AERO MODELLER

FULL SIZE PLANS
HELICOPTER MODELS

MAP
HOBBY MAGAZINE

APRIL 1964

TWO SHILLINGS

U.S.A. & CANADA 40 Cents

MODEL CARS

is here!

First Issue Now on Sale

FIRST FRIDAY OF THE MONTH **2/6**

CONTENTS SUMMARY

Simple Chassis Construction based on making Auto Union Type C with pictures, cutaway sketches, 1/32nd scale drawings.

PORSCHE 904 GT 3-view drawings in 1/32nd scale of latest sports racing contender.

KIMBER SPECIAL — the first M.G. plus MIDGET M Type—the first Midget in plans and pictures.

WHO'S WHO OF MODEL CAR MANUFACTURERS — all the sets and systems described, discussed, illustrated.

Getting it Right : How to search out "gen" on models, using the Silver Arrow Mercedes Benz cars as examples.

Theory of Car Performance : What makes a car go—how to design your car from the drawing board up.

Racing Car Show & Brighton Toy Fair Reports.

Latest Trade Releases.

William Boddy on "My Model Car Collection". . . . plus comment . . . editorial . . . correspondence.

No. 2 On Sale April 3rd

Another Chassis Construction article—this time on BRM.

DRAGSTERS—in model form—how to make your own drag strip, build a drag car, run it plus . . .

ALLARD DRAGSTER drawings for your model plus . . .

MODEL DRAG MEETING by British Hot Rod Association in words and pictures. Are we up to U.S. standards ?

Famous **BRESCIA BUGATTI** 1/32nd drawings.

FALLER CAR SYSTEM reviewed in full.

Back from Nuremberg : What's new at Europe's Toy Fair.

Plus lots more exciting features, articles, comment.

● *SAME SIZE MAGAZINE as* AEROMODELLER *MODEL CARS is 9¾ x 7¼ in., 52 pages deep including cover and sells at 2/6d. monthly. It is YOUR magazine — we will style it to suit you. Editor Dickie Dickson welcomes comment, even hostile criticism in a good cause, but do say something about it—don't just let us soldier on. . . . Emphasis on 1/32nd, but we like the lot, including diesel and glow powered models . . . non-working or wonder working if you know how. . . . Get it and enjoy it or tell why you haven't. . . .*

MAP HOBBY MAGAZINES

FILL YOUR MODELLING NEEDS THROUGHOUT THE MONTH

MODEL AERONAUTICAL PRESS LTD.

38 CLARENDON ROAD, WATFORD, HERTS

First Friday of the Month
MODEL CARS

Second Friday of the Month
RADIO CONTROL MODELS

Third Friday of the Month
AEROMODELLER

Fourth Friday of the Month
MODEL MAKER

Editorial Director
D. J. Laidlaw-Dickson

EDITOR
R. G. MOULTON

AERO MODELLER

MAP HOBBY MAGAZINE

April 1964

VOLUME XXIX No. 339

other modelling angles . . .

Radio in a plastic kit sounds an attractive proposition ; the story leading to the development of a radio control system to fit a tiny plastic ship kit is told in the April issue of 'Radio Control Models & Electronics'. Lead feature describes the construction of an excellent superhet receiver. For the twixt sea and air enthusiasts, the full size plan is for an airscrew driven hovering "Catamaran". Specially designed for single channel radio, it can be built in three evenings for a 1 c.c. engine. A new control system which may prove to be a real winner in terms of adaptability and simplicity, is explained.

Now predominantly marine, the April issue of 'Model Maker', out on March 6th, will contain full-size plans for a 30 watt class electric R/C boat—"Moccasin" and full account of the two electric M.P.B.A. recognised classes (30 watt and 300 watt). This month's Model Maker plans service addition is the "Fairey Swordsman" by Philip Connolly—model is 33 in. long for radio control. Norman Ough carries on where he left off—this month his subject is Torpedo Tubes. Supporting articles include : An unusual Marblehead design, lathe change-wheels and Museum models in Glasgow.

Main feature in May issue (No. 2) of 'Model Cars' will be model Drag Racing aspects including "just-like-the-real-thing" electric beam timing: how to make your own Drag Racer: a scale plan of Sydney Allard's original Drag car. More orthodox car modellers will be well served with Simple Chassis construction based on the BRM. Then we report in detail on model cars at Nuremberg International Toy Fair, including a full report on sub-miniature (1/75th scale) Faller system—has it a Grand Prix future?

contents

HANGAR DOORS	174
TAURI	176
SIGNPOST	179
AUSTRALIAN NATIONALS	180
VERON VESPA	182
LET'S GO FLYING	183
TRADE NOTES	186
FAMOUS BIPLANES — DOUGLAS WORLD CRUISER	188
ENGINE ANALYSIS — OLIVER 3.5 c.c.	192
READERS LETTERS	194
THERMAL HUNTING	196
HELICOPTERS	197
COUPE D'HIVER CONTEST IN FRANCE	200
CLUB AND CONTEST NEWS	202

cover

Hovering over the Jefferson memorial with the Washington memorial obelisk at left in the background, is one of the personal transport helicopters used by the President of the United States of America, based at Washington D.C. The four Sikorsky helicopters are provided by the U.S. Marines, Air Force, Navy and Army. They are the type 61 known as VH-3As, the equivalent of the Civilian amphibious S-61N. Large windows are provided for the V.I.P. cabin. Standard accommodation of the aircraft in civilian form is 28 passengers. The S-61 holds many world records with speeds of over 200 m.p.h., in fact it is the first helicopter to break the 200 m.p.h. figure. The shape will become familiar to British eyes when G-ASNL and G-ASNM start operations on the British European Airways Penzance to St. Mary's (Isles of Scilly) Service.

next month . . .

Undoubtedly the most successful A/2 glider over the past year, of British competitions, has been Al Wisher's **Wishbone**, which joins Plans Service in May. This surprisingly simple, yet very high performance glider, will be an immediate attraction for the novice and expert alike. **Squadron Markings** returns with more details of World War I Fighters for scale fans, while for the beginner, John Barker continues his **Let's go Flying** series. A new aviation book survey will bring our opinion on many recently introduced titles of interest to aeromodellers and our full-size plan of the month will have a very great attraction for the small local field flyer. An all-sheet model designed for radio control, but capable of free flight, it offers the very basic requirements for a model powered by .8 to 1.3 c.c. from Dick Stouffer whose "Simpleton" was published in January 1963 and has the affection of many a sport flyer. These, and many other features we are planning for your interest, all appear in May edition—out April 17th.

Editorial and Advertisement offices

38 Clarendon Road, Watford, Herts

Telephone : **Watford 32351** (Mon.-Fri.)

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

Second class postage rates paid at New York, N.Y. Registered at the G.P.O. for transmission by Canadian Post. American enquiries regarding subscriptions, news stand sales and advertising should be sent to : AEROMODELLER, Eastern News Distributors Inc., 255 Seventh Avenue, New York 1, N.Y., U.S.A.

Direct subscription rate 28/6 per annum including enlarged December edition and index. U.S.A. and Canada direct rate $4 AEROMODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the third Friday of each month prior to date of publication by :—

MODEL AERONAUTICAL PRESS LTD

VERON

★R★A★D★I★O★S★T★A★R★S★

All Top-Flight Performers!

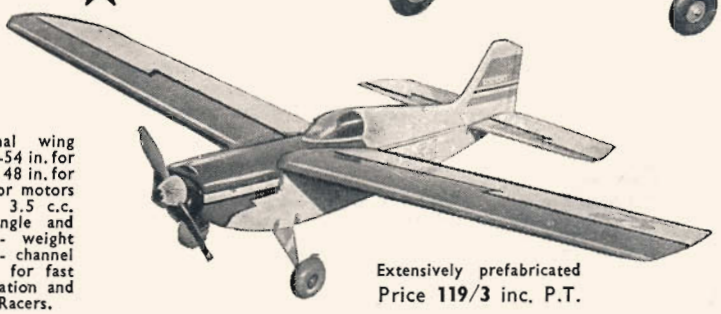
SPECIALIST DESIGNS FOR RADIO CONTROL THE FINEST BRITISH DESIGNS EVER!

CESSNA SKYLANE ★

For motors 1.49 up to 3.5 c.c. for single and lightweight multi-channel radio — rudder, elevator and engine speed systems only.
Die cut and pre-cut balsa and ply parts, preformed undercart, 2" wheels, spindled, shaped and slotted parts spinner, etc.

Price **103/6** inc. P.T.

★ VISCOUNT



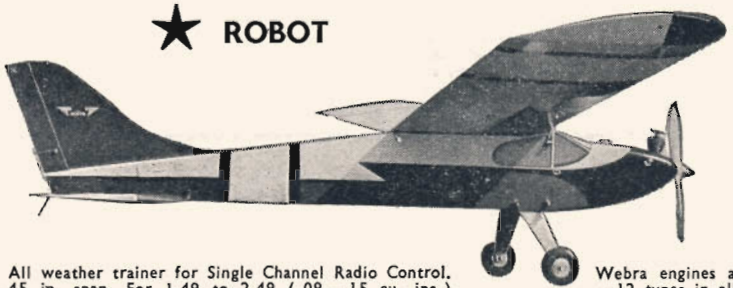
Optional wing span—54 in. for Radio, 48 in. for F.F. For motors up to 3.5 c.c. for single and light - weight multi - channel 5 c.c. for fast penetration and Pylon Racers.

Extensively prefabricated
Price **119/3** inc. P.T.

Powered by WEBRA ENGINES

"WEBRA" Diesel Engines are the finest continental model motors made; superbly finished, notable for their ease of handling, ease of starting, reliability and power.

★ ROBOT



All weather trainer for Single Channel Radio Control. 45 in. span. For 1.49 to 2.49 (.09—.15 cu. ins.) diesel and glow plug motors using all single channel radios for rudder, elevator or engine speed control.

Price **83/6** inc. P.T.

Webra engines are available —12 types in all to suit all Veron Kits. Radio Control versions have complete multi-speed R/C carbs.

★ **PICCOLO**
8 c.c. **68/6**

★ **RECORD**
1.5 c.c. **74/5**
R/C 1.5 c.c. **84/1**

★ **MACH I**
Mach I 2.47 c.c. **115/10**

★ **MACH II**
Racer 2.48 c.c. **146/11**

★ **BULLY**
II 3.44 c.c. **121/8**
II R/C 3.44 c.c. **135/1**
Glow 3.44 c.c. **118/1**
Glow R/C 3.44 c.c. **132/9**

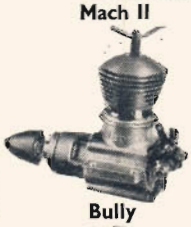
★ **WINNER**
II 2.46 c.c. **86/7**
II R/C 2.46 c.c. **96/5**

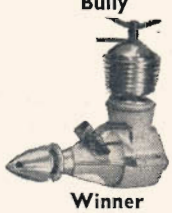
★ **BIG BEN**
(Not Illustrated)
Glow 5 c.c. **121/8**
Glow R/C 5 c.c. **137/9**


Piccolo


Record


Mach II


Bully


Winner

MODEL AIRCRAFT (B'MOUTH) LTD. NORWOOD PLACE • BOURNEMOUTH

DISTRIBUTORS IN U.S.A.: **WESTEE HOBBY EXPORTS, 5808 West Chicago Avenue, Chicago 51, Ill., U.S.A.**
DISTRIBUTORS IN CANADA: **ACADEMY PRODUCTS LTD., 45 Wingold Avenue, Toronto 19, Canada.**
DISTRIBUTORS IN AUSTRALIA: **GEORGE PIZZEY & SON LTD., 131-141 Johnston Street, Fitzroy, N.6. Melbourne.**

BALSAWOOD

. . . sheet

SIZE 36" LONG BY	PRICE EACH
1/32" x 2"	s d 10
3"	1/2
4"	1/6
1/16" x 2"	10
3"	1/2
4"	1/6
3/32" x 2"	1/-
3"	1/5
4"	1/11
1/8" x 2"	1/1
3"	1/6
4"	2/3
3/16" x 2"	1/3
3"	1/9
4"	2/7
1/4" x 2"	1/4
3"	2/-
4"	2/11
3/8" x 2"	1/8
3"	2/4
4"	3/5
1/2" x 2"	2/-
3"	3/-
4"	4/-

strip . . .

SIZE 36" LONG BY	PRICE EACH
1/16" x 1/16"	d 1½
1/8"	1½
3/16"	2
1/4"	2½
3/8"	3
1/2"	3½
3/32" x 3/32"	2
1/8"	2
3/16"	2½
1/4"	3
3/8"	3
1/2"	3½
1/8" x 1/8"	2½
3/16"	3
1/4"	3

SIZE 36" LONG BY	PRICE EACH
1/8" x 3/8"	s d 3½
1/2"	4
3/16" x 3/16"	3
1/4"	3½
3/8"	3½
1/2"	4
1/4" x 1/4"	4
3/8"	4½
1/2"	5
3/8" x 3/8"	6
1/2"	7½
1/2" x 1/2"	9
1"	1/2
3/4" x 3/4"	1/6
LARGER SIZES ARE CLASSED AS BLOCK	

. . . block

SIZE 36" LONG BY	WEIGHT PER 36" BLOCK IN BALSA DENSITY OF- 6 LB.	8 LB.	10 LB.	14 LB.	PRICE EACH
1" x 1"	oz. 2·0	oz. 2·7	oz. 3·3	oz. 4·7	s d 2/3
1½"	3·0	4·0	5·0	7·0	3/6
2"	4·0	5·3	6·7	9·3	4/3
2½"	5·0	6·7	8·3	11·7	5/-
3"	6·0	8·0	10·0	14·0	6/3
1½" x 1½"	4·5	6·0	7·5	10·5	4/6
2"	6·0	8·0	10·0	14·0	5/3
2½"	7·5	10·0	12·5	17·5	6/3
3"	9·0	12·0	15·0	21·0	8/-
2" x 2"	8·0	10·7	13·3	18·7	6/6
2½"	10·0	13·3	16·7	23·3	8/-
3"	12·0	16·0	20·0	28·0	10/-
3" x 3"	18·0	24·0	30·0	42·0	15/-
4"	24·0	32·0	40·0	56·0	20/-
SPECIAL SIZES CAN BE CUT TO ORDER					

Solarbo

whatever size of Balsa you want and for whatever purpose . . .

IS THE BEST YOU CAN BUY

SEE 1964 Graupner KITS AT YOUR LOCAL MODEL SHOP!

41" span

DE-LUXE KIT
£4.19.6

THE AMAZING CONSUL

Here's an outstanding model for R/C enthusiasts! Fuselage, wings, tail READY FINISHED in skin-toughened expanded polystyrene. This de-luxe kit also includes all necessary ply and balsa parts, shaped wire undercart, wheels, cements, transfers, etc.—and the design was SPECIALLY DEVELOPED for rudder-only radio control.

for motors up to 2.5 c.c. Single or 2-channel R/C

R/C AIRCRAFT

41" span **CONSUL** ... **99/6**
48" span **SATELLIT** ... **117/6**
71" span **CARAVELLE** **199/6**
55" span FLORIDE **155/-**

Note: 'Consul' and 'Satellit' are designed for rudder only; and 'Caravelle' for full-house multi installations.

F/F or R/C KITS

32" span **TOPSY** ... **35/-**
(engines up to 1 c.c.)
46" span **KADETTE** ... **55/6**
(engines 1-2 c.c.)
51" span **ATLAS** ... **46/6**
(engines up to .09 c.c.)
43" span **KAPITAN** ... **59/6**
(Biplane: engines up to 2 c.c.)

F/F SCALE KITS

44" span **PIAGGIO** ... **114/6**
(engines up to 2.5 c.c.)
44" span **PIPER TRIPACER** **89/6**
(engines up to 2.5 c.c.)
44" span **CESSNA 180** **72/6**
(engines up to 1 c.c.)
33" span **BOLKOW JNR.** **69/6**
(engines up to 1.5 c.c.)

CONTROL LINE SCALE

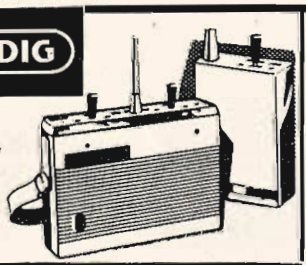
27½" span **MEW GULL** **69/6**
(engines up to 2.5 c.c.)
39" span **FOCKE WULF** **82/6**
(2.5 c.c. engines)
31½" span **DORNIER Do 27** **69/6**
(for 1.5 c.c. engines)
30" span **MUSTANG** **55/6**
(for .15 cu. in. engines)
25½" span **MESSERSCHMITT** **57/6**
(for .15 cu. in. engines)
28½" span **KLEMM** ... **57/6**
(for .06 cu. in. engines)

GLIDERS & SAILPLANES

17" span **WEIHE 50** ... **79/6**
70" span **AMIGO** ... **58/3**
power pylon kit 12/6d.
74" span **PASSAT 57** **50/-**
50" span **FILOU** ... **50/-**
power pylon kit 14/6d.
43" span **DONALD DUCK** **37/6**
53" span **HOBBY** ... **34/6**
38" span **BEGINNER** **28/9**
27½" span **UHU** ... **18/6**
79" span **K.10** ... **117/6**

1964 GRUNDIG

SENSATIONAL ADVANCES IN SELECTIVE ASSEMBLY AND FINAL CHECKING NOW MAKE GRUNDIG



THE WORLD'S MOST RELIABLE RADIO CONTROL EQUIPMENT

Every piece of Grundig equipment is checked "THREE SEPARATE TIMES" before being offered for sale. Apart from meeting the most exacting electronic requirements, each item must also pass extreme humidity, temperature, mechanical and vibration tests far in excess of normal functional requirements. When you buy Grundig you 'buy reliability' . . . plus, of course, the simplicity of plug-together circuits. All Grundig radio/Graupner servos are fully interchangeable . . . just plug together, switch on and it works . . .

2-, 4- and 8-CHANNEL Tx's
Crystal stabilised hand-held transmitters with all-transistor circuits working off a single 12 volt battery. Power and range to spare!
2-ch. Tx **£19.15.0** 4-ch. Tx **£31.10.0**
8-ch. Tx **£39.10.0** 4- to 8- convertor **£10.15.0**

RECEIVER and FILTER UNITS
Fully transistorised, plug-together units giving 2-, 4-, 6- or 8-chan.
Receiver **£8.19.6**
Filter units **£8.19.6** each

GRUNDIG SERVOS

BELLAMATIC II

To complete your R/C installation use a matching GRUNDIG SERVO. No wiring, no soldering—just plug in!
Powerful, self-centering motor servo for rudder, elevator, ailerons. Weight 1.4 oz.
Price **£5.15.0**

SERVO-AUTO-MATIC

Progressive (quarter-turn) motor servo for trim, engine speed, etc. Works on single-channel signal. Weight 1⅛ oz. Price **65/-**
Unimatic **59/6**
Multi-purpose single-channel motorised actuator.
Duomatic **105/-**
Powerful 6 volt 'multi' servo

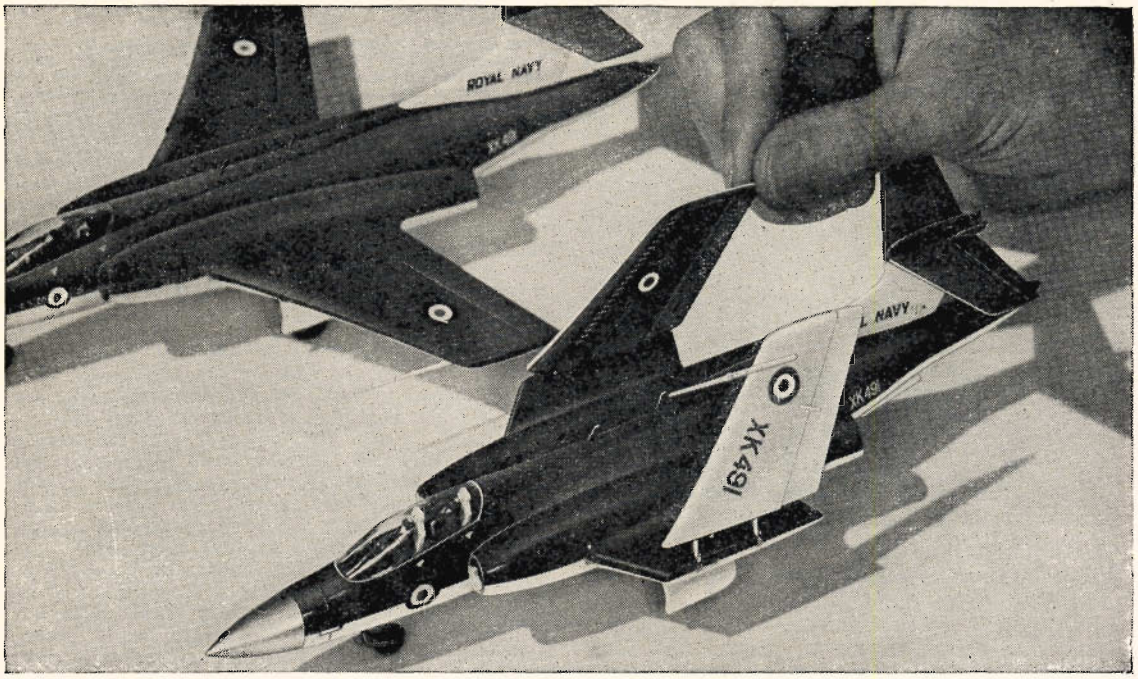
U.K. DISTRIBUTORS

RipMax LTD

MODELS & ACCESSORIES

U.S.A.: POLKS MODEL HOBBIES, 314 Fifth Avenue, New York, 1, N.Y.
CANADA: G. BOOK & CO., 45 Wingold Avenue, Toronto 19, Ont.
AUSTRALIA: PAUL GROSMANN Pty., 18a Tynton Road, Ashfield N.S.W.
S. AFRICA: PHIL de BRUYN 85 Pritchard Street, Johannesburg.
N. ZEALAND: BURTON BRAILSFORD 261 Willis Street, Wellington, C2.
HONG KONG: RADAR CO. LTD., 2 Observatory Road Kowloon H.K.

80 HIGHGATE ROAD, LONDON, N.W.5. TELEPHONE GULLIVER 5108



. . . it even has folding wings!

This Airfix 1/72nd scale Blackburn Buccaneer (NA39) also has folding nose cone, rotating bomb bay. 10½" long. 45-part kit 4/6.

It's typical of the realism you get with Airfix models. They're just like the real thing! More than that, though, Airfix give you constant scale, so that the models of every series are proportionately right; and a great ever-increasing range—there are 13 series now, with over 200 kits. At prices from 2/- to 17/6, Airfix are great on value too.

For endless modelling fun—make it Airfix.

JUST LIKE THE REAL THING!

AIRFIX

CONSTANT SCALE CONSTRUCTION KITS

From model and hobby shops, toy shops, and F. W. Woolworth.

STOP PRESS !

LATEST AIRFIX PRODUCTION

DASSAULT MIRAGE 111

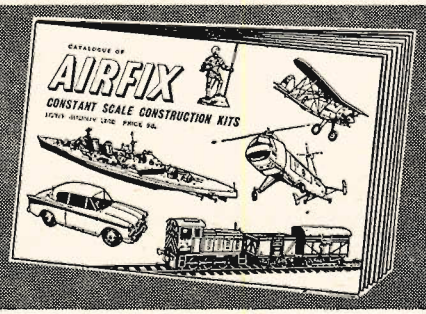
A brilliant plane and a superbly detailed 39-part Airfix kit doing full justice to it. Authentic 1/72nd scale model measuring 7½ ins. long. Complete with French Air Force markings. **3/-.**

ALSO NEW! the famous H.M.S. Hotspur 2/- the 00/HO Prestwin Silo Wagon 2/- and the 00/HO Russian Infantry 2/-.

A.362

GET YOUR CATALOGUE

32 pages of models, facts and kit details from your dealer - only 9d



Symbolic of the 'entente cordiale', which was particularly evident at Chavenay airfield for the Coupe d'Hiver Anglo-French Challenge contest, is this Hangar Door heading photograph, showing the Auster, Brochet, Piel and Jodel aircraft grounded—leaving the airfield (and strong wind) to the aeromodellers. Flying did take place but the pilots kept to a very small corner of their field.

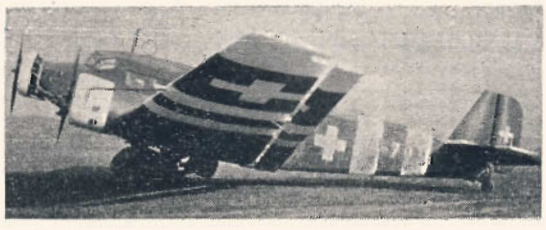
Penetration — the last word

We little realised that Mr. Garfield Rees' controversial feature on the definition of "Penetration" would have inspired so much correspondence. Some of the more interesting views will be found on pages 194-5. It was only fair to let Mr. Rees see these letters in advance of printing, and we print below his last and final comments on the subject:

Lt. Johnson's letter provides a definition of "penetration" concerning stability in gusty conditions whereas Mr. Wotton's definition is one of distance covered quickly without any greater loss of altitude than a slower aeroplane.

I did not say it was a bad thing to add weight to a slope soarer to increase its speed, I merely pointed out that whatever happens to the model it will NOT *penetrate, and its ground speed is a function of airspeed and windspeed. How the airspeed is increased is a matter for the individual model, and for the slope soarer, weight must be increased, for usually when I have tried this form of gliding, the windspeed was greater than the speed of the unweighted model in a vertical dive! In a case such as this one* CANNOT *compensate by trim alone, even if one wanted to, so weight is added to increase the airspeed. As it is now realised by almost everybody concerned that an aeroplane cannot have a positive groundspeed when flying into a windspeed greater than its airspeed and, therefore, cannot "penetrate", could not someone invent a new word? A word is needed to describe a model's ability in gust conditions—those conditions described so well by Lt. Johnson. I agree so much with what he writes except his use of "the word", that I think he ought to be asked to invent our word for us. What about one of those glorious Americanisms like "gustability"? Or perhaps a committee of the F.A.I. could assemble and define "penetration". This should please those people who want to keep the word and do away with the multitude of meanings it has at the moment.*

I would remind readers that aerodynamics is a science and in a science every word used should have a PRECISE *definition.*



We had hardly closed for press on our Signpost page in this issue when the accompanying photograph came to our attention, illustrating the Ju.52 in what was probably its most vividly decorated form. The scheme is described on page 179 and we thought that we should not miss the opportunity of using such a unique photograph, taken during the war years.

World Pen-Friendship

The Parker Pen Co. Ltd. are running a world-wide correspondence programme in connection with the 1964 World's Fair, which opens on April 22nd in New York. Under the sponsorship of the Parker Company an I.B.M. computer will be installed and operated throughout the two years that the Fair will run. The computor is to be used for a purpose which we know will interest a very large number of our readers who have always enjoyed international correspondence with their counterparts in other lands. Special forms are available for completion by all applicants and we have a stock of these which can be supplied on request (with stamped and addressed envelope). The modeller is asked to supply a num- of answers which will define his particular interests, language, age and the location of his intended pen-friends. The computor will then exchange applications so that the addresses of pen-friends will be linked. All forms of model making are catered for, and we know that a large number of aeromodellers will want to put the computor to its good use in the coming months.

London Film Show

The London Society of Air Britain will be running a 2 hr. 10 min. programme on Wednesday, April 8th, at Holborn Central Library, London, beginning 7 p.m. It includes Air Britain's own film on "The Hawker Hart", a full length feature from U.S.A.F. Strategic Air Command "Forbidden Area" and others on Rocketry, a Norwegian Thunderstreak Squadron, and a lightplane rally. All aviation enthusiasts are welcome.

Proportional to the Fore

Proportional radio control is rapidly achieving the anticipated success in the U.S.A.; latest news of the large contest at Phoenix, Arizona, over February 22nd-23rd, gives the following results: *Class III, Multi-Expert.* 1. Cliff Weirick (Bonner Proportional). 2. Willie Smith (Bonner Proportional). 3. Ralph Brooke (Orbit Proportional). 4. Jerry Pullen (Kraft Proportional). 5. Phil Kraft (Kraft Proportional). Our companion magazine, *Radio Control Models & Electronics,* will be running a review of the present state of the proportional art in the commercial field in an early issue. They hope to be able to include information on British equipment as well as the many sets now being produced in the U.S.A., and also another new outfit from South Africa. This is to be marketed by Jix Hobbies of Pretoria for £260

complete with servos, and is a digital system available with dual stick control, with claim for low battery drain, fully transistorised and with a fail safe device on all controls. Produced under the guidance of Monty Malherbe, the "Constellation" proportional represents an entirely new venture from a new manufacturing source as far as model equipment is concerned, and we wish it every success. It has been designed by Dr. Dereck Ashpole, Ph.D., who has been flying radio for the last 10 years.

