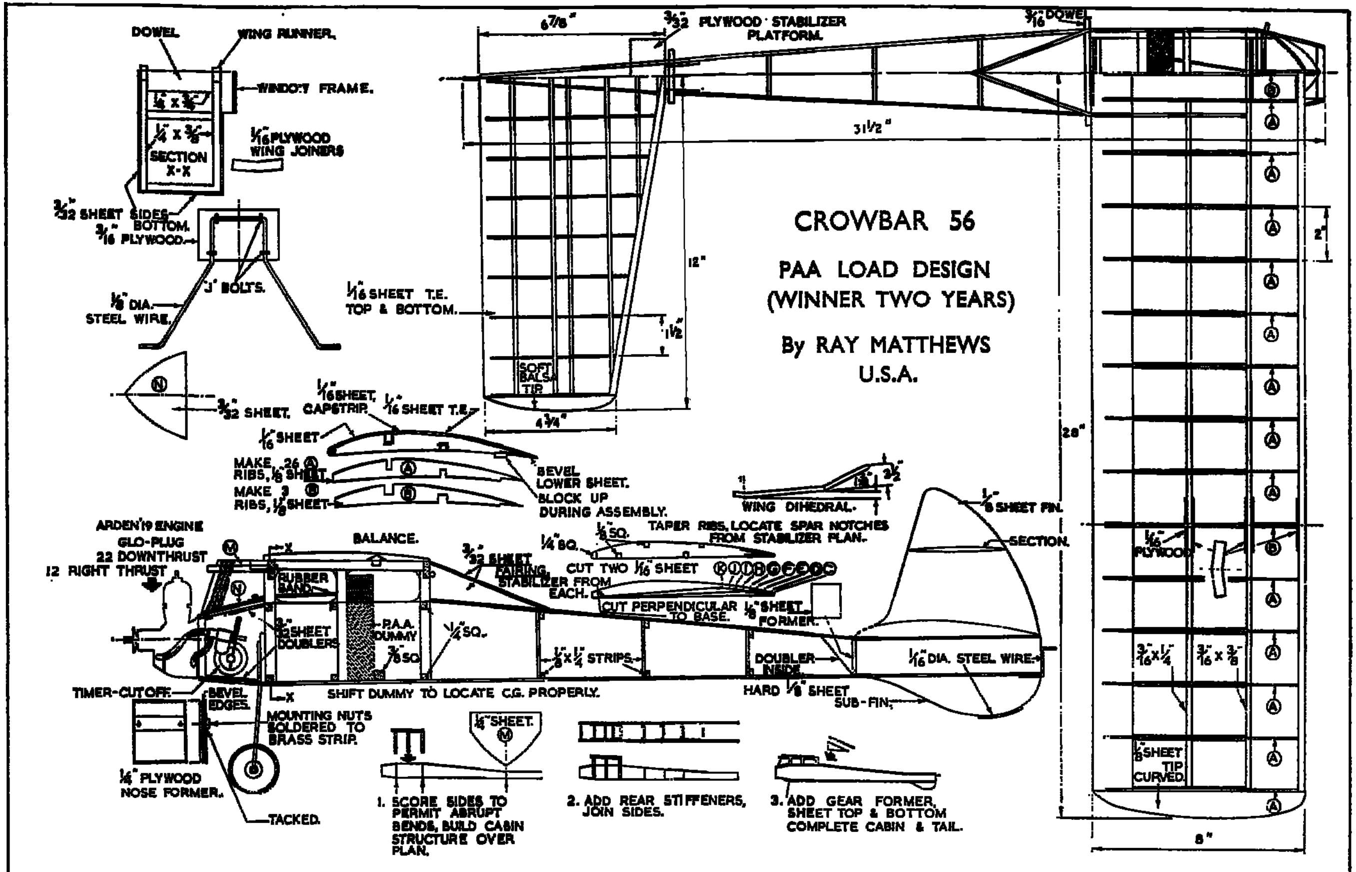
RUSSIAN CONTEST RUBBER DURATION MODEL

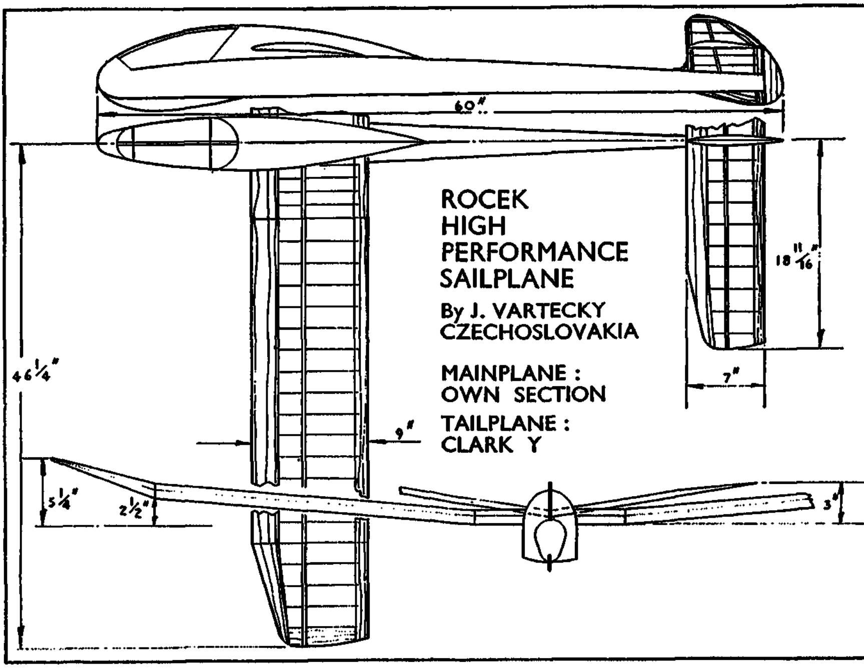
Developed by the MODEL AERO INSTITUTE OF MOSCOW

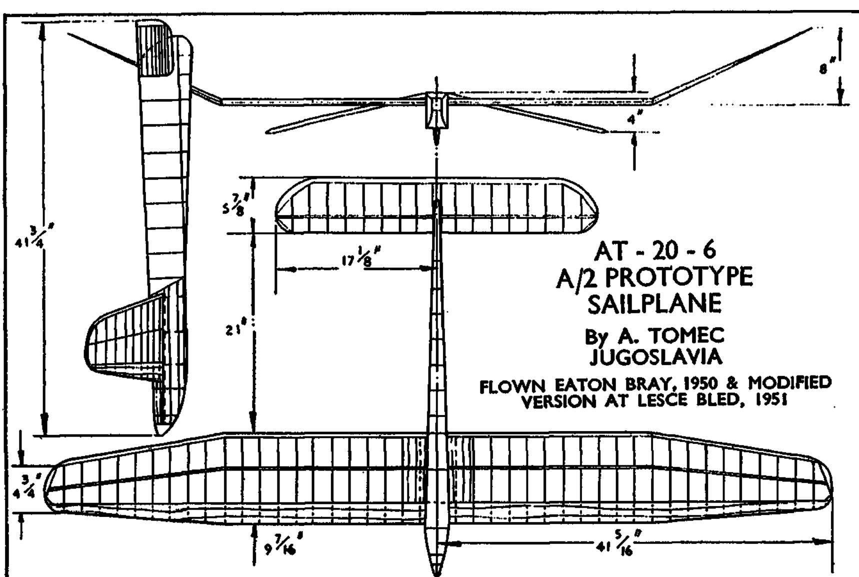
All balsa construction
Benedek airfoils.

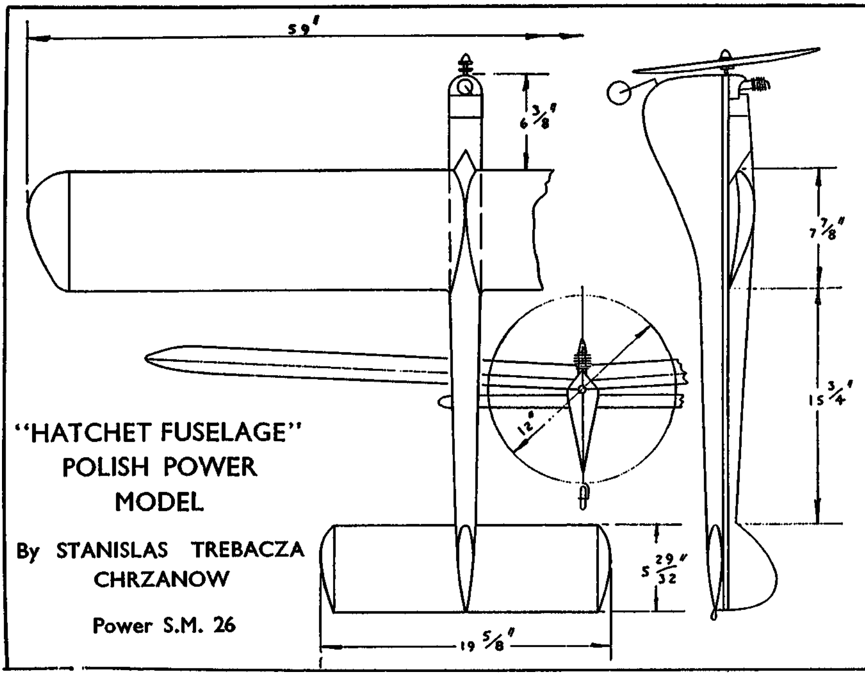
2 : 25 still air performance

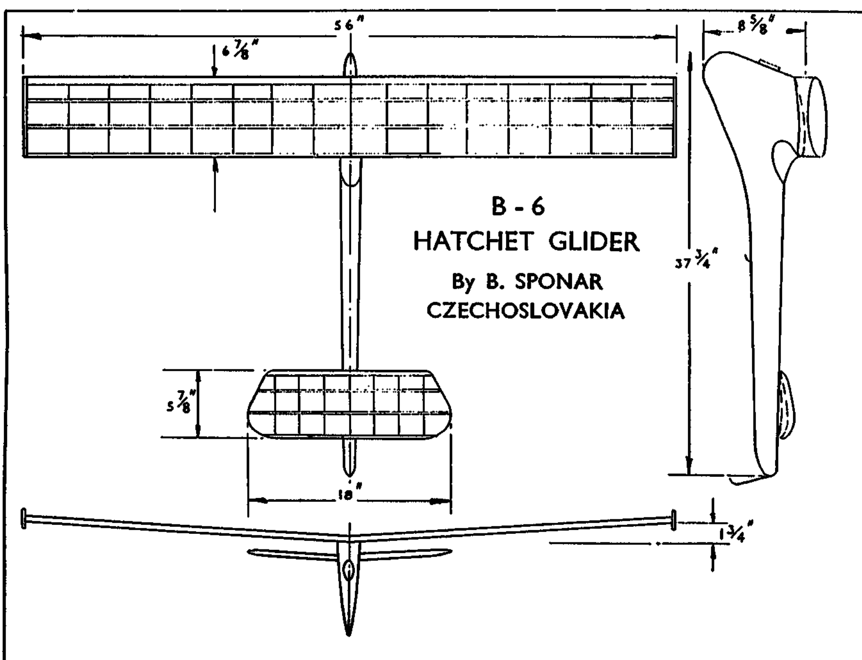

1/16" x 1/8" L.E.
3/32" SQ T & B
1/4" x 1/16" T.E.
20"
4 3/8"
ALL FORMERS 1/16" SHEET.
7 3/4"
18 1/4"
3/32" x 3/16" L.E.
1/8" x 1/4" T & B.
5/16" x 3/32" T.E.
ALL RIBS 1/16" SHEET.
1/16" SQ BOTTOM ONLY.
1/16" SHEET TIP.
3"
ALL RIBS 1/16" SHEET
85 3/4"
TORBELLINO II
HIGH PERFORMANCE SAILPLANE
By SALVADOR BAGUENA SPAIN
MAINPLANE SECTION R.A.F. 32
TAILPLANE SECTION R.A.F. 30
(at negative incidence – 3°)
1/16" SHEET T.E.
3/32" SHEET TIP.
6"
2"
1/16" x 1/2" SPAR.
1/8" SQ LONGERONS & STRINGERS.
5 1/2"
3/32" x 1/8" L.E.
7 11/16"
1 3/8"
4 1/2"
1 11/16"
35 1/4"

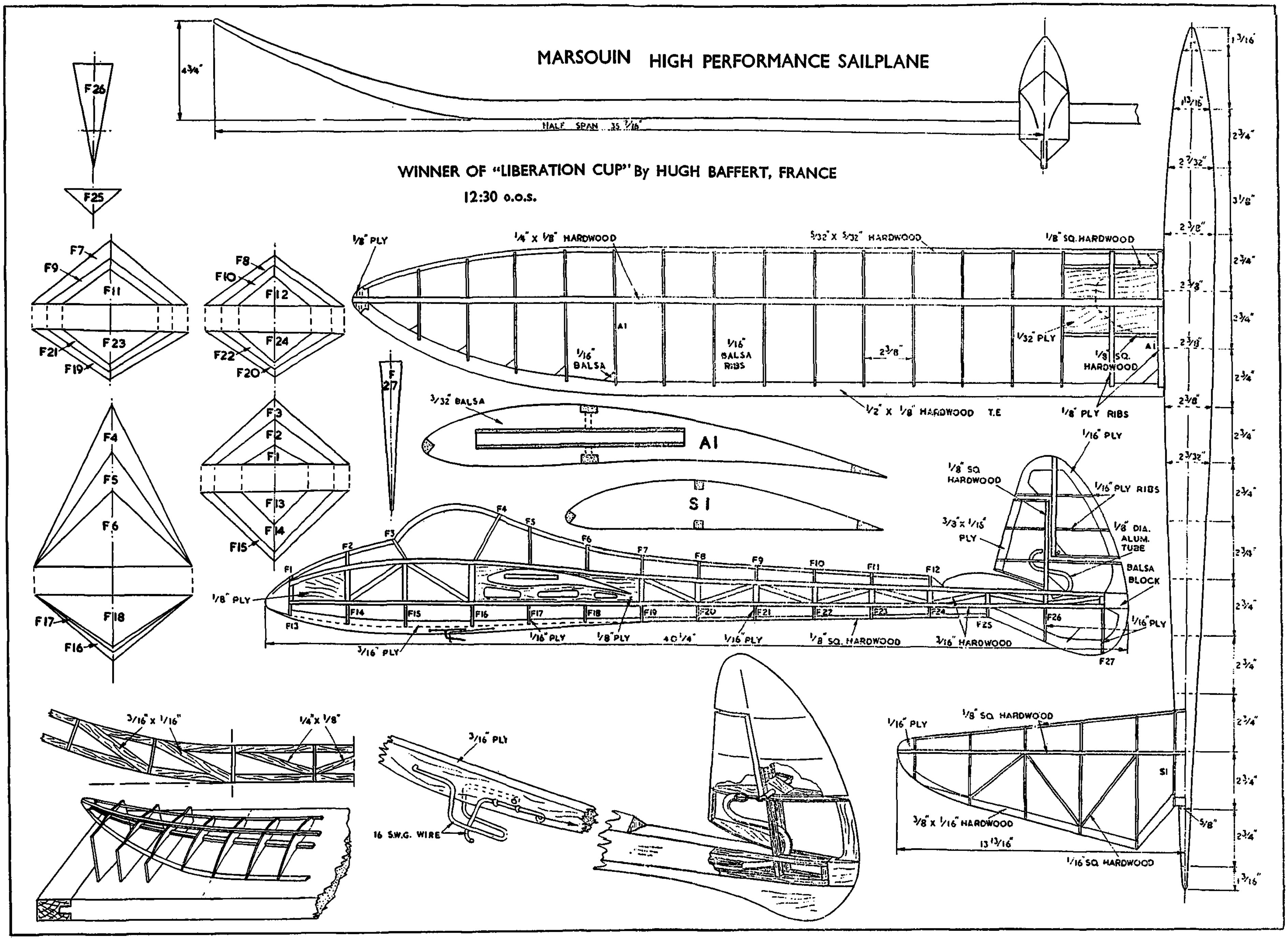

CROWBAR 56
PAA LOAD DESIGN
(WINNER TWO YEARS)
By RAY MATTHEWS
U.S.A.
DOWEL.
WING RUNNER.
WINDOW FRAME.
1/16 PLYWOOD WING JOINERS
SECTION X-X
3/32 SHEET SIDES
BOTTOM.
3/16 PLYWOOD.
'J' BOLTS.
1/8 DIA. STEEL WIRE.
3/32 SHEET.
1/16 SHEET, CAPSTRIP.
1/16 SHEET T.E.
1/16 SHEET
MAKE 26 (A) RIBS, 1/8 SHEET.
MAKE 3 (B) RIBS, 1/8 SHEET
BEVEL LOWER SHEET.
BLOCK UP DURING ASSEMBLY.
1/16 SHEET T.E. TOP & BOTTOM.
SOFT BALSA TIP
6 7/8"
3/32 PLYWOOD STABILIZER PLATFORM.
3/16 DOWEL
31 1/2"
12"
1 1/2"
4 3/4"
28"
2"
8"
WING DIHEDRAL.
TAPER RIBS, LOCATE SPAR NOTCHES FROM STABILIZER PLAN.
1/4" SQ.
1/8" SQ.
CUT TWO 1/16 SHEET STABILIZER FROM EACH.
CUT PERPENDICULAR TO BASE.
1/8" SHEET FORMER.
1/8" SHEET FIN.
SECTION.
1/16" PLYWOOD
ARDEN '19 ENGINE
GLO-PLUG
2° DOWNTHRUST
2° RIGHT THRUST
BALANCE.
RUBBER BAND.
3/32 SHEET FAIRING.
1/32 SHEET DOUBLERS.
P.A.A. DUMMY
3/16 SQ.
1/4" SQ.
1/8 x 1/4 STRIPS.
DOUBLER INSIDE.
HARD 1/8" SHEET SUB-FIN.
1/16 DIA. STEEL WIRE.
TIMER-CUTOFF.
BEVEL EDGES.
SHIFT DUMMY TO LOCATE C.G. PROPERLY.
MOUNTING NUTS SOLDERED TO BRASS STRIP.
1/4" PLYWOOD NOSE FORMER.
TACKED.
1/4" SHEET.
1. SCORE SIDES TO PERMIT ABRUPT BENDS, BUILD CABIN STRUCTURE OVER PLAN.
2. ADD REAR STIFFENERS, JOIN SIDES.
3. ADD GEAR FORMER, SHEET TOP & BOTTOM COMPLETE CABIN & TAIL.
3/16 x 1/4
3/16 x 3/8
1/8" SHEET TIP CURVED.

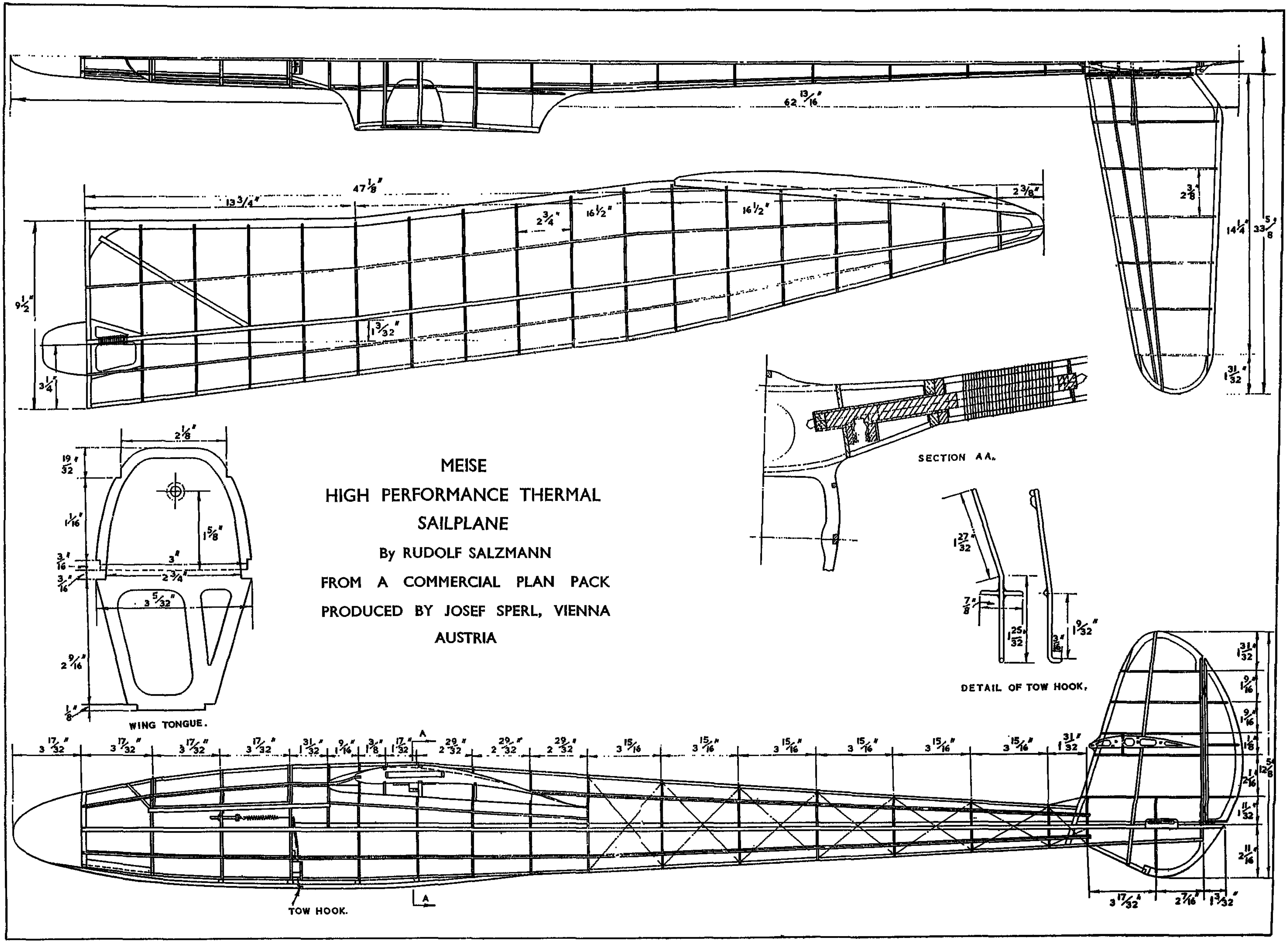

ROCEK
HIGH
PERFORMANCE
SAILPLANE
By J. VARTECKY
CZECHOSLOVAKIA
MAINPLANE :
OWN SECTION
TAILPLANE :
CLARK Y
60"
46 1/4"
18 11/16"
7"
9"
5 1/4"
2 1/2"
3"

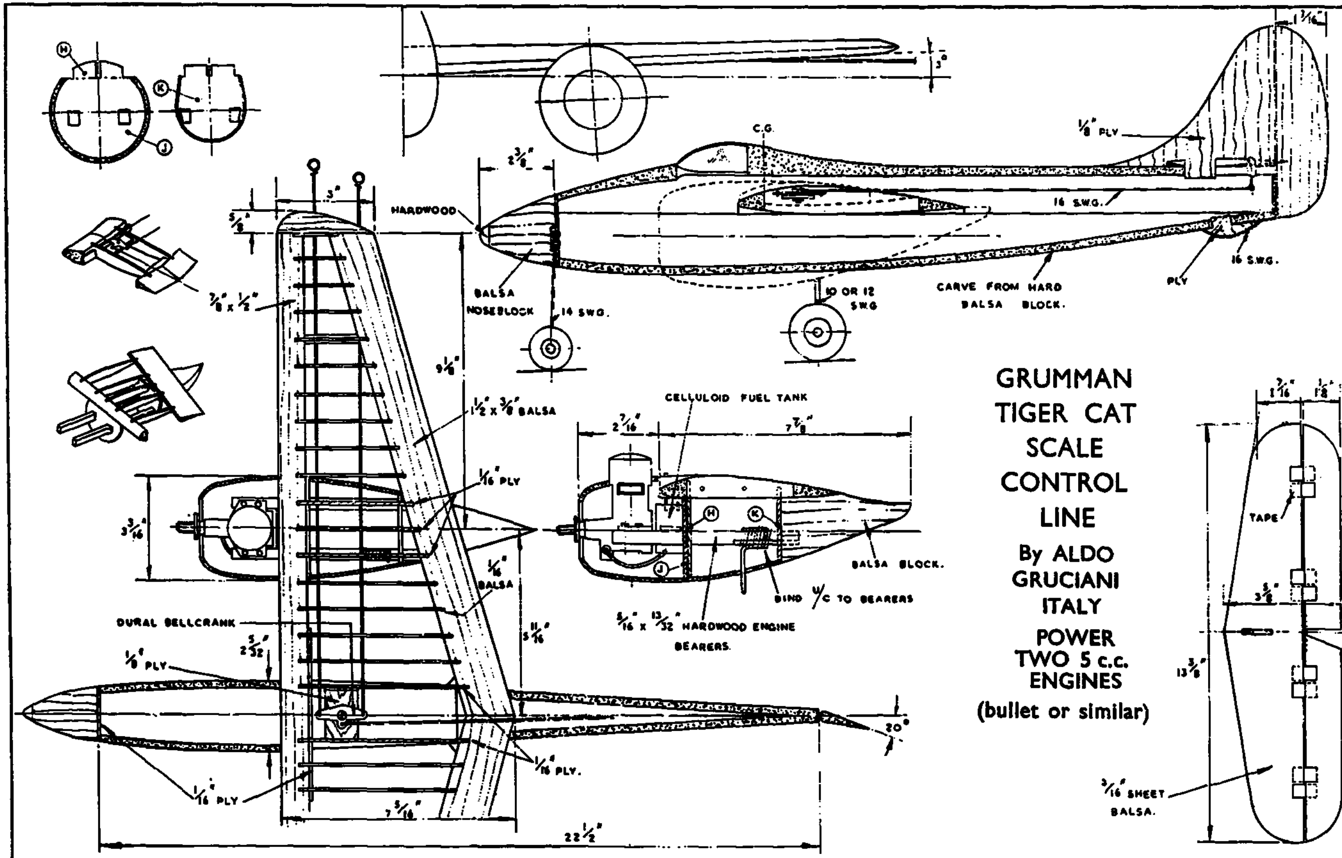

AT - 20 - 6
A/2 PROTOTYPE
SAILPLANE
By A. TOMEC
JUGOSLAVIA
FLOWN EATON BRAY, 1950 & MODIFIED
VERSION AT LESCE BLED, 1951
8"
4"
5 7/8"
41 3/4"
17 1/8"
21"
4 3/4"
9 7/16"
41 5/16"

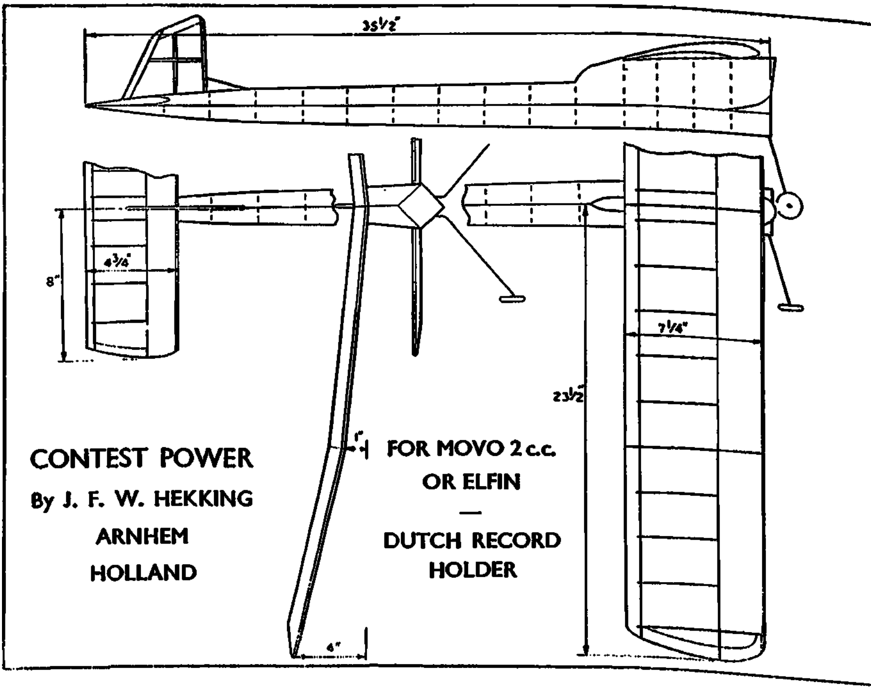

59"
6 3/8"
7 7/8"
15 3/4"
12"
5 29/32"
19 5/8"
"HATCHET FUSELAGE"
POLISH POWER
MODEL
By STANISLAS TREBACZA
CHRZANOW
Power S.M. 26


56"
6 7/8"
8 5/8"
B - 6
HATCHET GLIDER
By B. SPONAR
CZECHOSLOVAKIA
37 3/4"
5 7/8"
18"
1 3/4"


MARSOUIN HIGH PERFORMANCE SAILPLANE
WINNER OF "LIBERATION CUP" By HUGH BAFFERT, FRANCE
12:30 o.o.s.
HALF SPAN 35 1/16"
4 3/4"
1/8" PLY
1/4" x 1/8" HARDWOOD
5/32" x 5/32" HARDWOOD
1/8" SQ. HARDWOOD
1/16" BALSA
1/16" BALSA RIBS
2 3/8"
1/32" PLY
1/8" SQ. HARDWOOD
1/2" x 1/8" HARDWOOD T.E
1/8" PLY RIBS
3/32" BALSA
A1
S1
1/16" PLY
1/16" PLY RIBS
1/8" DIA. ALUM. TUBE
BALSA BLOCK
40 1/4"
1/16" PLY
1/8" PLY
3/16" PLY
1/8" SQ. HARDWOOD
3/16" HARDWOOD
3/16" x 1/16"
1/4" x 1/8"
16 S.W.G. WIRE
3/8" x 1/16" HARDWOOD
13 13/16"
1/16" SQ. HARDWOOD
5/8"

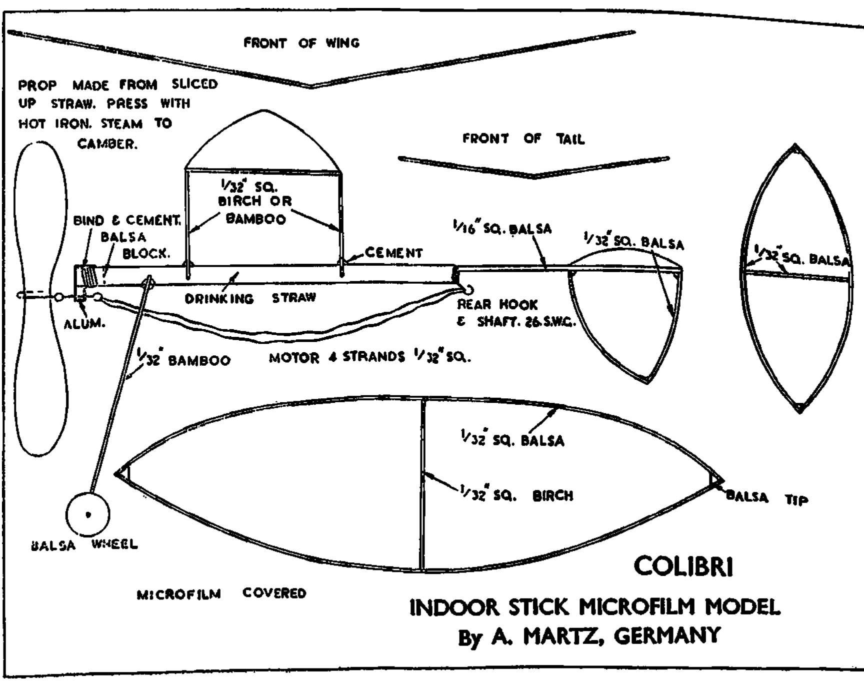

MEISE
HIGH PERFORMANCE THERMAL
SAILPLANE
By RUDOLF SALZMANN
FROM A COMMERCIAL PLAN PACK
PRODUCED BY JOSEF SPERL, VIENNA
AUSTRIA
SECTION AA.
DETAIL OF TOW HOOK.
WING TONGUE.
TOW HOOK.


GRUMMAN
TIGER CAT
SCALE
CONTROL
LINE
By ALDO
GRUCIANI
ITALY
POWER
TWO 5 c.c.
ENGINES
(bullet or similar)
C.G.
1/8" PLY
16 S.W.G.
HARDWOOD
BALSA
NOSEBLOCK
14 SWG.
10 OR 12
S.W.G.
CARVE FROM HARD
BALSA BLOCK.
PLY
16 S.W.G.
7/8" x 1/2"
1/2" x 3/8" BALSA
1/16" PLY
1/16" BALSA
DURAL BELLCRANK
1/8" PLY
1/16" PLY
1/16" PLY.
CELLULOID FUEL TANK
BALSA BLOCK.
BIND U/C TO BEARERS
5/16" x 13/32" HARDWOOD ENGINE
BEARERS.
TAPE
3/16" SHEET
BALSA.
22 1/2"
7 5/16"
9 1/8"
3 3/16"
3 11/16"
2 5/32"
2 3/8"
2 7/16"
7 7/8"
13 3/8"
3 5/8"
1 7/16"
1 1/8"
1 3/16"
3"
5/8"
3°
20°

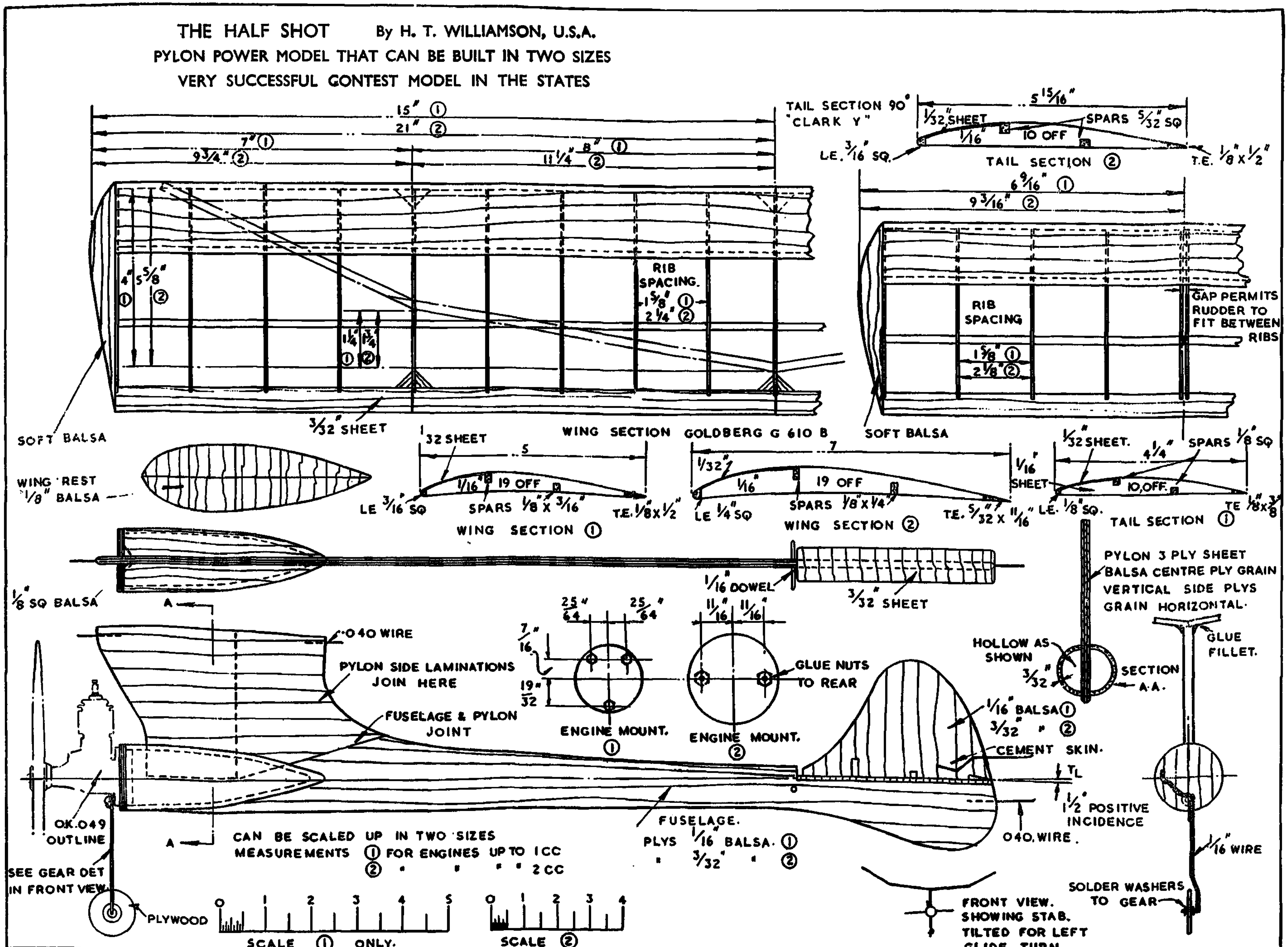


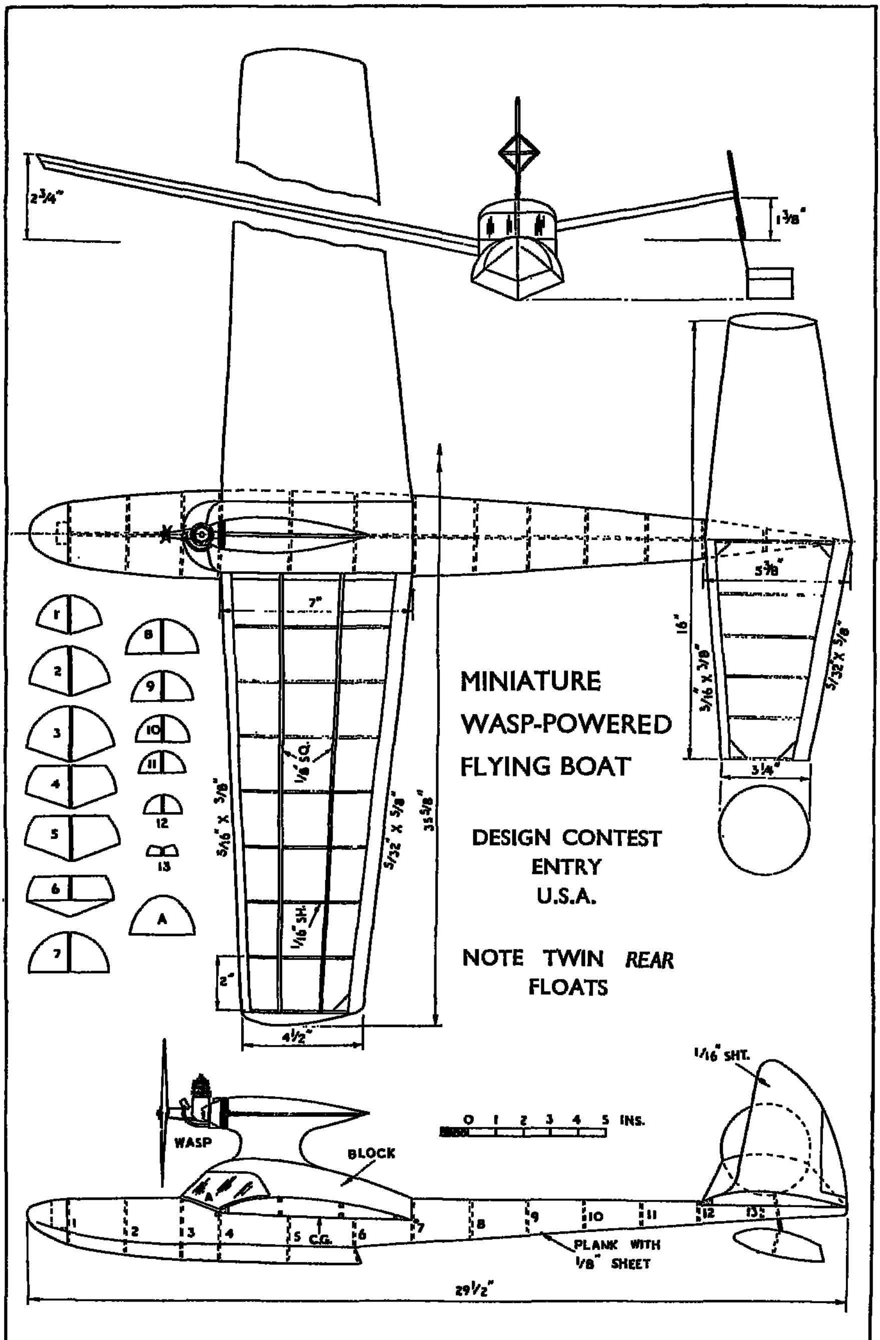
CONTEST POWER
By J. F. W. HEKKING
ARNHEM
HOLLAND

FOR MOVO 2 c.c.
OR ELFIN
—
DUTCH RECORD
HOLDER

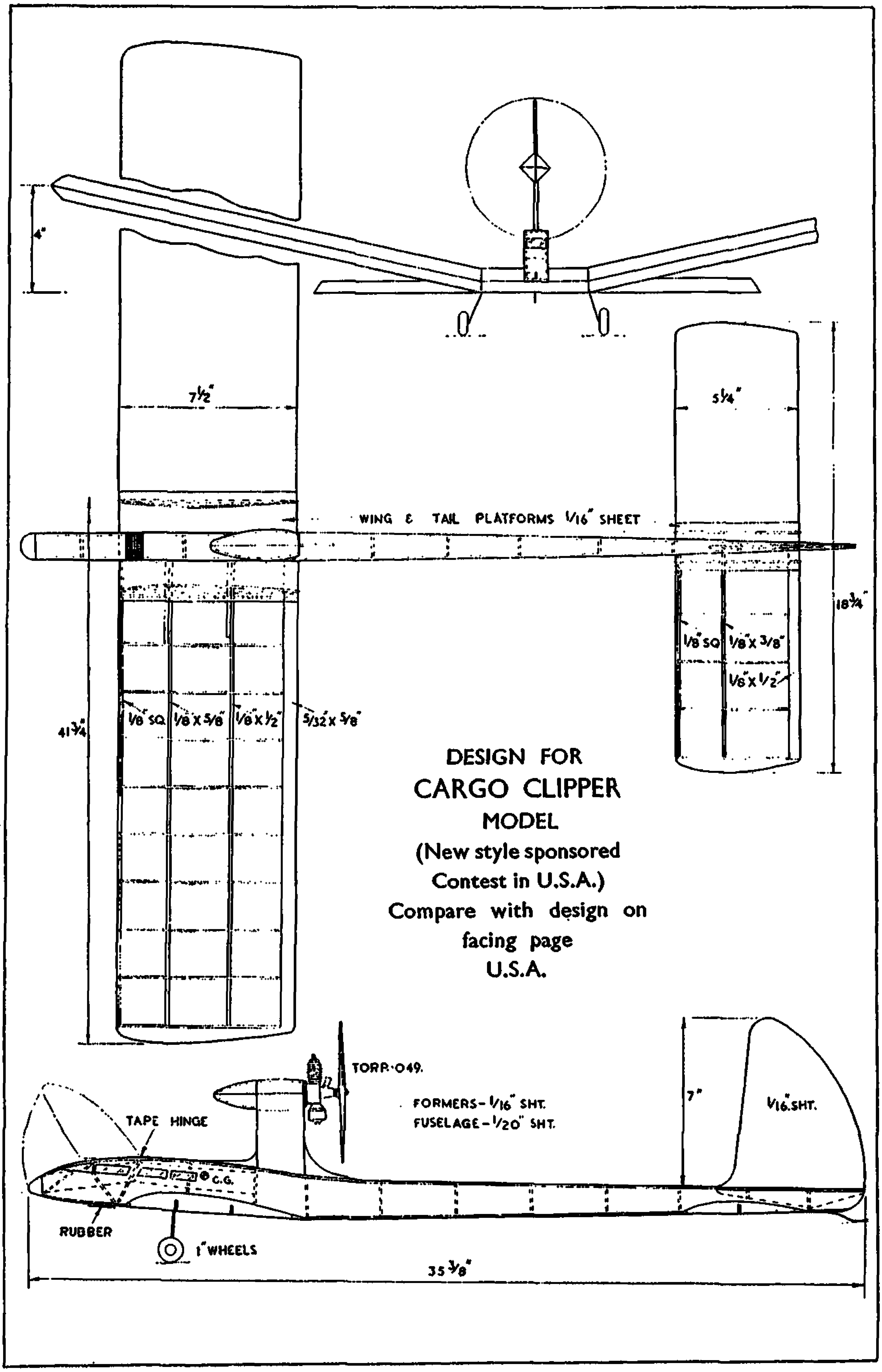


COLIBRI
INDOOR STICK MICROFILM MODEL
By A. MARTZ, GERMANY

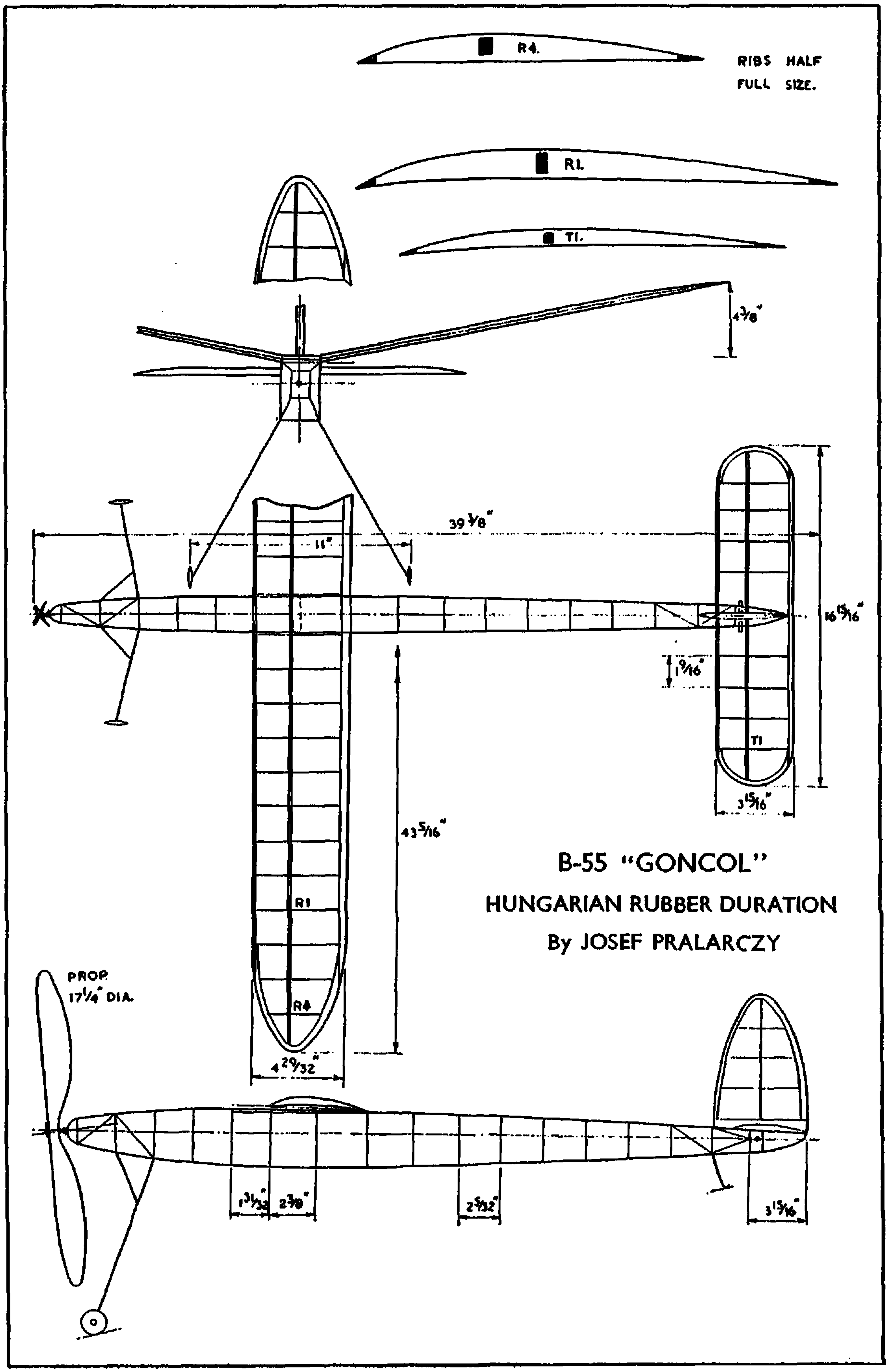

THE HALF SHOT By H. T. WILLIAMSON, U.S.A.
PYLON POWER MODEL THAT CAN BE BUILT IN TWO SIZES
VERY SUCCESSFUL CONTEST MODEL IN THE STATES
TAIL SECTION 90° "CLARK Y"
1/32" SHEET
SPARS 5/32" SQ
10 OFF
L.E. 3/16" SQ.
TAIL SECTION ②
T.E. 1/8" x 1/2"
RIB SPACING 1 5/8" ① 2 1/4" ②
GAP PERMITS RUDDER TO FIT BETWEEN RIBS
3/32" SHEET
SOFT BALSA
WING SECTION GOLDBERG G 610 B
WING REST 1/8" BALSA
32 SHEET
19 OFF
LE 3/16" SQ
SPARS 1/8" x 3/16"
T.E. 1/8 x 1/2"
WING SECTION ①
1/32"
LE 1/4 SQ
SPARS 1/8" x 1/4"
T.E. 5/32" x 11/16"
WING SECTION ②
1/16" SHEET
1/32" SHEET.
SPARS 1/8" SQ
L.E. 1/8" SQ.
10 OFF.
TE 1/8" x 3/8"
TAIL SECTION ①
PYLON 3 PLY SHEET BALSA CENTRE PLY GRAIN VERTICAL SIDE PLYS GRAIN HORIZONTAL.
1/8" SQ BALSA
1/16" DOWEL
3/32" SHEET
·040 WIRE
PYLON SIDE LAMINATIONS JOIN HERE
FUSELAGE & PYLON JOINT
ENGINE MOUNT. ①
ENGINE MOUNT. ②
GLUE NUTS TO REAR
HOLLOW AS SHOWN
SECTION A-A.
GLUE FILLET.
1/16" BALSA ①
3/32" " ②
CEMENT SKIN.
1 1/2° POSITIVE INCIDENCE
040 WIRE.
FUSELAGE.
PLYS 1/16" BALSA ①
3/32" " ②
CAN BE SCALED UP IN TWO SIZES
MEASUREMENTS ① FOR ENGINES UP TO 1CC
② " " " " 2 CC
OK.049 OUTLINE
SEE GEAR DET IN FRONT VIEW
PLYWOOD
SCALE ① ONLY.
SCALE ②
FRONT VIEW. SHOWING STAB. TILTED FOR LEFT GLIDE TURN.
SOLDER WASHERS TO GEAR
1/16" WIRE



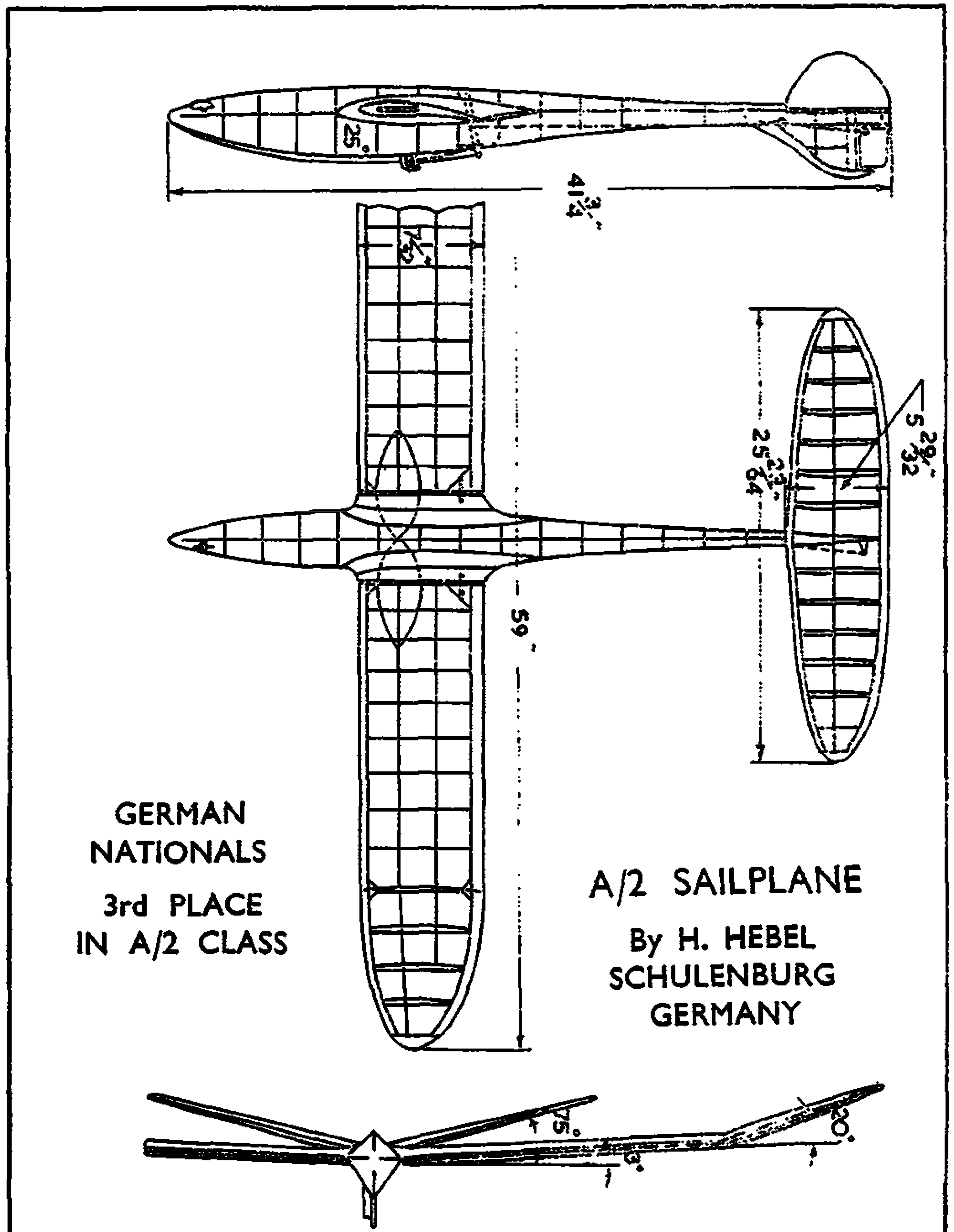
MINIATURE
WASP-POWERED
FLYING BOAT
DESIGN CONTEST
ENTRY
U.S.A.
NOTE TWIN REAR
FLOATS
WASP
BLOCK
C.G.
PLANK WITH
1/8" SHEET
1/16" SHT.
29½"
35⅝"
16"
7"
4½"
2"
3¼"
5⅜"
2¾"
1⅜"
3/16" X 3/8"
5/32" X 5/8"
1/8" SQ.
1/16" SH.
0 1 2 3 4 5 INS.



DESIGN FOR
CARGO CLIPPER
MODEL
(New style sponsored
Contest in U.S.A.)
Compare with design on
facing page
U.S.A.

