

MODEL AIRCRAFT



I'6

**NOVEMBER
1957**

FARNBOROUGH AIR DISPLAY FEATURE

SAY

Skyleada

NOTE TO RETAILERS
Modellers everywhere are
now insisting on "SKY-
LEADA" branded Balsa
because of its consistent
high quality. Write for
list at VERY competitive
prices.

FIRST

For BETTER Value in Model Aircraft Kits

JUST LOOK AT THE BIG WING-
SPAN of these Rubber-Powered
Models of Popular Aircraft you
can build from Kits at only

3/9 each inc. P.T.

26" AUSTER
26" GRASSHOPPER
24" CESSNA BIRD DOG
24" PIPER SUPER CRUISER
24" COMPER SWIFT
24" PUSS MOTH
20" TIGER MOTH
20" HAWKER FURY
24" SHORT SEAMEW

and a

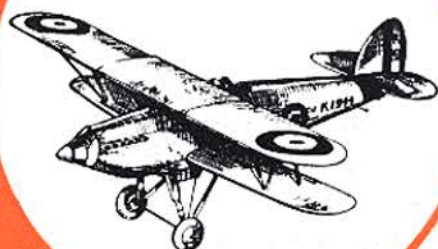
SAILPLANE GLIDER
32" SEAGULL

Series also includes

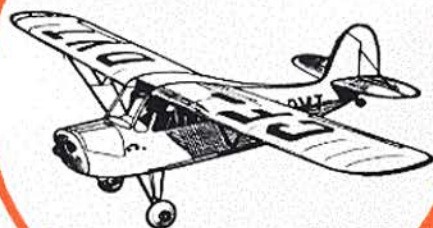
JETEX 50 POWERED
FOLLAND GNAT
PERCIVAL JET PROVOST
GLOSTER JAVELIN
HAWKER HUNTER
SUPERMARINE SWIFT
D.H. COMET
D.H. VENOM
D.H. 110
AVRO VULCAN
AVRO 707A
M.I.G. 15
U.S. NAVY CUTLASS
THUNDERJET
MYSTERE IV
SUPER SABRE
SABRE F.86

NOW AVAILABLE FROM YOUR
RETAILER

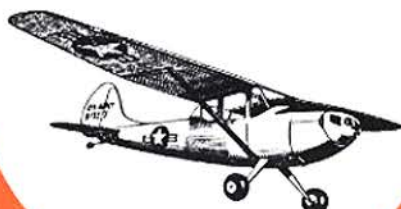
36" SPAN HUSKY



20" HAWKER FURY



24" PIPER SUPER CRUISER



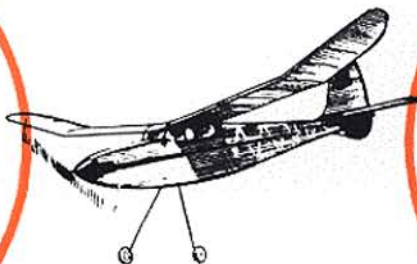
24" CESSNA BIRD DOG



20" TIGER MOTH

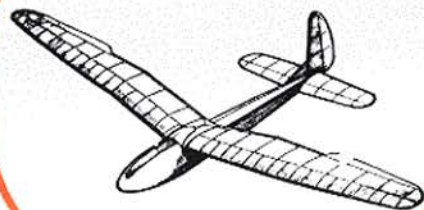


24" SHORT SEAMEW



A DE LUXE KIT which includes a
14" FINISHED BALSA PROPELLER
An easy to build Duration Model with
a really exceptional performance.

12/9 inc. P.T.

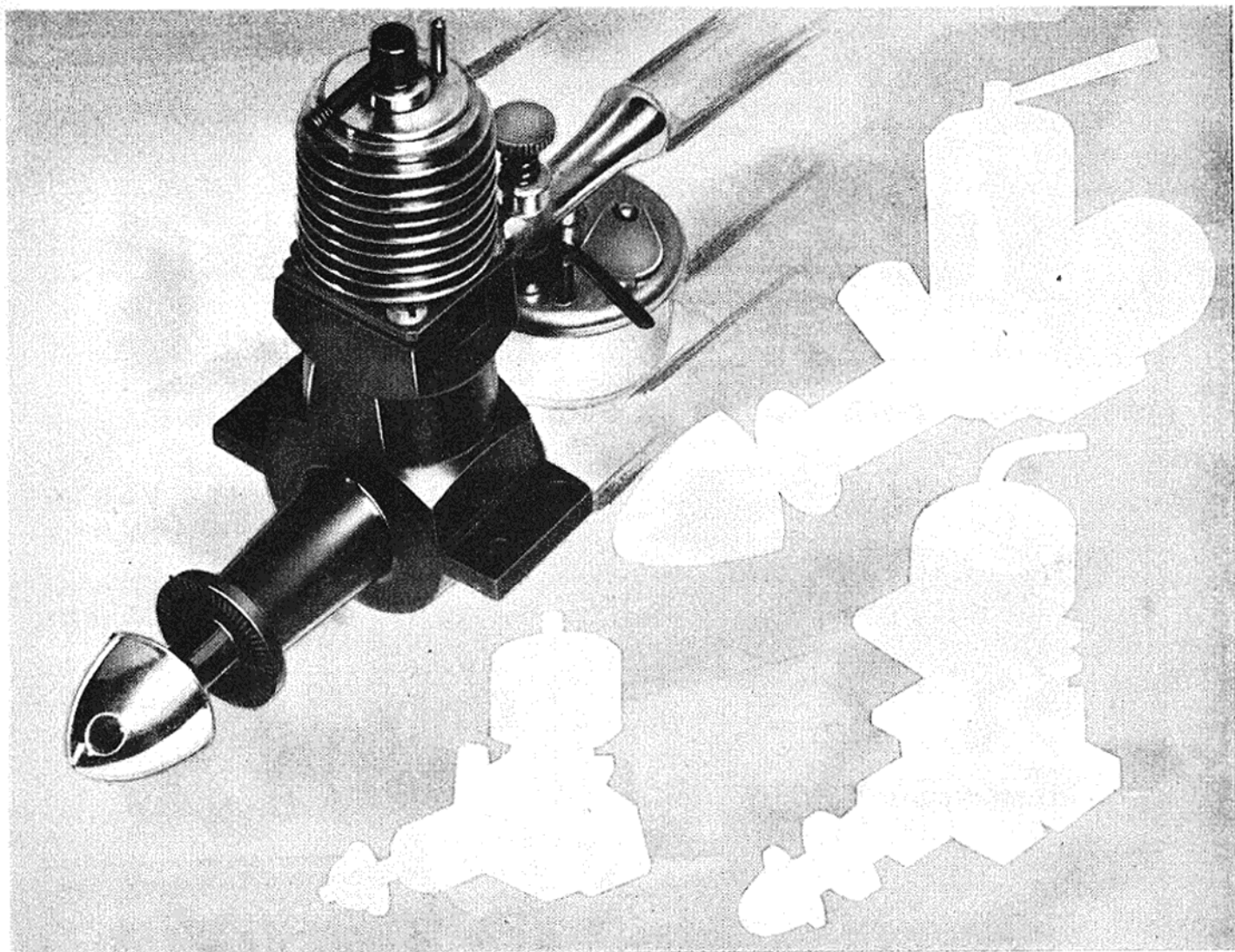


32" SEAGULL

NOTE TO MODELLERS
For better modelling insist
on "SKYLEADA" branded
Balsa and be sure of get-
ting THE best.

Ask your retailer for a copy of the NEW detailed illustrated leaflet or send us a
stamped addressed envelope. Note to retailers: If you have not already received
a supply send a post card direct to us

BRITISH MODEL AIRCRAFT MFG. CO. LTD. 180 LONDON ROAD
MITCHAM · SURREY



stands out above all

For trouble-free flying you cannot beat the Mills. It's the world's most reliable starter, built to maintain its excellent qualities under the most arduous conditions. This dependable engine is the surest guarantee for successful model flying.

P.75 without cut-out 59/8d.
S.75 with fuel cut-out 65/7d.
1.3 " " " " 89/5d.
Prices include purchase tax.