Tiger Club Displays

Modellers who like the old-time atmosphere of the barnstorming air display will be pleased to learn that five Tiger Club flying displays are to be given in 1964. March 30th (Easter Monday), at Panshanger Aerodrome (near Welwyn); May 18th (Whit Monday), at Sywell (near Northampton); June 28th at Rochester Aerodrome; August 3rd (August Bank Holiday), Fairoaks Aerodrome (near Woking); and August 16th at Shoreham Aerodrome. Flying will start at 3 p.m. and continue till 5 p.m. The acts (aerobatics in Stampe biplanes and the American Cosmic Wind racer, formation displays by Turbulents, formation aerobatics, crazy flying, parachuting, balloon bursting, bombing, wing-riding, etc.), will follow the well-established air circus pattern, though several acts have been developed and improved since last year.

A New Idea in Model Trading?

News of a "consortium" between three wholesaler/manufacturer groups — Skolkits, Bradshaw Model Products and Estral Ltd. has already been advised to the model trade. It is interesting to speculate whether this is the beginning of a new phase in trader service that could mean much both to the dealer and more importantly the retail customer. Trade associations of quite loosely knit companies have for a long time been known, for example, in the grocery trade, where groups of small shopkeepers got together to enjoy the benefits of bulk buying and accountancy and so combat the menace of their Goliath trade rivals.

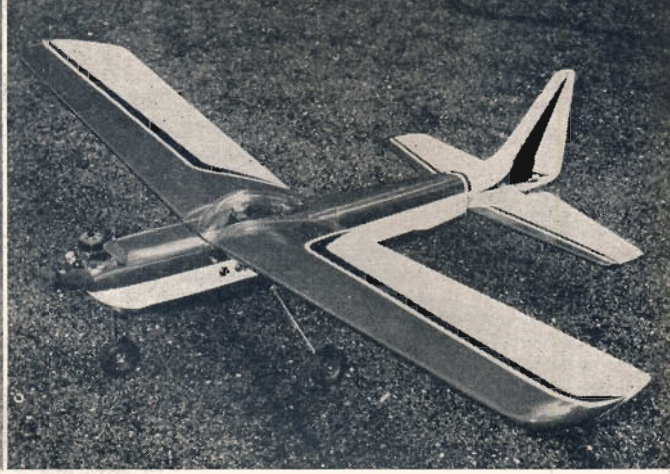
The arrangement is new to the model trade, however, so let's take a look at the people concerned. Nick Skolnick of Skolkits has been running as many as three model shops (he has only two now) for some time, largely as a hobby relaxation from his main business. He trained as a pilot in the RAF but never made it on account of an ear defect so had to be content with engineer duties mainly on Lancasters. Is married with one 20-year-old son.

Roy Lever, mainstay of BMP is another ex-RAF model trader from Transport Command. His forté must surely be kit production and product testing since he will take every opportunity of getting his latest models on to the flying field.

Michael Zusmer of Estral is perhaps least known of the three but has long been an active and keen modeller, mainly c/l, but now veering to r/c. What these people can do for us all remains to be seen, but some aspects, such as British manufacture of certain continental kits, better and wider service arrangements, and ultimately better goods and lower prices must be to everybody's good in the long run. We wish this "Troika" the best of gallops!

TAURI TESTS.—All of the test flying with our prototype Tauri, which is described on the following pages, was conducted at R.A.F. Bovingdon. During the early stages this coincided with the filming of "Squadron 633". Our model shared the airfield with a fleet of re-decorated Mosquitos, two Messerschmitt Bf.108s and a now famous B-25 Mitchell, as well as the usual resident aircraft. It was a very interesting occasion and especially so on one day when arrival of a genuine wartime jeep disgorged a group of very interested film people to see what WE were doing. Most interested was the star of "Squadron 633", Cliff Robertson (who featured as the late President Kennedy in "P.T.109") and who proved to be quite knowledgeable on multi-channel radio control. His Royal Air Force battledress uniform added authenticity to the occasion. Cliff filmed on his own "amateur" equipment, a number of flights by the Tauri and took note of the equipment we were using. It is rumoured that he has since bought a real live Spitfire for himself, of Belgian origin, so perhaps in some small way we were able to further encourage his obvious aviation interests. See photo at right. →

At the Musee de l'Air, Paris, during the tour by the British Coupe d'Hiver team. At left, the editor, Bill Horton, Maurice Bayet and Pete Cameron are seen discussing the first double row engine, the 160 h.p. Gnome in the 1913 Deperdussin racer. Centre, Geoff Kent admires the first ever Bebe Jodel, whilst Jak 9, D.H.9 and myriad others are seen in background. Right, John O'Donnell admires original paddle blade on very early Voisin airscrew. Just the shape for a single blade folder!



TAURI

THE WORLD FAMOUS 57 in. MULTI-CHANNEL RADIO CONTROL TRAINER BY ED KAZMIRSKI

(Produced with co-operation of Top Flite Models)

HERE'S A MODEL with a purpose. First and foremost it has been specifically designed as a *trainer* for multi-channel radio control. Through the kit issued by **Top Flite** in the U.S.A., it has already become world famous.

We learned of it first when designer (and then World Champion) Ed. Kazmirski visited our offices during his demonstration trip to S. Rhodesia. Ed's design philosophy appealed to us in its purposeful approach, and earnest effort to salvage some of the "sudden death" novice attempts to learn how to fly multi-control with contest designs. Tauri is small and therefore costs less to build than larger multi designs. It employs a relatively small engine (of 3.5 c.c.) and is therefore slower, yet no less efficient by virtue of the thick, semi-symetrical wing section. Above all, it is an easy model model both to build and fly. It is also a *fully* aerobatic aeroplane, though initially intended for six channel radio installations—rudder, elevator and engine.

For a first try at the multi game, this is about as much as one can handle. Installation capacity allows for all equipment ranging from the Super-Regen. relay Rx to the latest relayless Superhets and a typical control system is shown on the plan.

Since weight is a most important factor in a load carrying radio model, choose balsa carefully, assessing the density of the wood according to its purpose.

Construction notes on the plan explain the warp resistant self-jigging wing structure and fuselage assembly: but the builder can profit from extra tips on individual items.

Since control depends upon them, the surface hinges should be free and allow 60 deg. motion in either direction. Use the "Herringbone" stitch so well proved in control-line circles.

The engine will have a lot of work to do and will be running for long periods. Mount firmly with brass bolts (which shear in a crash) and don't forget the locknuts. Bearers must be liberally proofed against fuel seepage. Align the fuel tank with the needle valve body and keep fuel tube short. Use a fuel filter and make sure the weighted end of the syphon pipe has free movement in the tank.

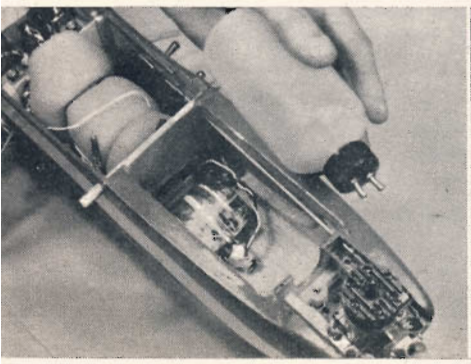
On the radio equipment, be sure to make a neat wiring job. Skin off only enough sleeving to make the solder connection and insulate every joint with Systoflex or fuel tube. That demon vibration can affect reeds in a receiver, a layer of ¼ in. – ½ in. foam rubber wrapping around the receiver case helps. Ed. Kazmirski advises to install the receiver so that the reeds hang down, where they are least affected. Modern reed banks with wider contact gaps have an amazing resistance to vibration bothers; but do not tempt fate.

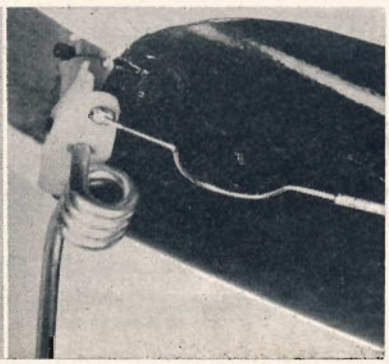
Servos should be mounted exactly as the manufacturer advises, either on grommets or foam rubber pads to minimise vibration effect on the mechanism and screws. New servos should be taken apart so that the soldered joints to the switcher plate and motor terminals may be coated with contact cement as an extra protective precaution. Incidentally, Ed. Kazmirski is emphatic that a slide switch should *never* be used but other respected authorities prefer a "knife-action" slide switch. Good quality is the essential. Pushrods are the most important links between the servos and the control horns. Ensure they and the horns are always in perfect order.

Check *every* soldered joint. Suspect joints or frayed wires should be replaced immediately. Sleeve every soldered joint and support with contact cement wherever possible, a quarter ounce of precaution saves pounds of trouble !

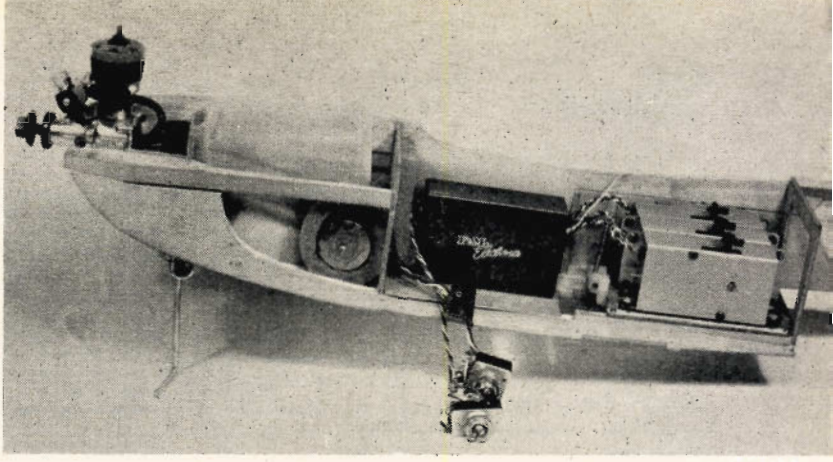
Trim

Many factors affect the correct trim of a model; weight, alignment, decalage, C.G. position, down and side thrust, wing leading edge radius, elevator settings and throw of control surfaces. Any one, or combination of elements, misaligned, may upset trim.





Framework and finished model views at top indicate the functional simplicity of the Tauri as built and tested by Tony Dowdeswell, with K & B 19 engine and at various times, F & M Matador or Orbit radio equipment and Bonner Transmite servos. At left is a view of tank access with the Deac accumulator pack below and receiver wrapped in foam rubber. Next is close up of the steerable nosegear with piano wire formed in shock absorbing "U" for direct drive from special lever shown on page 178.



Partly assembled fuselage from the American Top Flite kit for Tauri, manufacturers of which have kindly co-operated in the production of the plan reproduced below. View shows disposition of Deac cells beneath tank, Rx and toggle switches, then triple servo installation for six channel control.

Even if a wing is built without warps, it is still possible that the model will not maintain a straight heading through loops. This is because the leading edge radius of the wing varies from tip to tip, causing yaw and roll effect. The remedy is to sand the leading edge with a formed block in the first place.

Experiment with various degrees of control surface throw. The elevator has 14 deg. movement each way, or 1 in. total motion at the trailing edge and the rudder 16 deg. each way for a total of 1¾" motion.

The amount of deflection used depends on the frequency or length of the pulses on the control lever. Over-controlling is common, so fly high initially until you have the feel of the model.

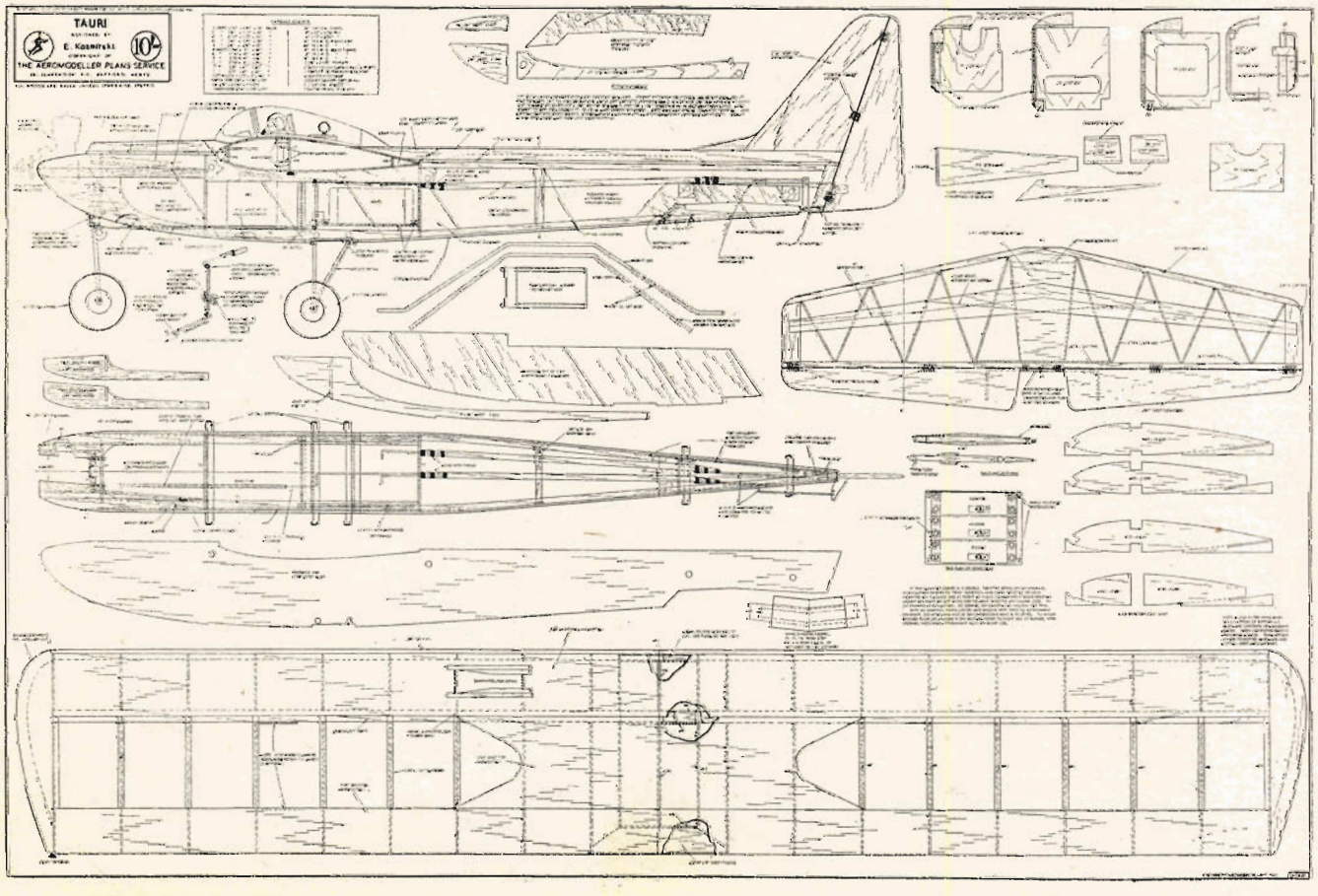
The two most important factors in trim are C.G. position and decalage (difference between angle of attack of wing and tailplane). The C.G. should fall between 30 per cent to 40 per cent of the wing chord from leading edge. If the C.G. is too far forward, the model will require more decalage (pack down the tail leading edge) which creates more drag and calls for extra power. When power is cut, the model tends to descend rapidly.

If the C.G. is too far back, the elevator becomes very sensitive and makes the model difficult to fly, especially in windy weather, so when moving the C.G. rearwards we *reduce* the decalage to compensate, preferably by increasing the angle of attack on the tailplane.

All C.G. and decalage adjustments should be made with absolute zero elevator settings to avoid tab effect. As the tail is adjusted in angle, so must the pushrod be adjusted to bring the elevator in line. Slight up or down elevator bias acts as a tab and will change the pitch attitude according to airspeed. The greater the speed, the more the effect. Warps produce the same characteristics, hence the importance of accurate surfaces. Spins are easier with a rearward C.G. position, outside loops are better, but inside loops become tighter. It's all a compromise!

Our Tauri provided us with nearly 50 long and most enjoyable flights before it met its end (*never*

FULL SIZE COPIES OF THIS 1/9TH SCALE REPRODUCTION ARE AVAILABLE THROUGH A.P.S. AS PLAN RC857, PRICE 10/- INCLUDING POST



fly in sunny weather without good sunglasses. Take them with you to the flying field even on winter days). Initially we installed an F & M Midas receiver and three Bonner servos, with a K & B 19 R/C for power.

Flying

The first things to get right are the take-off and then the turns. Take off with full power, headed into wind. A few short pulses of up elevator will lift the nose as speed builds up on the ground and once airborne, only blip sufficiently to maintain a steady climb.

Use short pulses on the rudder lever and give a few blips of "up" elevator to keep the nose up in a turn to bring Tauri back. After satisfying yourself with circling flight, switch to slow motor. Brought in on slow motor the Tauri controls easily on landing. Don't overdo the flare out, or it will stall and hit the deck nosewheel first, then you get an uncontrollable switchback, on the stalky undercarriage.

After mastering the basic flying, try flying the model towards you to get used to the reversal of directional control. Now for a few aerobatics. Loops are always best to start with. Just make sure you have plenty of altitude and forward speed and then hold full up elevator. If it tends to roll out at the top the speed loss is too great so pulse round the loops and open them out.

Stall turns are fun. With plenty of forward speed, lift the nose vertically into a climb, then give two fairly long pulses or rudder followed by full rudder signal as the model slows down, to bring the wing over. Let the Tauri drop a little and build up speed before levelling off.

Tauri performs a spectacular barrel roll with simultaneous rudder and elevator. The first one will probably leave you a little breathless, but it has plenty of automatic recovery ability, don't worry.

A natural follow on from the "snap" or barrel roll is the "Split S" or reversal, and this is the manoeuvre we like best of all. Simultaneous elevator and rudder roll the Tauri to inverted, whereupon you pull full up to half loop and recover in the reverse direction and level off. Make sure you don't overdo the roll which is very fast and easily overshoots the inverted position. For a really spectacular reversal, roll to inverted and just leave her there to recover on her own after a long curving dive. *Wow!*

Outside loops are best done from altitude. Hold full down elevator and keep it there as the nose tucks under. If the nose will not lift from the inverted up the other side, then hold full up elevator. This is where that extra altitude is beneficial. If it does not like the outside loop, consider moving the C.G. position aft.

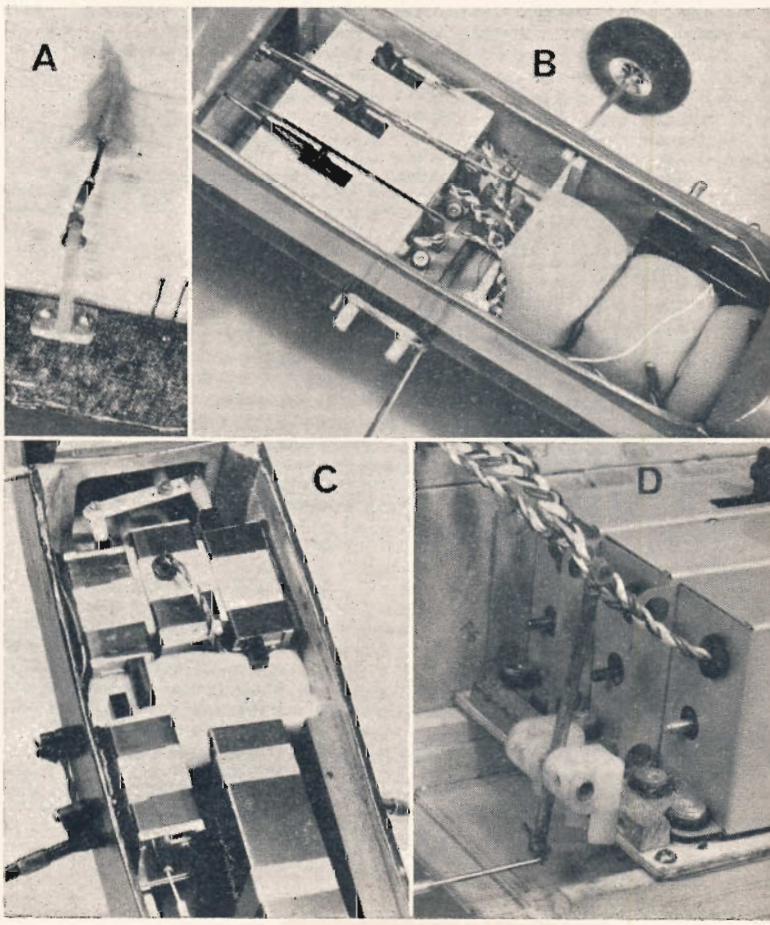
Inverted flight is for the experienced, and without trim elevator, is likely to be something of a switchback.

You will find the Tauri forgiving. Give it a chance and it will help you on the way to multi success. Later we fitted a trim servo to our test model, plus a brake on the steerable nosewheel. Those without a trim servo should adjust their elevator servo for a wide neutral. A flick of down on the elevator control lever will bring in that extra trim for smooth level flight.

We have seen Tauri with complete 10 channel installations and .35 motors but these are not for the inexperienced. Eventually ours had all but the aileron servo installed, performing well with only a .19.

Finally, to quote the words of designer Ed. Kazmirski in his booklet "Multi R/C Flying", issued with the Top Flite Tauri kit:— *"Two of the prime requisites for successful multi flying are reliability and maintenance. These two go hand in hand and should be learned and practiced by the R/C novice and expert alike before his model ever leaves the ground. What good is a well constructed and beautifully finished airplane loaded with complex radio gear if the prospective flyer doesn't bother to take the time to insure against trouble created by out-of-tune radio gear, poor wiring, bad solder points, defective switches and plugs, poorly mounted servos, and engines improperly mounted".*

Take heed, follow the rules and Tauri will guide you to multi success.



A. Geoff Chapman has a full 10 channel Tauri using direct Bowden cable drive to strip ailerons as on pylon racers. Wire comes from servo through an arc to tube in T.E. to connect horn on surface. B. Our six channel arrangement with nosewheel steering, rudder, elevator and engine controls. Compare with picture C, where Chapman's 4 "Maxamite" servos add trim to elevator control and fifth servo in wing drives ailerons. The Rx is a Matador. D is close up of a nosewheel steering level made from tubing and curtain fittings to obtain good ratio drive.

SIGN POST

A MONTHLY ENQUIRY SERVICE

Each month, *Aeromodeller* and *Air-Britain* combine forces to answer interesting questions sent in by readers. Postcards, please, to "Sign Post" c/o Aeromodeller, 38 Clarendon Rd., Waford.

As Good as New

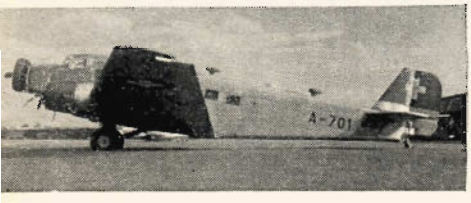
Here in Switzerland I occasionally see a solitary Junkers Ju 52/3m staggering by, or so it seems in this jet age! Some information please, on colouring and history.

(T.B. O'H., Chesieres-Villars (Vaud), Switzerland).

Three Junkers Ju 52/3m tri-motor transports were delivered to the Swiss Air Force in 1939 and have been in constant use ever since. In fact, writes Les Sarjeant of the 'Air-Britain Swiss Aviation Research Group': "When asked what modern transport will eventually replace the Ju 52s, the popular and scornful reply is 'What for? They're good for many years yet!' ".

The three Ju 52s have the military serials A-701, '2 and '3 (constructor's nos. 6580, 6595 and 6610 respectively) and are now mainly used to ferry military pilots between airfields, the chief base being Dubendorf.

Air-Britain artist Bruce Rigelsford has selected three representative colour schemes for modellers (see accompanying drawing) but in the interests of clarity he has simplified the outline and has omitted the underwing national marking.



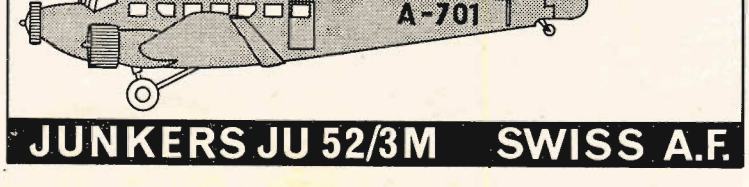
Wartime (top view)—During World War 2 the Ju 52s were at their most colourful. As a neutral country the reasons are self-evident. The initial colour scheme, apparently of olive drab overall, was embellished with broad bands as shown in the drawing. While the white cross on red background remained constant in size on the tail, the fuselage and wing (upper and lower) white crosses were enlarged and the original red discs replaced by broad red panels or bands. The military serial (white but for clarity indicated in black on drawing) appeared only on each side of the rear fuselage. At this period, the main wheels were spatted. All three motor cowlings were white as were the tips to main and tailplanes.

'Post-war, 1947-59' (middle view)—For the first time, the trio of Ju 52s began to shed the extravagant colour schemes (which incidentally reduce payload and increase cost of maintenance, paint being heavy and expensive!) and adopted an overall metal finish. Even the military serials were exchanged for "pseudo" civil markings since the HB-H— registrations are reserved for military or governmental aircraft. Certainly civilian-registered aircraft are less restricted when it comes to flying to or over foreign territories. In 1947 A-703 became HB-HOP (and did fly abroad!), HB-HOS (A-701) followed in 1948 while HB-HOT (A-702) was registered as such in 1951. All were based at Dubendorf. At least in the early part of this post-war period they retained their wheel spats and the changeover from olive drab overall was not immediate. The pre-"D-Day Invasion Stripes" disappeared and the civil registrations were in black, the motor cowlings were blue. The registration letters appeared on the mainplanes, both upper and lower surfaces, replacing the military insignia which was retained on the tail, the white cross being enlarged and the red band extending to the fin as well.

'The Supersonic Sixties' (bottom view)—Today the Ju 52s trundle the skies having reverted to the original 1939 mainplane white-cross-in-red-disc and the original serials, now in black.

"Hals und Beinbruck!"*

* *(The traditional German "Happy Landings!" airmans' saying.*—EDITOR)

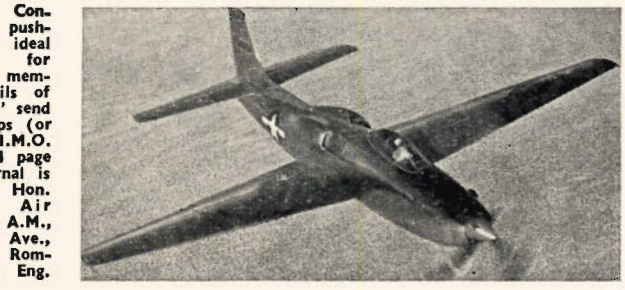


Push-pull Jet

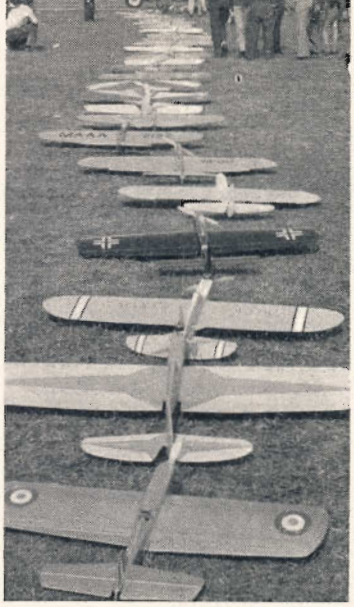
Everyone to their taste but I think the Convair YP-81 was a beautiful aeroplane and I would like to have details of the colour scheme, please.

(P. deM., Brussels).

Hmmm! Apart from having to scratch our heads as to what was the YP-81 we must agree that (in this case) beauty is in the mind of the beholder. For our money a beautiful American jet was the sylphlike Convair XB-46 four-jet bomber of 1947. Meanwhile, back at the ranch . . . the YP 81 which was natural metal overall, was three months short of beating the Trent-powered Gloster Meteor F. Mk. 1 (EE227) to being the World's first turboprop-powered aircraft. In fact the Convair YP-81 (44-91000) was the first military aircraft to employ both turboprop—and pure-jet power, with a GE XT31 of 2,300 e.s.h.p. driving a four-blade propeller and an amidships GE J33 of 4,000 lb. s.t. fed by "elephant ear" intakes. The impressive feature of the YP-81 which first flew on December 21, 1945, was the long range of 2,500 miles at cruising 275 m.p.h. at 25,000 ft. The canopy over the single seat was modelled on the successful shape of the P-51 Mustang.



Right, the Convair YP-81 push-pull jet has ideal proportions for R/C. For membership details of "Air Britain" send 6d. in stamps (or a 2/- P&O./I.M.O. if sample 24 page monthly journal is reqd.) to Hon. Registrar, Air Britain, Dept A.M., 11 Castellan Ave., Gidea Pk., Romford, Essex, Eng.