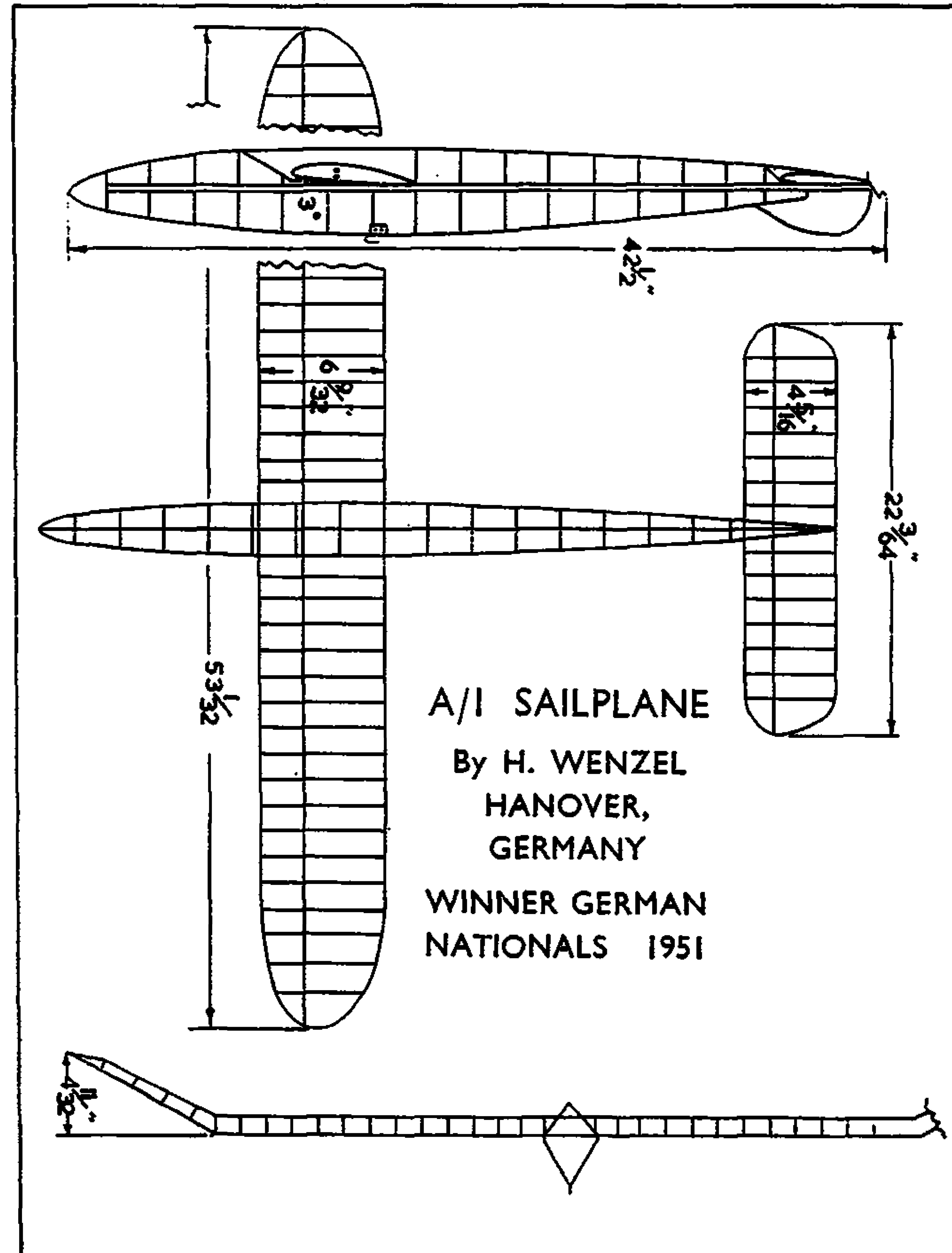


B-55 "GONCOL"
HUNGARIAN RUBBER DURATION
By JOSEF PRALARCZY

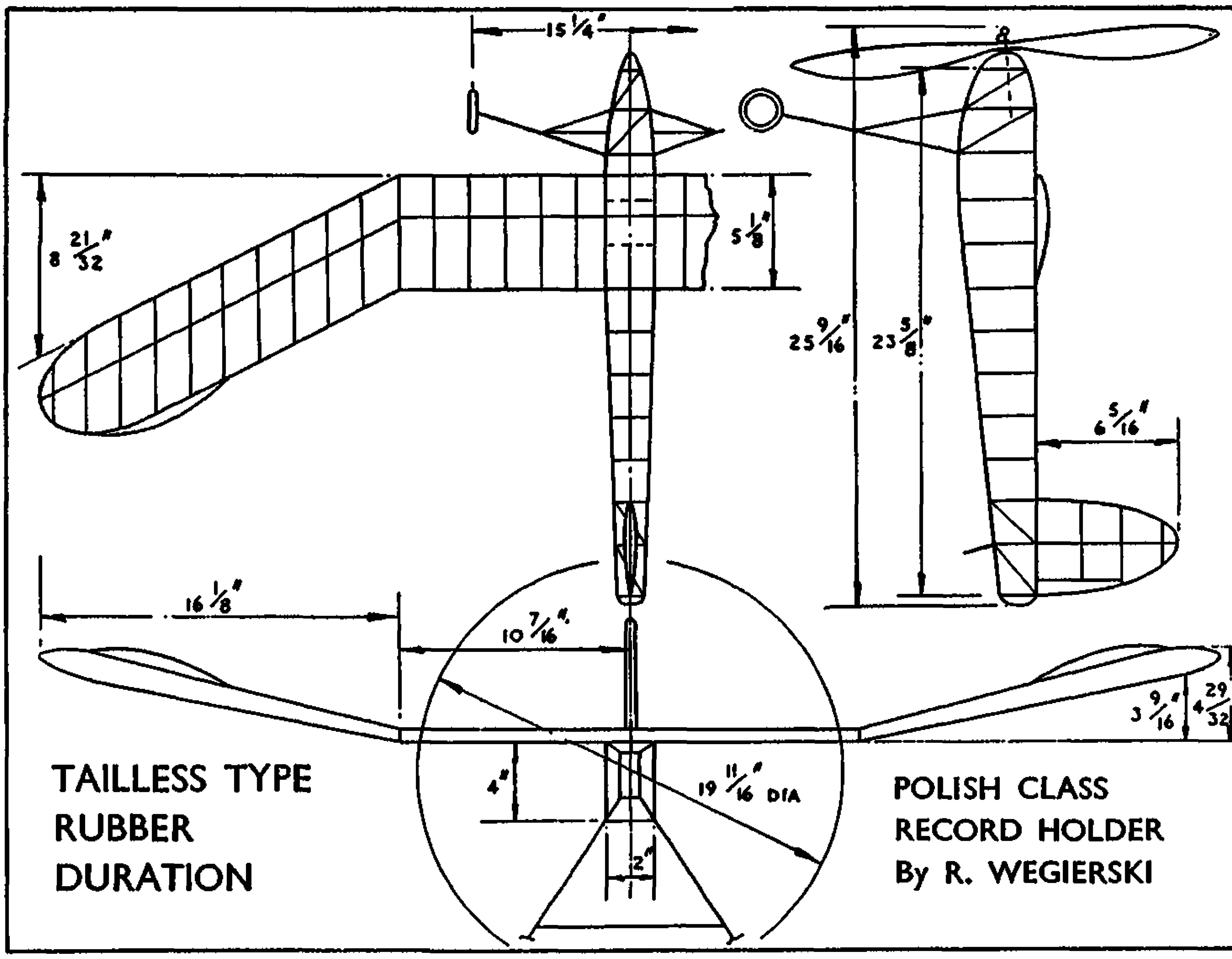


GERMAN NATIONALS
3rd PLACE IN A/2 CLASS

A/2 SAILPLANE
By H. HEBEL
SCHULENBURG
GERMANY

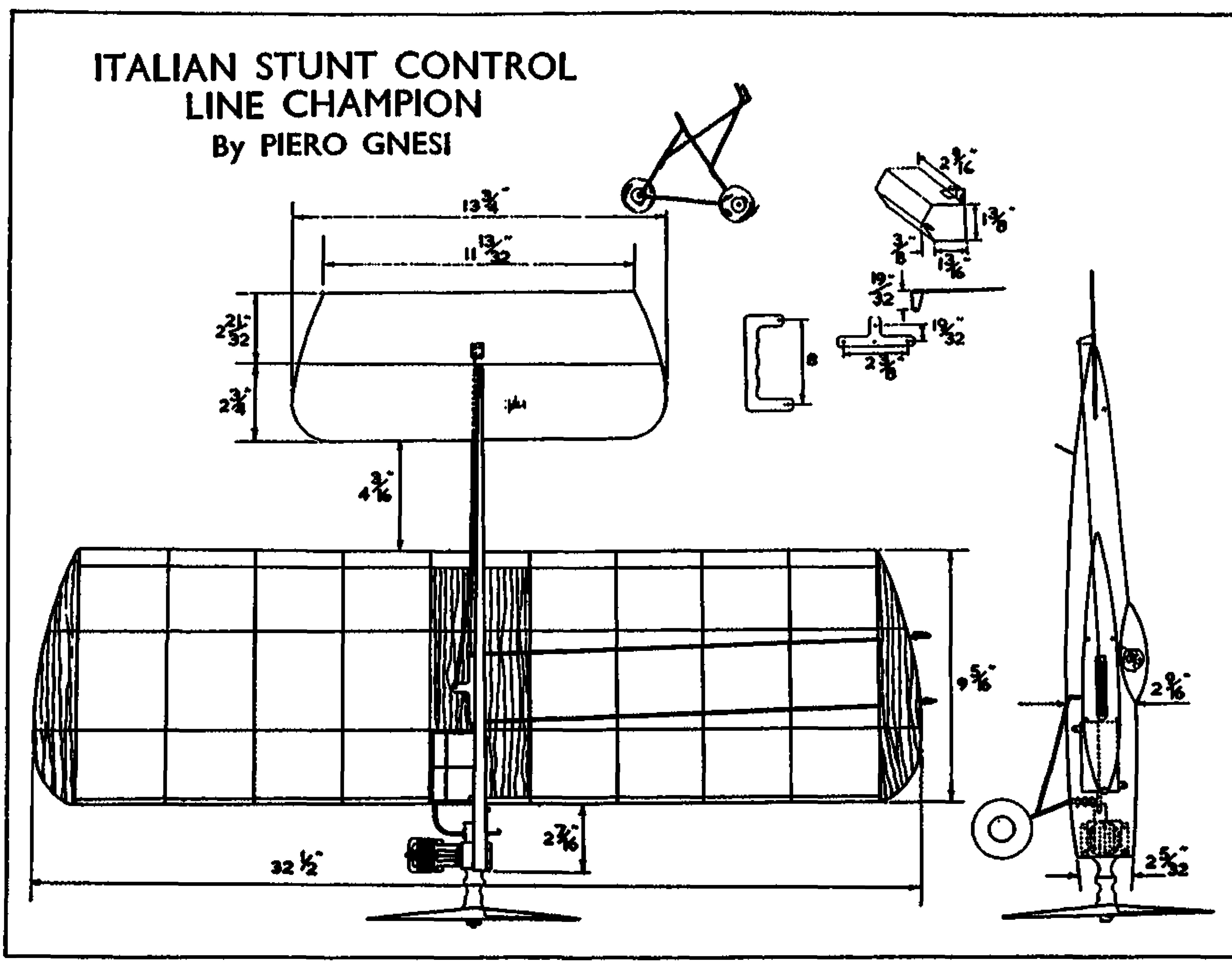


A/1 SAILPLANE
By H. WENZEL
HANOVER,
GERMANY
WINNER GERMAN NATIONALS 1951

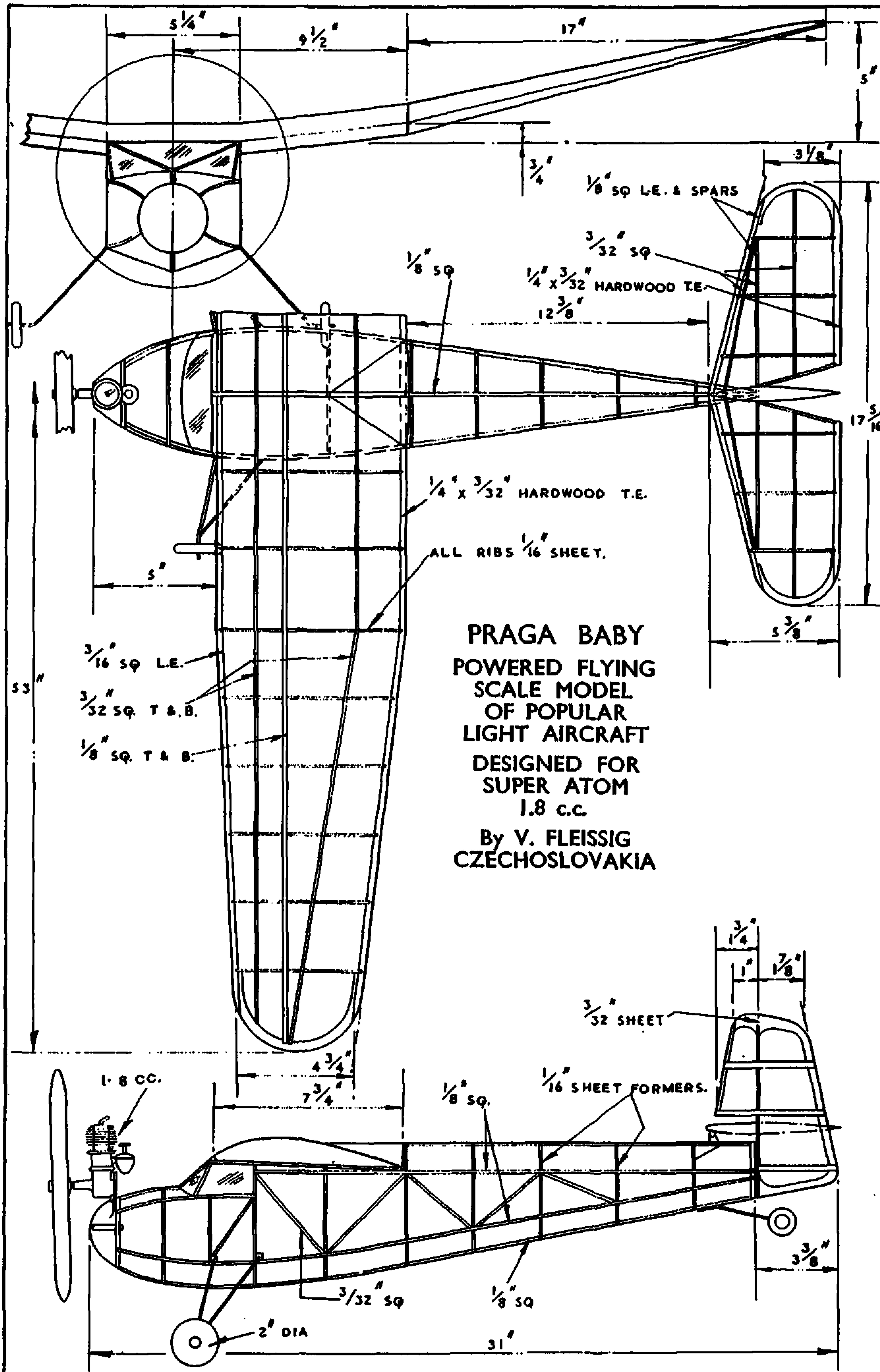


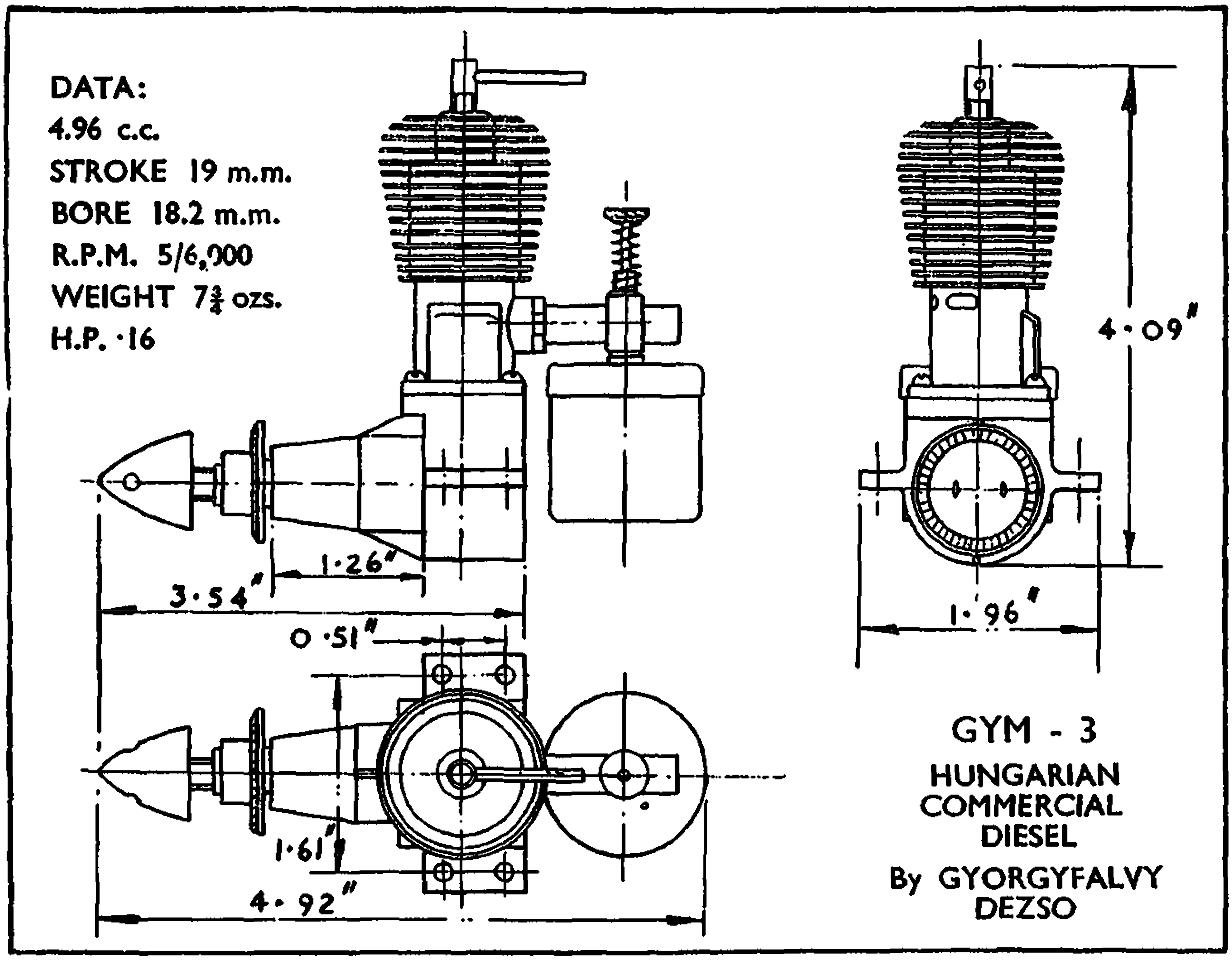
TAILLESS TYPE RUBBER DURATION

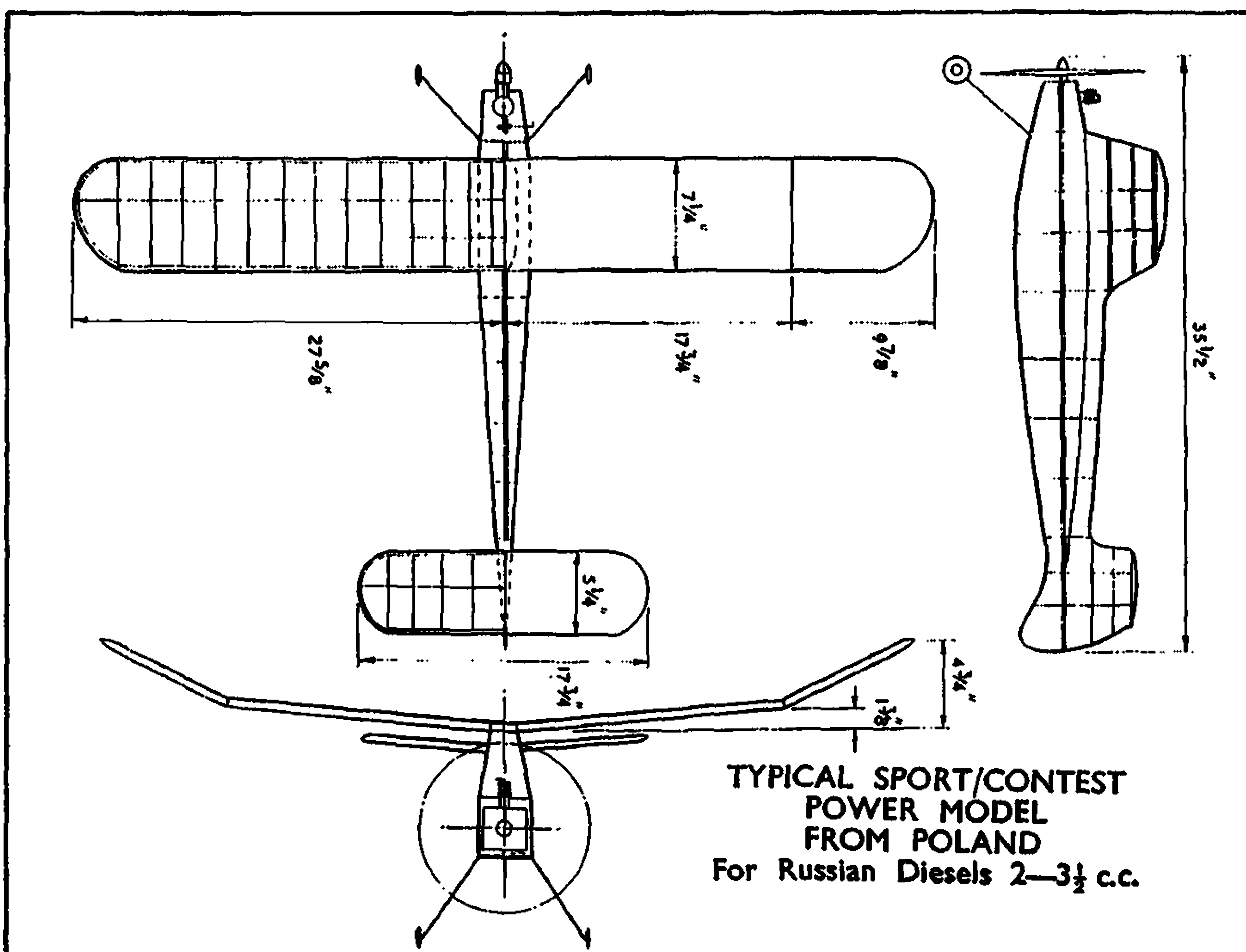
POLISH CLASS RECORD HOLDER
By R. WEGIERSKI



ITALIAN STUNT CONTROL LINE CHAMPION
By PIERO GNESI


5 1/4"
9 1/2"
17"
5"
3/4"
3 1/8"
1/8" SQ L.E. & SPARS
3/32" SQ
1/8" SQ
1/4" x 3/32" HARDWOOD T.E.
12 3/8"
17 5/16"
1/4" x 3/32" HARDWOOD T.E.
ALL RIBS 1/16" SHEET.
5"
5 3/8"
3/16" SQ L.E.
53"
3/32" SQ. T & B.
1/8" SQ. T & B.
PRAGA BABY
POWERED FLYING
SCALE MODEL
OF POPULAR
LIGHT AIRCRAFT
DESIGNED FOR
SUPER ATOM
1.8 c.c.
By V. FLEISSIG
CZECHOSLOVAKIA
1 3/4"
1"
1 7/8"
3/32" SHEET
4 3/4"
1·8 CC.
7 3/4"
1/8" SQ.
1/16" SHEET FORMERS.
3/32" SQ
1/8" SQ
3 3/8"
2" DIA
31"

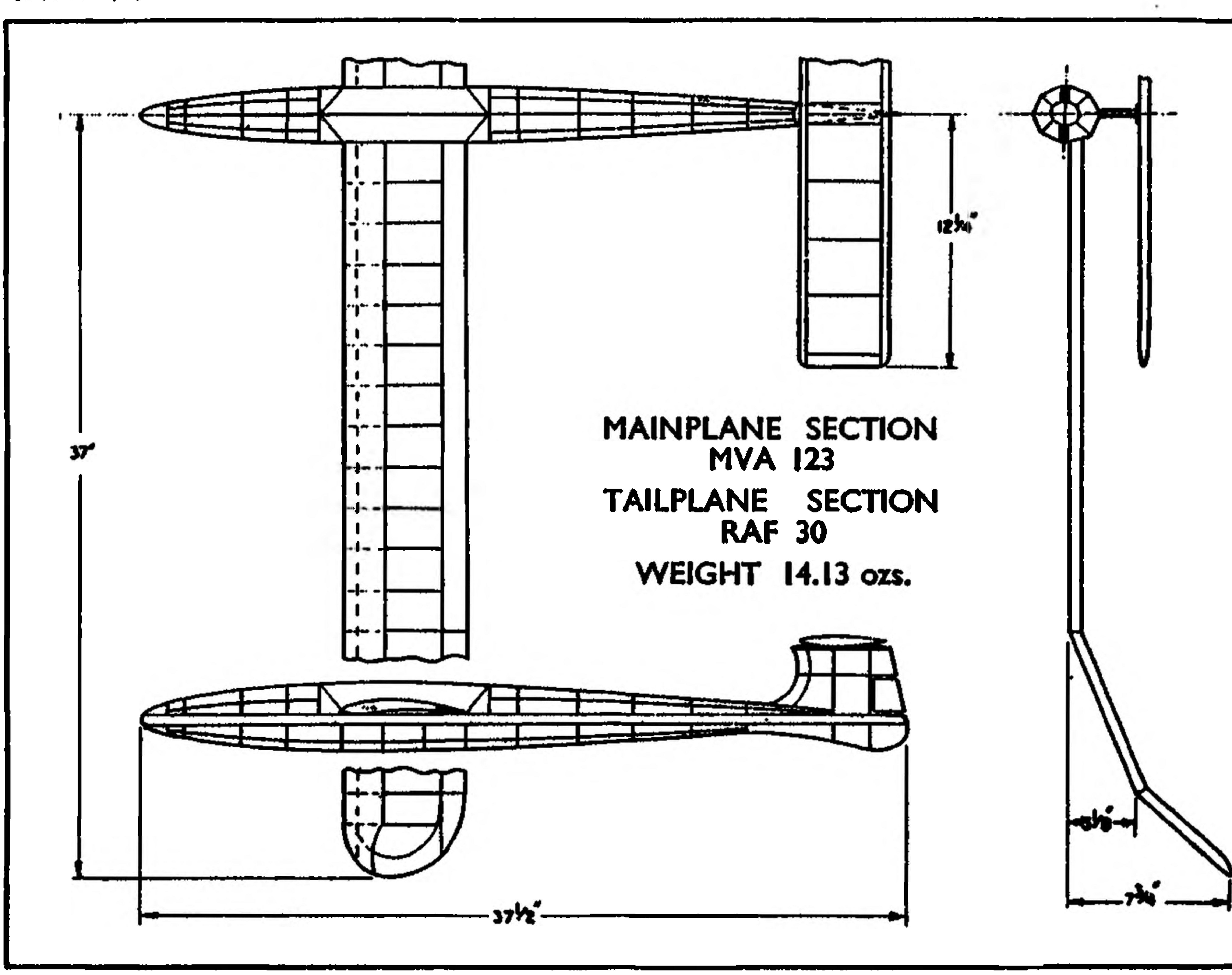

DATA:
4.96 c.c.
STROKE 19 m.m.
BORE 18.2 m.m.
R.P.M. 5/6,000
WEIGHT 7¾ ozs.
H.P. ·16
1·26"
3·54"
0·51"
1·61"
4·92"
4·09"
1·96"
GYM - 3
HUNGARIAN
COMMERCIAL
DIESEL
By GYORGYFALVY
DEZSO

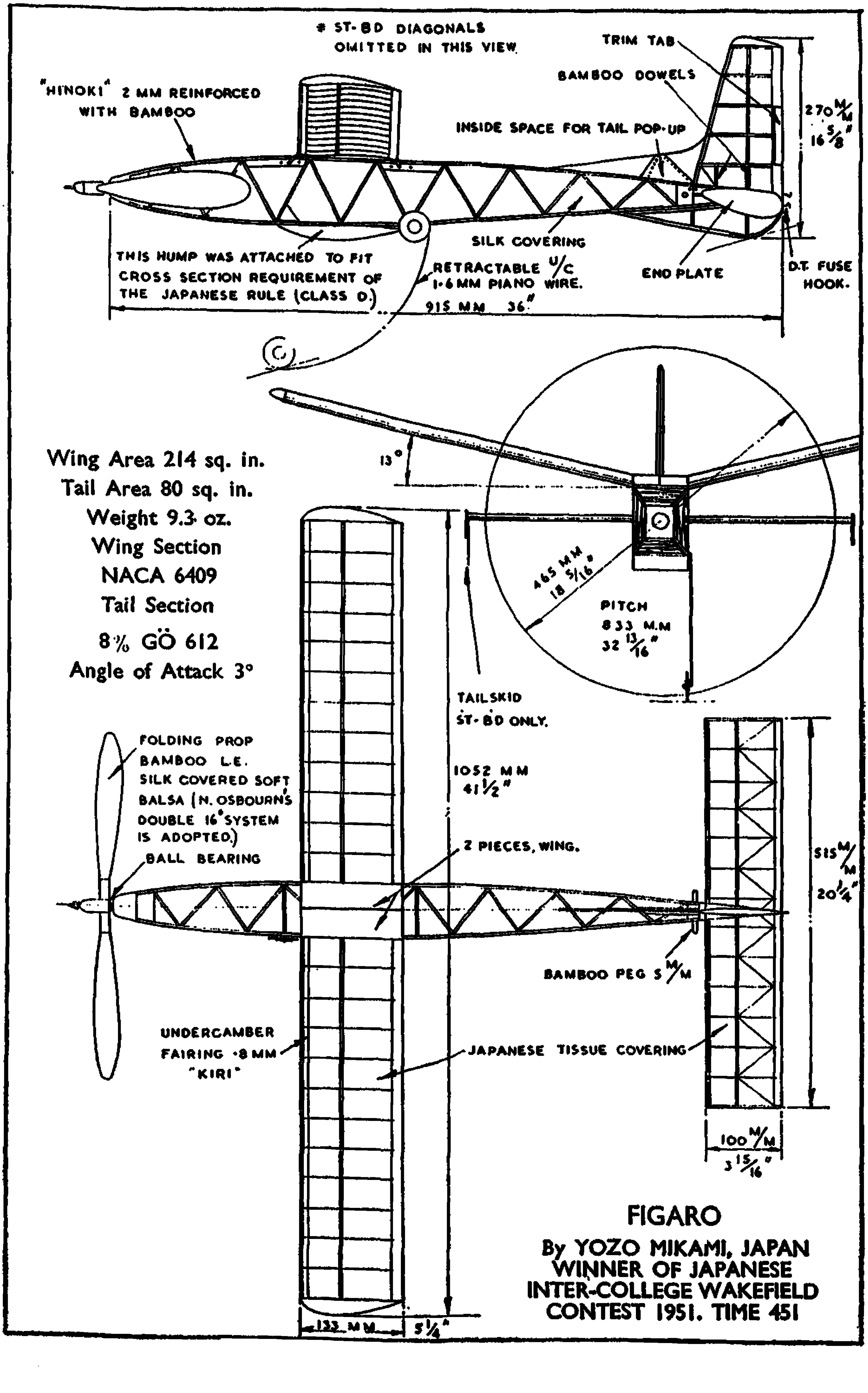

7¼"
27 5/8"
17¾"
9 7/8"
35½"
5¼"
4¾"
TYPICAL SPORT/CONTEST
POWER MODEL
FROM POLAND
For Russian Diesels 2—3½ c.c.

A/2 SAILPLANE

By ANDRÉ AVONTS, Belgium.

This pleasing model without frills is typical of the design trend of Belgium and neighbouring Holland. Flown in Jugoslavia this summer it took sixth place with an aggregate time of 698 secs.—highest placed Belgian entrant.

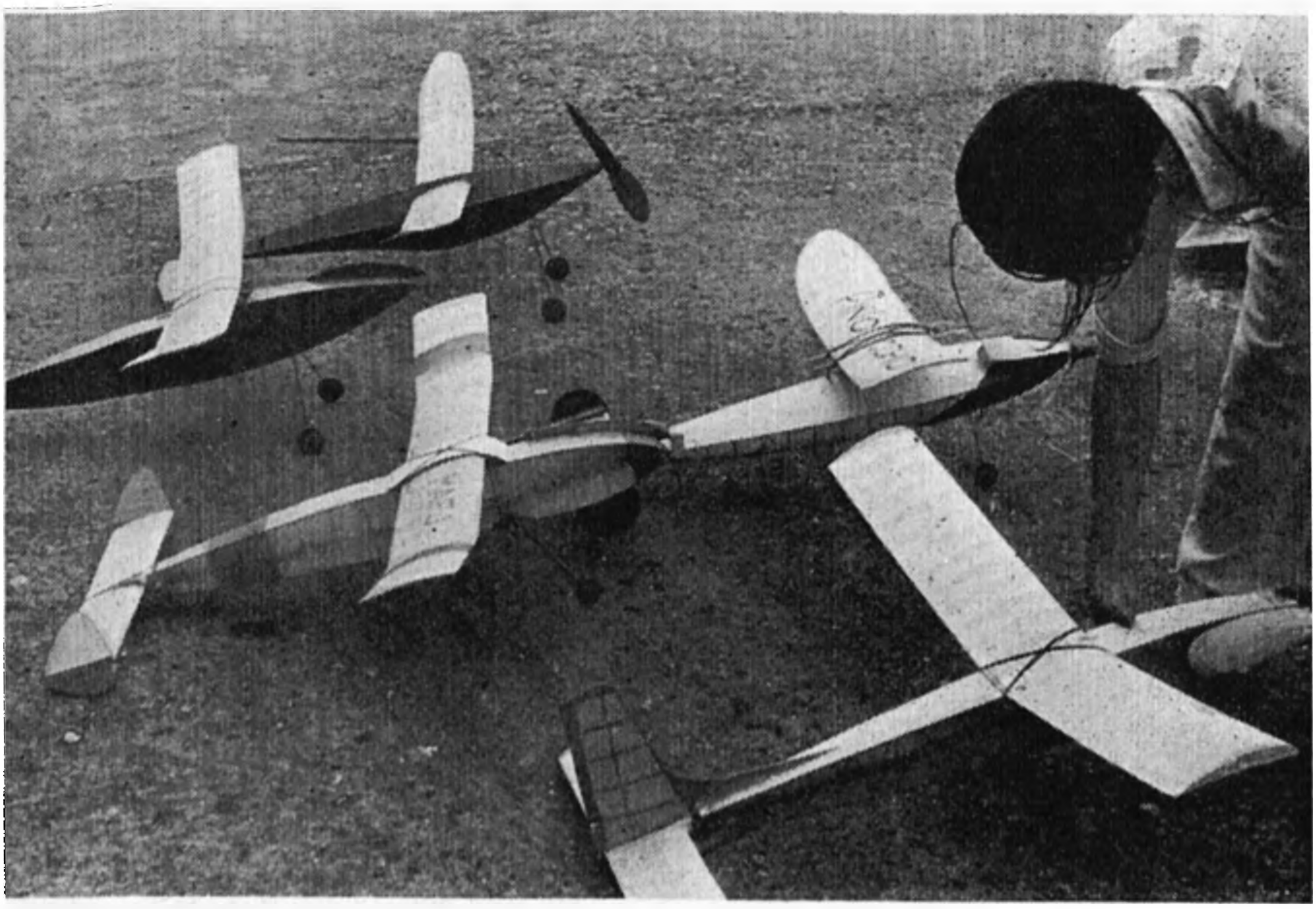




Wing Area 214 sq. in.
Tail Area 80 sq. in.
Weight 9.3 oz.
Wing Section
NACA 6409
Tail Section
8% GÖ 612
Angle of Attack 3°

FIGARO

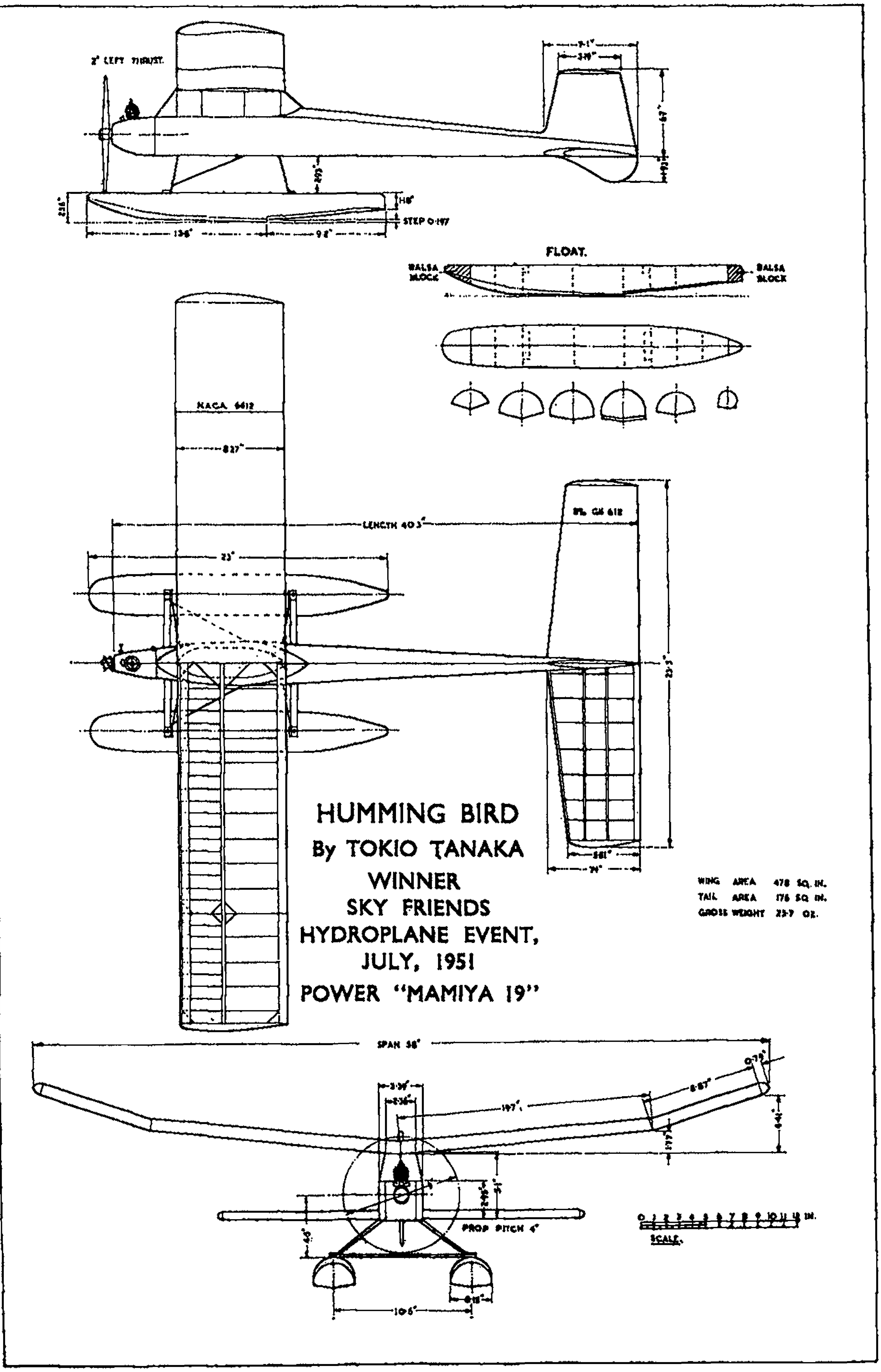
By YOZO MIKAMI, JAPAN
WINNER OF JAPANESE
INTER-COLLEGE WAKEFIELD
CONTEST 1951. TIME 451



FIGARO. Wakefield Model *by* Yuzo Mikami, Japan.

Description. This design from Japan is notable particularly for its "advanced" approach in its constructional detail. Note in particular the Warren bracing to fuselage, endplates to tail, dorsal extension to fin, retractable undercarriage and double-bladed folding prop—in fact, most of those modern improvements which Wakefield flyers today are discarding in favour of simpler layouts less prone to mechanical mishaps. We may see Japanese entrants in Sweden and will withold judgment until then! Model is illustrated in foreground of Wakefield group above.

Twin-engined flying boat "The Whale," designed by Minoru Sato whose "Miss Yamanaka" appeared in 1950 Annual. Span 57 in., length 49 in., weight 21 oz., wing area, 420 sq. in. Power: Mamiya 09s.

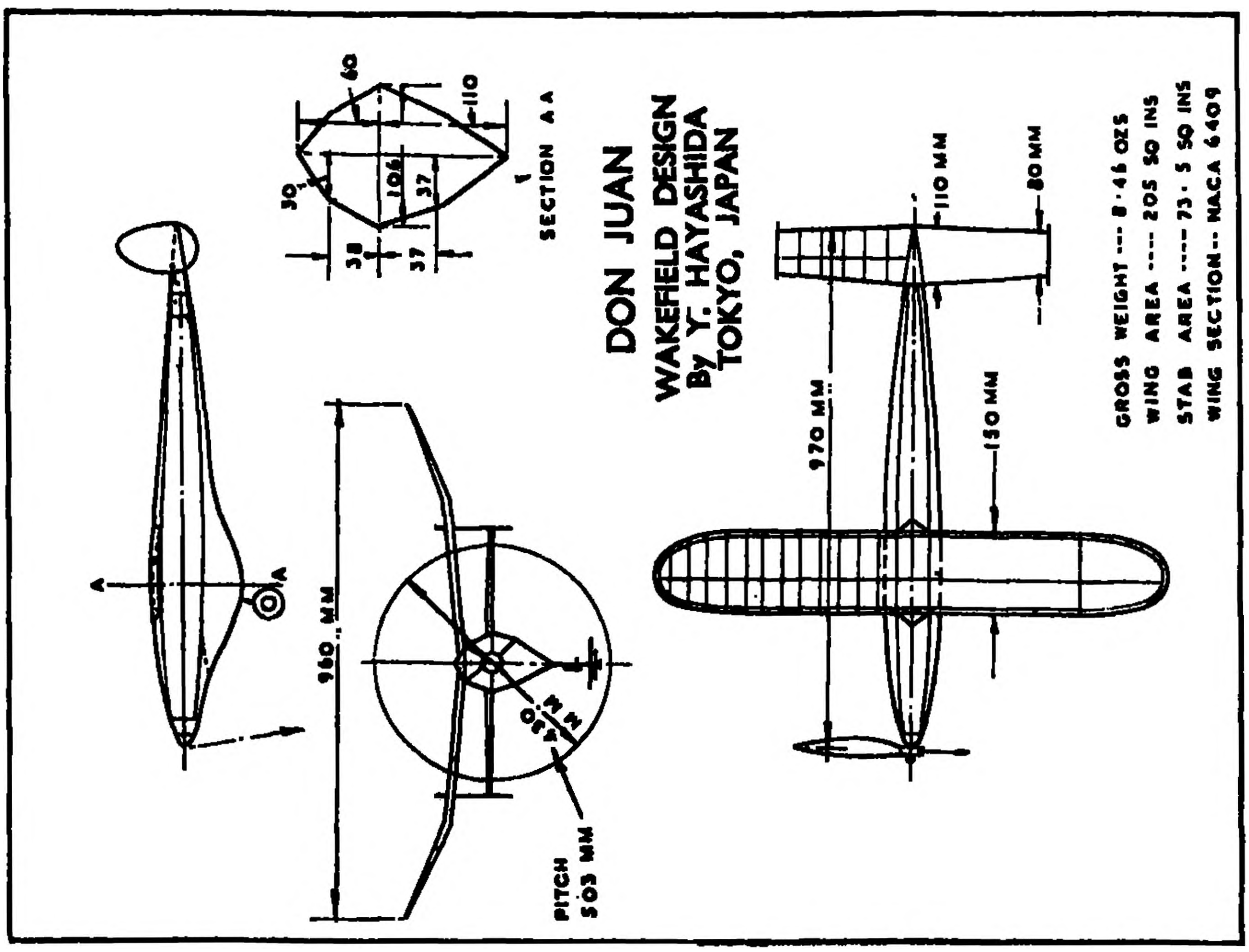

2° LEFT THRUST
FLOAT.
BALSA BLOCK
BALSA BLOCK
NACA 6412
LENGTH 40·3"
HUMMING BIRD
By TOKIO TANAKA
WINNER
SKY FRIENDS
HYDROPLANE EVENT,
JULY, 1951
POWER "MAMIYA 19"
WING AREA 478 SQ. IN.
TAIL AREA 176 SQ. IN.
GROSS WEIGHT 23·7 OZ.
SPAN 58"
PROP PITCH 4"
SCALE.

HUMMING BIRD

Powered Seaplane by Tokio Tanaka, Japan.

Description.— This interesting little seaplane powered by the local Mamiya 19—this firm, by the way, make some of those Japanese versions of Leica, Conta and other cameras, and model engines are a sideline just because one of the directors is a keen aeromodeller, so we hear—is typical of the very great interest by Japanese enthusiasts in all types of waterborne models. Floats or a hull are to them nearly as normal as wheels to us, so that would-be seaplane enthusiasts might do a lot worse than build any of their hydroplanes. Humming Bird is quite straightforward : twin floats support the whole weight without the need for a tail float. Floatshape is designed to avoid " dig-in " and at the same time offer minimum unsticking trouble. The drawing can be dimensioned up from the scale where not marked, and should be a very suitable craft for any good diesel of 2½ to 3½ c.c.

Performance.—Our correspondent gives no performance figure, but as winner of one of the leading Japanese power events should at least compare with any British seaplane designs at present available.



VALENTIN THE BIRDMAN

A Parachutist for Your Control Line or Free Flight Model

Some readers may remember Clem Sohn, the Birdman of the 'thirties, who was sponsored in this country by the *Daily Express*. His speciality was to dive from an aircraft and perform impressive birdlike evolutions by means of wings attached to arms and legs. He finally pulled the ripcord of his 'chute and landed safely. One day his parachute did not open . . . A modern successor is Sergeant Valentin, of the French Air Force, who provides similar entertainment and has, indeed, been billed to appear in this country. However, he wisely carries a lap pack in addition to a shoulder pack.

The model Birdman offered to our readers is based on Sergeant Valentin, and colour scheme given is his standard dress for these displays. It can be released from a control line model by means of a third line; even more satisfactory is its release from a free flight model by means of a timer. It can even be arranged for departure when dethermaliser lifts tail, giving all the appearance of baling out.

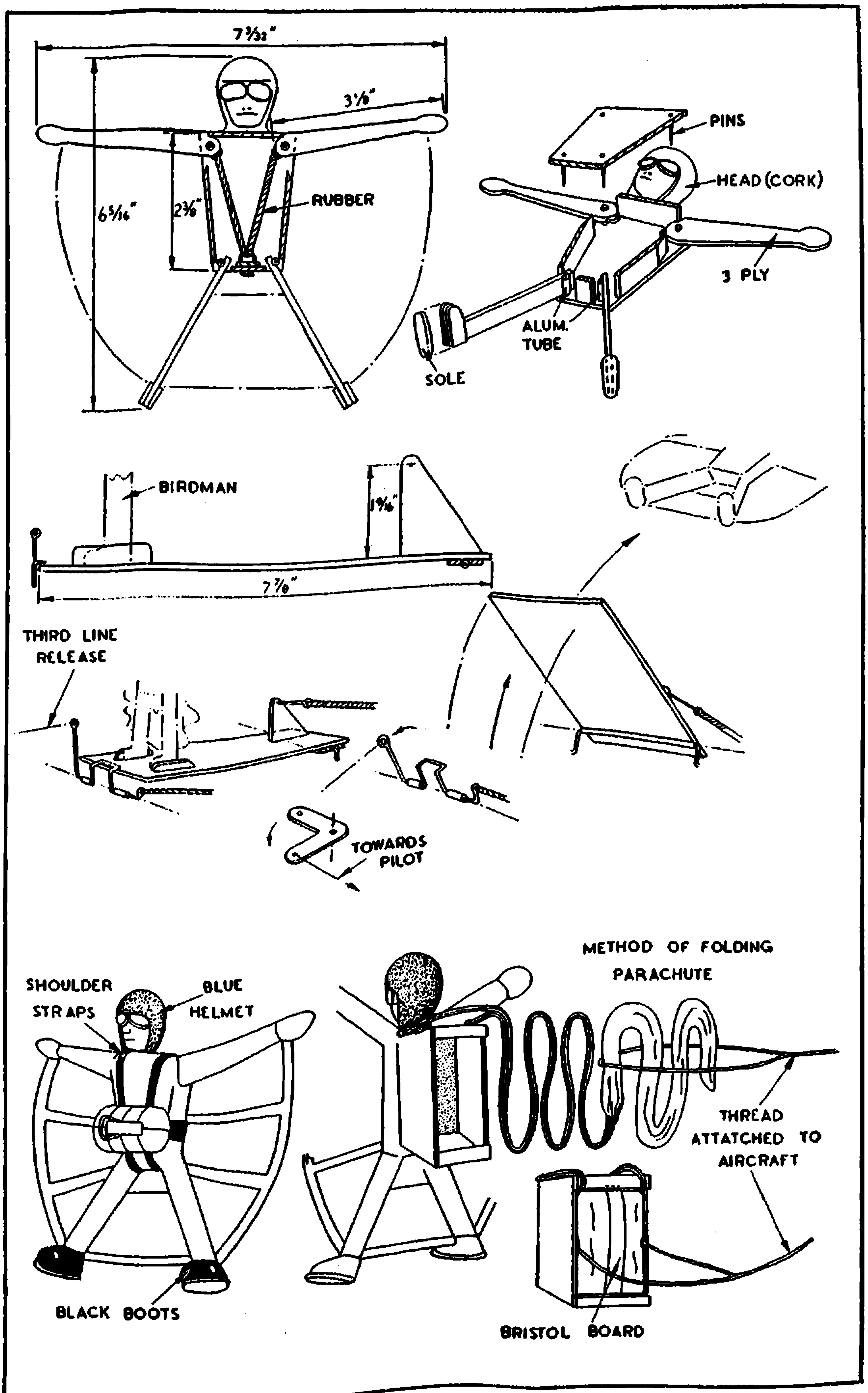
French modeller Moreau provided the model which has been thoroughly tested and proved a great success on club rallies, galas, and other occasions where a little extra spectacle goes down well. Sketches are dimensioned, and while smaller Valentins can be made, they are not recommended as they are too small to be readily visible in the air—particularly if free flight releases are to be made away from the main spectators.

Alternative release systems for third line or timer are illustrated. Basically they are the same, only difference being point of attachment of the pull cord. The basic platform is arranged inside the fuselage, so that Birdman can be slipped in place with his feet wedged between the two retaining pieces. By lowering the arms the wings are folded and retained in place by the elastic bands with just enough force to make a snug fit without jamming on release.

When the platform is released Birdman is thrust upwards and ejected. His arms swing up and he is away. Note the provision of an additional fine thread line from the aircraft attached to the parachute. This acts as a ripcord and by varying its length, duration of the Birdman antics can be adjusted.

Parachute should be of silk or stout tissue, and for size illustrated should be about 25 ins. in diameter, with sixteen lines evenly spaced round the circumference of about 30 ins. long. Note the strip of Bristol board which holds the parachute in place until jerked out by the pull of the release thread.

Valentin is an amusing figure that can be produced in less than an evening's work. Those unskilled in modelling a suitable head may find a small celluloid doll—usually acquired nude with a little bath—can be decapitated to substitute for the cork carved head.


7 3/32"
3 1/8"
6 5/16"
2 3/8"
RUBBER
PINS
HEAD (CORK)
3 PLY
ALUM. TUBE
SOLE
BIRDMAN
1 9/16"
7 7/8"
THIRD LINE RELEASE
TOWARDS PILOT
METHOD OF FOLDING PARACHUTE
SHOULDER STRAPS
BLUE HELMET
THREAD ATTATCHED TO AIRCRAFT
BLACK BOOTS
BRISTOL BOARD

RADIO CONTROL REVIEW

By H. G. HUNDLEBY

George Zigic launches Yugoslavia's first radio model on its first flight. This design is outstandingly stable on the turn, maintaining height even under full rudder application.

TO THOSE who have been hesitating on the threshold of Radio Control flying, let us state emphatically that technical radio knowledge is *not* necessary, although a limited knowledge of basic electricity is a great help. If you are a reasonably experienced model bod, know how to solder, and are prepared to be meticulously thorough in your modelling habits, then radio control can be your metier. *If*, however, you are one of those people who are incapable of making a good soldered joint; cannot appreciate that a battery has a positive and a negative terminal; and are somewhat careless in your modelling, then leave well alone.

THE BASIC PRINCIPLES.

Since the beginning is always the best place to start, let us describe in simple terms the basic principles and equipment used in radio control as applied to model aircraft.

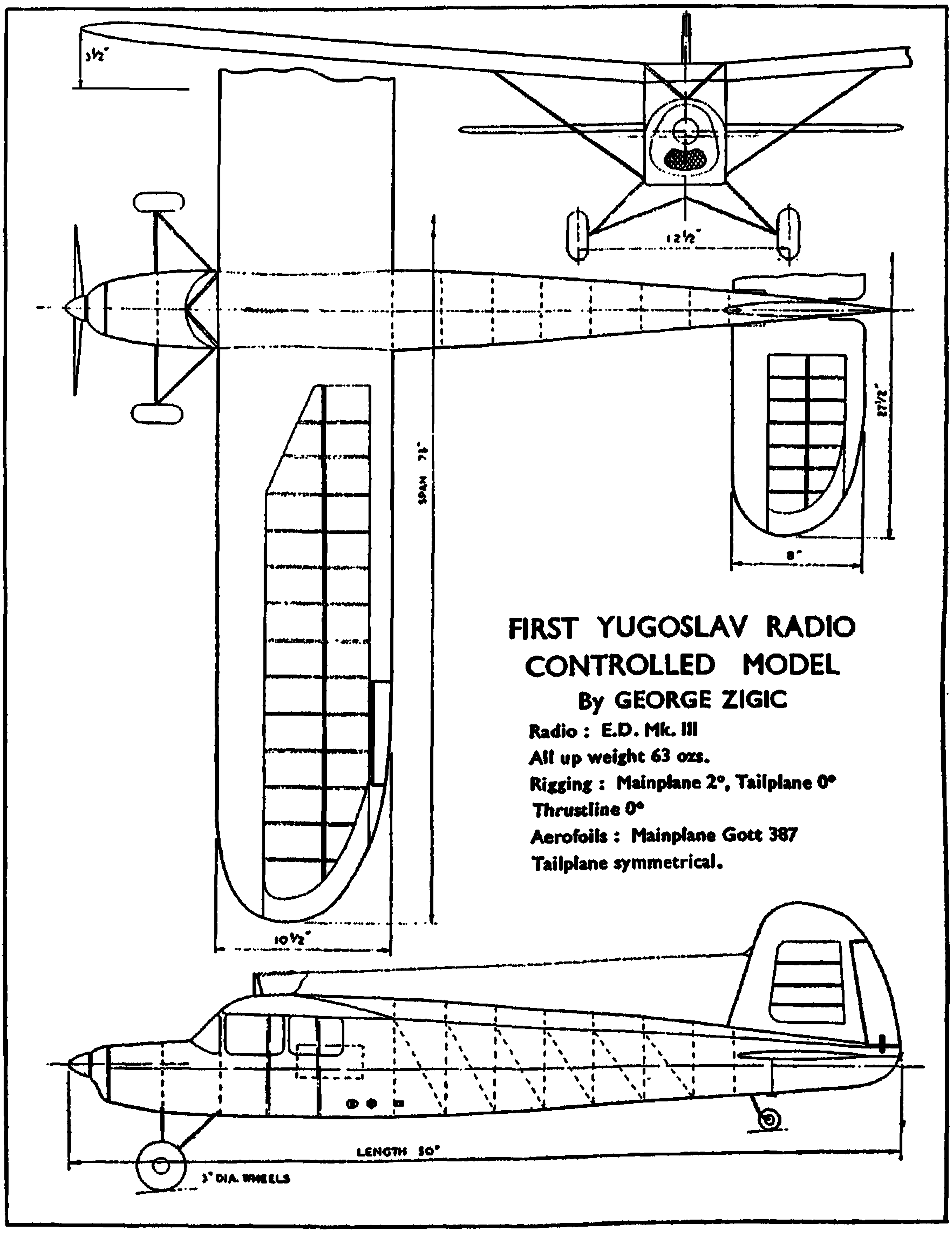
The *Transmitter* is normally a rectangular and portable case containing the transmitter set itself, a high tension battery and a low tension battery. On it is mounted an aerial, a switch, an extension lead with push button control, and in some cases a milliammeter. When operated it sends out a signal on the prescribed wavelength which is picked up by the receiver.

The *Receiver* is so designed that receipt of a signal results in a current change within the receiver circuit. In this circuit is incorporated what is known as a *Sensitive Relay*, which is in simple language an electro-magnetic switch designed to operate at a certain current. Any change of current resulting from receipt of a signal by the receiver, either opens or closes the relay.

If we connect another simple electric circuit to the opening and closing portions of the relay, usually known as the *points* or *contacts*, then it is obvious that we can switch this circuit on or off by pressing the transmitter button. And so by connecting in this last mentioned circuit a mechanical, solenoid-operated device known as an *Escapement*, which is capable of operating the control surfaces of a model, we have completed a chain of events which enable us to radio control a model aeroplane.

MODEL DESIGN.

It is impossible to list all those designs which are suitable, but any high wing cabin model of the sport flying type of approximately 4 ft. 6 in. span upwards would suffice. Examples that come to mind are the Keil Kraft " Junior 60 " and " Falcon," Veron's " Stentorian " and A.P.S. designs such as " Eros," " Phoenix," " Black Magic," etc. For those who wish to start from scratch there are a handful of designs available in this country specifically for radio such as the famous " Rudder Bug," by Walt. Good, the late " Funf " Taylor's " Whiplash," and the author's " Sparky."



BRITISH COMMERCIAL RADIO CONTROL EQUIPMENT

Name	Type	Weight	Size in Inches	Valves	Batteries	Price inc. P.T.
E.D. Mk. I TRANSMITTER	Two valve, pre-tuned L.F. modulator and H.F. oscillator circuit. 1.2 watts.	12 lbs.	9½ x 4½ x 6	F.P. 220 and P. 215	H.T. 120 volt " Winner." L.T. 1½ volt " All-Dry No. 1."	£6 1s. 0d.
E.D. Mk. I RECEIVER...	Three valve, super-regenerative with positive feed-back.	7 ozs.	5 x 3¾ x 2½	Hivac XL Hivac XSG Hivac XY	H.T. 67½ volts three B/122. L.T. 1½ volts D.18 or D.19. G.B. 6 volts four D.14.	£9 12s. 3d.
E.D. Mk. I ESCAPEMENT	Clockwork actuated 2 or 4 pawl types available.	2½ ozs.	3 x 1¾ x 1½		4 ½-volt 1289 or three ½ Pencells.	£2 18s. 11d.
E.D. Mk. II TRANSMITTER	Dual purpose for carrier operation or for modulated carrier. 4 watts.	10 lbs.	9½ x 8 x 8	D.C.C. 90	H.T. 120 volt " Winner." L.T. 1½ volt " All-Dry No. 1."	£7 0s. 0d.
E.D. Mk. II RECEIVER	Three valve miniature, with positive feed-back. Bakelite case.	4½ ozs.	4 x 2½ x 1½	Three X.F.Y. 12	H.T. 45 volts, two B.122. L.T. 1½ volts, D.18 or two ½ Pencells. G.B. 6 volts, four U.2.	£10 10s. 0d.
E.D. Mk. III TRANSMITTER	Single valve, cross-fed Hartley oscillator.	12 lbs.	9½ x 4½ x 6	D.C.C. 90	H.T. 120 volt "Winner." L.T. 1½ volt " All-Dry No. 1."	£5 14s. 9d.
E.D. Mk. III RECEIVER	Single valve super-regenerative.	1¾ ozs.	Cylinder 1½ in. dia. x 3½	X.F.G. 1	H.T. 45 volts, two B.122. L.T. 1½ volts, one ½-Pencell.	£3 14s. 5d.
E.D. Mk. III ESCAPEMENT	Lightweight self-centring. Rubber driven and incorporates current-saving device.	⅞ oz.	2½ x 1½ x ½		4½ volts, three ½-Pencells.	£1 2s. 11d.
E.D. MINIATURE ESCAPEMENT	Rubber driven, self-centring.	¾ oz.	1½ x 1½ x 1		4½ volts, three ½-Pencells.	£1 2s. 11d.
E.D. HAND TRANSMITTER	Miniature, 1½ watt. Single valve	25 ozs.	2½ x 4½ x 5	D.C.C. 90	H.T. 67½ volts B.101. L.T. 1½ volts D.9.	£6 5s. 0d.
E.D. Mk. IV RECEIVER	Three channel, tuned reeds. Reed unit also available separately.	9½ ozs.	3½ x 2¾ x 2	Two XFY 12 One 3S4	H.T. 45 volts, two B.123. L.T. 1½ volts, one D.18. Polarising battery for reeds, one B.122.	Not yet known
E.D. Mk. III RELAY	Balanced armature, 5,500 ohms. 45 volts.	⅞ oz.	1 x ½ x 1			£1 2s. 6d.
E.D. POLARISED RELAY	Polarised balanced armature, 3,500 ohms. Capable of operating at .5 m.a.	⅞ oz.	1 x ⅞ x 1			£1 15s. 0d.
E.C.C. TELECOMMANDER 950A RECEIVER ...	Single valve super regenerative, with permeability tuning. Bakelite case.	2 ozs.	1½ x 2½ x 1½	One XFG 1	H.T. 45 volts, two B.122. L.T. 1½ volts, one ½-Pencell.	£4 7s. 6d.
E.C.C. TELECOMMANDER 951 RECEIVER ...	Single, hard valve quench type.	—	—	One 1S4 or 3S4	H.T. 45 volt, two B.122. L.T. 1½ volt, one D.18,	Not yet known
E.C.C. STANDARD TRANSMITTER	Push-pull stabilised oscillator circuit.		9 x 6 x 6	Two 3A4	H.T. 90 volts Portable 61. L.T. 1½ volts, All-Dry 32.	£5 0s. 0d.
E.C.C. PILOT TRANSMITTER	Push-pull stabilised oscillator circuit.			Two 3A4	H.T. 90 volts, Portable 61. L.T. 1½ volts, All-Dry 32.	£6 17s. 6d.
E.C.C. INTERNATIONAL TRANSMITTER ...	Push-pull stabilised oscillator circuit, with built-in indicator lamp and milliammeter.			Two 3A4	H.T. 90 volts, Portable 61. L.T. 1½ volts, All-Dry 32.	£8 8s. 9d.
E.C.C. CLUBMAN TRANSMITTER	Push-pull oscillator, feeding push-pull R.F. amplifier, cathode modulated via a 6AK6 pentode, fed by 9002 L.F. oscillator. Rotary generator includes keying relay.			Two ECC 91 One 6AK6 One 9002	One 6 volt motor cycle accumulator.	£18 15s. 0d.
E.C.C. TYPE 3 ESCAPEMENT	Rubber driven with current saving device, interchangeable rotors available.	⅞ oz.	2½ x 1¾ x ⅞		3 volts, 2 ½-Pencells.	£1 1s. 10d.
E.C.C. TYPE 5a RELAY	Balanced armature, with silver contact points and grub screw adjustment. Coil resistances available between 1,000 and 8,000 ohms.	½ oz.	1 x 1½ x ⅞			£1 11s. 3d.
FLIGHT CONTROL Mk. III TRANSMITTER ...	Two valve push-pull TPTG Circuit. 4.5 watts.	Optional	Optional	Two 3Q5	H.T. 180 volts, two 90 volt L5509. L.T. 1½ volts, All-Dry No. 1 or 5050.	£2 11s. 8d. (Kit only)
FLIGHT CONTROL Mk. III RECEIVER	Single valve, self-quenched, super regenerative, band spread tuning.	2½ ozs.	2¾ x 1⅞ x 2	One XFG1	H.T. 45 volts, two B.122. L.T. 1½ volts, one ½-Pencell.	£2 19s. 1d. (Kit only)

All of the above manufacturers are prepared on demand to provide most of the above equipment to suit overseas frequencies.

BRITISH COMMERCIAL RADIO CONTROL EQUIPMENT

Name	Type	Weight	Size in inches	Valves	Batteries	Price inc. P.T.
FLIGHT CONTROL Mk. IV TRANSMITTER ...	Two valve self-excited oscillator with Colpitts anode circuit.	Optional	Optional	Brimar 3D6 BG8	H.T. 90-147 volts. L.T. 1½ volts, L.5050.	£2 15s. 7d. (Kit only or with Chassis assembled, wired and tuned 25s. extra)
IVY RECEIVER	Single hard valve, quenched.	2¼ ozs.	3½ x 1⅞ x 1½	One 1S4	H.T. 45 volts, two B.122 or 90 volts, four B.122. L.T. 1½ volts, D.18 or D.19.	£4 7s. 6d.
MINIMITER TRANSMITTER	Two valve push-pull Hartley oscillator.	20 ozs.	8½ x 2⅜ x 2	Two DL92	H.T. 90 volts, one B.126. L.T. 1½ volts, one D.18.	£4 7s. 6d.

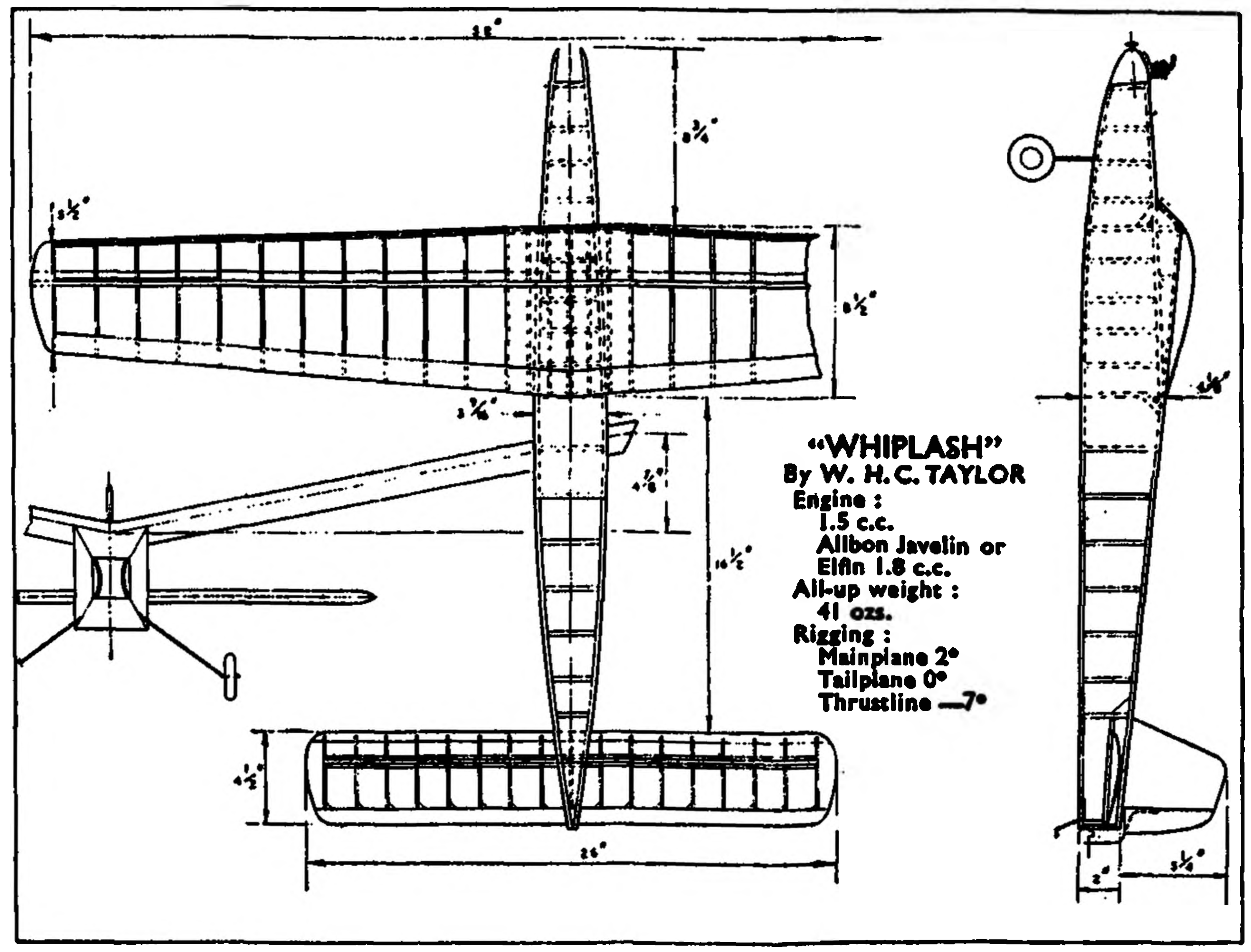
Bill Tickner launches for Sid Sutherland in the 1951 Taplin Trophy, watched by contest Judge Max Coote.

Before considering any of the above it must be decided as to what type of radio flying is desired. The average sport flying cabin job is perfectly satisfactory for normal pleasure flying, but will lack the necessary penetration and " stuntability " for contest work. Two excellent examples of opposite trends in radio control design are given with this article.

Sid Sutherland's " Old Faithful " needs little introduction. As one of the outstanding R/C stunt designs of British aeromodelling it has many contests to its credit. It is practical in appearance, rugged in construction, and is capable of remarkable penetration in winds of almost gale strength. Power unit is an Amco 3.5, which is also the engine used in George Zigic's model that the author watched perform its first test flight in Yugoslavia this year. The contrast in flight characteristics between these two machines was most interesting, and a study of their design features is recommended to those who intend to try their own hand.

The main design considerations for radio control stunt models over and above normal requirements are penetration; ability of the machine to fly " hands off " into wind when left to its own devices and aerobatic ability. Rigging of the flying surfaces; the C.G. position; the lengths of the nose and tail moments; and the all important question of loading governs the first and third requirements. Fin area in the main controls the second. For penetration there is no doubt that high wing loadings are essential and it is no coincidence that all of the designs given in this article and also the author's stunt models have loadings around the 1 pound per sq. ft. mark. The centre of gravity should for fairly obvious reasons be placed in a more forward position than that for normal free flight trim and 25% of the chord back can be taken as a good approximation.

Rigging is a variable; in other words various methods can be used to reach the same end. Both " Whiplash " and " Old Faithful " use long nose moments coupled with normal tail moments to achieve the desired nose down attitude for penetration, whereas the writer has found a normal nose moment plus an abnormally short tail moment to be most successful. The latter combination has the additional advantage of increasing manoeuvrability and makes looping easier providing the slight loss of longitudinal stability is taken care of by a lifting tail. Without hesitation your scribe states here and now that the lifting tail correctly rigged is one of the greatest boons to radio design yet, and again it is significant that all the above mentioned stunt jobs are so equipped. By virtue of slipstream effect the lifting tail keeps the nose down with power on, and loses most of its effectiveness on the glide.



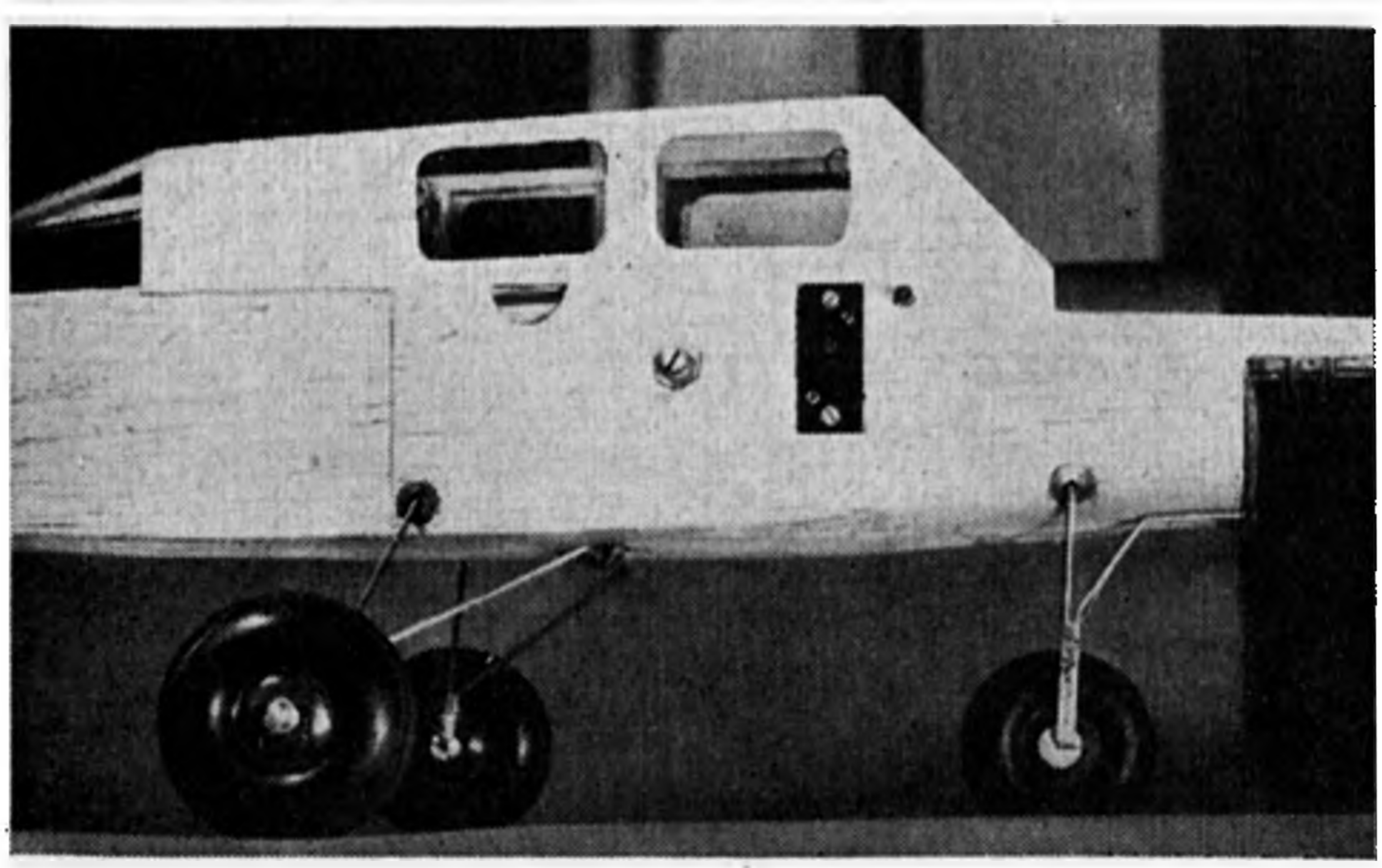
"WHIPLASH"
By W. H. C. TAYLOR
Engine: 1.5 c.c. Allbon Javelin or Elfin 1.8 c.c.
All-up weight: 41 ozs.
Rigging: Mainplane 2° Tailplane 0° Thrustline —7°

Fin areas of between 8 and 10% should provide adequate directional stability coupled with dihedral angles up to 10°. Increasing dihedral beyond this amount produces a design that persists in rolling off the top when attempting to loop. Polyhedral also produces the same undesirable effects, so keep your dihedral angles straight. It is a good plan to employ an underfin as this provides plenty of area where it will do most good, *i.e.*, in the slipstream. Rudder area should be approximately one-fifth to one-third of the total fin area and the amount of movement around 5°. As a general principle it is better to use a large area and a small amount of movement rather than the reverse, as this keeps glide response good.