MILLS BROS (Model Engineers) LTD | 143 GOLDSWORTH ROAD WOKING SURREY

Please mention MODEL AIRCRAFT in your reply to Advertisers

The Latest

VULCAN

FOR
VALUE

Plastic Kits

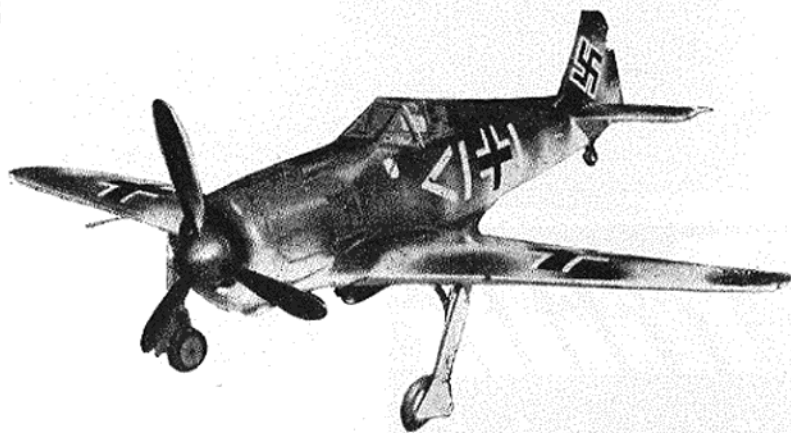
Add these superb models to your range of 1/96" Scale Models



Messerschmitt 109G

- ALL PLASTIC PARTS MOULDED TO SHAPE
- AUTHENTIC TRANSFERS AND CEMENT INCLUDED IN KIT.

only 2/6 Including Purchase Tax



Focke Wulfe 190

**ALL THE BEST
MODEL AND TOY
SHOPS STOCK
VULCAN MODELS**

EXPORT ENQUIRIES TO
MODEL EXPORTS LTD.,
4 Drapers Gardens,
Throgmorton Street,
London, E.C.2.

Manufactured by

DORKING FOUNDRY LTD., 62 WEST ST., DORKING, SURREY



'LEARN ABOUT HORSES'



'MAN WITH A HOBBY'



COMMERCE WAY · LANCING · SUSSEX
Telephone: LANCING 2866-7
Telegrams: SOLARBO WORTHING

DIRECTORS: J. V. PATTERSON & MICK R. FULLER M. H. FARMORE

There is an Arab proverb which goes something like this -

He who knows not and knows not that he knows not
is a fool - shun him.
He who knows not and knows that he knows not
wishes to learn - teach him.
He who knows and knows not that he knows
is asleep - wake him.
He who knows and knows that he knows
is a wise man - follow him.

Knowledge is necessary for full enjoyment and, indeed, I am inclined to think that the happy people in this world are the people who know most. I said recently that I thought the man with a hobby is a contented man - I think that is saying the same thing in a different way.

The Aero-modeller going to a Model Rally gets far more enjoyment than the casual looker-on. He can appreciate what is happening and so fully enjoy it.

One of the things I've always endeavoured to do with my own family is to see that they have hobbies. I have had to learn a lot myself in the process but I have also acquired a lot more enjoyment of things like sailing, to take one example.

Now, I am having to start all over again to learn about horses with my small daughter. All I have learnt so far is that when they breed on your too they hurt, and what a fool I feel when, for lack of experience with them, things don't go right! In a year's time I shall know a lot about horses, but there will always be a lot of people who know a lot more than I do!

The real difficulty seems to be to assess how much you know. The "know-all" is not generally the most knowledgeable. On the other hand no one achieves much without confidence in himself.

Perhaps I could add to the proverb -

"He who knows a little but thinks he knows a lot
is a conceited ass - kick him!"

P.S. We sell Balsawood.

Mr. Paterson

BALSA TIPS . . . No. 7

Try doping both sides of printed sheet before cutting, if the wood is at all brittle or the parts are intricate and close together. This will help bind the wood fibres and reduce the risk of splitting as well as giving a cleaner appearance after sanding.



**THE BEST
TIP OF ALL
ALWAYS
ASK FOR
SOLARBO
BALSA**



**THE BEST BALSA YOU CAN BUY COMES FROM
SOLARBO LTD · COMMERCE WAY · LANCING · ENGLAND**
Phone: LANCING 2866-7 Grams: SOLARBO, WORTHING

PLANS

Published in recent issues
of "Model Aircraft"

PRICES OF ALL PLANS INCLUDE POSTAGE

RUBBER-DRIVEN

- M.A. 180. Toucan, by John Palmer 6s. 0d.
This carefully planned "new rule" Wakefield model won the Gutteridge Trophy in 1953.
- M.A. 195. Thermaleer, by B. T. Faulkner 5s. 0d.
A 36 in. span lightweight rubber duration model which has won many contests.
- M.A. 219. Chaletma, by J. Fuller 5s. 6d.
A robust high-wing cabin model of simple construction that will give plenty of trouble-free flying. Span 48 in.
- M.A. 255. Ruskie, by W. Pullen 6s. 0d.
A well-proven Wakefield design which has done well in National contests. Span 43 in.
- M.A. 258. Ottair, by G. J. Lefever 5s. 6d.
This contest-winning Wakefield model can be built to the old or new F.A.I. formula. Span 48 in.

GLIDERS

- M.A. 222. Oberon, by J. van Hattum 5s. 6d.
This open-competition glider is of simple construction with attractive lines, good aerodynamic form and easy trimming characteristics. Span 58 in., length 38 in., weight 11 oz.
- M.A. 226. Mutant, by W. P. Woodrow 3s. 6d.
A lightweight, open class sailplane, designed to prove that strength need not be associated with weight, but can be obtained by constructional methods. Span 48 in.
- M.A. 243. High Noon, by A. J. Longstaffe 5s. 6d.
Developed from a highly successful series of designs, this A/2 glider is a potential competition winner. Length 37 in., span 72 in.
- M.A. 248. Wanderer 10, by J. Baguley 4s. 6d.
A 68 in. wing span glider that can be flown as a lightweight in open contests or, suitably ballasted, as an A/2.
- M.A. 263. Yeti II, by T. Coward 5s. 0d.
An A/1 glider for slope or tow launching with proven contest performance. Span 42 in., length 36 in.

CONTROL-LINE

- M.A. 244. Alien, by W. P. Woodrow 3s. 6d.
A Class A team racer designed to conform to latest practice by using the "split" fuselage type of construction. Span 24 in., length 19 in.
- M.A. 247. De Havilland Chipmunk, by Frank Buckland 4s. 6d.
An authentic C/L model of the famous R.A.F. training aircraft. Suitable for 2.5-5.0 c.c. engines. Span 40 in., length 28 in.
- M.A. 249. Zeke 5-2, by M. F. Hawkins 3s. 6d.
A C/L scale model of one of the best-known Japanese fighters of the last war. Suitable for 1.5-2.5 c.c. engines. Span 27 in., length 22 in.
- M.A. 251. Bell Airacobra, by B. Reggiano 5s. 6d.
This U.S. Air Force World War II fighter makes a fine, sleek-looking control-line scale model suitable for 2-3.5 c.c. engines.

- M.A. 253. Nucleus, by W. P. Woodrow 3s. 6d.
An attractive-looking delta-winged team racer for Class A or B. Span 22 in.
- M.A. 256. Nurk, by M. Bassett 3s. 6d.
This Class 1-A team racer has many contest wins to its credit and is capable of speeds of over 75 m.p.h. Span 21 in.
- M.A. 257. P-40 Warhawk, by R. Taccani 3s. 6d.
A very realistic control-line scale model of a famous American fighter. Suitable for 1-1.5 c.c. engines. Span 21 in.
- M.A. 259. Great Lakes Trainer, by A. D. Kingswood 5s. 6d.
A very attractive biplane which makes a fine control-line model. For 2.5-3.5 c.c. engines. Span 28 in.
- M.A. 267. The Tramp, by Wiestaw Schier (two sheets) 8s. 0d.
An all-in-one C/L composite from Poland that can be flown as a biplane, monoplane, seaplane or ski plane, yet is quite simple to build. Span 35½ in., length 23½ in.
- M.A. 262. Gee-Bee Q.E.D., by P. M. H. Lewis 5s. 0d.
A scale C/L model of the famous 700 h.p. P. & W. S5E Hornet-powered Q.E.D. which took part in the England to Australia Air Race of 1934. Span 24½ in., length 20 in.

POWER-DRIVEN

- M.A. 239. M.K. Sportster, by Hoh Fang Chiun 3s. 6d.
A pleasing-looking model for 0.5 c.c.-1.0 c.c. engines, which is a very stable flyer. Length 26 in., span 39 in.
- M.A. 245. Sunstreak, by Brian Faulkner 4s. 6d.
An easy-to-build, easy-to-fly duration model for 0.5-0.8 c.c. engines. Span 36 in., length 34 in.
- M.A. 246. Helio Courier, by J. Fergusson 5s. 0d.
A one inch to the foot scale model of an unusual prototype built for the U.S. Army. Length 29 in., span 39 in.
- M.A. 250. Colonial Skimmer, by E. Fearnley 5s. 6d.
Designed by an acknowledged expert, this model will appeal to flying scale enthusiasts who want something different. For 0.75-1 c.c. engines.
- M.A. 252. Zoom, by H. Stillings 6s. 0d.
A rugged, easily-built radio control model, capable of performing well in all weathers. Suitable for 2.5-5 c.c. engines. Span 53 in.
- M.A. 254. Clancy, by M. Ballentyne 3s. 6d.
An all-balsa free-flight biplane for 0.5 c.c. engines. Can be built in an evening. Span 18 in.
- M.A. 260. Fokker D.7, by W. Barrett 3s. 6d.
This World War I German fighter lends itself particularly well to scale counterpart, having comparatively straight lines and no rigging wires. Span is 20 in. The model is suitable for any engine up to 0.5 c.c.
- M.A. 261. S.E.5, by P. Lambert 3s. 6d.
One of the most famous of all World War I fighters, this 24 in. span model has been specially designed for the newcomer to power scale models, and has all sheet balsa wings.
- M.A. 266. Beep Jeep, by E. Fearnley (two sheets) 7s. 6d.
A R/C design which has made many successful flights and is robust enough to sustain crash damage. Suitable for 2.5 to 5 c.c. engines. Length 44 in., span 66 in.