Control line stunt models await their turn to fly.

17th AUSTRALIAN NATIONAL CHAMPIONSHIPS

THE 17TH AUSTRALIAN NATIONAL Model Aircraft Championships were held at Strathalbyn, near Adelaide, South Australia from December 27th to January 3rd. Attendance was good, with 460 entries flying, and weather decidedly 'hot'.

Control line events were flown at the Community Oval, where camping, including toilet, electricity, showers, and catering facilities were available. Also on the spot were the services of an Association (modelling) Hobby Shop, the profits of which went to the South Australian Associated Aeromodellers.

On the evening of December 27th, all modellers attended a civic reception in the Town Hall of Strathalbyn, where, for a welcome by the Mayor.

Sunday dawned a beautiful day, with very little wind and a cloud cover with temperatures in the 80's. Conditions were ideal for free flight and radio, in fact absolutely perfect.

Free flight events were flown on private farm property some seven miles from Strathalbyn, and the farmer had mown three take off strips for the R/C events, each some 70 ft. wide by 300 ft. long.

Judges for the *Multi Radio* were Squadron Leader Peter Watson (R.A.F.), Squadron Leader Peter Fairhurst (R.A.F.) and Basil Tomlinson, D.C.A., Examiner of Airmen. Each had previews of a multi flyer in action, and were made fully conversant with comp. requirements, the day prior to the competition.

Tom Prosser (using home made gear) won with his "Sultans" and one can have nothing but praise for Tom's flying. Positioning of manoeuvres, height of execution, and calling was so precise that even a layman would have judged him winner. While Tom is outstanding, his pal, Basil Healy (also with "Sultan") was hot on his heels. Doug Murray of W.A. did not give of his best with his A.P.S. "Gee-String", and failed to present as big a threat as expected.

Equipment wise, there was a selection of Silvertone, O.S. (Superhets), F & M, and Reptone. Tom Prosser was on 40 M/c. After the competition Doug Murray, Tony Farnan, and Tom Prosser really impressed the crowd with follow the leader aerobatics, and a triple aircraft spin from some 1,000 ft. A feature of the multi flying was the immaculate 3 point landings of Lyall Winley's "Astro Hog",—a treat to behold.

Though Doug Murray gained only third place, he overdid a playful take off near the Competitors' Umbrella Shades during an exhibition. His "Sultan" disappeared into the midst of three beach umbrellas and bods, at full throttle and 12 inches altitude, to emerge some split second later in the other direction in a climbing turn, having executed a neat steep turn through the three umbrellas which were placed in a triangle with less tan 6 ft. separating them from each other! Apart from the "Sultans" the remainder had an assortment of Flat top "Stormers, G-Strings, Astro Hogs and Sultans", but wonder of wonders not a single "Taurus" or "Orion"!!

F.A.I. Power was flown on the same day and if Doug Murray failed in Multi R/C, he left no doubts about the F.A.I. event which he won in fine style using a Cox 15.

Monday was free of trouble until Brian Ether's model, which won the *F.A.I. Team Race* with ETA 15 in 5:29, was further examined, and the fuselage cross section was found wanting. He was subsequently disqualified. This was indeed a sad finish to a fine race, although the eventual winners, Jack Oehme, and Ray Silva deserved their victory for perseverance.

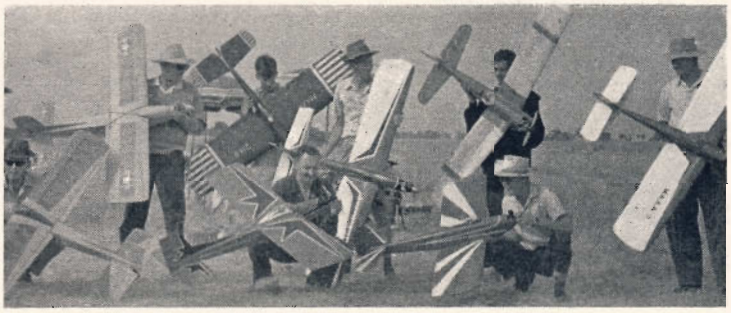
Junior Combat was a fiery *event* which must surely have gladdened the hearts of the balsa suppliers. The winner, J. Densham, from N.S.W. impressed as a truly aggressive flyer who showed no mercy, and he used flapped almost conventional models.

Tuesday, and back to Free Flight. The day was gusty, and not pleasant for the flyers, the temperature remain-in. near 90° F. in the shade (almost 115° F. in the sun). Grass in the fields was tinder dry, and it only needed a misbehaving D/T fuse for a fire to develop. Fortunately, nothing happened, though the Emergency Fire Service, and St. John's Ambulance were ready in attendance.

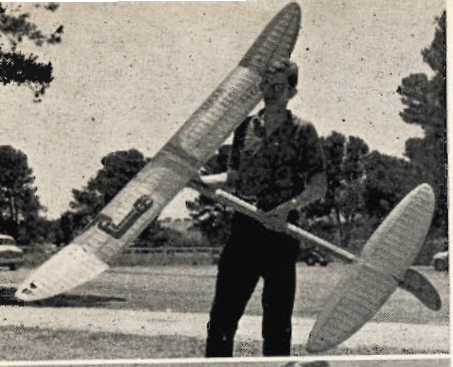
Jetex event was won by D. Hegarty of N.S.W., whose model was flown proxy by Ivor (Yogi) Stowe. All free flight events suffered the effects of the wind, and the *Power Scramble* must have cost pounds (avoirdupois) with all the physical effort required by the winner R. Duance of S. Australia.

Single Function R/C was flown in bad conditions, but was won impressively by Lyall Winley of N.S.W., whose son, Neville, gained 4th place. Both used low wing models.

Wednesday, January 1st, was another C/L day and brought to light a very close battle for 1st place in *Senior Stunt*. Ken Dowell of Victoria won the event when Ken Taylor (Vic) ran into some inconsiderate gusts at the top of his vertical eights, in one flight Hard luck Ken, you've the reporter's sympathy. Ken Dowell deserved his victory, as would Ken Taylor if he had won. The standard was exceptional and the first two place getters used models with fully sheeted wings. They were "Angelique" and a



Above, multi flyers with stripe tipped winning "Sultan", 2nd left at back. Left, Lyall and son Neville Winley were 1st and 4th in rudder only, 1st and 3rd in intermediate using low wings. Right, winning C/L "Comanche" by McGreary. 3rd was R. Shepherd's "Flockart Mustang" with Greenhill's F/F winning "Bulldog", 72 in. with Glo-Chief 35.



F/F Champ O'Connor, with winning Class 3 model and P. Lloyd, top in Junior Rubber. Right, is L. Jarvis with white "Turbulent", a replica of the actual aircraft flown to the Nats site by his father. Ideal for scale checking !

reported and photographed by Brian Horrocks

which completely destroyed his model before it could be checked.

Thursday was a good day for free flight, with many fly-aways taxing the retrieving services to the utmost. Worthy of mention is Dave Anderson (S.A.) who is a most persistent tryer, and this year he made 2nd place in Nordic A/2 glider. An interesting feature of this day was the arrival of a "Druine Turbulent" on the flying field flown in by Keith Jarvis whose son had entered a flying scale "Turbulent" in the F/F event—a good check for fidelity to scale. (*Last month we reported a similar Turbulent arrival at the N.Z. Nats—who'll bring one to the British Nats this year?*—Ed.)

Intermediate Radio was quite impressive, and a victory was in order for Lyall Winley who flew the same model he won the Single function event with; the difference being a tailplane equipped with elevators, and cascaded controls. His son, Neville placed 3rd.

After the Radio comp., Tom Prosser took the air and proceeded to fly "Shark" with a "T-Bird" flown by Reg Towell of N.S.W. in third place. Brendon Stretch of Vic. won Junior Stunt flying his version of Sirotkin's "Space Hound".

In Class II Team Race (5 c.c.), Wesley Penfold (S.A.) had a bad fire the complete A.M.A. Control Line Schedule but with Multi radio control: Reverse Wingovers, Hour Glasses, Clover Leaf, Squares, Triangles, in fact, the lot.

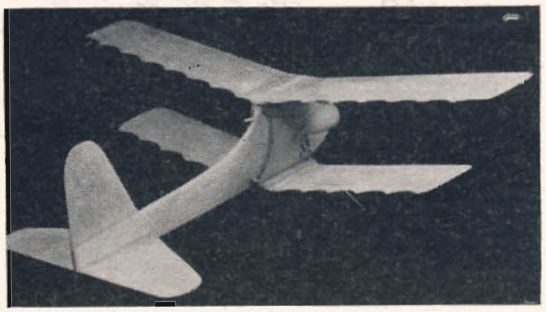
Friday, January 3rd, was the last day with the highlight being the flying of a fabulous "Piper Comanche" complete with electric retracting U/C. This is a scale model which really flies and needless to say, the winner of C/L Scale. Second place model was a "Fairey Battle Trainer", which just scraped in with its qualifying flight. Fidelity to scale won the placing for this machine. In third place was a model of Ron Flockart's ill fated "Mustang".

The Lord Mayor of Strathalbyn presented the prizes and in a farewell speech commented on the exemplary behaviour of the visitors at the Presentation Evening. Prizes consisted of similar trophies for all events and placings with Gold for first, Silver for second and Bronze for third. Trophies were a plinth mounted laurel wreath with a plane angled across the front of the wreath.

The Champs are also a great social occasion with Film Evenings, a Night Scramble, Night Car Rally, New Years Eve Ball, and an Auction ably conducted by Ivor (Yogi) Stowe — altogether a *fair dinkum* show.

	FIRST		SECOND		THIRD	
FREE FLIGHT EVENTS						
Chuck Glider	P. Lloyd, VIC	168.00	S. O'Connor, VIC.	151.40	A. Withnall, VIC.	150.20
Wakefield	R. Wilkins, VIC.	731.50	S. O'Connor, VIC.	648.40	W. Penfold, S.A.	589.20
Jetex	D. Hegarty, N.S.W.	274.00	W. Penfold, S.A.	206 30	S. Stones, VIC.	168.00
Power Ratio 1	R. McDonald, N.S.W.	24.80	S. O'Connor, VIC.	23.42	B. Laughton, VIC.	19.95
Power Ratio 2	W. Penfold, S.A.	26.20	D. Murray, W.A.	24 80	D. Morrison, W.A.	18.50
Power Ratio 3	S. O'Connor, VIC	11.26	N. Moore, S.A.	3.30	L. O'Reilly, S.A.	2 63
F.A.I. Power	D. Murray, W.A.	822.80	D. Morrison, W.A.	760.80	R. Greeves, VIC.	740.60
F.A.I. Sailplane	C. Stones, VIC	446.00	R. Greenhill, VIC	431.10	L. O'Reilly, S.A.	388.00
Nordic A.2	R. Wilkins, VIC	800.00	D. Anderson, S.A.	743.00	R. Greenhill, VIC.	660.20
Power Scramble	R. Duance, S.A.	487.00	P. Moorfield, S.A.	400.00	D. Anderson, S.A.	395.00
FF. Scale	R. Greenhill, VIC.		L. Jarvis, S.A.			
RADIO CONTROL EVENTS						
Single R/C	L. Winley, N.S.W.	2539.00	G. Enery, VIC.	2349.00	A. Walsham, VIC.	2270.00
Intermed'ate R/C	L. Winley, N.S.W.	1341.00	N. Fell, VIC.	973.00	N. Winley, N.S.W.	820.60
Multi R/C	T. Prosser, N.S.W.		B. Healy, N.S.W.		D. Murray, W.A.	
CONTROL LINE EVENTS						
Open Stunt	K. Dowell, VIC.	2083.50	K. Taylor, VIC.	2074.00	R. Towell, N.S.W.	1987.50
Open Combat	A. Shinfield, N.S.W.		V. I. de Vos, VIC.		I. Bristow, S.A.	
F.A.I. Speed	L. Buck, S.A.	108.00	G. Lawson K. Fryer	100.80		
Speed Class 2	A. Kerr, N.S.W.	139.80	A. Kimanides, VIC.	127.10	G. Lawson, VIC.	124.90
Speed Class 3	P. McGee, N.S.W.	141.60	K. Parker, N.S.W.	137.20	A. Kerr, N.S.W.	134.60
½A T.R.	J. Dorcian, VIC.	11-22.80	B. Laughton, VIC.	13-2.80		
F.A.I. T.R.	J. Oehme/R. Silva, S.A	6-40.80				
Class 2 T.R.	G. Lawson/Fryer, VIC.	7-36.20	R. Wilson, VIC.	7-49.90	J. McGrane, VIC.	9-12.40
Class 3 T.R.	N. Moore/ K. W. Green, S.A.	7-44.80	J. Oehme/R. Silva, S.A.	9-9.40	G. Barnes, W.A.	9-14.00
CL Scale	N. J. McGreary, N.S.W.		R. D. Hull, N.S.W.		R. Shepherd, VIC.	
Proto Speed	A. Babbington, N.S.W.	31.50	D. Kidd/A. Kimonides, VIC.	34.00	K. Bertina/C. Stone, W.A.	36.60
Advertiser Trophy	N. Moore/ K. W. Green, S.A.					
JUNIOR EVENTS						
Junior Chuck Glider	P. Lloyd, VIC.	145.50	B. Stretch, VIC.	112.70	G. Fahey, N.S.W.	109.20
Junior A 1. Glider	G. Fahey, N.S.W.	294.20	P. Moorfield, S.A.	251.60	P. Lloyd, VIC.	203.50
Junior Rubber	P. Lloyd, VIC.	332.70	T. Stowe, N.S.W.	184.30	G. Fahey, N.S.W.	114.40
Junior Stunt	B. Stretch, VIC.	1830.00	J. Prosser, S.A.	1799 00	J. Hughes, VIC.	1245.50
Junior Combat	I. Densham, N S.W.		J. Hughes, VIC.		G. James, VIC.	
Junior ½A T.R.	W. East, N.S.W.	11.57	J. Densham, N.S.W.	12-59.60		

Junior Champion of Champions P. Lloyd, VIC. **Senior Champion of Champions** S. O'Connor, VIC. **State Shield** Victoria



Veron's VESPA

THE VERON VESPA is a kit of deceptive simplicity. Experts may dismiss it as so much nonsense, yet if they were so to do, they would be guilty of failing to recognise the elementary fact that the simpler the model, the more difficult it is to design. We were so attracted by the Vespa kit submitted for review that by co-operation with Messrs. Model Aircraft (Bournemouth) Ltd., we are able to publish the 3-view general arrangement drawing below, to give a better conception of the design. Due to prefabrication, the 23 in. "Mini-Bipe" is not supplied with a full-size plan. Instead the instructions are given in 16 adequate stage by stage sketches, coupled with complete descriptions so that no novice need have fear of making a mistake.

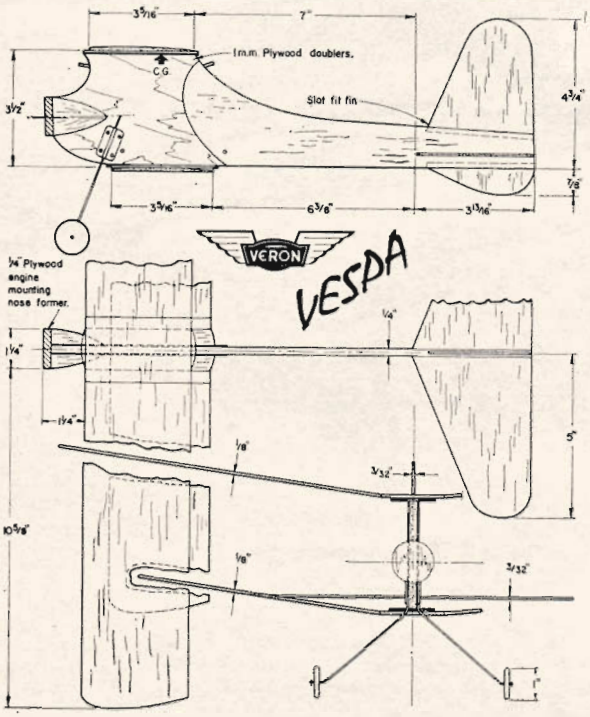
An alternative arrangement, which has considerable appeal, is the suggestion that the trailing edges of the wings be scalloped to give a "vintage" look. We have done this successfully on the test model using sandpaper wrapped round a large diameter dowel and the addition of a set of R.A.F. Roundel transfers over an all-silver finish gives a Fighter like appearance.

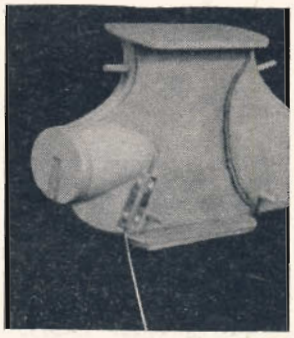
The Vespa can be made quite quickly but we would not suggest that the novice should rush the job. Be specially careful that the plywood engine mounting former is securely glued in place and that there is some allowance for downthrust, because it is this which eventually determines the effectiveness of the otherwise zero incidence flat wings.

Vespa introduces power flying in its most simple free flight form. The model is robust and very easy

to trim. It should more than satisfy any newcomer to the hobby interested in our new beginners series "Let's Go Flying" and we commend it especially to junior modellers as an inexpensive and tough kit.

The model was designed for the radially mounted Cox Tee Dee .020 engines, but is adaptable to the ½ c.c. diesels such as the Quickstart Dart and earlier, E.D. Baby. Using these engines, it is necessary to shorten the nose by about ½ in. to retain the same balance and at the same time to fit a different ¼ plywood engine mounting plate mounted horizontally. It is also possible that one could mount these beam fitting engines sideways simply by cutting a "U" out of the nose profile.

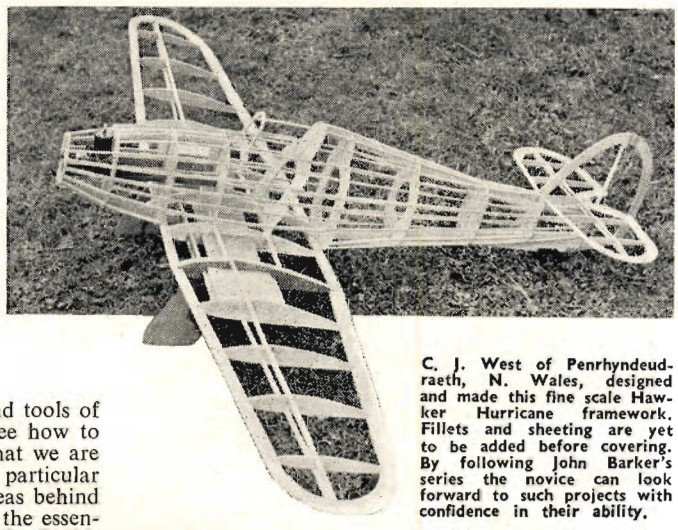




Photographs illustrate the component parts of Vespa prior to assembly (below) and with the nose former in place, together with dowels and wing platforms (right). Assembled airframe before and after finish (above) shows the stark but attractive lines of our test model.

Let's go FLYING

—with John Barker who details the basic approach to model construction



C. J. West of Penrhyndeudraeth, N. Wales, designed and made this fine scale Hawker Hurricane framework. Fillets and sheeting are yet to be added before covering. By following John Barker's series the novice can look forward to such projects with confidence in their ability.

LAST MONTH we looked at the materials and tools of aeromodelling. This month we want to see how to use some of these. First of all, let's see what we are trying to do on the building side. Take particular notice of the next few paragraphs. The ideas behind them are of great importance. They show the essential simplicity of building almost *all* models. Building a 'difficult' model is really more a matter of patience than skill. This is a question of the mental approach to the hobby which has been mentioned before.

Basic principles of building

Construction of the majority of model aeroplanes consists of cutting a number of pieces of wood to the correct shape and then holding them in the correct position until the cement dries. That is all. We carry out these operations of cutting and holding in such a way as to ensure accuracy. The method is usually the easiest and fastest. Cuts which are short in length don't cause much trouble, they just need care to keep the blade upright. Longer straight cuts are made with the help of a straight-edge, and curved cuts with the help of a template.

Now for holding. A jig is a device for holding pieces in place whilst certain operations are performed on them. A jig can be anything that does this job. For instance, the most common way of building a model is to pin down the parts directly over the plan. The pins are then forming a jig. It should perhaps be mentioned that jigs are sometimes used to help in cutting and templates are also used for forming.

To sum up this simple but important principle. We must cut the wood accurately and then hold it in the correct position until the cement dries. We make the achievement of this much easier by the use of such things as templates, straight-edges and jigs.

Some structures are designed to be self jigging by careful shaping of the parts. These models can be a delight to build, particularly from a prefabricated kit, but are often heavier. Sometimes with models not made from kits, the time saved on assembly will be spent on more elaborate cutting. This is worthwhile if a more accurate structure is the result.

Now to deal with some of the basic jobs in greater detail.

Cutting balsa strips

Cutting balsa strips to length is straightforward but you will find that soft and hard woods require slightly different techniques. With soft balsa the blade is stroked across the wood as the cut is made. This gives a clean cut and prevents the wood from being crushed. With hard wood the blade is pushed down with a see-sawing motion.

Cutting sheet along the grain

Straight cuts along the grain are made with the help of a straight-edge. Take care to hold the straight-edge firmly with the fingers spread well apart. If the straight-edge tends to tilt on a narrow cut, place a piece of scrap under the opposite edge as shown in *figure* 2.1. Whether the cut goes right through in one pass, or whether several strokes will be required, depends on the thickness and hardness of the balsa.

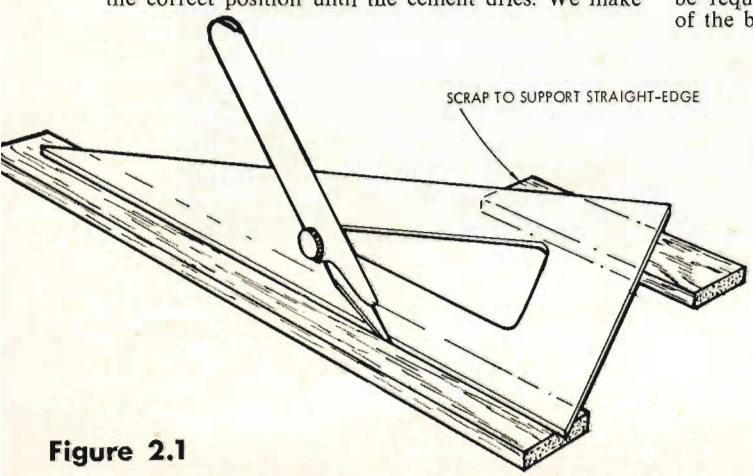


Figure 2.1

Cutting across the grain

When cutting across the sheet care must be taken not to split the wood along the grain at the end of the cut. See *figure* 2.2. If you do have trouble, reverse the cut when nearly through and finish off towards the centre from the other edge.

Cutting block

Apart from the particular case of propellers, which will be dealt with later, the shaping of block balsa is not usually important. Block is usually used for fairings and as such is finished off with sandpaper to suit

the surrounding structure. Usually the procedure will be ; rough saw the block to shape with a small hacksaw, true up any mating faces, glue into place and finally finish to shape with a knife and sandpaper. It will be found that most block will require a coat or two of dope before the sandpaper will give any sort of finish on the end grain.

Cutting sheet to curved outlines

When cutting ribs a template is almost always used as shown in *figure* 2.3. A template is a kind of pattern, usually cut from thin plywood or metal to the shape of the part to be produced. It is laid on the sheet balsa and used as a cutting guide. You should take great care in producing your templates. Not only does this give an accurate job but the cutting is made much easier with a good template.

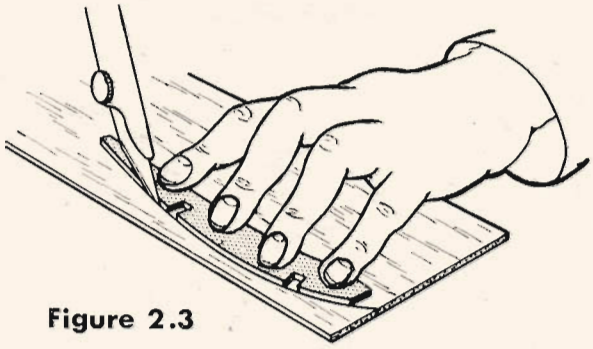


Figure 2.3

The chief point to watch in using a template is that it is held firmly whilst the cut is made. This is not so easy as it sounds. Awkward grain can play havoc with your intentions particularly when cutting on the nearest side of the template. If you do have difficulty with this, *figure* 2.4 gives a suggestion which will cure the trouble. Two small drawing pins are pushed through pieces of balsa and then through the template, and glued. The pieces of balsa are of such a thickness that the points of the pins protrude by about $\frac{1}{32}$ in. These points will then key the template to the sheet which is being cut. You will find that the template and the sheet can always be moved to give the easiest cutting position.

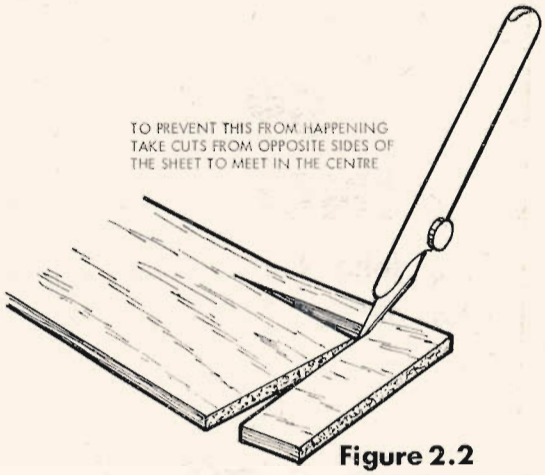
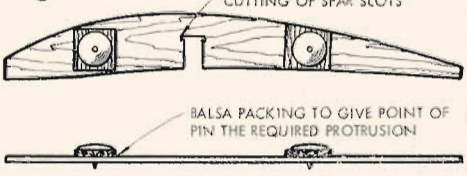


Figure 2.2

Figure 2.4 also shows a tip which is helpful in cutting the spar slots. A slight nick is made which allows the balsa knife to get right into the corners and give a clean cut which removes all the waste wood. It should be noted that spar slots are cut *after* the main rib outline has been separated from the sheet but before the template is moved. In other words the first (outline) cut goes straight across the end of the spar slots. The sides of spar slots should usually be cut by inserting the point of the knife and then pressing the rest of the blade straight down. Attempts to use a stroking cut will often lead to splitting of the ribs.

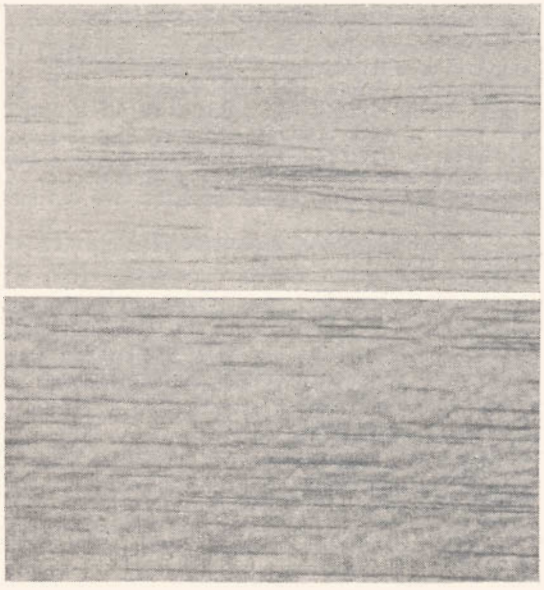
Figure 2.4



A pointed knife blade is best for cutting ribs. A broad blade will not follow the template properly. The job is made much easier if a sharp blade is used and it is a good idea to arrange your blade changes to coincide with the job of rib cutting.

We now turn to the production of curved items where a template is not used. This is really two problems, firstly to transfer the required shape from the plan to the sheet of balsa, and secondly to do the cutting.

One way of getting the shape required on to the sheet of balsa is to draw it there directly with drawing instruments. We will not elaborate on this method. Anyone with a sufficient knowledge of drawing to do it this way will soon pick up the short cuts for himself. A more general way to do the job is with the help of tracing paper, as shown in *figure* 2.5. The tracing paper is placed over the plan and the required part is traced through. The tracing paper is then positioned over the wood so that the grain runs in the correct direction.



Examples of straight grain (above) and "quarter" grain (below) show grades of balsa to look out for.