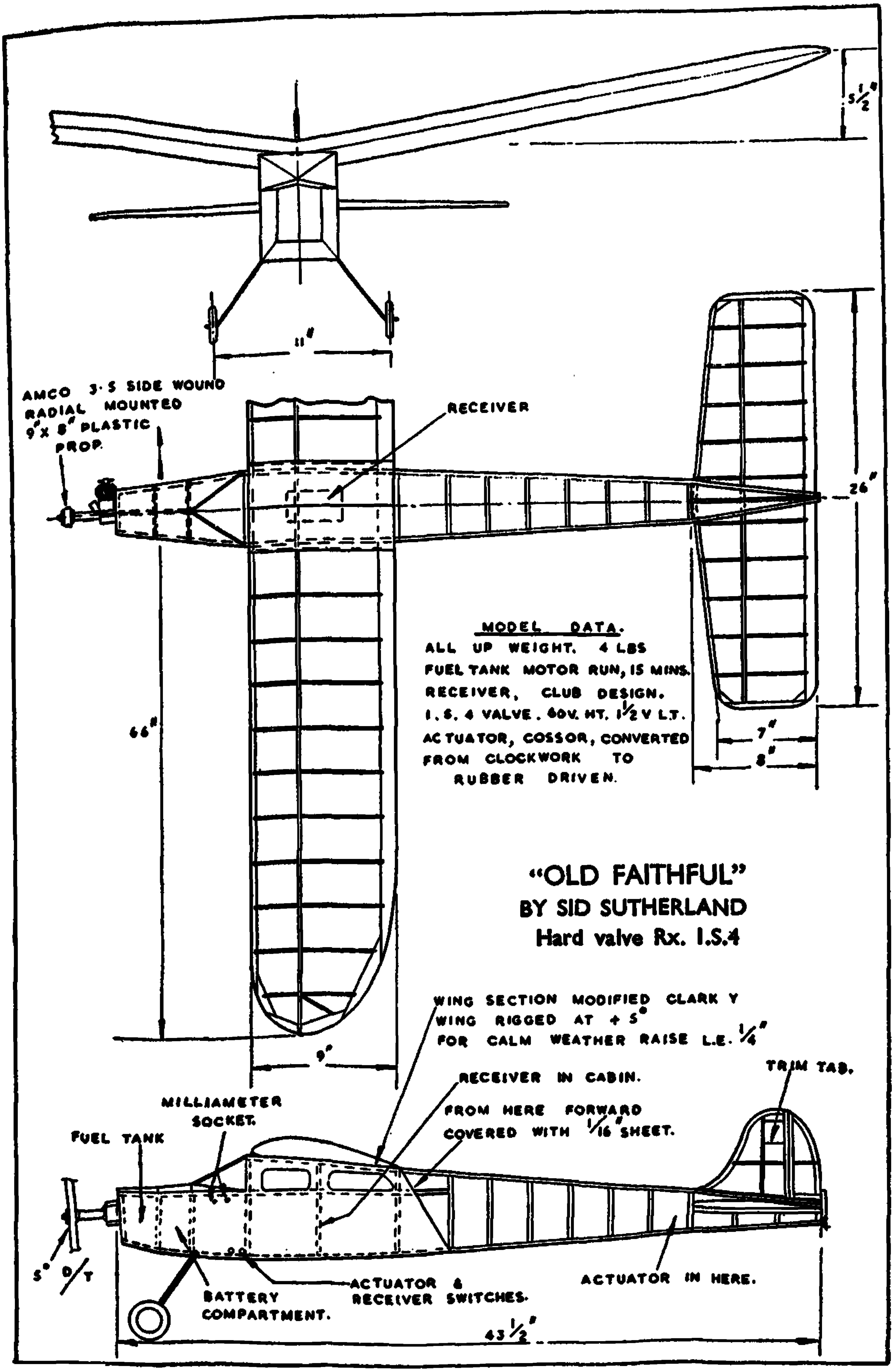
STRUCTURAL CONSIDERATIONS.

It is obvious that additional strength is required in certain places, especially for aerobatic models. We need a fuselage of sufficient size to accommodate the equipment and we need to be able to get at that equipment on the field without dissembling the model. Wings must be capable of withstanding dives, zooms, and other rapid changes of attitude, and there is a good case for the use of hardwood spars, and wing struts with models above 5-foot span. High wing cabin designs with doors for radio access are prone to weakness around the cabin, especially as the wing shocks are transmitted at this juncture. When it is considered that undercarriage shocks also occur around the same area it is plainly obvious that this particular portion of the fuselage should be the strongest.

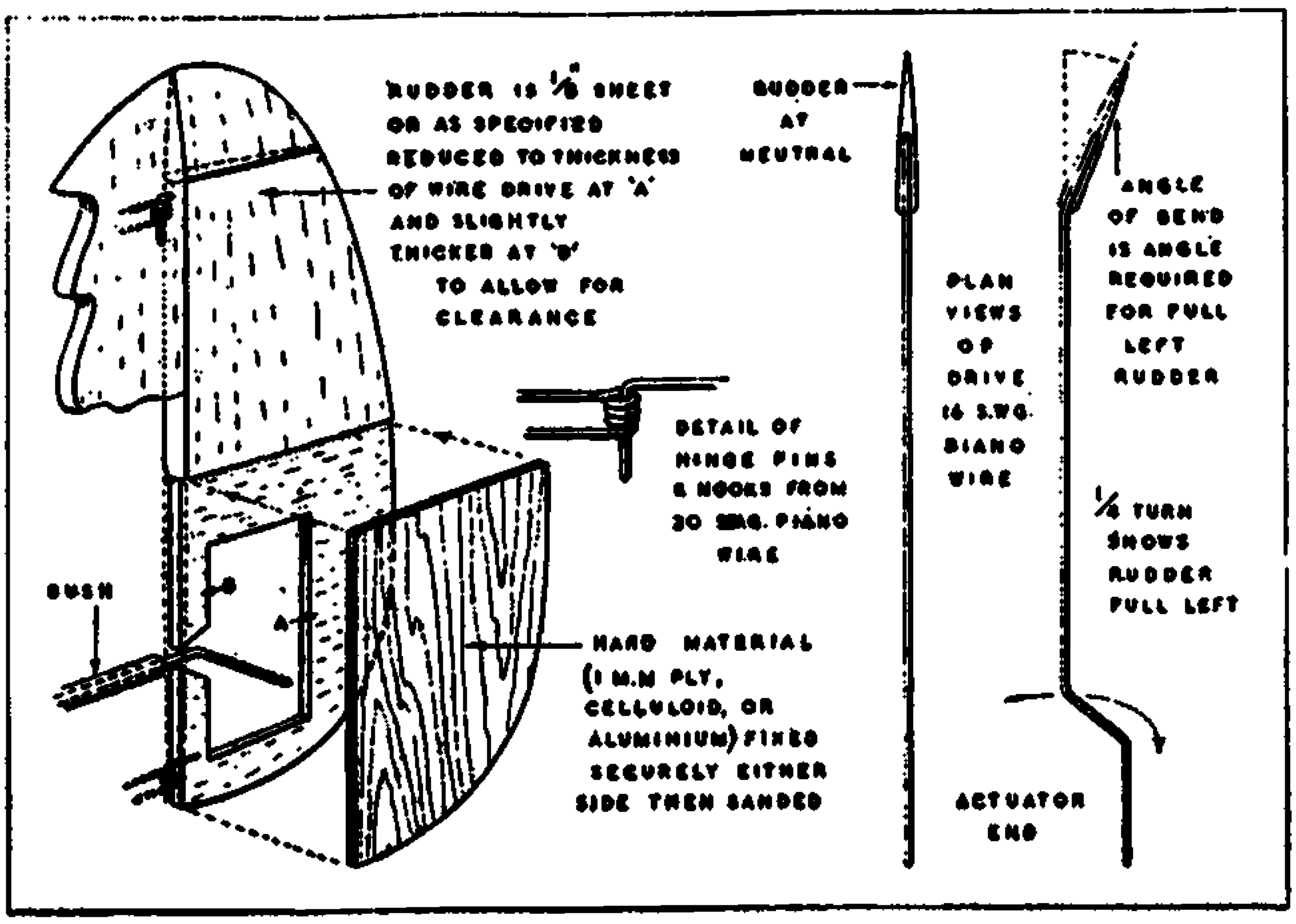
As comparatively high loadings are essential, the additional weight at the designer's disposal should be intelligently used to boost structure at the vital points. Complete sheeting of the fuselage to well aft of the trailing edge of the wing is most desirable and plywood formers should be



Two views of the author's latest tricycle job, demonstrating operation of the rubber band "springing" on all three undercarriage members.



"OLD FAITHFUL"
BY SID SUTHERLAND
Hard valve Rx. I.S.4



Totally enclosed rudder system devised by D. Hodge of Stonehaven, of particular value for R.C. scale models.

used wherever possible. All undercarriageattachment points should be preferably of plywood with undercarriage tubes securely bolted in position and not merely sewn and glued as in normal practice.

Whilst on the subject of u ndercarriages we would mention that they must be capable of settling a fast and heavily loaded model on the deck, and herefore must work ! With this thought in mind the author has for some time been using pivoting legs with rubber band springing. The general principle is that the leg travels rearwards against the tension of the rubber which absorbs the majority of shock. This is only the broad principle which can be altered and developed for even the largest of radio models. P. E. Norman, that well-known exponent of heavyweight flying scale models, employs the same principle, but utilises Terry coil springs.

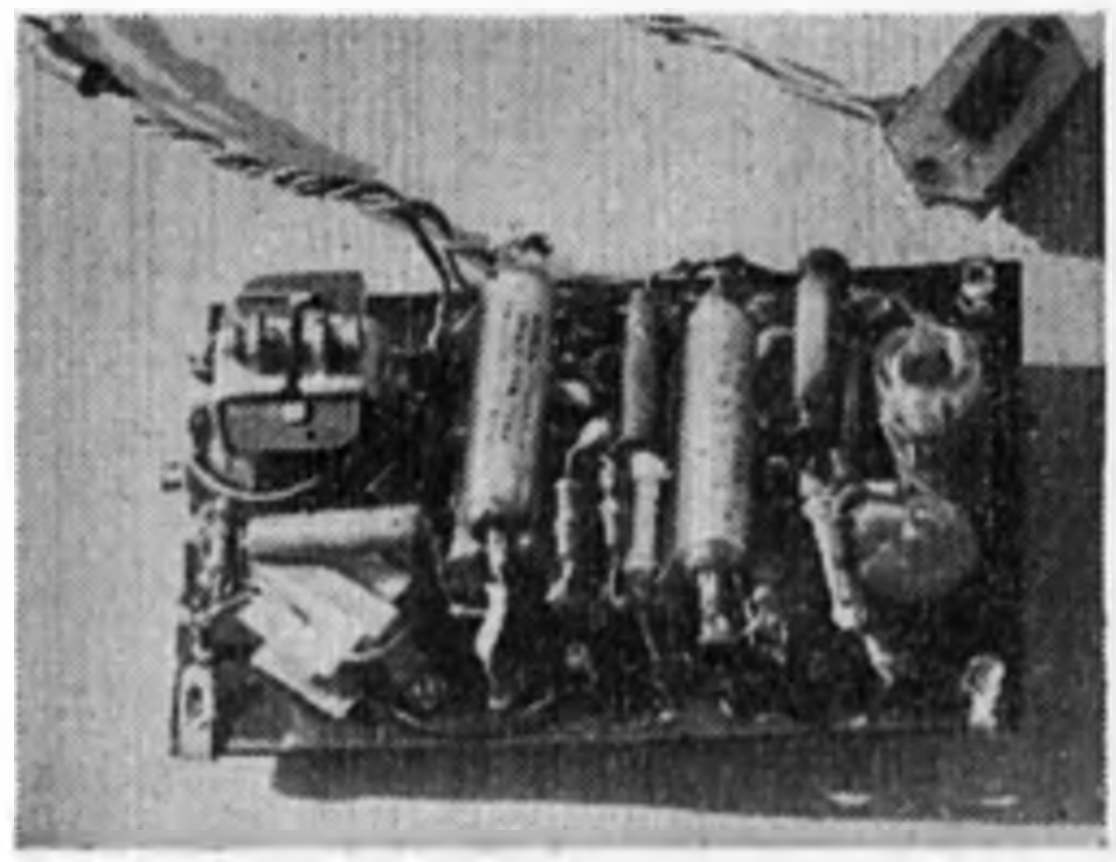
Radio Equipment.

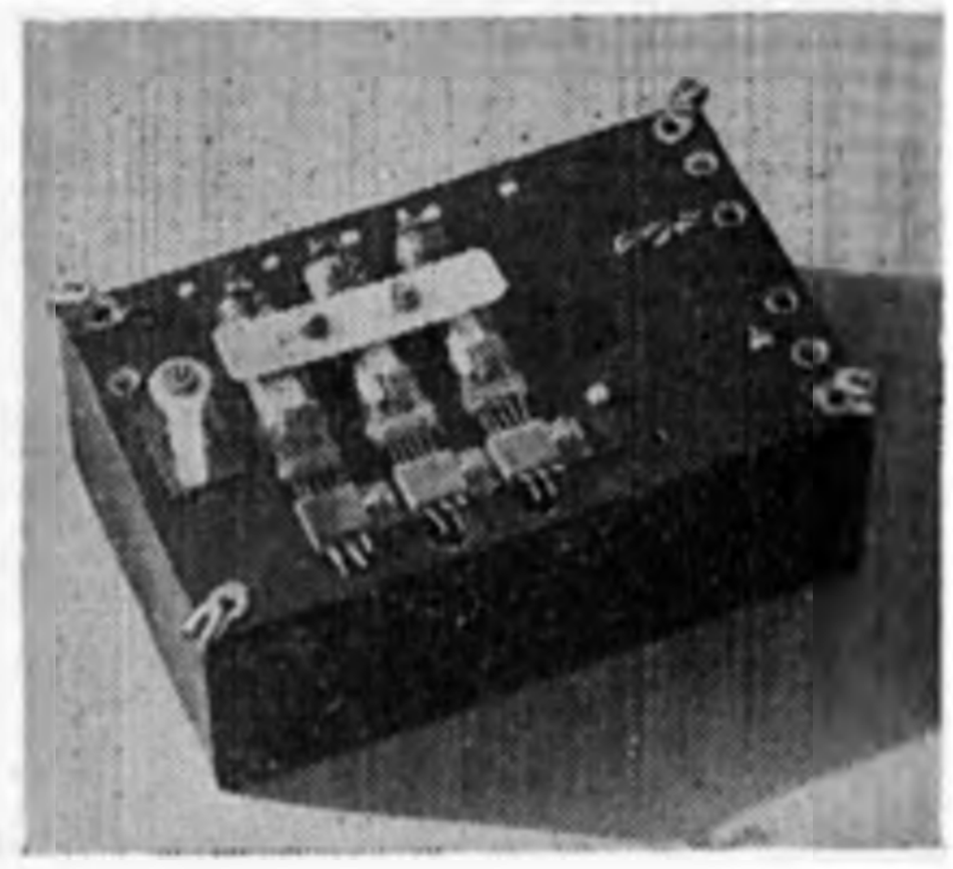
Again a word to those who were hesitating on the threshold and we hope are now really hitched to the R/C bandwagon. Assuming that their model has been decided upon, the next thought will be the equipment, method of installation, number of controls, etc.

Dealing with the last consideration first, the answer is a " must." One control only, that being rudder. It is the simplest and the safest, yet provides anything up to figure eights, spins, loops, and Immelman turns. Introducing additional controls introduces additional complications and the human element finds it difficult to cope. Rudder movement is simply obtained via the escapement mechanism of which several excellent commercial examples are available.

Varying forms of rudder linkage may be employed, but again the simplest is the most efficient, so for your first attempt use the normal single crank operating a yoke attached to the rudder. It can be wound from the rear and is quite positive in action. Make sure that the rear bearing is absolutely free and do not use tubing as this may tend to bind on the shaft should the latter be slightly out of line. It is better to use a small strip of tinplate with a hole drilled to form a bearing. Again with the rudder hinges themselves make certain that they operate freely. The writer has used linen hinges, but recommends the use of " lifting pin " type hinges which are much more frictionless in action.

Two views of the E.D. Mk. II miniature 3-valve receiver.



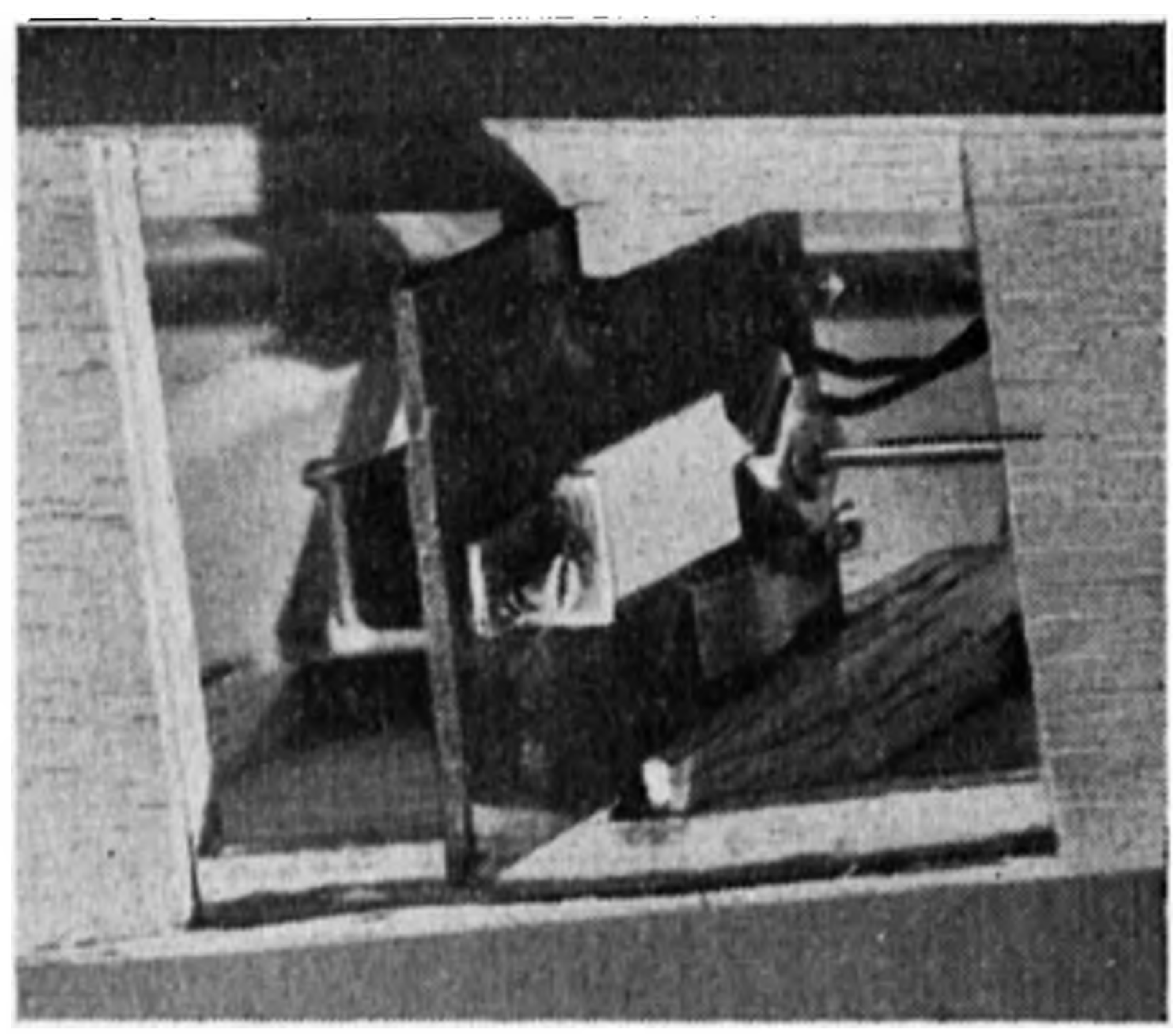


Wiring diagrams are provided with all the commercial sets and installation is mainly a matter of intelligently positioning the various controls. Most people place their metre socket, potentiometer, aerial trimmer, and tuning control on the starboard side (facing forwards) and their switches on the port side near the nose.

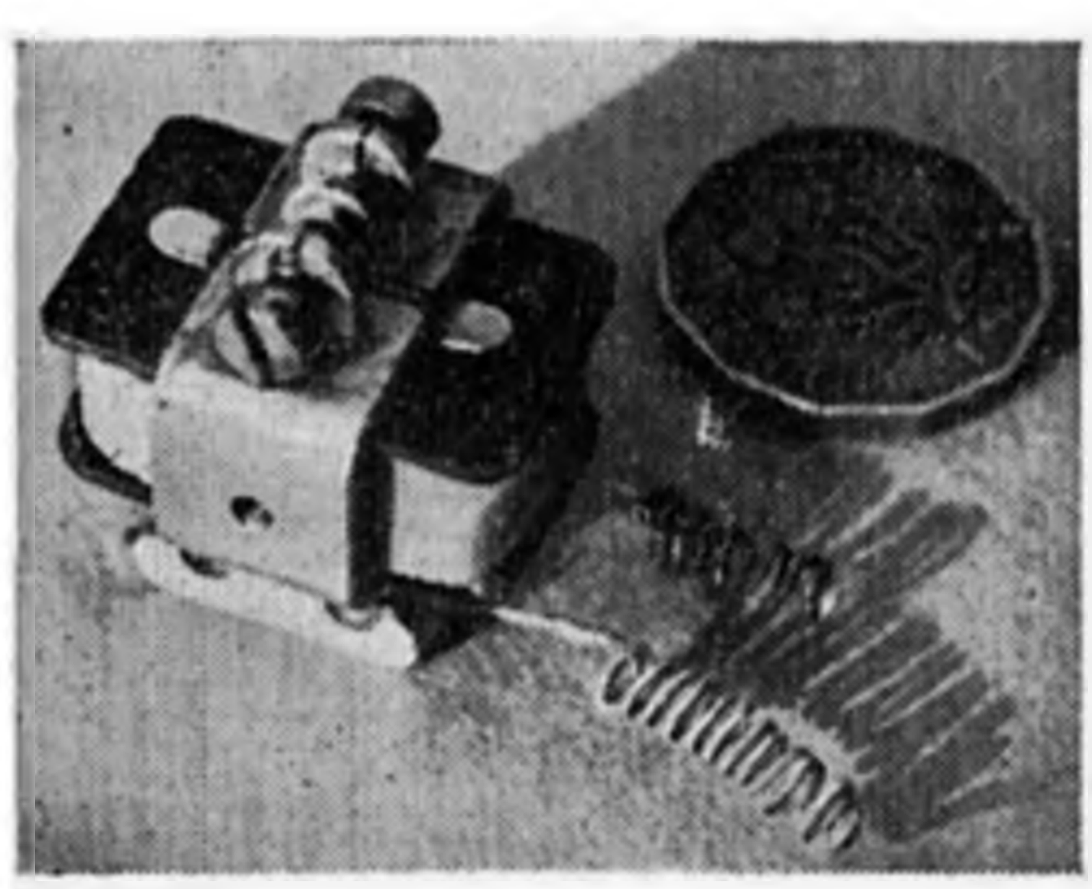
The importance of first class soldered joints for all electrical connections cannot be over-emphasised and, for pity's sake, use a *hot* iron so that the solder really runs and does not congeal in a lumpy mass which invariably results in a dry joint.

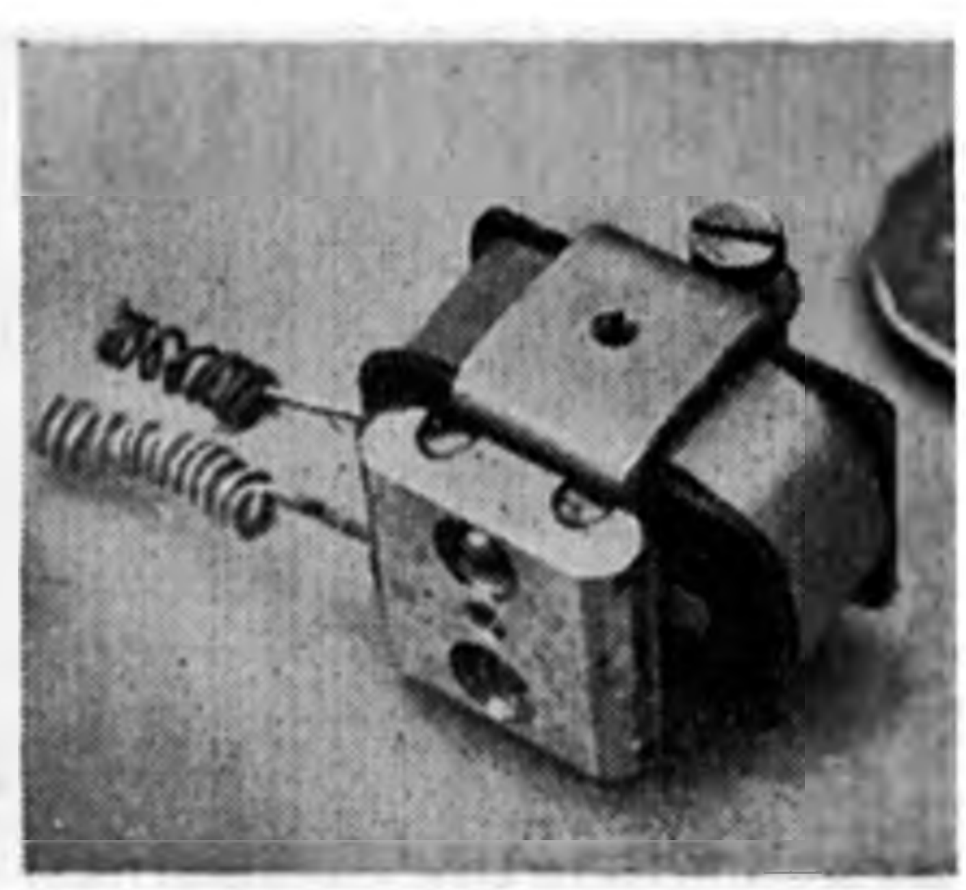
Batteries should be taped together with Sellotape and the H.T. battery leads can be soldered in place as these need very occasional replacement. L.T. and escapement connections can be effected by soldering press-studs to batteries and leads, or they can be merely twisted together and a rubber sleeve slipped over the joint. In any event, ensure that the connections are positive. The batteries should be positioned low down in the fuselage in front of the receiver and preferably in their own compartment. It is a good plan to either hold them down with a stretched rubber band or to line two sides of the compartment with sorbo rubber which grips the batteries when the door is shut. The escapement itself should be mounted as near the rudder as is feasible and one good method of installation "swiped" from Bill Tickner is shown in the photograph. The leads are left long enough for withdrawal and the escapement is a slightly loose fit in the slot which permits a certain amount of self-centring action, giving 100% alignment to the crank.

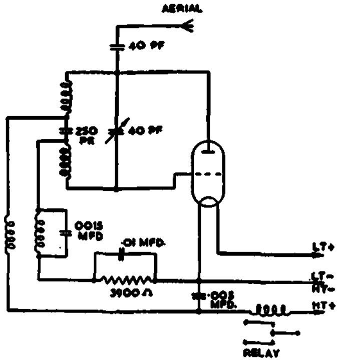
Right is a useful method of escapement installation, featuring an E.C.C. Star Wheel type escapement fitted with current saving device.



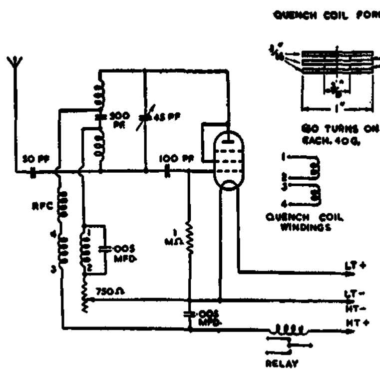
Below are two views of the latest E.D. Polarised Relay which weighs only 7/8 oz.







GOOD BROS. CIRCUIT USING HALF A 3A5 VALVE.



"QUENCH" TYPE 1S4 CIRCUIT

Choice of receiver is a matter for the individual and as readers can see from the commercial list, there are many to choose from.

To date, we have had the most experience with the lightweight X.F.G.1. types which employ a " soft " thyratron valve of limited life. Much has been written about the trials and troubles of the X.F.G.1 and the writer's only observation is that he had not experienced any trouble himself and furthermore has been using the same valve in his set the whole of this season. It is felt that quite a number of people who have claimed only a few hours' life from these valves have not used a circuit that is ideally suited. The X.F.G.1 receivers are lighter and their battery consumption is less than in the new hard valve types, which advantages must be compared with the almost indefinite valve life of the " hard " type with its heavier battery consumption. Many of the leading fliers have changed from " soft " to " hard " during 1951. Sid Sutherland, for instance, uses a 1S4 circuit developed in conjunction with the late " Funf " Taylor and Bill Tickner. A great deal of experimental work has been conducted on these hard valve quench type receivers during the past year and two typical circuits are given for those readers who would prefer to build their own. With them is the original Good Bros. circuit.

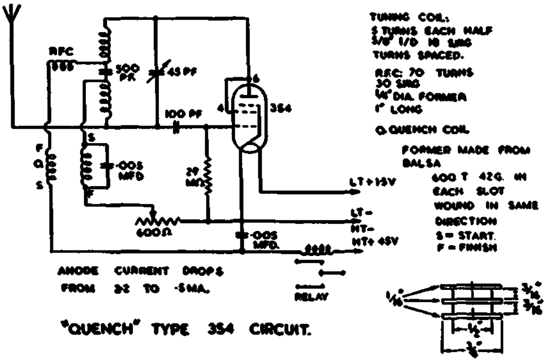
Receiver mounting is an item over which much care should be taken. The usual method is to suspend same between rubber bands of adequate tension. Do not underestimate the amount that even a 2-ounce receiver can move forward when a fast moving model comes to an abrupt halt and allow accordingly! In small models with limited cabin room, glue also a sorbo rubber pad to the bulkhead in front of the receiver.

Operation and Flying

There is no doubt that if a proper system of checking is applied to one's radio flying, in other words a definite instrument and cockpit drill à la full size practice, then a crash should be a very rare thing.

Firstly, test your radio equipment thoroughly, both on the bench and later in the model, paying particular attention to the escapement.

The model itself should then be thoroughly flight tested, complete with all equipment barring the receiver, where an appropriate payload can be suspended. Conduct test flying in comparatively calm weather and do not be satisfied until the model flies straight, both under power



"QUENCH" TYPE 3S4 CIRCUIT.

and on the glide. A model flying anywhere near the stall is quite useless for radio flying; it should appear under elevated if anything.

With the model perfectly trimmed and the radio equipment operating faultlessly, you are then ready for your first flight. Set up the transmitter and if you have the necessary milliameter check that it is working satisfactorily. Carry out tuning checks to the receiver at a range of at least 100 yards, enlisting the aid of an experienced R/C flier if you can. Remember to check operation at range with the shorting plug in position after you have removed the milliammeter.

Flight procedure is :—

1. Wind escapement. 2. Switch on transmitter. 3. Check radio, firstly with milliammeter for correct standing current, etc., and secondly with shorting plug only. 4. Start engine. 5. Check radio, and you are then ready to launch.

After landing repeat the above sequence and continue to do so between *every flight*.

Persistent use of the milliammeter between each flight is one sure way to avoid trouble. This invaluable instrument shows the standing current, and can also be used to check the relay operation when used in conjunction with the potentiometer. If the standing current has dropped below the figure recommended and if you are unable to increase this by means of the potentiometer, then you have a fair indication that either your H.T. batteries are getting flat (very rare) or that the aerial length needs adjusting to compensate for ageing of the valve. If after several flights the standing current is wavering, *i.e.*, rising and falling just below the normal reading, then this is an indication that your L.T. batteries need renewing. It is a good plan to purchase an inexpensive voltmeter for checking all of the flight batteries at periodical intervals.

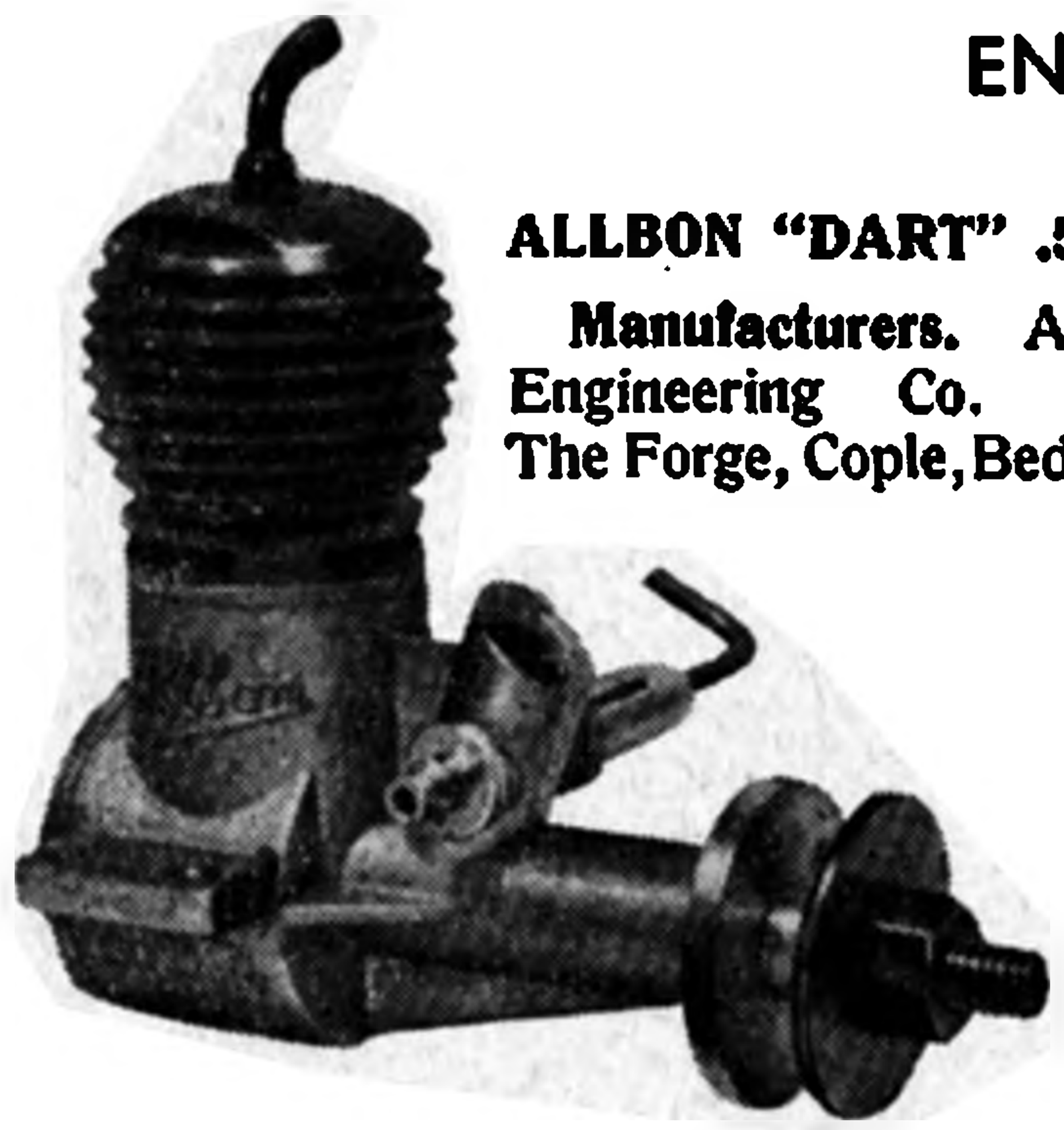
If you have any doubt of any single item of your equipment, then suspend flying operations until that doubt is removed. *You cannot take chances with radio control.*

Now comes the pleasurable part. Take it easy at first, just try one gentle turn after another. Use the button sparingly and attempt nothing clever until you have completed at least a dozen flights.

If there is anything other than a light breeze, fly well up wind before commencing any manoeuvres (another golden rule this !), remember that there is a definite time lag after you have taken off a turn. In other words, the model will continue turning for a second or two under its own inertia, so do not forget to allow for this. The way to gain altitude rapidly, is not to climb into wind, but to climb across wind.

There are dozens of little wrinkles to be learnt only from actual flying experience, so go ahead and get those flying hours in. But remember, CHECK and CHECK AGAIN between every flight.

ENGINE ANALYSIS



ALLBON "DART" .5 c.c.

Manufacturers. Allbon Engineering Co. Ltd., The Forge, Cople, Bedford.

Retail Price. 52s. 6d. plus Purchase Tax.
Delivery. Immediate.
Spares. Full spares and repair services available.
Type. Compression ignition.
Specified Fuel. Mercury No. 3 or No. 8.
Capacity. .54 c.c., .033 cu. in.
Weight. 1.2 oz.
Compression Ratio. Adjustable.
Mounting. Beam, upright or inverted.
Recommended Airscrew. 6×4 in., or 7×3 in.
Bore. .350 in. **Stroke.** .350 in.
Cylinder. Meehanite. Radial ports, 3 exhaust, 3 transfer. Cylinder screwed into crankcase.
Cylinder Head. Dural screwed on to cylinder.
Crankcase. Aluminium pressure die casting.
Piston. Meehanite, dural gudgeon pin carrier, conical top. No rings.
Connecting Rod. Dural.
Crankpin Bearing. Plain.
Crankshaft. Nickel chrome. Hardened, ground and lapped.
Main Bearing. Plain.
Little End Bearing. Plain.
Induction. Rotary shaft inlet valve.
Special Features. Gudgeon pin being retained inside piston prevents scoring of cylinder bore.

TEST

Engine. Allbon " Dart " .5 c.c. Diesel.
Fuel. Mercury No. 8.
Starting. Extremely good. Care must be taken not to flood the engine when run in an upright position, as the air intake of the carburettor is then vertical and may become filled with fuel.

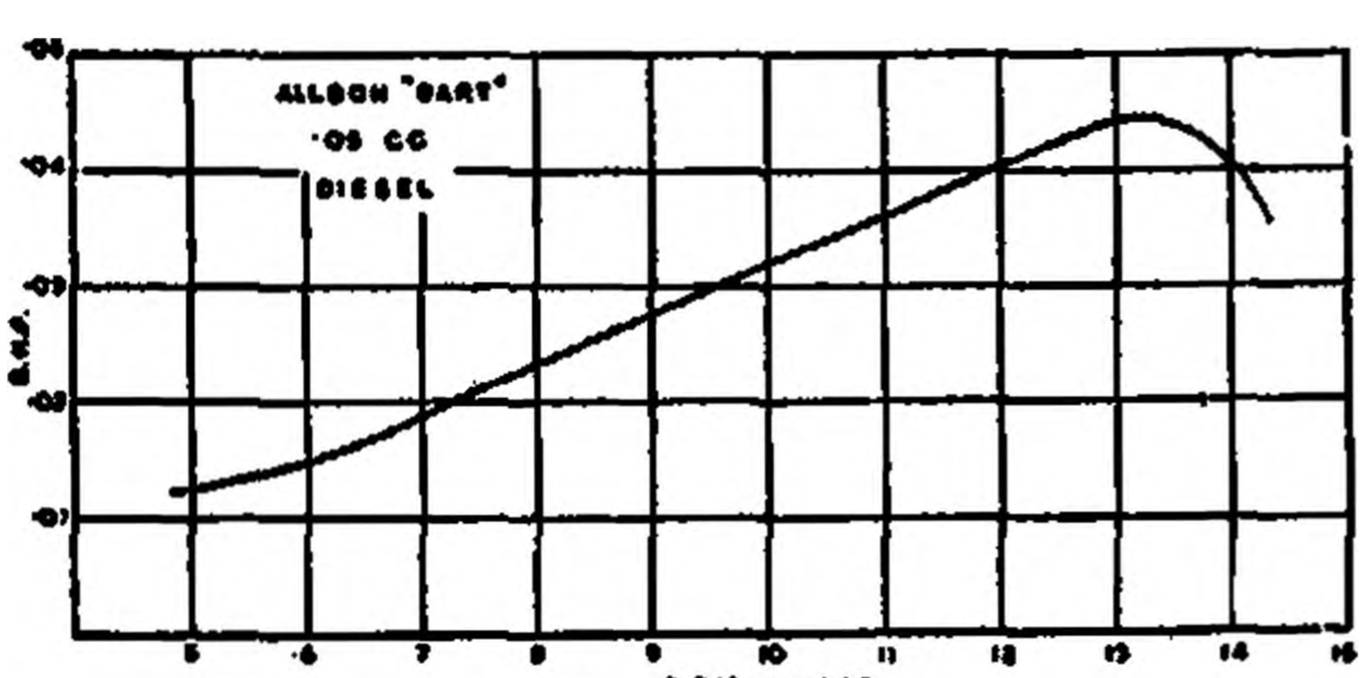
Running. Very steady over a wide range of speeds, but careful adjustment of the fuel-control needle is necessary at speeds above about 13,000 r.p.m.

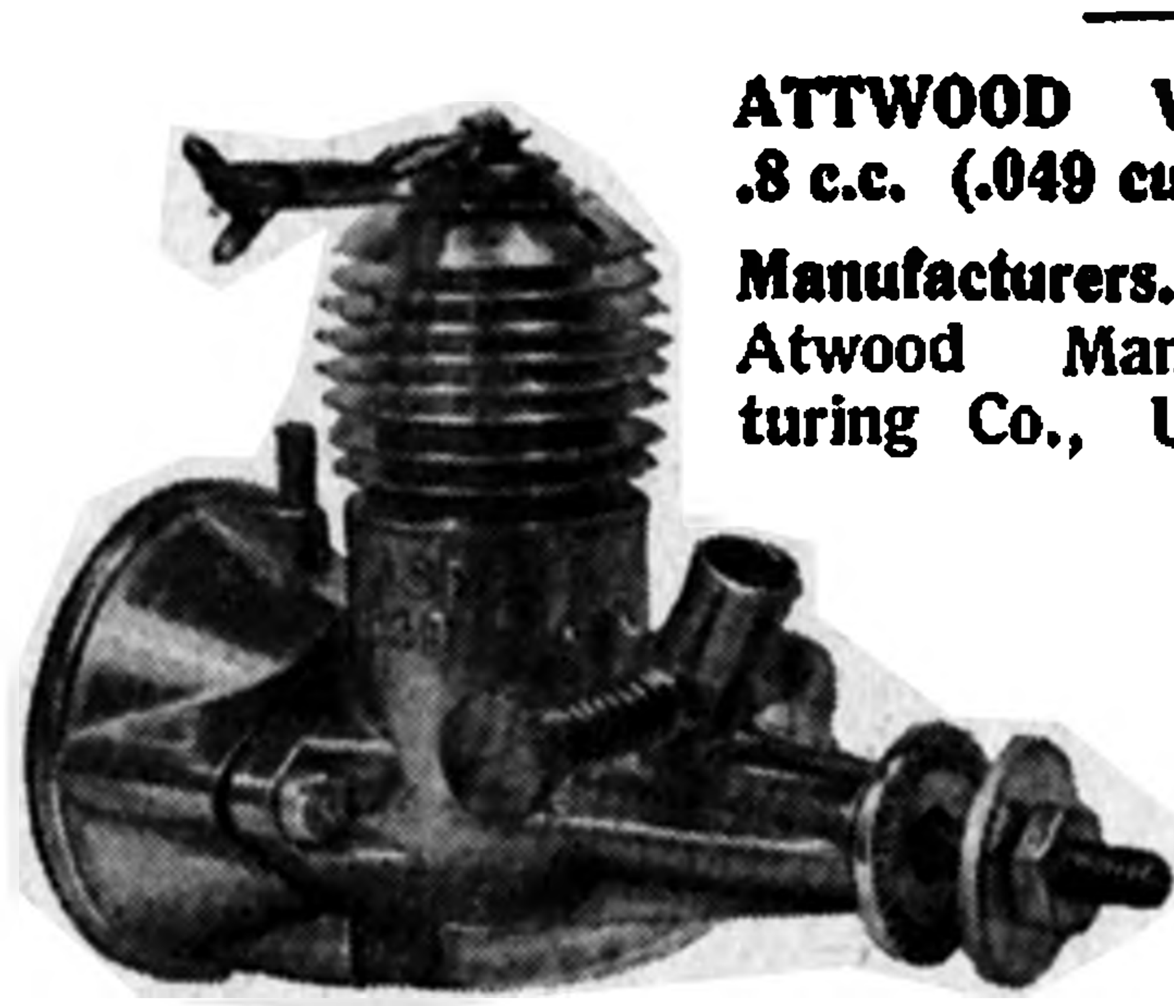
B.H.P. Starting at .012 b.h.p. at around 5,000 r.p.m., power rises steadily to a peak output of .0445 b.h.p. at 13,300 r.p.m. The engine may be considered to be running efficiently at speeds between 11,000 and 13,500 r.p.m. so that a fairly wide choice of airscrews is presented.

Checked Weight. 1.25 oz. less fuel tank.
Power/Weight Ratio. .575 b.h.p./lb.
Remarks. Tests were carried out with two separate engines, and the performance of one was better at the peak speeds. This may have been due to more careful running-in on the one engine, the latter having had two hours at about 6,000 r.p.m. with a fuel containing an added amount of lubricating oil.

The .033 cubic inches capacity prompts a comparison of Dart performance with that of contemporary American glow-plugged miniatures of between .035 and .045 cubic in.

Having operated the Dart quite successfully with an 8×4 in. propeller, we would have little hesitation in stating that here at least is a capacity at which the diesel shows superior power over its glow-plugged equivalent. No doubt many of our friends in the U.S.A. will find this motor a must for their " half A " classification of contest models.





ATTWOOD WASP .8 c.c. (.049 cu. in.).

Manufacturers. Atwood Manufacturing Co., U.S.A.

Retail Price. $6.75 (£2 8s. 4d. plus duty and P.T.).
Delivery. Not available in Great Britain.
Type. Glow-plug.
Bore. .421 in. **Stroke.** .356 in.
Stroke/Bore Ratio. .846.
Capacity. .803 c.c. .049 cu. in.
Mounting. Radial. **Airscrew.** 6 in.×3 in.

TEST

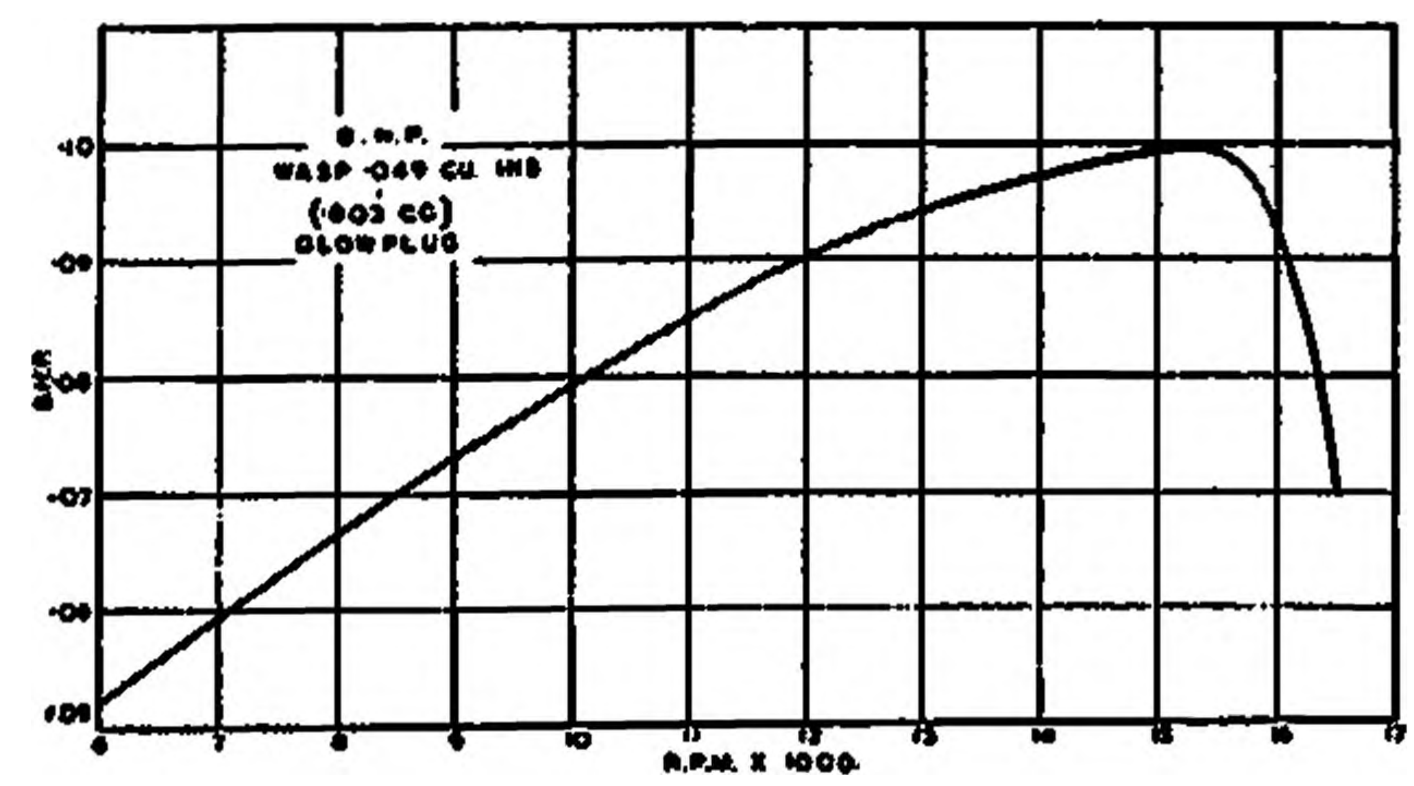
Engine. Wasp, .049 cu. in. (.803 c.c.).
Fuel. Mercury No. 5, Glow-plug.

Starting. The engine started well when the maker's instructions were followed; namely, by priming with fuel through the exhaust port with a drop or two of castor oil in the venturi. When hot, this process was not necessary. Needle setting was critical.

Running. This engine did not seem happy at speeds below about 6,000 r.p.m., but ran excellently above this, especially at the extremely high speeds. The top range was remarkable, and an unrecorded run at 17,600 r.p.m. was obtained.

B.H.P. The Wasp engine takes full advantage of its great speed to pile up horsepower in the high range. Maximum was reached at 15,400 r.p.m. with an output of .0995 b.h.p. Such an output for an engine of .803 c.c. capacity is remarkably good, and exceeds any result previously obtained for engines of this class.

Checked Weight. 1.5 oz. (including fuel tank).



Power/Weight Ratio. 1.06 b.h.p./lbs.

Remarks. This is a very fast engine, with a remarkable power/weight ratio. The needle control is inclined to be critical, especially at high speeds. The cylinder head should be well tightened, with the spanner supplied, as there is a tendency for the head to loosen when the engine is running at high speed. The needle valve is rather too near to the propeller for comfort in handling.

E.P.C. MOTH .85 c.c.

Manufacturers. E.P.C. Engineering Co. Ltd., Cameron Street, Haydn Road, Sherwood, Nottingham.

Retail Price. £1 15s. 11d., inclusive of Purchase Tax.

Delivery. Ex-stock.

Spares. Ex-stock.

Type. Compression Ignition Diesel.

Specified Fuel. Mills Blue Label 2 pts., ether 1 pt.

Capacity. .85 c.c., .048 cu. in.

Weight. 2 oz. less tank.

Compression Ratio. Variable.

Mounting. Beam, upright or inverted.

Recommended Airscrew. 7×4 in. for free flight.

Bore. .375 in.

Stroke. .472 in.

Cylinder. Cast iron.

Cylinder Head. Alloy, integral with fins.

Crankcase. Pressure die cast. D.T.D. 424 Alloy.

Piston. Steel, hardened and centreless ground.

Connecting Rod. Mild steel.

Crankshaft. 10 ton shear steel.

Main Bearing. Phosphor bronze bush, in die-cast D.T.D. 424 alloy front end.

Induction. Sideport.

Contra Piston. Steel, hardened and centreless ground.

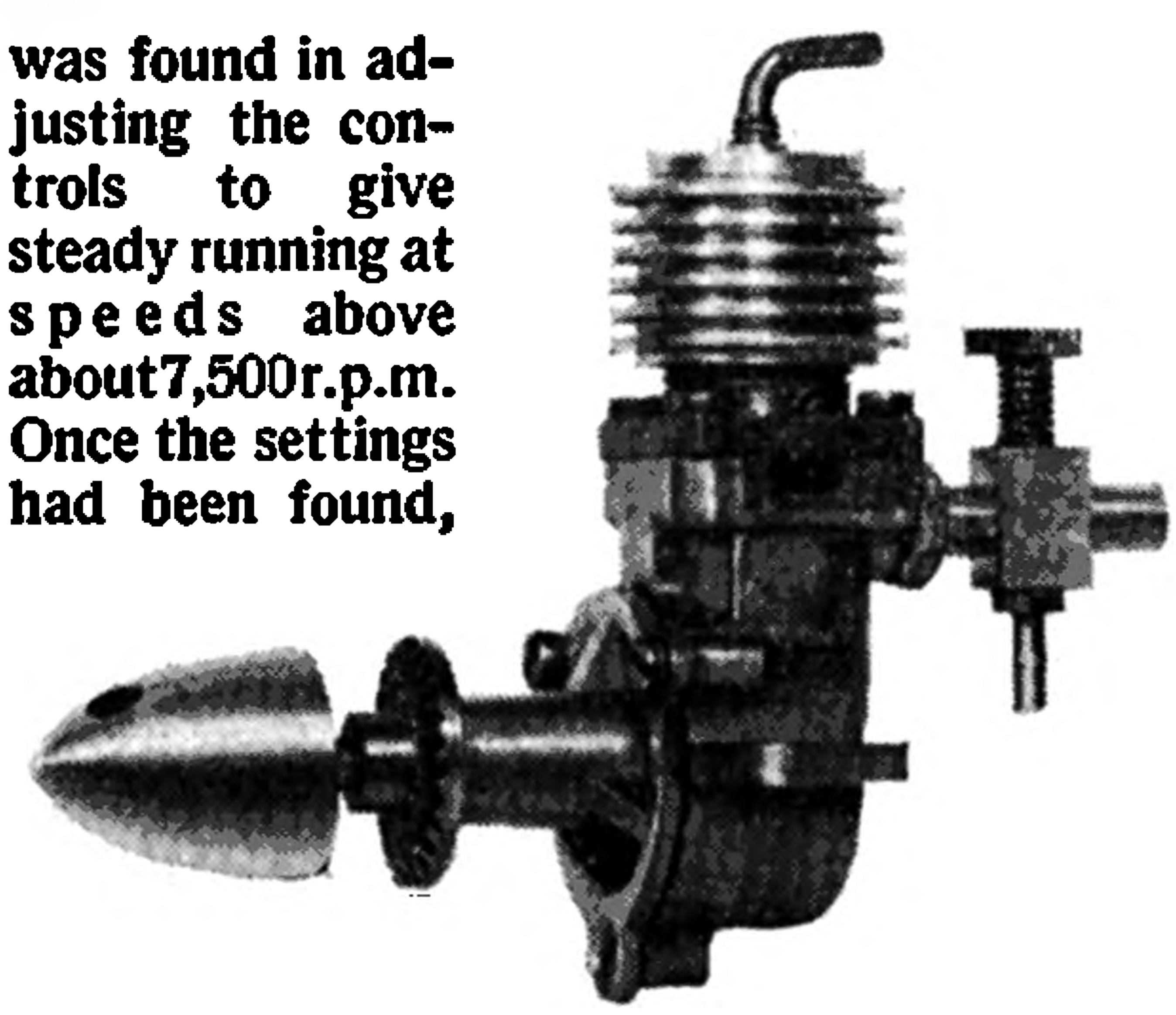
Special Features. Simple porting arranged for easy starting. Robust construction.

TEST

Engine. E.P.C. " Moth " .85 c.c. Diesel.

Fuel. Mercury No. 3 plus ether.

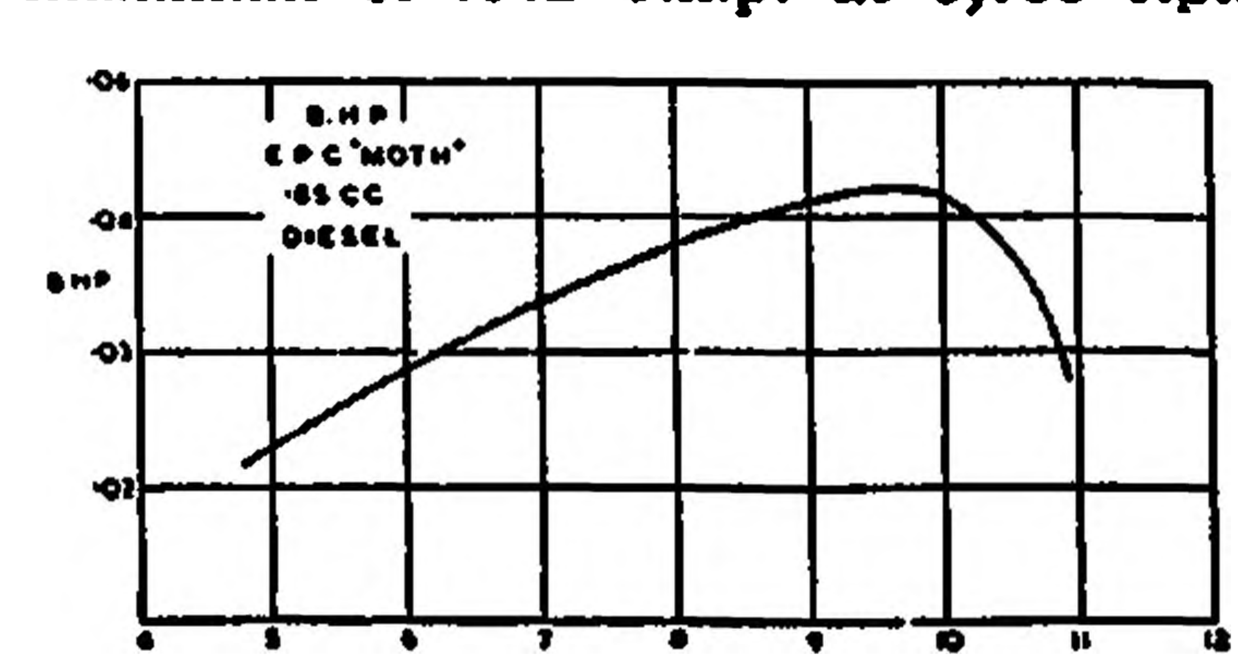
Starting. Following the maker's instructions for settings, the engine started readily enough with hand-flicking, but a little trouble was found in adjusting the controls to give steady running at speeds above about 7,500 r.p.m. Once the settings had been found,



however, no difficulty was experienced in duplicating the correct adjustments for good performance. The carburettor needle control seems to be rather on the sensitive side.

Running. The preceding paragraph really gives the running characteristics of the engine, but, as already stated, the engine was happiest at speeds below 9,000 r.p.m.

B.H.P. The engine was tested from 5,000 r.p.m. onwards, and at the lowest speed a b.h.p. output of .023 was recorded. Output then rises steadily, reaching .0335 b.h.p. at 7,000 r.p.m., .038 b.h.p. at 8,000 r.p.m. with a maximum of .042 b.h.p. at 9,700 r.p.m.



Beyond this speed output falls rapidly, until it is but .029 b.h.p. at 10,900 r.p.m.

The useful part of the curve lying between 7,500 and 9,000 shows a difference of only .005 b.h.p. between these points.

Checked Weight. 1.9 oz. (less tank); maker's weight, 2 oz.

Power/Weight Ratio. .616 b.h.p./lb.

Remarks. This engine, selling at the remarkably low price of 35s. 11d., including purchase tax, is extremely good value, and shows no signs of cheapness in appearance, quality or workmanship. All parts have a clean, machined appearance, and seem to be remarkably sturdy in construction. It should be ideally suitable for the beginner, and the general-purpose flyer.

FROG 150 1.49 c.c.
Manufacturers. International Model Aircraft Ltd., Morden Road, Merton, S.W.19.

Retail Price. 49s. 6d. including Purchase Tax.
Delivery. Immediate.
Spares. Immediate.
Type. Compression Ignition.
Specified Fuel. Frog " Powa-Mix " or equal parts by volume of ether, paraffin, and castor oil.
Bore. .5 in. **Stroke.** .460 in.
Capacity. 1.49 c.c.
Advertised Weight, complete with tank. 3.125 oz.
Compression Ratio. Infinitely variable.
Mounting. Beam or radial, upright, inverted or " sidewinder."
Recommended Airscrews. Free Flight, 8 in. × 5 in.; Control Line, 8 in. × 6 in.
Recommended Flywheel. 2¼ oz.
Cylinder. Steel, hardened, ground and honed. Screwed into crankcase.
Cylinder Head. Duralumin, turned and screwed to cylinder.
Piston and Contra Piston. Mechanite, ground and lapped.
Crankcase. Aluminium alloy, die-cast.
Connecting Rod. Forged Hiduminium RR56.
Crankpin Bearing. Plain.
Little End Bearing. Plain.
Crankshaft. Steel hardened and ground.
Induction. Crankshaft rotary valve.
Special Features. Although of different construction to the earlier engines in the Frog range, all the well tried and proven basic design features, including the original internal transfer passages with bevelled tops, are retained, to give high power coupled with compactness and light weight.

TEST

Engine. The Frog " 150 " Diesel, 1.49 c.c.

Fuel. Frog " Powa-Mix."

Starting. When cold the engine was primed for starting in accordance with the makers' recommendation. This was not necessary with a warm engine, and starting was excellent at all times.

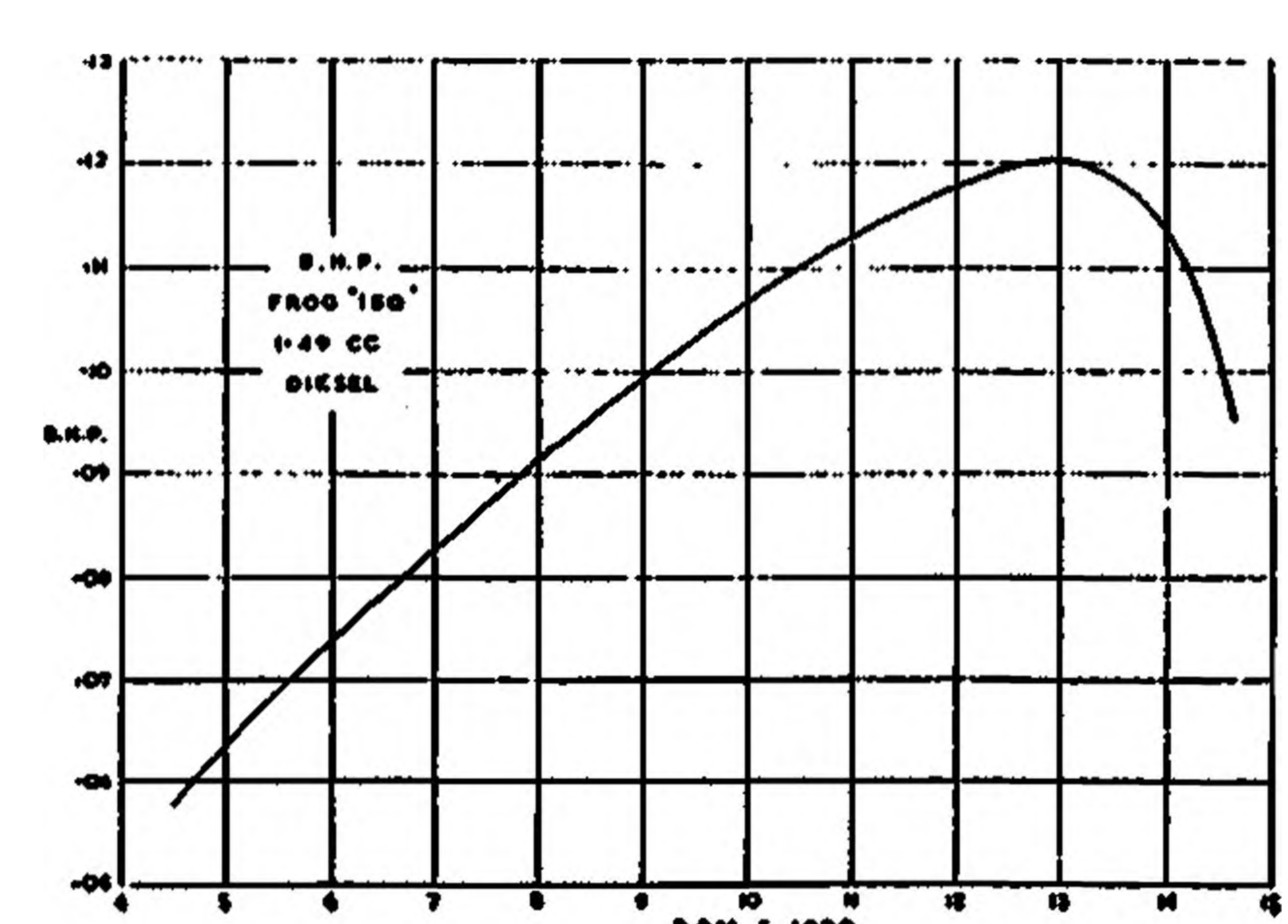
Running. In spite of its advanced design, this engine was remarkably flexible, and ran well and evenly at all tested speeds. At the higher ranges the needle setting appeared to be rather critical.