Send 8d. for post paid copy of the new enlarged Plans Catalogue

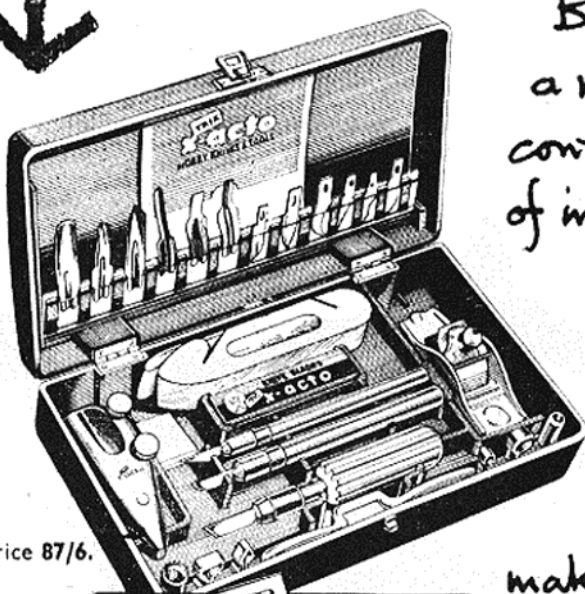
PERCIVAL MARSHALL, 19-20 Noel Street, London W.1

X-actly what I want!

Here's a ready reminder for your Santa Claus. Sign it—cut round lines and leave in strategic position. Good luck!

Dear

No doubt you have been wondering what to give me for Christmas? Perhaps I can help you—This is X-actly what I want — Its the Trix X-acto



Price 87/6.

TRIX
x-acto
HOBBY KNIVES & TOOLS

"Burlington" Hobby Chest.
a magnificent moulded cabinet containing 3 knives, a selection of interchangeable blades, gouges and routers, as well as a balsa stripper, a plane, a sander, and a spoke-shave.

Of course Trix Ltd. also make smaller sets, and tools can be bought individually.

Love from

P.S. Why don't you send this coupon for details?

TO: **TRIX LIMITED**
5 Conduit Street, London, W.1.
One of the Ewart Holdings Group of Companies



Please send me leaflet on Burlington Chest,
X-acto Hobby Knives & Tools.

NAME

ADDRESS

M2/11

Presenting...

FAMOUS KEILKRAFT FAMILIES

No 5

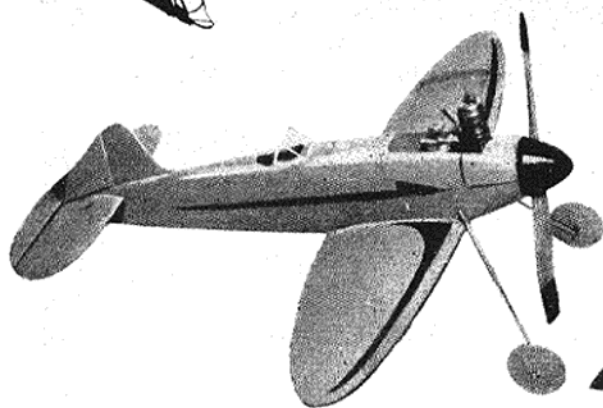
The PHANTOM kit made aeromodelling history in England 10 years ago. It was the very first control line kit ever to be produced in this country. And today it is still the finest, toughest trainer available, unless your diesel is under 1 c.c. Then you need the PHANTOM MITE—small brother to the Phantom—but just as tough!

PHANTOM

21-inch WINGSPAN CONTROL LINE TRAINER

Still the most popular beginner's C/L trainer, the PHANTOM features all-sheet construction for long life and easy repairs. The kit is absolutely complete and even includes parts for a control line handle. Among the prefabricated components are the wing panels, tail-plane, fin and fuselage sides. For engines from 1 to 2 c.c.

22/-



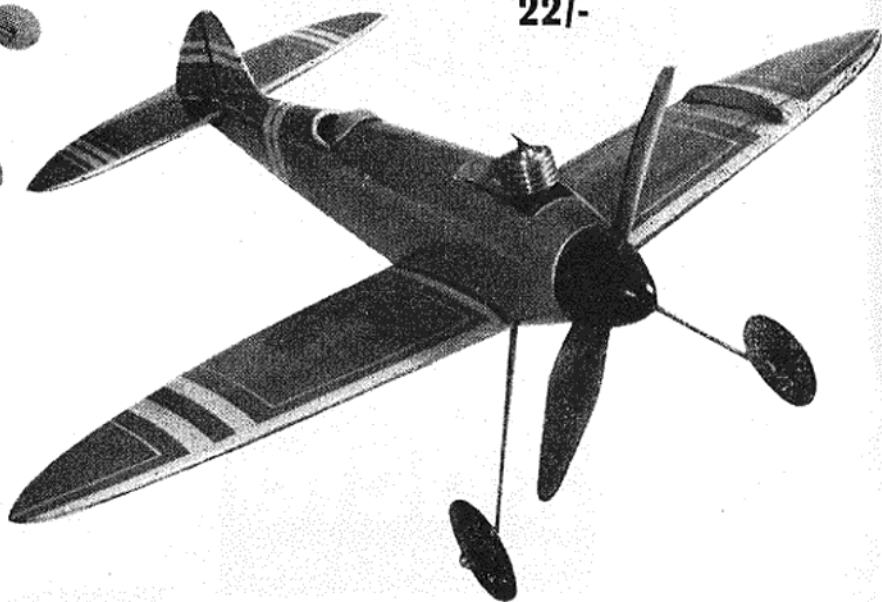
PHANTOM MITE

16-inch WINGSPAN

A smaller version of the famous Phantom—for up to 1 c.c. motors. Similar in appearance to the larger model, this kit also features many shaped parts. Makes an ideal team race trainer in view of its sturdy construction and easy-to-fly qualities. Suitable Engines: Allbon Spitfire, Dart .5 c.c., E.D. Bee, E.D. .46, Mills .75 and similar motors.

13/6

Fill up your tank with
KEILKRAFT "RECORD" Diesel Fuel
No Ether required!



Sole distributors in U.K. for

ALLBON & D.C. ENGINES
ELMIC Timers and D/Ts.
ELFIN Engines
AEROKITS boat kits

Also distributors for
E.D., E.C.C., BRITFIX,
AMCO, and the famous
LINDBERG Plastics

BUY KEILKRAFT AT YOUR LOCAL MODEL SHOP

If no model shop convenient, order direct from KEILKRAFT. Please add 6d. extra packing and postage



Manufactured by E. KEIL & CO. LTD., WICKFORD, Essex Phone: Wickford 2316

MODEL AIRCRAFT

Managing Editor
E. F. H. COSH

Assistant Editors
R. WESSON
N. J. BUTCHER

Consulting Editor
A. F. HOULBERG,
M.B.E., A.F.R.Ae.S.



NOVEMBER 1957

Vol. 16

No. 197

CONTENTS

Special Features

AUTOMATIC VARIABLE PITCH PROPS	351
IN MOSCOW	352
M.A. BEGINNERS' COURSE	358
INTERNATIONAL R/C CONTEST	365
FARNBOROUGH IN MINIATURE	368
ACCENT ON BRITISH MOTORS	370
GOOD TAKE-OFFS—HAPPY LANDINGS	372
BOOKSHELF	373
RUNNING AN EXHIBITION	380
TOP TIPS	380
EASING THE STRAIN	383

Regular Features

HERE AND THERE	349
ENGINE TESTS	
Supra Tigre G.31	354
TOPICAL TWISTS	364
OVER THE COUNTER	373
AVIATION NEWSPAGE	374
CLUBS	382

Plans

NAKAJIMA TENZAN	357
SCOOT	362
GENGANGAREN	378

Photopages

ALL-BRITAIN RALLY	376
-------------------	-----



The official Journal of the
SOCIETY OF MODEL
AERONAUTICAL
ENGINEERS



Published the 20th of each month prior to date of issue by
PERCIVAL MARSHALL & CO. LTD.
19-20 NOEL ST., LONDON, W.1.
Telephone: GERrard 8811
Annual Subscription to all parts of the world 20s. 0d. post paid.