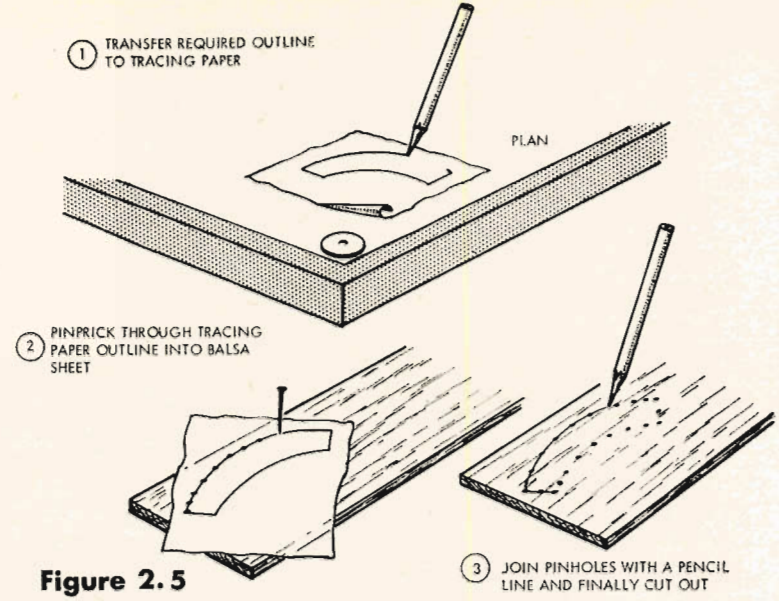


Figure 2.5

Grain direction is usually shown on the plan; if it is not, arrange the grain to run along the greatest length of the part. The outline shape is then pricked with a pin through to the balsa. After removing the tracing paper the pinpricks are joined with a pencil. The part is cut out, keeping just to the outside of the outline. Final sizing is achieved with sandpaper.

If you run out of tracing paper at the crucial moment, you will find that quite thick paper can be used if the plan and the paper are held flat against a window pane so that the light shines through. One final point on the matter of making parts from sheet. As a general rule, parts which are made with the help of a template or straight-edge should be to finished size as cut. Parts which are cut 'freehand' will need a sanding allowance for final finishing.

Cutting Plywood

For cutting thick plywood, a fretsaw or hacksaw is almost a necessity but for the thinner ply, more usually used in aeromodelling, a balsa knife will normally suffice. Just take your time and go over the line as many times as necessary until you work your way through. If a hole has to be made in plywood, drill small holes in the corners as shown in *figure* 2.6 and connect them with knife cuts. Should the hole be irregular in shape remove as much as you can by this method and then whittle the rest.

Quite good results can be obtained by cutting the plywood near to shape with a pair of scissors and finishing off with sandpaper.

Laminating Curved Outlines

We have already discussed the cutting of curved items from sheet balsa. There is another method of producing curved parts which can be superior in certain applications, particularly where the radius of curvature is small. A typical application is a wing tip. This second method is to laminate the item from thin strips of wood glued together. Laminated parts have great strength due to the favourable run of the grain and the interposed glue. Laminating is another of these jobs which seem impossible if you tackle it the wrong way and yet is ridiculously easy if performed correctly.

We must first make a pattern or template to the shape of the curve we wish to produce. Material used for the pattern is not critical and a piece of balsa about $\frac{1}{8}$ in. to $\frac{1}{4}$ in. thick will serve very well. This pattern is cut to the *inside* line of the curve and is made somewhat longer than the part we are making. It is more clearly seen in *figure* 2.7. It is essential that the pattern has a smooth regular outline with no bumps.

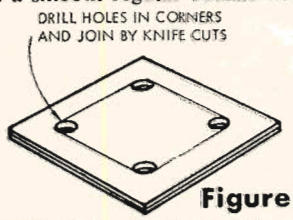


Figure 2.6

Next cut a number of strips and lay them side by side on the building board. The cross section and number of these strips will be noted on the plan. Typical values would be four strips of $\frac{1}{8}$ in. by $\frac{1}{32}$ in. The length must be a little longer than the curve to be produced. Ends are trimmed to proper length and shape after laminating. The upper side of all the strips but one are coated with balsa cement or PVA. The strips are then stacked together. Start by placing the unglued strip on top of the adjacent glued strip and then these two on to the next strip and so on. Now comes the interesting bit. Place the centre of the stack of strips roughly in contact with the centre of the pattern and press down with the fingers. Now, maintaining this steady pressure, slowly move the fingers, one in each direction, around the pattern thus forming the strips to shape. Finally secure the ends of the strip with a rubber band or pins and leave to dry. Drying always takes longer on these laminating jobs so leave for at least a couple of hours, preferably all night. After removal from the pattern the ends may be trimmed to shape. The normal procedure is also to give a rough sanding at this stage and leave the final finishing until the part is glued in place.

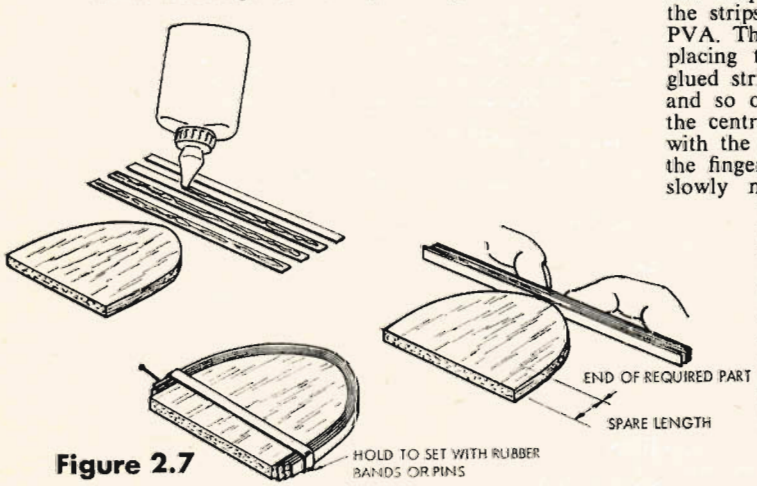
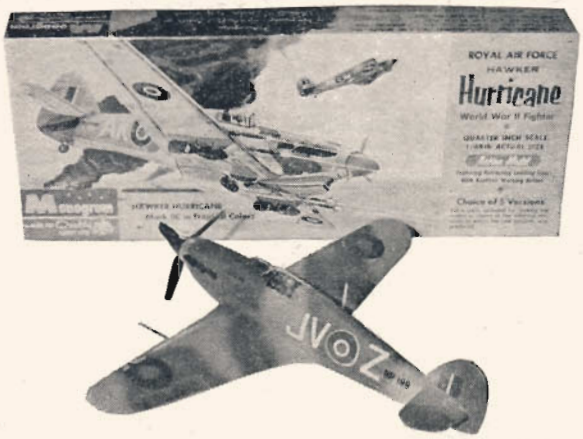


Figure 2.7

(To be continued next month)



TRADE NOTES

QUITE A FEW SURPRISES were revealed at the eleventh British Toy Fair held at Brighton, February 9th-13th. In the plastics field, **Airfix** displayed their new 2/- series 1/72nd 'Mirage IIIC' in French markings, which looks like a very attractive model indeed, being wide open to modification for Swiss, Australian, South African or Recce variations. This kit is now in circulation. **Revell** had a fine trio of kits up their sleeves in the beautifully produced 1/72nd 'Fokker DVII' (in Goering's all white colour), a 41 Squadron 'S.E.5a' and French 'Nieuport 17C Scout'. These are immediately available at 2/- and are to be joined by the 'Albatros DIII, SPAD XIIIC' (Rickenbacker's) and 'Camel' (Roy Brown's) coming in May. Among the modern series of Fighters at 2/11d., we can expect the unusual but attractive 'I-16 Rata, Brewster Buffalo' (pre-war markings) and 'Nakajima Frank' in September. This is also the release date for the 1/144th scale 'Boeing 727', a prototype of which was shown as Lufthansa D-ABIB.

Revell's 'Boeing B17 Fortress' will come as a reissue in "Memphis Belle", markings at 12/6d. during March, to be followed in June by the 'Avro Lancaster', also 1/72nd, but this time the special version as used by 617 Squadron in Operation "Upkeep". The rotary, dam busting bomb is apparently accurately reproduced and markings supplied for Guy Gibson's aircraft. As if this were not enough Revell are also introducing a series of Panorama displays with reversible back-cloths to show off their products. These will sell at around 6/11d. and vary from an intriguing hidden airstrip of World War II to a dawn raid in World War I. Some of the **Lindberg** plastics took our eye, in particular the motorised 1/48th scale 'Avenger', which has retractable undercarriage, controls operating from the cockpit and extensive attention to detail. At 25/11d. this is a challenging kit, span is 13¼ in. We also liked their similarly motorised 'Stuka' and 'Zero' and also a kit of which we were not aware, for the 'Draken', all at 13/6d. Since the Draken has no propeller to turn, its particular gimmick is the ability to fire rockets! At this stage we should mention the separate February Show in London's Haymarket by **International Model Aircraft.**

Heading shows latest Monogram 1/48th scale plastic kit to sell at 12/-. Can be made in several versions. Left is Roy Lever of Bradshaw Model Products, displaying the new Tony Junior prototype along with the ½A team racer, "Star Shooter", while in the background were the Metz and Channel Master radio control outfits distributed by B.M.P. of Manchester.

Following the "Trailblazer" series mentioned last month, opening with the Supermarine S6B, we are promised the 'Vickers Vimy' in the Spring and 'Bristol 138' height record monoplane and Lindbergh 'Ryan N.Y.P.' both in the autumn. In the military aircraft series of **Frog** plastics, the R.A.F 'Mitchell III' will come in the summer, with the 'Blackburn Skua' followed by the 'Junkers Ju 88'. So—plastic modellers are due for plenty of activity!

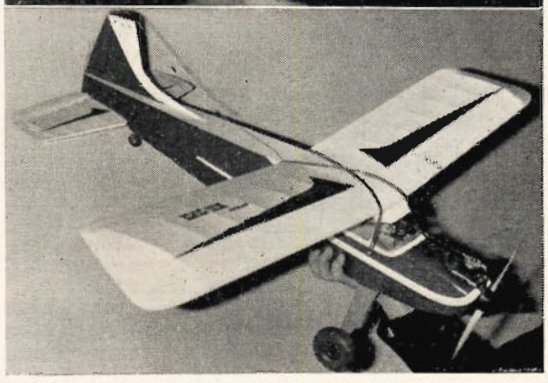
Similar industry was pleasantly revealed to us by some kit manufacturers, notably **Keilkraft,** where our eye was first taken by an entirely new radio design scaled down from the successful 'Super 60'. The prototype, fitted with an OS.15 and R.E.P. Twin Triple Receiver, is 48 in. span and christened 'Mini-Super'. It looks to us as though it is going to really fill the bill for the popular sports flying category and will be supported by the 36 in. 'Gyron', which has already been publicised in these columns and is due to come out soon. The latter has been tested with the R.C.S. 'Guidance System'.

Pride of place among the engines displaced among the Keil products in **Model Exports** stand, was the 'Merco 61'. This is indeed a magnificent product, now fitted with optional spinner and one of the most clever silencers we have seen. Pendant, so that the silencer is below the line of the exhaust stack, it uses a series flow guiding vanes to aid exhaust extraction. Den Allen calls it "Turbo Flow". May is the projected date for first Merco 61 deliveries.

New **Mercury** kits on show were the attractive pair of rubber designs, 'Mystral' (24 in.) at 9/6d. and 'Sirocco' (32 in.) at 12/6d.

On the K-K radio side, more revelations. First, a German proportional control system by **Stabo** of Hildesheim at £220 complete. Our friends of R.C.M. & E. deal with this one in their current issue. On show were prototypes of the 'Allegro' and 'Skyliner' multi channel designs to be kitted and the extraordinarily small German 'Uniphon' receiver and 'Handy' transmitter. In this outfit, each component measures 1¼ x 1¾ x 3 in. so that the Rx is the same size as Tx and we understand these are used extensively by illusionists, cost is £17 9s. 6d. Most useful gadget for R/C'rs is the TK20A Universal Test Meter distributed by Keil at 49/6d. We also understand that they will be importing the increasingly popular OS "Pixie" all transistor single channel outfit soon. This has become extremely popular in the U.S.A. and Australia.

Bradshaw Model Products, coupled with **Estral,** had many new prototypes on show. The 'Tony Junior' at 49/6d. (42 in.) and 'Navy Fighter' (also for 2.5 to 3.5 c.c.) are each from Frank Warburton's design board. The latter is priced at 46/11d. Joining the range of radio kits is 'Grasshopper", 36 in. for small engines at 39/11d. This is a practical and boxy design with tricycle undercarriage and is fully pre-fabricated, including undercarriage and wheels.



Keilkraft development staff man, Ernie Webster, displays confidence in the entirely new version of the Keilkraft "Hurricane" plastic ready-to-fly, to sell at £4 19s. 10d. Now moulded in a new red plastic and equipped with an upright mounted Wen-Mac Rotomatic .049 glow engine with spring starter, the Hurricane has a three blade prop and re-designed torsion bar undercarriage. It appears to be indestructible, though K.K. Rep' Ernie Smith in background, is taking care ! Tips can actually be touched above fuselage ! Below it is the prototype "Mini Super", 48 in. R/C Sportster by K.K.

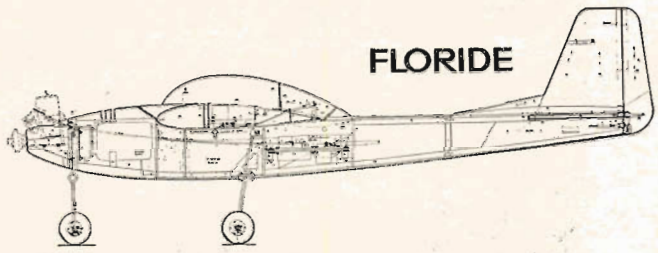
B.M.P. had many new lines on display, including an opened up Metz 10 channel outfit (£137 15s. complete) and their own "Channel Master" four channel at £49 10s. and 12 channel to come at about £95.

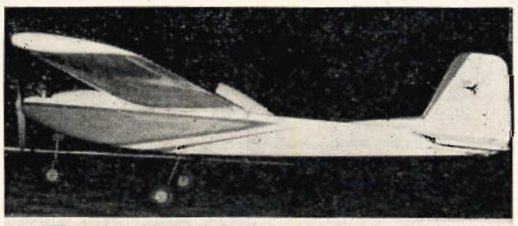
Joining B.M.P. and Estral in the new consortium is **Skol-Kits,** where a fine display of made up **Robbe** models were shown, including the mammoth **'Tipsy Junior'.** Revelation in this department was the framework of 'F.B.37' — none other than Fritz Bosch's own championship model, to be kitted by Robbe and available here soon. Hardwood lined fuselage, prefabricated normal wing construction and many practical features will be included. Price announcement is £12 11s. Skol-Kits have produced some neat printed leaflets to publicise their range and a Stop Press edition includes announcement of a new 'Telecont' 2 channel receiver at £19 8s.

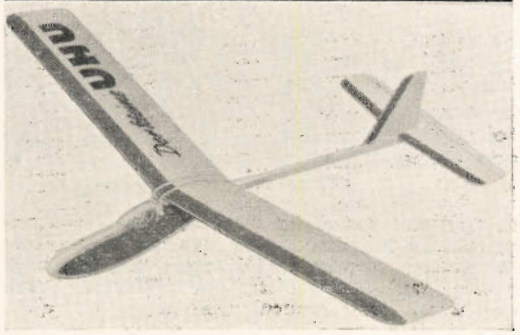
We mentioned the new **Monogram** 1/48th 'Hurricane plastic scale kit last month. It was on display at **A. A. Hales Ltd.** Beautifully prepared by the American factory and bought back only a few days before from the Chicago Trade Fair by Mr. Hales, the Hurricane is, to us, one of the most attractive plastics yet produced. The kit is so arranged to be convertible to any of several Mks and the realism of the mouldings is excellent. Tropical version in 213 Sqdn. markings is shown on the box and the prototype model displayed in 6 Sqdn. markings. Another exciting novelty announced, but not on display was the forthcoming Cox ready-to-fly model of the 'Spitfire' which is bound to have a great appeal. It will be 23 in. span to sell at £6 19s. 6d.

Ripmax's concentration on radio control was inescapable. The most compact and clearly displayed range of R/C accessories from linkages through to complex kits, left the visitor impressed with so comprehensive a stock. Visual displays of the **Graupner-Grundig** equipment and R.M.A. servo mechanisms served to introduce the uninitiated to the mysteries of radio control. (Incidentally, a fine set of leaflets No. E.100 to E.106, deal with the R.M.A. servos in a most professional way and set a standard which others could well follow.) Out at last is the 4 channel Superhet by **MacGregor,** operating on 9 volts and to be sold as a finished item in sealed plastic case at about £28. This Rx has over 120 components, including 18 transistors and has been the subject of extensive development for some time. It should well meet the aim of a foolproof Superhet Rx for the sport flyer who wants 4 channels.

New **Graupner** kits displayed by Ripmax ranged from the 'Little UHU' glider, a 27½ in. pod and boom tow-launch design which can be thoroughly recommended to any novice, up to the magnificent K10 glider, reviewed last month, and the latest Samann design 'Floride', at £7 15s. which can run to full multi channel on as little as 3.5 c.c.





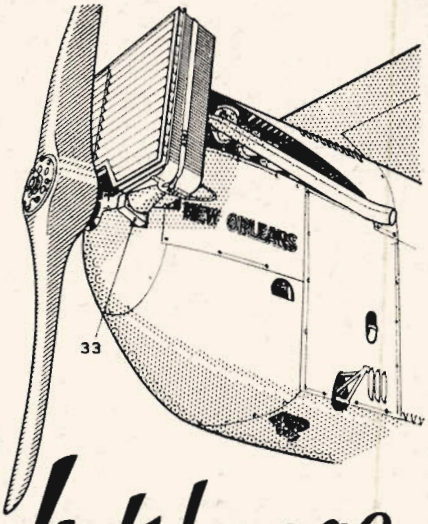


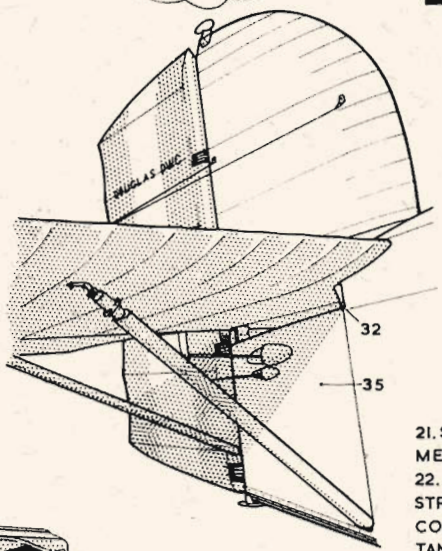
Below "Floride" side elevation showing disposition of equipment in this neat 55 in. design by Graupner, is side view of prototype displayed by Ripmax at Brighton in smart multi colour decor. Should be a popular design, kit will be 155/-. Bottom, the "Little Uhu" glider, an ideal suggestion for all novices.

17. OIL TANK 18. METAL TREAD PLATES ON PLY FLOOR 19. FUSELAGE FRAME STEEL TUBES OF GRADUATED GAUGES 20. FUEL TANKS OCCUPY ENTIRE SPACE UNDER COCKPIT FLOOR

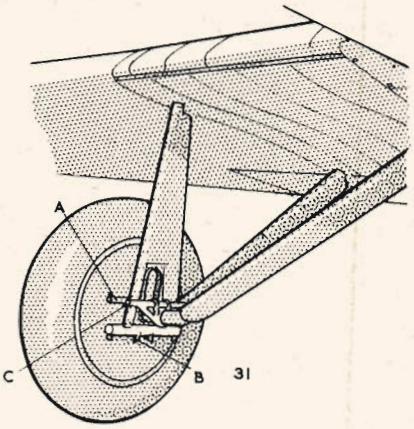
DOUGLAS DWC

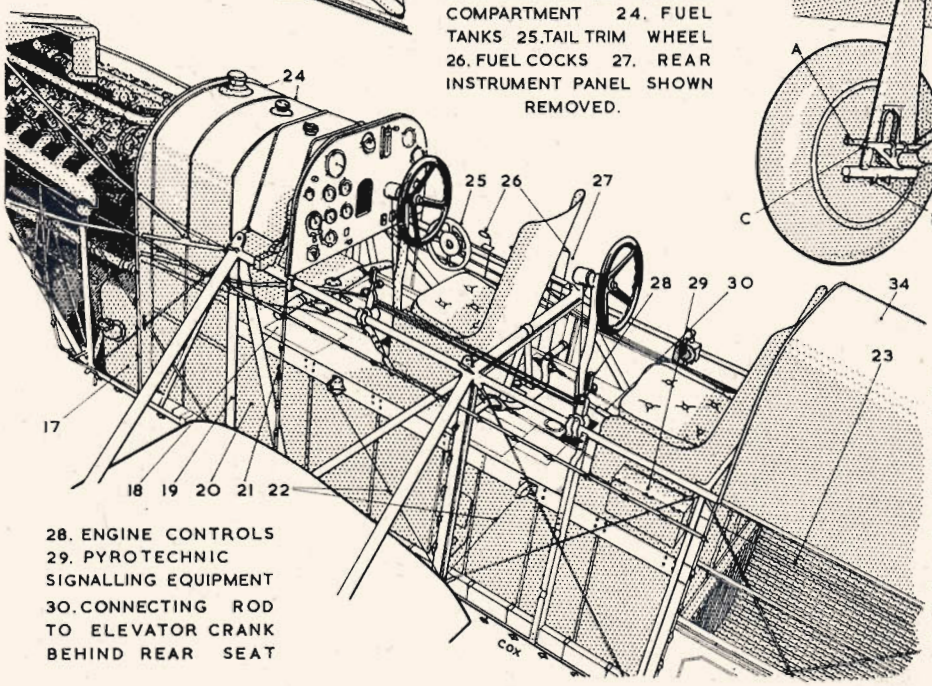
Sketchpage





21. SUPPORTING FRAME FOR METAL FUSELAGE PANELS 22. AILERON CABLES 23. WOOD STRIP LINING INSIDE BAGGAGE COMPARTMENT 24. FUEL TANKS 25. TAIL TRIM WHEEL 26. FUEL COCKS 27. REAR INSTRUMENT PANEL SHOWN REMOVED.

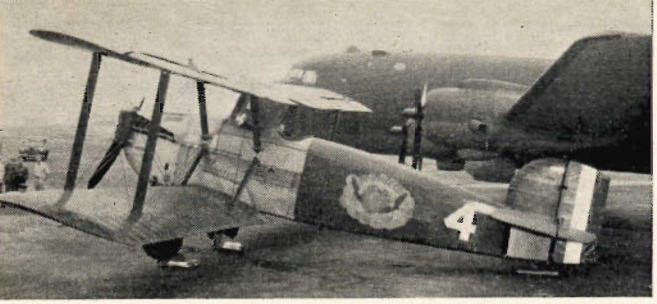




28. ENGINE CONTROLS 29. PYROTECHNIC SIGNALLING EQUIPMENT 30. CONNECTING ROD TO ELEVATOR CRANK BEHIND REAR SEAT

31. TEN LOOPS OF RUBBER CORD FROM "A" UNDER "B", OVER "C" UNDER "B", THEN RETURNED OVER "A" 32. STABILIZER PIVOTED AT FRONT SPAR 33. ENGINE BEARER 34. PLYWOOD COVERING BETWEEN STATIONS 6 AND 7 ON PROTOTYPE 35. METAL PANEL

THE CONSTRUCTION of the "World Cruiser" was conventional for the period. The fuselage, of steel tube with wooden formers and stringers for the fabric covering, was in three sections. The removable metal panels were secured with safety pin wires. The wings were of all wood construction with built-up ribs and box spars; the fixed tail surfaces were of wood, the rudder and elevators of steel. The all-wood floats were covered on top with plywood and below the chine with two veneers of mahogany. It is believed that the floats were finished with marine clear varnish.



FAMOUS BIPLANES No. 33

DOUGLAS DWC

"WORLD CRUISER"—by G. A. G. COX

IN THESE DAYS of cosmic exploration it is interesting to reflect on the fact that just 40 years ago this month, the first flight round the World was acclaimed as a major achievement. By contemporary standards the flight would appear to be laboured and more creditable as a feat of organisation rather than endurance and navigation but in 1924, just five years after the first North Atlantic crossings, such a journey presented hazards and difficulties enough to justify national pride in its success.

Even in the 'twenties, the Americans "thought big". While our efforts to earn national prestige for Britain in the transatlantic race were private ventures, each with a single aircraft, America trebled her chances of success by sending a flight of three Curtiss NC-4s across via the Azores. Similarly, four Douglas "World Cruisers" took off from Seattle on April 6th, 1924, with the considerable resources of the U.S. Army Air Service and U.S. Navy to reduce to an absolute minimum the possibility of failure.

The machines chosen for the flight were specially designed for the purpose, but very similar to the Douglas DT-1 and DT-2 torpedo planes. They were powered by the same 400 h.p. Liberty engine but with a more ungainly radiator mounting, and of course extensive modification was necessary to accommodate extra fuel tanks. These gave the "World Cruiser" a range with wheels of 2,200 miles and as a seaplane of 1,650 miles but a cruising speed of around 85 to 90 m.p.h. meant that allowance for headwinds and other adverse conditions would reduce the safe range to roughly half that figure, and the journey was effected in more than 70 short hops the longest of which, from Iceland to Greenland, was 830 miles. In addition to the prototype which was used for testing and training, four machines were built by the Douglas Company at Santa Monica, California. The aircraft, numbered 1 to 4 were named, in order, "Seattle", "Chicago", "Boston" and "New Orleans".

The flight made a rather hesitant start from Lake Washington, Seattle on April 6th. Bad weather had delayed the departure for one day, then on April 5th "Seattle's" propeller was damaged by water spray. On the following morning three aircraft took off for Prince Rupert, B.C., followed 40 minutes later by the "Boston" which had had starting trouble.

The flight to the Aleutian Islands was made in six stages, but with the early loss of the "Seattle" which crashed between Chignik and Dutch Harbour. Eight more hops took the remaining three aircraft to Southern Japan and from there they flew without major mishap via China, French Indo-China, Siam and Burma to Calcutta. Thus far much of the route had followed coastlines, offering harbours and river estuaries for safe landings, while at stations along the route ships of the Asiatic Fleet were in attendance supplying replacement engines, floats, etc.

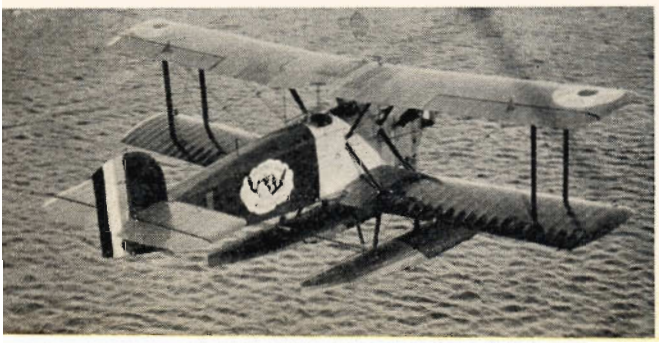
When on July 1st the machines left Calcutta they were equipped with wheels for the long overland section of the journey. From here the route lay across India, where the Americans could use facilities provided by the Royal Air Force, through Persia, Asia Minor and the Balkans to France. From Strasbourg aircraft of the French Air Force provided an escort to Paris and a tumultuous welcome. On July 16th the aircraft left Paris for Croydon, accompanied by an airliner and a commercial photographic aeroplane. At the Blackburn Aircraft Company's airfield at Brough, the wheels were exchanged for floats and the flyers took off to follow the coast to Fraserburgh and then by compass to the Orkney Islands.

On August 2nd, almost four months after their departure from Seattle, the remaining three machines climbed from their sheltered harbour in the Orkneys to encounter real trouble. Over the North Atlantic they flew into fog so dense that the "Boston" and the "Chicago" decided to climb above the fog bank or risk collision. At 2,800 ft. they found clear sky and circled for 30 minutes in the hope of finding the "New Orleans". Unsuccessful, they returned to Kirkwall not knowing that No. 4 had spun almost to wave top height, recovered, and flown on past the fog belt to Iceland. On the following day the "Boston" and the "Chicago" took off once more and headed for Iceland. When somewhere between the Orkneys and the Faroes, the "Boston" suffered a sudden loss of oil pressure, and was forced to land on the sea while the lonely "Chicago" flew on to join the "New Orleans" at Hornfiord. Fortunately, there were four ships of the U.S. Navy in the area and the men were rescued, but the "Boston" was a total loss. Now there were two.

A broken front spreader bar and a damaged propeller further delayed the flight at Reykjavik, but the remaining aircraft reached Pictou in Nova Scotia on September 3rd, to be joined by the prototype aircraft, now named "Boston II" for the triumphal last stage of the journey across America landing in Seattle on September 28th.

The total distance covered by the flight was approximately 28,000 miles in 175 days, and of this 371 hours were flying time, giving an average speed of 75 m.p.h. Statistics of such a flight have little meaning, but one remarkable figure is worthy of mention: no fewer than 29 engines were fitted to the aircraft during their World flight.