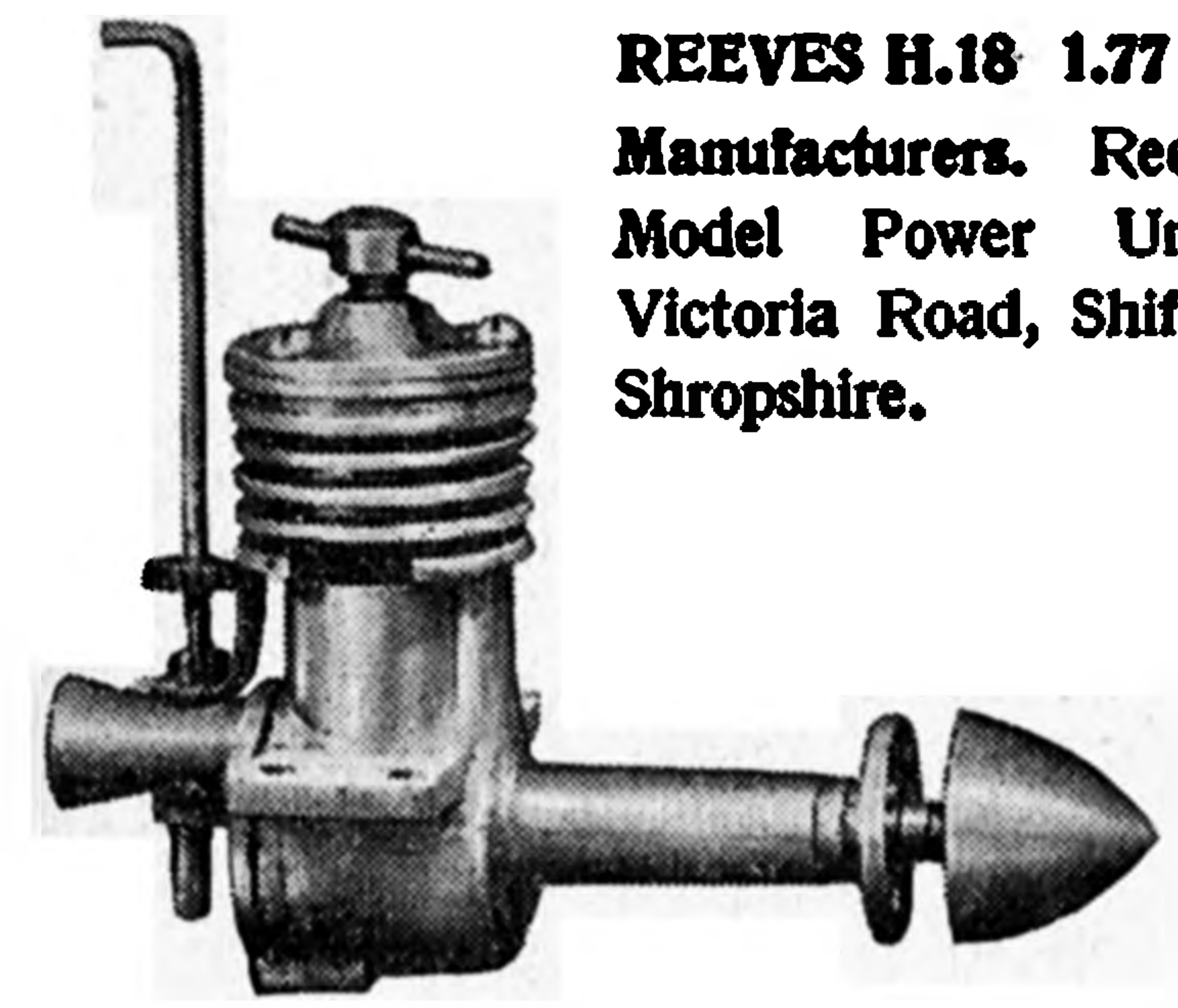
B.H.P. Starting at .058 b.h.p. at 4,500 r.p.m. the curve shows a steady rise in power to a maximum of .121 b.h.p. at 12,000 r.p.m., with a steep drop above this speed. At 10,000 r.p.m. the power was shown as .107 b.h.p., so that it is advisable to run as near the 13,000 mark as possible for best results.

Checked Weight. 3.1 oz. including fuel tank.

Power/Weight Ratio. .625 b.h.p./lb.

Remarks. In assessing the power/weight ratios, it must be remembered that this takes into account the fuel tank; most engines of this modern type are supplied less tank. The power/weight ratio of the Frog engine may, therefore, appear lower than some other published figures. At the high end of the speed range, fuel consumption was fairly rapid. But running at 11,000 r.p.m. on an 8 in. × 5 in. prop. the consumption was favourably measured when 15 c.c. of fuel was consumed in 5 min. 32 sec. This was repeated before and after the main test, always giving the same results. Team race enthusiasts will recognise the economy on fuel. The time to consume fuel in the tank supplied was 1 min. 38 sec.





REEVES H.18 1.77 c.c.

Manufacturers. Reeves Model Power Units, Victoria Road, Shifnal, Shropshire.

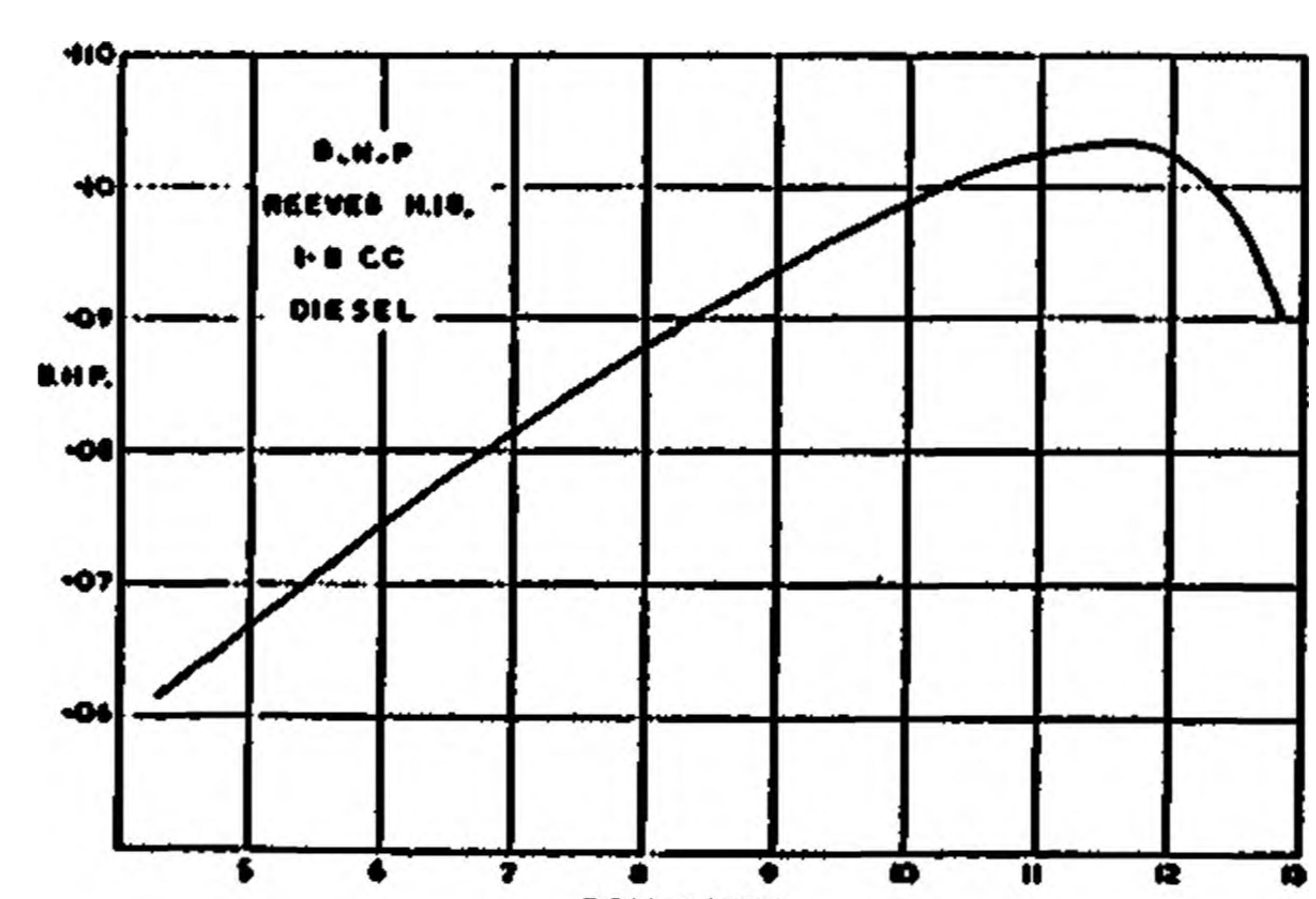
Retail Price. 62s. 6d., including Purchase Tax.
Delivery. Immediate.
Spares. Full spares and repair service by return of post.
Type. Compression ignition.
Specified Fuel. Equal parts paraffin, oil and ether, or Mercury No. 3.
Capacity. 1.77 c.c., .102 cu. in.
Weight. 3 oz. bare.
Compression Ratio. Adjustable.
Mounting. Beam, upright or inverted.
Recommended Airscrew. 8×6 in. or 8×8 in. for control line; 9×4 in. for free flight.
Bore. .510 in.
Stroke. .500 in.
Cylinder Liner. Case-hardened steel, ground, honed, and lapped.
Cylinder. Aluminium alloy casting, one piece with crankcase and integral fins, two exhaust ports and one transfer duct.
Cylinder Head. Plain aluminium alloy with three retaining screws.
Crankcase. Aluminium alloy casting.
Piston. Flat topped, case-hardened steel, ground and lapped, no rings. Silver steel gudgeon pin.
Connecting Rod. Case-hardened steel, ground and lapped.
Crankshaft. Case-hardened steel, ground and lapped.
Main Bearing. Plain.
Induction. Rotary disc valve.
Contra Piston. Case-hardened steel, ground and lapped.
Special Features. Extra long crankshaft bearing giving engine longer life. Anti-vibration carburettor needle. Will run in any position without any alteration to engine.

TEST

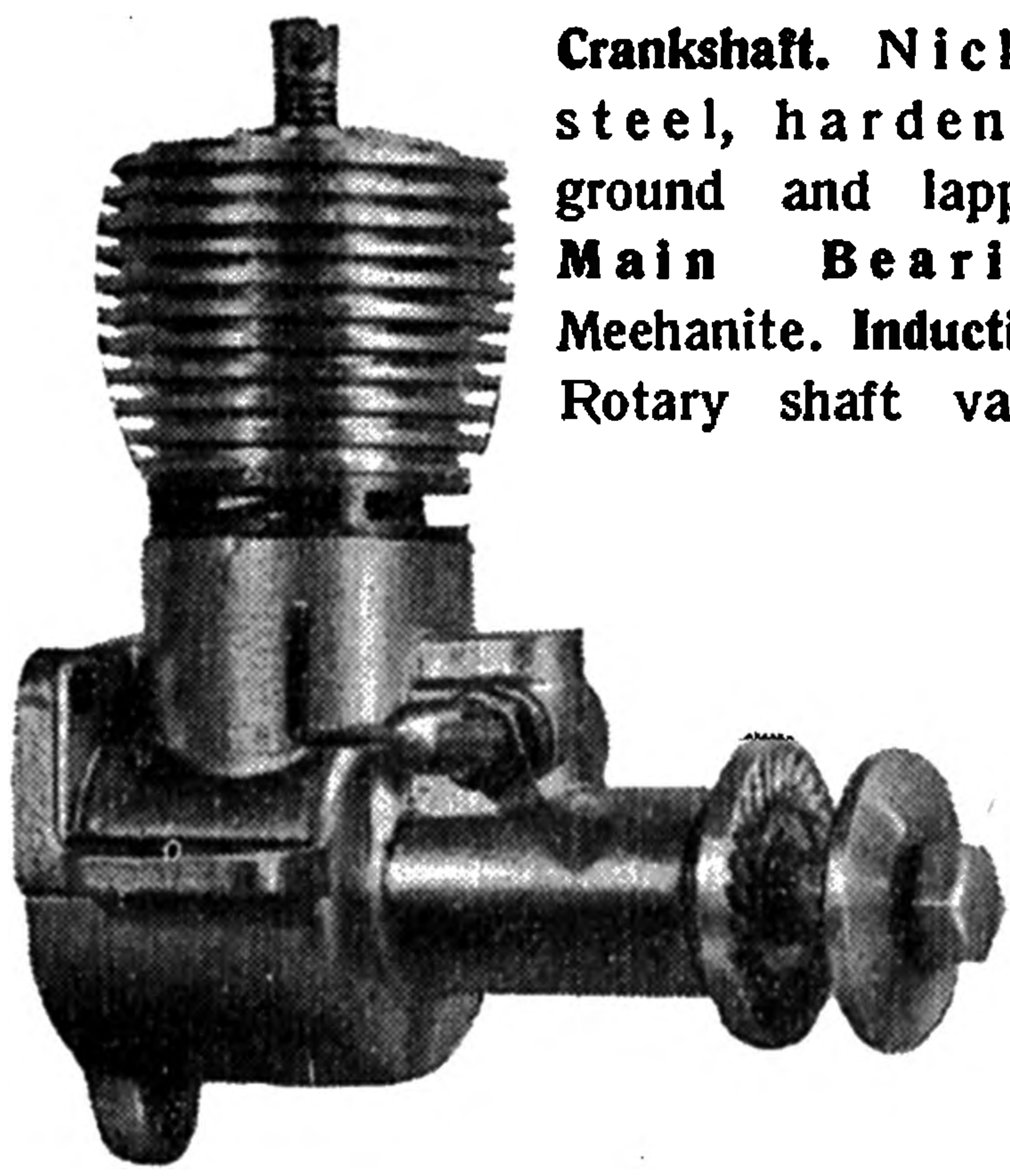
Engine. Reeves H.18 Diesel.
Fuel. Mercury No. 3 plus ether.
Starting. Very good under all conditions.
Running. Smooth and consistent at all speeds, with good flexibility of needle control. The extended needle is a great convenience, and the situation of the carburettor at the rear of the engine makes for safety for the fingers.

B.H.P. As mentioned, a rather unusual performance was evident at the lower speed range. At 4,000 r.p.m. the output was as high as .060 b.h.p., which rose steadily to a maximum of .1034 b.h.p. at 11,700 r.p.m. Although dropping rapidly, a power of .087 b.h.p. was obtained at about 13,000 r.p.m. The engine may be considered to be performing excellently at any speeds between about 9 to 12,000 r.p.m.—a wide range of variation.

Checked Weight. 3.25 oz. (without fuel tank).
Power/Weight Ratio. .510 b.h.p./lb.
Remarks. This engine seems satisfactory from all points of view. The hardened cylinder and liner, the hardened and ground crankshaft, and the long main bearing, should make for long wear. Engine controls are particularly well placed for convenient handling.



SABRE 2.45 c.c.
Manufacturer. G.B. Motors, Grange, South Australia.
Distributor. Model Aircraft Industries, Glenelg, South Australia.
Australian Retail Price. 99s. 6d. (equivalent £4 Sterling).
Type. Compression Ignition (Diesel).
Fuel. Equal parts castor oil, kerosene (paraffin), ether, plus 2% amyl nitrate.
Capacity. 2.45 c.c.; .14 cu. in.
Weight. 4 oz.
Mounting. Beam or radial.
Recommended Airscrews. 8×6 in., 8×8 in. for control line; 9×5 in. for free flight.
Bore. .555 in. **Stroke.** .620 in.
Cylinder. Hardened steel, 360 degree porting.
Cylinder Head. Duralumin.
Piston. Meehanite.
Contra Piston. Meehanite.
Crankcase. Diecast aluminium D.T.D. 424.
Connecting Rod. Machined duralumin.



Crankshaft. Nickel steel, hardened, ground and lapped. **Main Bearing.** Meehanite. **Induction.** Rotary shaft valve.

TEST

Engine. Sabre 2.50 c.c. Competition Diesel.

Fuel. Equal parts castor oil, paraffin, ether, plus 2% amyl nitrate, as recommended by makers.

Starting. Good at all times, with engine hot or cold.

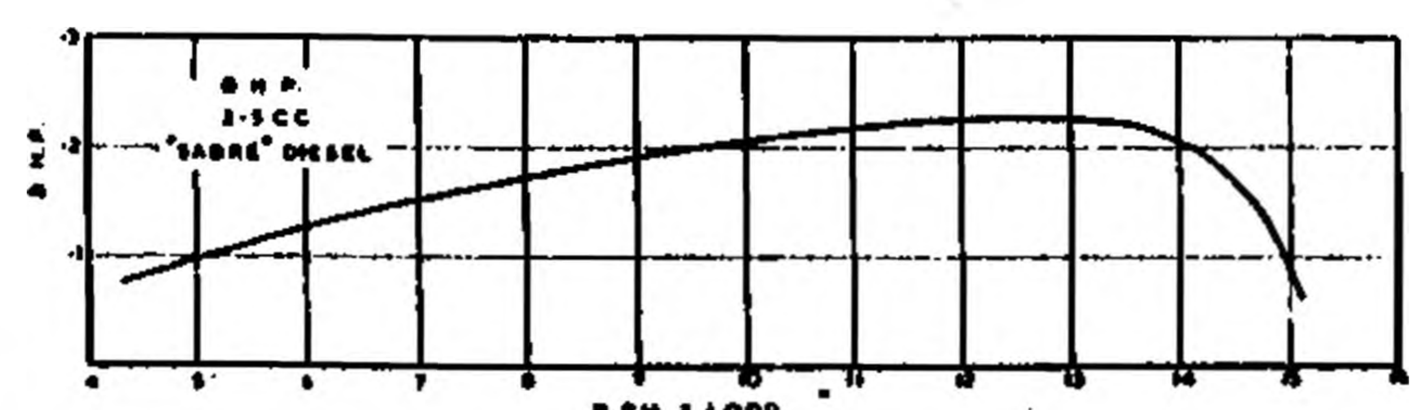
Running. This engine runs extremely well and evenly over a range of speeds greater than would be expected from an engine of this class. Needle control is not unduly sensitive, but the position of the needle valve is dangerously near to the airscrew.

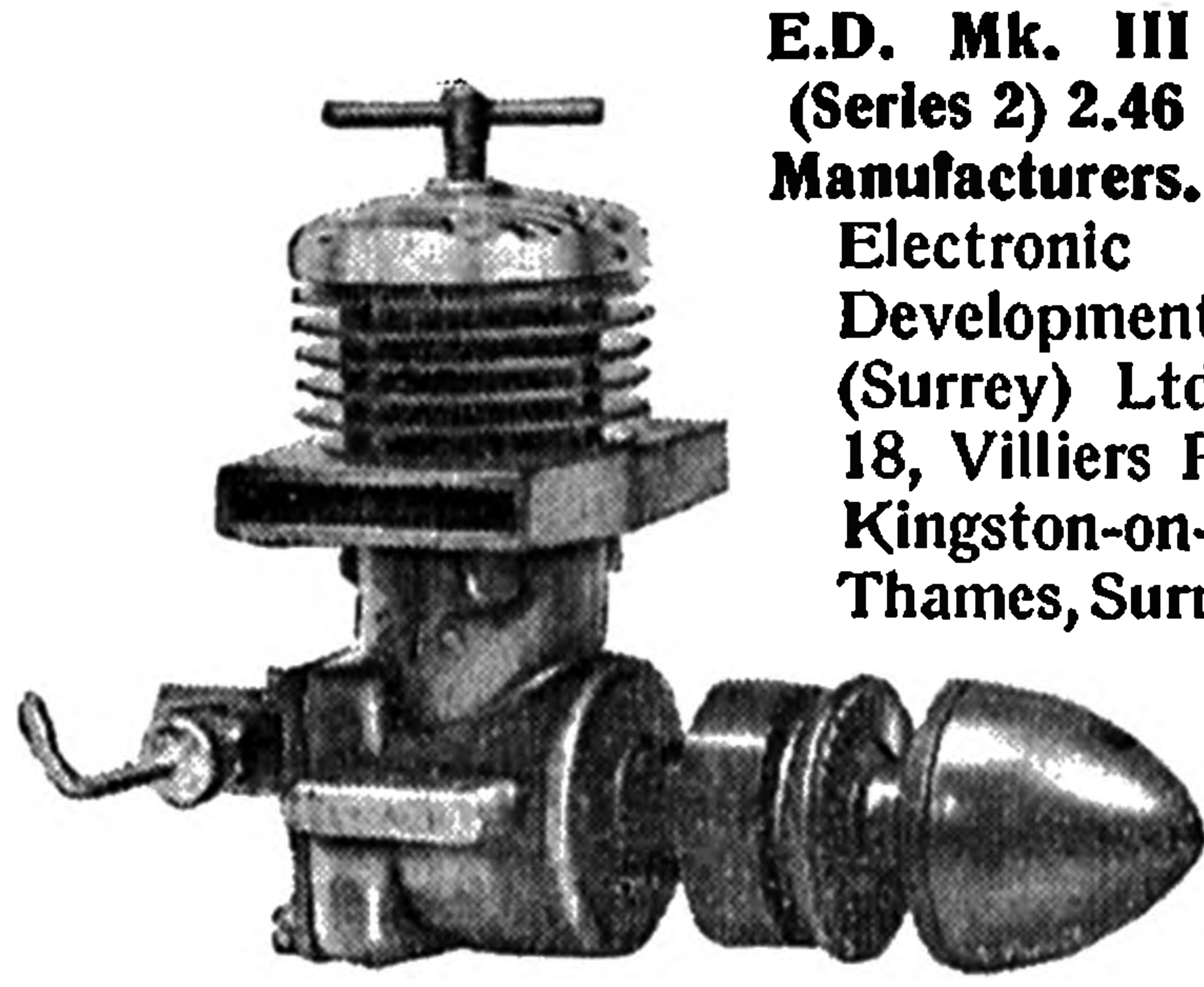
B.H.P. The maximum b.h.p. figure of .225 at around 13,000 r.p.m. puts this engine into the super class. The power curve is exceptionally flat and shows surprisingly little variation between about 10,000 and 14,000 r.p.m. At speeds above this figure the output drops fairly sharply, until it is down to .060 b.h.p. at 15,100 r.p.m. At the other end of the scale, a similar output is found at around 4,000 r.p.m.

Checked Weight. 4.2 oz. less tank.

Power/Weight Ratio. .860 b.h.p./lb.

Remarks. As the fuel recommended for this engine is rather unusual in these days of proprietary fuels, a few random readings were taken at various points of the speed-range, using a well-known branded diesel fuel. Results seemed to be about the same using both, so the test was recorded on the fuel advised by the manufacturers.





E.D. Mk. III (Series 2) 2.46 c.c.

Manufacturers. Electronic Developments (Surrey) Ltd., 18, Villiers Rd., Kingston-on-Thames, Surrey.

Retail Price. 72s. 6d.
Delivery. Ex-stock.
Spares. Ex-stock.
Type. Compression ignition.
Specified Fuel. 1 part castor oil, 1 part paraffin oil, and 1½ parts ether.
Capacity. 2.46 c.c.; .150 cu. in.
Bore. .590 in. **Stroke.** .550 in.
Advertised Weight. 4¾ oz. (refer to checked weight).
Compression Ratio. Variable to infinity.
Mounting. Beam.
Recommended Airscrew. 9½ in. × 6 in. pitch, for Free Flight or Stunt.
Cylinder Head. Die-cast, held down by six screws.
Crankcase. Pressure die-cast, aluminium alloy.
Connecting Rod. Dural forging.
Induction. Rotary disc valve.
Special Features. Conversion cylinder heads for glow-plug or spark ignition, plus a contact set for 2-speed control can be supplied as an extra.

TEST

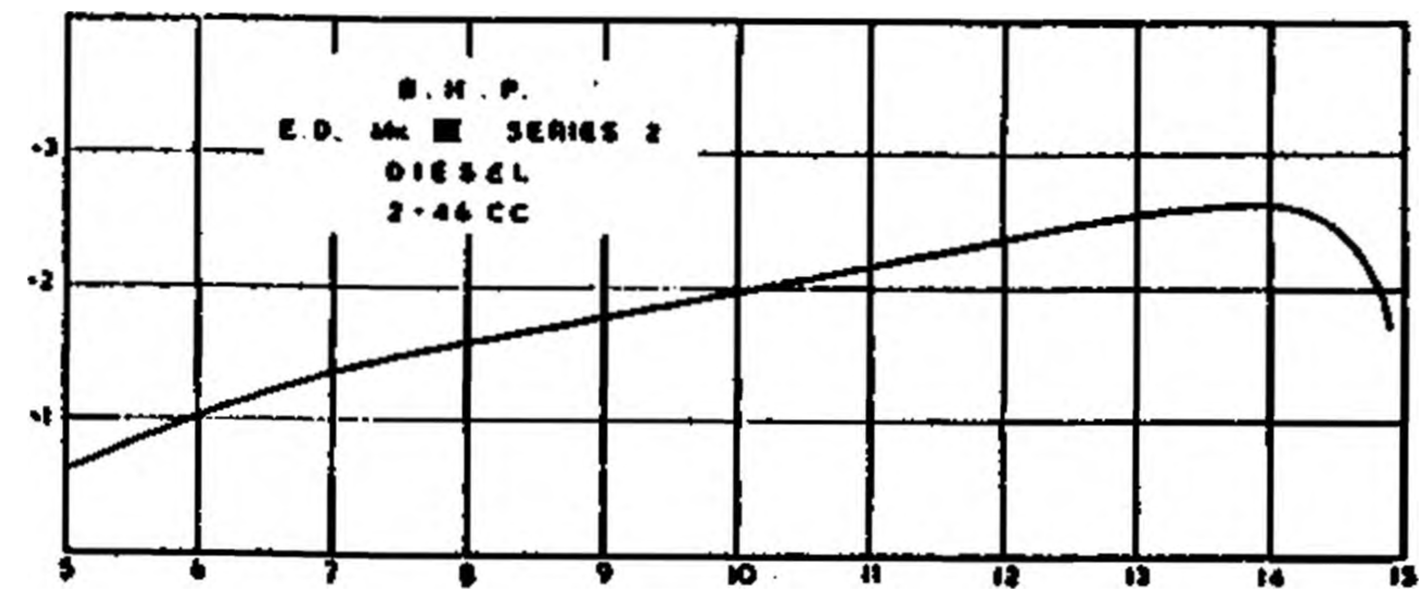
Engine. E.D. Mark III; Series 2; Diesel; 2.46 c.c.

Fuel. Castor oil, 1 part; paraffin oil, 1 part; ether 1½ parts (this is the maker's recommended fuel). I added to this, on my own account, 2% amyl nitrate.

Starting. Extremely good under all conditions.

Running. In spite of its good performance at the higher speeds, the engine ran well down to about 5,000 r.p.m. Tests were not made below this figure.

B.H.P. The torque curve for this engine was practically flat between speeds of 7,000

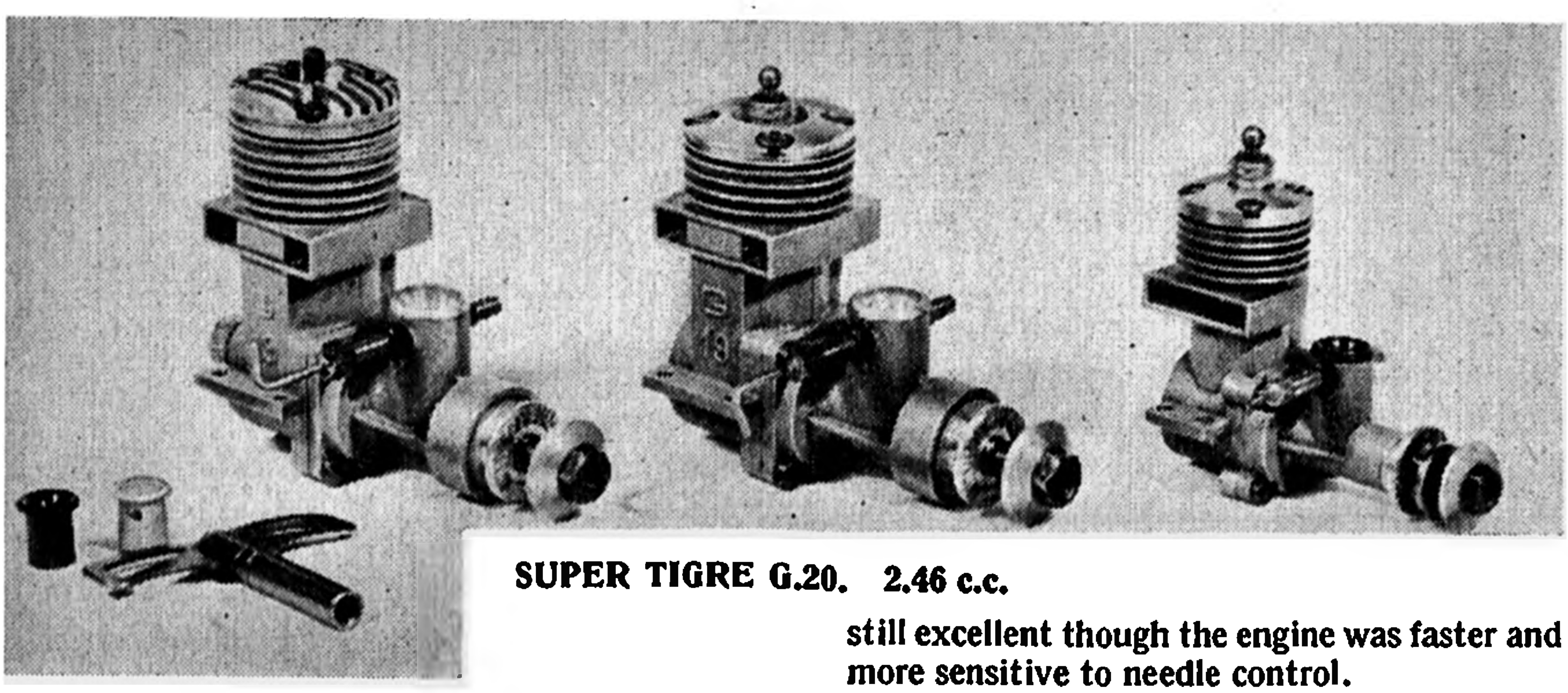


and 12,000 r.p.m., so that the b.h.p. rises in steps of exactly .020 for every 1,000 revs. per minute between these speeds. The rise for the next 1,000 revs. to 13,000 r.p.m. shows an addition of .026 b.h.p. after which the curve flattens considerably until a peak output of .260 b.h.p. is attained at 14,100 r.p.m.

Checked Weight. 5½ oz. less tank.

Power/Weight Ratio. .756 b.h.p./lb.

Remarks. No trouble was experienced throughout the tests, and the engine ran well at all times. On completion, a very slight piston leakage was detected.



SUPER TIGRE G.20. 2.46 c.c.

Retail Price. 5,800 Italian Lira (£3 7s. 0d.).
Type. Glow-plug.
Specified Fuel. 66% methanol, 33% castor oil.
Capacity. 2.46 c.c.; .15 cu. in.
Weight. 4.25 oz.
Mounting. Beam, upright or inverted.
Bore. 15 mm. **Stroke.** 14 mm.
Cylinder. Special iron lapped sleeve pressed into die cast body.
Cylinder Head. Light alloy, unfinned.
Crankcase. Light alloy pressure die-casting.
Piston. Light alloy with two steel rings.
Connecting Rod. Light alloy, bushed at big end.
Crankshaft. Large diameter, hollowed.
Main Bearing. Ball race at web end.
Induction. Rotary shaft inlet valve.
Special Features. Robust construction. Single transfer passage. Single exhaust port, large bore intake for interchangeable venturis.

TEST

Engine. Super Tigre G20, 2.5 c.c. Glow-plug.

Fuel. Mercury No. 5.

Starting. The engine is supplied with 3 types of plastic venturi tubes which may be fitted into the air intake of the carburettor. One, coloured red, is for racing purposes; one black, for stunt flying; while a white one is recommended for general and free flight. The engine was run-in using the black venturi and starting was excellent with good flexibility of needle control. Tests were undertaken with the red venturi in position, and starting was still excellent though the engine was faster and more sensitive to needle control.

Running. All that could be desired over a wide speed range.

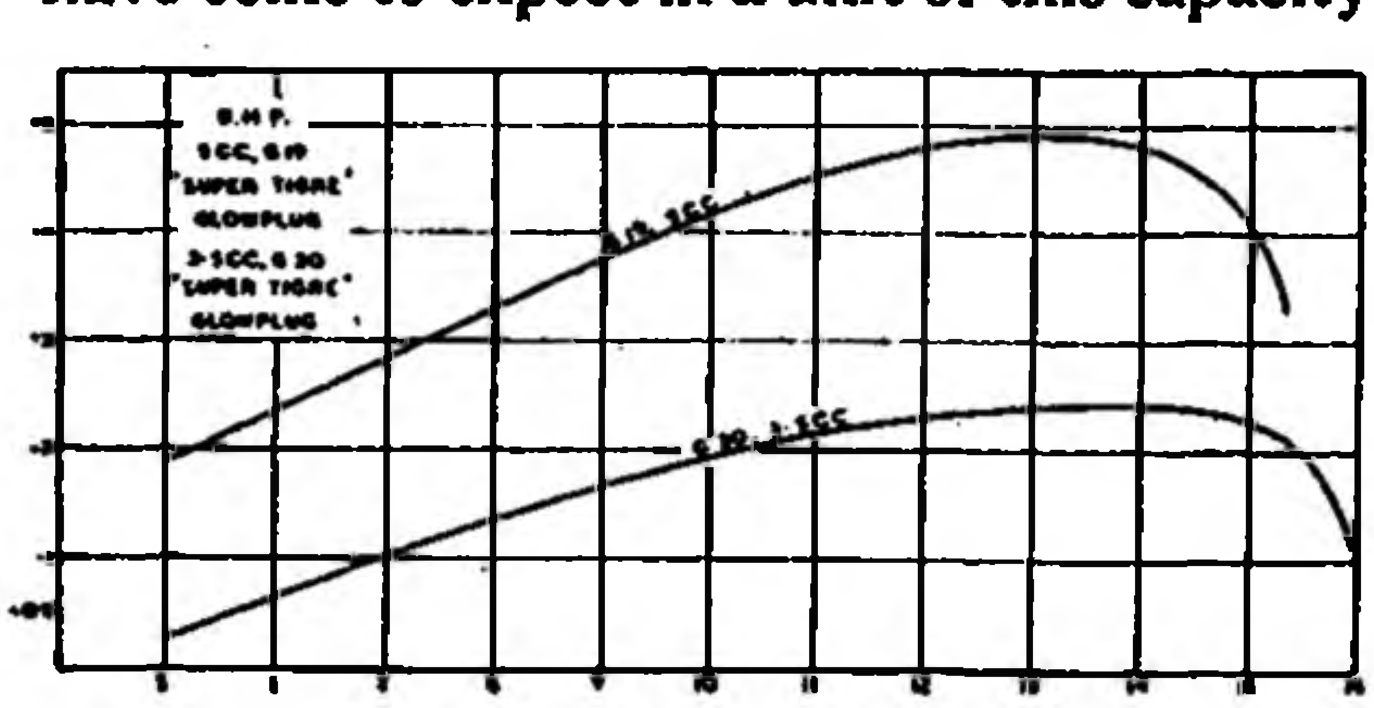
B.H.P. The results from this engine are rather exceptional, not only for the high power output, but for the remarkably flat curve obtained. We thus see that between speeds of 10,500 r.p.m. and 15,500 r.p.m. the variation in output is only .04 b.h.p. so that the engine may be considered efficient over a range of 5,000 r.p.m.!

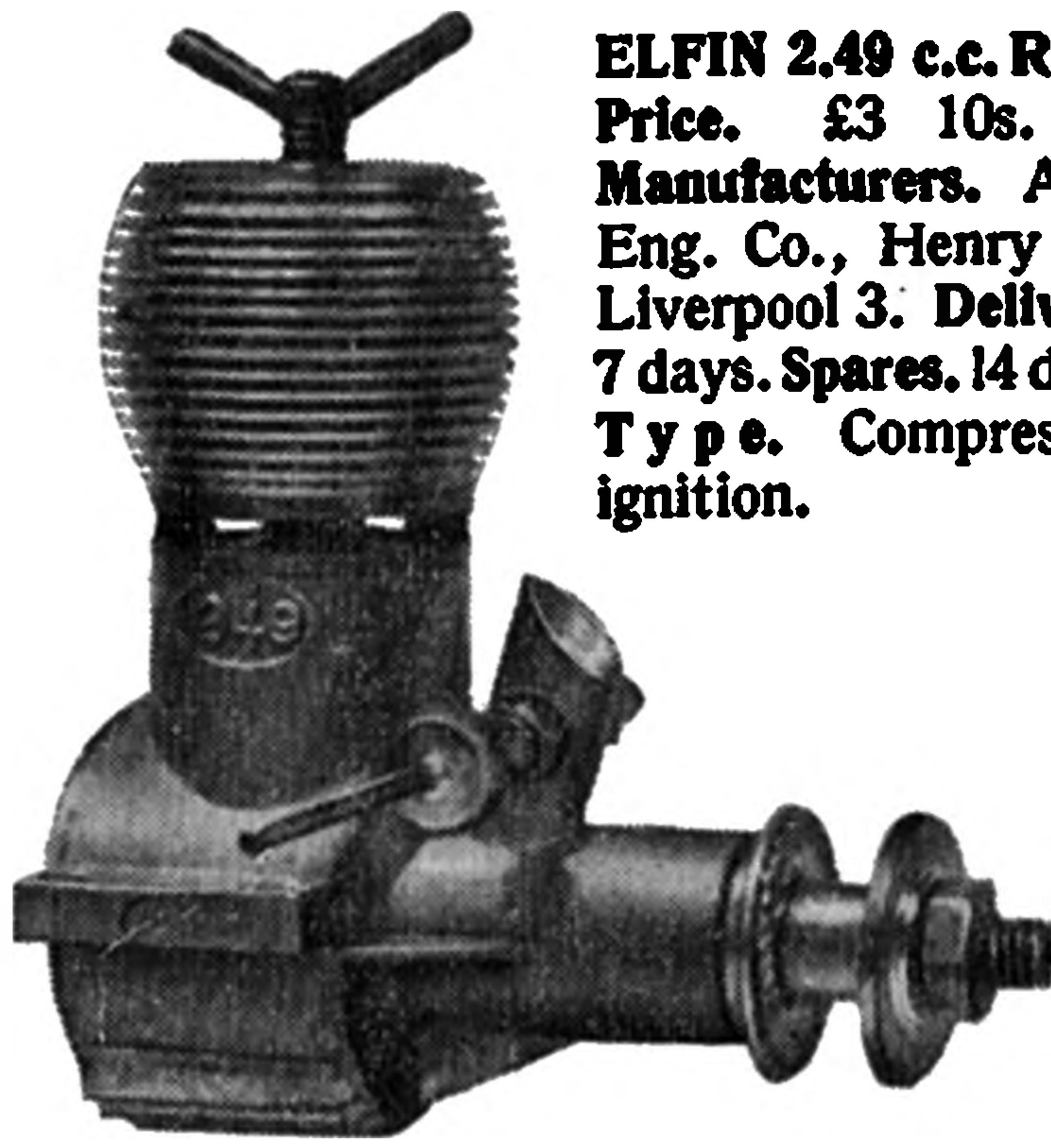
Maximum output was found to lie somewhere in the region of 14,000 r.p.m., but the extreme flatness of the curve at this point makes it difficult to pin-point within a few hundred r.p.m. The exceptional figure of .24 b.h.p. was recorded, which falls little short of the maker's claim of .25 b.h.p. at 15,500 r.p.m. At this speed, however, our results showed that the output was down to about .15 b.h.p.

Checked Weight. 4.4 oz. (less tank).

Power/Weight Ratio. .872 b.h.p./lb.

Remarks. The sturdy construction which is a characteristic of the G.19 is again evident in this smaller edition. This naturally results in an engine of greater weight than we have come to expect in a unit of this capacity.





ELFIN 2.49 c.c. Retail Price. £3 10s. 0d. **Manufacturers.** Aerol Eng. Co., Henry St., Liverpool 3. **Delivery.** 7 days. **Spares.** 14 days. **Type.** Compression ignition.

Specified Fuel. 1/3 each paraffin, castor oil and ether, plus 2% amyl nitrate.
Capacity. 2.437 c.c.; .125 cu. in.
Weight. 3.125 oz.
Compression Ratio. 15–20 to 1, adjustable.
Mounting. Beam.
Bore. .554 in. **Stroke.** .625 in.
Cylinder. Comprises liner and head. Liner nickel chrome steel, case hardened.
Cylinder Head. Screwed to cylinder.
Crankcase. Pressure die cast.
Piston. Deflector head, no rings.
Connecting Rod. Duralumin, turned, roller bearings.
Crankshaft. Nickel chrome steel, case hardened.
Main Bearing. Cast iron.
Crankpin Bearing. Plain.
Little End. Plain.
Induction. Shaft rotary valve.
Special Features. 360 degrees porting. Full sub-piston induction.

TEST

Engine. Elfin 2.49 c.c. diesel.

Fuel. Castor oil, paraffin, ether (equal parts), plus 2% amyl nitrate.

Starting. Excellent under all conditions.

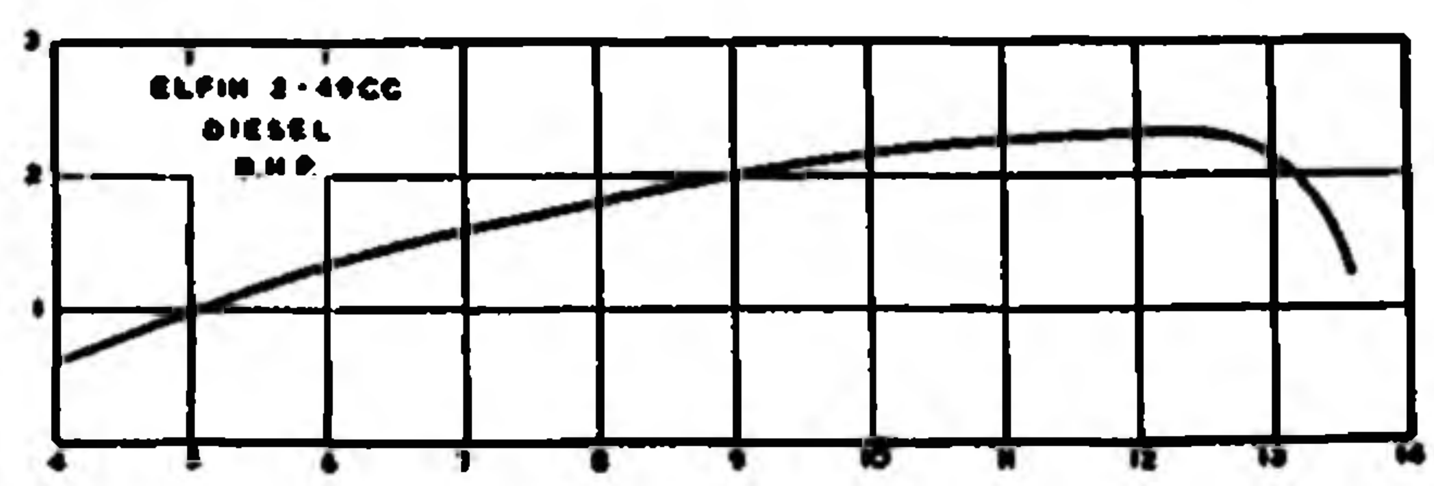
Running. This engine runs extremely well at all speeds from 4,000 to 13,000 r.p.m., and the needle control is flexible. As with most engines using the rotary crankshaft inlet valve, the needle is uncomfortably near to the revolving propeller.

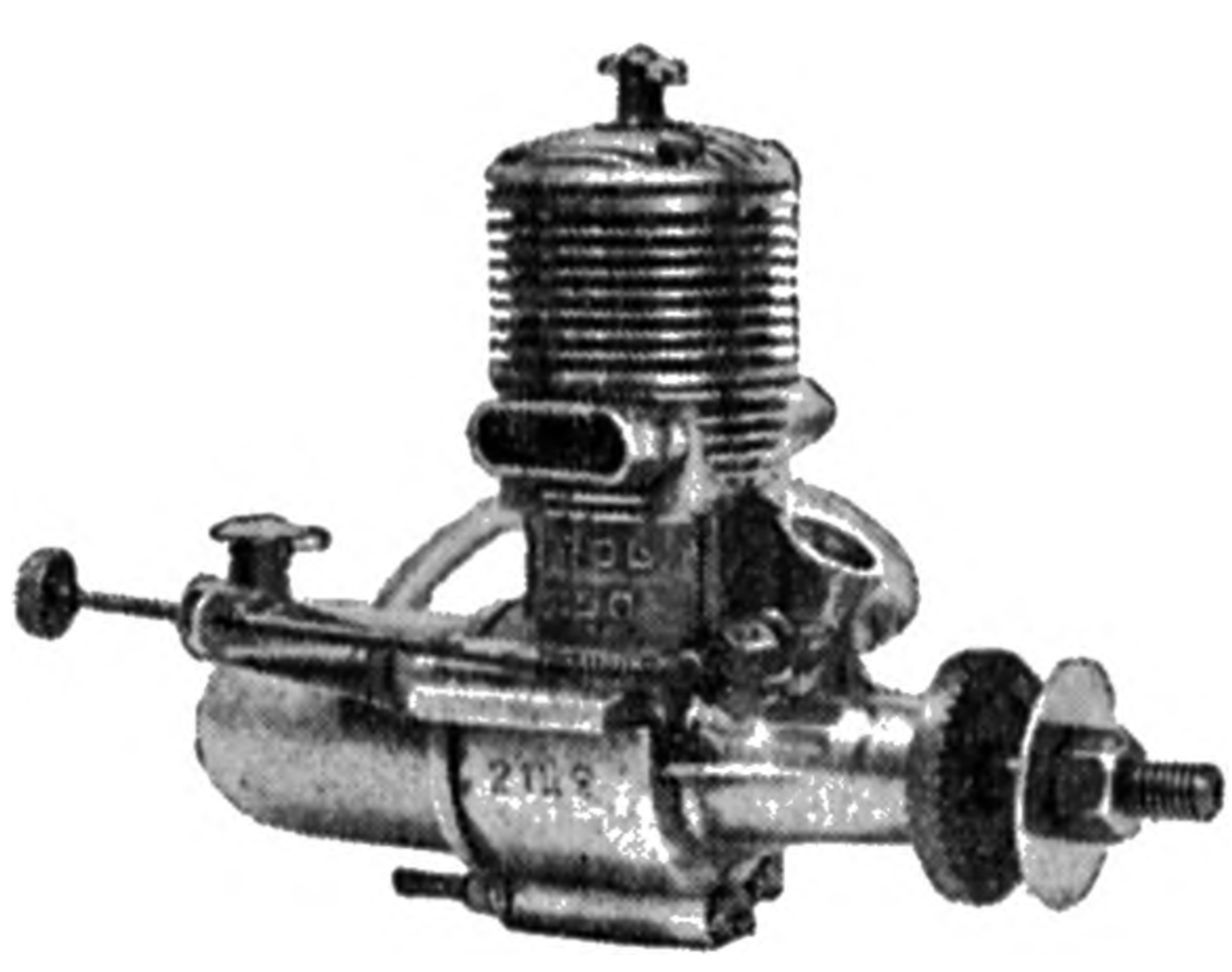
B.H.P. At the lowest speed, about 4,000 r.p.m., the output was .060 b.h.p., and this rose gradually to a maximum of .231 b.h.p. at 12,300 r.p.m. As with all engines showing an extremely flat curve, the exact point of maximum output is difficult to determine within 50 r.p.m. or so. Output continues high up to around the 12,600 r.p.m. mark, but a rapid decrease is evident beyond this figure.

Checked Weight. 3.4 oz. (less tank).

Power/Weight Ratio. 1.09 b.h.p./lb.

Remarks. This engine is noteworthy for its compact design, light weight, and high power/weight ratio.





FROG 250 2.49 c.c.
Manufacturers. International Model Aircraft Ltd., Morden Road, Merton, London, S.W.19.
Retail Price. 72s. 6d.
Delivery. Ex-stock.
Spares. All spares from Spare Parts Dept.
Type. Compression ignition.
Specified Fuel. Frog "Powa-Mix."
Capacity. 2.49 c.c.; .151 cu. in.
Bore. .580 in. **Stroke.** .575 in.
Weight. Complete with tank 5.5 oz.
Compression Ratio. Infinitely variable.
Mounting. Beam or radial.
Recommended Airscrew. 9×6 in. pitch.
Recommended Flywheel. 2¼ in. dia.; 4 oz. weight.
Tank. Pressure die cast. Held by one screw. May be easily rotated for any position.
Cylinder. Hardened steel turning complete with fins, ground and honed.
Cylinder Head. Pressure die cast. Held by four steel screws.
Contra Piston. Meehanite, ground and lapped.
Crankcase. Pressure die cast Aluminium Alloy.
Piston. Meehanite; flat top, ground and honed.
Connecting Rod. Hiduminium RR56 alloy.
Crankpin Bearing. Plain.
Crankshaft. Hardened steel, ground and honed.

Main Bearing. Phosphor Bronze.
Little End Bearing. Plain.
Induction. Shaft rotary valve.
Special Features. Designed primarily for radio control or free flight. Full advantage is taken to use die cast parts where possible for exceptional strength and neat appearance. One-piece cylinder barrel complete with fins ensures freedom from distortion, coupled with controlled expansion when hot.

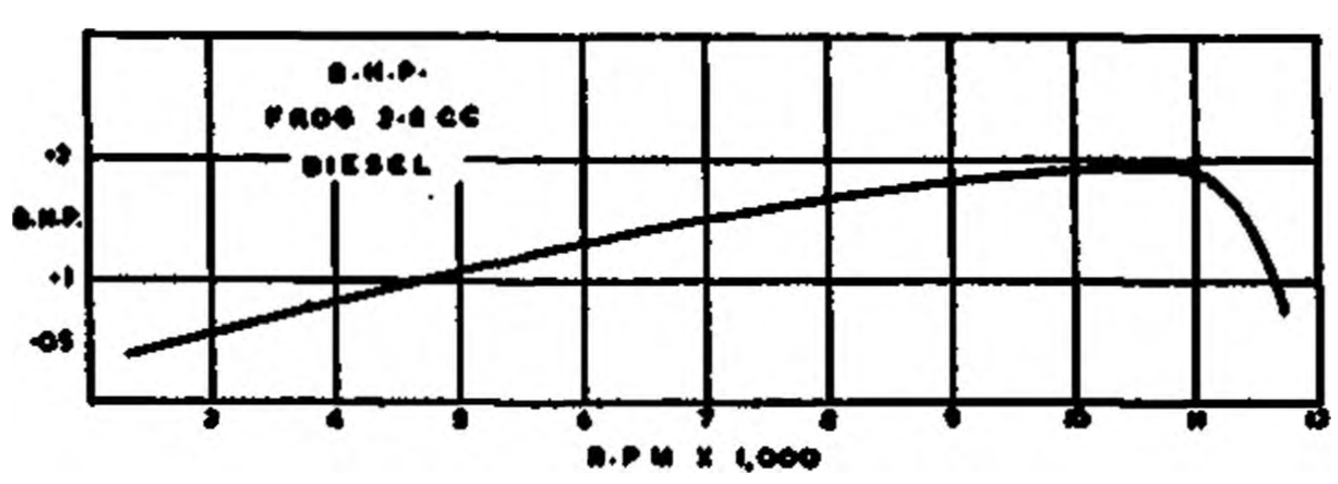
TEST

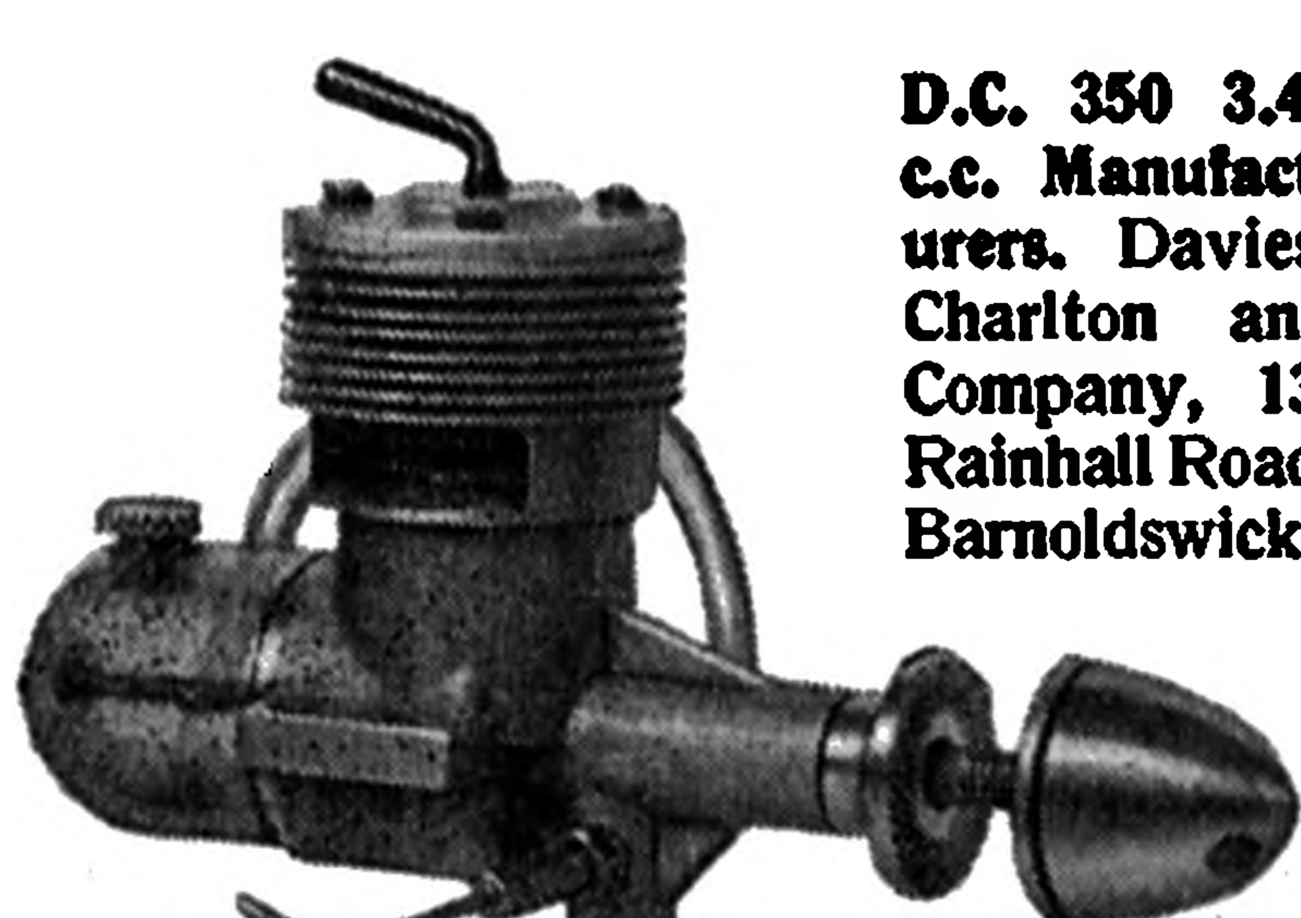
Engine. Frog " 250 "; .250 c.c. diesel.
Fuel. Mercury No. 8.
Starting. In spite of the slight leakage past the contra-piston the starting qualities of the engine were good, and no real difficulty was found. When primed with fuel through the exhaust ports, starting was really excellent. Carburettor suction seemed remarkably efficient; so much so, that care was needed not to flood the crankcase.

Running. The great flexibility of this engine, running smoothly and evenly over a range of speeds from 2,000 to 11,000 r.p.m., made the testing a real pleasure. Under a wide range of loadings no " fiddling about " or continual adjustments were necessary to maintain a steady performance. Although only tested down to 2,300 r.p.m. there was no doubt that even running would have continued much lower down the scale—a remarkable characteristic with little practical value in the very low range. The steady runnign between 8 and 11,000 r.p.m. is valuable, however, as it means that a good performance can be obtained between these speed ranges without undue trouble with needle settings.

B.H.P. The curve shows that at 2,300 r.p.m. an output of .04 b.h.p. was available, which rose steadily to a maximum of .192 b.h.p. at 10,700 r.p.m. Down to 8,000 r.p.m. the engine may be said to be doing very well, so that it may be seen that, coupled with the great flexibility, the engine is in no way critical.

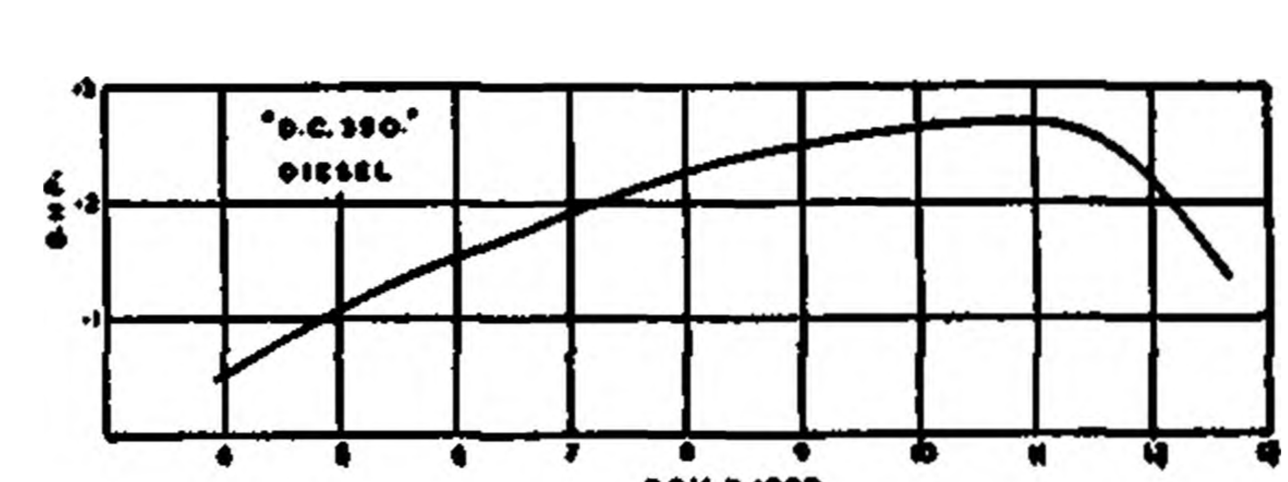
Checked Weight. 5.6 oz. including tank.
Power/Weight Ratio. .55 b.h.p./lb.
Remarks. Considering that the engine develops its maximum power at 10,700 r.p.m. it is rather strange that the manufacturers claim that the speed range is only 2,000 to 10,000 r.p.m.! In considering the power/weight ratio it must be remembered that most modern engines are supplied *without* tank, so that the high power/weight ratios sometimes shown are not truly related to that of the Frog engine. An excellent general purpose unit.





D.C. 350 3.44 c.c. Manufacturers. Davies-Charlton and Company, 13, Rainhall Road, Barnoldswick.

Retail Price. £3 10s. 0d.
Delivery. Ex stock.
Spares. Ex stock.
Type. Compression ignition diesel.
Specified Fuel. Mercury No. 3 or No. 8.
Capacity. 3.44 c.c.; 12 cu. in.
Weight. 5½ oz. including tank.
Compression Ratio. Variable.
Mounting. Beam, upright or inverted.
Recommended Airscrew. Free flight, 10 in.×6 in.; control line, 9 in.×8 in.
Bore. 11/16 in. **Stroke.** 9/16 in.
Cylinder. Cast in one piece with crankcase.
Cylinder Head. Held with set-screws.
Crankcase. Die-cast D.T.D. 424.
Piston. Plain. Meehanite. Ground and honed.
Connecting Rod. Forged aluminium turned from solid.
Crankpin Bearing. Plain.
Crankshaft. Nickel chrome. Hardened, ground and lapped.
Main Bearing. Plain.
Little End Bearing. Plain.
Induction. Rotary crankshaft valve.
Cylinder Liner. Nickel chrome.
Special Features. Only three screws are used in the assembly of this engine. The exhaust is partly shrouded. Low fuel consumption. Extreme flexibility of control. Engine bearer mountings are to be enlarged in future production models.



TEST

Engine. D.C. 350 diesel; 3.5 c.c.

Fuel. Mercury No. 3.

Starting. Excellent at all times.

Running. Extremely good and steady at all tested speeds, but was inclined to run in short bursts at speeds in excess of about 12,500 r.p.m. due to the compression control-lever slacking off under vibration. The engine ran remarkably well at the very low speeds (below 4,000 r.p.m.), a rather unusual performance for such a short-stroke unit. Fuel control was extremely flexible, and made correct adjustment quite simple.

B.H.P. The curve obtained from this engine is extremely good, not only because of the high maximum output, but because of the flat character. We thus see that at 7,250 r.p.m. the power output is .200 b.h.p., yet the gain at 11,000 r.p.m. is only .070 b.h.p. This means that the engine may be considered to be running efficiently over a very large speed range, and quite large variations in speeds between 9,000 and 11,500 would make little *perceptible* difference to the performance of the aeroplane.

Maximum output was found at 11,000 r.p.m. with a reading of .270 b.h.p.

Checked weight. 5.7 oz., with tank. (Maker's figure is 5.5 oz.)

Power/Weight Ratio. .835 b.h.p./lb.

Remarks. In view of the excellent power output, high power/weight ratio, flat power curve, and flexibility of control, this engine should be very suitable for control-line flying. The low fuel consumption should be extremely useful for team racing.

SUPER TIGRE G.19 B. 4.82 c.c.

Manufacturers. Micromeccanica Saturno, Via Fabri 4, Bologna, Italy.

Retail Price. 8,500 Italian Lira (£4 18s. 0d.).

Type. Glowplug.

Specified Fuel. 66% Methanol, 33% Castor oil.

Capacity. 4.82 c.c.; .29 cu. in.

Weight. 8.5 oz.

Mounting. Beam, upright or inverted.

Bore. 19 mm. **Stroke.** 17 mm.

Cylinder. Special iron lapped sleeve pressed into die cast body.

Cylinder Head. Light alloy, plain unfinned (diesel version has cooling fins).

Crankcase. Light alloy, pressure die casting.

Piston. Light alloy, two steel rings.

Connecting Rod. Light alloy, bushed each end.

Crankshaft. Large diameter, hollowed.

Main Bearing. Ball races each end of shaft.

Induction. Rotary shaft inlet valve.

Special Features. Robust construction, large intake area, four exhaust ports.

TEST

Engine. Super Tigre G.19 B., 5 c.c. Glowplug.

Fuel. Mercury No. 5.

Starting. This engine starts easily with needle valve at around 4 turns open, but a prime with fuel on the piston makes things easier. Engine was started by pulley and cord for testing purposes, when no priming was found necessary.

Running. Extremely good over a wide speed range; not unduly sensitive to needle control.

B.H.P. As will be seen from the curve, tests were recorded at speeds between 5,000 r.p.m. and 15,300 r.p.m. It was not found possible to reach the manufacturer's figure of .56 b.h.p. at 15,500 r.p.m., but a very excellent result of .485 b.h.p. at 13,300 r.p.m. was attained. Between 11,000 and 14,600 r.p.m. the curve is exceptionally flat, and the engine may be considered to be performing well at all speeds between these limits.