THE NATIONALS

Changes Forthcoming?

BRITISH model fliers will be pleased to learn that the S.M.A.E. Council are now considering what changes can be made in the organisation of this meeting. We welcome this long overdue action and hope that the Council will tackle this problem in a bold and adventurous manner. Only by the adoption of a completely fresh outlook can the British Nationals be re-planned and re-vitalised so that it will become, what should undoubtedly be, the meeting of the year and one worthy of the title.

The Council's task is not an easy one and their best efforts will fail unless they receive the fullest co-operation from the area committees and the clubs. A real British Nationals would be a fine advertisement for both the S.M.A.E. and the model aircraft movement—an objective which it is worthwhile trying hard to achieve.

R/C Team Fiasco

WE are quite frankly at a loss to understand how the British entries in the King of the Belgians' Cup R/C Contest failed to check that their models conformed to the F.A.I. requirements relating to international contests. How ridiculous it was for members of a so-called British team to travel to Belgium with models that could have been eliminated from the contest before it had even started! There can be no buck-passing either, as the

people concerned should have known that the F.A.I. regulations would apply to this contest.

This incident provides further proof—if any was needed after the recent Criterium d'Europe incident—that the S.M.A.E. must seriously review the present system of sanctioning the entry of British "teams" in certain international events on a "pay your own expenses" basis. Certainly these "holiday trips" seem to do little to uphold our prestige in continental model flying activities.

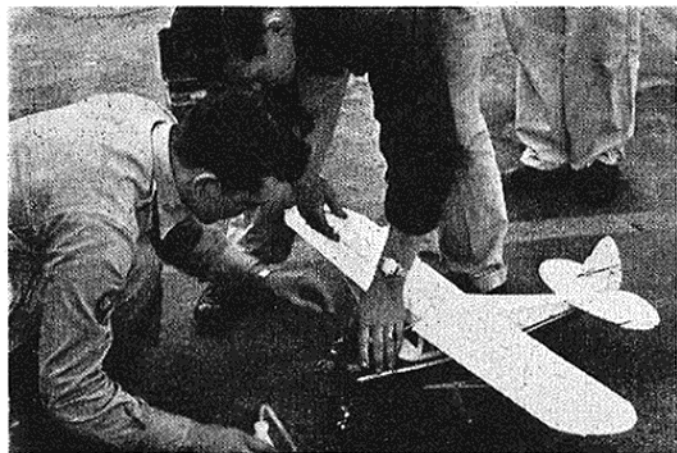
Danish Distance Record

WE learn from our correspondent in Denmark that the Royal Danish Aeroclub recently homologated a new absolute Danish distance record, the new figure being 116.5 kilometres (72.5 miles). The record holder is 15-year-old Ole Christiansen, who is chairman of a club in Eastern Jutland. The model—Hans Hansen's Skymaster—was built from a kit, and it also established a new Danish record for A-2 models.

The model disappeared over the sea in the direction of Sweden and was found on the same day there at Ugglarp, south of Falkenberg on the Swedish west coast, having landed 0.7 miles from the sea.

On the Cover

Its wheels barely off Farnborough runway 25, this Canberra B.(1) 8 was ably put through its paces by English Electric test pilot Johnny Squier, during the S.B.A.C.'s Flying Display last month. Photo by asst. ed., Roy Wesson.



U.S. Army Model Champs.

INSPIRED no doubt by the success of the United States Air Force Model Aircraft Championships during the past eight years, the U.S. Army (Europe) decided this year to hold their own Championship Meeting. This was organised by the U.S.A.R.E.U.R. Special Services at Nuremberg, W. Germany, on September 9th-13th and was acclaimed a great success by the 35 contestants from five European commands who took part. As a result it is certain that the



Championships will become a very popular annual event.

In the photograph above on the right Mr. H. G. Hundleby (*Aeromodeller*) and Mr. E. F. H. Cosh (*MODEL AIRCRAFT*) are seen with their co-judges, Capt. Paul Foret and Lt. Jack Bomar, examining one of the entries in the Flying Scale event. This was won by the very attractive Piper Tri-Pacer seen in the photograph on left, which combined good looks with a realistic flying performance.

R.Ae.S. GARDEN PARTY

"the best of both worlds"

WE had the best of both worlds when we attended the R.Ae.S. Garden Party last month. There was a flying display by many veteran aircraft, and an indoor exhibition featuring a fine collection of model aircraft and some rare World War I specimens from the

Nash Collection. The models ranged from current aircraft types to the unique examples built by Mr. Donald Stevenson in the early 1900s. In an all too brief chat with Mr. Stevenson—a spritely 75 years old—we learned that he still holds the strong views he expounded in an article entitled

"Models That Made History," published in the July, 1954, *MODEL AIRCRAFT*. The majority of the models in the exhibition were built by members of the various clubs within the Vickers-Armstrongs organisation, who were the hosts for the garden party.

Of the flying display, it was exhilarating to see flying again such types as the Fairey *Swordfish* and *Fulmar*, Hawker *Hurricane* and *Tomtit*, and, of course, the *Spitfire*. The latter machine, a Mark V, has been restored to more than its former glory by Vickers-Armstrongs, who have given it a glossy finish in the interests of easy cleaning. The markings are authentic, being those of a *Spitfire* that flew with 92 Squadron during the war. A previous owner—Air Commodore Wheeler, of the Shuttleworth Trust—flew it as GA-ISU.

Odd feature of this particular *Spitfire* is the four-bladed airscrew, which is driven by a Rolls-Royce Merlin that was formerly mounted in a *Seafire*. Mr. A. H. Luscombe of Vickers, whose particular "baby" this has been, told us that he is on the look-out for a Merlin from a Mark V. In the meantime, he said the *Spitfire* will be flown regularly once a month during the winter "to keep the moths out," so if you see those famous elliptical wings over your district, don't call in a psychiatrist—he wouldn't believe you anyway.



On the left: Mr. Donald Stevenson, A.F.R.Ae.S., with one of his early models. Above: Lady guests were just as interested as their menfolk in the models on display. Below: This model Vimy was built in about six weeks by Arthur Bristow of Vickers' Aircraft Division.

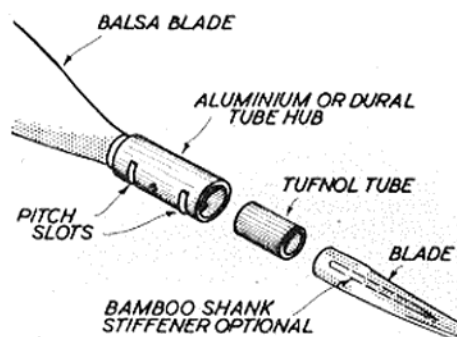


Automatic V.P. Propellers

AN automatic variable pitch propeller is a "natural" for rubber motor power. A rubber motor unwinding gives out variable power, extremely high during the first few seconds and then gradually falling off. At no time is the power output of a rubber motor completely constant and so, strictly speaking, no fixed trim can be completely satisfactory for a rubber model. Thus a device that will allow the first burst of power to be absorbed without recourse to wasteful down-thrust, while still utilising to the full the diminishing power throughout the rest of the run, is to be desired.

One such proven device is a variable pitch propeller where the blade pitch is controlled by the torque of the motor. Such a propeller is fairly easy to make and get working and is a fruitful field for experiment.

The most successful variable pitch



propellers are made on the basis shown in the sketch. The hub is a thin wall aluminium or dural tube (thicker tubing can be turned down to about 1/32 in. wall thickness for lightness). The propeller blades are balsa, bushed with Tufnol tubes. That is to say, the ends of the blades are carved to a cylindrical shape and plugged into short lengths of Tufnol

tubing. This tubing should be a wobble-free but easy sliding fit in the aluminium hub tube.

The blades are held in the hub by wire pins passing through the blade shanks and locating in slots cut in the hub tube. The circumferential length of these slots governs the amount of pitch change which each blade can achieve. A 30 deg. angular movement is a good starting point for experiment.

The actual position of these slots is not very critical. In practice, the blades can be aligned in the hub on a jig to give either the required maximum "coarse" or "fine" pitch and the pins then inserted to lock the blades into the hub. Thus any arbitrary position can be chosen for the hub pitch slots. It is only their circumferential length which is important as governing the amount of pitch change possible.

The propeller can be mounted in two ways. When the blades are assembled a spring must be added to force the blades into the required "low power" pitch position. This may be "fine" or "coarse" pitch, depending on which way round you want to work the propeller. Starting with fine pitch at high power, going to maximum coarse pitch at low power gives the maximum theoretical propeller efficiency. Starting with the blades in coarse pitch, changing to fine pitch as the power falls off, approximates to constant thrust and therefore a constant speed climb. The latter appears to be the best solution.

Locating the drive mechanism (which is simply a lever linkage between the propeller shaft and the pins locking the propeller blades in the hub) on the front of the hub gives fine pitch at full power, returning to coarse pitch at low power.