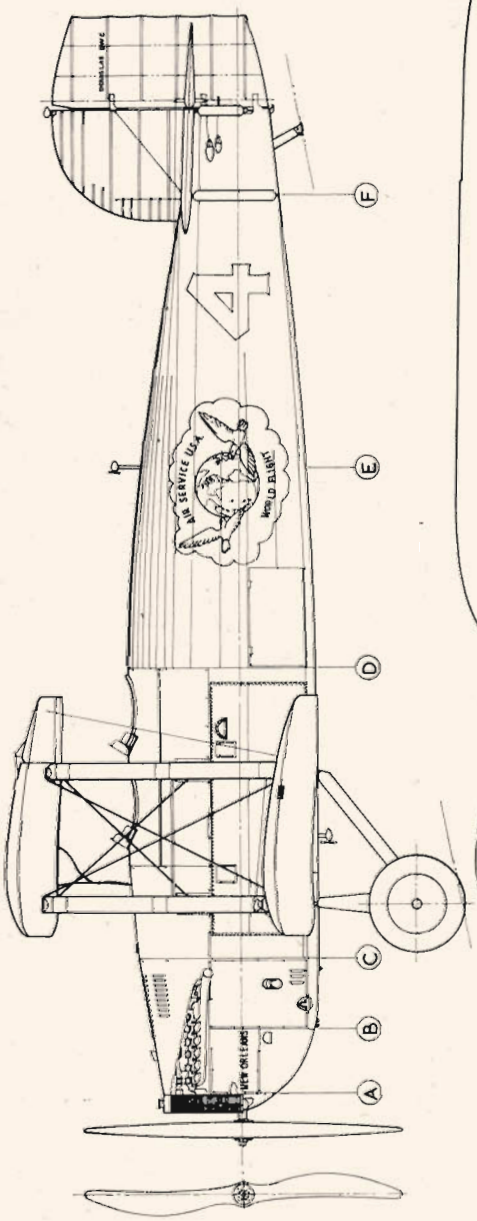
The two surviving "World Cruisers" have been preserved and are on permanent display in America; the "Chicago" is in the Smithsonian Institution in Washington, and the "New Orleans" is in the Air Force Museum at the Wright-Patterson Air Force Base in Dayton, Ohio.

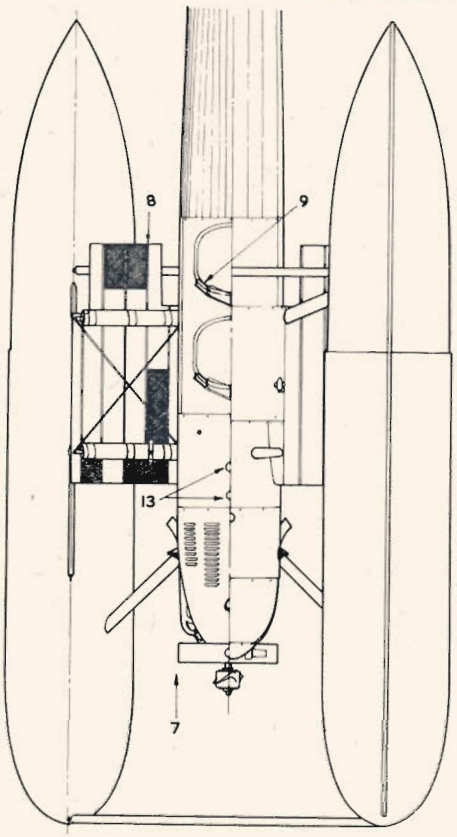


At top: The slightly bedraggled "New Orleans" taken out for an airing alongside a Douglas C-54 military freighter.
Left: The ill-fated "Seattle", No. 1 aircraft in the flight which crashed near Port Moller, Alaska, on April 30th, 1924.

MARKINGS

RADIATING LINES ON TAIL AT 5 DEGREE INTERVALS AND RUDDER LETTERING: BLACK.
AIRCRAFT NAME ON NOSE: BLUE WITH YELLOW OUTLINE.
NUMERAL 4 ON FUSELAGE: WHITE.
WORLD FLIGHT EMBLEM: LIGHT BLUE FIELD, DARKER BLUE SEA AREAS ON GLOBE, ORANGE LAND AREAS, WHITE POLAR REGIONS. EAGLES NATURAL COLOURS. LETTERING GOLD, ALL OUTLINES BLACK.
RUDDER STRIPES, FRONT TO REAR: BLUE WHITE RED.





1. NO UPPER DIHEDRAL ON PROTOTYPE.
2. ALL MACHINES EQUIPPED WITH WHEELS AND FLOATS.
3. JURY STRUT FITTED WHEN WINGS ARE FOLDED.
4. PANELS REMOVED BEFORE FOLDING WINGS.
5. 45" WIDE RADIATOR FOR TROPICAL CLIMATES.
6. BAGGAGE COMPARTMENT.
7. UPPER CENTRE SECTION REMOVED.

Reprints of this 1/72nd scale plan and dye-line prints of the 1/36th scale drawing are available as plan pack AF2777. Price 2/6d. plus 6d. post from "Aeromodeller" Plans Service.

DOUGLAS D.W.C. WORLD CRUISER

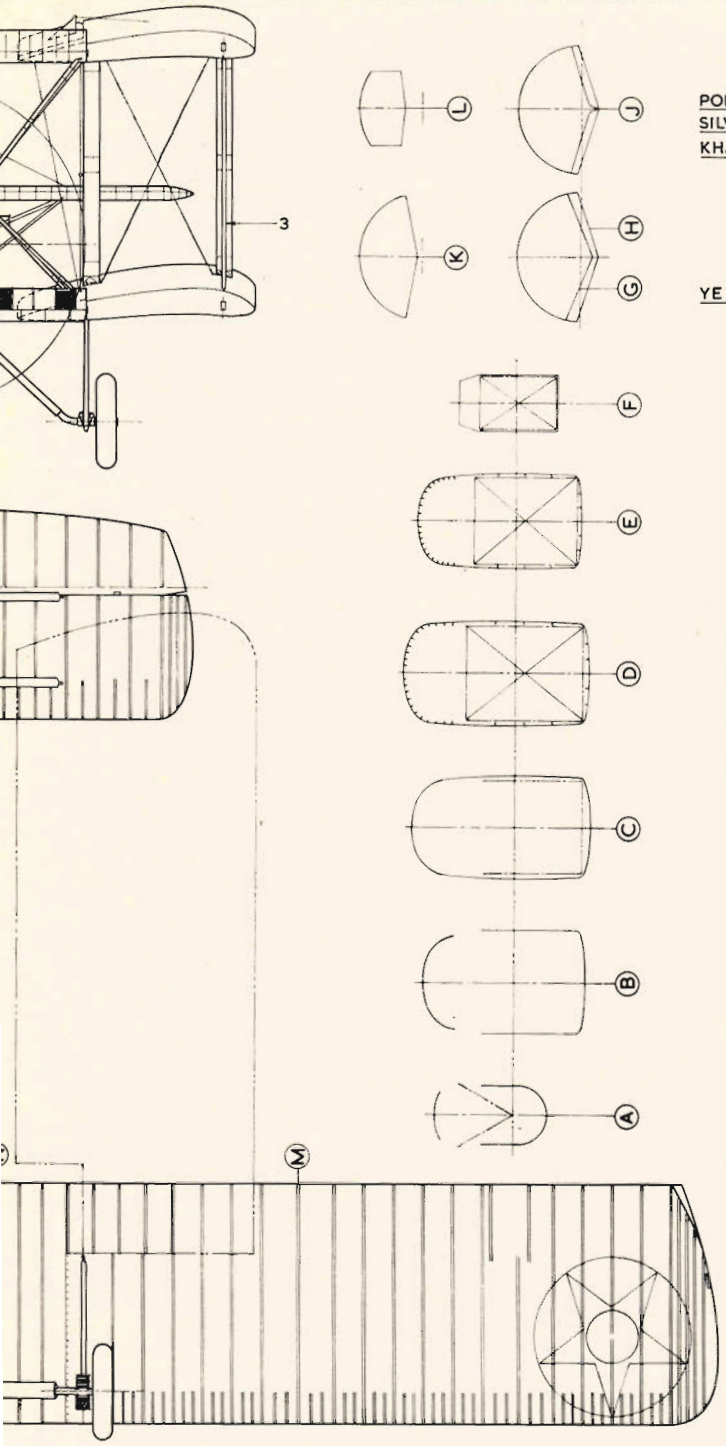
COLOURS

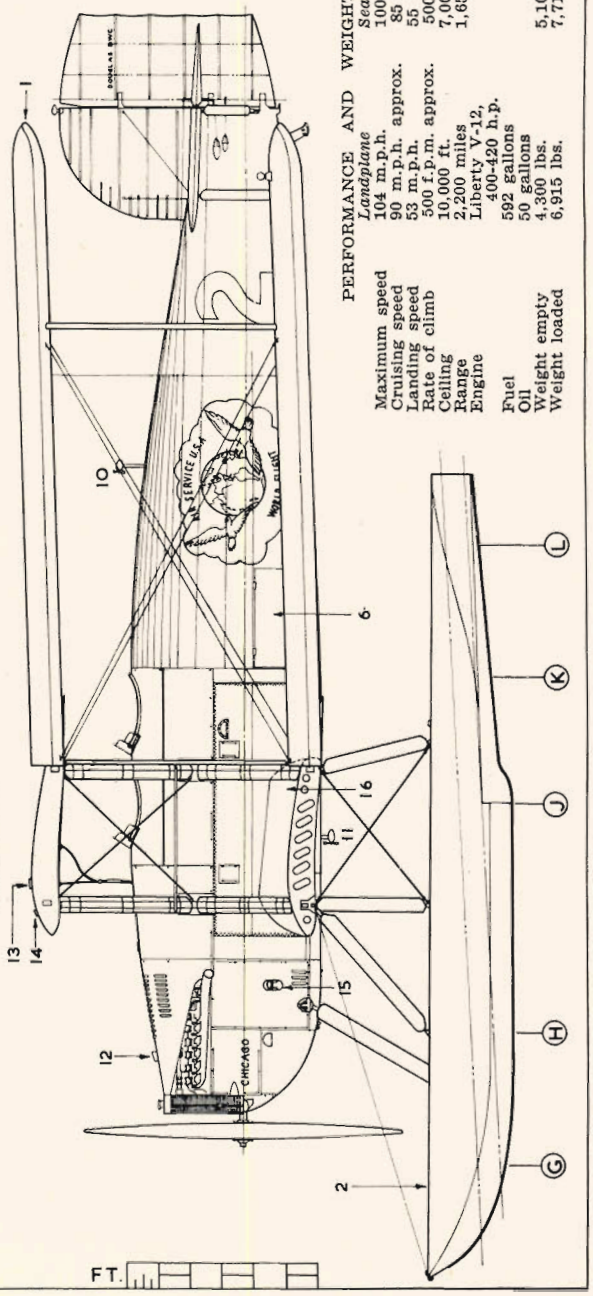
POLISHED METAL	COWLING PANELS FORWARD OF D.
SILVER	FABRIC SURFACES FORWARD OF D.
KHAKI	FUSELAGE AFT OF STATION D.
	UPPER WING, LOWER SURFACE.
	LOWER WING, BOTH SURFACES
	STABILIZER AND ELEVATORS,
	LOWER SURFACE.
	FIN, AND ALL STRUTS.
YELLOW	UPPER SURFACE OF UPPER WING,
	STABILIZER AND ELEVATORS.

DRAWN BY G.A.G COX

PERFORMANCE AND WEIGHTS

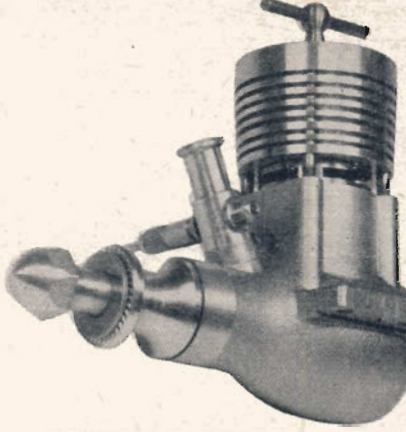
	Landplane	*Seaplane*
Maximum speed	104 m.p.h.	100 m.p.h.
Cruising speed	90 m.p.h. approx.	85 m.p.m. approx.
Landing speed	53 m.p.h.	55 m.p.h.
Rate of climb	500 f.p.m. approx.	500 f.p.m. approx.
Ceiling	10,000 ft.	7,000 ft.
Range	2,200 miles	1,650 miles
Engine	Liberty V-12, 400-420 h.p.	
Fuel	592 gallons	
Oil	50 gallons	
Weight empty	4,300 lbs.	5,100 lbs.
Weight loaded	6,915 lbs.	7,715 lbs.





8. WOOD STRIPS ATTACHED TO PLYWOOD COVERING OF UPPER SURFACE.
9. HINGED SIDE WIND SCREENS.
10. GENERATOR (EARTH INDUCTOR COMPASS).
11. GENERATOR. 12. CARBURETTOR AIR INTAKE.
13. FUEL FILL. 14. WATER FILL. 15. OIL FILL.
16. FUEL TANK LEFT SIDE ONLY.

The writer is indebted to Mr. Bill Fleming of New Jersey and to Mr. Dick Meixell of Ohio to whom must go all credit for obtaining information from many sources, and who lent this material and the photographs which appear in this article.



OLIVER 3.5 cc "Tiger Major"

Specification

Displacement: 3.47 (.212 cu. in.)
Bore: .620 in.
Stroke: .705 in.
Bare weight: 6 oz.
Collector ring: $\frac{1}{8}$ oz.
Max. power: .386 B.H.P. at 13,200 r.p.m.
Max. torque: 35 oz.-in. at 9,000 r.p.m.
Power rating: .112 B.H.P. per c.c.
Power/weight ratio: .0643 B.H.P. per oz.

Material specification:

Crankcase: gravity die casting in LAC 113 B light alloy.
Cylinder: EN 32 steel, fully hardened.
Crankshaft: EN 36 Nichrome heat treated and ground.
Piston: Meehanite.
Connecting rod: turned from RR 56 light alloy, bronze little end bearing.
Cylinder jacket: turned dural.
Main bearings: $\frac{3}{8}$ in. (rear) and $\frac{1}{4}$ in. dia. ball races (front) Hoffman L. J.
Propeller driver: turned dural.
Crankcase back cover: turned dural (threaded to screw in)
Contra piston: Meehanite.
Spraybar: brass.
Manufacturers: J. A. Oliver, "Four Acres", Ringwood Road, Ferndown, Dorset.
Price: £5.15.0 + £1.3.2 P.T. Collector & Silencer fitted £1. Collector separate, un-machined 12.6d.

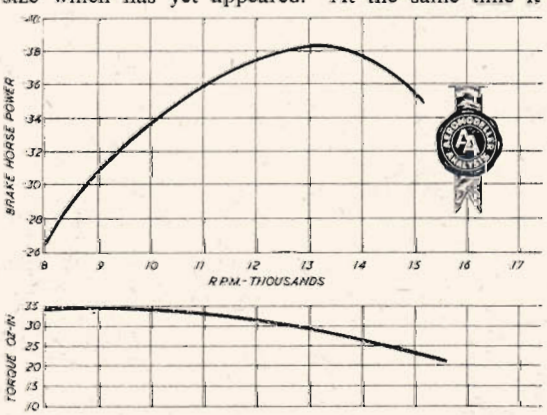
ENGINE ANALYSIS No. 121 By R. H. WARRING

THE OLIVER name has come to mean something apart in diesels, with the 2.5 c.c. 'Tiger' enjoying a fine reputation over a long period of time. A smaller version—the 1.5 c.c. 'Tiger Cub'—has enjoyed similar success in Team Racing. For some time there has been speculation regarding further Oliver developments. These have now been answered by the appearance of the 3.5 c.c. 'Tiger Major'.

It looks very much like a scaled up 'Tiger' which, in terms of cylinder geometry, it virtually is. A similar relatively large stroke/bore ratio is retained, in this case with the bore increased from .551 in. to .620 in. and the stroke from .620 in. to .705 in.

Only major technical difference appears to be in the induction timing, with sub-piston induction eliminated entirely on the 3.5. Whilst this probably accounts for the lower specific power output (just under .12 BHP per c.c. as compared with the .136 BHP per c.c. of the 'Tiger'), this has been necessitated in order to accommodate silencing as an optional feature. To that end Olivers make a special collector ring with backward facing stub exhausts to fit the 3.5, with the further option of mounting an expansion chamber on the exhaust stubs. The collector ring alone gives a surprisingly high degree of silencing with an almost negligible power loss (only 200 to 250 r.p.m. at 10,000 r.p.m.), whilst the addition of an expansion chamber to the end reduces noise to 'sewing machine' order with an r.p.m. drop at a maximum of 5 per cent at the higher speeds.

Unlike many 3.5's, which are virtually or even essentially bored out 2.5's, the 'Tiger Major' is designed from the start as a 3.5 and as a consequence —together with Oliver know-how—achieves the highest specific power output of any diesel of this size which has yet appeared. At the same time it peaks at a quite moderate r.p.m. figure, the test figure of .386 BHP being realised at 13,200 r.p.m.



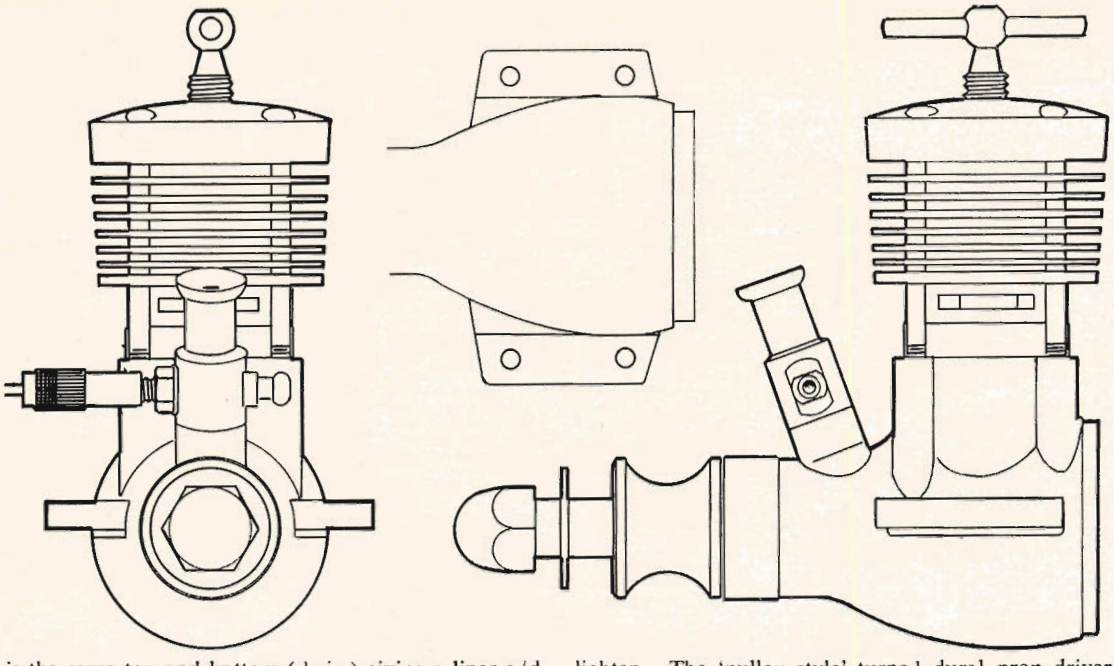
Apart from high peak BHP developed at moderate r.p.m., the other outstanding performance characteristic of the 'Tiger Major' is the exceptionally high torque maintained at lower r.p.m. The 'Tiger Major' will, in fact, continue happily to swing large diameter propellers at very good speeds, and up to about 10-11,000 r.p.m. will do this with only a moderate nitrate content in the fuel.

The 'feel' of Olivers for handling is different from 'run of the mill' engines, largely because each is virtually individually made and set up to 'optimum' limits. When cold, the contra piston seems to stick, but adjustments can be made smoothly and positively once the engine is running and the control range embraces nearly two complete turns. Backed right off the 'Tiger Major' will continue to run quite happily at low speeds in 'burps'. Similarly needle adjustment is equally non critical and only produces an abrupt response when leaned out too much.

With the collector ring in position starting characteristics have to be learned all over again in terms of 'squish' and 'pop' rather than the more usual crack of firing and bark of running. It is possible to prime through an exhaust stub, although this can easily be overdone leading to a flooded crankcase. Finger choking or a small prime in the intake is best. We would not regard the 'Tiger Major' as being amongst the easiest of diesels to start, especially with the collector ring in place, but neither is it unduly difficult—it just needs practice. The only item which can be subject to valid criticism, in fact, is the spraybar assembly. The fuel pipe side could definitely be longer with advantage and the needle thimble, although easy enough to adjust, is a little crude for an engine of this calibre.

The typical Oliver crankcase unit is a gravity die casting which has been embellished as far as external appearance is concerned by sand blasting. The underside of the mounting lugs and the outer diameter of the front ball race housing are machined. Internally the ball race housings are machined to size together with the inside of the crankcase and a 'trough' for big end clearance and four transfer ports are scalloped out of the lower cylinder housing. This section is also machined on the o/d to fit the exhaust collector ring. *See photographs on next page.*

The cylinder liner is of hardened steel of conventional form with transfer ports pierced upwards at an angle of approximately 60 deg. Wall thickness



is the same top and bottom ($\frac{1}{16}$ in.) giving a liner o/d of .750 in. and .875 in. over the exhaust flange. Bore is ground and honed to finish whilst the liner is ground all over on the outside. The liner seats on a thin gasket under the exhaust flange and is retained by a turned dural jacket held down by four long screws extending into the crankcase unit. Liner and jacket are virtually a piston and cylinder fit—so much so that it was necessary to remove the compression screw to release the compression when re-assembling! A point to watch in re-assembly is that the transfer ports in the liner match up with the positions of the transfer passages in the crankcase.

The piston is of cast iron and quite long, turned away to thin walls below the boss through which the gudgeon pin hole is drilled. It is of conventional form with a shallow conical top and strictly parallel o/d. It is quite heavy (approximately $\frac{3}{8}$ oz.). The gudgeon pin is .172 in. diameter silver steel, drilled through for lightness and a floating fit. Connecting rod is turned from dural with a bushed little end and plain big end, both journals having oilway holes. Crankcase clearance between big end and crankcase wall is tight, even with the big end bearing reduced to minimum safe wall thickness and the interior crankcase groove.

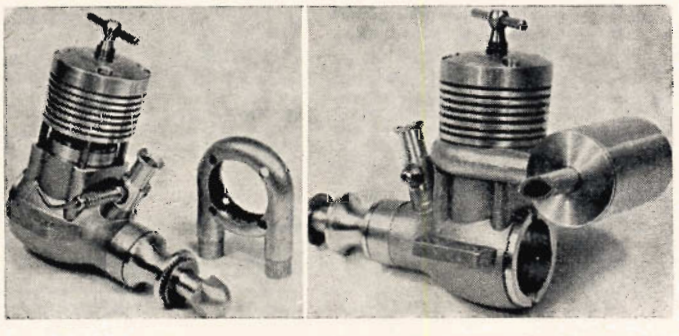
The crankshaft is of hardened steel, carried on one standard (rear) and one lightweight (front) ball race. Diameter is $\frac{3}{8}$ in. stepping down to a $\frac{1}{4}$ in. dia. threaded length protruding from the front bearing. The crank web is cut away for counterbalance and the integral .2 in. dia. crankpin is drilled out to lighten. The 'pulley style' turned dural prop driver mounts on a split steel collet whilst the assembly is completed by a $\frac{5}{16}$ in. o/d combined prop nut and stub shaft screwing on to the $\frac{1}{4}$ in. BSF shaft thread. The stub shaft needs relieving in length (or a thicker washer fitting) in order to grip 4 in. pitch propellers.

The exhaust collector ring as made by Oliver is a gravity casting which is hollowed out by machining and also faced and trimmed for diameter size to be virtually an exact fit over the cylinder liner exhaust flange and lower cylinder machined diameter. This is a service to be offered at 20/- for collector, silencer and fitting (*as photos below*).

Summarising, we feel that Oliver have produced another winner in the 'Tiger Major', with a special appeal for control line enthusiasts, whether they fly Combat or just large stunt models. Size and power also make it a choice for radio control, where it should compare in 'hauling capacity' to a 5 c.c. glow motor. Here, however, we feel that the vibration level being very much higher than a glow engine could be a disadvantage. A throttle is being developed, also a marine version. The more than acceptable level of silencing achieved with just the collector ring at no real power loss is another selling point, although cost is against it as a popular choice for a sports engine. Everyone who likes model engines should, however, own an Oliver, if only for the pleasure of possessing and handling an outstanding example of a diesel which is 'right' in design and with a sparkling performance—showing what can be done with genuine model engineering 'know how'.

Propeller—R.P.M.

Top Flite nylon	11 x 4	9,600
	10 x 6	9,900
	9 x 6	10,800
	9 x 4	13,500
	8 x 6	13,300
	8 x 4	15,200
K-K nylon	12 x 6	8,500
	12 x 4	9,100
	11 x 6	8,900
	11 x 4	10,400
	10 x 6	10,100
	10 x 4	12,600
	9 x 6	10,500
	9 x 4	13,500
	8 x 6	12,800
	8 x 4	14,700
Frog nylon	9 x 6	12,200



Penetrating comments

DEAR SIR,

I take strong exception to Mr. G. Rees' remark in the February 1964 AEROMODELLER, p. 84, that penetration "does not exist". Indeed his clarification of this supposed "misnomer" suggests a failure to comprehend and understand the penetration phenomenon. For penetration deals with a *dynamic flight condition*, not the static flight condition Mr. Rees details. Mind you, everything he describes about airspeed, ground speed, drift and ground track is *correct*. He has properly treated the "wind triangle" so familiar to air navigators but unfortunately the entire article bears not the slightest relationship to penetration. I will attempt to set the record straight.

To demonstrate what is meant by "penetration" let us start with a hypothetical case. Suppose we have two adjacent air mases (see Fig. 1), one

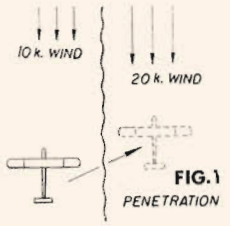


FIG. 1
PENETRATION

moving at 10 knots relative to the ground, the other at 20 knots relative to the ground. Now let's forget the ground since it is irrelevant to the whole discussion. We need only know that a *velocity difference* (of 10k) exists between the air masses. In the slower air mass a model glides at constant airspeed and in equilibrium.

Now let us slip the model into the faster airstream. (Granted some wind shear and mild turbulence exists at the boundary between the two masses but this does not alter what follows). Because the model has mass (that is, due to its inertia) it cannot adjust instantaneously to the 10k difference in speed. *Momentarily* the model finds itself with 10k surplus airspeed! Now a stable model in a given trim condition will fly at a constant airspeed. Thus the equilibrium of forces is momentarily upset, the model (due to the increased drag at the higher speed) begins to decelerate and aerodynamic forces are produced which *attempt* to return the model to its original state of equilibrium. Normally then, a dynamic oscillation results, the model "hunting" around until the original airspeed and equilibrium conditions are re-established in the *new* airmass. The same results are produced slipping the model from the 20k wind into the 10k airmass. It is momentarily deficient of 10k airspeed.

All that is required then to demonstrate good or bad penetration characteristics in a model is velocity fluctuations or variations in the airmass such as those produced by gusts, turbulence or thermal activity. Indeed a model flying in relatively smooth air followed by a thermal penetration is confronted with a change in airspeed AND a change in the direction of the wind vector (see Fig. 2). In this case the

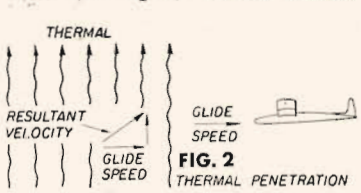


FIG. 2
THERMAL PENETRATION

dynamic response of the model in the longitudinal, lateral and directional sense is involved. A model with good penetration characteristics (fast glide speed, heavy, clean aerodynamics, good dynamic stability) will adjust smoothly to fluctuations in the air mass while one with poor penetration (slow glide, light, sloppy aerodynamics, critical dynamic stability) will perform poorly and might even develop unstable tendencies which might end only in the destruction of the model. This explains models all of us have seen which fly beautifully in still air but seemingly go beserk in windy weather. Their penetration characteristics are poor and their stability so critical that the model cannot adjust to gusty, turbulent conditions.

One more point: There are smooth winds and gusty winds. That is to say it is possible for the wind to be strong (velocity of the airmass is high relative to the ground) even though the moving airmass is relatively free of gusts and turbulence. Gerry Ritz of Chicago, Illinois, discovered this at the 1959 Nordic A/2 Championships when he found that in spite of a high wind his calm weather models performed as they did in still air. In these cases penetration characteristics are unimportant. More usually, however, wind is accompanied by gusts and turbulence as any pilot knows who has watched the beautiful ripple patterns produced by a wind blowing across a

FIG. 3
GUST PATTERN ON A GRAIN FIELD

grain field (see Fig. 3). In this case, given two models with similar still air performance, that model possessing superior penetration will have a definite edge in competition.