Checked Weight. 8.6 oz. (less tank).

Power/Weight Ratio. .9 b.h.p./lb.

Remarks. This engine is probably the sturdiest that we have yet encountered, and no concessions seem to have been made to reliability in order to save metal or cramp design. In spite of this, the power/weight ratio is very good, so that we have an engine which should give long life and reliability with an excellent power output.

ENGINE ANALYSIS OF OTHER ENGINES

A summary of each year's Engine Tests appears in the appropriate *Aeromodeller Annual*. Thus, issue of

1949 contains:

Kalper, .3 c.c.
Amco, .87 c.c.
E.D. Mk. I,,Bee," 1 c.c.
Frog 100, 1 c.c.
Mills Mk. II, 1.3 c.c.
Elfin, 1.8 c.c.
E.D.Comp.Special,2c.c.
Masco Buzzard, 2.8 c.c.
Allbon, 2.8 c.c.
E.D. Mk. III, 2.49 c.c.
Jagra Dyne, 3 c.c.
Weston, 3.5 c.c.
K Vulture, 5 c.c.
ETA 5, 4.99 c.c.
ETA 29, 4.85 c.c.
Nordex RG10, 9.98 c.c.

1950 contains:

Frog 100 Mk. II, .99 c.c.
Allbon Arrow, 1.49 c.c.
Allbon Javelin, 1.49 c.c.
Elfin, 1.49 c.c.
Amco 3.5, 3.48 c.c.
E.D. Mk. IV ,3.46 c.c.
Forster G29, 4.86 c.c.
Frog 500, 4.92 c.c.
Wildcat Mk. III, 5.24 c.c.
Fox 35, 5.75 c.c.
Yulon 49, 8.2 c.c.

WHITHER THE RUBBER-DRIVEN MODEL?

By C. S. R.

UNTIL shortly before the last war the rubber-driven model was practically the only type of machine built in this country, and it was not until the inception of the King Peter Cup that model gliding achieved more than a casual interest amongst British aeromodellers; the average model glider of that time being nothing more than a converted rubber-driven model that had usually seen better days; The acquisition of an American "Brown Junior" engine had tempted a handful into experimenting with the power-driven model, but it is true to say that the vast majority of aeromodellers prior to 1939 devoted their attention solely to the rubber-driven model, interest being fairly evenly divided between the Wakefield specification and general sports fliers.

Since that time the model glider and power-driven model have rocketed in favour, and many new phases of aeromodelling such as control-line (stunt and speed), Jetex and radio control have come into being. Probably the greatest increase in popularity has been in the glider field, and this was undoubtedly the outcome of various restrictions imposed on aeromodelling during the war years, which gave this phase of the hobby a degree of advancement which would have taken years under normal conditions. This, plus the astounding increase in small engine manufacture following the war years, has somewhat naturally diverted a great deal of attention from the rubber-driven model, and generally speaking this class of aeromodelling has taken a back seat of recent years.

The outstanding exception is, of course, in connection with the Wakefield specification model, and in spite of the numerous other issues now common in aeromodelling, the Wakefield model seems to have the greatest attraction for those who study the game seriously, the general opinion being that this class of model demands the greatest amount of concentration in both designing, building and flying to produce the ultimate. This vogue perhaps reflects the present-day tendency towards specialisation, and whereas the pre-war years found the majority of experts dabbling with all kinds of rubber-driven models and occasionally the new-fangled power and glider models, the much greater interest currently shown in the competition type of model demands a degree of specialisation practically unknown in the last decade.

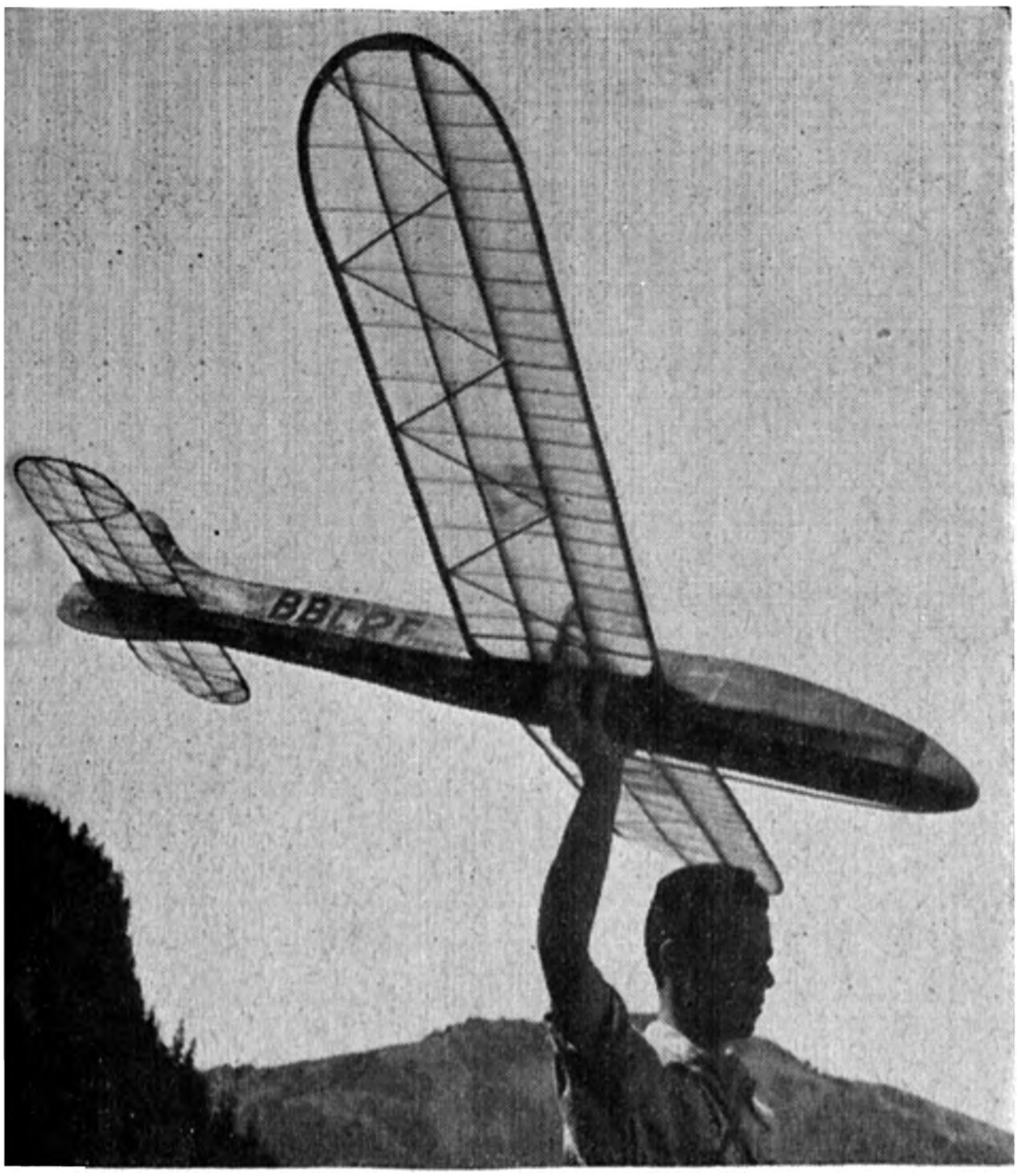
Unfortunately, this contest specialisation has led to an almost complete desertion of the general sports type of rubber-driven model, and it is rare nowadays to see any modeller flying other than a hot contest type of machine, whether it be to Wakefield specification or a lightweight. This was very noticeable at the majority of the big open meetings which were such a feature of 1951, and a peculiar factor is that at least 90% of rubber driven models seen at such meetings have been of the Wakefield class. Obviously this points to one thing, namely, that concentration on, and specialisation with, the Wakefield class of model has produced a standard of flying that is hard to match with other classes of machines, and it has been proved time and again that the Wakefield model has reached such a high pitch of development, plus an ability to withstand the average weather conditions met in Great Britain, that it has become an almost automatic choice for the rubber-driven competition. The writer views this tendency with some apprehension, for specialisation in any phase of the hobby eventually leads to a lack of support by the rank and file, and it is to be hoped that the ordinary non-specialist class of rubber-driven model receives more attention during the coming year than has been apparent in 1951.

Accepting the Wakefield as typical of the past years' rubber-driven model, we see that the streamliner is fast fading from the picture, a mere handful of diehards still continuing with this class of machine. Though aerodynamically superior from some viewpoints, the streamliner suffers by virtue of construction complications with its attendant handicaps under field repair requirements. In these days of ultra keen competition, and where the ability to retrieve or repair a model in time for each round is a major factor, the streamliner has given way to the more simple slabsider with which can be grouped the diamond and semi-streamlined type of fuselage.

Following Ellila's double win with the return gear system a fair amount of attention was devoted during 1951 to this type of rubber accommodation, but it is interesting to note that the majority still stick to the single skein straight-drive machine.

Modification of the Wakefield specification did not lead to the expected freak designs, the general practice being to lengthen the fuselage slightly although nothing out of the way appeared amongst the better-known British Wakefield exponents. It was left to the Americans to produce the unexpected when the abnormally long fuselages used by Foster and Andrade in Finland created a great deal of comment. Whether these 60-inch fuselages will become a regular feature of the future rubber-driven model it is too soon to predict, but there is no doubt that the majority of modellers in Great Britain are not too sure of the advantages to be gained by such practices. Whilst the American machines are undoubtedly top class performers it was obvious that they had their limitations according to weather conditions, and I have no doubt that the majority of modellers would prefer to stick to the type of machine which they know can be successfully operated under the average conditions met with in this country.

Whilst the *Aeromodeller* has introduced the "Walthew" and "Junior Miss" in recent months in an endeavour to stimulate interest in the non-Wakefield class of machine, the tendency is for the more experienced class of modeller to ignore such designs and leave them to the beginner, devoting his abilities to the development of better Wakefield durations. This is a pity, for the general sports type of machine can give a great deal of pleasure and we rather deprecate the current tendency in the hobby to devote far too much attention to the development of the out-and-out contest machine, overlooking the fact that flying for fun can give just as much pleasure as a win in a big competition. Perhaps 1952 will see a change in this position, which I am sure will be to the improvement of this great hobby of ours.



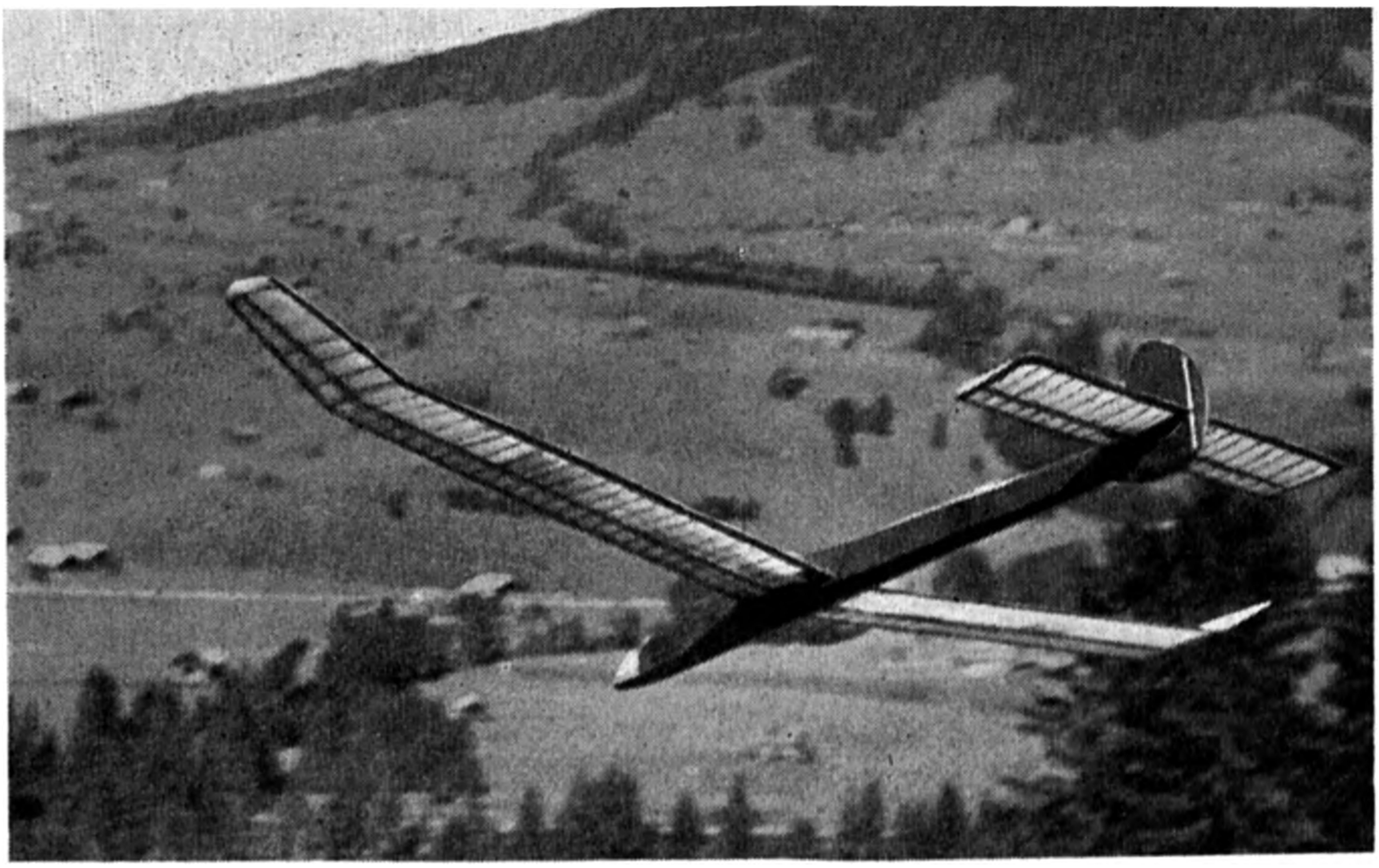
SWISS MODELS OF THE YEAR

PHOTOGRAPHS BY MAURICE DUFEY, ZURICH

Above: Bruno Bachli, well known Swiss aeromodeller, who has been in most post war Swiss international teams as power, glider, and Wakefield flyer, seen with a typical Bachli low wing sailplane.

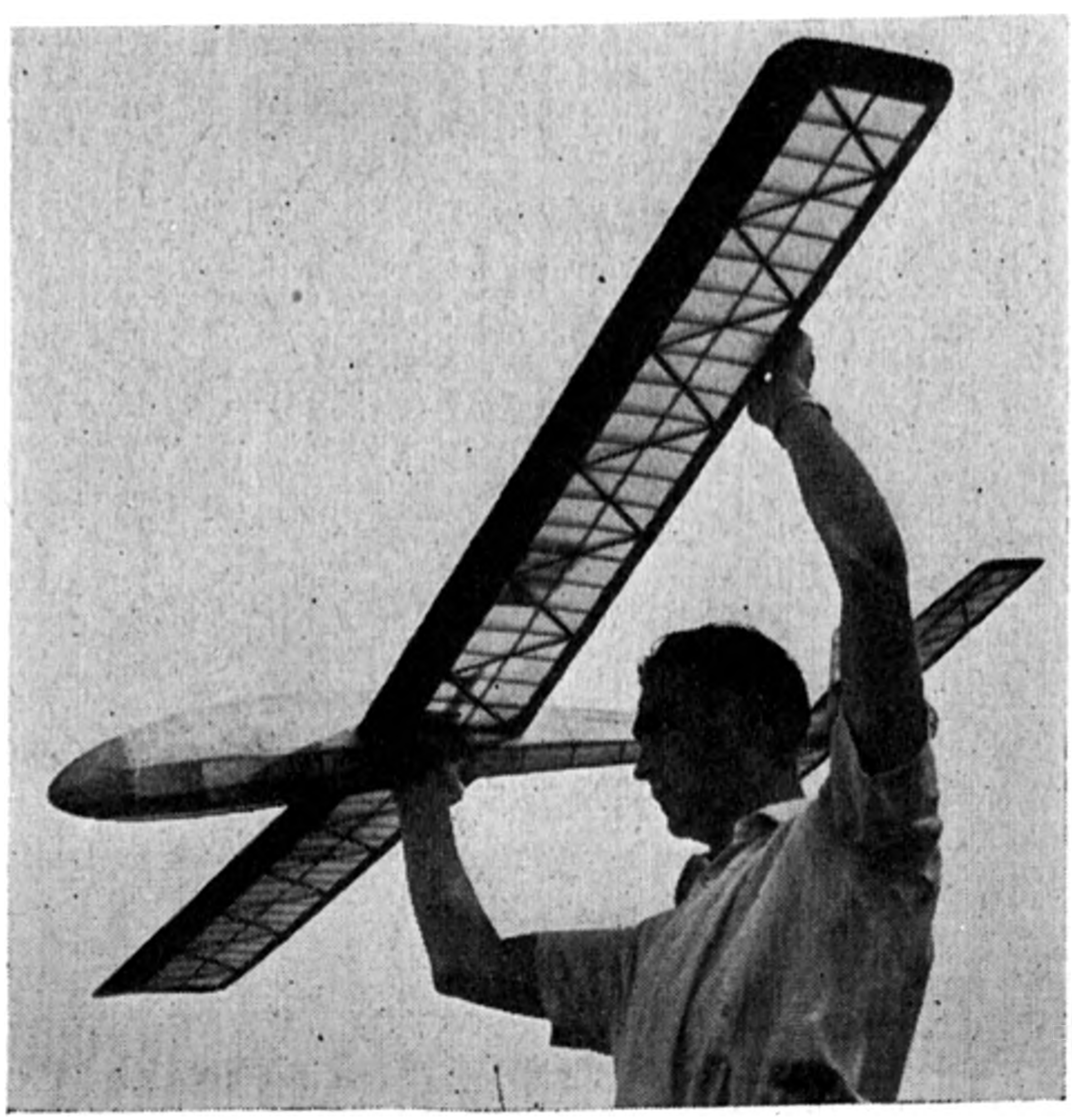
Right: B. Birrer, of Baden, with his winning flying wing glider—note curved taper of trailing edges.

Below: J. Barbey, of Vevey, with his interesting Canard sailplane—a formula that has always aroused interest amongst Swiss experimenters.



Above: The magnificent site chosen at Saanen for the Swiss National Slope Soaring Models Contest on August 11th-12th. A model is seen just launched from the slope: with good fortune it will clear the belt of firs below and land safely in the valley.

Right: W. Hauenstein, of Zurich, with his compass controlled slope soarer. This was the winner of the annual Swiss Compass Steering Contest, flown again at Saanen on August 18th-19th. This contest which, so far as we are aware, is unique in post-war model flying, has long been a Swiss speciality, though in pre-war days German and Austrian enthusiasts also developed a number of such models.



GEARS

By Ron Warring

GEARED rubber motors for duration flying are by no means a modern development. In the early 1930's most of the successful "heavy-weights" of those days were geared. J. B. Allman won the 1934 Wakefield with a geared model and was a particularly consistent flier of that era. Some of the best of the first eight-ounce Wakefields were also geared, notably R. T. Howse's machine which at one time held the British R.O.G. record, and a few modellers have persisted in similar layouts throughout. All the successful British models of this type had one thing in common. The gears were located at the front and the complete motor was, in effect, split into a number of separate motors of smaller cross section. Two, three or four individual motors were generally used. The greatest single disadvantage of such systems was the difficulty in winding. To stretch wind all the motors at one go was almost impossible. To wind each motor individually produced many complications. This, and the amount of work necessary to make an accurate, smooth running gear box, were two important factors favouring single skein motors.

Long after most model designers had relegated geared drives as appropriate to the pre-war history of development in duration design, Ellila won the Wakefield with a geared model. The gear system was different—the gears at the back of the model giving, in effect, a double length motor in a standard fuselage. Reaction to Ellila's success was one of polite scepticism. Even that geared system was as "old as the hills"—actually dating back to the early '30s, at least—and you could get about the same length of motor by the standard methods of cording or mechanical tensioning. But when Ellila repeated his success in 1950 it became apparent that the motors in a return gear system were operating more efficiently than a comparable motor arranged in a single skein, and suitably tensioned.

Even then relatively few Wakefield experts in this country thought it worthwhile to adopt the return gear system. As far as the writer is aware, only three—J. B. Knight, J. Gorham, and E. W. Evans—got down to the problem in any detail during the winter of 1950-51. Knight did not get very promising results and abandoned further development of his geared job. Gorham got slightly better results than with a comparable model with a single skein motor, leaving him still undecided. Eventually he flew both the models in various competitions with marked, and roughly equal success. Evans, on the other hand, was so impressed with the performance of his geared model that he persisted only with this system. The few other modellers who experimented with "return gears" appear to have come to the same conclusions as Knight.

Now, no geared model got in the 1951 Wakefield team and no geared model won any of the National competitions, up to September. They were, in any case, in the absolute minority. But the flying of these geared models undoubtedly impressed.

The writer's own attitude to gears at the start of the 1951 flying season was that he could at least duplicate their performance with a long, single-skein motor. Here, however, a new factor entered into the question. The long single skein motor accommodated in a normal motor length exhibited a marked tendency to bunch, particularly when wound to more than about 70 per cent. full turns. Other modellers—notably Smith (Icarians) and Gorham, have apparently found, and obviated, similar faults by mechanical means. After his experience with bunching at the Wakefield Trials, however, the writer was more than willing to try a geared model as a positive cure for this trouble.

The performance of this geared model has been so consistently superior to that of the single skein machine (for the same weight of rubber, same wings and tail unit) that the experiment was more than justified. Nor did the geared model prove any more difficult to wind or handle. Some six months later than Evans the writer has reached a similar conclusion.

However, far more than a cure for bunching, taut motors undoubtedly give a better power output from the rubber. Pretty obviously there is an optimum hook distance for motors of a given length and it would be worthwhile to conduct a series of experiments to find out just what the relationship is. Further to that, however, the writer suspects that *there is a marked centre of gravity shift* on a long, corded motor when it is unwinding in a normal length fuselage— a CG shift sufficient to upset the trim of the model although the motor itself has not actually bunched, in the accepted sense of the word. This would account for many inconsistencies of flight trim with models of this type.

Without any more preamble, then, it would seem that both from individual experiences and actual results (three Wakefield wins in succession) the geared Wakefield should have a potentially superior performance to that of a comparable single skein model. However, there is another point. If this superiority is due solely to the fact that a return gear system permits the use of a long motor taut between hooks, then similar results without the complication of gears could be achieved with a long fuselage. There would be no penalty of fuselage cross section under the new Wakefield rules, and, as the 1951 Wakefields showed, the very long fuselage designs flown by some of the American team did, in fact, put up a most remarkable performance.

The problem may be summarised as in Fig. 1. Which of the three models illustrated is the best proposition for duration flying? The orthodox single skein motor with the unwound motor length reduced by cording (or a mechanical tensioner) would now appear to have several disadvantages—prone to bunch, possibility of motor CG shift when unwinding upsetting trim, and loss of power for the same cross section of rubber. Here the aforementioned experimental data would be invaluable. At least it would indicate an *optimum* fuselage length for a corded motor of given made-up length. This optimum would undoubtedly be considerably longer than the present "standard" Wakefield fuselage length.

The geared model has the advantage of employing a long, taut motor within a reasonable fuselage length, obviating all the potential faults of the first system. Its basic disadvantage is that *double* torque and tension is developed in the fuselage which has to be resisted by the structure. (Contrary to a commonly held opinion, both motors in a return gear system are wound in the same way.) There is also the bother of making a light, efficient gear train which must be man enough for the job and not weigh more than ¼ ounce, preferably less.

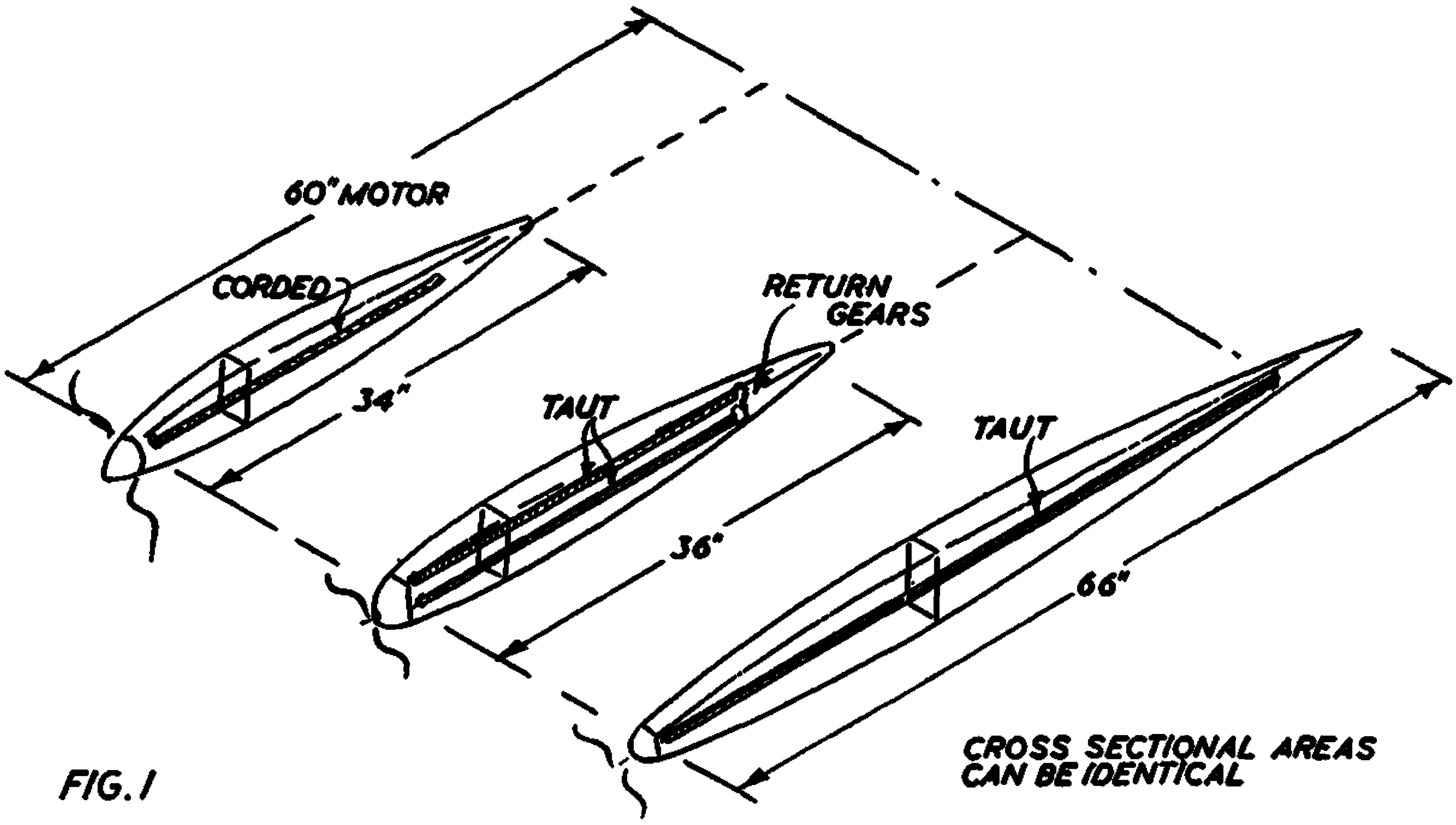


FIG. 1

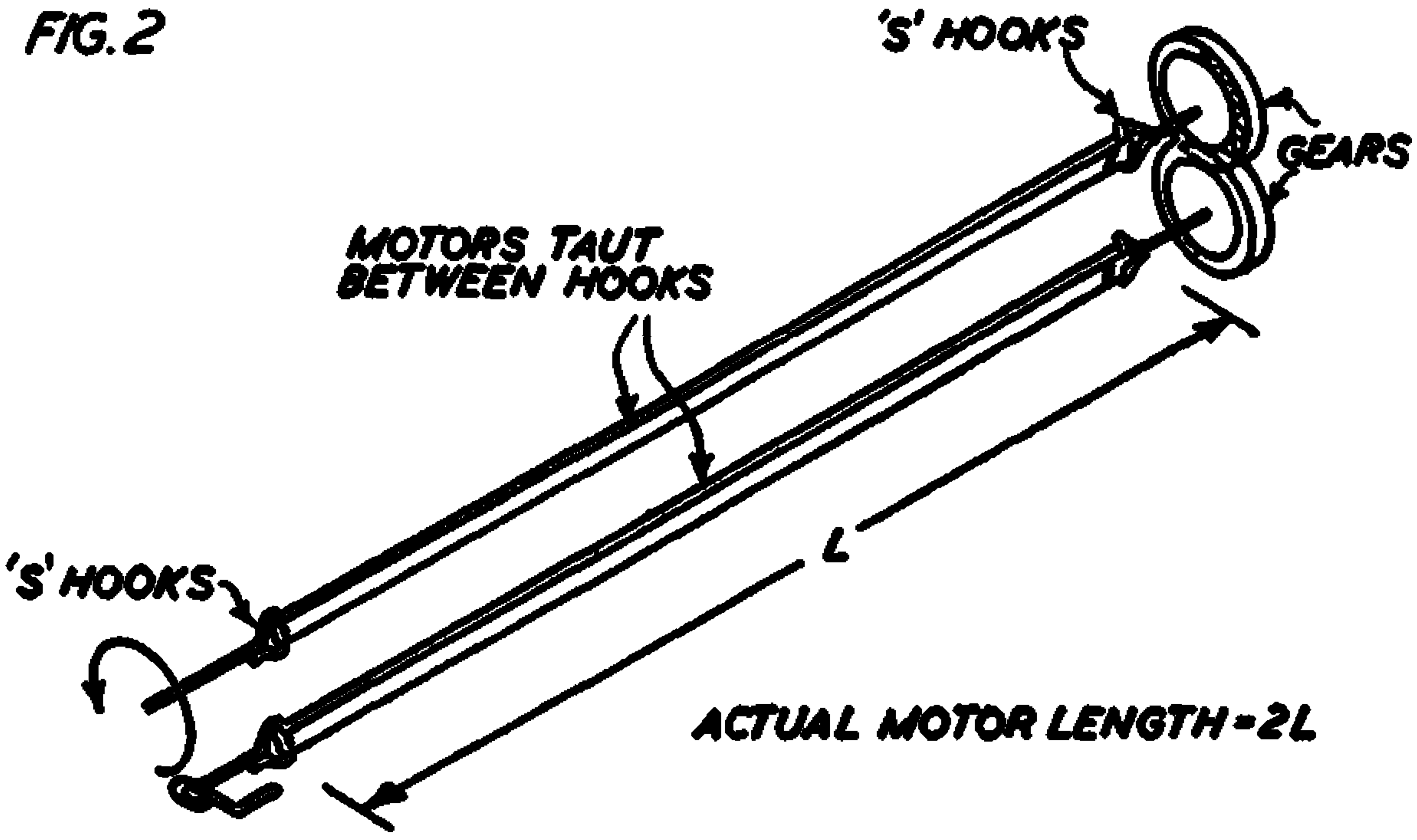


FIG. 2

The long fuselage layout offers a more direct solution, but to get a similar motor taut between hooks the fuselage length will have to be in excess of five feet. This makes it very difficult to design and build a structure which is both strong enough and light enough. It would be a model which would be easily damaged in bad landings, and not the sort of machine one would fly with confidence in rough weather. Aerodynamically, however, the long fuselage leads to a long tail moment arm, with the possibility of reducing tailplane area and putting more area into the wings for increased performance.

The final choice between the three is still quite an open one.

Now to devote the rest of the article to gears. The standard layout for a return gear system is shown in Fig. 2 and suitable gear diameters are listed in the table below, as recommended by E. W. Evans.

Motor	12	13	14	15	16 strands $\frac{1}{4} \times 1/24$ strip
Gear dia. in.	$\frac{3}{4}$	$\frac{7}{8}$	15/16	15/16	1
No. of teeth	20	—	22	—	24

The usual method of mounting the gears is on a tubular pillar of dural or steel, as in Fig. 3. Both the gears and the tube will have to be lightened to get below $\frac{1}{4}$ ounce total weight, the tube by skimming down the diameter and the gears by cutting out. Dural is usually employed for the gear wheels, when a thickness of 1/16 to 5/64 in. is adequate. A reason-

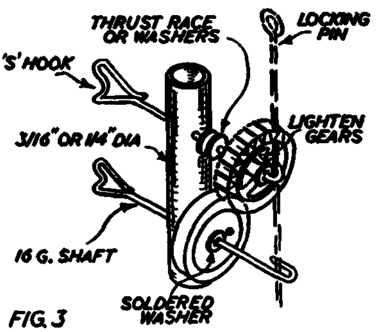


FIG. 3

able thickness allows a certain amount of play without danger of the gears coming out of mesh. Setting up the gears and drilling the shaft holes must be done with care, in order to get the right depth of engagement, but provided the gears do run freely without chatter they will be capable of giving good results.

It is a characteristic of the return-gear system that the gears do not rotate evenly as the motors unwind. From fully wound, the top motor only unwinds at first, sometimes for as long as fifteen seconds before the torque appreciably drops off at the gear end of the motor and the second motor cuts in and feeds, through the gears, into the unwinding top motor. In this " feed " the gears screech round at high speed for something less than one second and stop again. In other words, the second or bottom motor feeds into the top motor in short bursts with a considerable interval between. As the top motor gets more and more unwound, the interval between bursts gets less and at the end of the power run the bottom motor is " feeding " every two or three seconds until the last turn on both motors has been used up.

The intermittent action of the gears is not due to friction, as some people imagine. A simple experiment will demonstrate this. Wind up an ordinary motor with a marker bound at the centre—Fig. 4—and let it unwind. Although the propeller spins out uniformly the marker will rotate in bursts, just like the gears work in bursts. When the marker does rotate it will spin round much more rapidly than the propeller, just as the gear speed when " feeding " is many times greater than the propeller shaft speed.

Since the gears run intermittently they are clearly audible in flight, often at a considerable distance. To reduce the noise, fibre gears (or Tufnol) have been suggested, but there are some doubts as to whether material of this type would stand up to the extremely rapid acceleration or deceleration experienced. The noise, as such, of metal gears is no particular " fault."

For design purposes, some data are summarised in Fig. 5. The diamond fuselage is the logical cross section to accommodate gears (elliptic is also very good, but introduces the complication and weight of a streamlined fuselage). Since the motors are usually taut between hooks, smaller clearances at the nose and tail are permissible.

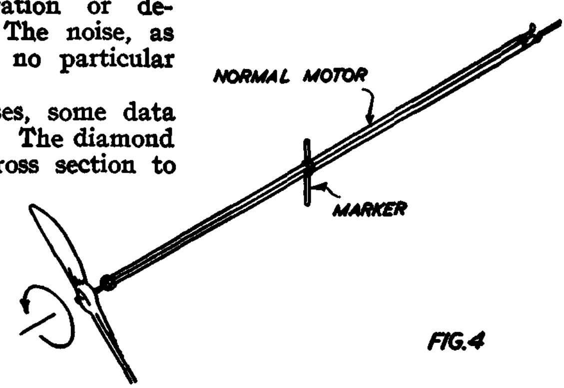


FIG. 4

The bottom motor is, of course, anchored to the front former of the fuselage and must have a fitting which can be withdrawn for stretch winding. Winding procedure is to lock the gears with a wire rod—as indicated in Fig. 3—wind the bottom motor first and locate the front fitting—holding the top motor taut and well clear of the lower motor. The top motor is then also wound in the normal manner with the same number of turns and the locking pin withdrawn. To facilitate winding some designers prefer to invert the arrangement shown, running the bottom motor to the propeller and locking the top motor to the front former. The top motor is wound first, in this case.

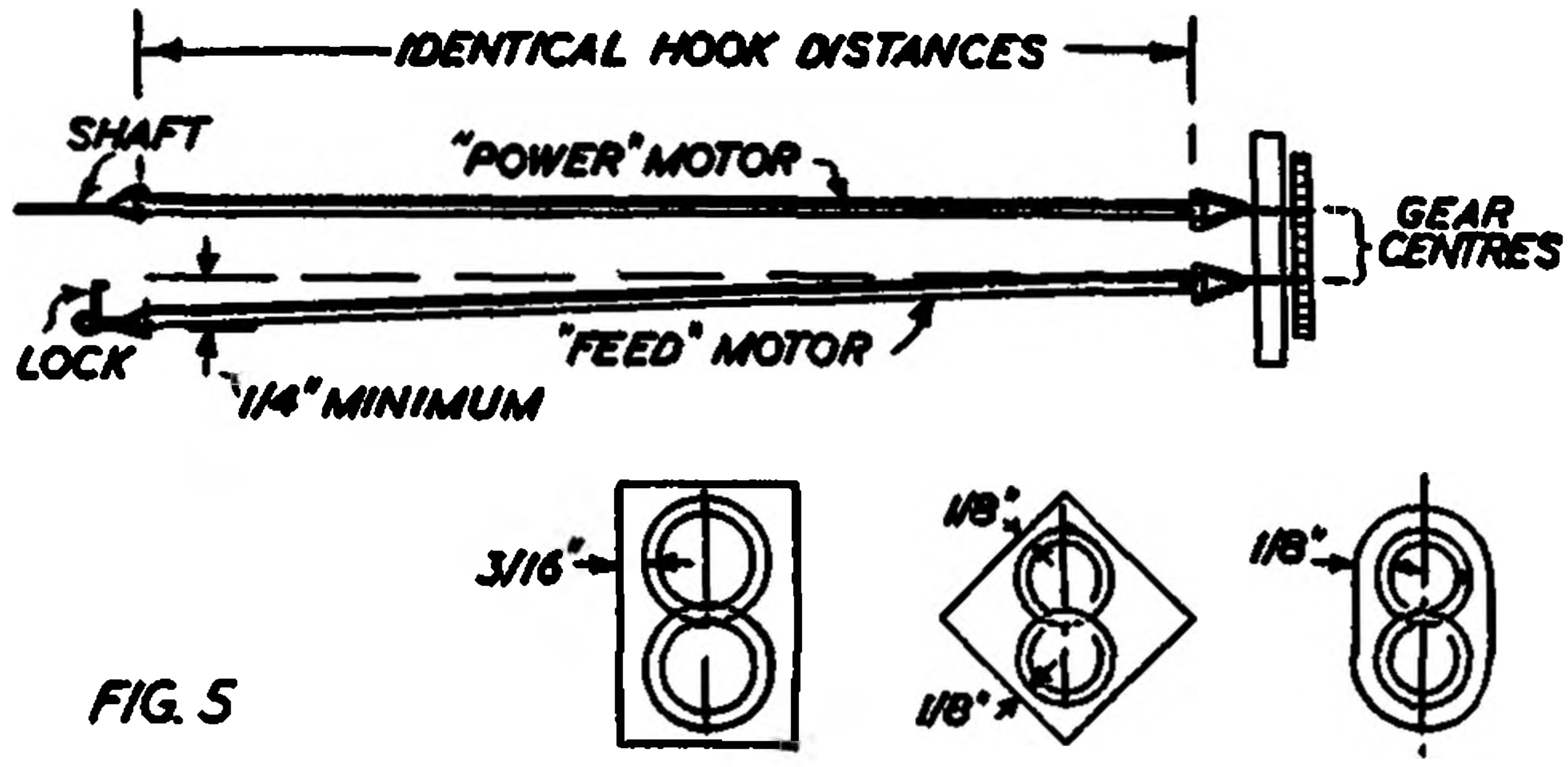


FIG. 5

The shape of things to come? Just a *moderately* long fuselaged Wakefield amongst this year's team from U.S.A. It gives a long taut motor, but whether it may be still further improved by gears has yet to be decided.

JETEX POWERED FLYING SCALE MODELS

By PHIL SMITH

Chief Designer to Model Aircraft (Bournemouth) Ltd.,

Makers of " Veron " Kits.

One of the most ambitious Jetex powered flying scale models we have seen, built by D. A. Marsh of Cosby, M.A.C. This twin jet Comet model was flown at the *Daily Despatch* Rally at Woodford, near Manchester, and, though trimming tests had not been completed, gave promise of exciting and realistic performance.

SINCE the advent of the Turbo-jet engine in full size aeronautics, the prototype aeroplane modellist (or free-flight scale fan) has found himself with a mode of propulsion that has defied emulation in the miniature sense and within the bounds of the average pocket, with the exception of the firework type rocket and, of course, Jetex.

It cannot be denied that there will in future years be very few full size aircraft powered by the conventional airscrew for the modellist to model and unless some genius designs a miniature turbo-jet at a price to fit the austerity pocket of the era, we shall all be modelling "oldies" with the same reverence we nowadays accord to '14-'18 types. However, Jetex power is a step in that direction, enabling us reasonably to reproduce in miniature the flight and form of the beautifully streamlined and contoured supersonic aircraft of this Atomic age.

My own herewith recorded experiences in developing a small range of Jetex 50 powered "squirts" will, no doubt, prove of interest to anyone intending to try this type of model, but must not, however, be taken as rule.

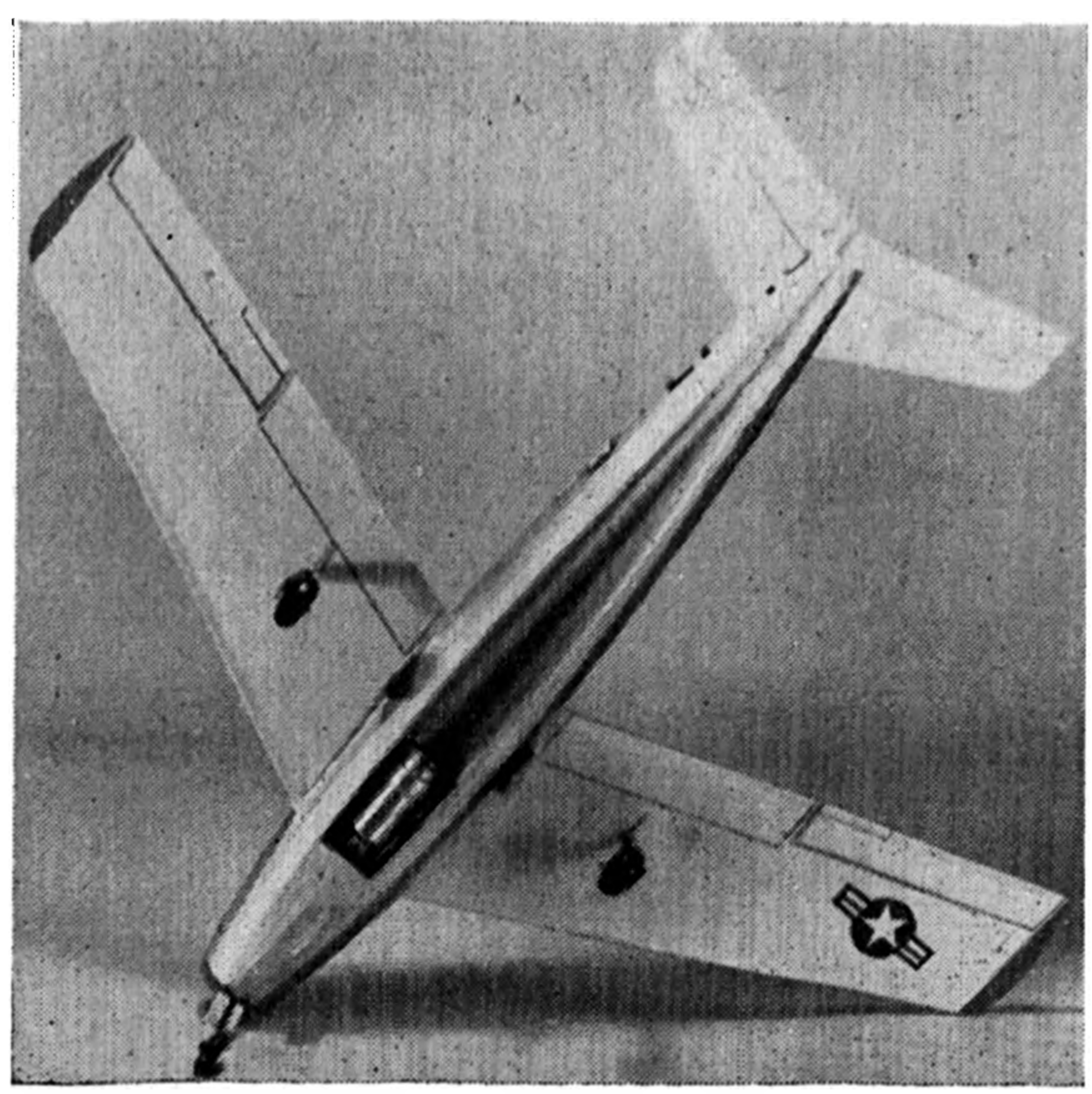
The first mistake I made with Jetex power was grossly to over-estimate the power available when relating scale designs to the same comparative size of Jetex duration model. It is virtually impossible to emulate the streamlined contours of a modern fighter with anything but formers, stringers, and laminated balsa construction, a mode which will no doubt give something like 45 to 65 per cent. more weight for the same span as compared to the conventional four-square longeron type of fuselage and common wing construction. To explain this more clearly, Mr. P. B. Allaker's 1950 Jetex Contest winner was 30-in. span and weighed only 2¾ ozs. including a Jetex 200 (motor weight 1.125 ozs. uncharged). I take my hat off to any modellist who can produce a scale model, within the meaning of the word "scale," of 30-in. span to weigh less than 4 to 4½ ozs. complete with the 200 size motor. I must admit that at least 10 per cent. of the extra weight will be taken up with the extra cockpit cover, transfers, insignia, and extra coloured finish as is so normally (and liberally) applied.

Therefore any scale model powered by Jetex would (for the average aspect ratio found in jet types) have to be:

(*a*) for the 50 motor, not more than 16/18-in. span and 1¼ to 1¾ ozs. all up weight;
(*b*) for the 100 motor, not more than 22/24-in. span and 2½ ozs. all up weight;
(*c*) for the 200 motor, not more than 28/30-in. span and 4½ ozs. all up weight;
(*d*) for the 350 motor, not more than 36/40-in. span and 7 ozs. all up weight.

It will be realised that the above figures are not contest duration figures, but those destined to give realistic and safe scale-like flight.

The second mistake I made in assessing the virtues of a Jetex motor was the "constant thrust" theme as expounded by the manufacturers, Messrs. Wilmot Mansour and Co. Ltd., for admittedly, the thrust is pretty even except for a slight gain in power as the unit heats up, but the fact that the makers state that "jet motors are most efficient at high speeds" gives a clue to the fact that once airborne, all Jetex models invariably accelerate. They continue to do so to a point where any slight building discrepancy such as wing warp is accentuated to the inevitable and final demise of the model. In other words, when building models of prototypes originally designed with little or no inherent stability, build accurately so that no disturbing balance (especially laterally) or other mal-set-up



Sabre underside showing how the Jetex 50 unit is concealed within a slot, giving adequate cooling and easy access. Note how the sweepback has been reduced, but still retains scale appearance.

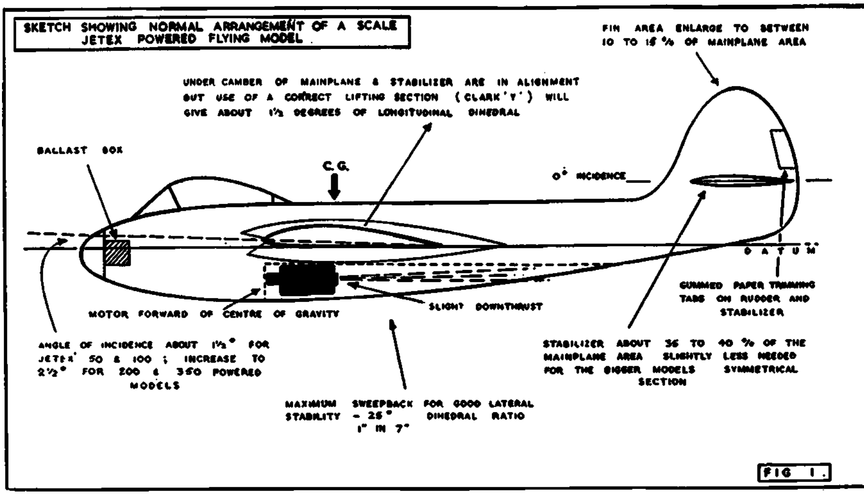


FIG 1.

will detract from the safe flight characteristics of the model. With gliders and rubber models you can sometimes get away with warps, but never in a Jetex model.

Sheet balsa wings are not recommended. They usually create a fast flying section, and this with the extra weight entailed, raises the wing loading to a point where the model invariably seems to be flying faster than the jet will push, so the model usually describes a huge parabolic arc into the ground or reaches a speed where contact with the earth or a solid object neatly demolishes the model. Use built-up cambered wings of a suitable lifting section (Clark Y, etc.) with conventional leading-edge, spar and trailing edge structure with tissue covering. This helps to create a form drag which gives the Jetex some work to do. A reasonable section will also help to stabilise the model laterally in flight, keep the flying speed within reasonable limits and obviate weight in the wrong place. (*See* Fig. 1.)

The C.G. ought not to be too low, but raised as near to the centre of resistance of the model, or, better still, on the thrust line with the thrust line high in the design. In scale designs, however, such a set-up is not easily found. As noted earlier, former, stringer, and tissue structures are the only ones which will give reasonable scale contours with light weight. Solid balsa bodies are out so far as Jetex is concerned.

So much for the basic structures. Positioning the Jetex units usually has its attendant detraction from scale effect. The natural place would be in the tail end of a model, but the extra ballast necessary in the nose would be prohibitive for the power generated. Therefore it must be amidships and one quite satisfactory way of fitting the motor unobtrusively is within a trough along the belly of the fuselage. A bit of "designer's licence" may usually be permitted so that the fuselage contour (usually round or oval) can be dropped to hide the width and depth of the trough.

This trough then permits free access for fitting, re-charging the motor and replacement in the clip. It enables re-positioning of the clip for balancing purposes. It also permits a free flow of air past the jet to encourage maximum thrust and cooling. Jetex motors are at their best when air is permitted to flow quite freely past the jet cap so that the jet efflux impinges upon air flowing for 360 degrees around the circumference of the unit. I always feel that far greater efficiency would result if the rear cap of a Jetex were " coned " to a point—the point being no more than the actual jet orifice. The difficulty attending such a design of unit is obvious from a production point of view.

The reaction of an underslung motor invariably causes a nose-up moment which unfortunately, not only encourages climb, but as the speed increases, a looping tendency. This sometimes can be overcome by imparting " downthrust " to the jet unit. This business of " up " and " down " thrust usually generates controversial thoughts within the mind of the novice, but we must remember that thrust in a Jetex motor is the " reaction " created within the unit body; thus if a jet efflux is pointing upwards, and backwards, the " reaction " for the unit body is downwards and forwards (or downthrust) and *vice versa*. See Fig. 2. So for an underslung motor, downthrust (jet tilted upwards towards the tail) will stop the oscillatory flight or looping tendency. By far the best position for the jet would be in line with the centre of resistance, but scale considerations generally obviate this. Occasionally, as with the French Turbo-jet Assisted Sailplane, the " Fouga-Cyclone " or latterly-called " Sylphe," the jet unit does come above the centre of resistance, creating a very stable flight set-up without tendency to spin. However, there is a nose-down urge as the speed increases, which can be offset by imparting a very little up-thrust (jet pointing downwards and backwards). Incidentally, a little model of this machine, the first I built of a series, is perhaps far more stable, both laterally and longitudinally than any other I have built. Although only powered by a Jetex 50, the span was 30 in. because of the high aspect ratio. A pal of mine flies his with a 100 unit and has great fun.

Lining the trough with thin cartridge or art paper, will overcome any burning tendency by the hot gases. When we recall that the greater percentage of the gas is steam, we can then no doubt understand why there is generally so very little charring of the structures in close proximity, even doped tissue. As long as there is reasonable space about the unit casing, as much as the normal clip will allow, charring will not take place, even should the casing become too hot to touch.

Positioning of the unit in relation to the C.G. is also interesting. With underslung motors the unit should be in front of the C.G. of the airframe. The effect of this is that, in powered flight, the extra weight forward will tend to keep the nose down as the model accelerates and the lift generated by the mainplane increases until the charge is expended;

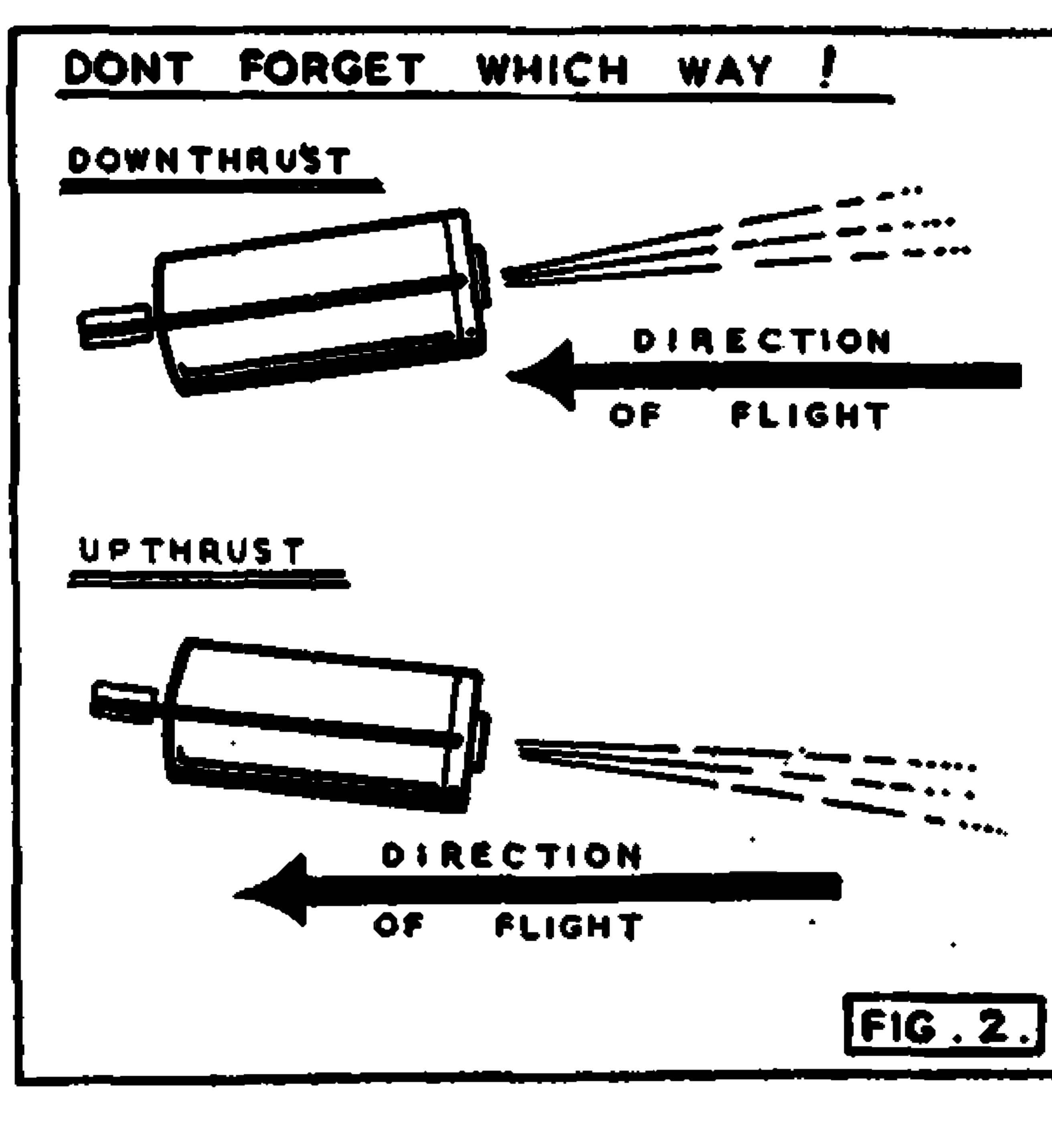
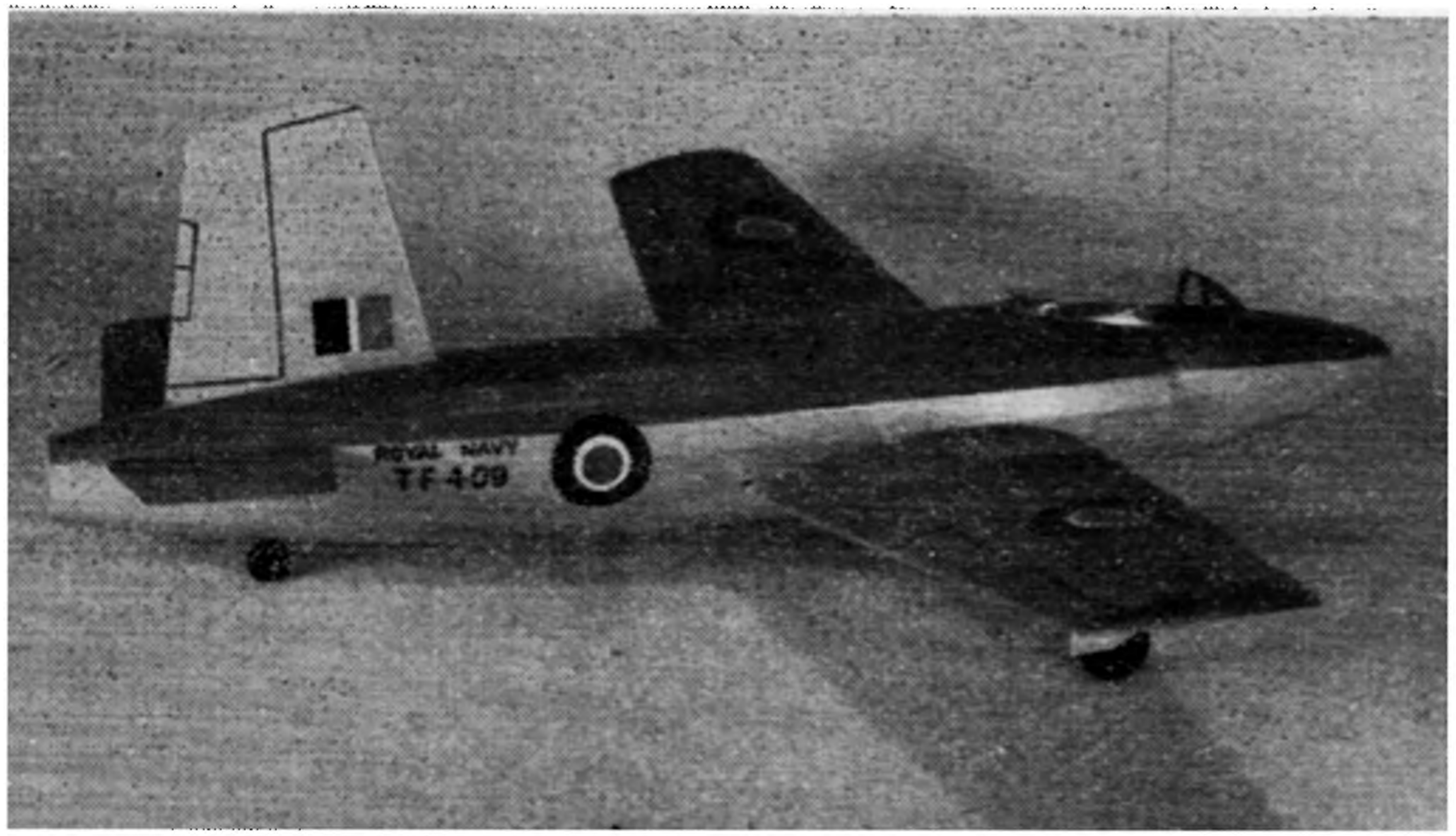
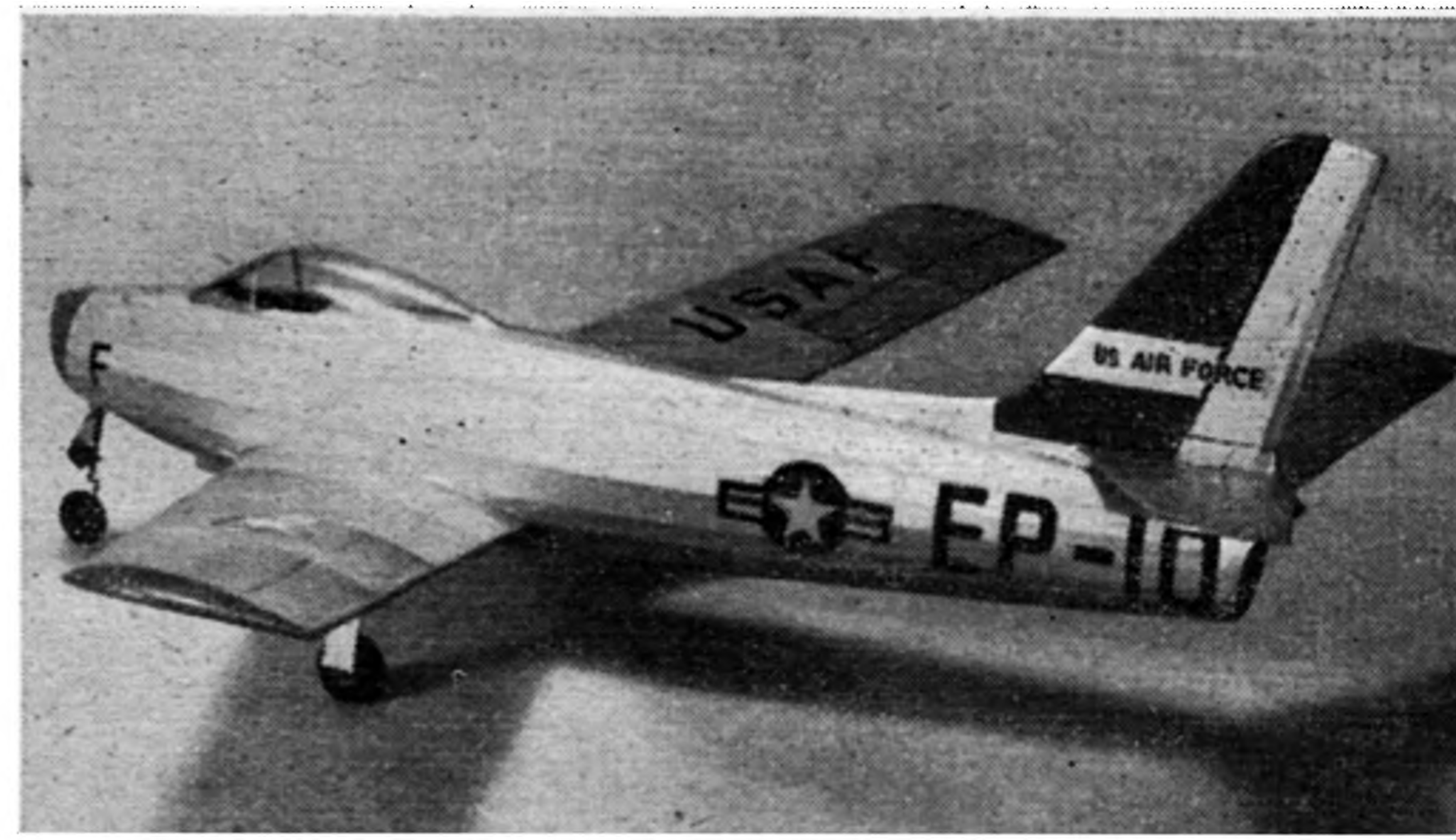
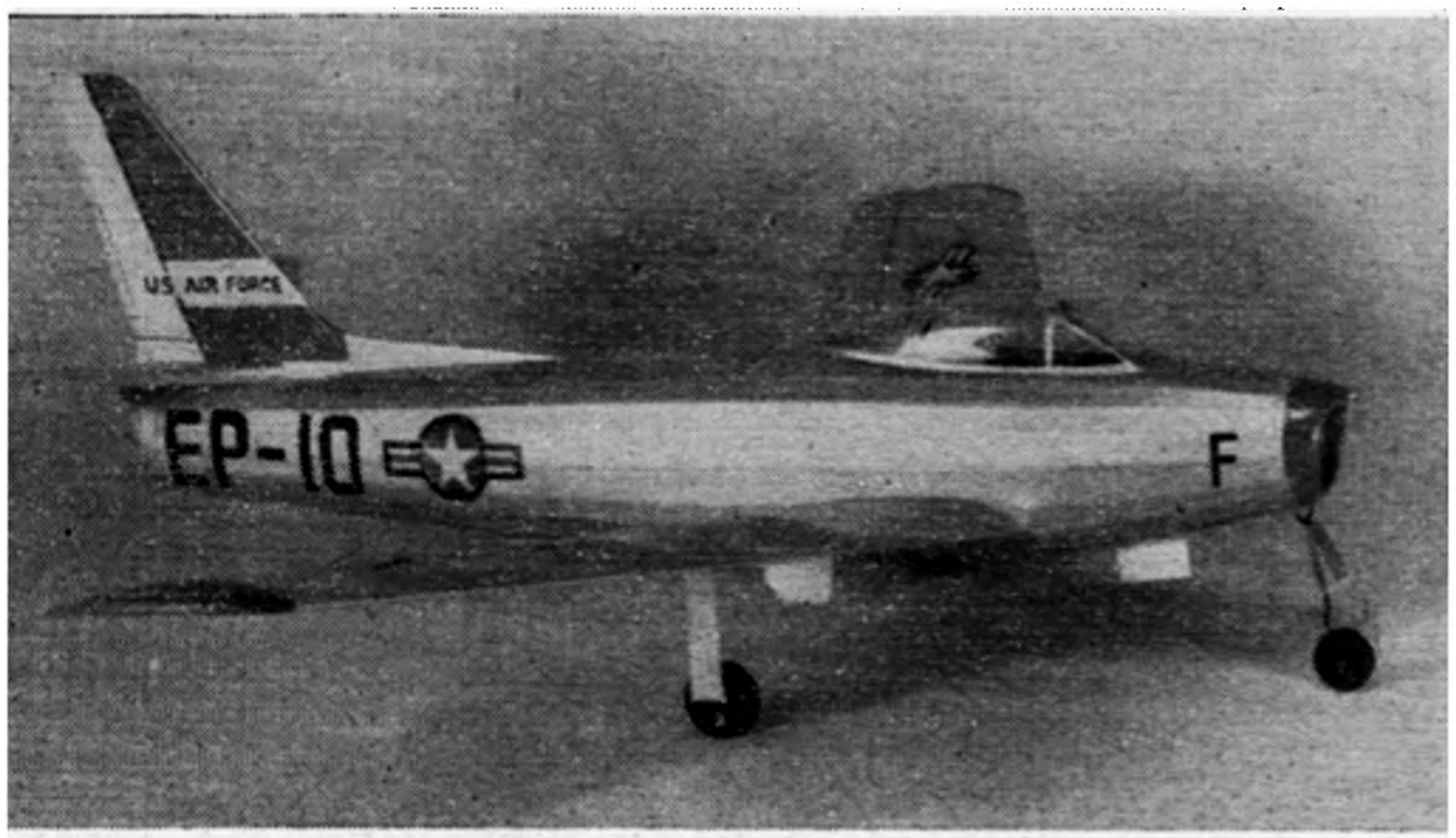


FIG. 2.