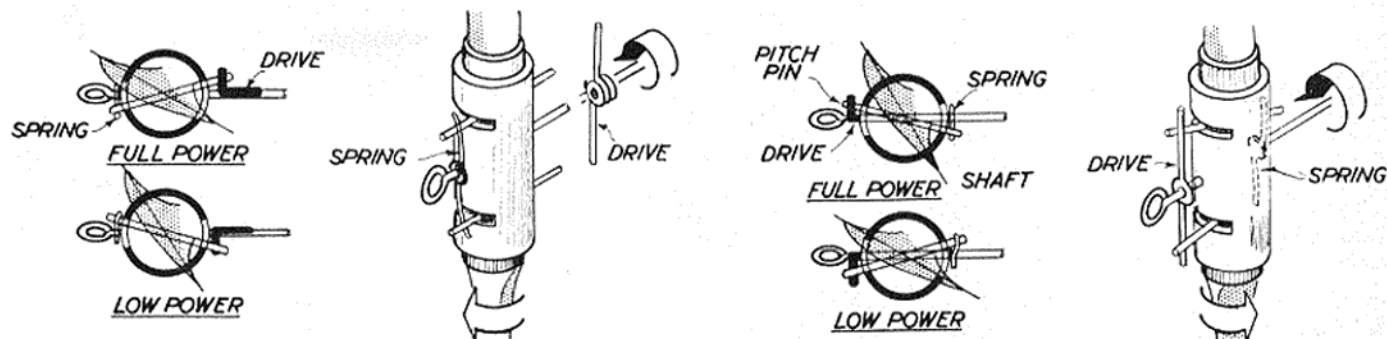
Locating the drive lever behind the hub gives coarse pitch for full power with the pitch progressively decreasing as torque falls off.

Spring tension is adjusted so that the rubber motor torque takes over completely at the beginning of the power run. Just how soon after the spring pressure starts altering the pitch is then a matter of adjustment and experiment to get best results. But the spring should never take over completely until the motor torque



Well-known Wakefield flier E. W. Evans has used a V.P. prop on his models, with consistent success.

has fallen to next to nothing so that for the majority of the power duration the propeller pitch is governed by the mechanism "floating" between torque leverage from the motor and the return action of the spring. A disadvantage of the high power-coarse pitch arrangement is that the propeller ends up with the blades in the highest drag position for free-wheeling. It is possible to arrange for them to return again to the coarse pitch or even a fully feathered position when the motor disengages, but the mechanism is rather complicated. Folding the blades at the end of the power run is a far simpler solution.





in MOSCOW

with
A. F. HOULBERG
for the

EUROPEAN FREE FLIGHT CHAMPS

AN invitation from the Central Aero Club of the U.S.S.R. to attend the fourth Criterium of Europe for power-driven F/F models which they were organising on their aerodrome at Tushino, Moscow, was accepted on behalf of the Model Commission of the F.A.I., as it afforded the opportunity of establishing closer relations between the aeromodellers on either side of the U.S.S.R. frontier.

The contest was supported by teams from Yugoslavia, Bulgaria, Rumania, Hungary, Finland, Poland, Czechoslovakia, and, of course, the U.S.S.R., who entered two teams; one the official entry, the other being a practice entry whose scores were not recorded in the official results.

Tushino aerodrome is the flying ground of the Central Aero Club and lies on the outskirts of Moscow. Like our London aerodromes it shows signs of being encroached upon by the building expansion taking place. The 'drome is similar in size to Cranfield and adjoins the buildings of the Central Aero Club from which it is separated by the main road; it is, however, devoid of runways.

One of the aircraft sheds had been cleared and set out with a central table running nearly the whole length of the building on which the competitors could erect their models for processing. Forming a "T" with this table was the actual processing table with the necessary measuring and weighing equipment.

All competitors were provided with forms to fill up giving the required data of their models to ensure compliance with the F.A.I. regulations, and it was surprising the large proportion of the competitors who arrived unequipped to deal with this. The result was some frantic last moment measuring up of models which would have been avoided

if the contestants had studied the F.A.I. rules and recommendations.

Flanking one side of the shed was a series of cubicles one of which was allocated to each team. These proved useful for housing the models overnight.

As so often happens in these contests the weather on processing day proved wet and unpromising, although on the day of the contest it turned fine. There was, however, a distinctly boisterous wind blowing across the aerodrome which resulted in quite a number of models going out-of-bounds and into the adjacent built-up area. Thanks, however, to the excellent retrieving arrangements made by the Central Aero Club (consisting of two helicopters, four vehicles and two motor-cycles) practically all models were successfully retrieved in good time.

The opening ceremony was carried out with much more pomp and circumstance than we are accustomed to in the western hemisphere; commencing with a parade of the competitors and their models, led by the panel of judges and officials to the martial strains of a 50-piece brass band. Each team took its place on the rostrum, was announced by name to the spectators, and presented with a bouquet of flowers by small girls dressed in the uniform of the Russian Youth Movement. Following the introductions and the exchange of pennants between the teams, the contest was officially opened by the slow raising of the U.S.S.R. flag on the flagstaff by the reigning champion, Vladimir Petuchoff, to the tune of the U.S.S.R. national anthem.

The actual organisation of the contest was very thoroughly carried out, with five starting points each equipped with two timekeepers and a recorder. Each competitor was provided with a pad of duplicate score tickets, both halves of

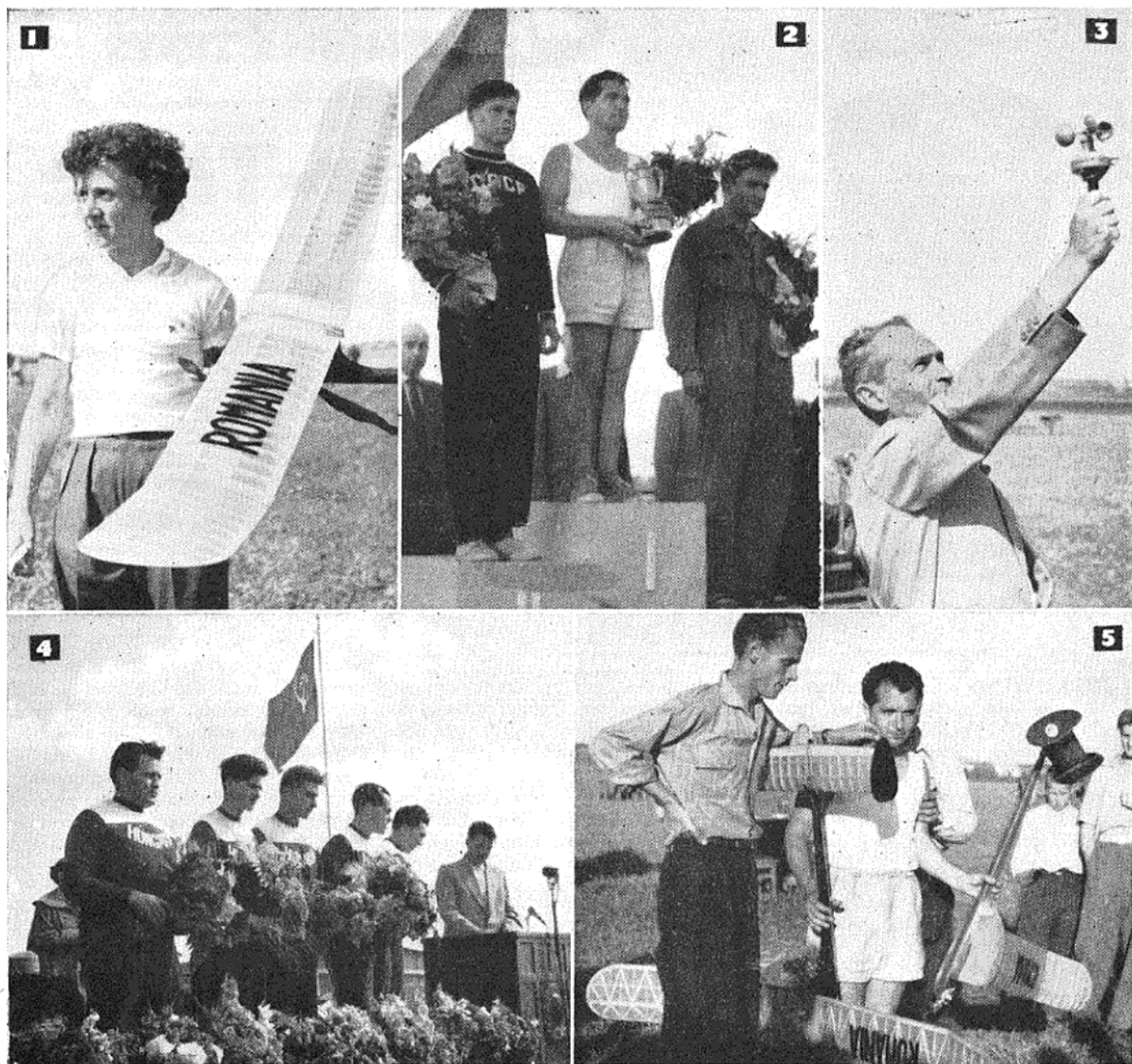
which were filled and signed by the recorder at the end of the flight. One half was then torn off and sent to central control, the competitor retaining the duplicate on his pad. This is a useful system as the competitor has a complete record of his performances for reference during the whole of the contest, and it avoids a lot of running backwards and forwards to the score board.