LT. WILLARD E. JOHNSON.
Texas, U.S.A.

Dear Sir,

It was with amazement that I read the article in the February issue entitled "Penetration" by G. Rees. Far from clarifying the issue, Mr. Rees shows a complete lack of understanding of the term "Penetration", and only explains the differences between Ground Speed and Airspeed which anyone who has flown models for only a short time should understand.

I agree that if you ask someone *"What is the penetration of your machine?"* it is not possible to give a direct answer. Neither is it possible to ask a car owner *"How good are your brakes?"* and get a direct answer. But it is possible to say *"In what distance will your car stop with a brake pedal pressure of say 20 lbs. at a speed of 30 m.p.h." An answer can* then be given in feet.

Similarly it is possible to measure the gliding angle and sinking speed of a glider at a given AIRSPEED, and in this way the Penetration of different machines may be compared.

I would like to quote an example from Philip Wills' book "On being a bird". An elementary glider has a minimum sinking speed of about 7ft./sec. and a gliding angle of about 1:12 at an airspeed of 30 m.p.h. A high performance machine has a minimum sinking speed of about 2 ft./sec. and a gliding angle of about 1:28 at an airspeed of 40 m.p.h. But at an airspeed of 80 m.p.h. the high performance machine still has a gliding angle of 1:15 and a sinking speed of 7 ft./sec. whereas to obtain this speed the elementary machine as to be dived vertically, in other words it now has a gliding angle of ZERO and its sinking speed is now 80 m.p.h. DOWNWARDS. Surely it can be seen that the high performance has far better penetration than the elementary machine.

I would therefore define penetration thus:— Penetration is the ability of an aircraft to fly fast without a disproportionate increase in sinking speed or gliding angle.

Finally surely even Mr. Rees can see that in certain circumstances, i.e., when slope soaring or flying a radio control model in high winds a machine with good penetration will do better than one with poor penetration.

Re Mr. Rees' reference to increasing the weight of a slope soaring glider; does he not know that increasing the weight of a machine does not increase its gliding angle. It does, however, have to fly a little faster, and its sinking speed is therefore a little greater.

GORDON D. TESTER.
Aberdeen.

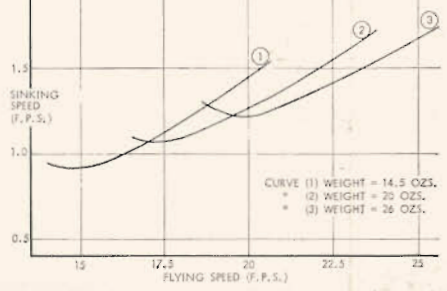
READERS

DEAR SIR,

The statement that "there is no such thing as penetration" was made by Mr. G. Rees in his article on "Penetration" in the February 1964 AEROMODELLER. While agreeing that the term is misapplied in some instances (e.g., circling models in a steady wind as mentioned by Mr. G. Rees) I feel I must point out that the term defines a very real property of both model and full size aircraft. The term is used mostly in the world of full size gliders, one aircraft being said to have "better penetration" than another if it is capable of covering a given distance faster than the other aircraft for the same loss of height. Good penetration is an essential feature of competition gliders as most competition events are organised as races.

The following example will illustrate how the penetration of an aircraft may be varied, and how the term may be correctly applied to model aircraft.

The three curves show the sinking speed in straight flight of a typical A/2 size glider for varying flight speeds (i.e., trimmed to fly at varying CLS) for three separate weights. It will be noted that at each weight there exists a minimum sinking speed, which occurs at a flying speed corresponding to the "minimum power" requirement of the model. This condition is known as the maximum power factor, or $\left(\frac{CL^{1.5}}{CD}\right)$ max. condition. At flying speeds (or CLS) above and below this optimum speed, the sinking speed increases. If we wish this model to fly at 20 fps



in order that it may make headway in a wind for slope soaring purposes, we can do this by a combination of trim and weight. Consider a 14.5 oz. model, we may over-elevate (trim to fly at lower CL) to give the required flight speed, when the sinking speed will be 1.45 fps. Now consider the same model in the trim to give minimum sink, but with ballast added at the CG to bring the weight up to 26 oz. This model will now fly at 20 fps with a sinking speed of 1.22 fps., i.e., It is more economical in terms of sinking speed to obtain the required flying speed by ballasting rather than by over-elevating, in other words the heavy model has "better penetration" than the over-elevated light model. It is clear, therefore, in the example of the slope soarer quoted by Mr. Rees that adding weight *will* in fact increase the "penetration" and that this does not merely increase the flying speed.

Good penetration will be of value in radio controlled models, for instance in a power-off approach in a high wind when the model can fly fast enough to make headway without an inordinate increase in the glide slope. The

LETTERS

performance of heavy multi-models compared with light single channel outfits in these conditions is very marked. It is also worthy of note that if the $\left(\frac{CL^{1\cdot5}}{CD}\right)$ max of a powered model is arranged to be at its normal flying speed when under power, the power requirement is a minimum.

The assumptions made in plotting the curves are given below. Although the figures apply to a hypothetical model the changes in performance brought about by variations of CL and weight are realistic.

Wing Area = 3.2 sq. ft.

A.R. = 12 : 1.

$\frac{CL \text{ at } \left(\frac{CL^{1\cdot5}}{CD}\right)\max}{CD} = 16.4$

$\left(\frac{CL^{1\cdot5}}{CD}\right)\max$ occurs at CL = 0.97.

CDp = 0.03.

Tail effects ignored. R.N. effects on CL, CD over the range of speeds used are ignored. Elliptic lift distribution assumed.

(NOTE :—These are justified when only looking at changes in, rather than calculation of, ultimate performance.)

D. R. WOTTON.

Taplow, Berks.

Author replies

(to comments published last month)

DEAR SIR,

Mr. Webster's remarks are interesting although concerned only with the glide ; my article was intended to be of a more general nature. I could not agree more with his last sentence, my own claim in this respect is some 2,500 *hours flying as a navigator in various aircraft. From this, I can assure Mr. Campbell that drift does depend solely upon heading, airspeed and wind velocity (speed and direction). It is a simple matter of triangles as he would discover if he took Mr. Websters advice. Mr. Anderson has missed the whole point of my article ; his model is 'always' blown backwards when flying into wind.*

The article was written to try to stop such questions one hears as "does it penetrate?" The only answer to the question can be "it depends upon the windspeed", which is meaningless. But, if the airspeed is quoted the questioner can anticipate the model's ground speed in 'any' wind conditions. I agree that a heavy model flying fast is not so easily upset by gusts but surely it is better to say that the model is stable in such conditions rather than that it "penetrates"? All the advocates of the word use it to mean different things, they bring in stability, ground speed, sinking speed and gliding angle at will. The word has no accepted aerodynamic meaning; like Topsy it just grew. My plea is to drop it, now and stick to established aeronautical terms which have a definite meaning, whoever uses them. G. REES.

Maiden Newton, Dorset.

Too heavy ?

DEAR SIR,

I was disturbed to see photographs of an 18 lb. R/C model in your March issue. I feel readers' attention should be drawn to the relevant "Definition and Dimensions of Model Aircraft" contained in the S.M.A.E. Rule Book, which coincide with the F.A.I. recommendations, except in the case of multi engined models, where our specification is more generous.

The relevant passages are :—

(1) The total surface of the wings and horizontal stabilising surface(s) must be less than or equal to 16.4 sq. ft. (150 sq. decimeters).

(2) The total weight must not exceed 11.023 lbs., (5 kilogrammes), except in the case of multi engined control line or radio control models when the maximum weight is 15 lbs.

(3) The maximum cylinder displacement must not exceed 0.61 cu. in. (10 c.c.), except in the case of multi-engined control line or radio control models where the maximum is 20 c.c. but no single engine may have a capacity exceeding 10 c.c.

It is possible that a model not conforming to these specifications, being outside the definition of a model aircraft, would not be covered by "model aircraft" insurance and that a special policy would have to be taken out to obtain third party cover.

N. J. BUTCHER, CHAIRMAN, S.M.A.E.

Brixton.

As mentioned in our issues of Oct. and Nov. 1962, *special exemption from model size restriction is required for models exceeding* 11 *lbs. by the Ministry of Aviation, also it seems, special insurance.*

Enforcing silencers

DEAR SIR,

Every sensible aeromodeller rejoices that—largely because of your efforts—effective silencers are now on sale. If only the pro-silencer case has been given, well, there really is no possible objection to silencers being *available.*

However, a suggestion has been put forward that silencers should be *mandatory* next season. There most certainly is a case against this.

First, it is an unwarrantable assault on the liberty of the individual. True, some fields cannot be used at present noise levels and local rules requiring silencers on these fields are justifiable. But if a modeller chooses to find and travel to an area where he can fly unsilenced, this is his privilege. Personally I love a noisy engine.

Next, it will handicap our international teams. They must have hard competition at home under exact international conditions. I know silenced models have won contests. This does not mean they have no disadvantages, it is only a testimonial to the skill of the pilots who overcame their limitations so successfully.

It is yet another difficulty in the path of the new boys we need so badly. Efficient silencers are big, heavy, cumbersome and dangerous in a crash, they all reduce power to some extent and if they become compulsory, models will go up a size so as to retain present power/weight ratios. Ironically, the new models though more expensive and difficult to build, operate and transport, will be little quieter. A silenced racing '60' is still a noisy brute.

Finally, we know nothing about it How many decibels, of what frequency, how often, how far away, constitutes a nuisance—in a particular locality? Let us not just say "Engines must have silencers". Silencers range from the useless with negligible power loss to the extremely efficient units that cost a fair amount of revs. Nor is it sufficient to rule that "Engines must be reasonably quiet". This is a subjective requirement that will vary from person to person. Detailed, quantitative restrictions are the only fair way. And then, how do we measure the noise? The instruments are expensive and require trained operators.

I have a lot of sympathy for the chaps who have difficulty finding flying fields : but inflicting this irritation on everybody without discrimination will not help. Local conditions may require local rulings. A general restriction is unnecessary, unfair, undesirable and impossible to apply effectively.

FLT. LT. N. FALCONER.

Changi, Singapore 17.

Largest Club ?

DEAR SIR,

With reference to your comment regarding the "Largest Club" in the March issue, we, of the Leicester Model Aero Club would like to place on record not only our current membership, which is 111 fully paid members, but what we believe is an unparalled record of service.

We have operated continuously since 1936, and for the last 16 years have sent a monthly bulletin to all members.

We compile our own annual competition calendar and have over a dozen trophies worth nearly £100, and in addition disburse £20 each year as prize money.

New members receive a badge and sample transfers, and copies of current club rules and other literature.

We hold an annual social, and various indoor meetings, film shows, lectures and auction sales, and have organised car rallies.

The club possesses two typewriters, two rotary duplicators and address duplicating equipment, and even supplies membership cards with protective polythene wallets.

Seven modern stopwatches are available for competitions and records, all winners receiving certificates in addition to trophies and cash prizes.

All members are covered by a group insurance policy, with a £50,000 indemnity wherever they fly as representatives of the club, which is operative from the moment they pay their subscription.

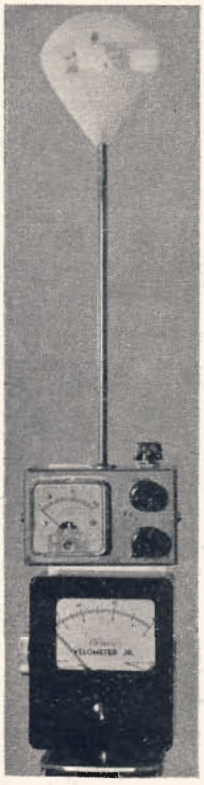
Committee meetings are held monthly without fail and are strictly business affairs, duplicated copies of minutes being circulated in advance.

We rarely hit the competition headlines, and do not claim to be a competition minded club, but we do claim that we offer a better service to aeromodellers than any other club in the midlands—and possibly in the country.

Any takers?

JACK MARSH, CHAIRMAN,
LEICESTER, M.A.C.

Leicester.



Thermal Hunting

Hints 'n tips on how to catch that lift by Jim Baguley

Device at left is the very latest in transistor amplified thermistor temperature change detectors, otherwise known as "neddy boxes" or Thermal Sniffers. It is mounted over a wind strength meter, which in turn is on a tall camera tripod. Scientific approach to Thermal Hunting needs good team work and technique.

IN GREAT BRITAIN thermal hunting is still in its infancy. Most people know when they have hooked a thermal but few can be reasonably certain of keeping the model in the area of rising air.

If the model is adjusted on the tow line so it will not go "to the top" and achieve the full 164 ft. height in calm weather, any small thermal will provide enough lift to give easy recognition of its strength. If you know your model well, you will sometimes notice that it overtakes you or it is pulling slightly over to one side when at the top of the tow. Both these characteristics are easily recognisable as thermal indicators.

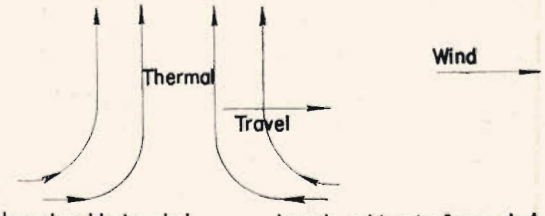
In windy conditions it is less easy to make such distinction, but the same evidence is still applicable and the model will try to go straight overhead even if not accompanied by excessive line tension. If the model is in a downdraught it will tend to lag back on the line. Any line tension above normal will have been caused by gusts.

The author finds he can measure line tension better by holding the winch in one hand and line in the other. Some people use lightweight winches, or completely detach the line. Starting with a 100 ft. of line, pay the line out as the model goes up and maintain the "feel" by using the other hand on the line. As thermals usually give a persistent pull, with downdraughts located before and after them, it is quite easy to distinguish (with practise) the thermal from a gust. To help thermal recognition, always try to take the model up slowly. Long tow hooks are an advantage, except in windy weather when they make release of the line more difficult. In such a case try pulling the model down and then flicking the line up, if you have a good strong wing and ample stall recovery. Some people advise fitting light tissue streamers to the end of the line, so when the thermal comes by, they stand up vertically as a visual indicator.

The author confesses he does not know a sure method of missing the downdraught and keeping in the thermal. Various ideas have been put forward, one being that the greater vertical speed at the centre of the thermal tends to push the model out. The model should move downwind at the same speed as the thermal. The strongest thermals may not always be the best as they could push the model into downdraught. Usually thermals are held to improve duration for long enough, so an extra strong thermal, whilst being good insurance, could lose the model, if one only requires an extra 30 seconds on still air average time to get a max. Usually if the model is "floated" off the line into its natural turn it will tighten up in the thermal. Should a violent stall occur through sudden release with excess line tension the model tends to go into a turn quickly and this can be the best method of release.

Many ideas have been forwarded on how to find thermals. The author uses a model which will hold line tension until the thermal comes along. A clockwork timer helps as one can wait as long as one likes without having a vast length of dethermaliser fuse or any fears of early d/t action. (See AERO-MODELLER January 1963 and April 1962 for systems). In best conditions one can even stand still and wait for a thermal, but in calm one runs out of upwind ground space and in strong wind one runs out of downwind space!

A good approach is to fly before the contest and endeavour to locate regular thermals. Two other dodges are, to wait downwind of the other flyer with the line out and tow off when he obviously catches a thermal or, to wait for a slight lull in the wind and rise in temperature which shows the approach of a thermal. This can be detected by exposed arms, or cheeks of the face, especially on a cold day. There are, of course, also "thermal indicators" using thermistors to indicate a rise in local air temperature.



THERMAL SYMPTOMS

(a) Temperature rise accompanied by lull in wind and followed by gradual increase in wind speed caused by an inrush at the base of the thermal.
(b) The obvious signs of a bird or model already in a thermal.
(c) Timing the thermal pulse if the conditions and terrain are sufficiently consistent.
(d) Sudden appearance of the sun—(debatable).
(e) Changing cloud formation (difficult to discern).
(f) Leeward of an obstruction in low wind conditions, caused by the break up of equilibrium of hot air under cold at local point.
(g) Rising slope in wind giving rise to a standing therma!—followed at the downward side by downdraught.
(h) Slow warming surfaces like water, woods, grass, etc., lose heat later in the day, giving thermals.
(j) Runways, buildings, etc., cause thermals at their junctions with the above during the day.

HELICOPTERS ARE FUN!

says FRANCIS G. BOREHAM who introduces a selection of novelties for indoors or outdoors

BUZZCOPTER is one of a series of underslung engine torque reaction helicopters starting from Francis Boreham's successful "Spraycopter", which flew at N.H. Gala 1961. This model has the advantage of flying either tethered or in free flight and is also capable of rising from the ground.

Auto-rotation is reasonably good even with the two bladed rotor, as the freewheel isolates the engine and propeller unit completely, thus permitting higher rotor r.p.m. and eliminating the drag of the usual top mounted engine.

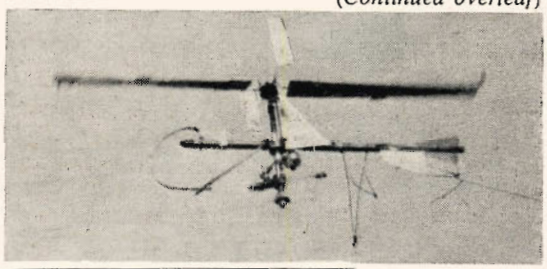
Construction is quite simple and straightforward, though perhaps unusual for the average aeromodeller. It employs many novel components, but can be made easily in the average home "worshop". Main structure is of aluminium tubing but alternatively balsa *could* be used since the design of pylon and engine unit permits the same drive to be mounted in various type fuselages either built up or in flat sheet silhouette form.

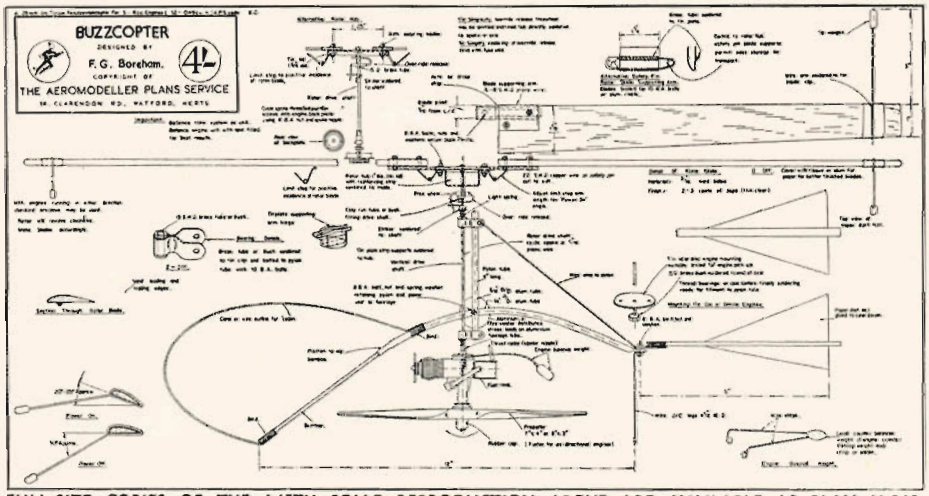
The important top and bottom bearings are brass tubes or bushes soldered to tin clips bolted to the pylon tube, which should be plugged with wood inserts at these points. The vertical drive shaft is a 15 s.w.g. cycle spoke which can be screwed into the engine back plate if it has such a tapping for the tank and locked with nut or screwed nipple. A small bob weight on wire stays balances the offset cylinder and is attached to the engine bearers by small bolts. The fuel tank is a small size tin control line type approximately 1½ x ½ x ½ in. and is retained by a tin clip soldered and then bolted to the bearers opposite the engine cylinder.

Springy wire u/c legs coupled with the bamboo front skid gives necessary ground clearance. Wheels are not fitted as they are not required for vertical take-offs. A rubber grommett or thimble on the propeller nut guards the engine for heavy impacts. The tin lid hub is provided with a brass tube or bush soldered in the centre and should be an easy running fit on the rotor axle.

The rotor blades are connected to the drive shaft by a dog clutch, permitting the blades to free wheel when the engine is not running, and allowing a slower rate of descent. This item, while improving the performance, is not absolutely essential, and those building the simplest possible model may like

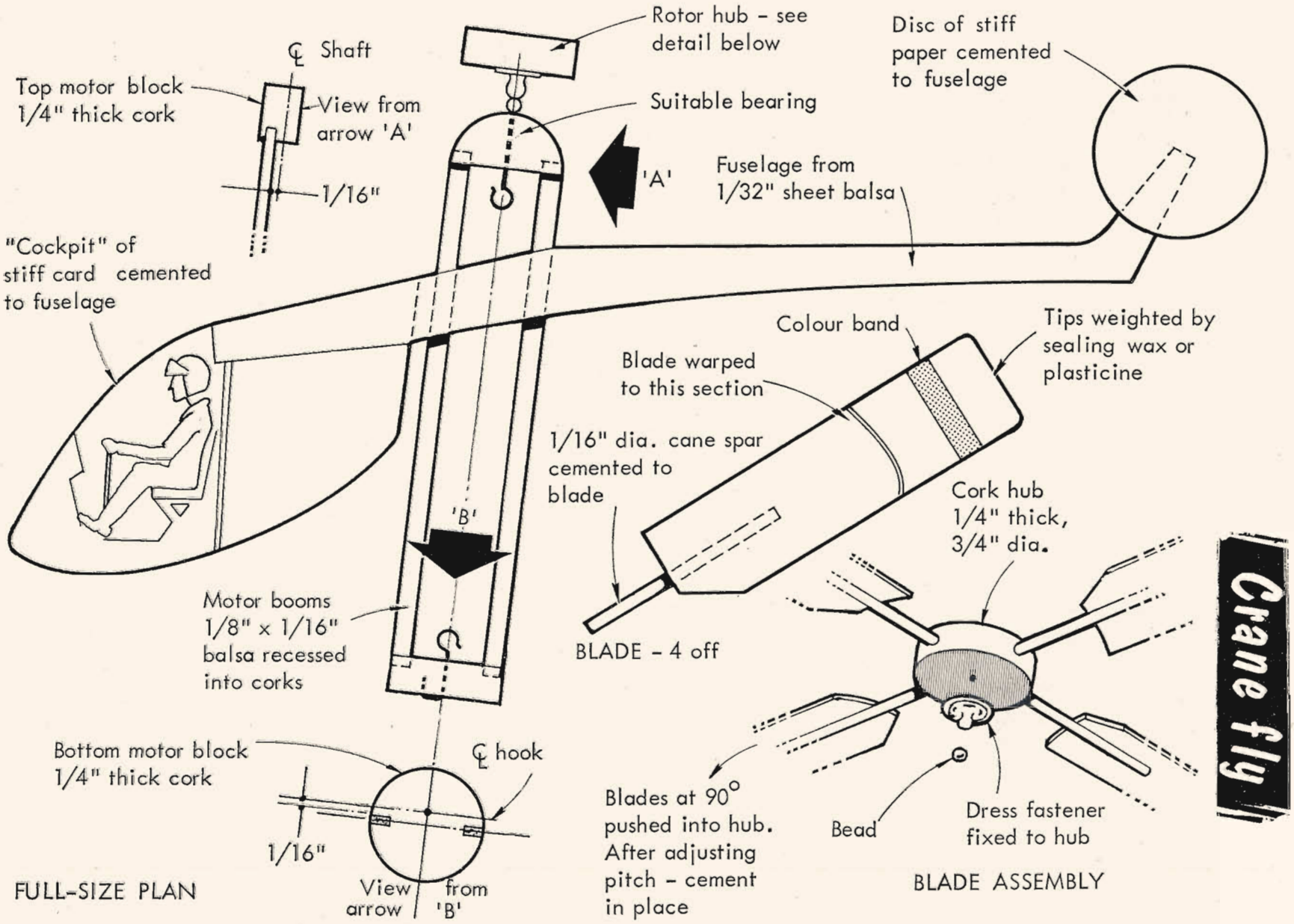
(*Continued overleaf*)





FULL-SIZE COPIES OF THE 1/5TH SCALE REPRODUCTION ABOVE ARE AVAILABLE AS PLAN U.860 PRICE 4/6, INCLUDING POST, FROM AEROMODELLER PLANS SERVICE.

Heading shows Francis Boreham preparing his Buzzcopter for a flight at the Northern Heights Gala, R.A.F. Halton. Photo immediately above shows the Buzzcopter as experimentally fitted with Watteyne vertical vanes at the hub. The stability of this model is quite amazing. For further details of Watteyne helicopter system refer to the current Aeromodeller Annual for 1963/4, when a Watteyne design was published, and Aeromodeller Annual 1961/2 for a complete feature on the use of vertical vanes.


Rotor hub - see detail below
℄ Shaft
Top motor block 1/4" thick cork
View from arrow 'A'
1/16"
Suitable bearing
'A'
Disc of stiff paper cemented to fuselage
Fuselage from 1/32" sheet balsa
"Cockpit" of stiff card cemented to fuselage
Colour band
Tips weighted by sealing wax or plasticine
Blade warped to this section
1/16" dia. cane spar cemented to blade
Cork hub 1/4" thick, 3/4" dia.
'B'
Motor booms 1/8" x 1/16" balsa recessed into corks
BLADE - 4 off
Bottom motor block 1/4" thick cork
℄ hook
1/16"
View arrow 'B' from
Blades at 90° pushed into hub. After adjusting pitch - cement in place
Bead
Dress fastener fixed to hub
FULL-SIZE PLAN
BLADE ASSEMBLY
Crane fly

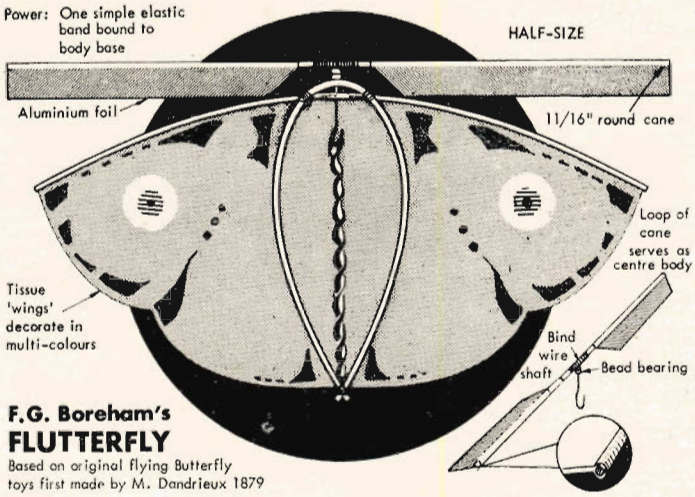
to discard it and lock the rotor hub to the drive shaft by soldering.

Care should be taken to keep the weight as low as possible and all up weight should be under 6 oz. using the Quickstart Dart engine.

It will be realised that a light model will be able to climb higher, and descend more slowly than a heavy model.

For early test flights, try out in calm air and R.O.G. only after experience of several flights. To hand launch, hold the helicopter by the tubular structure in front of stabiliser, and when rotor r.p.m. is steady, simply release — *do not throw* into the air.

For tethered flying use light cord or thread attached to the bolt securing the stabiliser to the fuselage.



F.G. Boreham's
FLUTTERFLY
Based on original flying Butterfly toys first made by M. Dandrieux 1879

Flutterfly is very simple. Start by bending 7½ x 1/16 in. cane to shape of body join by binding at the base. Wing spar is 7 in. of cane bound in position as shown. Drill or make a hole through the cane for the propeller shaft wire to work freely. The propeller is made with a 7 in. cane spar and blades of aluminium paper glued as shown, don't forget a spot of oil on the shaft for best results and climb!