A quartette of Jetex powered flying scale designs by Phil Smith for Veron kits. *Top left* is the R.N. Attacker o 18 in. span, and weight without motor of 1⅜ oz. *Top right* is the Sabre of same span and weight. *Bottom left* shows another aspect of the elegant Sabre. *Bottom right* is another 18 in span design—the Thunderjet, this model weighing only 1⅛ oz. Jetex 50 is the power unit utilised in all cases.

then, in the glide, the airframe C.G. returns to its normal position as the charge burns away.

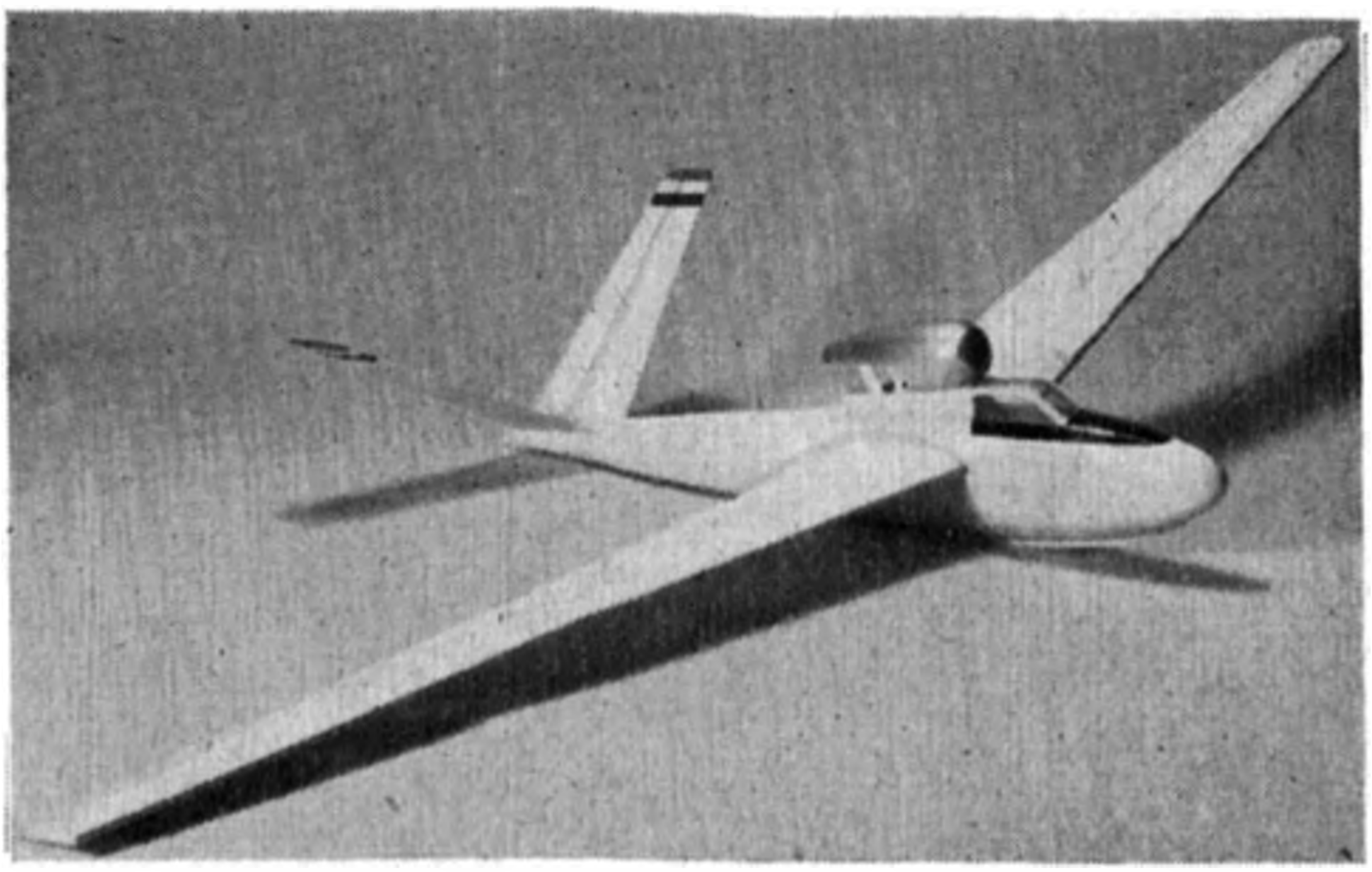
The foregoing statements will therefore accentuate that the models must at all times be balanced and thoroughly glide tested with an uncharged motor in place. It must be noted that individual thrust settings will have to be made with individual models. Postcard thickness shims under the mounting clip to create extra up or down thrust settings, are all that are required to produce a variance between climb and level flight.

This variable flight speed factor usually calls for symmetrical or flat section tailplanes. The short tail moment arms of scale models in relation to duration types are such that lifting section tails create longitudinal instability and delicate settings between the "power-on" and "power-off" flight trim. In fact the tailplane should be a stabilizer for the mainplane and no more, about 35 to 40 per cent. of the mainplane area, usually considerably more than true scale proportions.

The longitudinal dihedral between wing and tail is usually incurred by the cambered section of the wing when we remember that the wing datum line is calculated from the point of curvature of the leading edge to the tip of the trailing edge. On a Clark Y section, this is usually about 1½ degrees and is quite sufficient on a Jetex 50 powered model or at the most, another 1 to 1½ degrees can be imparted for the heavier models when powered by Jetex 200 and 350 units. In other words, with the undercamber of a Clark Y section flat with the tailplane, there is in reality about 1½ degrees of longitudinal dihedral, and more, up to 3 degrees, may be added for heavier models. In any case, extra longitudinal trim can be gained by small gummed paper tape trim tabs set along the trailing edge of the tailplane and incorporated within the outline shape. Similarly, lateral and directional trim may also be had when set up along the wing tip and fin trailing edges respectively. In test flying, a gentle turn should be achieved by rudder trim during the power run. A turn will invariably eradicate a stall, for once a Jetex model points its nose down, the result is either a dive straight in or a violent oscillatory flight.

One scale model that would need perhaps less fin area than the prototype, would be the Russian M.I.G. 15. The fin and tailplane are so highly located in relation to the thrust line that spinning tendencies are bound to be a heritage of a scale model which was not accurately trimmed and balanced. A better design by far, is the Lavochkin 17 with reasonable fin area and a high wing placing. Most other prototype designs therefore, usually require more fin area; that designed into most modern jet designs is totally inadequate for model use. The reduced fin areas on jet fighters is no doubt due to the absence of torque reaction, a feature which, in the Jetex scale models, considerably eases their trimming for flight. The amount of fin area to be added cannot be generalised, but is best arrived at by trial and error under flight conditions. Let it be said that swept-wing types, such as the Sabre, require less than the conventional wing types as with the Thunderjet; dihedral should be about 1 in. for every 10 in. span each side of the fuselage.

Sweepback, as incorporated in most supersonic jet fighters, is far too great for lateral stability in scale models and must be "tempered" in the drawing stage to an amount not exceeding 25 degrees on the leading edge. This can usually be done without detracting greatly from the



On the left: A somewhat larger scale model of 30 in. span. Prototype is the French jet assisted sailplane Fouga Cyclone. Weight, including motor is only 1¾ oz., and once again the Jetex 50 is employed.

Below right: The fascinating twin Jetex 350 Helicopter flown so successfully by Joe Mansour, partner in Wilmot Mansour & Co. Ltd., manufacturers of the Jetex motor units.

sonic planform of such a design as the Sabre, whose normal sweepback is 38 degrees.

It has always seemed that Jetex in Scale Control Line would be most satisfying, but to power a 30 in. model of an " Attacker " or similar, nothing less than a 350 unit would give anything like the velocity for a stunt performance. Firstly, the duration of standard charges (3 in a 350 unit) would not be great enough (36 secs.) and at present, far too costly to run in comparison to the more orthodox diesel motor. I would however, like to see a long 350 size unit capable of housing say 10 standard charges—the overall length would be no more than 7½ in., weight 6½ ozs. and the duration about two minutes. I wonder how many people have

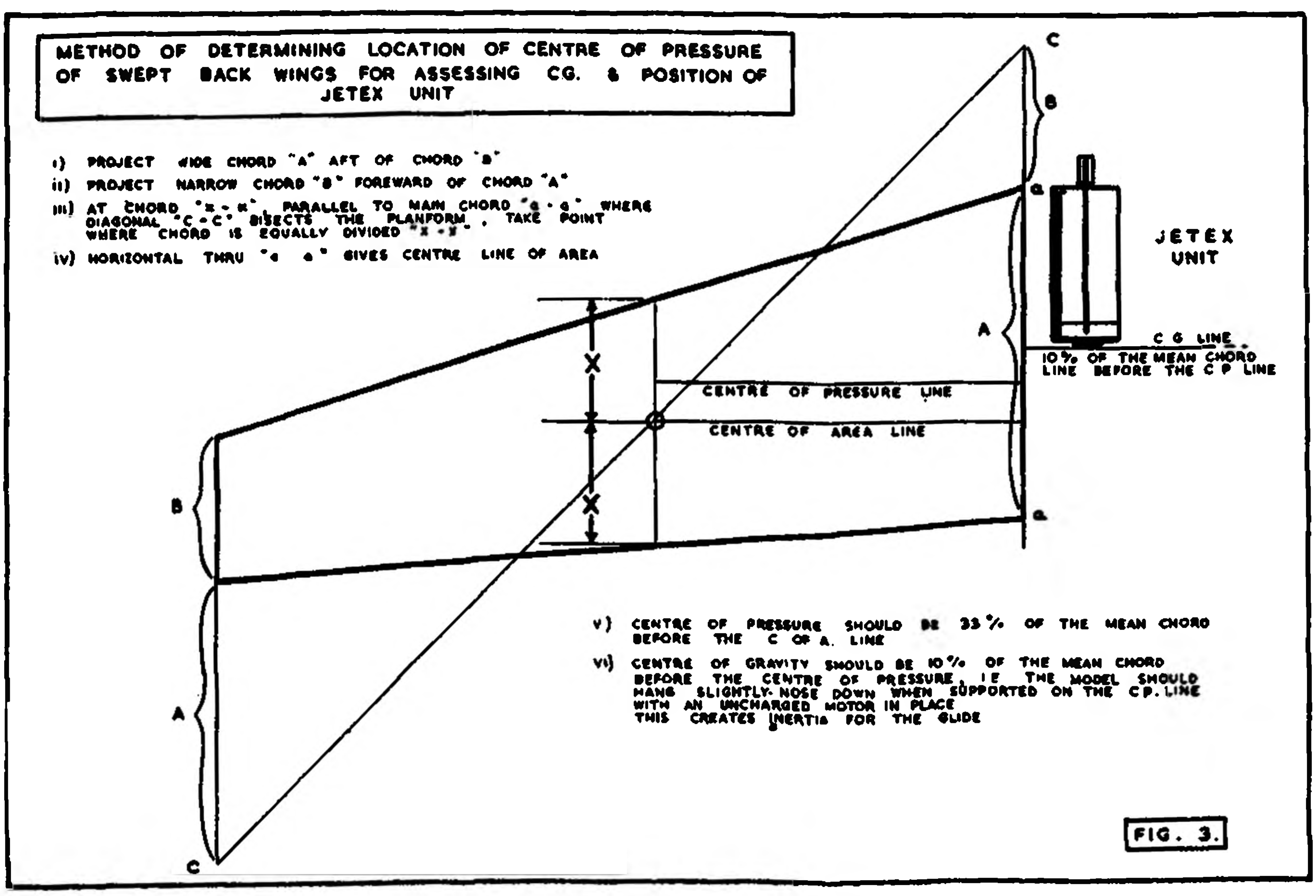
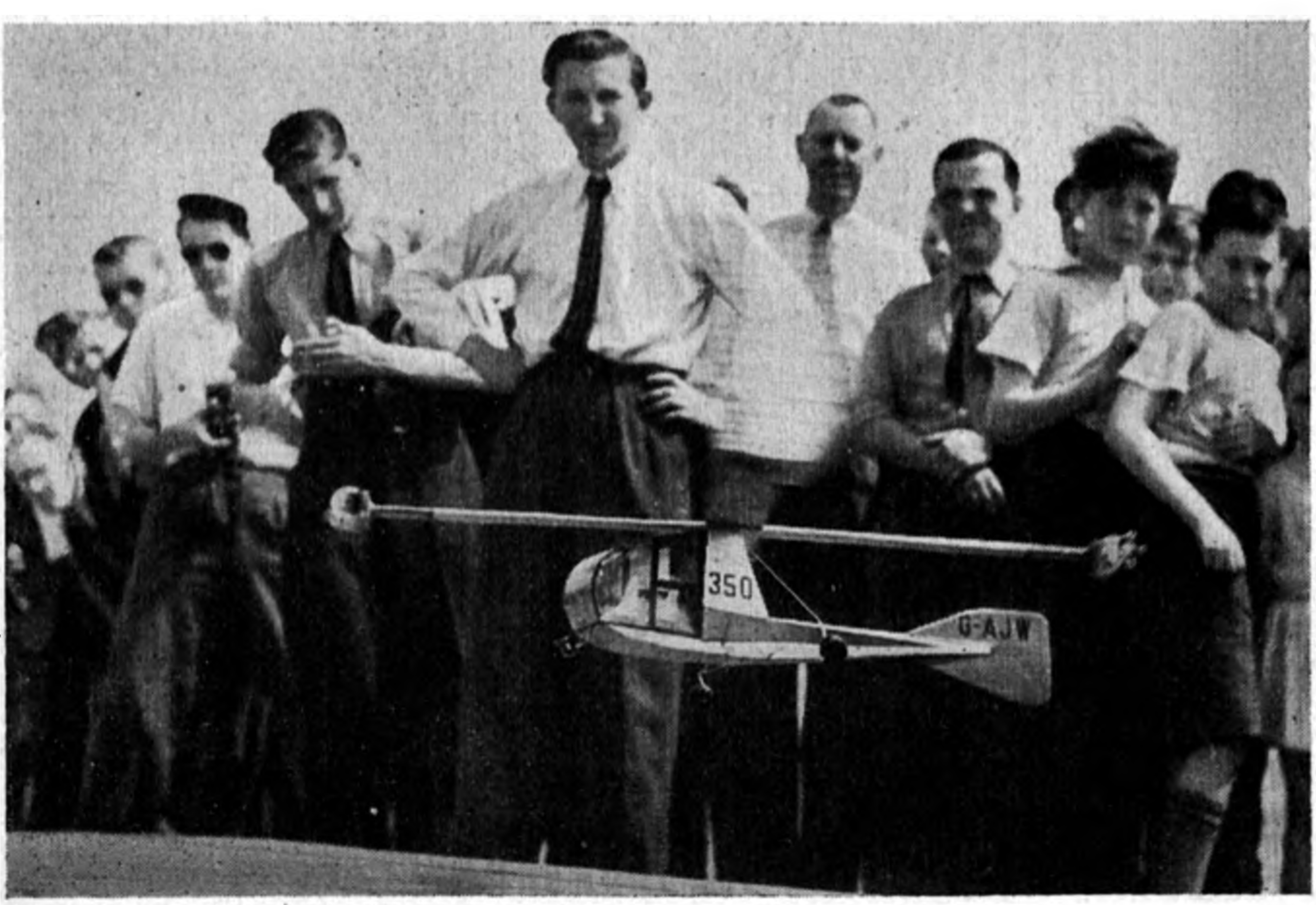


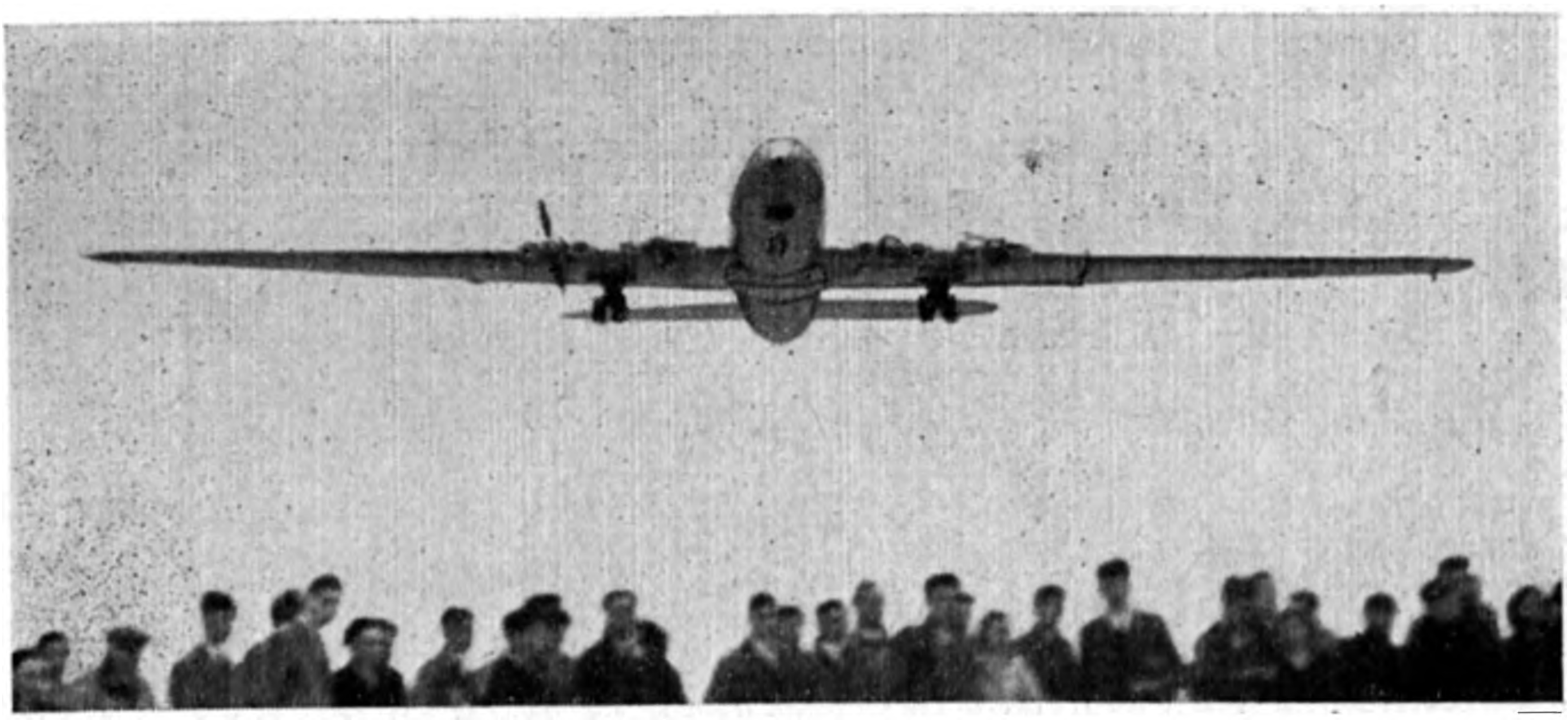
FIG. 3.

ever seen a Jetex unit "escape" from its mounting clip and continue on its own in flight—the speed is something to be marvelled at. It may quite well be that a Jetex 350 unit in a 15 in. span control line model of, say, the Lavochkin 17, weighing 1½ ozs. airframe weight, would fly somewhere in the region of 150 m.p.h.

Mr. P. R. Payne claims he once calculated that the muzzle velocity of a Jetex 350 unit was 2,450 m.p.h. and for the average thrust to be just over 5 ozs. It would seem therefore, that except for the cost and more elaborate re-fuelling technique, Jetex may yet be accepted as a medium for powering small scale Control Line models.

The fitting of Jetex as propulsive units to the rotors of model helicopters, is a "natural." Much has already been written about this type of model, but it must be acknowledged that this mode of power is far superior to rubber motors for turning the rotors. Rubber motors require such a long length to give a suitable duration, that the resultant fuselage (to wit—stick helicopters) completely rules out scale dimensions. Some modern helicopters have small ram-jets upon the rotor tips, but although it is known that Jetex units so placed can rarely be synchronised and balanced, this has quite easily been overcome by fitting the units to a transverse beam of ply or similar material as in the Jeticopter designs. This, coupled with a simple system of angular hinge lines for auto-rotation of the blades, means that model helicopter design has now assumed more normal proportions to scale and near scale. At this year's Northern Heights Gala Day, second place in the helicopter trophy was taken with a twin Jetex 350 powered helicopter, which was as near scale as one could wish. Its flight of 2 mins. 51 secs. means an autorotational glide of some 2 mins. 16 secs., which is better than most scale rubber jobs.





MULTI ENGINED MODELS

THE scale model builder from the earliest days has always had a hankering after multi-engined models. This has for so long been mere wishing that the occasional free flight twin-engined jobs that had their brief day were regarded as no more than the exceptions which proved the rule that it just could not be done.

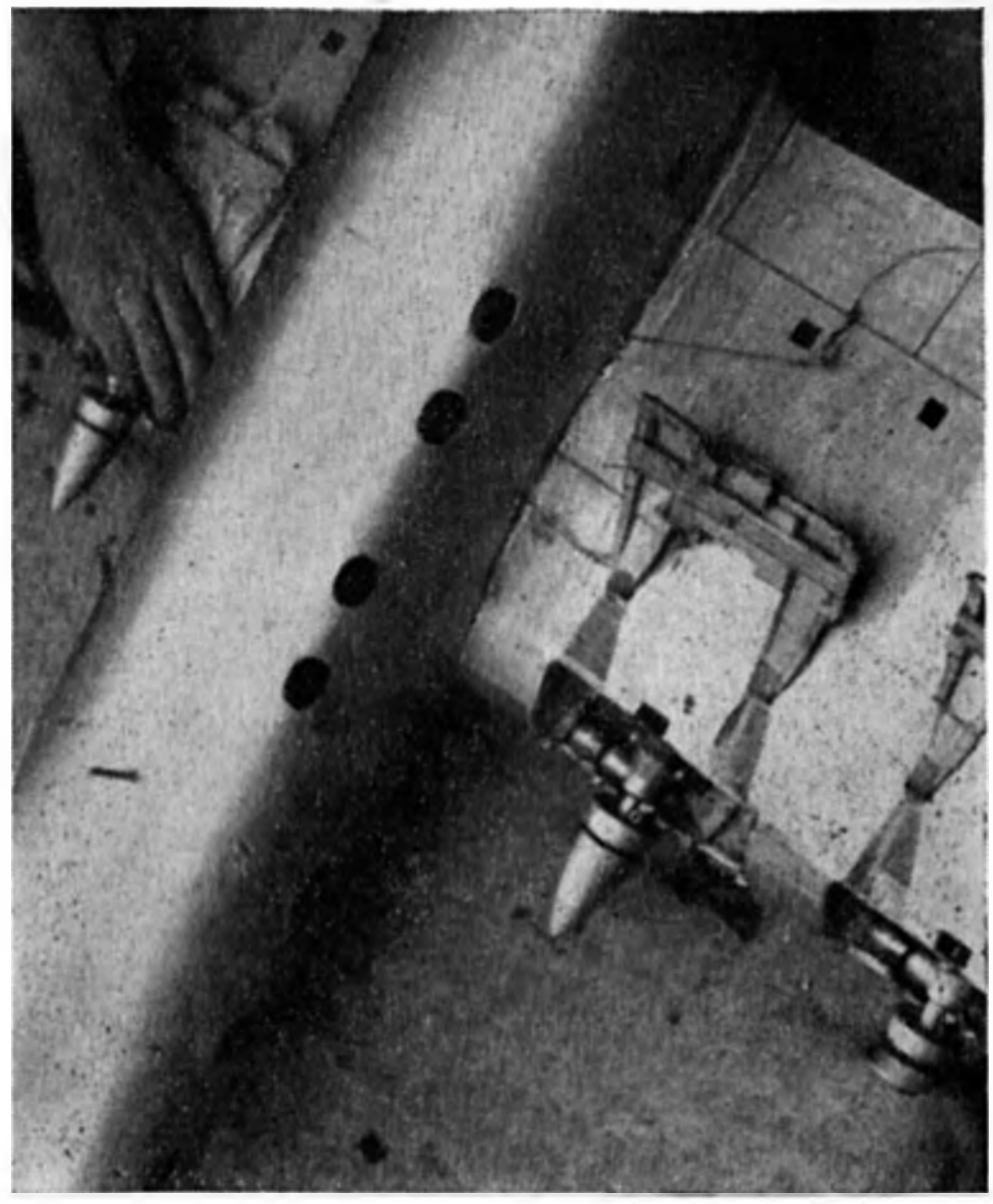
Among such models we call to mind Rupert Moore's ingenious rubber powered series culminating in his Blenheim Bomber. Only in Rupert's magic hands did the Blenheim and its precursors fly. He even produced a twin-engined Wakefield that performed creditably! H. J. Towner also tackled the problem from a different angle with his Airspeed Envoy, and several models that were actually kitted. Again, in our experience, we have only seen the designer produce reasonable flights. With the advent of small, cheap, commercial diesels of uniform performance it seemed that the troubles of short motor run or Heath Robinson complications that were part of the rubber modeller's nightmare, would be overcome. But a new problem arose, with the difficulty of arranging that motors cut out at the same time; or, alternatively, another fearsome complication of automatic rudder trimming device to keep the model steady on one engine. So once again, a few hardy souls only attempted to solve the problem. Among those who succeeded, in part at any rate, we must number Col. Taplin, who flew such a model radio-control. His approach, we believe, was via a direct coupling shaft interconnecting the engines by means of

On the left: Peter Holland's Brabazon coming in with wheels down and outboard engine stopped—an action picture that does justice to its scale lines!

Left bottom: The Brabazon taking off in the Festival Sports Arena before a packed crowd of visitors.

Right: A close-up of the Brabazon's engines with covers hinged back—the third engine has just been started.

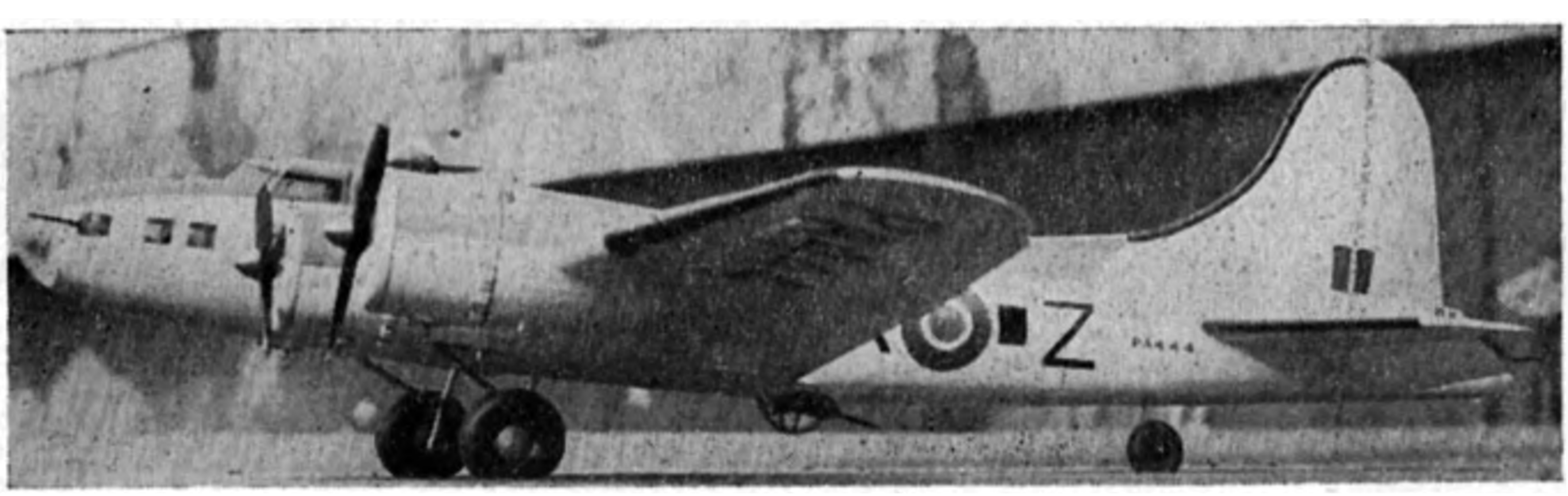
Bottom: Lifelike shot of A. Briggs Fortress II posed against fullsize hangars. A Bill Dean picture.



bevel gears. Of course, the addition of radio control made it simpler to give appropriate rudder if anything went amiss. But still the multi-engine phase had yet to come.

We should perhaps recall one other angle on engine failure. This was the selection of a scale prototype, such as the Fokker D.23 design, which lost to the Lightning in U.S. Air Force trials, to decide on a twin-engined fighter for mass production. Here the airscrews were placed fore and aft of the central fuselage, the tail being carried on twin booms. Irregular cutting by one or other of the engines therefore had no effect on the forward motion of the aircraft. Hodgson produced a semi-scale version of this in rubber which would produce a regular two-minute flight, and could be flown with one or other of the airscrews removed. Only snag here was the need for a pusher type prop to be carved—a problem which has somehow never much appealed to aeromodellers—a kind of " cack-handed " carving.

The arrival of control line flying to this country seemed the answer to everything. But strangely enough everyone was too pre-occupied at first with flying the most unsightly boxes, and learning the technique of handling models in the air, until contest stunt flying got to be the specialised province of the few : or making stub winged engines fly faster and faster



in a whirligig of sound, so that little attention was paid to beauty or scale appearance.

Now that the novelty has worn off, virtually every builder considers appearance as well as performance, so that stunt models are elegant, graceful creatures that are a pleasure to behold, while speed enthusiasts have produced ever faster designs without any sacrifice of beautiful lines and quality finish. At the same time those keen flyers with no pretence to contest victories or record-breaking speeds have concentrated on scale models.

The Festival of Britain, with its many opportunities for public demonstration of our art and hobby, set quite a number of people thinking on much the same lines. If two engines were possible, why not four? The spectacular Brabazon had made its first test flights and in goodwill trips had been seen by most interested followers of air progress, if not actually "in the flesh," in the newsreels at the local cinema.

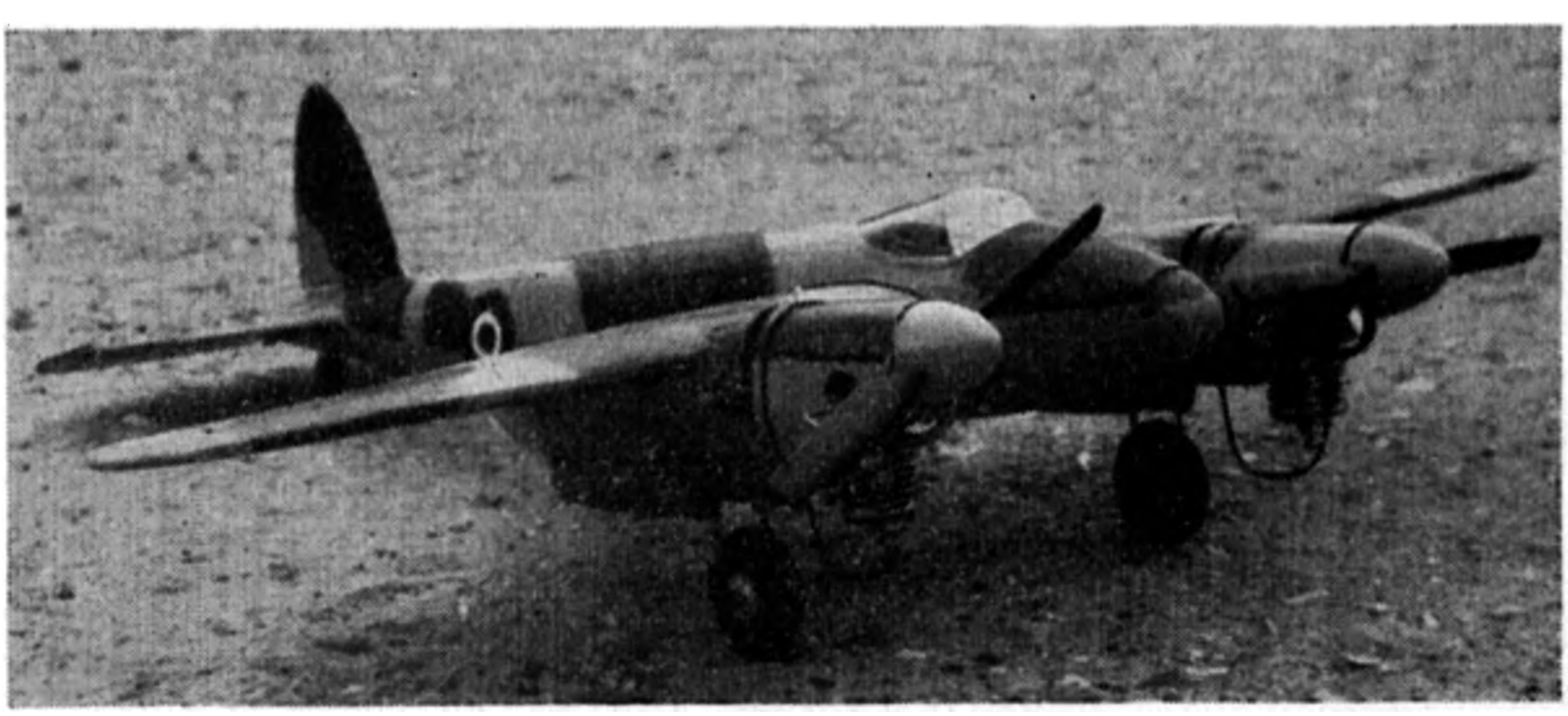
Its sleek lines were just the thing for a model. Plans appeared in the fullsize and model press, there were vast numbers of photographs—and what a lovely job for the Festival performance!

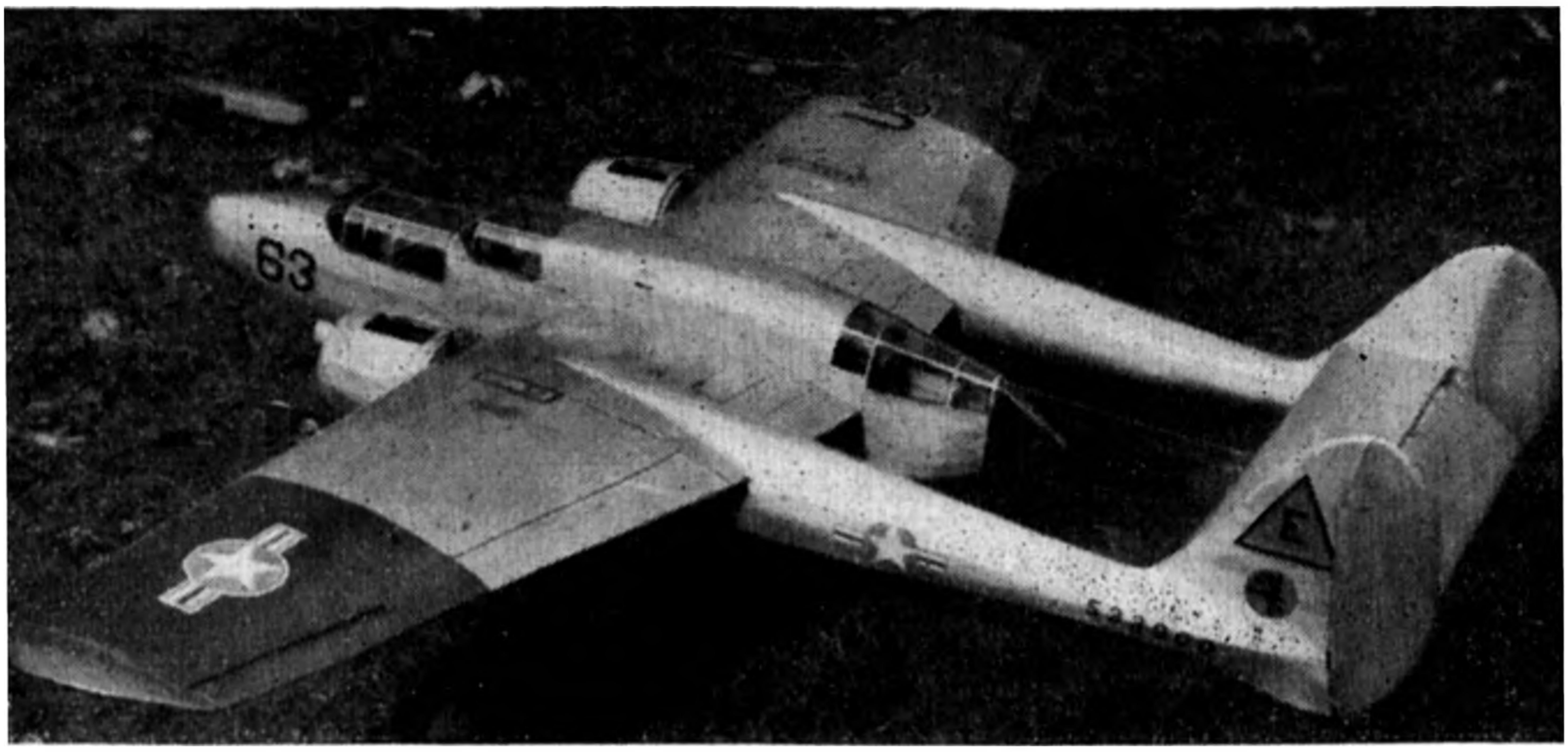
Of course, four engines make rather a dent in the deepest pocket, but undeterred, the builders pressed on, with the promise of engines on loan for flying, or clubs made it a group project. At least three Brabazons are now built and doing a splendid job educating the masses into a belief that aeromodelling really means something, but the best known must surely be Peter Holland's, of Apsley, for he has had the pleasure and privilege of flying it at displays in the London area, including the South Bank site, Wembley Stadium, and several big air displays within forty miles of town.

Transport has been something of a problem, for with span of some ten feet, of which only the outboard panels are removable, and a length of not much less, it is not a model to take on the tube. It has, however, been successfully parked on Assistant Editor Hundleby's Austin Seven saloon—though it nearly stopped the London traffic!

The Holland version is a half-inch to the foot model, with a total weight of 8 lb., and is powered by four Elfin 1.8 engines. One belongs to

An attractive De Havilland Mosquito control line model by J. C. Chaplin, of Winchester. This is a prototype that lends itself well to multi-engined modelling.

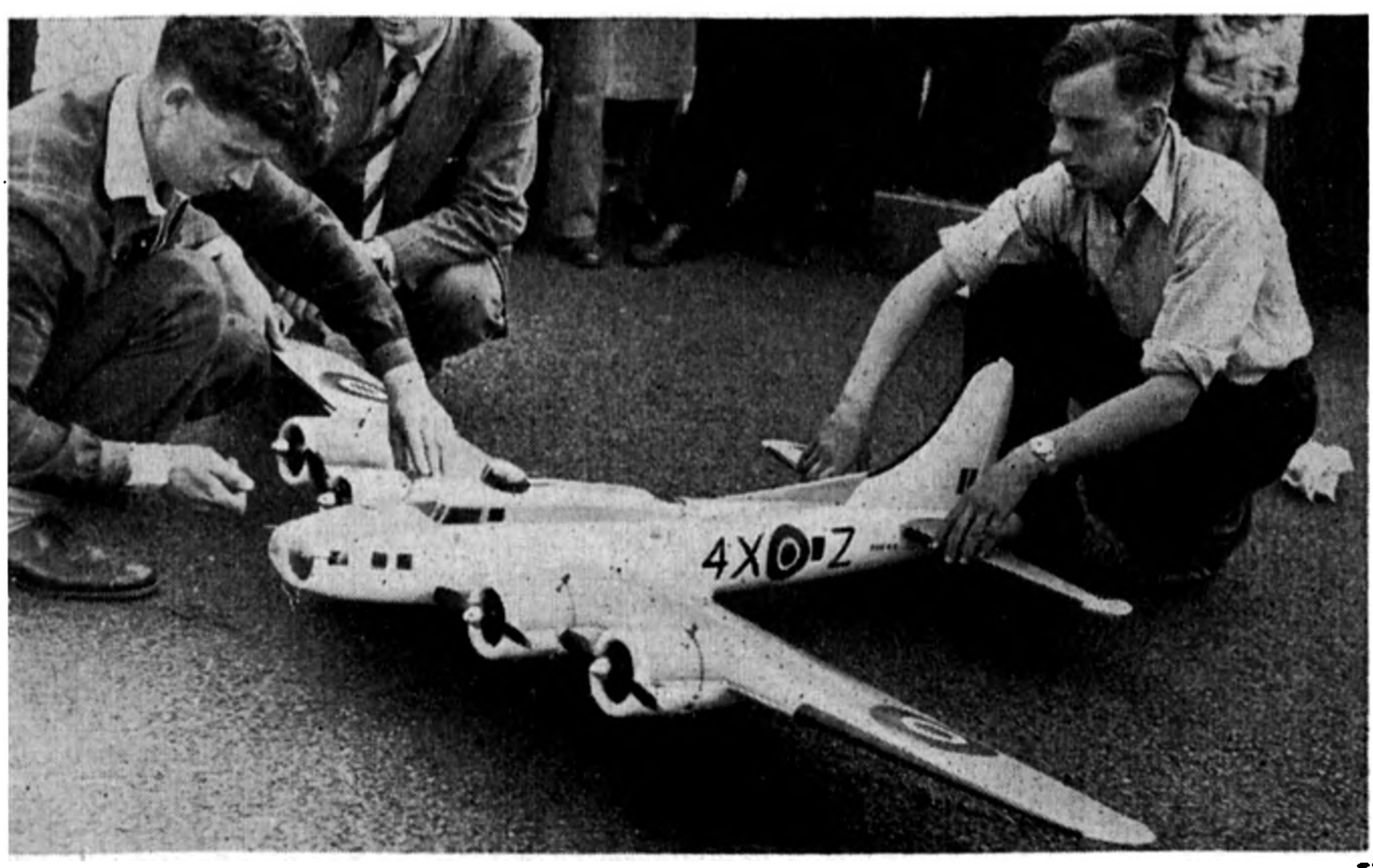




Another attractive twin-engined model of the Black Widow, in appropriate U.S. markings, built and flown by R. J. Thorne and family, of Richmond, Surrey, who have incidentally built no less than ten multi-engined models successfully.

the builder, the three others are borrowed from friends and clubmates. Their services as a team are also needed to get the four engines started. Undercarriage is retractable and detractable, and possesses operating brakes. It took four months of spare time work to produce, and entailed the assembly of approximately fourteen hundred parts ! It will continue airborne with one motor cut, and begins to glide in as a second motor falters. Colouring is authentic silver finish of the prototype—a fact which cameramen from newsreels, agencies and our own model magazines have been quick to appreciate—a real glamour model that loses little by repro-

A. Briggs, of Mitcham, holds the tail of his Coastal Command Fortress II while the engines receive a preliminary warming-up.



duction in black and white. And when we add that its builder sports a truly photogenic profile and a beard, it can be regarded as one hundred per cent. news value.

This should not be allowed to obscure the activities of others in the same field of multi-engined models. A. Briggs, of Mitcham, has produced a remarkable Flying Fortress II, gay in R.A.F. Coastal Command colouring. This is slightly smaller, being just over 6 ft. 6 in. in span, and is powered by four E.D. Mk. IV diesels. All up weight is 10 lb. Performance is therefore rather brisker than the Brabazon, and, being smaller, is capable of being flown with more liberties.

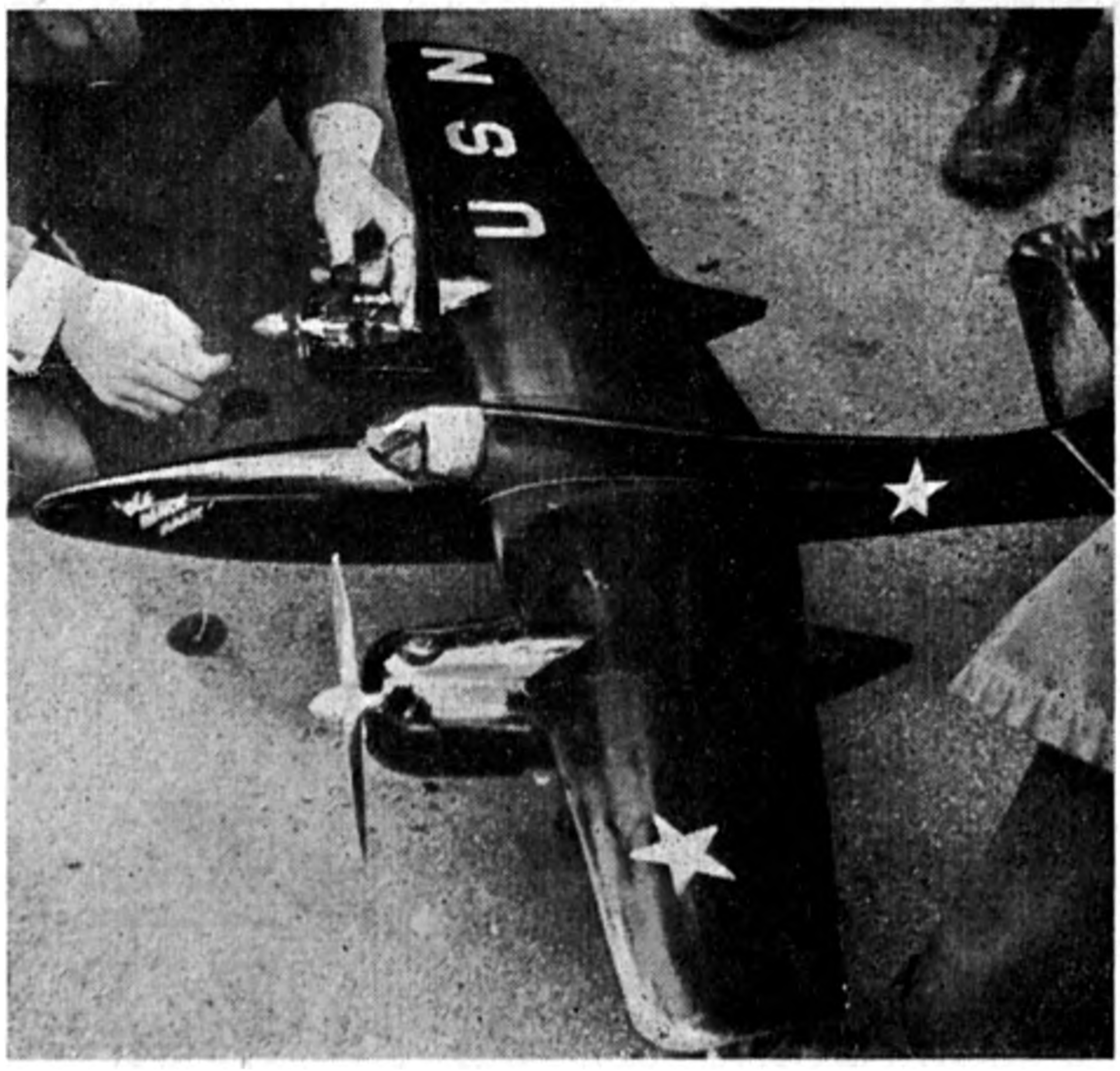
Visitors to the Wembley meeting will remember its sparkling performance with a bevy of smaller aircraft in support or pursuit.

Early cutout of the outboard motors is covered here by installing smaller tanks to these engines. Thus the nearest motor to the pilot remains running longest, and prevents that horror of the model flying into the centre of the circle. Takeoff is impressive, but plenty of smooth space is desirable to get a troublefree unsticking, as the writer inadvertently found at Wembley, when, alas, he was just fouled by a wingtip when photographing another circle's activities! Happily, damage was quickly repaired and the model has been flying as well as ever since.

In the twin-engined category we must mention J. Donavour-Hickie, who has put in a vast number of hours flying at demonstrations this summer with his Sea Hornet. Although this model cannot claim to be particularly scale, with its engines popping out of the cowlings, it has the virtue of complete reliability. In the air, too, with props spinning, it loses its slightly unrealistic air as seen on the ground.

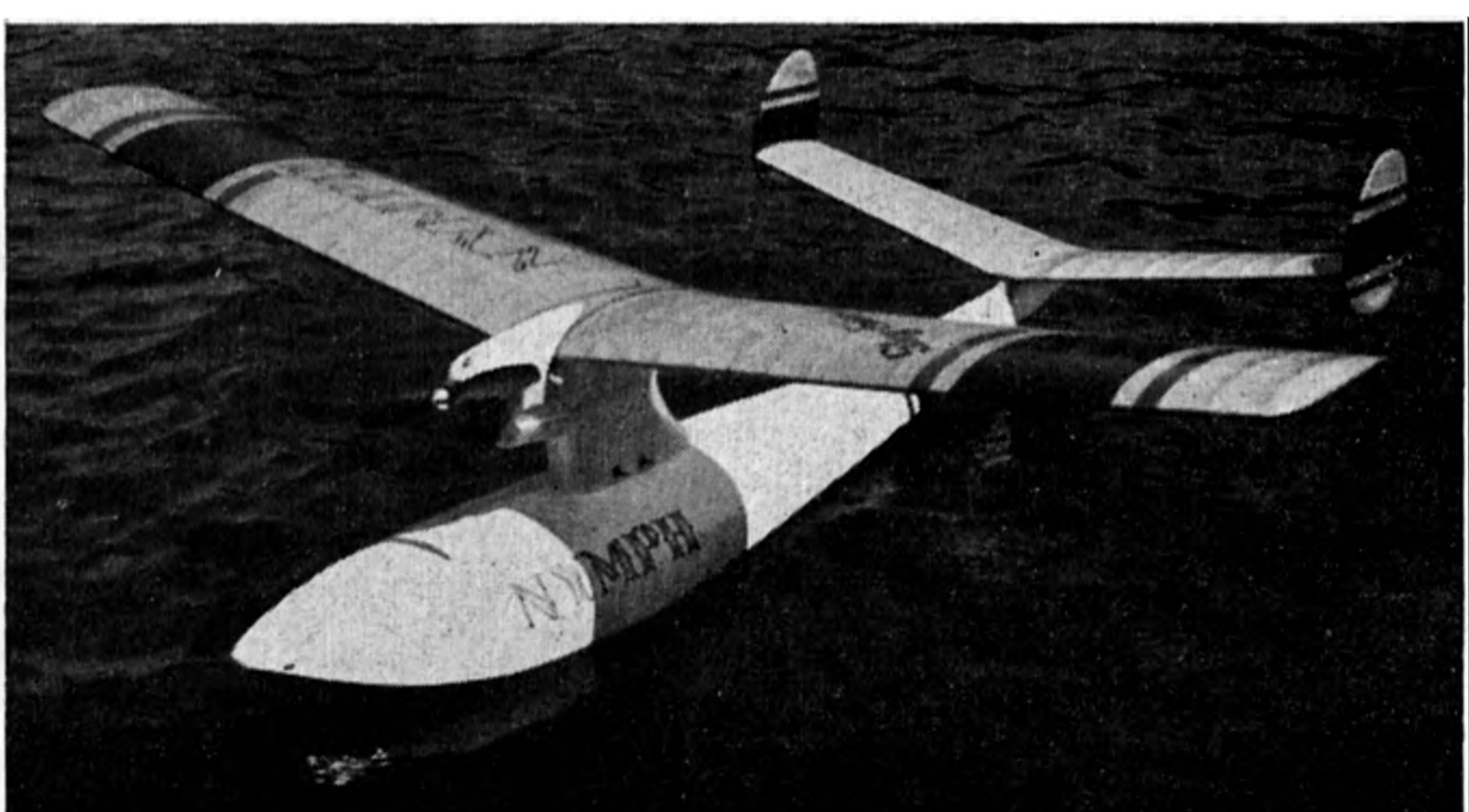
Altogether, it seems that control line is the absolute answer to flying any multi-engined aircraft, and we look forward to seeing even more of them next season. Perhaps it is not too much to hope that some bright organiser will run a four-engined control line contest, when the public could see them in their dozens!

Left: Close-up of J. Donavour-Hickie's Sea Hornet—a model that put in a lot of flying hours this summer at demonstrations in all parts. Inelegant on the ground it is essentially practical and its reliable performance belies its unscale appearance when at rest.



Right: A Grumman Tiger Cat powered by two E.D. Comps built by Donald Deely of Birmingham. Plans of an Italian built model of this machine appear on page 54, though in this case two 5 c.c. engines are employed.

Japanese Flying Boat "Nymph," built by Hide Iwata—seen at the Sky Friends Hydroplane Meeting on Lake Yamanaka in July, 1951. Power is an Arden 199.



NATIONAL MODEL AIRCRAFT GOVERNING BODIES

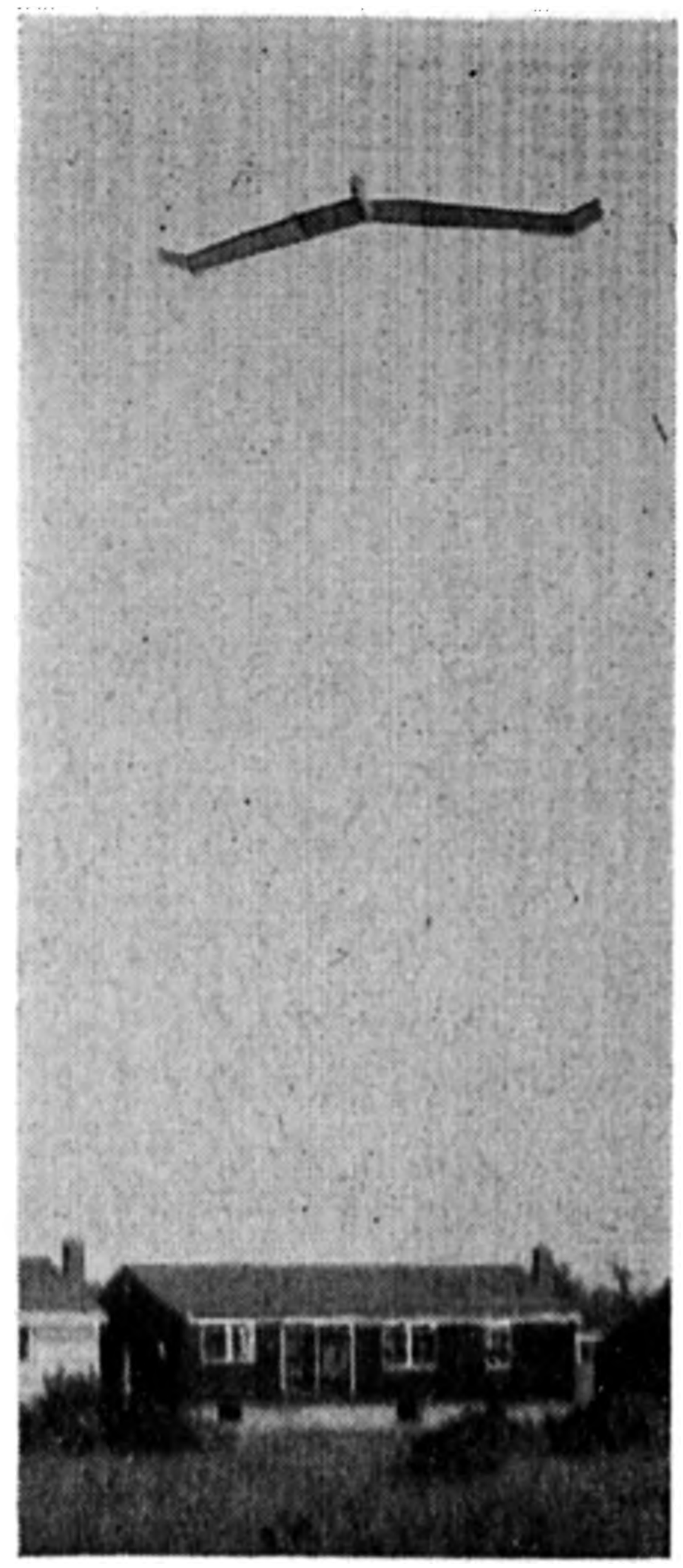
In most instances the full-size national aero club is directly responsible for the conduct of model aeronautics, but in some cases, as for example the S.M.A.E., a specialist group has been delegated to handle affairs on behalf of the parent body. To avoid delays in correspondence any letters dealing with model aeronautics should always be very clearly marked as such.

GREAT BRITAIN	The Society of Model Aeronautical Engineers, Londonderry House, Park Lane, London, W.1.
AUSTRALIA	The Model Aeronaturical Association of Australia, Sec.: M. G. McSpedden (A.C.A. Aust.), 195, Elizabeth Street, Sydney, New South Wales.
AUSTRIA	Osterreichischer Aero Club, Vienna 1. Dominikanerbastei 24.
ARGENTINE	Aero Club Argentino (Seccion Aeromodelismo), Rodriguez Piera 240, Buenos Aires.
BELGIUM	Fédération de la Petite Aviation Belge, 1, Rue Montoyer, Brussels.
BRAZIL	Aero-Clube de Brasil, 31, Rua Alvaro Alvim, Rio de Janeiro.
CANADA	Model Aeronautics Association of Canada, 1555, Church St., Windsor, Ontario.
CHILE	Club Aereo de Chile, Santa Lucia 256, Santiago.
CUBA	Club de Aviacion de Cuba, Edificio Larrea, Havana.
CZECHOSLOVAKIA	Aeroklub Republiky Ceskoslovensko, Smecky22, Prague II.
DENMARK	Det Kongelige Aeronautiske Selskab, Norre Farrimagsgade 3 K, Copenhagen.
EGYPT	Royal Aero-Club d'Egypte, 26 Rue Sherif Pacha, Cairo.
FINLAND	Suomen Ilmailuliitto, Mannerheimintie 16, Helsinki.
FRANCE	Fédération Nationale Aeronautique (Modèles Reduits), 7, Avenue Raymond Poincare, Parix XVI.
	Aero-Club de France (Modèles Reduits), 6, Rue Galilee, Paris. *(Communications should always be addressed in duplicate to both these bodies as they jointly share responsibility for certain aspects of aeromodelling.)*
GERMANY	Model Aviation Committee of the German Aero-Club (M.F.K.), c/o Hans A. Pfeil, (21a) Bad Pyrmont, 15 Brunnenstrasse, British Zone.
HOLLAND	Koninklijke Nederlandsche Vereeniging voor Luchvaart, Anna Paulownaplein 3, The Hague.
HUNGARY	Magyar Repulo Szovetseg, V. Sztalin-ter 14, Budapest.
ICELAND	Flugmalafelag Islands, P.O. Box 234, Reykjavik.
INDIA	All India Aeromodellers' Association, 8, Lee Road, Calcutta, 20.
IRELAND	Model Aeronautics Council of Ireland, Abbey Buildings, Middle Abbey Street, Dublin.
ITALY	Federazione Aeromodellistica Nationale Italiana (F.A.N.I.), Via Cesare Beccaria 35, Rome.
JUGOSLAVIA	Aeor-Club Jugoslavije, Uzun, Mirkova IV/I, Belgrade.
LUXEMBOURG	Aero-Club du Grande-Duche de Luxembourg, 5, Avenue Monteray, Luxembourg.
MONACO	Monaco Air-Club, 8, Rue Grimaldi, Monaco.
NEW ZEALAND	New Zealand Model Aeronautical Association, c/o Mr. L. R. Mayn, 120, Campbell Road, Onehunga, Auckland.
NORWAY	Norske Aero Club, Ovre Vollgae 7, Oslo.
PERU	Aero Club del Peru, Lima.
POLAND	Aeroklub Rzeczypospolitej Polskiej, Ul. Hoza 39, Warsaw.
PORTUGAL	Aero Club de Portugal, Avenida da Liberdade 226, Lisbon.
RUMANIA	Aeroclubul Republico al Romaniei, Lascar Catargi 54, Bucharest.
SOUTH AFRICA	South African Model Aeronautic Association, 302, Grand National Buildings, Rissik Street, Johannesburg.
SPAIN	Real Aero-Club de Espana (Subeseccion de Aeromodismo), Carrera de Jan Jeronimo 19, Madrid.
SWEDEN	Kungl. Svenska Aeroklubben, Malmskillnadsgatan 27, Stockholm.
SWITZERLAND	Aero Club de Suisse (Modèles Reduits), Hirschengraben 22, Zurich.
SYRIA AND LEBANON	Aero Club de Syrie et du Libon, Beyrouth.
TURKEY	Turk Hava Kurumu (T.H.K.), Enstitu Caddesi, 1. Ankara.
UNITED STATES OF AMERICA	Academy of Model Aeronautics, 1025, Connecticut Avenue, Washington 6, D.C.
U.S.S.R.	Aero Club Central de l'U.S.S.R., V. P. Tchkalov, Moscou-Touchino.
URUGUAY	Aero-Club del Uruguay, Paysandu 896, Montevideo.

THUNDERWING

Successful Powered Flying Wing

By DONALD BROGGINI, U.S.A.



Thunderwing (No. 17) well-up at take-off, preparatory to an o.o.s. flyaway.

DESCRIPTION.—The plane has a 5-foot wingspan, with a wing area of 330 sq. in. and it weighs about 5½ or 6 ounces complete with all hardware—motor, timer, dethermalizer, fuel tank and landing gear. Planes of this design have been flown with glow-plug motors ranging in size from .035 to 0.74 cubic inches (.5 c.c. to 1.2 c.c.). I am sure though that your diesels smaller than .5 c.c. will also prove very satisfactory, as witness the "Manx Arrow" Flying Wing that appeared in *Aeromodeller*, January, 1951, which was powered by a .2 c.c. Kemp and is as large or a larger plane than the "Thunderwing." The plane has usually been flown with an .049 cubic inch glow-plug motor which is probably equivalent in performance to your .75 c.c. diesels.

Some of the plane's special features are :

(1) The plane has no rudders as such, the side area of the polyhedral wingtips acting as rudders.

(2) Aerodynamically it has a toed-in tip rudder effect.

(3) Except for the wheels and nacelle, 100% of the craft's surfaces are a lifting section and lifting in an upwards direction.

(4) The airfoil is a cambered reflexed section developed from a series of flying wing sections.

(5) The plane is not critical to adjust or fly. Its sixteen predecessors are the reason why.

(6) It is, of course, a well-proven design, being light in weight and possessing a low wing and power loading.

(7) Cathedral centresection—this gives a light, convenient way of raising the thrust line, and it also helps to raise the centre of lift somewhat, as opposed to the motor-pylon on a dihedral or flat centresection. On this particular design the cathedral centresection also helps lower the C.L.A. more than would the flat centresection with a pylon to mount the motor.

(8) Widespread two wheel landing gear—this provides excellent take-off characteristic, an unsuccessful take-off being virtually unknown. It also provides shock absorption for rough landings at the two lowest points of the wing.

(9) Simple fuse-actuated parachute dethermalizer.

(10) Like most Flying Wings it has an excellent glide.

(11) As may be seen from the pictures, and by noting the power loading, the plane also has an excellent climb.