In spite of the high wind, max's were being achieved with considerable regularity and at one time it appeared that a fly-off would be necessary. However, each competitor in turn made at least one bad flight except the ultimate individual winner, Moldovearm of Rumania, who was the only one to achieve five max's and gain 900 points. Second individual place was gained by Abramov of the U.S.S.R. with a total score of 880 for the five flights, and he was

Continued on page 381



Czech flier Hyeck, who scored four max's altogether, with one round a blank.



1. The only lady competitor at the meeting, Mrs. R. Pourichi of Rumania.

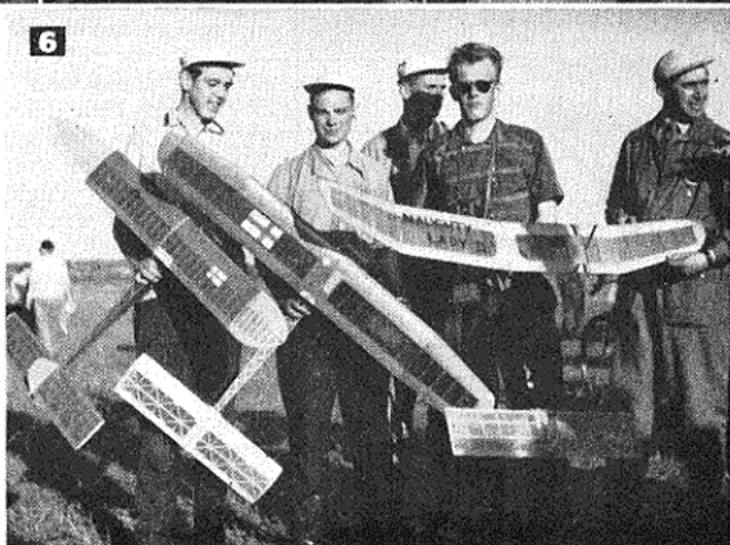
2. Individual place-winners on the Olympic games-type rostrum. Left to right: Abramov, U.S.S.R. (2nd); Moldovearm, Rumania (1st); and Cherny of Czechoslovakia (3rd).

3. B. Kraslavsky, the chief judge, tests the wind speed with the anemometer. This is in sharp contrast to western scientific methods—a handful of grass thrown into the air.

4. Amid banks of flowers, and themselves holding bouquets, the Hungarian team is presented to the spectators.

5. A. Moldovearm of Rumania, the individual winner, with his two models.

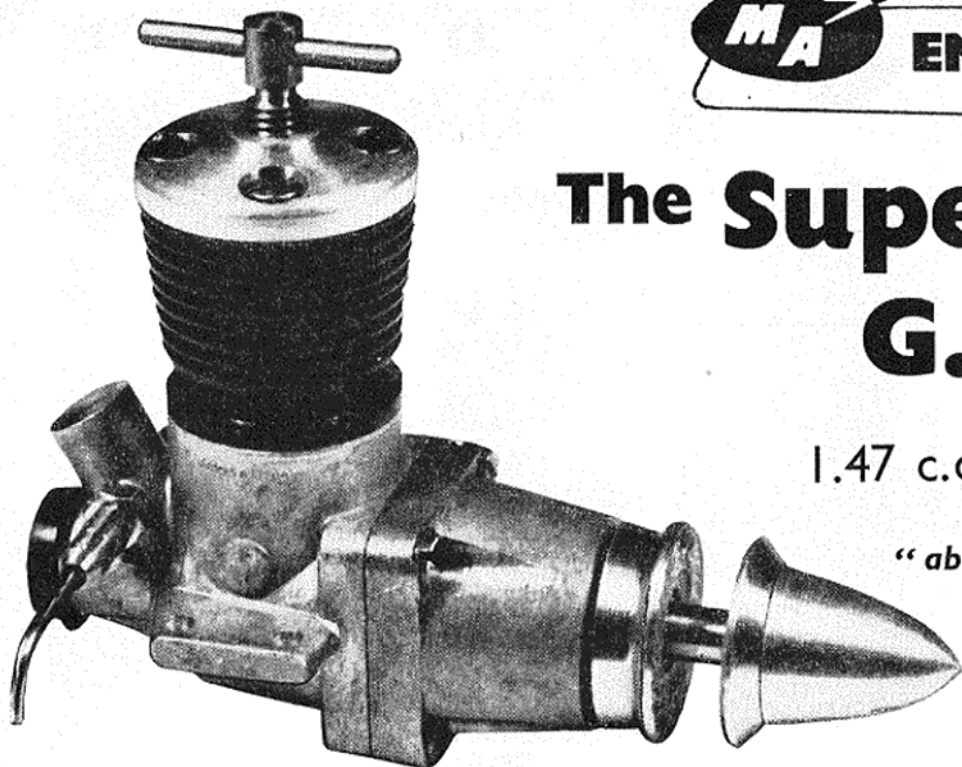
6. The victorious Finns, who gained the team award. Raulio and Pimenoff (centre) flew at Cranfield last year.



**ENGINE TESTS**

The Super-Tigre G.31

1.47 c.c. diesel

*"above average"**performance in its class"*

FOLLOWING the withdrawal from production of the two most powerful contenders in the 1.5 c.c. engine class (the Oliver Tiger-Cub and the Elfin 1.49 BR), no British 1.5 c.c. production engine now exists which is capable, in standard form, of equalling a specific output of 100 b.h.p./litre. Engines of this size currently manufactured in the United Kingdom are reliable, general-purpose types, low-priced and mostly well made and it must be

admitted that existing contest rules, few of which are framed around a 1.5 c.c. capacity limit, do not encourage a demand for ultra-high performance in the 1.5 c.c. group. Nevertheless, there are modellers who continue to favour a 1.5 c.c. size for competition work, and the opportunity to become reacquainted with above-average performance in this class was welcomed when the Italian Super-Tigre G.31 was received for test.

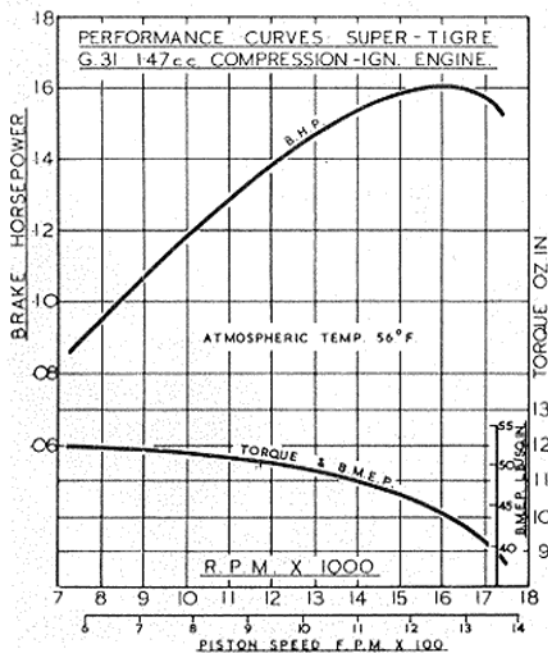
carburettor American Atwood model car engine and was continued in the single-carburettor, dual rotary-valve Champion and Glo-Devil model aircraft engines from this manufacturer. It was also adopted as the method of induction on the 10 c.c. Bunch Contester D.60R, and the Fox 59 used it for a time in the course of this engine's progression from a disc-valve motor to its present crankshaft-valve layout. Currently it is employed by the Super-Tigre G.24 10 c.c. racing engine and by the Miles 5.7 c.c. spark-ignition R/C engine. In most of these larger applications the system is more clearly described as a "drum valve," since the valve rotor is usually in the form of a short, large-diameter flanged cylinder, but, in the case of the G.31 and G.30, "rear shaft valve" is an accurate enough term, since the component closely resembles a shortened disc-web crankshaft with the crankpin removed.

Chronologically, the 1.47 c.c. G.31 comes before the 2.47 c.c. G.30 which, described recently in MODEL AIRCRAFT, is designer Jaures Garofali's latest offering in the highly competitive International class, and there is little doubt that the G.31 served to test certain of the features that are seen in the larger engine, notably the rear shaft induction system which is common to both models.