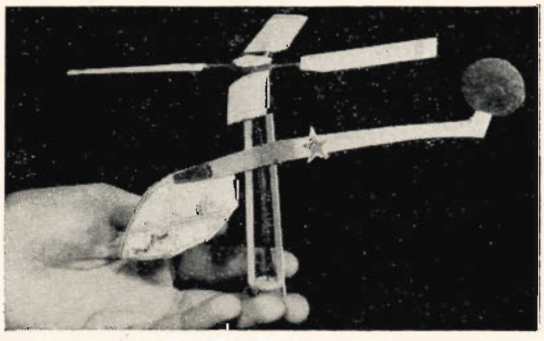
An indoor model

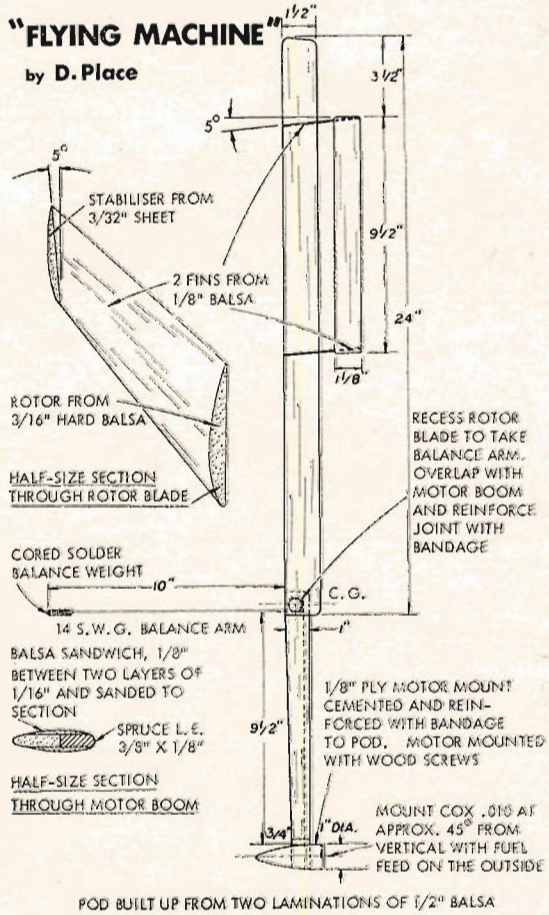
Crane fly full-size plans on page opposite are for something you can make from materials in the scrap box and add household miscellany such as beads for bearings and bottle corks. The drawing itself is self explanatory and photo below illustrates general assembly. It can be made in 90 minutes and will ascend to a considerable height, even on ordinary rubber band power. Adjust the power for a general indoor cruise or outside altitude attempts.

Another approach, but strictly for outdoors, is the **Flying Machine** single blade direct drive helicopter as first introduced by Charles McCutcheon in AEROMODELLER for *July* 1954. These fascinating machines have been widely copied in almost every country throughout the world but particularly so in Soviet zone nations, where they hold many records for altitude distance and duration. Dick Place has produced a miniature version for the little Cox engines and dimension drawings at right enable you to make a most effective replica. Launch with a flick of the wrist at the C.G. position to start rotation and stand back as the flying razor chops its way upwards.

Or perhaps you prefer a novelty made of cane and tissue? Here's one which will flutter wonderfully in any living room and can be made for the most elementary rubber band power.

Crane fly ready for winding and a jaunt around the room.





ABOVE, Josianne and André Merrite from Ivry, Paris, who placed 5th with diamond fuselage, double blade prop, compact design. Below it is Poulain's unusual high thrust design with power model characteristics, placed 3rd. HEADING shows winner Alain Landeau, Paris, with his model made in 1960. BELOW, sheet structures, Daniel Degaugue used two part fuselage, pod and boom and Marc Cheulot, launching his tube fuselage, high pylon design, each with sheet Jedelsky wings.

FRANCE WINS CHALLENGE IN WINTER CUP

THE HUGE SIGN DRAPED around the terminal at London Airport read "Welcome Home Boys". Ten thousand voices rivalled the whine of our Darts in the Viscount as we taxied across the apron . . . but we were leaving as those Beatles arrived. Thus inspired, the British team, Pete Cameron and Bill Horton of Crawley, John O'Donnell (Whitefield), Trevor Faulkner (Luton), Geoff Dallimer (Stevenage), Geoff Kent (Watford Wayfarers) and the editor departed for Paris early on Saturday, February 22nd. We were bound for the annual Coupe d'Hiver event run by **Le Modele Reduit D'Avion,** by invitation of the editor and creator of the class, Maurice Bayet. It was the 20th such event for these small rubber models, rules for which are simple :— Max rubber 10 grammes (.35 oz.), Minimum total weight 80 grammes (2.82 oz.) and Min. fuselage cross-section 20 sq. cm. (3.1 sq. in.).

A good, unaided flight is in the 80-90 seconds range—a thermal assisted "max" therefore shoots one up the results list with handsome encouragement. The class is rapidly gaining recognition for its virtues in many countries outside France and presents a challenge for the expert as well as a fine exercise for the newcomer.

French hospitality began with our welcome by Maurice Bayet in Paris. A quick tour of the City, enjoying sunshine and calm led to luncheon and then a guided visit to that amazing cavern of aeronautica, the Musée de l'Air. Lost in admiration of some of the world's finest scale models, or of early machines restored to original state, and fascinated by this vast collection of the famous aircraft, the team gained quick appreciation for the traditional French flair for the unorthodox. More sight-seeing—and then to business early on Sunday 23rd by coach to the airfield, South East of the city.

George Robson, joined the party to proxy fly his Timperley team mate Ron Brownson's entry. Since one could enter any number of different models, this brought our total strength to 12 entries, of which 9 were flown.

Chavenay is a small hilltop grass surfaced field in rolling farmland. H.Q. was already established as the horizontal windsock indicated strong wind, averaging 20 m.p.h., and a group of early arrivals gave one the familiar aspect of a typical S.M.A.E. Area meeting at full strength. By mid-day the scene had progressively altered to that of a very well supported rally, with long lines of parked cars and

SEE HOW THEY LAUNCH ! Left to right, R.O.G. stances by Pete Cameron (top G.B. flyer—model design published last month), Bernard Raulin and very sleek "Mini-Wake". Bill Horton (G.B.—note "invasion" ident. stripes). C. Tacher with one of the smaller models. 68-year-old Bolek Degler, oldest and furthest travelled competitor up from Perpignan, and lastly Trevor Faulkner (G.B.) for whom R.O.G. was a fascinating experience, of which he would like to see more.

Individual results

1	A. Landeau	47	120	119	**286**
2	B. Mardel	120	120	35	**275**
3	R. Poulain	79	68	120	**267**
4	B. Raulin	71	91	104	**266**
5	A. Meritte	120	62	76	**258**
6	**P. Cameron**	53	117	87	**257**
7	P. Mailfert	99	89	59	**247**
8	**J. O'Donnell**	70	84	77	**231**
9	A. Bussiere	42	86	100	**228**
10	R. Quesnel	86	64	77	**227**
11	**T. Faulkner**	84	82	56	**222**
12	E. Gouverne	120	25	75	**220**
20	**G. W. Dallimer**	60	70	61	**191**
34	P. Cameron	48	43	67	**138**
37	**G. Kent**	67	60	27	**154**
46	G. Dallimer	6	42	80	**128**
48	**W. Horton**	54	37	35	**126**
58	**R. Brownson**	45	24	—	**69**

ANGLO-FRENCH CHALLENGE

(First three from each Nation)

France 828 : Great Britain 710

no less than 137 Coupe d'Hiver models entered and on the field. Of these, organiser M. Pierrard tells us that 75 returned flight times and bearing in mind the weather conditions, these figures give one the most convincing impressions of enthusiasm for the class.

Models came in all shapes, and sizes. Clearly the "Garter Knight" influenced British models were largest on the field, and most conventional. One low-wing which R.o.g'd most realistically and was extraordinarily stable in the wind reminded the editor of his first "Cruiser Pup"—25 years back; Another bore the wartime identity red and yellow stripes of wartime Vichy-French aircraft to show its age, and the winning model was indeed now in its fourth year—Coupe d'Hiver designs are durable! There were all-sheet novelties such as Marc Cheulot's high pylon design; mid-wings; and some small models which could hardly have exceeded 100 sq. in. wing area. René Jossien placed 23rd with a tail-less entry. What appeared to be a ½A power model with a tube replacing a high thrust engine came 3rd for Raymond Poulain, and many entries had separate wing-half assemblies for suitcase transportation. Undoubtedly the most advanced design was Bernard Raulins (4th place) tube fuselage, geodetic wing, outrigger blade double folding prop model and significantly he was leader of those who did not score a "max" of 2 mins. There were only 9 max's recorded in the entire contest.

Since one was permitted complete freedom as to when to fly, the fortunes of the competitors chopped and changed throughout the day. All flights had to rise off ground from a small concrete patch marking the edge of the grass runway or else from specially provided plywood boards so that everyone was faced with the same disadvantage of having to fly over the hump of the hill and down into the ploughed valley into a turbulent area.

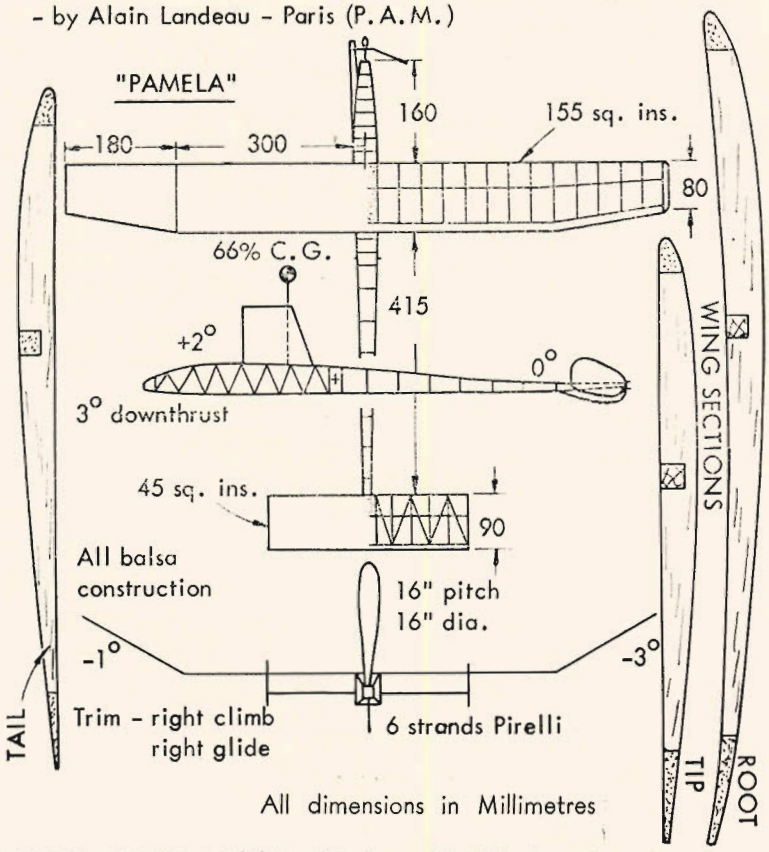
As it happened, only one of the British flights managed to get clear of this area for a near maximum and that was Pete Cameron's 2nd flight, made during the most favourable weather at mid-day, just before the rains came, and lasted till the 4 p.m. close. John O'Donnell was especially unlucky in his second flight. The model travelled some distance down into the valley and practically severed the wing on a barbed wire fence. Extensive repairs were made in the shelter kindly provided by the organisers and the third flight made at the last possible moment. Another to suffer from broken wings was Bill Horton and George Robson was unlucky in having the wing mount damaged on the proxy model, repairs and wet wings deterring the adventure out for a third flight until it was just too late and contest was closed.

Geoff Dallimer's best performance was actually with his second model, all the flights for 20th place being made in the rain and showing a good consistency, whilst damp tissue so affected Geoff Kent's third flight he lost a potential 15 or so places. Whilst six strands of 6 mm. Pirelli was an almost universal choice for power, T. Faulkner used seven strands and Pete Cameron eight strands of 3/16 x 1/24 Dunlop. There was nothing concrete to be learned for a lead toward design trends or techniques and perhaps that is the one most important and pleasant aspect of the open chance one has in Coupe d'Hiver.

This was one of those grand events where individual victory was far less important than the enjoyment of the competition. The amicable spirit flowed through prize-giving, where practically every competitor received some souvenir to take home, to the final send off in the Aero Club "Gaston Caudron" bar to a champagne toast for the next time, and a return of the challenge match.

1963 COUPE D'HIVER WINNER

- by Alain Landeau - Paris (P.A.M.)



Winning model details above shown design changes from the original Beissac "Smissio", 1958 winning design we published in Dec. 1961. Airfoils full size.

BRISTOL WINTER RALLY

The Bristol and West M.A.C. Winter Rally held on February 2nd at Blakehill Farm Airfield was well supported in all events except Open Rubber. By 9 a.m. competitors had already arrived from as far afield as York and Bournemouth. Conditions were "average" with favourable wind direction and overcast sky. That up and coming all-rounder Dave Wiseman of York was first away to record a max. in ½A Power, but only 1:26 on his second flight. This was typical of the conditions throughout the day with down draughts as common as lift. A tow line check proved to be a good lie detector, some nylon lines were found to stretch 20 ft. on the 4½ lb. pull test. Open glider attracted the largest entry of 41. Dave Wiseman of York won with a time of 8:54 followed by Mike Burrows of St. Albans with 8:37. In the "All In" event a combination of F.A.I. power/rubber/glider, three power models came out tops followed by three rubber models and then the gliders. Open Rubber had only six fliers but three of these managed a full score, Wells of Hornchurch winning with a time of 4:43 from Jack North of Croydon with 2:54. John O'Donnell lead the ½A power event with a full score flying his conventional "Laiden Maiden" with a T.D. .049 for power. Second place man G. Cornell of Croydon had too wide a trim on the model and the timekeeper clocked it off just before 3:00. Peter Manville made up for his 3rd place in F.A.I. by winning open power with a full score. Many of the Open Power models were based on George Fuller's famous "Dixieclander". J. O'Donnell again walked off with the Rally Championship. Results as follows. **Open Glider** (41 entries) 1. D. Wiseman, York 8:54. 2. M. Burrows, St. Albans 8:37. 3. P. Newall, Surbiton 7:51. **All F.A.I.** (26 entries) 1. B. Nicholson, Canterbury 9:00. 2. Sladden, Canterbury 8:45. 3. P. Manville, Bournemouth 8:19. **Open Rubber** (8 entries) 1. Wells, Hornchurch 9:00 + 4:43. 2. R. J. North, Croydon 9:00 + 2:54. 3. R. L. Bailey, Oxford 9:00 + 2:25. **½A Power** (13 entries) 1. J. O'Donnell, Whitefield 9:00. 2. G. Cornell, Croydon 8:52. 3. D. Hipperson, Croydon 8:19. **Open Power** (22 entries) 1. P. Manville, Bournemouth 9:00. 2. J. O'Donnell, Whitefield 8:33. 3. G. Cornell, Croydon 8:02. **Rally Champion.** 1. J. O'Donnell 28:44.

At Bristol Winter Rally, Blakehill Farm, P. Manville made a perfect score to win Open Power.

Timperley Mixture

Conditions were not ideal on February 9th for Timperley D.M.F.C. Rally. In addition to open free flight, Chuck glider, "Old Time" rubber were on the programme. Power was J. O'Donnell's victory with an aggregate of 8:35. Chuck glider went to Ron Brownson of Timperley who also won the Chuck Glider at the last N.W. Area two day event, the prize for that being an electric massage machine (which seems to have been effective!). Open glider was won by R. Fiddler of Ashton with 6:56. "Fillibusters" filled first two "Old Time" places, B. Faulkner of Cheadle doing 6:26 to lead L. Massy of Timperley, followed by R. Brownson with "Upstairs Maid".

Rats and Jets

Sharston M.A.C. has a membership of nearly 50 and their first control line event of the season, a Rat-Race was held on February 2nd. Because of the early darkness the final was abandoned and so three members tied for first place. Two Rossi and one O.S. jet are on order from abroad and the club is hoping to experiment with these and two home made jets. Any modellers in the Manchester area are welcome to club meetings at Sharston Hall, held every Friday evening.

New Modelling Clubs

Chadderton Grammar School, Lancs, have formed a club under the direction of their chemistry master Dr. Hitchin and wish to contact other local schools for competition purposes.

Wakefield Radio Control Society, Yorks, is, as the name implies, a specialist group. Local modellers with R/C interests should contact Harry Clifton, 12 Milnthorpe Lane, Sandal, Wakefield.

Maidenhead and District M.A.C. have changed their name back to the original **Rebels M.A.C.** due to confusion between the two Maidenhead clubs. Local modellers should contact A. F. Clements, 8 Cornwall Close, Spencer's Estate, Maidenhead, Berks.

Regular club meetings have been resumed by **Watford Wayfarers** at Derby Road Primary School, 7.30 p.m. on the last Friday each month. The new secretary is H. J. Webber, 93 Tudor Avenue, Watford.

A new S.A.A. club in Scotland is **Larkhill Orbiters** with control line interest as the name implies, contact J. Strang, 2 Cherryhill View, Larkhill.

CLUB AND CONTEST NEWS

Fog Bound at Chobham

Croydon's Winter Gala on February 16th at Chobham Common was mist bound with only 200-300 yards visibility and zero drift. Events were run with five 2 minute maxes. Top in ½A Power was Dave Hipperson of Croydon with four maxes and one flight O.O.S. upwards into the fog at 10 seconds. It took three hours to find the model as the fog came down to 10 yards at dusk. Coupe d'Hiver was a walk-over for J. O'Donnell. Jim Baguley took his timekeeper to another part of the Common and did some slope flying with the timekeeper at the bottom of the slope. Results were **½A Power.** 1. D. Hipperson, Croydon 8:10. 2. G. Head, Portsmouth 8:03. 3. V. Taylor, St. Albans 5:50. **Coupe d'Hiver.** 1. J. O'Donnell, Whitefield 7:01. 2. Fleetwood, Hornchurch 6:09. 3. G. Kent, Watford Wayfarers 5:52. **A/1 Glider.** 1. J. Baguley, Hayes 9:09. 2. J. Barker, St. Albans 8:56. 3. A. Young, St. Albans 7:22.

South Wales Activity

Swansea M.A.C. is a newly re-formed club and at present at 36 strong and a local newspaper has given them excellent publicity. Team Racing is the most popular activity, with stunt models a close second. Club meetings are held every other Saturday evening in the Swansea Y.M.C.A. hall. Negotiations are taking place with the local council for a permanent flying site and the Mayor is providing his support.

Weight Lifters

Chingford M.F.C. held a P.A.A. load contest for R.T.P. models using .8 c.c. engines with 80 sq. in. wing area. Winning model by J. Aldrige lifted no less than 1¾ lbs.! This club flies regularly at Chingford Plains where they are busily practising for the season's combat events.

Celebrating after their fine Annual Dinner with fellow Northern Area members are modellers in the 1963 Champion Team, with their Trophy. Held at Leeds, the function was much enlivened by Blackburn Aircraft Club's entertaining film show and mock Brains Trust.

ST. ALBANS A/1 and VINTAGE CONTEST

Held on January 26th at Chobham the St. Albans M.A.C. A/1 and Vintage contest had good weather and vintage times. In this event G. Head of Portsmouth took first place with a "Mercury Mallard" powereed by a Cox T.D. .09 for 8:22 (he was restricted to 10 second engine run). Second place went to A. Mussell of Brighton flying an Ohlsson 60 powered "Gismoe" to 6:50. Rubber took third place in the form of a "G.H.20 Wakefield" by J. E. Oulds of Crawley. In the A/1 event Jim Baguley of Hayes took first with 7:42, followed by J. Barker of St. Albans with 7:48.

SOUTH OF SCOTLAND WINTER RALLY

Held on January 26th at Abbotsinch the **Scottish Winter Rally** had disappointing weather and a poor combat entry. Listed as a "Sassenach", John O'Donnell (now moving to Stevenage and South Midland Area) won both rubber and power. In view of the distance he had come they gave him 75 per cent of the entry fee instead of the intended 50 per cent. In F.A.I. team race fastest time went to J. Reid of Dumbarton M.A.C. using an Oliver Tiger for a 4:58 heat. Class B team race had a four man final and after J. Pinkerton's unstable model had crashed Paddy Breen won using a Rivers Silver Arrow. Junior interest was high in ½A. Eddie Black of G.S.A. retains form to win A/2 convincingly as a consistent all weather flier.

RESULTS

Rubber. 1. J. O'Donnell, Sassanach 8:44. 2. J. Arnott, Kirkcaldy 5:28. 3. F. Ballardie, Scotmac 3:00. **Power.** 1. J. O'Donnel, Sassanach 7:03. 2. F. Ballardie, Scotmac 6:25. 3. T. Toolan, Sassanach 3:00. **Glider.** 1. E. Black, G.S.A. 8:10. 2. T. Preston, Edinburgh 5:07. 3. B. Harris, Prestwick 4:13. **½A T/R.** 1. J. Pinkerton, Hornets 12:06. 2. D. Gordon, Hornets 12:42. 3. R. Barnes, Larkhall 58 laps. **F.A.I. T/R.** 1. J. Reid, Dumbarton 9:57. 2. J. Pinkerton, Hornets 12:43. 3. J. Bisland, Dumbarton 78 laps. **Class B T/R.** 1. P. Brenn, Prestwich 10:26. 2. D. Mitchell, Prestwick 11:44. 3. D. Gordon, Hornets, 75 laps. Stunt. 1. D. Pinkerton, Hornets.

Pertinent notice at Blackehill Farm Airfield seen during the Bristol Winter Rally.

R.A.F. Club in Germany

R.A.F. Geilenkirchen model club P.R.O. Mick Taylor (ex-Laindon M.F.C.) writes to say that despite difficulties in obtaining materials and a pathetic lack of members (even in the Royal 'Air' Force) the club has done well in R.A.F. Germany contests, particularly in Combat and Rat-Racing. They also hope to enter a team in the 1964 German Nationals.

Miss Mary McKechnie, presents the Leask Cup to Eddie Black for Open Glider at the S.A.A. A.G.M.

New London Rally
(includes Beginners Stunt Event)

Finchley Fliers M.A.C. have now obtained a flying site from the local council to use during the summer for a control line rally. Also they have a floodlight playground for night flying. Their Control Line Gala will be held on May 31st and commence at 10 a.m. Events are ½A Combat, A Combat, Stunt Class A, Stunt Class B, and all classes of Rat-Racing. Pre-entry 2/6d. by May 1st to K. D. Lesser, 20 Squires Lane, Finchley, London, N.3. All entries will be acknowledged by May 10th. Class "A" stunt is a beginners event with a maximum engine capacity of 2.5 c.c. Rat-Racing will be run to F.A.S.T.E. rules (Aeromodeller Plans Handbook page 86). All contestants must have S.M.A.E. membership. Part of the entry fees will be given in aid of a handicapped children's charity.

Contest Calendar

March 22nd *G.M.A.C. Hornets Rally.* Abbotsinch Airfield. R/G/P, ½A and B T/R, Combat.

March 29-30th *North Western Area Easter Meeting.* R.A.F. Tern Hill 10 miles south of Whitchurch (Salop) on A.41. "Sunday 29": Open Rubber, Open Power, F.A.I. T/R, Combat, C/L Stunt, R/C Scale. "Monday 30th": Open Glider, Combined F.A.I. F/F Event, B T/R, ½A T/R, Combat, Multi R/C, F/F Scale. Pre-Entry forms from G. K. Mutch, 90 Wolverham Road, Ellesmere Port, Cheshire.

April 5th *Farnborough M.A.C. Easter Monday Bank Holiday Spot Landing R/C Competition.* Chobham Common. Pre-Entry 2/6d. and details from J. Goldsmith, 14 Leopold Ave., Farnborough, Hants.

April 5th *Rolls-Royce Welfare M.A.C.* Pylon Race meeting. Thulston Field, four miles south of Derby. Single Channel, Multi and Multi-relay Race. Pre-Entry forms from F. N. Dawson, 42 Hollis Street, Alvaston, Derby.

April 12th *Bristol R/C M.A.C.* Pylon Racing, two classes: (i) For Pylon Dusters only; (ii) Open to any R/C model. At R.A.F. Hullavington, Wilts.

May 3rd *South Bristol M.A.C.* Vintage Model contest, Blakehill Farm airfield. R/G/P., Jetex, Chuck Glider, and C/L Stunt (1950 S.M.A.E. pattern). All models pre 1.1.51.

May 31st *Finchley Fliers C/L Gala,* Glebe Land, Finchley, London, N.12. ½A Combat, A Combat, Stunt Class A, Stunt Class B, Rat-Racing all classes (F.A.S.T.E. Rules). Pre-Entry 2/6d. by 1.5.64 to K. D. Lesser, 20 Squires Lane, Finchley, London, N.3.

May 31st *Barnstormers/Kirkaldy Rally* Abbotsinch Airfield. R/G/P, ½A, A and B, T/R, Combat.

S.M.A.E. Contest Programme

March 22nd *K.M.A.A. Cup (A/2 Glider); Frog Senior Cup* (Open Power); F.A.I., Rubber. *At Area Venues.*

April 19th *Gamage Cup* (Open Rubber); *Pilcher Cup* (Open Glider); F.A.I. Power. *At Area Venues.*

April 19th Centralised C/L events *at R.A.F. Tern Hill.*

April 19th Multi Radio Control at *Woburn Abbey.*

May 3rd F.A.I. Control Line Team Trials *at R.A.F. Barkston Heath or Wigsley.*

May 16th or 17th *British National Championships at venue to be announced.* Thurston Cup (U/R Glider); Women's Cup (G/R/P); Lady Shelley Cup (Tailless); S.M.A.E. Trophy (Radio Control Multi); Scale Flights (Radio Control); Scale Flights (Free Flight); Scale Flights (Control Line); Gold Trophy (C/L Stunt); Team Racing (Class A); Combat (Prelim. Heats); Speed (Classes 1, 2, and 3).

May 17th or 18th Model Aircraft (U/R Rubber); Sir John Shelley (U/R Power); P.A.A. Load (Payload); S.M.A.E. Trophy (Radio Multi); Scale judging (Radio Control); Scale judging (Control line); Scale judging (Free Flight); Team Racing (Class ½A); Team Racing (Class B); Combat (Heats and Finals); Speed (Classes 4, 5 and 6).

May 31st *White Cup* (Open Power). *Frog Junior Trophy* (Open Glider/Rubber), *Flight Cup* (Open Rubber) *Area Venues.*

May 31st Centralised C/L events at *Topcliffe* (nr. Thirsk).

June 14th Multi Radio Control *Centralised.*

June 21st *Scottish Gala. Abbotsinch Airfield.* Open R/G/P, ½A Power. Class A and B T/R.

August 2nd and 3rd *North Western Gala.* S.M.A.E. Cup (A/2 glider), Quickstart Trophy (½A Power). C.M.A. Cup (Open Glider). Halifax Trophy (F.A.I. Power), Gutteridge Trophy (F.A.I. Rubber). Open Rubber and Open Power. C/L events to be arranged.

July 26th *Aeromodeller Trophy.* Radio control Multi *Centralised.*

robbe

telecont

ITC MODEL CRAFT

GREMLIN

WE HAVE ALREADY ANNOUNCED to the Trade the formation of a "consortium" or trade association between the undermentioned companies by which we shall operate collectively with resulting benefits all down the line . . . the dealer will have a wider range under the one account . . . the modeller buyer a far wider selection possible from even the very small model shop. Just see some of the goods we are handling . . .

ROBBE

POWER BOATS
- Albatross 35½" R/C 80/–
- Albatross Fitting kit 56/8
- Korsar 28" R/C 123/10

SAILING BOATS
- Pamir 23" 52/6

MOTOR BOATS
- Royal 24½" R/C 34/11
- Nice 24¼" R/C 34/11

GLIDERS
- Monsun A.1 45½" 42/8
- Rhonadler A.2 scale 73¼" R/C 102/11

RADIO CONTROL PLANES
- Pan 51½" 85/6
- Klemm 35 50" scale 101/–
- Thor 64¼" 181/6

CONTROL LINE
- Focke-Wulf P149D 29½" scale 72/4

TELECONT

RADIO CONTROL EQUIPMENT

All transistor, leather case, telescopic aerial and DEAC installed :
- 3-chan. Tx £39.12.0 inc. tax
- 5-chan. Tx £46.14.0 inc. tax
- 9-chan. Tx £59.15.0 inc. tax

Receivers :
- 3-chan. £22.15.0 inc. tax
- 5-chan. £34.14.0 inc. tax
- 9-chan. £46. 0.0 inc. tax

ESTRAL

I.T.C. AND COMET RANGES

CAM A MATIC ACTION
- Mercer Raceabout 106/6
- Battling Betsy Tank 95/9

REMOTE CONTROL
- 1925 Ford T 40/6

EXHIBIT MODELS
- Yacht "Water Witch" 74/3
- M.14 Korean Battler 66/6

Earth Science
- Tyrannosaurus Rex 23/11

Scale Plastic Planes
- Martin Bomber 11/9

MILITARY MASTERPIECES
- T-92 Airdrop Tank 26/9

MINIATURE MASTERPIECES
- Assorted 5/6

SILVER DOGS
- Boxer 26/9

READY-TO-FLY PLANES
- P-40 Tiger Shark 109/11

REDI-FLITE JNR.
- Assorted 7/6

GREMLIN

Control Line kits	Kitten Trainer	16/6
	Chipmunk	19/11
	Star Shooter	25/11
	Imp	14/10
	Wizard	14/10
Combat	Wildcat	26/11
Stunt	Tony De Luxe	119/6
	Tony Basic	99/6
	Navy Fighter	46/11
F/Flight	Ballerina	14/11
Radio Control	Sky-Stinger	69/6
	Lancer	99/6
	Navigator	130/–

Accessories
- R/C clunk tanks all sizes
- Nylon 6/9 sq. yd.
- Nylon Rudder horns 1/9
- Metal control horns
- Full range Bellcranks.