(12) The craft is a tractor, not a pusher. This makes launching technique easier and eliminates the need for carving a " backwards " prop or having a motor that will run backwards.

(13) Removable nacelle. The nacelle on the pictured plane is removable and held on with rubber bands. This provides easy changing of power plant units, as well as being shock absorbing, and provides an additional way of trimming the plane longitudinally. The removable nacelle, however, is a convenience rather than a necessity.

(14) The construction is strong and simple. The original plane has been flying actively both winter and summer since late in 1949 with but minor paper tears as the only damage suffered.

Unfortunately, in the States a Flying Wing continues to be looked upon as a freak or novelty. Here we are looked upon with surprise if we arrive with such a plane—and even the thought of weakness in the brain department is expressed for attempting to compete against conventional aircraft. Happily in England there seems to be a more open mind on the subject, and a number of wings are flown without undue comment. Be that as it may, " Thunderwing's " contest successes are impressive and can be left to speak for themselves :

PERFORMANCE.—1950.

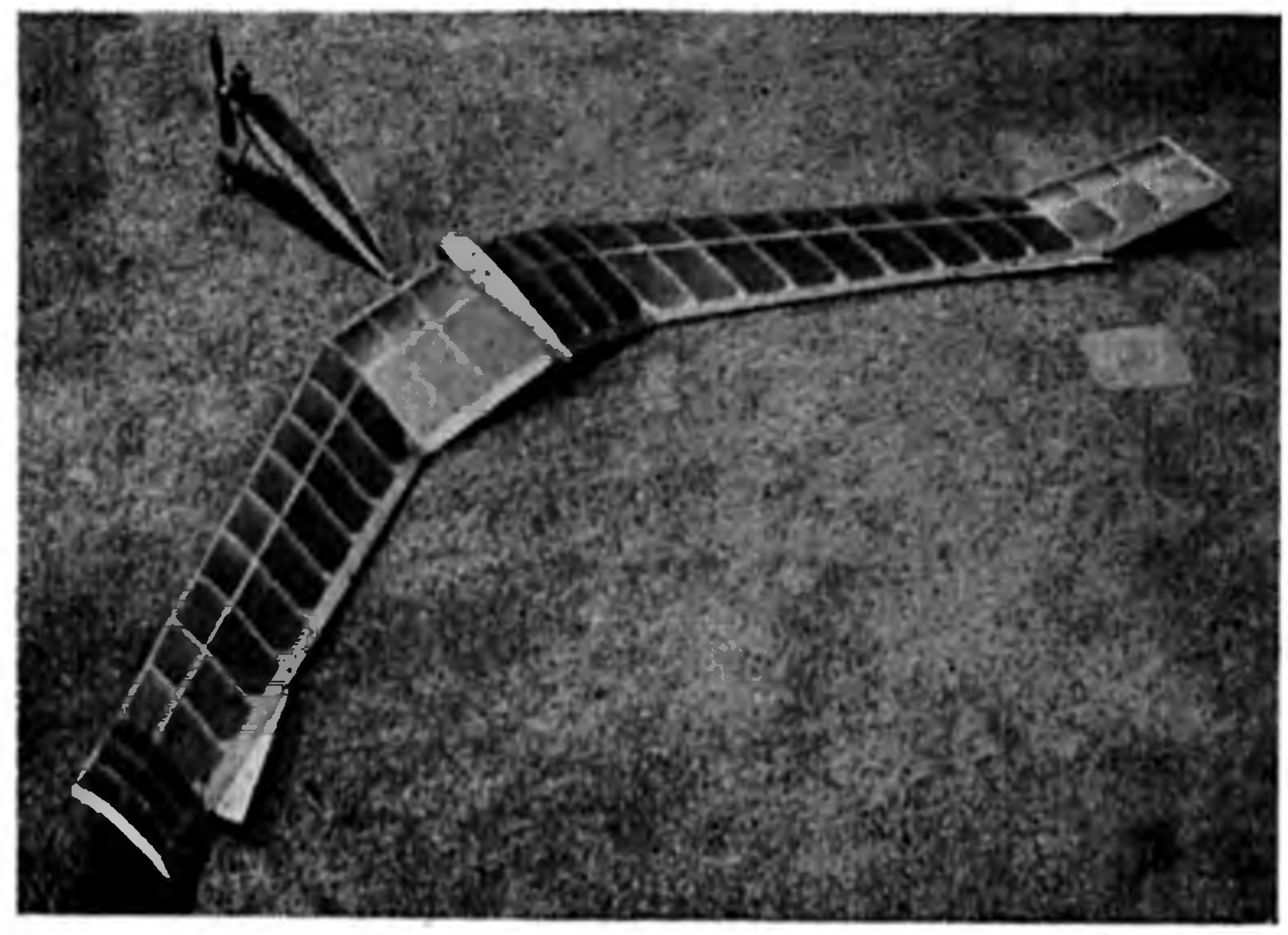
(1) Thunderwing (Plane 17).
Fourth at Snowbird Contest for 1/2A only. Held by Screamon Demons on February 12th—unbelievably nice weather. Time : 11 or 12 minutes.

(2) Thunderwing.
No place at Mirror Model Flying Fair. The plane finished about 10th—30 miles per hour wind.

Impressive take-off of Thunderwing from tarmac surface. The model is just airborne as wing shadow in foreground indicates.

(3) Thunderwing.

Fifth at Metropolitan Model Airplane Championship — held by Richmond Model Flying Club on July 2nd. The plane hooked no thermals. It did just about two minutes on every flight, for a total around 6 minutes.



An earlier development design of Thunderwing (No. 158) with engine housing pod removed.

(4) Thunderwing.

Second at Nassau Plymouth Eliminations. Missed first place by 18 seconds. A field of fifty entered 1/2A.

First Flight : 4:29. Second Flight : 6:02 delayed. (Motor run 2 seconds over. Second Flight : 2:17. Third Flight : 5:38. Plane was up for well over 10 minutes and lost. Three-flight total : 12:24.

(5) Thunderwing.

Second at Eastern Championships—held by Skyscrapers on August 20th. No thermals. Three flights were 2:11, 2:30, and 2:50.

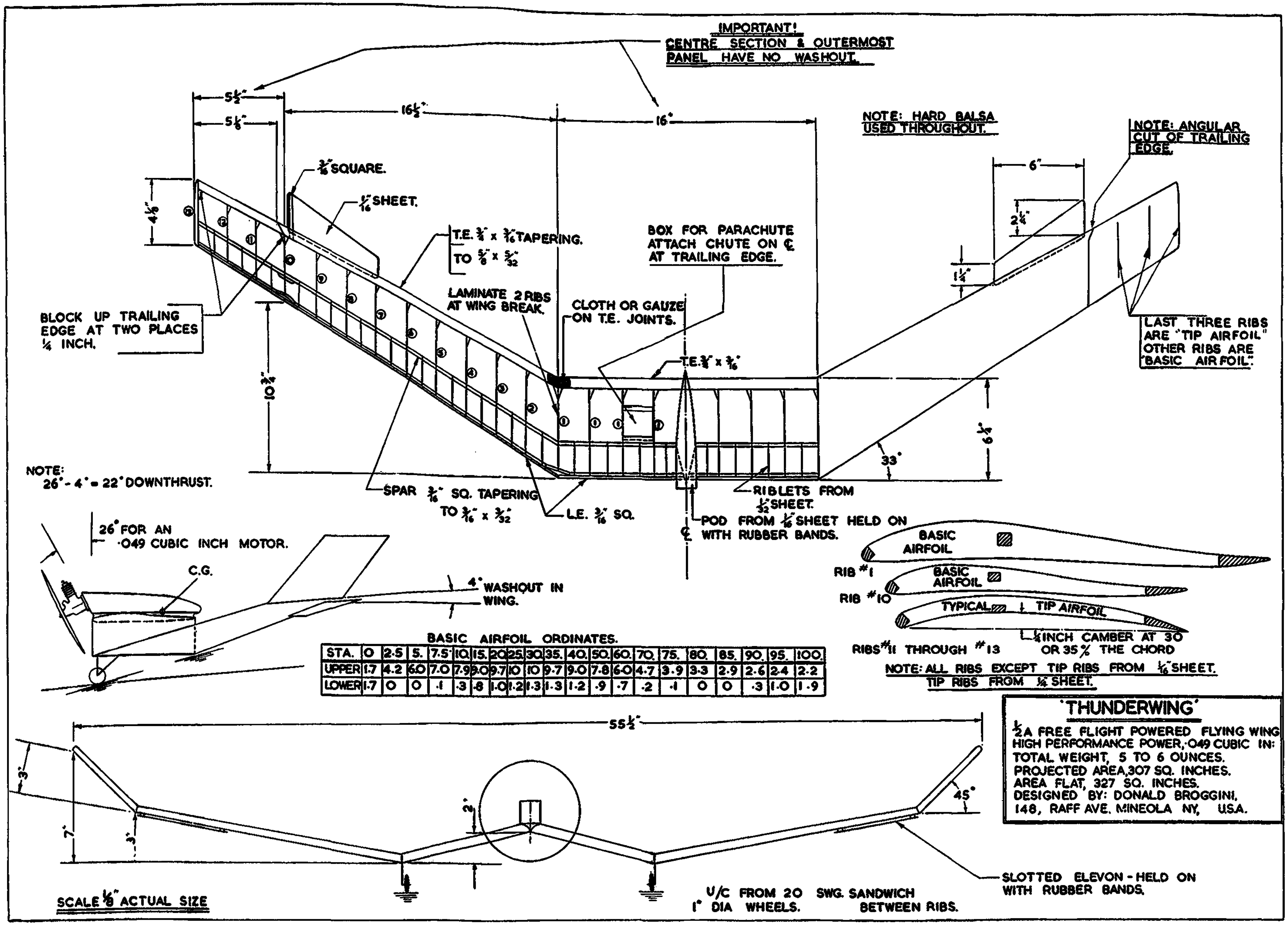
(6) My nephew, John's, Thunderwing.

Sixth at Third Annual Model Airplane Championships, held September 3rd, by Long Island Gas Monkeys—miserable day. Late in the afternoon my nephew decided to fly although the weather had become worse. Flying in a light rain, he racked up three wet flights with absolutely no thermal help for a place. Time : a little under 6 minutes.

A friend, Ken Fitch, with his Thunderwing, which in its turn has never failed to impress in contest flying.

(7) Thunderwing.

Fourth and fifth by John and myself at the Long Island Championships—held by Screamon Demons on September 10th. Weather was almost a repeat of the previous week. We both flew in a day of on and off rain. No thermals. John's time : 75 minutes ; mine : 65 minutes.



BASIC AIRFOIL ORDINATES.

STA.	0	2.5	5.	7.5	10.	15.	20.	25.	30.	35.	40.	50.	60.	70.	75.	80.	85.	90.	95.	100.
UPPER	1.7	4.2	6.0	7.0	7.9	9.0	9.7	10	10	9.7	9.0	7.8	6.0	4.7	3.9	3.3	2.9	2.6	2.4	2.2
LOWER	1.7	0	0	·1	·3	·8	1.0	1.2	1.3	1.3	1.2	·9	·7	·2	·1	0	0	·3	1.0	1.9

'THUNDERWING'

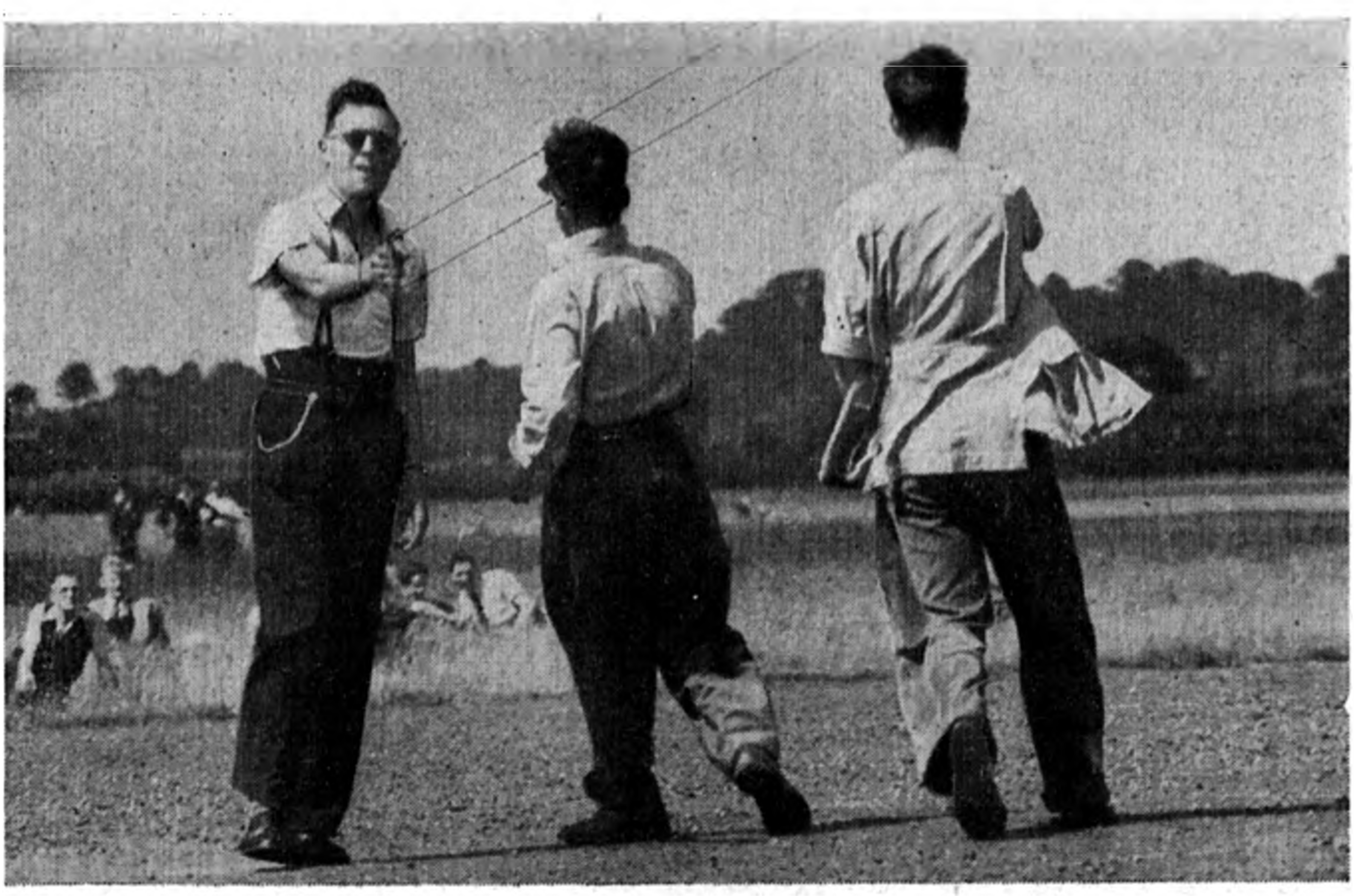
½A FREE FLIGHT POWERED FLYING WING HIGH PERFORMANCE POWER, ·049 CUBIC IN:
TOTAL WEIGHT, 5 TO 6 OUNCES.
PROJECTED AREA, 307 SQ. INCHES.
AREA FLAT, 327 SQ. INCHES.
DESIGNED BY: DONALD BROGGINI, 148, RAFF AVE. MINEOLA NY, USA.

TEAM RACING OF THE YEAR. *By* RON MOULTON.

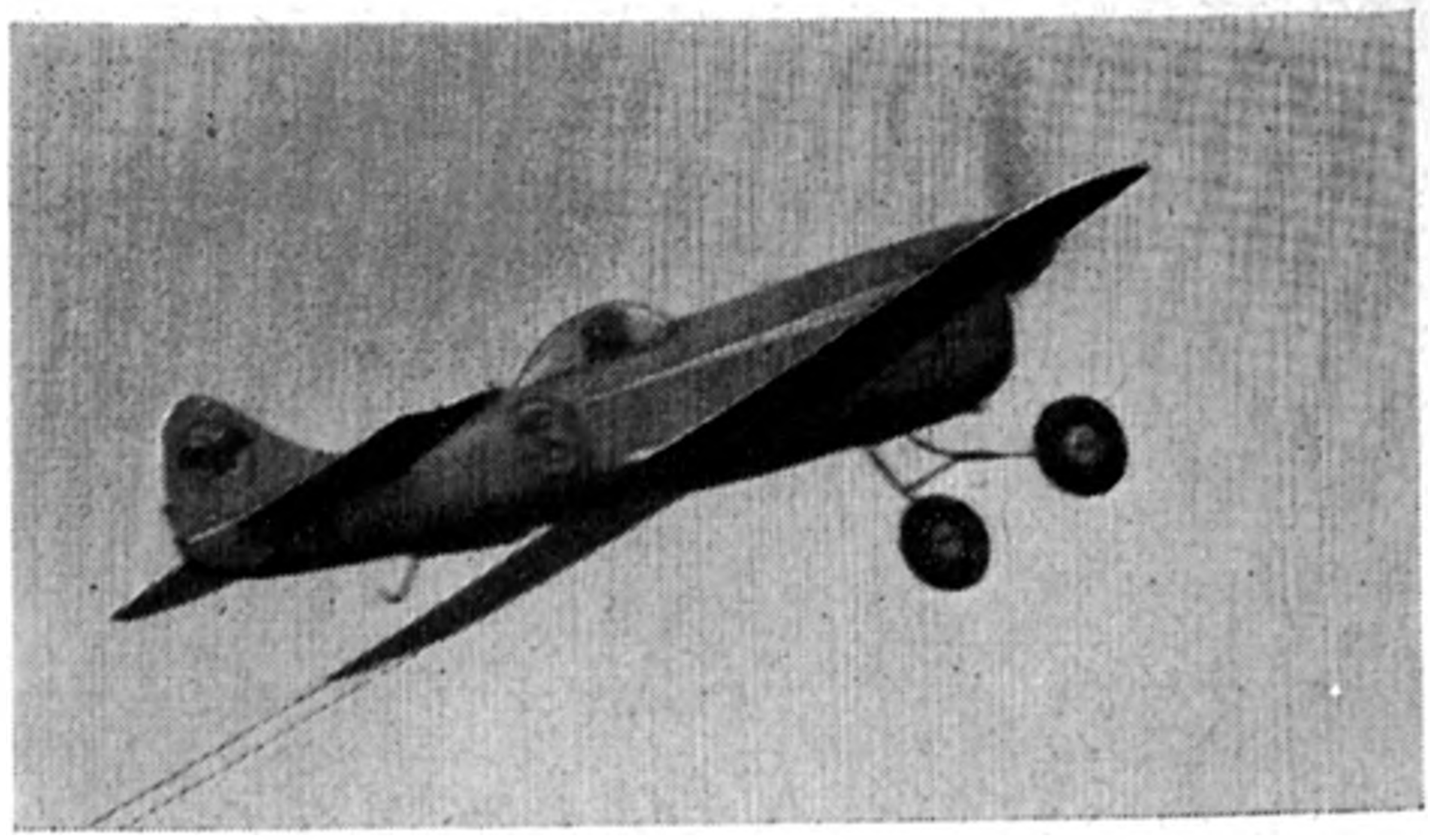
THE continued spread of enthusiasm for team-racing in 1951 needs no emphasis. Practically every one of the many annual club rallies and gala days have incorporated both class A and B events in their programmes, and have found that it is, without exception, the most attractive way of demonstrating control-line to the public.

But although the team race fans have grown in numbers, the facts and figures show but little increase in performance. Several race speeds of 1950 were indeed faster than races in 1951, despite the trend toward the faster-flying racer as against the long-range job. Class B in particular shows least improvement, though class A racers have increased their speeds to almost equal their twice-size brothers. In one lone case, a class A race has provided the fastest time for ten miles yet recorded in Great Britain, when B. Henderson and his fast-working team-mates from Blairgowrie covered 200 laps at a speed of 67 m.p.h. including pit stops. This was at the Scottish National control-line rally, Montrose, where we trust the Scots timekeepers were true to tradition and mean with the stop-watch. So now it will be up to the Southerners to beat this record figure if they can, the airspeed will have to be raised to over 75 m.p.h., and the 2.5 c.c. followers will know that it is no easy task.

For the larger 5 c.c. racers, airspeeds approaching 100 m.p.h. are no longer impossible, and with the continuing improvement in time taken over pit-stops, the Scottish record figure should go for the proverbial " Burton," in theory at any rate. But the fly in the ointment is that omnipresent "human-element " that will always pop into the circle with the four pilots and eight mechanics to do its utmost to maintain



Long range photography by Ed. Stoffel produced the excellent close-up of George Bashford (Battersea) in action (*bottom, opposite page*) and winning the W. Essex gala Class B race with his E.D. IV powered model (*at right*).



steady sales in the engine-spares and balsa departments of the loca model shop. We have yet to see a class B final finish without some form of minor mishap (more often major!). Classic example being, of course, the five plane prang at the Wembley Stadium Festival Championships, which resulted in surprising little damage and gave the crowd some blood for their money.

There, too, is the answer why team racing should be so increasingly popular even among aeromodelling beginners. The element of chance, that anything might happen to the best models in a race, puts beginner and expert on the same footing. Admittedly, in two seasons, several names have been consistently on top of the field, but note that for every time a long-experienced team has won, so also has a hitherto unknown name featured in the prize lists.

There's no need here, for us to waste space in encouraging the novice and offering tips on how to win—the fourteen pages of AEROMODELLER ANNUAL, 1950, devoted to the subject, are still as helpful as they were twelve months ago, in fact many a team might well spend an evening in study of that article to uncover their faults and find the remedies for future races.

Rather, let us analyse what has happened in the 1951 season, and from that, deduce what might be done to bring about improvements in 1952. Firstly, team racing depends upon organisation, which must be of a high standard of accuracy in recording performances, and should adhere to the book of rules as laid down by the S.M.A.E.

Of the many races we have attended in the 1951 season, one alone stood out as a good example of organisation, and that was the all-team race meeting at Godalming, Surrey, with the Northern Heights gala and W.E.A. gala running close seconds. We apologise to those who pass without mention and will tactfully avoid reference to names of clubs whose ideas could do with revision.

The Godalming meeting was completely controlled by a powerful public address system. Several times the jury were able to warn high flying and other tricksters to play fair or be disqualified, and through every race, the pilots could hear occasional comment on how fast they were flying, and how many laps were left for them to complete. Pit stop times were also taken and relayed to the teams, who, like their own

R. Greenwood, of Worthing, has a realistic Class B racer using a Frog 500. Its concours finish and smart decoration show what can be done with a little extra thought and patience.

particular pilot, were wearing coloured armbands to assist in identification. A master Referee, complete with a powerful whistle and starting flag, dominated the flying area, whilst a battery of timers, centralised at one table, co-ordinated with lap counters to provide immediate results at the close of each heat. A simple blackboard and easel arrangement ensured that all onlookers could follow the facts and figures of the day's racing, whilst to complete this methodical meeting, prizes were distributed in triplicate so that the teams were as well rewarded as the winning pilots.

Races were run in the usual system of five-mile eliminators for three racers at a time, and a final over ten miles for the heat winners and subsequent semi-final winners. Now, although this system, allowing heat winners and perhaps the " fastest second " to fly off in a final to find the eventual winner is the most popular, it is also obvious that some of the second and even third placers in one heat may actually be faster than the winner of another heat. Accordingly, at one popular rally, every flight was timed, and instead of having eight heat winners passing through semi-finals to the final, the fastest four were selected from their heat performance, and the other four, though they had won their heat, did not have a chance in the final. The fairness of the system cannot be disputed; but the human element wrecked the experiment when it was discovered that the stop-watch operators were sadly in error. In fact, the eventual winner was by no means as fast as many other of his eliminated competitors! Centralised timekeeping would have avoided considerable embarrassment there.

At another rally we found opponent team associates counting off laps of their opposite number. One counter appeared to be a trifle shady on his mathematics, and we are sure he allowed the other team a few bonus laps to make sure they would lose! Even worse was the occasion when counters for one team mixed their classes and read off 200 laps for a winning class B job, which surprisingly passed unnoticed until they cut short a class A racer at 160 laps! Then, of course, there's the popular tank check dodge, where at several different races we have not been asked to make sure that the tank is empty before the test, and could easily have got away with an oversize tank.

A keen administration will make sure that none of the above snags arise, but on the experience of the 1951 season, the following apparatus would appear essential to a well-run meeting :—

An efficient public address system, which the pilots can hear above the engine noise.

A table and seating for three or four timekeepers, each with two stop-watches.

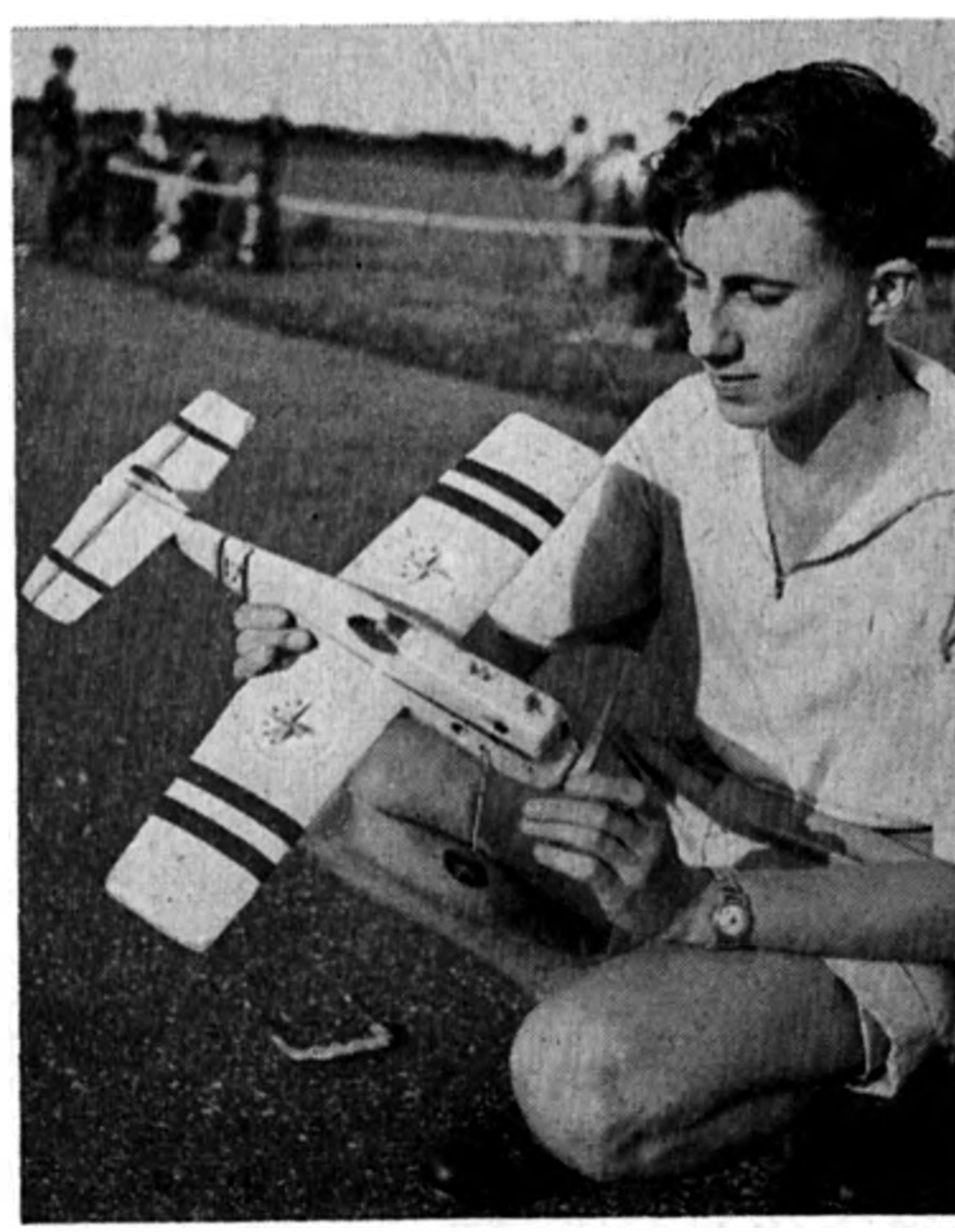
Coloured armbands for each team and counters, flags for starting and finishing.

Lap scoring cards for counters. A score board for spectators to see.

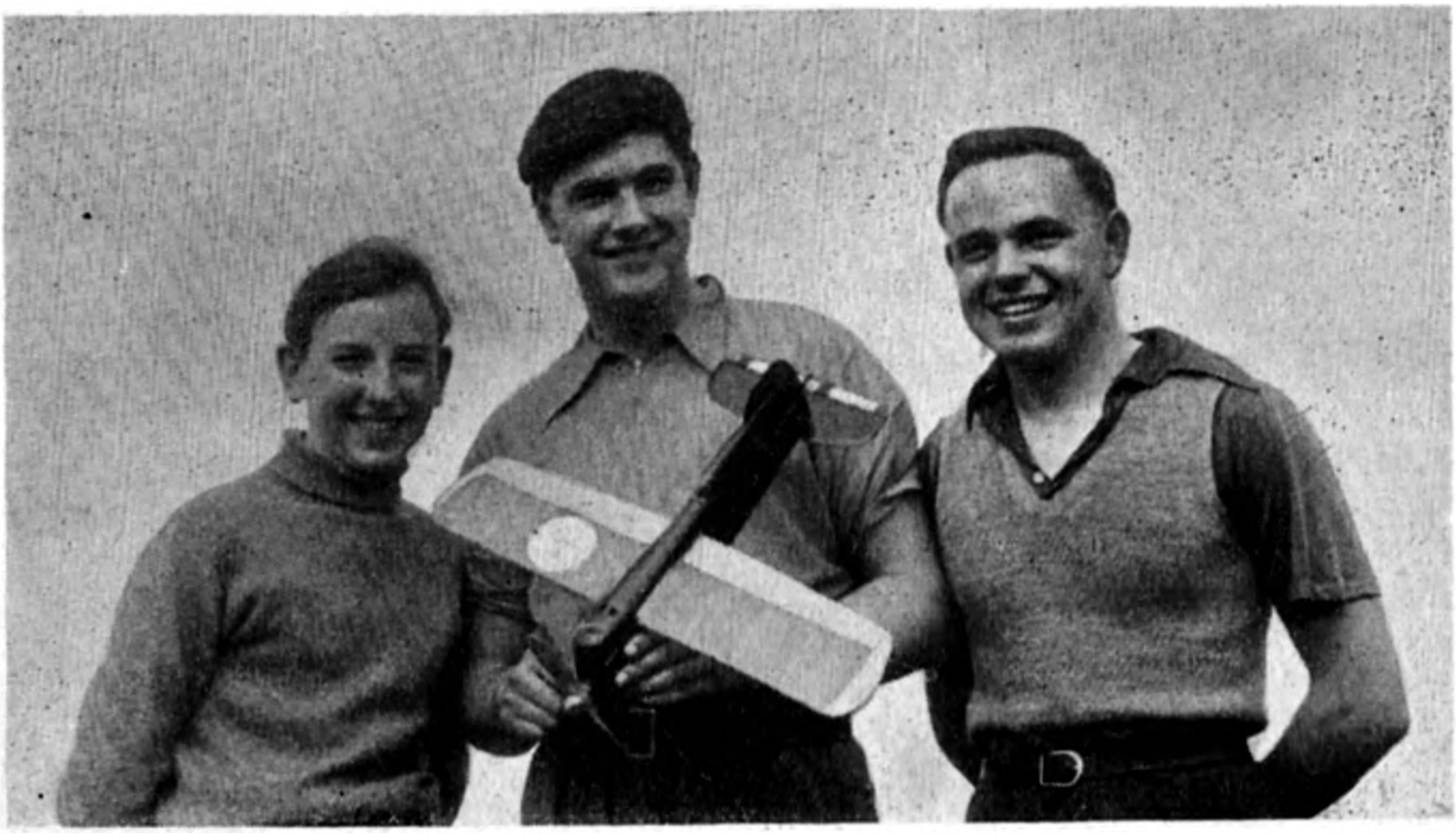
So much for organisation, now let us examine model development during 1951 and analyse the trend in design. As noted earlier, the greatest development has been with the class " A " type, for the smaller, up to 2.5 c.c., motors. At first, enthusiasm for this class was very much overshadowed by the interest in 5 c.c. racers, then, with the introduction of the team-race league in several S.M.A.E. areas, and contests at popular rallies, class A became suddenly a favourite with junior modellers, who could hardly afford the expensive racing motors used in class B. At present, class A entries exceed the larger class by quite a margin, and the reason for this is obvious, in that the 2.5 c.c. motor is the most popular in Great Britain.

Mention is made of the maximum capacity permitted only (2.5), because we have yet to observe a motor of less capacity achieving first place, although the smaller motor is obviously more economic in operation and can cover greater distances per tankful. Airspeed is the critical factor, for the difference in pit stop times for all of the small diesels is negligible. Whether the engine be an Elfin 1.49, Javelin or E.D. III series 2, the pit stop can, with practice, easily be narrowed to 10-15 seconds. Glow-plug ignition does not enter into this class, due to the lack of suitable engines ; but, in any case, experiment has proved that neither the air-speed nor range of a 2.5 glow motor can compare with its diesel equivalent.

With the E.D. III series 2, a common winner in 1951, using all types of commercial fuels, and a range of airscrews that range in appearance from toothpicks to shovels, most of the races have been won by the



One of the few good looking Class A racers seen in '51 is this neat grey effort by D. Hayford, of Tottenham, using an E.D.2.46. Though heavier than most Class A models, its airspeed is over 70 m.p.h.



The most successful team of 1951 was the High Wycombe club combination of C. Doig, refueller; R. Edmonds, owner/pilot; and D. Langston, the starter. Their long list of first placings with the E.D.2.46 Class A model shown here, began with the Festival Championships at Wembley, where they made several 7 second pit-stops.

lightest loaded model. Tissue covered wings and boxlike fuselages are hardly conducive to " scale or semi-scale appearance," as required in the rules, and many of these lightweight winners could justifiably be eliminated by a discriminate processor. Long spindly wire undercarriages, plain wrapped aluminium sheet cowlings, with openings in front and for compression large enough to permit the pilot to walk through (if he had a body in proportion to his mis-shapen head), are frequently observed at meetings, defeating the first object of team racing, i.e., to race semi-scale or scale models. Thus, though class A models have improved in performance, they have equally detracted in appearance. The 42' line length will need revision in '52, for at 70 m.p.h., class A circulation is too fast for safety. Best evidence of this came when twice " Gold " trophy winner, Brian Hewitt, won the class A League Finals and said " Never again,—that was much too hectic ! "

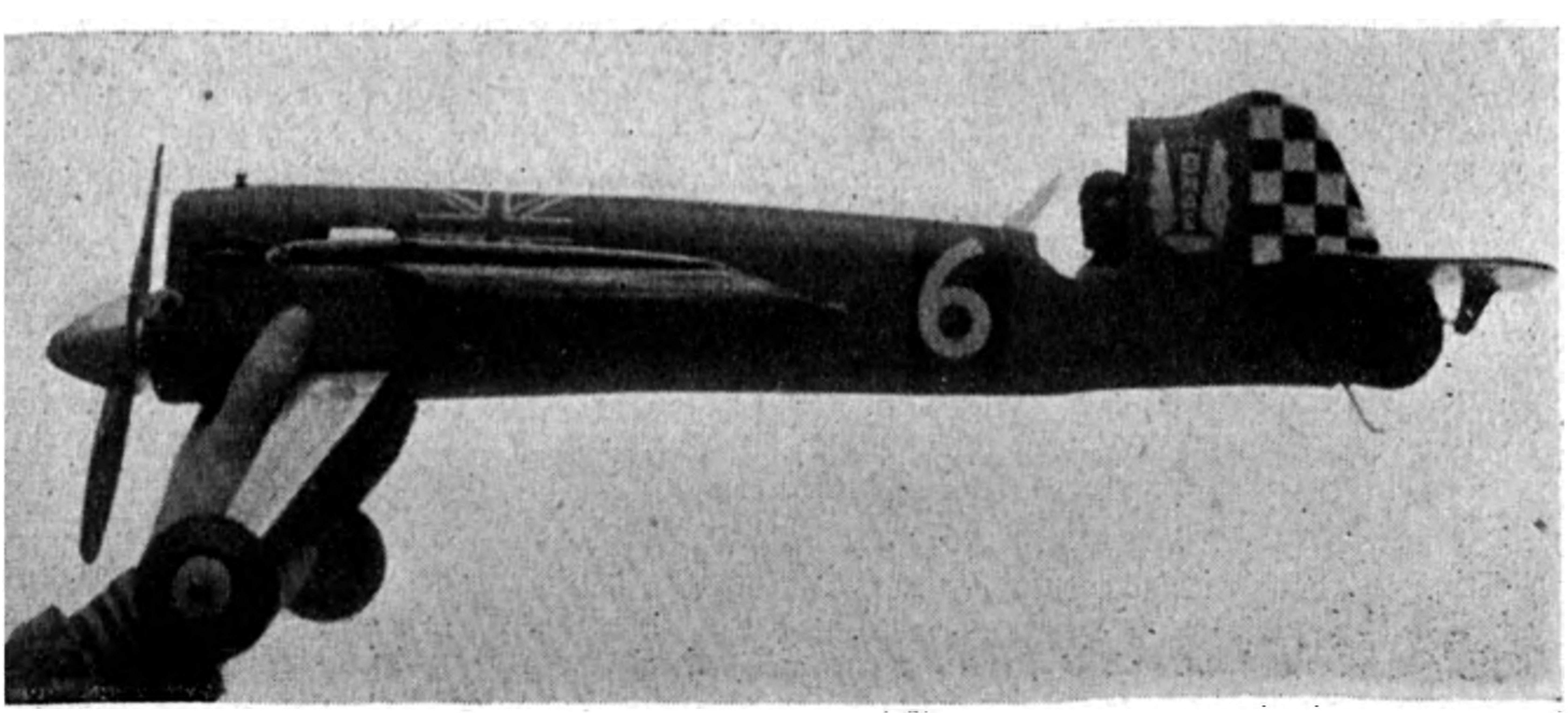
Upright motor mounting has been a universal choice for easiest starting with the diesels used in class A ; but opinion is still divided on the best mounting for class B motors. Inverted operation for racing glow-plug motors definitely gives better restarting performance when the motor is hot, and one cannot ignore the succession of wins attributed to " Skipper " D. W. Rowe with his inverted diesel Amco 3.5 in Red Lightning. The Bushy Park team also favours inverted mounting, as did B. Harper's (Outlaws) winning Ohllson powered grey racer. Against these fast " inverted " racers, there are the " Gay Deceiver " and " Fruit Nose," upright engine designs from the experienced West Essex teams.

Besides making the task of providing realism simpler, inverted mounting also means a shorter undercarriage, and corresponding less drag. Unlike class A, appearance of the B racers is still within the regulation " scale or semi-scale " and the models have a more business-like air about them.

In class B, the main requirement is first, fast pit-stops, next, high flying speed (in the region of 80 m.p.h.) and now, after viewing the 1951 season, durability. On the first point, faster pit stops might yet be achieved, if *each* of the starters carried complete equipment. Lightweight 1.5 v. accumulators can be carried, with fuel, spare props, etc., so that if starters await the landing on opposite sides of the circle, the time to retrieve and start refuelling will be cut by many valuable seconds. Greater duration between refuellings can be effected by additives to the fuel, Cellusolve being one particularly useful " range-extender," whilst more attention to tank vent design could add several laps to many models we have seen foaming their fuel out in waste.

But the best way for T. R. fans to improve their flying, is by continual study of the faults in the opposition. Note how many laps you can make up while the other chap is on the ground in a pit stop, then remember that the same will work against YOU, when you are on the ground! That's where Team-work comes into Team-racing.

We reproduce the above view of a full-size racing aircraft (Percival Mew Gull) in contrast to the example team racer below. Readers may make their own deductions as to our purpose. Suffice to say that we would much rather see a 1952 move toward models looking like the upper picture than a continued trend in the direction indicated below.

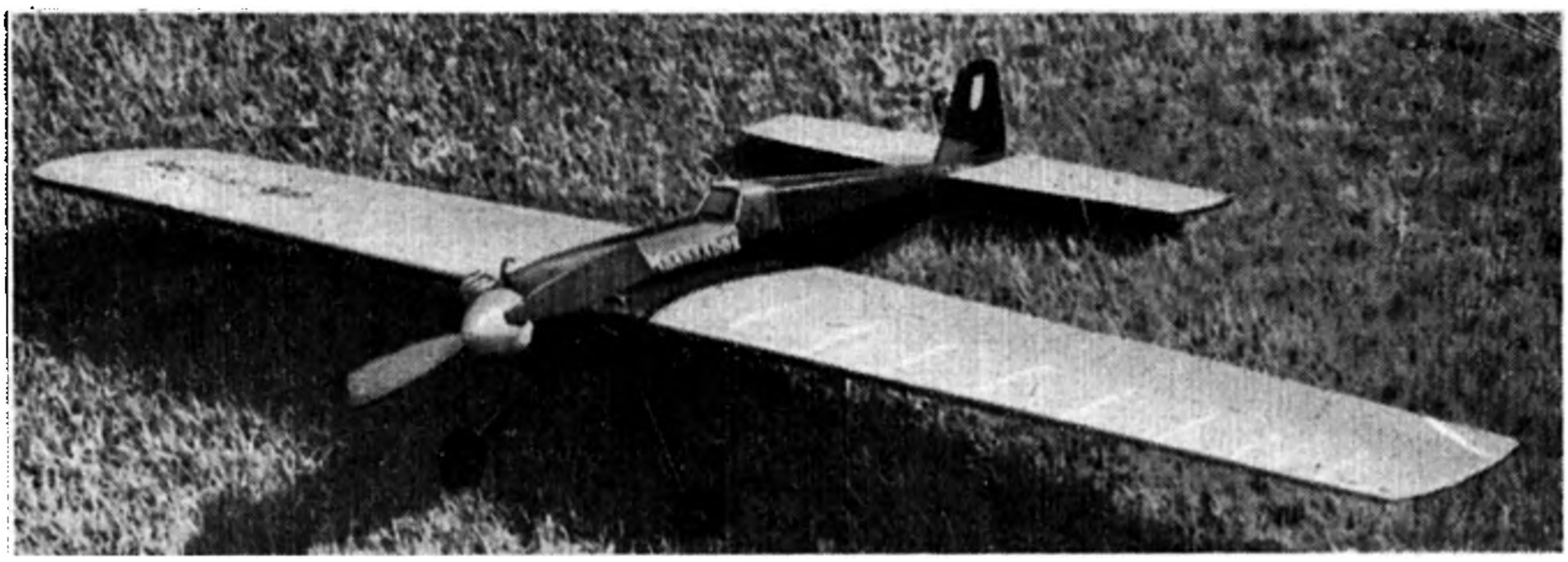


Left: Peter Wright, of St. Albans M.A.C., shown here at the Wembley Stadium meeting with his magnificently built metal winged models that did so well in the British team at Knokke. The smaller took the speed Concours d'Elegance and the larger the 5 c.c. World Speed Class.

Right: Allan Hewitt's Ambassador another double first prize winner at Knokke, taking the Stunt Concourse d'elegance and also winning the Stunt Class, proving that looks and performance can go together.

FIRST CONTROL LINE WORLD SPEED CHAMPIONSHIPS and THIRD EUROPEAN STUNT CHAMPIONSHIPS at KNOKKE, BELGIUM, 28-30 JULY

Placing	Name	Country	Points/Speed
CONCOURS D'ELEGANCE			
	Individual Class—Speed		
1	Wright, P.	Great Britain	292
2	Millet, Dr.	France	281
3	Gordijn	Holland	273
4	Lippens, G.	Belgium	272
	Individual Class—Stunt		
1	Hewitt	Great Britain	284
2	Vallez	Belgium	246
3	Malfait	France	242
4	Suls	Holland	241
WORLD CHAMPIONSHIPS—Speed 2.5 c.c.			
1	Hewitt	Great Britain	151.075 km/h
2	Wright	Great Britain	142.579 ,,
3	Claydon	Great Britain	141.812 ,,
4	Kreulen	Holland	139.097 ,,
5	Billinton	Great Britain	131.074 ,,
6	Janssens	Belgium	106.875 ,,
7	Cordier	Belgium	105.109 ,,



Placing	Name	Country	Points/Speed
	Speed 5 c.c.		
1	WRIGHT	Great Britain	201.682 km/h
2	KREULEN	Holland	186.533 „
3	CORDIER	Belgium	182.279 „
4	MILLET, DR.	France	179.108 „
5	LABARDE	France	174.345 „
6	LIPPENS	Belgium	171.169 „
7	VALLEZ	Belgium	170.783 „
8	JANSSENS	Belgium	163.710 „
9	HAGEDOORN	Holland	77.672 „
10	GORIJN	Holland	75.630 „
11	DUPUY	France	56.426 „
	Speed 10 c.c.		
1	LABARDE	France	204.651 km/h
2	LANIOT	France	194.139 „
3	DEXOBRY	France	190.609 „
4	MILLET, DR.	France	186.495 „
5	MALFAIT	France	184.507 „
6	HAGEDOORN	Holland	160.919 „
7	MEUWLI	Switzerland	109.756 „
8	BILLINTON	Great Britain	104.046 „
9	CORDIER	Belgium	100.000 „
10	VEENHOVEN	Holland	98.901 „
11	VALLET	Switzerland	91.370 „
	Jet		
1	DUNN	Great Britain	214.926 km/h
2	CLAYDON	Great Britain	126.760 „
AEROBATICS			
1	HEWITT	Great Britain	3200
2	VALLEZ	Belgium	2779
3	MARSH...	Great Britain	2723
4	JANSSENS	Belgium	2613
5	CORDIER	Belgium	1988
6	SULS	Holland	1463
7	LANIOT	France	1264
8	GOBEAUX	Belgium	752
9	MEUWLI	Switzerland	511
10	CLAYDON	Great Britain	397
11	MALFAIT	France	326
12	DEZOBRY	France	271

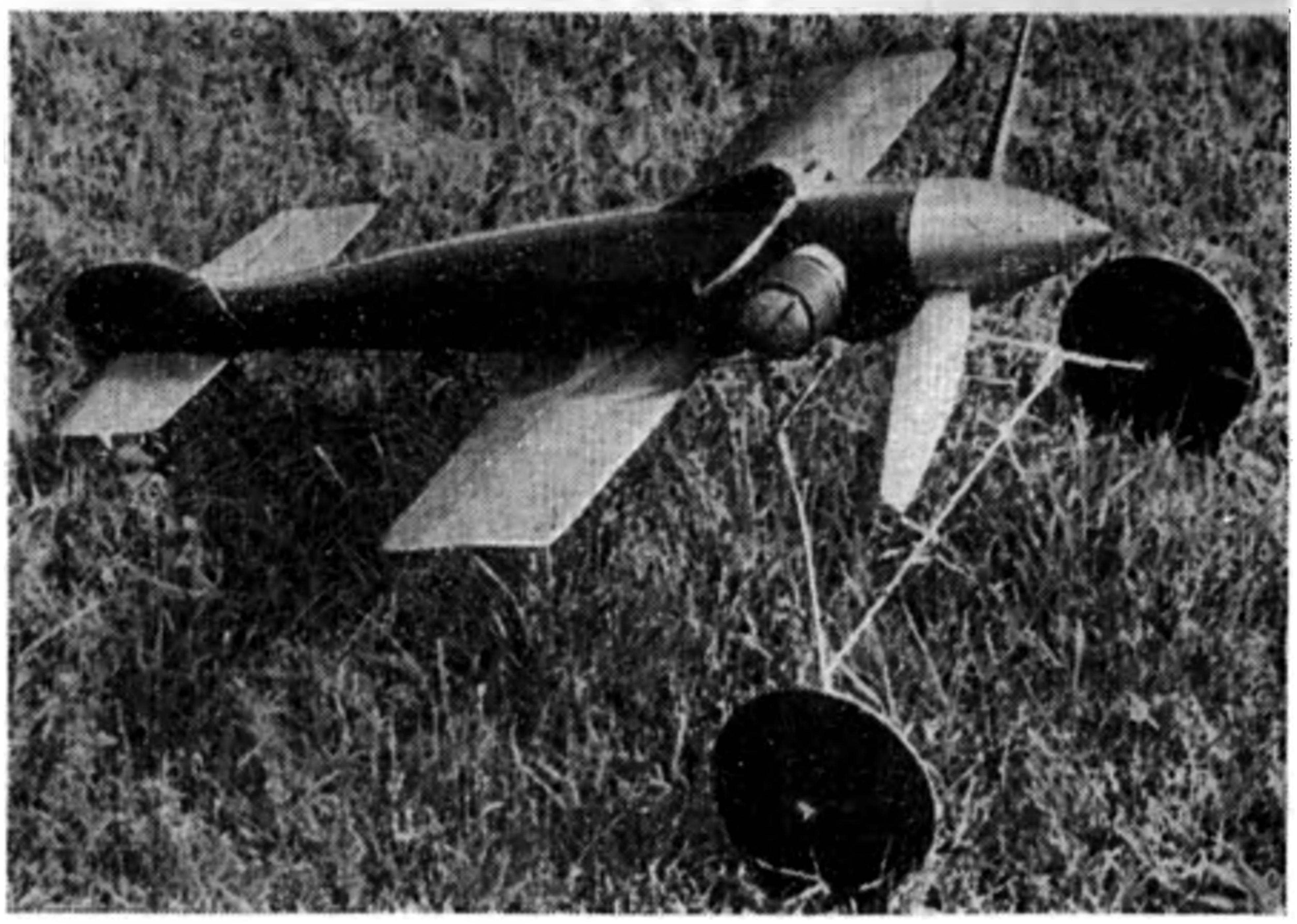
Prizewinners at Knokke—an "Entente Cordiale" of one Frenchman and six Englishmen. Reading from left to right are Labarde, France, who took the 10 c.c. Cup for speed, Peter Wright, winner of Speed Concours and 5 c.c. Speed Cups, Ken Marsh, Claydon, Alan Hewitt, winner of Stunt Concours and Stunt Cups: in front Billinton and Dun, who with Claydon put on such a fine jet exhibition, winning the extra prize of a silver oyster butter dish, shown in foreground. The larger cup also fell to the British team as Champions of Europe.

Below: Mackness—check shirt—assists Dun and Claydon in preparing the smaller of their two jet models at Knokke.

MODELS AT KNOKKE

The only thing wanting to make the Knokke meeting this year absolutely complete was an American team, when its status, both as a World Championship and review of current model design would have been incontrovertible. However, as world speed records went in all classes except 10 c.c., there can be little doubt of the quality present.

The method of selecting a British team by eliminating contests was more than justified in their showing against other national teams, who had been selected mainly on general merit, rather than current form—for aeromodelling internationals are just as subject to bad patches as any highly trained athlete. Happily our team was right in the pink of condition and never looked anything but the winners. Their models, too, showed an advance on what



had been presented in other years. Peter Wright's two metal-winged midgets in the 2.5 and 5c.c. classes were thoroughbreds of particular interest. They did much to prove the value of "adding a little simplicity" for there was literally not a square inch of them that could have been more highly polished to reduce drag, or a shaving that could have been pared off for greater efficiency. Progress along these lines may be less spectacular than some new wing form, but it pays ample dividends in contest success. Hewitt's 2.5 c.c. model, which also broke its class record, followed conventional polished wood construction with protruding sidewinder engine, and must claim its merit on behalf of Gig Eifflaender's amazing little hand-made engine, which was running to perfection.

Dutch models showed an advance in technique on previous years' entries, but followed standard practice in the larger sizes, only manifesting individuality in the 2.5 c.c. and 5 c.c. classes. The same must be said for France, where only Labarde was able really to get going, again with his steadily developed version of the model that had done well in previous years. Dr. Millet brought another specimen of his skill in highly polished wood.

Nothing outstanding was on show in the stunt class that had not been seen before : Hewitt's winning Ambassador, in a class of its own for style and finish, was the result of steady development rather than any new design form.

Top right : Alan Hewitt's record breaking 2.5 c.c. model, with sidewinder mounted "Gig" Eifflaender 2.43 c.c. special engine. While speed is something of a novelty for the Hewitt Brothers, Alan handled the little plane as one to the manner born.

Bottom right : Alex Houlberg receives the Championship of Europe Trophy from the Burgomaster. M. Victor Boin, who has done so much to promote these annual contests stands on the extreme left.

Scene at Lesce Bled, where processing of A/2 sailplanes takes place in the spacious front of a hanger.

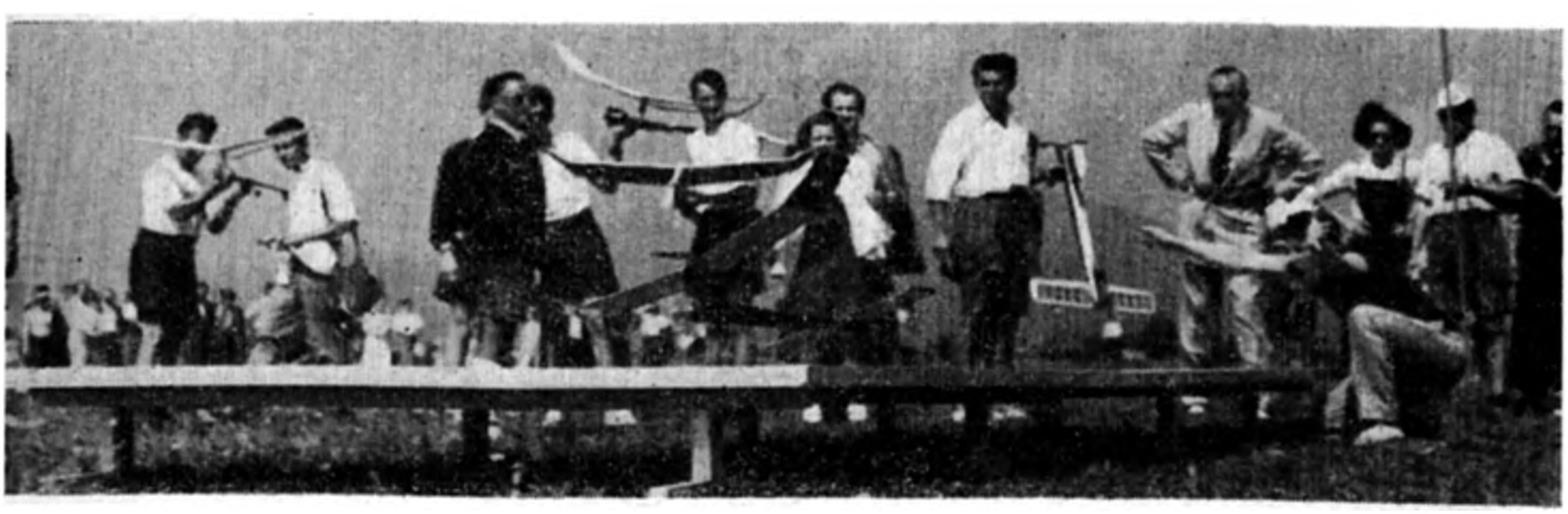
SWEDISH CUP FOR A/2 GLIDERS HELD AT LESCE BLED, JUGOSLAVIA

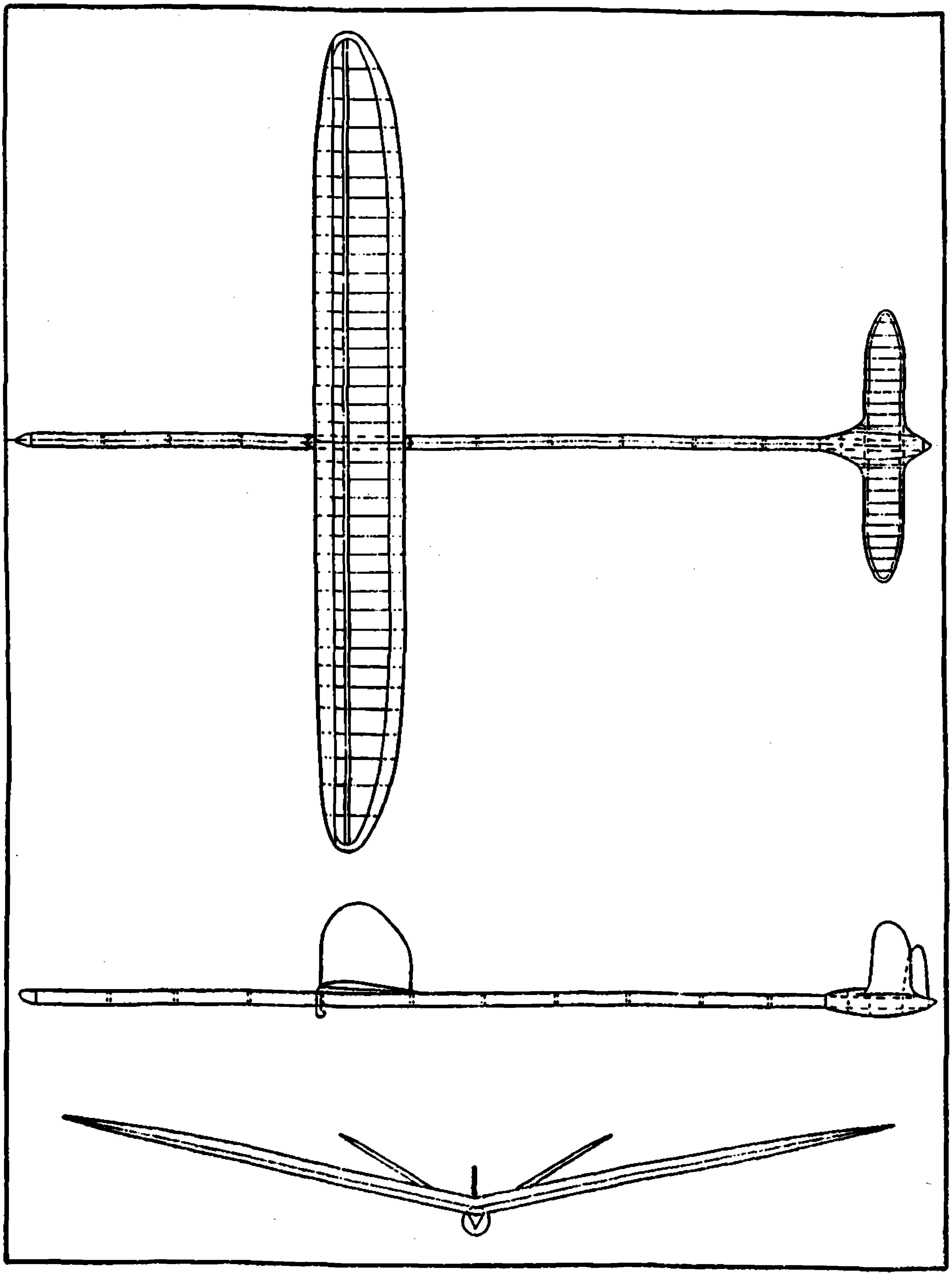
Placing	Contestant	Country	First Flight	Second Flight	Third Flight	Total
1	Czepa, Oskar	Austria	300	271	300	871
2	Petkovski, Ljube	Jugoslavia ...	300	279	221	800
3	Hansen, Arne	Denmark ...	300	245	252	797
4	Monks, R. C.	Great Britain ...	300	300	154	754
5	Serres, Pierre	France	227	198	300	725
6	Avonts, Andre	Belgium	190	286	222	698
7	Leppert, Hugo	W. Germany ...	265	300	132	697
8	Andersson, Rune	Sweden ...	252	253	150	655
9	Hansen, Kai	Denmark ...	232	110	300	642
10	Bausch, L.	Holland	300	115	222	637
11	Teunissen, A. A.	Holland	300	103	232	635
12	Hansen, Borge	Denmark ...	300	101	232	635
13	Breznikar, Radoslav ...	Jugoslavia ...	300	128	203	631
14	Thomas, H. R.	Great Britain ...	293	110	215	618
15	Maes, Jean	Belgium ...	146	241	228	615
16	Sandberg, Kurt	Sweden ...	300	256	40	596
17	Gunjic, Borislav	Jugoslavia ...	300	130	150	580
18	Bettenmann, K.	Switzerland ...	268	111	177	556
19	Bernfest, Stjepan ...	Jugoslavia ...	178	180	183	541
20	Galenne, Jean	France	90	300	138	528
21	Spring, Helge	Finland	143	201	183	527
22	Schramme, W.	Switzerland ...	83	161	234	478
23	Hekking, J. W.	Holland	54	233	185	472
24	Santala, Teuro	Finland	234	105	118	457
25	Odenman, Ragner ...	Sweden ...	61	185	188	434
26	Morisset, Jacques	France	86	160	170	416
27	Rolf, Wallenius	Finland	291	70	52	413
28	Bailey, W. T.	Great Britain ...	300	—	108	408
29	Holland, W. P.	Great Britain ...	102	180	120	402
30	Seissler, Hermann ...	W. Germany ...	88	86	228	402
31	Koorn, P. C.	Holland	59	141	192	392
32	Tlapak, Leopold	Austria	179	108	98	385
33	Samann, Gustav	W. Germany ...	144	112	118	374
34	Ferber, Lucienne	Belgium ...	47	243	80	370
35	Kuhr, Wilhelm	Austria	108	127	132	367
36	Barth, Kurt	W. Germany ...	300	—	—	300
38	Huybrechts, Alois ...	Belgium ...	112	70	116	296
39	Degen, A.	Switzerland ...	48	117	109	274
40	Ekelund, Henry	Denmark ...	125	23	125	273
41	Berney, R.	Switzerland ...	135	38	29	202
42	Goetz, Claude	France	51	57	78	186

JUGOSLAV AERONAUTICAL UNION CUP FOR POWER MODELS HELD AT LESCE BLED, JUGOSLAVIA

Placing	Contestant	Country	First Flight	Second Flight	Third Flight	Total
1	Morisset, J.	France	183	203	300	686
2	Fresl, E	Jugoslavia ...	168	300	132	600
3	Pracek, V.	Jugoslavia ...	155	287	128	570
4	Monks, R. C.	Great Britain ...	168	212	171	551
5	Prohaska, D.	Jugoslavia ...	162	140	185	487
6	Hristic, D.	Jugoslavia ...	103	105	273	481
7	Leppert, H.	Germany... ...	—	177	300	477
8	Barth, K.	Germany... ...	208	148	91	447
9	Serres, P.	France	86	300	—	386
10	s'Jongers, F.	Belgium ...	131	104	103	338
11	Schramme, W.	Switzerland ...	103	115	118	334
12	Teunissen, A.	Holland	253	33	39	325
13	Maibach, F.	Switzerland ...	76	132	104	312
14	Galenne, J.	France	—	300	—	300
15	Ferber, M.	Belgium ...	60	110	117	296
16	Holland, P.	Great Britain ...	166	42	84	292
17	Schrattenberger, L. ...	Germany... ...	91	110	87	288
18	s'Jongers, J.	Belgium ...	84	107	93	284
19	Kmoh, V.	Jugoslavia ...	117	156	—	273
20	Hormann, G.	Austria	63	55	144	262
21	Goetz, C.	France	95	72	82	249
22	Tasic, T.	Jugoslavia ...	97	147	—	244
23	Kuhr, W.	Austria	83	64	93	240
24	Lippens, G.	Belgium ...	88	71	64	223
25	Lederer, A.	Austria	79	106	—	185
26	Czepa, O.	Austria	58	77	—	135
27	Jedelski, E.	Austria	42	60	26	128
28	Koorn, P. C.	Holland	44	21	32	97
29	Hekking, J. W.	Holland	82	—	—	82
30	Tlapak, L.	Austria	—	34	46	80
31	Bausch, L.	Holland	—	22	17	39

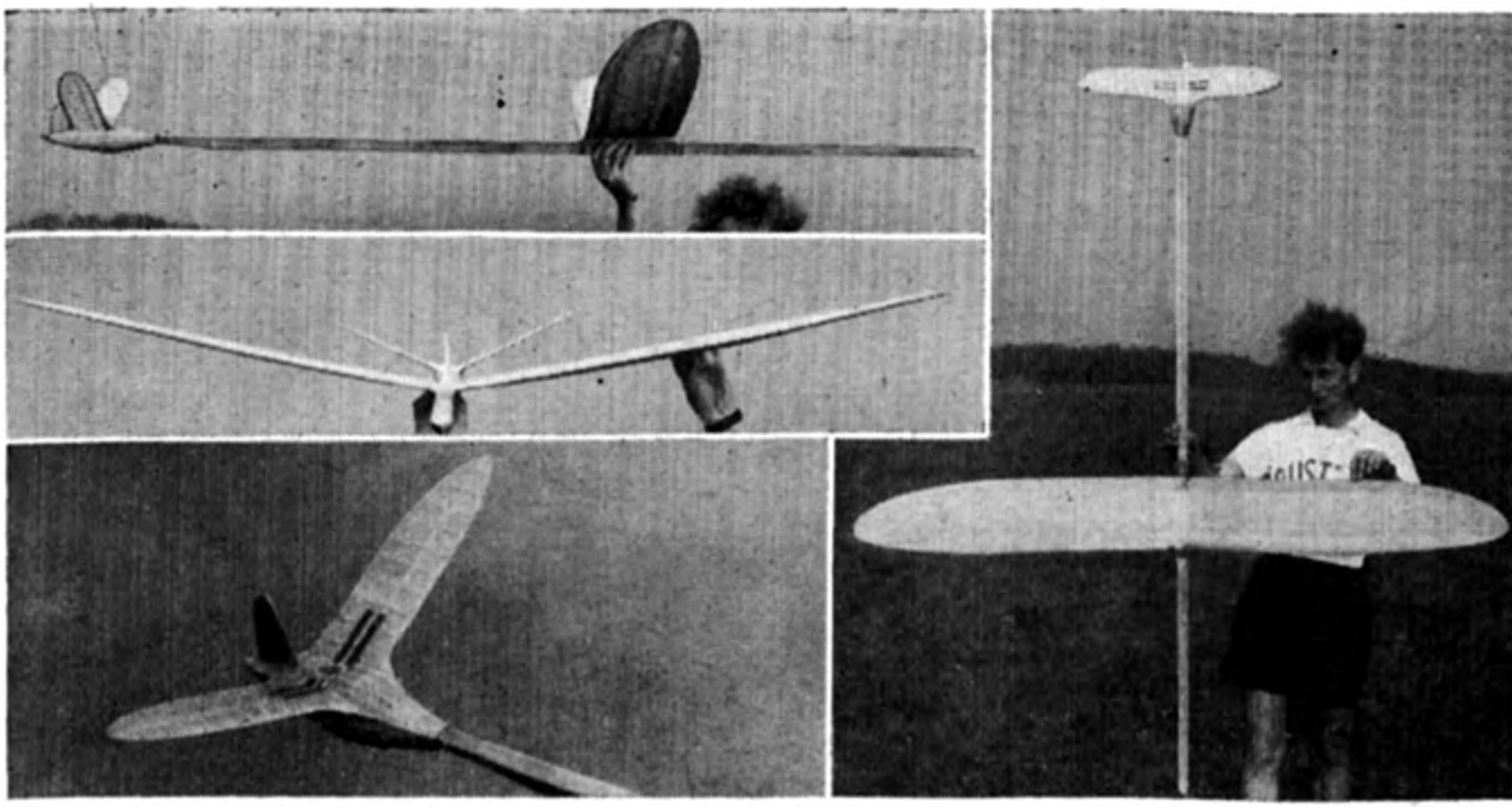
Typical Continental take-off platforms were in use for the Jugoslav Power Trophy; the slight elevation is of great value in avoiding "take-off back" amongst competitors !