This system of induction is by no means new, of course, but this is the first time that it has been used on an engine of the G.31's size and type. It was first seen more than 15 years ago on a production model engine, as an auxiliary intake valve in the twin-

Another feature which distinguishes the G.31 from current British 1½-c.c. offerings is its use of twin ball bearings supporting the crankshaft. These are carried in a very robust front housing which is heavily flanged and secured to the crankcase with four screws. The crankshaft has a disc web and crescent counterweight which, however, does not quite balance the crankpin weight. The crankcase casting itself incorporates the rear rotary valve bearing and carburettor intake.

The cylinder is of the reverse-flow scavenged type incorporating twin opposed exhaust ports and twin



opposed internal transfer flutes. The piston is a composite unit in cast-iron and aluminium alloy, the gudgeon-pin being carried in a duralumin yoke which slides into a Meehanite shell and is locked in position with a circlip.

Construction throughout is to the usual high standards associated with Super-Tigre motors. Externally the engine is cleanly finished but without any decorative treatment such as tumble polishing or colour anodising and it is to the all-important interior fits and finishes that we must look to appreciate the above average workmanship that goes into these engines.

Compared with the normal run of plain-bearing, shaft-induction small diesels, the G.31 offers 20-30 per cent. more power at 2,000-3,000 r.p.m. higher peaking speeds at the cost of a 30 per cent. weight penalty (i.e. about 1 oz.), but without any appreciable increase in overall dimensions. Overhang, due to the rearward carburettor position, is kept to a minimum and the upwards facing intake simplifies access for choking.

Specification

Type: Single-cylinder, air-cooled, reverse-flow scavenged two-stroke cycle, compression ignition. Induction via rear mounted rotary shaft valve with sub piston supplementary air induction. Bevelled piston crown with matching contra-piston.

Swept Volume: 1.473 c.c. (0.0899 cu. in.).

Bore: 12.5 mm. (0.492 in.). Stroke: 12 mm. (0.472 in.).

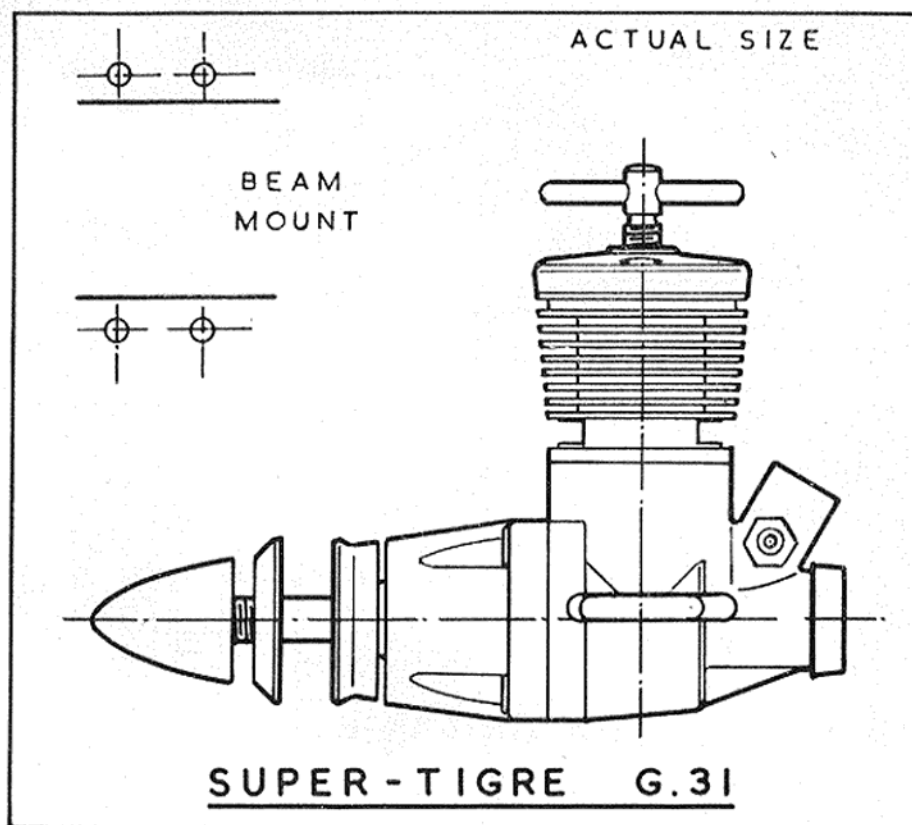
Stroke/Bore Ratio: 0.96 : 1.

Compression Ratio: variable.

Weight: 4 oz.

General Structural Data

Pressure diecast aluminium alloy crankcase with integral rear plain bearing and carburettor intake. Pressure diecast aluminium alloy front bearing housing containing one 7×19 mm. and one 5×16 mm. ball journal bearings and secured to main casting with four screws. Nickel-chromium steel crankshaft, hardened and heat treated, with disc web and crescent counterweight. Valve rotor of hardened alloy steel with drive via slot and spigot from crankpin. Valve bearing sealed by synthetic rubber cap over rear end of housing. One piece hardened lead-iron cylinder with integral cooling fins and screwed into crankcase. Machined alloy head secured to



cylinder with four screws. Piston of Meehanite with duralumin yoke carrying gudgeon-pin and retained by circlip inside piston skirt. Machined dural connecting rod. Spraybar type needle-valve assembly. Beam mounting lugs.

Test Engine Data

Running time prior to test: $1\frac{1}{2}$ hours.

Fuel used: 37 per cent. I.C.I. Technical Ether BSS.579, 35 per cent. Shell Royal Standard Kerosene, 25 per cent. Castrol R, 3 per cent. amyl-nitrate.

Performance

The G.31 is an easy starting motor and, in general, has favourable handling characteristics. The controls are easy to manipulate. The contra-piston movement is smooth and unaffected by cylinder temperature. It may be thought that the engine deserves a slightly more elaborate needle device than the split thimble type fitted. Its location, however, is good, being well back from the prop. but not too close to the exhaust, and the complete spraybar assembly is reversible for the most acceptable installation relative to upright, inverted or side mounting of the motor.

Dynamometer tests on the G.31

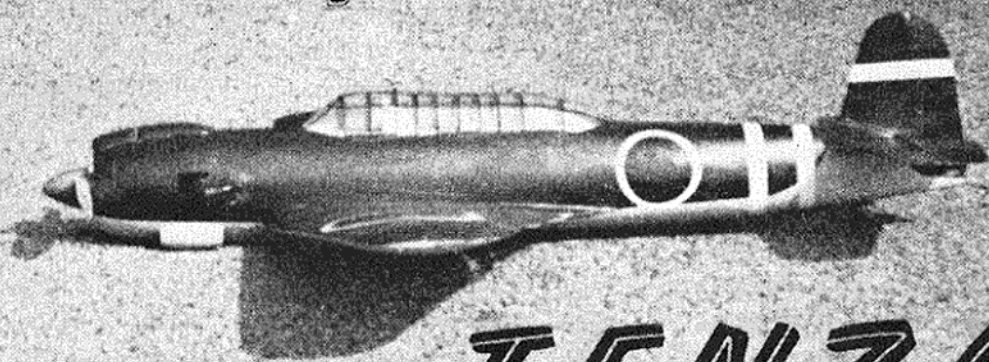
were carried out over an 11,000 r.p.m. range from 6,500 r.p.m. upwards. At low speeds the engine disclosed fairly good torque for motors of this capacity, the maximum relative b.m.e.p. on test being approximately 53 lb./sq. in. at 7,000 r.p.m. Nevertheless, it was only at speeds above 12,000 r.p.m. that the true worth of the engine became readily apparent, for, although the maximum torque figure was obtained at the relatively modest speed mentioned, it was the comparative flatness of the torque curve—the reluctance with which torque declined as the load was reduced—that allowed the horsepower curve to climb to a high peak. This reached a shade over 0.16 b.h.p. at 16,000 r.p.m. and is one of the best performances we have obtained for a 1.5 c.c. engine.

The G.31 appears to have no vices. It ran quite smoothly at all speeds tested and was obviously perfectly happy when running at really high revolutions. There was little or no loss of power with warming up and the engine was noteworthy for its consistently maintained output at high speeds.

Power/Weight Ratio (as tested): 0.65 b.h.p./lb.

Specific Output (as tested): 109 b.h.p./litre.

The Nakajima



TENZAN

THE Japanese name of *Tenzan* means "Heavenly Mountain"; the Allied code name for this aircraft was "Jill," and while in no way imaginable can "Jill" be said to have "heavenly" lines, she was certainly a hefty aeroplane. Consequently her C/L model counterpart is of really stout construction and has the ability to "take it."

Wing

Assemble the two wing halves with L.E., $\frac{1}{8}$ in. square spars, T.E. and W.9. The tips are two laminations of $\frac{1}{16}$ in. sheet with aluminium tubes between laminations of the port tip, for the control wire lead outs.

Join the halves at the centre section with W.10 and a separate piece for the L.E. Sheet the under surfaces to the mid line and the top to W.1. Instal the control plate and push rod.