Epoxy Resin Paints
- Red, white, yellow, blue, black, green 4 oz. 5/6

YOUR MODEL SHOP STOCKS WHAT YOU WANT !

MAKE SURE THEY KNOW YOUR WANTS !

IF IT FLIES OR IS MODELABLE THEN WE HAVE IT FOR YOUR DEALER.

SEE ROBBE, TELECONT, GREMLIN, ITC MODELCRAFT PRODUCTS AT YOUR MODEL SHOP . . . THEY CAN STOCK UP IN HOURS IF NEED BE . . . WE WILL BE DELIGHTED TO ASSIST

BRADSHAW MODEL PRODUCTS
ESTRAL MODELS LTD.

SKOL-KITS LTD

Sole Distributors in The United Kingdom & Northern Ireland

166 Mile End Road, London, E.1

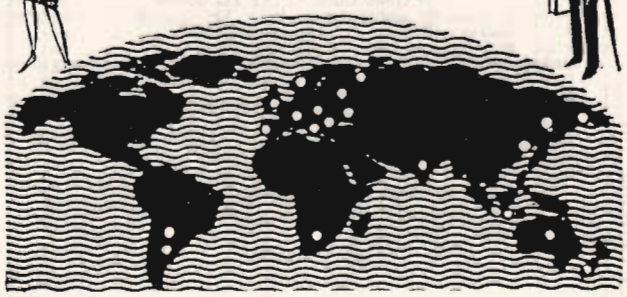
Tel.: Stepney Green 1972

Equado

BALSAWOOD

IN DEMAND THROUGHOUT THE WORLD

SINGAPORE · SWITZERLAND · HOLLAND
PARAGUAY · ARGENTINE · PORTUGAL
YUGOSLAVIA · SOUTH AFRICA · BELGIUM
MALTA · FINLAND · INDIA · NEW ZEALAND
AUSTRALIA · ITALY · THE CONTINENT
NORWAY · MALAYA



More and more satisfied clients the world over receive their regular shipments of "Equado"—such is the popularity of this fine balsawood used by modellers everywhere.

"Equado" balsawood is supplied in metric and English sizes.

TRADE PRICE LISTS ON APPLICATION TO SOLE MANUFACTURERS & SHIPPERS

E. LAW & SON

(TIMBER) LTD.

272-274 HIGH STREET, SUTTON, SURREY

TELEPHONE: VIGilant 8291-2

CLASSIFIED ADVERTISEMENTS

PRESS DATE for issue May, 1964, March 23rd, 1964

ADVERTISEMENT RATES:

Private Minimum 18 words 6/- and 4d. per extra word.
Trade Minimum 18 words 12/- and 8d. per extra word.

Box Numbers to count as six words when costing.

Box replies to be sent care of Advertisement Departmnt, Model Aeronautical Press Ltd., 38 Clarendon Road, Watford. Copy received after first post on the 23rd will be held over until the next issue, unless cancelled in writing before 10th of following month.

FOR SALE

MUST SELL. Octone Tx. and 10 channel relayless Rx. £17 10s. 6 engines in perfect condition ; 2 Paw 19, 1 Veco 19 Glow, and 1 Cox TD 09 Glow £3 each. 1 Paw 1.49 £2 15s. 1 AM .15 £2. 1 K.K. Marquis and 1 Veron Pinto £1 each. R. Clarke, 5 The Pastures, Cheriton, Alresford, Hants.

Racers 35/- each, O.S. Max 29 25/-, Super Fury 30/-, ED 3.46 25/-. Engines for spares :— Hornet, AM 15 and Bees 10/- each. ED PC1 transmitter. Boomerang receiver and OS compound escapement £5 o.n.o. RX1 tone receiver AF output assembled 60/-. 3½ in. airtrap wheels 5/-. 6 volts electric motor ideal for boat 10/-. Large box of assorted components 20/-. Plans S.A.E. for details. Bailey, 23 Tedder Road, Kinloss, Forres, Morayshire, Scotland.

"Terrytone Mk. II" receiver 70/- ; MacGregor tone transmitter 70/-, relayless "U.K." tone receiver 40/- ; "Gasser" pylon racer 20/- ; Partly built Graupner "Amigo" 71 in. R/C glider kit 20/- ; complete bound set "Radio Control Models & Electronics" (47 issues), offers. Edwards, 5 St. Francis Crescent, Salisbury.

SELLING UP CHEAP ! O.S. 29 (rebore) 50/- ; Enya 19 40/- ; Eta 15 (new) 80/- ; Oliver (mod.) 80/- ; O.S. 15D 60/- ; O.S. 15 I and II 40/- ; A.M. 15 20/- ; 48 props 40/-. Miller, 'Braemar', Cranfield, Bletchley, Bucks.

AM 25, £2 ; AM 15, £1 10s. ; Frog 80, £1. Props., C.L. wire, test stand, etc., £1. "Aeromodellers" Jan. 61-Dec. 63, and some A.P.S. plans £2 10s. Thomas, Graylands, High Lanes, Ongar, Essex.

All issues R.C.M. & E. to Aug. 1962, 30/-. "Aeromodellers", 40 issues, 1943-1950, £2, January 1953 to March 1962 inclusive, £5. 55 issues "Model Aircraft" 1954 to 1960, 30/- "Model Airplane News", Jan. 1959 to May 1962, plus annuals, mint, £4. £13 lot. Caldwell, 23 Murrayshall Road, Scone, Perthshire.

GIVING UP. Little used Rivers Silver Streak 2.5 £3. Silver Arrow (3.5 c.c.) £3. Mills 0.75 30/-. Test stand 7/6d. Plans 5/-. Fuel tanks, balsa, etc. Offers INVITED for all. Francis, 41 Eastern Avenue, Reading.

R.E.P. Unitone Tx. and Rx. used only in glider, £8 10s. A.M. 35 £2. Unimatic actuator new £2. Hurrikan 1.48 diesel, new £3. E. Nicholls, 81 Wolseley Street, Reading.

Frog 349 BB, good condition, 60/- ; AM 15, 30/-. Leggate, Holt Farm, Turnby, Mareham-Le-Fen, Boston, Lincs.

Completed unflown Taurus. Superhet FM. Tx. Rx. 10 ch. 5 amplified servos wired to Rx. Deacs switches. Deac charger. Super Tigre 51. Cost £183, quick sale £90. E. Diamond, 4 Acacia Road, Guildford, Surrey. Phone 66009.

Home built Transmitter and Receiver (Minirep circuit), perfect £4. Ground based Tone Transmitter control box aerial £2. R. Stewart, 3 Edson Road, Higher Crumpsall, Manchester 8.

Retiring. 2 Cubs £2 10s. each. 1 Oliver Tiger £2, good condition. 2 Oliver Tiger crankcases, 3 barrels, £1 10s. Mackay, 234 Preston New Road, Blackpool.

New K & B 15R and pan £3, perfect Merco 35 £2 10s., excellent E.T.A. 15D, £2. Wilson, Rosemount, Bobmore Lane, Marlow, Bucks.

Eta .29 Mk. V £4, new Venner 2 volt accumulator £1. Dunkley, 45 Cromer Road, Finedon, Wellingborough, Northants.

20 recent Aeromodellers and Model Aircrafts. S.A.E. for list. E.D. Bee 25/-. Sutcliffe, '12 Bells', 12 Lewis Lane, Cirencester.

Rossi Vulcan Jet, new and unused, £10 o.n.o. J. Griffith, 38 Little Reeves Avenue, Amersham, Bucks.

Veco 19/R.C. £5 10s., Otarion receiver £7 10s.—both brand new, unused with instructions. Edwards, 101 High Street, Stevenage. Phone Stevenage 906.

Dual proportional Marcytone Rx., unused 90/-. Two boxed MK multi-servos 50/- each. Box No. 721.

'Aeromodellers', Sept. '54 to present, complete and in good condition. Offers. Templeman, 49 Ridgeway Road, Timperley, Cheshire.

Cox 15 Special, never run, unwanted present, 126/- plus postage. P. Sole, 31 Albert Street, Northampton.

Veco 19 50/- ; Eta 29 VI 70/- ; Super Fury 32/- ; Tuned Torpedo 19 80/- ; McCoy 35 27/- ; Cub II 90/- ; Frog 500 25/- ; A.M. 25 28/-. S.A.E. enquiries, G. Adams, 145 Sturge Avenue, Walthamstow, London, E.17.

R.E.P. Quadratone Tx. and matched Rx. Two Musclemites, all new and unused. Bargain £35. Harris, 1 Northdown Court, Godstone, Surrey.

A.S. .55 diesel, not even bench run, 35/- ; C/L to suit, 10/-. "Aeromodellers" (January '61 to date) 10/- per year. 12 Rye Crescent, Cople, Bedford.

Min-X single channel Tx, £9 10s. J-Que single channel Rx with built in relay, £3 10s. O.B.M. mini servo, £1 5s. (£14 the lot) All o.n.o. Moore, 19 Leighton Road, Wing, Leighton Buzzard, Beds.

K.K. Spectre kit, less tank 27/6d. E.D. Hornet excellent 30/-. DC Rapier excellent 60/-. ETA 29 Mk. VIC, still boxed £5 10s. John Lakefield, Aelybryn Drive, Llanelly, Carms.

WANTED

Vol. 7 Aircraft of the Fighting Powers and pre-1954 Royal Flying Reviews. Mr. Prior, 7 Norton Close, Cambridge.

WANTED

Bound volume 1957-8 R.A.F. Flying Review, good condition. R. A. Love, 1401 McCullough N.E., Huntsville, Alabama, U.S.A. (Alabama 35801).

Aerial Warfare, Aviation, Airship Zeppelin Books, Magazines (Sales Lists—4d.). Letchford, 116 Bohemia Road, St. Leonards, Sussex.

Stunt Queen kit or plan. B. Gitsham, 65 Beechwood Road, Caterham Valley, Surrey.

Plan 'Sunnanvind' condition immaterial 4/-. January 1954 Aeromodeller good condition 2/6d. Markham, 213 Park Lane, Frampton Cotterell, Bristol.

Keil Kraft handbook and catalogue for 1958-1959-1960 and 1962, stating price, year and condition. D. Sadler, 39 Greenstead Road, Colchester, Essex.

TRADE

AMERICAN KITS. Tauri £8 6s. ; Taurus £14 10s. ; Schoolboy £1 12s. 6d. ; Schoolmaster £2 12s. 6d. ; Nobler £3 18s. 6d. ; Misbehavin' £18 10s. (super prefab) ; Falcon Sr. £4 7s. 6d. ; Skylark £5 13s. 6d. ; Viking (FAI) £3 1s. 6d. ; Duckhawk £11 11s. 6d. ; Hustler £8 15s. 6d. ; Citation £11 15s. ; Rudderbird £5 4s. 6d. ; Sterling Mustang £11 18s. 6d. ; Sterling P-63, Kingcobra £11 18s. 6d. ; Ares £5 4s. 6d. ; Smoothie £3 19s. 6d. ; Thunderbird £4 17s. 6d. Henry J. Nicholls & Son Ltd., 308 Holloway Road, London, N.7. Tel. : NORth 4272.

Rossi 60, 10 c.c., £17 ; G.20 Super Tigre Rossi, modified, £8 ; G.21, 5 c.c., modified, £10 ; Speed pan for G.20 with spinner, £1 ; G.21 pan, £1 5s. ; G.20, etc., team race pan, 13/- ; 4 grades glow plugs, 4/- each ; Vulcan jet, £12 ; 6 x 8, 6 x 9, 6 x 10 speed props, 3/- ; 7 x 8, 7 x 9, 7 x 10, 3/2d. Rossi, Via Pace 13, Brescia, Italy.

Send 5/- and S.A.E. for the "Phillips" bumper bundle of 1939/45 squadron insignia transfers plus R.A.F. roundels and American stars. Phillips Transfers Ltd., Woodford Green, Essex.

Watford and District enthusiasts, a visit to the Hobby Centre is a must. 53 Market Street, Watford.

Ex-Government Stop Watches, 45/-. Illustrated leaflet on request. CHARLES FRANK, 67-73 Saltmarket, Glasgow, C.1.

TATONE TIMERS—Standard or ½A Fuel Shut-Offs or D-Ts. Price now 33/- each, post free, from Dave Posner, 61b Canfield Gardens, London, N.W.6.

His-Air-Dec Decals, British, U.S.A., German, 8½ x 11 in. sheet, 7/6d. HIS-AIR-DEC MAGAZINE, 24/- p.a. B.M.W. (Models), 329 Haydons Road, S.W.19.

APOLOGIES—If you've written and received no reply. Normal "service by return" resumed after MARCH 18th. Ed Johnson.

"LaGrotto", Model Supplies, 1 St. John's Road, Gt. Clacton, Essex. Phone 736. Keil Kraft, Ripmax, Frog, Yeoman, kits, accessories, engines, etc. 'Radio Control', R.E.P., R.C.S., Graupner, repairs and servicing. 'Special' repairs for Home Build enthusiasts. Tx's, Rx's built to order. Enquiries S.A.E.

BOOKS

MODEL NEWS (Australia)—published Bi-monthly, 12/- per year, sterling posted direct, covers all Australasian Aeromodelling in pictures, features and plans. 11 West King Street, Southport, Queensland, Australia.

"SAILPLANE & GLIDING"—Published every month. Send stamped addressed envelope for descriptive leaflet ; or 3/4d. for current copy ; or £1 for a year's subscription to British Gliding Association, Dept. "A", 19 Park Lane, London, W.1.

American Magazines. Year's subscription "Model Airplane News" 46/6d. ; "American Modeller" 35/6d. ; "R/C Modeller" 46/6d. Full catalogue free. Willen Ltd., (Dept. 1), 61a Broadway, London, E.15.

AEROMODELLER back issue Mart. Vast stocks of back issues held in stock. Beaumont, 2A Ridge Avenue, London, N.21.

Model-Avia, the model magazine that covers the world of model flying. Edited in French. Send for free specimen and subscription details : Model-Avia, 31 rue du Printemps, Bruxelles 5, Belgium.

Wanted, Janes Fighting Ships and Aircraft, also R.F.C. books. Wg. Cdr. F. E. F. Prince, The Sheilings, Wonersh, Surrey.

GLIDING

Gliding holidays at Doncaster Airport. Inexpensive 5 day instructional courses for beginners. Details from : J. W. Hayes, 24 Regina Crescent, Havercroft, Nr. Wakefield, Yorks.

EXCHANGE

Twin Aqua-lung, Tarzan wet suit, weight belt, mask, fins, etc. Will exchange for multi job. Details—Williams, 10 Third Avenue, Dovercourt, Essex.

Exchange 8 M/M. 3 lens cine camera holiday metermatic, also Brownie 8-58 projector with films, for best multi R/C equipment and servos offered. Value around £30. Also 4 ft. 6 in. electric boat R/C complete, what offers. Phone Romford, Essex, 46922.

K & B 15 R, brand new, block and pressure tank, for 15 or 19 R/C glow, or £4 10s. cash. Box No. 722.

BIRMINGHAM Tel: NOR 5569

THE MODEL MECCA
204 WITTON ROAD,
BIRMINGHAM 6

Aircraft, Boats, Trains, etc., B'ham's Telecont Radio agents. "Gena" Fibre Glass Hulls.

BIRMINGHAM Tel: EAS 0872

THE PERRYS
769 Alum Rock Road, Ward End
520 Coventry Road, Small Heath
Birmingham 10. Tel: Vic. 4917

British and Imported Engines, Radio Control, Model Racing Car Sets and Accessories Kraft and Citizenship Radio Control stockists. **All Nation Mail Order Service.**

BLACKPOOL Tel: 24695

MODEL CRAFT
24a DEANSGATE,
BLACKPOOL

Agents: Skol-Kits, Keilkraft, Revell, Monogram, Taplin, Jena E.D., Thimbledrome, McCoy.

BLACKPOOL Tel: 27402

THE MODEL SHOP
75-77 CAUNCE STREET

KITS & ACCESSORIES
Keil, Ripmax, Airfix, etc.

BOLTON Tel: 27097

ROLAND SCOTT LTD.
Mail Order Specialists

The obvious shop for all your modelling requirments. The showroom of the North.
Phone your order ANYTIME
147 DERBY STREET

BOURNEMOUTH Parkstone 3981

WESTBOURNE MODEL SUPPLIES
2 Grand Cinema Buildings,
Poole Road, Bournemouth West

The shop that meets a modeller's needs — so why not visit us when in Bournemouth.

BRADFORD Tel: 26186

THE MODEL SHOP
182 MANNINGHAM LANE
(Opp. Bellevue School)

Kits, Engines, Radio, Accessories. Yorkshire's Telecont stockists. Solarbo balsa, silk, dope, plywood, etc. Mail Order. S.A.E. for lists.

CHICHESTER Tel: 3592

PLANET MODELS & HANDICRAFTS
108 THE HORNET,
CHICHESTER, SUSSEX

Aircraft and Boat Kits. All Accessories "Tri-ang", "Trix", "Scalextric" Personal Service. Mail Orders.

DONCASTER Tel: 2524

B. CUTTRISS & SONS

MODELS AND HANDICRAFTS
40 DUKE STREET

Call and see our Shop

GLASGOW Central 5630

CALEDONIA MODEL Co.
Model & Precision Engineers
478 ARGYLE STREET, GLASGOW, C.2

Everything in aircraft, watercraft, railways, race cars. Spares, repairs, re-bores, re-builds. Parts made to order, etc.

GUILDFORD Tel.: Guildford 2274

PASCALLS MODEL SHOP
E. PASCALL (GUILDFORD) LTD.
Opposite Astor Cinema
105 WOODBRIDGE ROAD, GUILDFORD

Stockist of all leading makes of model kits and accessories.
Mail Order Service. M.E.T.A. Dealer

HAYES Hayes 7671

MAC'S
3 BROADWAY PARADE, COLDHARBOUR LANE, HAYES, MIDDX.

Hayes' most active hobby centre. Meet and learn from the experts.

HEMEL HEMPSTEAD Tel: Boxmoor 6800

TAYLOR & McKENNA
(Hemel) LTD.
206 MARLOWES
HEMEL HEMPSTEAD, HERTS

For Model Boats, Aircraft, Railways, Racing Cars and Accessories.

HORSHAM Tel: 2932

DAVID PIGGOTT
2 BISHOPRIC, HORSHAM

Kits by Keil, Frog, Veron, etc., and a very large range of Engines.

Send S.A.E. for lists.

IPSWICH Tel.: 51195

EAST ANGLIAN SUPPLIES
37-39a UPPER ORWELL STREET

Race Cars, Radio, Boats, Model Aircraft, Fishing Tackle, Guns. Mail order, Home or Abroad.

KIDDERMINSTER

MODEL MART
2 Comberton Road (opp. Railway Station)

We are Aeromodelling enthusiasts, and wish to help you with your requirements.
MAIL ORDER SERVICE
Headquarters: Kidderminster District F.C.

LANCASTER Tel: 3031

THE MODEL SHOP
8 CHINA STREET

Large stocks of all Plastic and Flying Kits, Engines and Accessories, Scalextric Roadways. Tri-ang and Lone Star Electric Railways.

LEEDS Tel: 27891

THE MODEL SHOP
58 MERRION STREET
(Nr. Tower Cinema)

Model Aircraft—boats—cars—railways, all makes engines. Every accessory, R/C equipment, same day postal service.

LEIGH Tel: 72673

LEIGH MODEL CENTRE
Mail Order Specialists
KITS—ENGINES—R/C
ANYTHING NEW—WE HAVE IT
97 RAILWAY ROAD

LINCOLN Tel: 27088

THE MODEL MAKERS MECCA
13 CLASKETGATE
(Next door to Theatre Royal)

Large stocks of all Plastic and Flying Kits, Engines & Accessories, Scalextric Roadways, Tri-ang and Lone Star electric railways.

LONDON Tel: STE 1972

ANGEL
166 MILE END ROAD,
LONDON, E.1.

YOUR Modelling needs are here. The enthusiasts' shop run by enthusiasts!! Full range of Kits and Accessories. Open all day Saturday.

LONDON CHE 4887

BLACKBURN MODELS LIMITED
146 MERTON ROAD,
WIMBLEDON, S.W.19

Complete range — Veron, Keilkraft, Frog. 14 brands in plastic kits. Radio equipment and boat accessories.

LONDON Tel. MIL 2877

H. A. BLUNT & SONS LTD.
Mill Hill Circus, London, N.W.7.

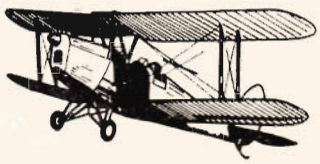
Complete range of model aircraft, engines and accessories, boats, cars and railways.

YEOMAN QUICKBUILDS

The most exciting range of pre-fabricated, pre-decorated kits in the world . . . each model a wonderful flyer. Every sheet balsa part is pre-cut . . . every assembly stage is covered completely and clearly by pictorial step-by-step plans . . . no tissue covering to do . . . no messy doping . . . just assemble each model ready to fly !

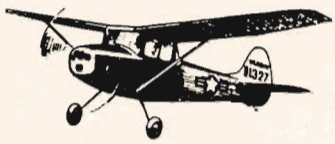
19" span AUSTER AUTOCAR

Top post-war British lightplane with a wonderful flying performance. Model duplicates all main detail of the original, pre-decorated in authentic trim and markings.



15" span D.H. TIGER MOTH

World famous trainer aircraft, stable, steady flyer. Pre-decorated in yellow colour scheme with British civil registration. Scaled from works drawings.



19" span CESSNA BIRDDOG

Wonderful flyer. Popular choice for flying scale, this model is really 'tops' in performance. Pre-decorated in military markings, etc. Could adapt to small glo motor power.

16" span PIPER PACER

Stubby, rugged model pre-decorated in dazzling orange and blue colour sheme and American civil markings. Kit also includes detail for making Tri-Pacer version.

18" span D.H. PUSS MOTH

Outstanding British lightplane of the 1930's pre-decorated in red colour scheme and civil registration. Scale undercarriage for exhibition or cantilever type for flying.

Each model features interlocking assembly - parts automatically key together for rapid, accurate building. Simple jigs make the biplanes dead easy! Pre-scored sheets bends readily to form curved panels, etc.

- **Completely pictorial assembling and flying instructions, plus quality in every part.**

QUICKBUILDS are the last word in PERFABRICATED PREDECORATED all-balsa models. They make model building a pleasure rather than a trial!

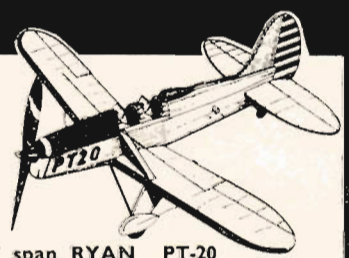
PRICE 6/6 EACH MODEL

19" span AERONCA SEDAN

Largest model in the range, beautifully pre-decorated in maroon colour scheme and civil markings. Large area wing big enough to take a small glo motor if you want to adapt !

18¼" span DORNIER Do 17

A magnificent flying model which faithfully duplicates the "character" of the full size aircraft. Scale realism unequalled for its type.

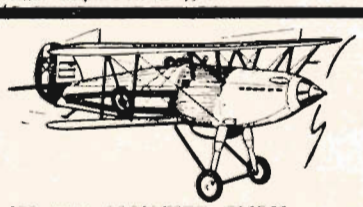


17" span RYAN PT-20

A beautiful low wing monoplane which flies as well as it looks! Fully pre-fabricated the PT-20 is finished in dual-tone blue and yellow.

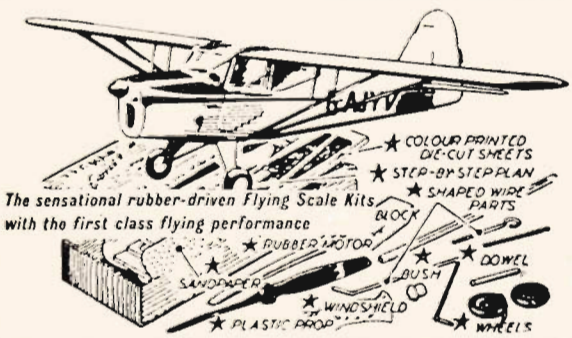
15" span GLOSTER GLADIATOR

Famous Royal Air Force biplane which makes a grand flying model. RAF markings and squadron insignia, fully detailed wing ribs, panel lines, etc.



15" span HAWKER FURY

Terrific value in kits! Easily formed decking, cowl, etc. Model colour-printed in authentic Royal Air Force squadron markings.



The sensational rubber-driven Flying Scale Kits with the first class flying performance

"QUICKBUILDS" set a new standard in pre-fabricated kit models. Every single sheet part is accurately die-cut and pre-coloured or printed. Easy to identify, easy to assemble. Each kit contains accurate die-cut sheet wood, block balsa (shaped where necessary) — die-cut windshield — plastic wheels — plastic propeller, nosebutton — shaped propeller shaft—rubber band motor, etc.—everything you need to complete the model, except balsa cement.

MANUFACTURED AND DISTRIBUTED BY

A. A. HALES LIMITED

26 STATION CLOSE, POTTERS BAR, MIDDLESEX

(Telephone : PR 52226)

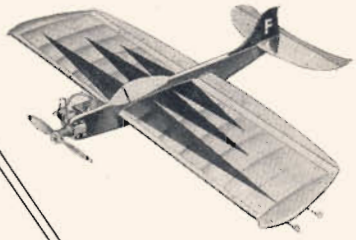
Made and Printed in Great Britain by Bletchley Printers Ltd., Central Gardens, Bletchley, Bucks, for the Proprietors, The Model Aeronautical Press Ltd., 38 Clarendon Road, Watford, Herts. Published by the Argus Press Ltd., 23-27 Tudor Street, London, E.C.4, to whom all trade enquiries should be addressed. Registered at the G.P.O. for transmission by Canadian Magazine Post.

GET TOP PERFORMANCE WITH A KEILKRAFT CONTROLINER

RADIAN stunt model

with coupled wing flaps and elevators

The latest thing in small stunt controliners for 049 motors. Kit contents include die-cut parts, stunt tank, preformed U/C, formed canopy, all hardware, full size plan and instructions. 22" wingspan. **19/4**



FIREFLY

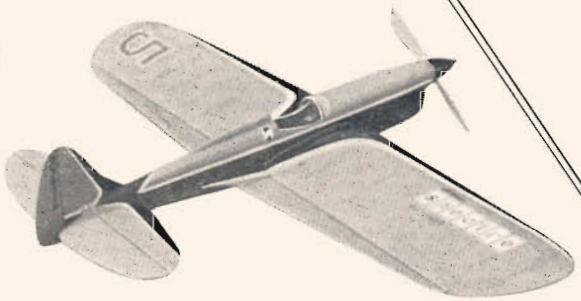
Stunt model with "profile" type fuselage, specially designed for engines under 1 c.c. Kit contains die-cut parts. Wingspan 20". **18/2**

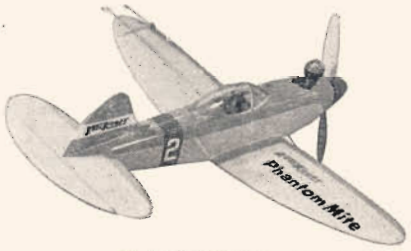
TALON

Combat design of considerable strength. Easy and quick to build. A fully aerobatic model that is great fun to fly. For 2.5 to 3.5 c.c. engines. Wingspan 32". **27/11**

SPECTRE

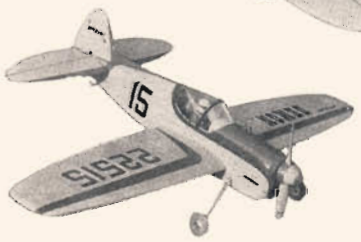
Outstanding stunt model featuring combined wing flap and elevator control. Wing ribs, formers, etc., die-cut in highest quality balsa. For 2.5 to 3.5 c.c. engines. Wingspan 41". **41/9**





PHANTOM MITE

The Phantom Mite is just about the toughest model available to the newcomer to control line flying. Features all sheet construction with wings, tailplane, fin and fuselage sides ready cut to shape. For .5 to .8 c.c. motors. Wingspan 16". **16/3**



DEMON

Class A team racer to the new S.M.A.E. specification. Kit contains die-cut parts. For engines up to 2.5 c.c. Wingspan 30". **33/1**

MARQUIS

A very fine looking stunt model with attractive semi-scale lines, featuring tricycle undercarriage and extra large cockpit. For 1 to 1.5 c.c. engines. Wingspan 30". **36/10**

IDEAL FOR THE NOVICE

KEILKRAFT FOR TOP PERFORMANCE