The Model : Brief Particulars

Toothpick : Span approx. 71¼ ins. Fuselage length approx. 78¾ ins., triangular section, ply covered over balsa formers at 6 in. intervals. Cross-sectional area in tailpod. Tailplane set at 0° wing at 3½° with washed out tips at 0°. Own airfoil (under-cambered) to wing. Tail 9% Clark Y C.G. 40% back from L/E of wing. Total weight, 14½ ozs.

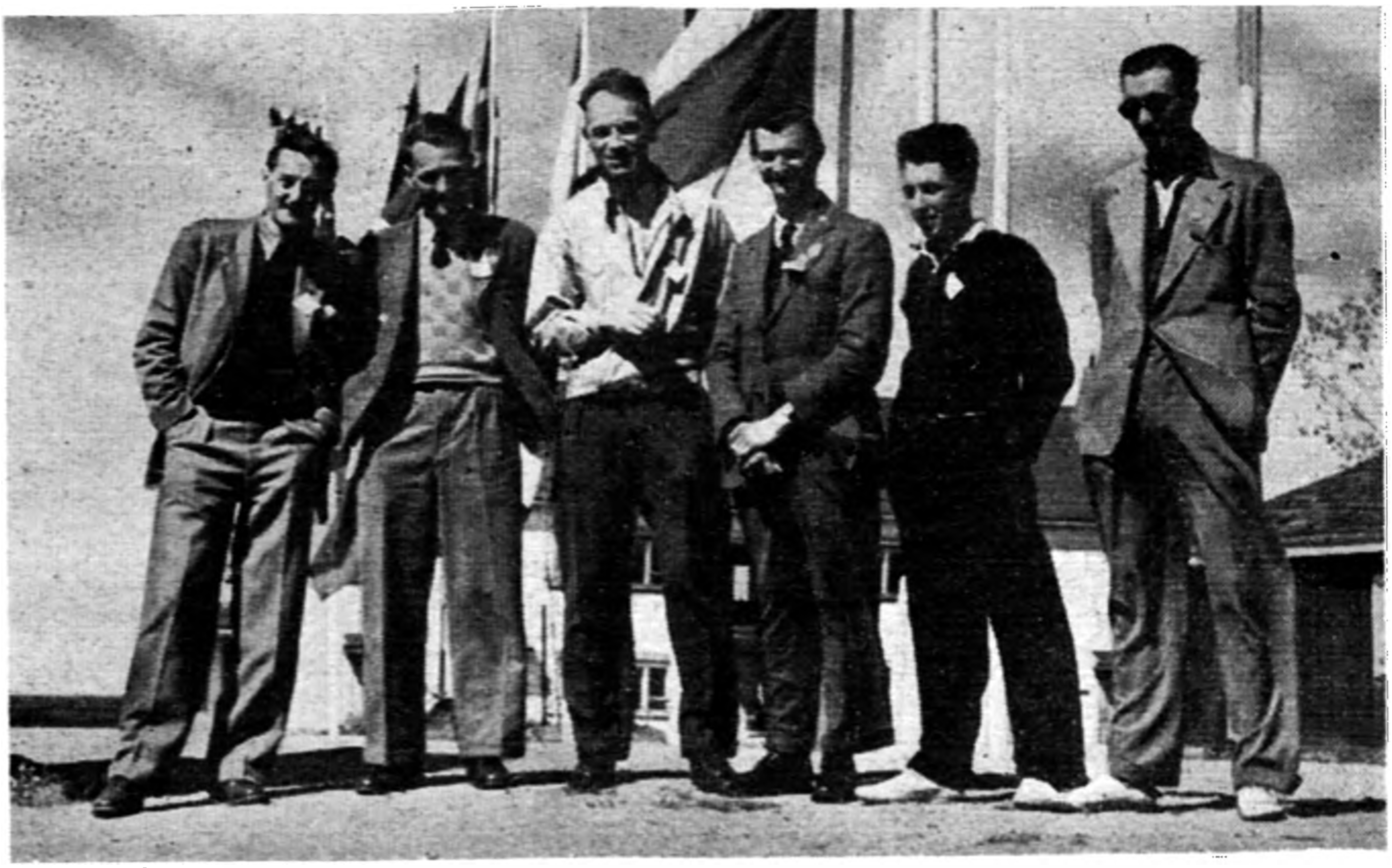


THE WINNER AND HIS MODEL

Oskar Czepa, the man behind the model, is a typical soft-spoken and unassuming Austrian who, together with a handful of enthusiasts from Vienna, forms the nucleus of their national aeromodelling club. Like many Viennese he was born in Czechoslovakia, and quite naturally is a musician as well as an aeromodeller. His instrument is the guitar, and after the war he played professionally in a band for the American forces in the Austrian zone, which probably accounts for his fondness of Bebop! By profession he is a paper maker at the large firm of Samun Vienna, and possibly as a result of being in the print trade, coupled with his enthusiasm for aeromodelling, was tempted to start a post-war aeromodelling magazine. This flopped through lack of purchasing enthusiasts, and the unfortunate Oskar is still paying for the first issue!

The fuselage, some 2 metres long, is triangular in section and made up of .06 mm. ply over ½ in. balsa formers spaced at 15 cm. intervals. The tow-hook is merely a dural strap clamped by a bolt at the apex of the triangulated fuselage and is positioned directly under the leading edge of the wing. The cross sectional area lies in the removable balsa tail pod, which is circular in section, and actually plugs over the rear of the fuselage. Owing to the extremely long moment arm and the dihedral tailplane, a very small fin is used. Wing span is 1.8 metres and the construction quite unique. Ribs are from .08 mm. ply with .06 mm. × 10 mm. ply spars inset top and bottom in a horizontal position to form an "I" section. The leading edge is sheet balsa covered and the trailing edge is a "sandwich" of ½ in. balsa (between ribs) and .08 mm. ply. The latter forms the top surface of the trailing edge, being glued over the balsa.

The tailplane is set at 0° and the wing at 3½°, with the tips washed-out, flying at 0°. Wash-out starts at the point where the ellipse commences and the air-foil section changes progressively from the same point so that the final tip section is symmetrical.



British Wakefield Team, 1951, at Jami Jarvi. *Left to right:* Frank Holland, F. H. Boxall, W. Rockell, Henry Tubbs, Ian Dowsett and R. Woodhouse.

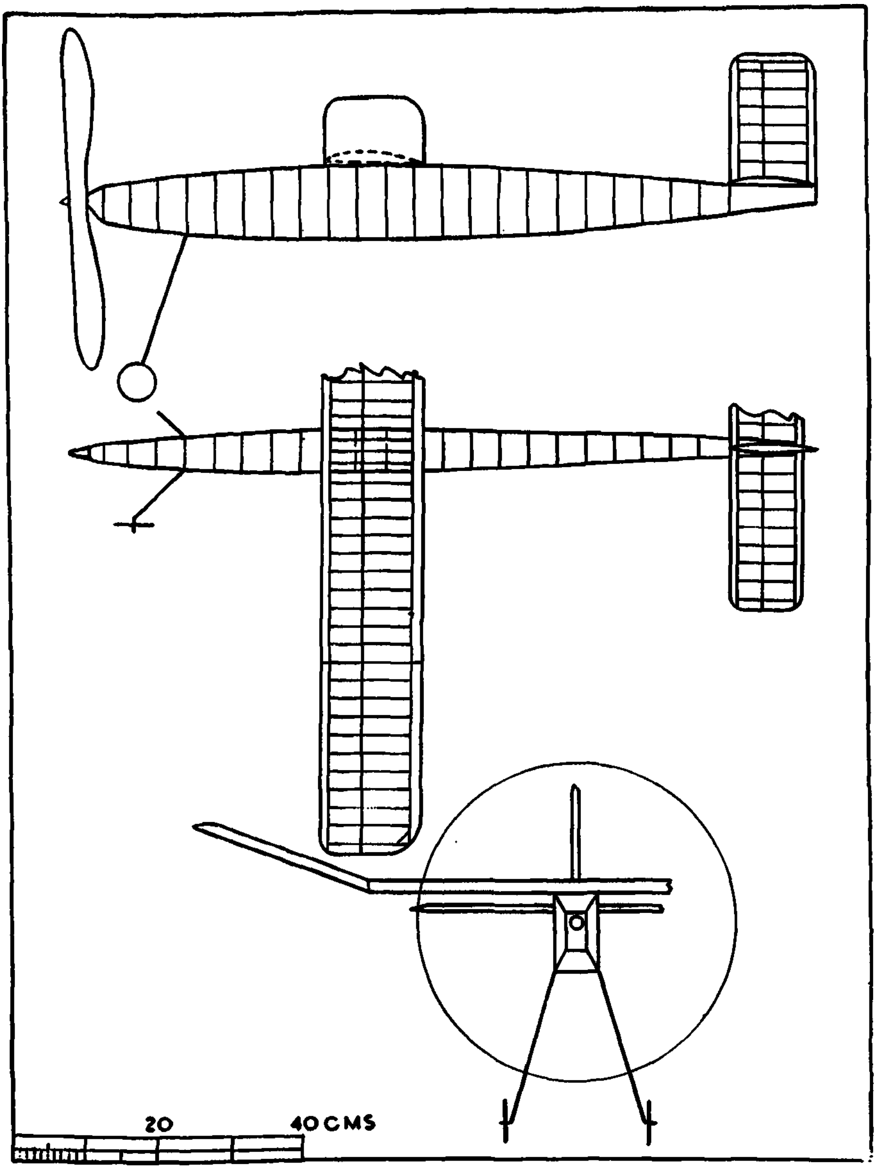
1951 INTERNATIONAL WAKEFIELD TROPHY CONTEST

Placing	Contestant	Country	First Flight	Second Flight	Third Flight	Total
1 (3) (3) ...	Stark, S.	Sweden	226.2	232.5	246.5	705.2
2 (2) (1) ...	Tubbs, H.	Great Britain ...	252.7	236.9	186.6	676.2
3 (5) (4) ...	Lustrati, S....	Italy	226.0	229.1	209.1	664.2
4 (1) (2) ...	De Jong, J.	Holland	258.1	206.0	189.8	653.9
5 (16) (6)...	Hofmeister...	U.S.A.	201.0	223.6	204.8	629.4
6 (18) (18)	De Vries	Holland	194.8	170.3	256.5	621.6
7 (5) (10)...	Andrade, M.	U.S.A.	226.0	180.5	208.3	614.8
8 (15) (5)...	Deschepper, P.	Belgium ...	202.2	243.4	164 0	609.6
9 (8) (8) ...	Holland, F.	Great Britain ...	221.2	190.0	187.4	598.6
10 (24) (9)...	Cassola, F.	Italy	172.0	236.0	190.2	598.2
11 (10) (12)	Dowsett, I.	Great Britain ...	215.9	184.2	166.7	566.8
12 (11) (11)	Elgin, J.	U.S.A.	212.1	192.0	156.0	560.1
13 (35) (23)	Dijkstra, G.	Holland	199.5	153.8	215.1	505.4
14 (3) (17)...	Gilg, P.	France	236.0	137.6	113.5	487.1
15 (14) (16)	Perryman, G.	U.S.A.	208.5	170.0	85.2	463.7
16 (7) (21)...	Ferber, M.	Belgium	223.5	127.0	106.3	456.8
17 (29) (22)	Fullarton, J. (Royle) ...	Australia... ...	151.1	185.0	117.0	453.1
18 (25) (24)	Lonergan, A. (Bryant) ...	Australia... ...	164.7	169.0	103.0	436.7
19 (27) (29)	Lippens, C.	Belgium	157.1	108.3	168.0	433.4
20 (6) (9) ...	Woodhouse, R.	Great Britain ...	224.0	184.0	23.4	431.4
21	Dijkstra, A.	Holland	197.4	153.8	79.4	430.6
22	Balasse, E.	Belgium	118.1	182.0	124.0	424.1
23	Leardi, A.	Italy	192.5	228.3	1.3	422.1
24	Thomas, J. F. (Seton) ...	Holland	122.0	150.0	126.0	398.0
25	Lim Joon, A. (Santala) ...	Australia... ...	186.0	64.1	146.3	396.4

Placing	Contestant	Country	First Flight	Second Flighs	Third Flight	Total
26	De Kat	Holland	158.0	236.0	1.5	395.5
27	Pelegi, G.	Italy	177.0	211.7	—	388.7
28	Sadorin, E.	Italy	186.3	195.0	—	381.3
29	Foster, J.	U.S.A.	211.7	152.6	—	364.3
30	Eliasson, H.	Sweden	122.8	129.5	110.2	362.5
31	Borjesson, B.	Sweden	5.7	217.5	133.5	356.7
32	Rockell	Great Britain ...	115.6	136.5	101.2	353.3
33	Blomgren, A.	Sweden	21.0	153.0	164.0	338.0
34	Huhtinen, P.	Finland	115.0	121.5	85.7	322.2
35	Wood, J. H. (Helenius) ...	Canada	209.1	105.2	—	314.3
36	Boxall, F. H.	Great Britain ...	149.2	143.4	16.0	308.6
37	Johanson, A.	Finland	132.5	126.2	41.0	299.7
38	Gerlaud, E.	France	12.5	140.9	140.6	294.0
39	Kneeland, D.	U.S.A.	190.3	11.4	70.6	272.3
40	Pointel, B....	France	218.0	28.8	—	246.8
41	Silmunen, T.	Finland	108.0	20.8	92.0	220.8
42	Tahkapaa, M.	Finland	1.0	89.0	105.5	195.5
43	Morris, C.	South Africa ...	37.3	61.0	86.0	184.3
44	Faiola, D. (Kannenworf) ...	Italy	—	183.0	—	183.0
45	Walter, J. (Relander) ...	Canada	151.4	20.0	—	171.4
46	Kivikataja	Finland	99.0	59.3	—	158.3
47	Ellila, A.	Finland	130.0	6.9	—	136.9
48	Van Rensburg, S.... ...	South Africa ...	70.0	46.2	—	116.2
49	Ford, A. (Kauhanen) ...	Canada	61.3	—	—	61.3
50	Holmes, J. (L. Santala) ...	Australia... ...	—	46.0	—	46.0
51	King, A. (Sandin)... ...	Australia... ...	6.0	—	—	6.0

Position of leaders at ends of First and Second Flights indicated in parentheses after final placing figure. Proxy flyers shown in parentheses after name of contestant.

Tubbs, Britain's top man, and second round leader, gets his model away safely from the take-off strip.



The Model.

WING : 41¾ in. span ; 5⅝ in. chord, untapered. TAIL : 19 in. span ; 3⅞ in. chord, untapered. FIN : 8½ in. high ; 3⅞ in. chord, untapered. FUSELAGE : 41 in. long ; 31¼ in. between hooks. PROPELLER : 19¼ in. diameter by 26 in. pitch. Airframe weight : 4 ounces. Rubber weight : 4⅛ ounces. The motor is arranged in a return gear system.

THE 1951 WAKEFIELD WINNER.

THE first man to win the coveted Wakefield trophy for Sweden is a veteran at this class of model, and a pioneer in aeromodelling in his country. Sune Stark, who is an aeronautical engineer by profession, has been an aeromodeller for over seventeen years, and has competed in five Wakefield contests. His first was that held at Fairey's in 1937, when Fillon took the honours for France. Sune was placed eighth in the results.

Twice winner of the Swedish Wakefield championships, he is a member of the famous Vingarna (The Wings) Club in Stockholm, which was founded fifteen years ago and has in fact been chairman of the club for the past eight years. Incidentally, the Vingarna Club is quite unique in that the preponderance of its members are Wakefield fliers, and almost every year, with few exceptions, the Swedish Wakefield team has included a member of Vingarna.

Sune is 32 years of age, married, and has one small daughter aged three. He comes of a family which has been prominent in Swedish aviation circles for many years. His father, Tyko Stark, has been Chairman of the Model Aviation Section of the K.S.A.K. (Royal Swedish Aero Club) for some considerable time, and both Sune and his brother, Borje Stark, are members of this model committee.

We first encountered Sune at the 1949 Wakefield at Cranfield Aerodrome, where this tall blonde Swede flew a model which is obviously an ancestor of this year's winning model. At the 1950 contest at Jami Jarvi he showed remarkably consistent flying, placing 11th in the first round, 11th in the second and 12th in the final list.

J. A. Gorham, of Ipswich, again appears as the heading to Contest Results as one of the season's outstanding contest modellers, though beaten into second place in S.M.A.E. Individual Championships by clubmate P. Wyatt at the very end of the season.

CONTEST RESULTS, 1950.

Results of S.M.A.E. Contests are published on the following pages together with details of principal Area and Club Events.

March 25th—PILCHER CUP (272 competitors)

	Open Glider	*Decentralised*	
1	Gates, G. K.	Southern Cross	13:03
2	Noel, T.	Wayfarers	12:28
3	Kemp, D.	Chelmsford	12:23
4	Gardner, R.	Surbiton	12:17
5	Simpson, M.	Park M.A.L.	11:20
6	French, N.	Central Essex	11:15

March 25th—GAMAGE CUP (156 competitors)

	Open Rubber	*Decentralised*	
1	Harwood, E.	Ipswich	11:37
2	Gorham, J. A.	Ipswich	10:50
3	Gilbert, M. H.	Flying Saddlers	10:37
4	Smith, E.	Icarians	9:35
5	Smith, W.	Upton	9:27
5	Rockell, W.	Gainsborough	9:27

April 15th—S.M.A.E. CUP (A/2 Glider Trials) (506 competitors).

	A/2 Nordic Gliders.	*Area Centralised.*	
1	Aitkenhead, C.	Loughboro College	11:32
2	Geesing, T.	Croydon	9:44
3	Gilbert, P.	Pharos	9:39
4	Smith, D. C.	Loughboro College	9:30
5	Wood, M.	Blackheath	9:00
6	Whitworth, C. D.	Kettering	8:59

April 15th—ASTRAL TROPHY (287 competitors)

	F.A.I. Power Duration.	*Area Centralised.*	
1	Trow, W.	Dudley	10:13
2	Hudman, J.	Birmingham	8:51
3	Marcus, N. G.	Croydon	8:06
4	Venville, B.	Solihull	7:47
5	Bickerstaffe, —.	Accrington	7:43
6	Lewis, R.	Eastbourne	7:42

May 6th—WESTON CUP (Wakefield Trials) (311 competitors).

	Wakefield Rubber.	*Area Centralised.*	
1	Gorham, J. A.	Ipswich	13:43
2	Atkinson, R.	Ipswich	12:11
3	Warring, R. H.	Zombies	11:58
4	Tangney, J.	Croydon	11:39
5	Mayes, C.	West Essex	11:14
6	Vicary, P.	Swansea	10:20

May 6th—HALFAX TROPHY (447 competitors).

	Ratio Power Duration.	*Area Centralised.*	
1	Cuinn, J.	Norwich	66.4 ratio
2	Jacobs, P. S.	Ipswich	54.5 „
3	Wyatt, P.	Ipswich	54.2 „
4	Marcus, N. G.	Croydon	50.1 „
5	Monks, R. C.	B rmingham	48.8 „
6	Worsnop, H.	Odiham	47.4 „

May 13th-14th—AEROMODELLER RADIO CONTROL TROPHY (22 competitors).
International R/C Precision. Centralised.

1	Taylor, W. H. C.	West Essex	550 points
2	Sutherland, S.	West Essex	517 „
3	Collins, S.	Northern Hts.	514 „
4	Panteney, R.	Eastbourne	370 „
5	Ives, T.	Country Member	344 „
6	Betts, C.	Finchley	311 „

May 13th-14th—INTERNATIONAL POWER CONTEST (31 competitors).
Power Duration. Centralised.

1	North, R. J.	Croydon	13:36
2	Howkins, F. E.	Birmingham	10:44
3	Jacobs, P. S.	Ipswich	10:34
4	Holland, W.	Apsley	9:23
5	Marcus, N. G.	Croydon	7:35
6	Lewis, R.	Ipswich	6:52

May 13th-14th—BOWDEN TROPHY (22 competitors)
International Payload Contest. Centralised.

1	Ward, R.	Croydon	7:32
2	Lucas, I. C.	Brighton	7:17
3	Meanwell, R.	Northampton	4:07
4	Yates, Col. R.	Headley	3:45
5	Monks, R. C.	Birmingham	3:30
6	Dudley, D.	Satyrs	3:00

May 13th-14th—CONTROL LINE ELIMINATORS (Team Selection for Knokke)
Centralised.

Class II—		
Wright, L.	St. Albans	111.9 m.p.h.
Scott, R.	St. Helens	111.3 „
Class III—		
Billington, M.	Brixton	109.2 „
Besley, S.	St. George's Hts.	93.2 „
Stunt—		
Hewitt, A. J.	Sth. Birmingham	265 points
Marsh, K.	West Essex	248 „

May 27th—GUTTERIDGE TROPHY (2nd Wakefield Eliminating Trials) (198 competitors).
Wakefield Rubber. Area Centralised.

1	Marcus, N. G.	Croydon	13:15
2	O'Donnell, J.	Whitefield	12:16
3	Holland, F.	Swansea	10:24
4	Gorham, J. A.	Ipswich	10:18
5	Knight, J. B.	Kentish Nomads	10:15
6	Sugden, D. C.	Loughboro College	10:02

May 27th—K. and M.A.A. CUP (2nd A/2 Nordic Eliminating Trials) (455 competitors).
A/2 Nordic Gliders.

1	Wheeler, B.	Birmingham	11:07
2	Askew, R.	Cheadle	11:05
3	Bootland, T.	Scunthorpe	11:03
4	Steel, D.	Yeovil	10:59
5	Farrance, W.	West Yorks	10:51
6	Jacobs, P.	Ipswich	10:49
6	Calvert, R.	Bradford	10:49

June 10th—PREMIER SHIELD. (Final Wakefield Trials)
Centralised.

1	Boxall, F. H.	Brighton	11:54
2	Holland, F.	Swansea	11:41
3	Woodhouse, R.	Whitefield	11:12
4	Rockell, W.	Gainsborough	11:11
5	Dowsett, I.	Pharos	10:42
6	Tubbs, H.	Leeds	10:42

June 10th—AEROMODELLER A/2 SAIL PLANE CHALLENGE TROPHY (Final A/2 Glider Trials)
Centralised.

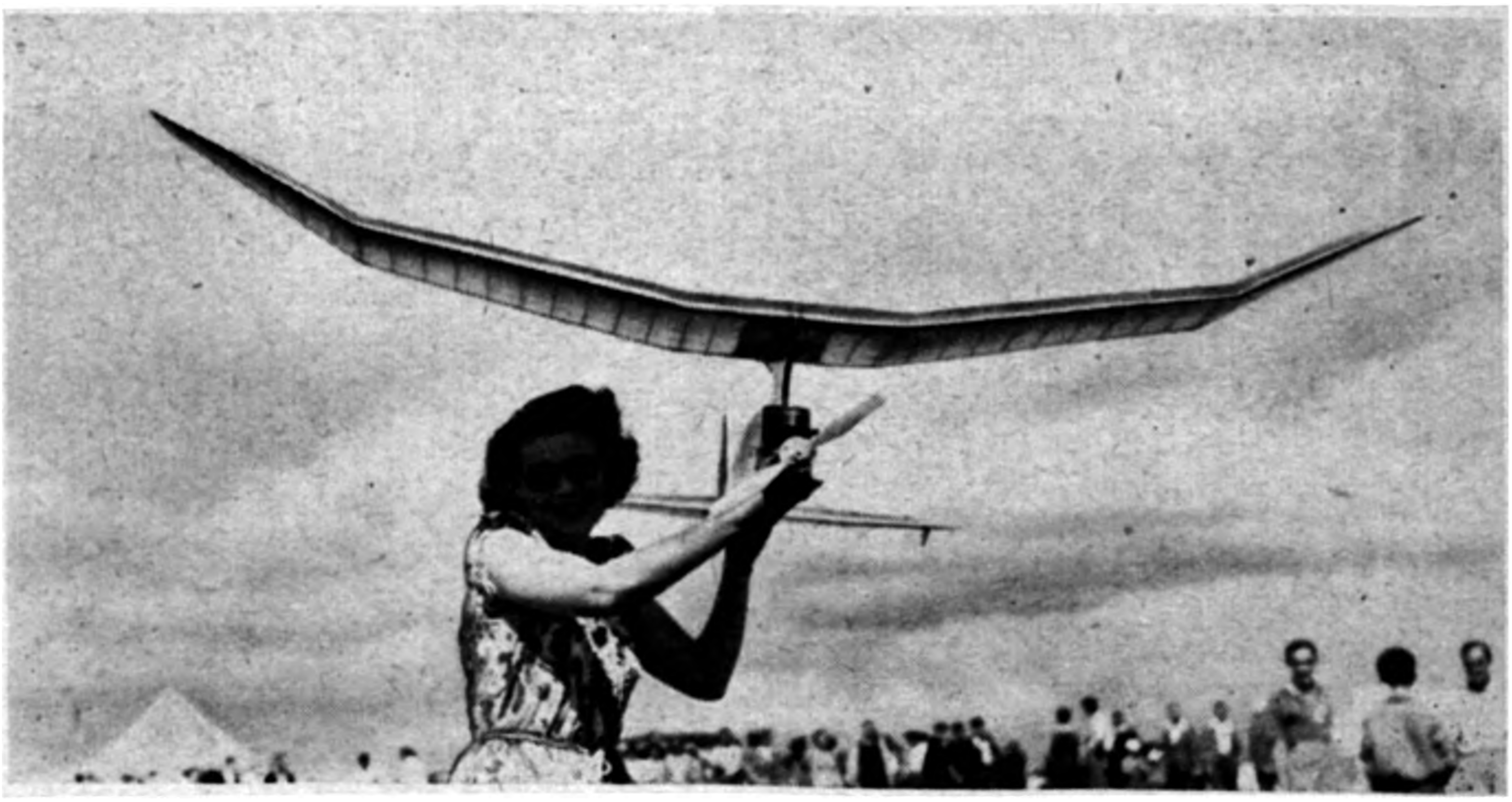
1	Wade, S. A.	Loughboro College	14:50
2	Bailey, W.	Wellingborough	14:17
3	Thomas, M.	Blackpool	13:51
4	Monks, R. C.	Birmingham	13:49
5	Holland, W.	Apsley	13:38
6	Hancock, J.	Surbiton	13:36

June 24th—NORTHERN HEIGHTS GALA, held at Langley Aerodrome

QUEEN'S CUP

Copland	Northern Heights	10:08
Allbone	Croydon	6:13
Parham	Worcester	5:09

A giant from Scotland seen at the Nationals held for the first time in Wales this year.



Welcome recruit from the ranks of the fair sex ! Mrs. Max Coote follows in hubby's footsteps in this picture taken during the Shelley Cup event. We look forward to seeing her name prominently in the Women's Challenge Cup results next season.

RUBBER (FAIREY CUP)

Gorham	Ipswich	10:0
Evans	Northampton	10:0

(Flown off for 1st place)

POWER (DE HAVILLAND TROPHY)

Trow	Dudley	6:24
Wyatt	Ipswich	5:34
Worsnop	Odiham	4:28

GLIDER (FLIGHT CUP)

Clark, J.	Surbiton	9:42
Wooliams	Wayfarers	8:30
Jones	Streatham	7:26

HELICOPTER

Dowsett	Pharos	4:51
Ward	Jetex	2:52
King	Pharos	2:26

CORONATION CUP TEAM RACE "A" (20 entries).

1	Edmunds	H. Wycombe	6 mins. 26 secs. for 5 miles
2	Neill	Tottenham	
3	Kennard	S. Birmingham	
4	Stabbs	Slough	

MODEL ENGINEER CUP CLASS "B" (29 entries).

1	Harper	Outlaws	9 mins. 4 secs. for 10 miles
2	Mason	Bushy Park	
3	Bourne	Godalming	
4	Norman	Berkhampsted	

AEROMODELLER CHALLENGE CUP

Gorham, J. Ipswich

July 15th—KEIL TROPHY (128 competitors).
Open Ratio Power. Decentralised.

1	Butcher, N.	Croydon	84.5 ratio
2	Perkins, G.	Croydon	80.6 ,,
3	Ward, R.	Croydon	74.9 ,,
4	Ladd, R.	Croydon	69.5 ,,
5	Chinn, J.	Norwich	69.2 ,,
6	Holt, J.	Upton	67.4 ,,
6	Pepperell, D.	N.W. Middlesex	67.4 ,,

July 1st—WOMEN'S CHALLENGE CUP
(24 competitors)
Open Rubber or Glider Duration Area Centralised.

1	Hathaway, Miss L.	St. Albans	8:48
2	Holt, Miss J.	Upton	8:39
3	Moulton, Mrs.	West Essex	8:11
4	Knight, Miss D.	Kentish Nomads	7:54
5	Woodhead, Mrs. F.	Spen Valley	6:48
6	Johnson, Mrs.	Blackheath	6:24

July 1st—MODEL ENGINEER CUP
Team Glider Contest. Area Centralised.

1	Solihull M.A.C.	53:38
2	Birmingham M.A.C.	48:07
3	Croydon D.M.A.C.	47:38
4	Brighton & D.M.A.C.	45:11
5	Surbiton M.F.C.	45:05
6	Loughboro College	42:29

July 1st—1.5 c.c. POWER CONTEST
(159 competitors).
Power Duration. Area Centralised.

1	Gorham, J. A.	Ipswich	14:50
2	Wyatt, P.	Ipswich	12:05
3	Willmott, D.	Belfairs	11:53
4	Grasmeder, W.	West Essex	10:57
5	Alexander, R. A.	Merseyside	10:40
6	Longstaff, A.	Belfairs	10:27

July 14th—"FESTIVAL OF BRITAIN" MODEL FLYING CHAMPIONSHIPS, held at Wembley Stadium
CONTROL LINE SPEED

			m.p.h.
Class 1—			
1	Kelsey, W.	East London	75.3
2	Stovell, P.	East London	74.55
3	Scott, R.	St. Helens	72.15
Class 2—			
1	Coles, A.	Bristol and West	85.79
2	Rae, G.	Malvern	74.55
3	O'Sullivan, P.	East London	73.35
Class 3—			
1	Clayden, J.	East London	75.82

Class 4— m.p.h.

1 Wright, P. St. Albans 125.54

2 Scott, R. St. Helens 111.4

3 Billinton, M. Brixton 108.5

Class 6—

1 Guest, F. C.M. 133.1

2 Billinton, M. Brixton 124.9

3 Taylor, R. (Billinton) Brixton 109.25

Class 7—

1 Hopkins, B. Bristol Phoenix 130.56

2 Claydon, J. East London 130.44

3 Connell, R. East London 122.4

CONTROL LINE TEAM RACE

Class A—

1 Edmunds, R. High Wycombe

2 Hayford, D. Tottenham

3 Marsh, R. Salisbury

Class B—

1 Jones, J. Birmingham

2 Bohling, H. Bushy Park

3 Morrell, P. Battersea

CONTROL LINE STUNT

m.p.h.

1 Russell, P. Worksop 358

2 Harper, B. Outlaws 338

3 Smith, P. Chingford 328

4 Bates, C. R.A.F. 311

5 Jarvis, J. Outlaws 306

July 15th—LADY SHELLEY CUP (23 competitors).

Decentralised

1 Lucas, R. A. Port Talbot

2 Gravett, E. Southern Cross 9:24

3 Harris, L. Croydon 8:34

4 Yeabsley, R. Croydon 7:47

5 Pizzey, C. Ipswich 6:31

6 Marshall, J. Hayes 5:57

First to fly at Wembley Stadium. I. Blenkinsop adjusts the spinner of his Atwood Champion powered 500 sq. in. model in the stunt event.

Concentration of A Class team race pilots at Wembley as they dice for position.

Preparing a 10 c.c. speed model at Wembley. M. Billinton, left, at the prop, assisted by Pete Wright.

August 5th/6th—BRITISH NATIONAL CHAMPIONSHIPS, held at Fairwood Common, Swansea

"GOLD" TROPHY (24 competitors).

Aerobatic Control Line

1	Hewitt, A. J.	S. Birmingham	330.5 pts
2	Hewitt, B.	S. Birmingham	323 „
3	Russell, P.	Worksop	312 „
4	Cooke, R.	Rotherham	307.5 „
5	Smith, P.	Chingford	202.5 „
6	Coles, A. V.	Bristol & West	173 „

MODEL AIRCRAFT TROPHY (75 competitors).

F.A.I. Rubber Duration.

1	Warring, R. H.	Zombies	6:27
2	Atkinson, R.	Ipswich	6:16
3	Knight, J. B.	Kentish Nomads	5:18
4	Gorham, J. A.	Ipswich	4:58
5	Marcus, N. G.	Croydon	4:49
6	Copland, R.	Northern Heights	4:45

THURSTON CUP (131 competitors).

F.A.I. Glider.

1	Lamble, J.	Chorleywood	8:17
2	Wheeler, B.	Birmingham	7:31
3	Yeabsley, R.	Croydon	7:13
4	Twomey, R.	Cardiff	6:02
5	Neve, R.	Brighton	5:57
6	O'Donnell, J.	Whitefield	5:43

S.M.A.E. RADIO CONTROL TROPHY (11 competitors).

Radio Control Precision.

1	Allen, S.	Battersea	250 pts
2	Hemsley, O.	Bushy Park	64 „
3	Goodman, R.	Bushy Park	50 „

SIR JOHN SHELLEY CUP (134 competitors).

F.A.I. Power Duration.

1	Wyatt, P.	Ipswich	10:00
2	Bennett, A.	Whitefield	9:26
3	Knight, J. B.	Kentish Nomads	7:35
4	Buskell, P.	Surbiton	7:27
5	Butcher, N.	Croydon	6:53
6	Bol, M.	Willesden	6:23

CONTROL LINE SPEED CONTESTS

Class II—		
Coles, A. V.	Bristol & West	94.54 m.p.h.
Taylor, R.	Brixton	86.26 „
Class III—		
Billinton, M.	Brixton	95.008 „
Class IV		
Taylor, R.	Brixton	112.24 „
Class IV—		
Billington, M	Brixton	128.29 „
Class VII—		
Hopkins, B	Bristol & West	124.42 „

August 18th.—BRITISH INDOOR NATIONALS.

("Daily Despatch" Indoor Rally).

Corn Exchange, Manchester.

Centralised.

Free Flight—			
1	Read, T.	S. Birmingham	9.18
2	Maxwell, J. H.	Bristol	8.50
3	Parham, R. T.	Worcester	8.47
Chuck Glider—			
1	Haisman, B. V.	Liverpool	28 secs.
2	Ward, S. A.	Whitefield	20 „
3	Fleeson, M. E.	Cheadle	20 „
R.T.P. Speed—			
	O'Donnell, J.	Whitefield	

Top left: Johnny Lamble, Chorley Wood, flying in the Shelley Cup at the Nationals, where he picked up the Thurston Glider Cup.

Top right: Ian Dowsett, 1951 Wakefield team member, with his interesting needle-nose Jetex 200 design that placed 10th in the Jetex Contest.

August 19th.—"DAILY DESPATCH" RALLY. Woodford Aerodrome, Nr. Manchester.

Power—			
1	Hepworth, J.	West Yorks	6.58
2	Jones, J.	Wallasey	6.39
3	Muxlow, E. C.	Sheffield	6.26
Junior :	Platt, Miss M.	Nth. Wirral	4.30
Rubber—			
1	Tubbs, H.	Leeds	8.26
2	Taylor, E. R.	Cheadle	7.27
3	Rhead, T.	Wigan	6.46
Junior :	Johnson, C.	Wigan	4.46
Glider—			
1	O'Donnell, J.	Whitefield	10.00
2	Lloyd, K. H.	Solihull	10.00
3	Regan, M.	Halifax	7.37
Junior :	Brier, T.	Huddersfield	5.53

Jetex—			
1	Dauncey, P.	Woodlands	11.4 ratio
2	Richmond, J. S.	Wolves.	11.2 "
3	O'Donnell, H.	Whitefield	9.1 "
Team Race—			
1	Reay, J.	Sale	
2	Pumford, E.	Wallasey	
Women's—			
1	Bennett, Miss W.	Whitefield	5.34
2	Well, Mrs. B.	Solihull	4.27
3	Aveill, Mrs. D.	Solihull	3.11
Radio Control—			
1	Marsh, D.	Crosby	100 pts.
2	Crusham, W. E.	Southport	75 "
3	Doughty, P. C.	Birmingham	75 "

Bottom left: D. Temple, Eastbourne, one of aeromodelling's "Mad Hatters," with his somewhat bent model, typical of weather conditions during some stages of the Nationals.

Bottom right: Personalities at the Indoor Meeting at Manchester Corn Exchange: Barry Haisman, chuck glider winner: and below him S. A. Ward, who was second. Tailless model is held by builder Ray Booth, and finally we have Ted Muxlow and his mike model.

Scenes from the Rally at Sherburn-in-Elmet, organised by the *Yorkshire Evening News*—their venture in sponsoring a model meeting was attended by a crowd estimated at 15,000 !

Scale (E. J. Riding Memorial Trophy)—

1	Lees, F.	Ashton	85 pts.
2	Farrance, W.	West Yorks	83 „
3	Cameron, I. S.	Merseyside	80 „

Senior Champion : Lloyd, K. H., Solihull.
Junior Champion : O'Donnell, H., Whitefield.

August 19th—ALL HERTS RALLY
Held at Radlett Aerodrome

Rubber			Secs.
1	Knight, J.	Kentish Nomads	505.0
2	Dowsett, I.	Pharos	485.9
3	Atkinson, R.	Ipswich	480.0
Glider			
1	Mason, —.	Sevenoaks	600.0
2	Dabbs, —.	Park M.A.L.	600.0
3	Rowe, —.	Icarians	554.4
Power			Agg. Ratio
1	Gorham, J.	Ipswich	30.32
2	Glynn, M.	St. Albans	30.27
3	Lewis, J.	N. Heights	29.90
Team Racing			m.p.h.
Class A—			
1	Edmunds, R.	High Wycombe	
2	Taylor, C.	West Essex	
3	Marsh, K.	West Essex	
Class B—			
1	Rowe, D. W.	Country Member	52.3
2	Cockerill, R.	Tottenham	51.8
3	Berkhead, R.	St. Georges Hts.	50.8

Control-line Speed.

Class 1	Billington, M.	Brixton	96.82
„ 2	Wright, P.	St. Albans	124.9
„ 3	Billington, M.	Brixton	124.3

Radio Control Stunt

			Pts.
1	Sutherland, S.	West Essex	313
2	Ascot, J.	Battersea	226
3	Allen, S.	Battersea	211

Concours D'Elegance

Rubber or Glider
Henderson, W. (Glider) N. Kent
F/F Models
Newton, J. (Ambulance Plane) N. Kent
C/L Models
Briggs, J. (Fortress) P.M.A.L.

CUP FOR OUTSTANDING MODEL
Newton, J. (Ambulance Plane) N. Kent

September 2nd—THE FARROW SHIELD (244 competitors, 54 clubs)
Team Contest for Rubber Duration. Area Centralised

1	Kentish Nomads	48 : 07
2	Northampton	42 : 46
3	Croydon	41 : 34
4	Leeds	35 : 47
5	Icarians	33 : 48
6	Ipswich	33 : 38

September 2nd—JETEX CHALLENGE CUP (53 competitors)
Ratio Duration for Jetex Power. Area Centralised.

1	Henderson, W.	N. Kent	32.6
2	Hardwick, H.	Wolves	22.6
3	Amor, R.	Ilford	21.8
4	Howkins, F.	Birmingham	20.7
5	Ransom, L.	West Essex	20.5
6	Magson, J.	Halifax	20.4

September 2nd—SCALE POWER CONTEST (15 competitors)
Duration Contest for Scale Power Driven Models. Area Centralised.

1	Wyatt, P.	Ipswich	1 : 50
2	Heppenstall, N.	Leeds	1 : 25
3	Minney, R.	Luton	1 : 22
4	Gorham, J.	Ipswich	1 : 19
5	Webb, R.	Ashford	1 : 18
6	Neale, D.	Leamington	1 : 08

September 2nd—RIPMAX TROPHY (22 competitors)
Radio Controlled Models Contest. Area Centralised.

			Pts.
1	Allen, S.	West Essex	400
1	Ives, T.	C.M.	400
3	Tickner, W.	West Essex	375
4	Sutherland, S.	West Essex	350
5	Dance, C.	Kentish Nomads	275
5	Fox, J.	Hatfield	275

September 9th.—FIRST "YORKSHIRE EVENING NEWS" MODEL FLYING FESTIVAL.
Sherburn-in-Elmet Aerodrome, Yorks.

Glider—			
1	Faulkner, B.T.	Cheadle	7.55
2	Cartwright	Bridlington	7.48
3	Hodgson, R.	York	7.46
Rubber—			
1	Dobson, T.	Salford	10.41
2	Rockell, W.	Gainsborough	10.40
3	Rutter, K. F. P.	Leeds	7.47
Power—			
1	Lord, E.	Accrington	7.50
2	Smith, T. W.	Blackpool	7.33
3	Lanfranchi, S.	Bradford	7.10
Chuck Glider—			
1	Briggs, C.	Southport	58 secs.
2	Davey, C. J.	Blackpool	49 „
3	Brown, R.	Grimsby	48.5 „
Radio Control—			
1	Crusham, W. C.	Southport	143 pts.
2	Ingham, S.	Blackburn	100 „
3	Dean, K. F.	Bradford	50 „

September 16th—TAPLIN TROPHY (9 competitors)
Held at Cranwell Aerodrome

Radio Control Flight Pattern		*Centralised*	
1	Sutherland, S.	West Essex	227 pts.
2	Weston, J.	Forresters	210 „
3	Allen, S.	West Essex	200 „
4	Boys, Howard	Northampton	170 „
5	Tickner, W.	West Essex	155 „
6	Hemsley, O.	Bushey Park	20 „

September 16th—BRITISH CHAMPIONSHIPS.
Held at Cranwell Aerodrome
Centralised.

Champion Area : London
Rubber : London
Glider : East Midland
Power : East Anglia

Individual Champions :

Power :	Jacobs, P.	Ipswich	7 : 17
Glider :	Jacobs, P.	Ipswich	6 : 52
Rubber :	Gorham, J.	Ipswich	13 : 43

POINTS

Area		*Rubber*	*Power*	*Glider*	*Total*
1	London	20	7	10	37
2	North Western ...	14	14	7	35
3	East Anglian ...	5	20	5	30
4	Midland	7	5	14	26
5	East Midland ...	2	2	20	24
6	Northern	10	10	3	23
7	South Eastern ...	3	3	4	10
8	South Midland ...	4	4	1	9
9	North Eastern ...	1	1	2	4
10	Southern	—	—	—	0

PLUGGE CUP
Club Championship Trophy

1	Birmingham	1333
2	Croydon	1325

BRITISH INDIVIDUAL CHAMPION
(Senior)

1	Wyatt, P.	Ipswich	167
2	Gorham, J.	Ipswich	166

CONTROL LINE CHAMPION

1	Billington, M.	Brixton	64
2	Taylor, R.	Brixton	58
3	Coles, A.	Bristol and West	44

Frog, Flight, Hamley, Junior Champion and Caton had not been decided prior to closing for press.

UNITED KINGDOM CHALLENGE MATCH
Heathfield Aerodrome, Ayrshire, Scotland
September 7th, 1951

England ... 13 points
Scotland ... 11 „
N. Ireland ... 6 „

Rubber Contest	*Glider Contest*	*Power Contest*
England 22:23	Scotland 18-36	England 18:04
Scotland 21:32	England 18:07	Scotland 15:44
N. Ireland 12:15	N. Ireland 3:51	N. Ireland 7:33

J. Newton, Blackheath, with his own design 8 lb. air ambulance, seen at the All-Herts Rally. This model, beautifully finished and detailed, was much admired at the M.E. Exhibition in London.

BRITISH NATIONAL MODEL AIRCRAFT RECORDS

as at 11th September, 1951

OUTDOOR (Minimum F.A.I. Loading)

Rubber Driven

Monoplane	Boxall, F. H.	(Brighton)	35 : 00	13/ 5/1949
Biplane	Young, J. O.	(Harrow)	31 : 05.1	9/ 6/1940
Wakefield	Boxall, F. H.	(Brighton)	35 : 00	13/ 5/1949
Canard	Harrison, G. H.	(Hull Pegasus)	3 : 21	3/ 6/1951
Scale	Marcus, N. G.	(Croydon)	5 : 21.7	18 /8/1946
Tailless	Boys, H.	(Rugby)	1 : 24.5	/ /1939
Helicopter	Tangney, J. F.	(U.S.A. & Croydon)	2 : 43.7	2/7/1950
Rotorplane	Crow, S. R.	(Blackheath)	: 39.5	23/ 3/1936
Floatplane	Parham, R. T.	(Worcester)	3 : 55.4	27/ 7/1947
Flying Boat	Rainer, M.	(North Kent)	1 : 09	28/ 6/1947

Sailplane

Tow Launch	Best, F.	(Leeds)	63 : 46	20/ 7/1948
Hand Launch	Campbell-Kelly, G.	(Loughboro Coll.)	24 : 30	29/ 7/1951
Tailless (T.L.)	Lucas, A. R.	(Port Talbot)	22 : 33.5	21/ 8/1950
Tailless (H.L.)	Wilde, H. F.	(Chester)	3 : 17	4/ 9/1949
Nordic A/2 (T.L.)	Whittall, L.	(Birmingham)	29 : 51.7	2/ 7/1950
Nordic A/2 (H.L.)	Campbell-Kelly, G.	(Loughboro Coll.)	24 : 30	29/ 7/1951

Power Driven

A (0-2.5 c.c.)	Springham, H. R.	(Saffron Walden)	25 : 01	12/6/1949
B (2.51-5 c.c.)	Dallawy, W. E.	(Birmingham)	20 : 28	17/ 4/1949
C (5.01-15 c.c.)	Gaster, M.	(C/Member)	10 : 44	15/ 7/1951
Tailless	Poile, W.	(Folkestone)	2 : 09.6	23/ 8/1950
Scale	Tinker, W. T.	(Ewell)	1 : 36.2	1/ 1/1950
Floatplane	Stainer, J. R.	(Canterbury)	2 : 59.2	14/ 8/1949
Flying Boat	Gregory, N.	(Harrow)	2 : 08.5	18/10/1947

Control Line Speed

			m.p.h.	
Class I	Scott, R.	(St. Helens)	80.00	9/ 7/1950
Class II	Coles, A. V.	(Bristol)	99.41	18/ 8/1951
Class III	Billinton, M.	(Brixton)	95.00	6/ 8/1951
Class IV	Wright, P.	(St. Albans)	124.54	14/ 7/1951
Class V	Shaw, C.	(Zombies)	118.42	19/ 6/1949
Class VI	Guest, F.	(C/Member)	133.1	14/ 7/1951
Class VII (Jet)	Stovold, R. V.	(Guildford)	133.3	25/ 9/1949

OUTDOOR (Lightweight)

Rubber Driven

Monoplane	Wiggins, R. E.	(Leamington)	17 : 46	3/ 6/1951
Biplane	O'Donnell, J.	(Whitefield)	4 : 14.5	21/ 6/1951
Floatplane	O'Donnell, J.	(Whitefield)	1 : 43.5	14/ 1/1951
Scale	Dubery, V. R.	(Leeds)	1 : 11	14/ 7/1951

Sailplane

Tow Launch	Mace, J. A.	(Upton)	28 : 17.2	16/ 4/1950
Hand Launch	Gates, G. K.	(Southern Cross)	5 : 18	3/ 6/1951
Tailless (T.L.)	Couling, N. F.	(Sevenoaks)	22 : 22	3/ 6/1951
Tailless (H.L.)	Faulkner, R. A.	(Whitefield)	1 : 10.1	10/ 3/1951

Power Driven

Class A	Archer, W.	(Cheadle)	31 : 05	2/ 7/1950
Class C	Ward, R. A.	(Croydon)	5 : 33	25/ 6/1950
Tailless	Gates, M. M.	(Unattached)	2 : 47	28/ 1/1951

INDOOR

Free Flight

Stick (H.L.)	Copland, R.	(Northern Hts.)	18 : 52	22/ 1/1937
Stick (ROG)	Mackenzie, R.	(Blackheath)	8 : 42	
Fuselage (H.L.)	Parham, R. T.	(Worcester)	7 : 15	18/ 8/1951
Fuselage (ROG)	Parham, R. T.	(Worcester)	7 : 30	18/ 8/1951
Tailless (H.L.)	Parham, R. T.	(Worcester)	2 : 59	18/ 8/1951
Tailless (ROG)	Parham, R. T.	(Worcester)	2 : 28	18/ 8/1951
Helicopter	Parham, R. T.	(Worcester)	2 : 09	18/ 8/1951
Rotorplane	Mawby, L.	(Ealing)	: 32.2	

Round the Pole

Class A	Muxlow, E. C.	(Sheffield)	6 : 05	10/12/1948
Class B	Parham, R. T.	(Worcester)	4 : 26	20/ 3/1948
Speed	Jolley, T. A.	(Warrington)	42.83	19/ 2/1950

WORLD RECORDS

As at 1st October, 1951

DURATION

Rubber

Orthodox	Nassonov, V.	(U.S.S.R.)	76 : 00	10/8/1949
Tailless	Kiraly, M.	(Hungary)	35 : 42	23/8/1950
Hydroplane	Egervary, G.	(Hungary)	54 : 04	23/8/1950
Tailless Hydro.	Aszalay, L.	(Hungary)	1 : 05	31/7/1949
Special A/cft.	Egervary, G.	(Hungary)	7 : 43	13/6/1950

Sailplane

Orthodox	Aimadinov, S.	(U.S.S.R.)	198 : 00	6/7/1950
Tailless	Mourastchecko, B.	(U.S.S.R.)	76 : 32	6/6/1951

Power

Orthodox	Sikirine, L.	(U.S.S.R.)	242 : 30*	18/8/1950
Tailless	Parparov, B.	(U.S.S.R.)	95 : 15	12/8/1950
Hydroplane	Vassiltchenko, M.	(U.S.S.R.)	170 : 00	28/7/1950
Tailless Hydro.	Rakov, E.	(U.S.S.R.)	30 : 00	28/7/1950
Special A/cft.	Khoukhra, Y.	(U.S.S.R.)	27 : 35	18/8/1950

DISTANCE

Rubber

Orthodox	Benedik, G.	(Hungary)	50.260 km.	20/8/1947
Tailless	Gall, T.	(Hungary)	0.720 km.	17/4/1949
Hydroplane	Horvath, E.	(Hungary)	45.150 km.	10/9/1949
Tailless Hydro.	Abaffy, E.	(Hungary)	0.435 km.	10/7/1949
Special A/cft.	Roser, N.	(Hungary)	0.238 km.	9/4/1950

Sailplane

Orthodox	Varache, M.	(France)	96.720 km.	21/7/1946
Tailless	Mourastchenko, B.	(U.S.S.R.)	33.360 km.	6/6/1951

Power

Orthodox	Malik, S.	(U.S.S.R.)	210.620 km.*	19/9/1947
Tailless	Trountchenko, N.	(U.S.S.R.)	38.669 km.	—/7/1951
Hydroplane	Smirnov, P.	(U.S.S.R.)	87.106 km.	19/7/1950
Tailless Hydro.	Rakov, E.	(U.S.S.R.)	8.650 km.	28/7/1950
Special A/cft.	Khoukhra, Y.	(U.S.S.R.)	12.201 km.	14/8/1950

ALTITUDE

Rubber

Orthodox	Poich, R.	(Hungary)	1,442 m.	31/8/1948
Hydroplane	Gasko, M.	(Hungary)	939 m.	18/8/1949

Sailplane

Orthodox	Benedek, G.	(Hungary)	2,364 m.	28/5/1948
Tailless	Koutcer, M.	(U.S.S.R.)	547 m.	17/8/1950

Power

Orthodox	Lioubouchkine, G.	(U.S.S.R.)	4,152 m.*	13/8/1947
Tailless	Parparov, B.	(U.S.S.R.)	1,788 m.	12/8/1950
Hydroplane	Kavsadze, I.	(U.S.S.R.)	4,110 m.	8/8/1950
Tailless Hydro.	Rakov, E.	(U.S.S.R.)	1,550 m.	28/7/1950

SPEED (Straight Line)

Rubber

Orthodox	Davidov, V.	(U.S.S.R.)	107.080 km/hr.	11/7/1940
Tailless	Koumanine, V.	(U.S.S.R.)	33.408 km/hr.	28/7/1950
Hydroplane	Abramov, B.	(U.S.S.R.)	76.896 km/hr.	6/8/1940
Tailless Hydro.	Koumanine, V.	(U.S.S.R.)	31.824 km/hr.	28/7/1950

Power

Orthodox	Stiles, E.	(America)	129.768 km/hr.*	29/7/1949
Tailless	Martinov/Rakov	(U.S.S.R.)	49.680 km/hr.	12/8/1950
Hydroplane	Khabarov, R.	(U.S.S.R.)	50.050 km/hr.	18/8/1948

SPEED (Control Line)

Orthodox *Class I*	Husicka, Z.	(Czecho.)	144.903 km/hr.	29/7/1951
Class II	Labarde, R.	(France)	192.240 km/hr.	9/7/1950
Class III	Millet, A.	(France)	212.580 km/hr.*	10/7/1950
Jet	Benedek, G.	(Hungary)	179.388 km/hr.	4/6/1950
Tailless *Class I*	Khoukhra, L.	(U.S.S.R.)	66.888 km/hr.	28/4/1950
Class II	Smirnov, V.	(U.S.S.R.)	99.288 km/hr.	12/8/1950
Class III	Gaevsky, O.	(U.S.S.R.)	163.447 km/hr.	23/5/1950
Hydro *Class I*	Vassiltchenko, B.	(U.S.S.R.)	70.056 km.hr.	16/8/1950
Special *Class I*	Mouritchev, L.	(U.S.S.R.)	71.028 km/hr.	28/12/1950
Class II	Rounkov, V.	(U.S.S.R.)	67.390 km/hr.	17/10/1940
Class III	Mouritchev, L.	(U.S.S.R.)	41.234 km/hr.	14/8/1949

* denotes absolute World Record.

AEROMODELLING LITERATURE ROUND THE WORLD

Some of our readers may be interested in foreign magazines dealing wholly or in part with aeromodelling. In spite of language difficulties much can be learnt from their pages. The list does not pretend to be complete, but offers a fair cross-section.

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FLYING MODELS	215 Fourth Avenue, New York 3, N.Y.	Bi-monthly. All aeromodelling
MODEL AIRPLANE NEWS ...	551 Fifth Avenue, New York 17, N.Y.	Monthly. All aeromodelling

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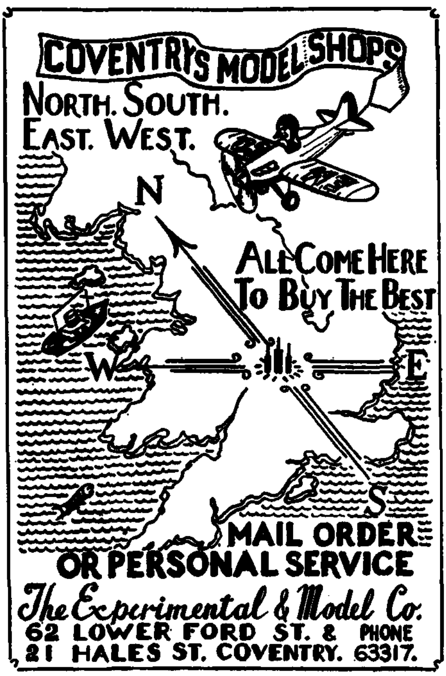
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Attenborough Model Railway,
64, Narborough Road,
LEICESTER.

The Model Shop,
6, Market Street,
LOUGHBOROUGH.

LINCOLNSHIRE

D. J. Spire & Co., Ltd.,
West Street,
BOURNE.

Musgrave & Co. (Tools), Ltd.,
13, Clasketgate,
LINCOLN.

S. A. Nobbs & Sons, Ltd.,
2, Norman Street,
LINCOLN.

MIDDLESEX

The Enfield Caravan & Model Supplies,
194, Baker Street,
ENFIELD.

L. M. Holland,
588, Greenford Road,
GREENFORD.

The Model Stadium,
5, Village Way East,
Rayners Lane,
HARROW.

Staines Model Shop,
53, Thames Street,
STAINES.

MODEL SHOP DIRECTORY

Wally Kilmister, Ltd.,
6/7, Neeld Place,
WEMBLEY.

NORFOLK

H. & C. Williment,
39, St. Benedicts,
NORWICH.

NORTHUMBERLAND

The Model Shop,
3, Ridley Place,
NEWCASTLE-ON-TYNE.

The Whitley Model Shop,
67, Park View,
WHITLEY BAY.

NOTTINGHAMSHIRE

Attenborough Model Railway,
82, Arkwright Street,
NOTTINGHAM.

Raylite Supplies, Ltd.,
21, Arkwright Street,
NOTTINGHAM.

Russell Models,
Control Line Specialists,
6, Ryton Street,
WORKSOP.

OXFORDSHIRE

R. E. Papel,
94, St. Clements,
OXFORD.

SHROPSHIRE

W. Alcock & Sons,
9, St. John's Hill,
SHREWSBURY.

SOMERSET

McPherson & Co.,
Model Engineers,
1, St. John Street,
WELLS.

STAFFORDSHIRE

Dunns,
67, Lower High Street,
CRADLEY HEATH.

Regent Model Shop,
Cleveland Street,
WOLVERHAMPTON.

H. Start & Sons, Ltd.,
61, Victoria Street,
WOLVERHAMPTON.

SUFFOLK

Wakelins (Suffolk), Ltd.,
Suffolk House,
FELIXSTOWE.

East Anglian Model Supplies,
37, Upper Orwell Street,
IPSWICH.

SURREY

R. Wills,
Scientific Hobbies,
92a, Brighton Road,
COULSDON.

A. Hunt (Croydon), Ltd.,
3/5, South End,
CROYDON.

James Rogerson, Ltd.,
12, West Street,
DORKING.

R. F. Bourne,
10, Bridge Street,
GODALMING.

James Rogerson, Ltd.,
30, Chertsey Street,
GUILDFORD.

Heset Model Supplies,
61, Brighton Road,
SOUTH CROYDON.

E.L.S. Model Supplies,
272, High Street,
SUTTON.

G. A. Pearce,
1, Oldfields Road,
Sutton-By-Pass,
SUTTON.

Rogers Models (E. E. V. Rogers), Ltd.,
56, High Street,
WEYBRIDGE.

SUSSEX

Croxfords,
3, Mill Crescent,
Nyewood Lane,
BOGNOR REGIS.

Arthur Mullett,
16 & 17, Meetinghouse Lane,
BRIGHTON 1.

Planet Model Aircraft Co.,
The Hornet,
CHICHESTER.

Eastbourne Aeromodel Shop,
35, Seaside,
EASTBOURNE.

Mechanical & Model Supplies,
39, Kings Road,
ST. LEONARDS-ON-SEA.

Modelcraft,
316, Bexhill Road,
ST. LEONARDS-ON-SEA.

Gaydons,
21, High Street,
WORTHING.

WARWICKSHIRE

Barnbys, Ltd.,
41, Corporation Street,
COVENTRY.

Beesley's,
89, Spon End,
COVENTRY.

Enterprize,
19, Far Gosford Street,
COVENTRY.

Moore's Handicrafts,
(C. H. Moore),
41, Clifton Road,
RUGBY.

WORCESTERSHIRE

Hal,
57, Market Street,
STOURBRIDGE.

MODEL SHOP DIRECTORY

A. N. Cutler,
7, Bridge Street,
WORCESTER.

WILTSHIRE

Wiltons (Sports & Games), Ltd.,
Canal & Queen Street,
SALISBURY.

Hobby's Corner,
10, Redhouse Road,
SWINDON.

YORKSHIRE

The Model Shop,
69a, Godwin Street,
BRADFORD.

Bridlington Model Supplies,
63a, Promenade,
BRIDLINGTON.

Modellers' Corner,
110, Commercial Street,
BRIGHOUSE.

Joseph Rowley,
The Model Supply Stores,
81, Bridge Street,
CASTLEFORD.

The Model Shop,
72, Daisy Hill,
DEWSBURY.

Nicholl, Brown & Coyle,
24, Commercial Street,
HALIFAX.

E. Page,
29, Westmoreland Street,
HARROGATE.

Modellers' Mecca,
178, Beverley Road,
HULL.

The Model Shop,
Burton Building,
Whitefriargate Corner,
HULL.

Leeds Aeromodel Supply,
94, Woodhouse Lane,
LEEDS 2.

C. R. Lister,
14, Wilson Street,
MIDDLESBROUGH.

Chas. Skinner,
The Model Shop,
82, Station Road,
REDCAR.

G. Thompson & Son,
68/69, North Street,
RIPON.

Aer-O-Kits (Sheffield),
Phoenix Works,
142, Rockingham Lane,
SHEFFIELD 1.

Ray's Model Stores,
157, Infirmary Road,
SHEFFIELD 3.

Sheffield Electrical & Model Engineers,
302, Shalesmoor,
SHEFFIELD 3.

NORTHERN IRELAND

Martin's Models,
Castle Street,
BALLYCASTLE.

Ato Model Crafts,
36, Wellington Place,
BELFAST.

SCOTLAND

Arthur West,
4, Primrose Street,
ALLOA.

Brian Sherriff,
93, Victoria Road,
DUNDEE.

Binns, Ltd.,
145, Princes Street,
EDINBURGH 2.

Modelcrafts,
112, High Street,
FALKIRK.

Caledonia Model Co.,
5, Pitt Street,
GLASGOW, C.2.

Jimmy Glassford,
(Late of Motherwell),
89, Cambridge Street,
GLASGOW C.3.

The Radio Doctor,
94, Titchfield Street,
KILMARNOCK.

Allison & Montgomery,
273, High Street,
KIRKALDY.

The Model Shop,
50, Caledonian Road,
WISHAW.

WALES

Bud Morgan,
22 & 22a, Castle Arcade,
CARDIFF.

Watkins Stores,
6, Waungron Road,
Llandaff,
CARDIFF.

OVERSEAS

AUSTRALIA

Gorries,
604, Stanley Street,
SOUTH BRISBANE S.2.

F. E. Knight,
South Coast Model Supplies,
69, King Street,
NEWCASTLE, N.S. WALES.

Curreys—Hobbies,
459, Newcastle Street,
West Perth,
WESTERN AUSTRALIA.

NEW ZEALAND

Little Wonder Models,
786, Colombo Street,
CHRISTCHURCH.

HONGKONG

The Juvenile Store,
624a, Nathan Road,
Mangkok,
KOWLOON.