Cut A.3 from soft $\frac{1}{2}$ in. sheet and add the outboard flap dowel, then A.1 and A.2. Fit A.3 to the wing and push the inboard dowel into place through W.1, having already attached the actuating rod to the dowel. Now solder the yoke to the push rod so that the flaps are neutral when the control plate is neutral.

Complete the sheeting of the centre section, leaving a hole for the flap rods. Add a 1 oz. lead weight to the outboard tip. Finally add capping strips noting that those on W.9 overlap the flap so that only a small gap is left. Add flap guides from $\frac{1}{8}$ in. dowel only after covering.

Fuselage

Cut F.1 from mm. ply and F.1A from $\frac{1}{8}$ in. balsa, then cement the two together. Assemble F.1 and 2,

engine bearers and tank, then cement two $\frac{3}{8}$ in. wide pieces of $\frac{3}{32}$ in. planking along the centre line of F.1 and 2 and insert all the other formers. Slide this skeleton along the push rod and cement F.2, 3, 4 and 5 to the wing. Cement some soft block between the planking behind F.8 to make a seat for the tailplane.

The tail is now cut from $\frac{1}{8}$ in. sheet. Make a hole in the elevator dowel with a red-hot pin. Pass the control horn through, and bend at right angles twice. Squeeze the end into the dowel with pliers then bind and glue. Assemble the tail and instal it, checking for neutral elevator with neutral flap.

Finish the fuselage sheeting, cementing F.10 and F.11 in place before sheeting the upper part of the fuselage. Assemble the fin and rudder, noting that as with the flaps there are capping strips but no ribs.

The cowling is carved from block or $\frac{1}{2}$ in. sheet with the half-former F.O. for mm. ply. Press studs, stitched to mm. ply let into opposing surfaces make good catches. The intake is carved from block and cemented to the fuselage, overlapping the detachable part. A $\frac{1}{2}$ in. wide ring of mm. ply is glued inside the

cowling. Add oil cooler, exhausts and wing fairing from soft block.

Cut small pieces of celluloid and make a hole in the centre to fit tightly round the tank vents. Slide them down the vent tube to lie flush on the fuselage. This makes an almost oil proof joint when well glued.

Finishing

Give two thick coats of talcum powder and clear dope mixed. Rub down and cover fuselage and tail with lightweight Modelspan. The wing and rudder are covered with heavy Modelspan and given two coats of dope.

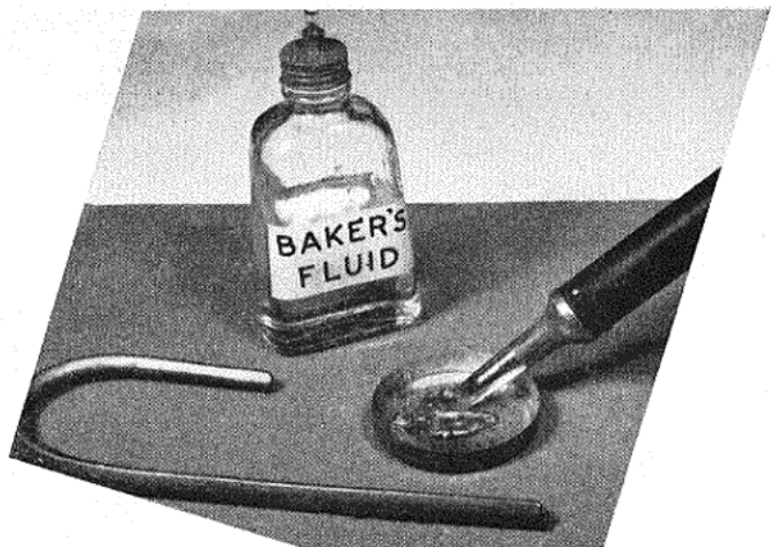
Undercarriage

This is of the "drop out" type and plugs into brass tubes let into blocks cemented to W.3; the wheels should be angled forward slightly. The undercarriage is not essential as the model can be hand launched successfully.

Colour Scheme

Upper surfaces dark green, or medium blue-grey. Lower surfaces: pale blue-grey. Red suns with white surrounds on fuselage and top of wing. No surrounds, just plain red suns under wing.

Soldering for the Modeller



EXCEPTING a few elementary glider models, almost every type of model plane calls for soft soldering somewhere in its construction.

For example, most models are fitted with a wire undercarriage and 99 per cent. of these have the wheels retained by soldered washers. Where a vee type steel wire undercarriage strut is used, the joint is invariably bound and soldered. C/L models usually have soldered control linkages and soldering is the safest and simplest method of securing the ends of the steel control-lines. Where special fuel tanks are required, soldering up from tinplate is the usual way of making them. Soft soldering is also the advised method of making all kinds of electrical joints. For engines having electrical ignition systems, it is the best means of obtaining safe and trouble-free connection and if and when you take up R/C, you will find a knowledge of soldering essential.

Of recent years, soldering has tended to become one of the less essential subjects of the average home handyman's repertoire. Soldered pots and pans and other utensils having given way to modern ones of spun aluminium and moulded glass and plastics, he is seldom called upon to mend a leaky kettle or baking tin. As a result, few have more than a hazy idea of soldering practice. Many go under the mistaken impression that there is nothing much to learn about it anyway. If you have any such notions, we urge you to read on.

How many models have you seen with really neat soldered joints? Make a point of checking on a few soldered axle ends. More often than not you will encounter an ugly blob perched precariously on the end of the wire, or an awkwardly balanced cup-washer spilling solder over one side. How frequently, too, do we see, or hear of, models shedding wheels on take-off or landing. Electrical joints are the easiest of all, yet many a radio model has been wrecked because of a "dry" soldered joint.

First, let us see what is meant by "soft soldering."

Soldering is a general term used to define various processes by which metals are joined by alloys having melting points somewhat below those of the materials united. There are various types of soldering alloys for different metals and various methods of applying the heat essential to the process. These range from very soft solders with melting points below the

boiling point of water (such as are used in pewter work), to "silver" solder and brass "spelter" used in *hard soldering* and *brazing*. *Soft soldering* is performed with a heated soldering-iron or "bit," or, when more convenient, by the direct application of heat from a spirit lamp or gas flame. *Hard soldering* requires the use of a bunsen-burner or gas-blowpipe, while *brazing* requires the greater heat of a special brazing lamp or oxy-acetylene apparatus. From here it is, of course, only a short step

THE NEW M.A. BEGINNERS' COURSE PART XXI

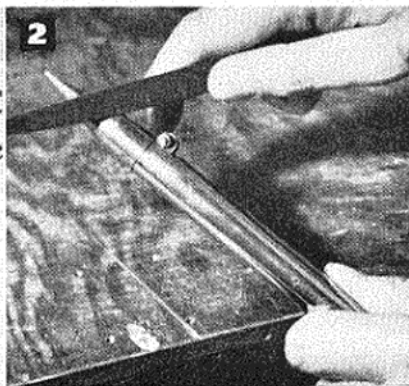
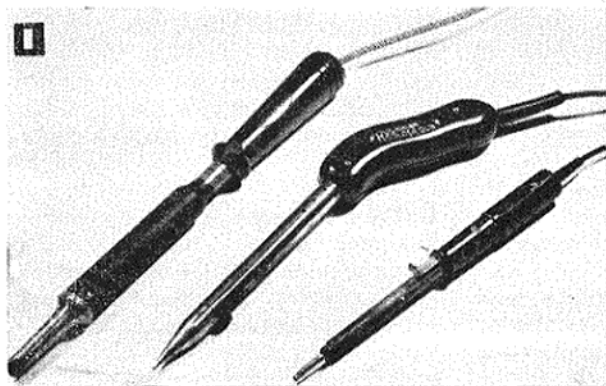


Fig. 1. Three types of electric soldering iron suitable for the model builder. Left is a Rawlplug iron of 115-watts rating for general structural work, while, on the right, is a Solon 25-watt instrument iron for electrical and R/C jobs. Between them is an 80-watt iron which can be used for both types of work. Fig. 2. Cleaning up a copper bit prior to re-tinning. Heading photo above: Tinning a new bit. Keeping the bit clean and properly tinned is of the utmost importance.

to oxy-acetylene welding as used in heavy industry.

Generally, soft soldering is intended for use with fairly soft materials such as brass, copper, tinplate, etc., but, by intelligent application, we can also make it serve with hard steel, such as undercarriage wire. Soft soldering, therefore, will suffice for virtually all the model aircraft enthusiast's requirements and only one type of solder is called for, *tinman's solder*, which is an alloy of lead and pure tin. Best quality tinman's solder contains 50 per cent. tin and is easier to work with than inferior grades having an excessive lead content.

So far as the modeller is concerned, soldering jobs can best be treated as falling into two main groups: electrical and structural. Each requires a different technique, different materials and, preferably, different tools.

As regards tools, the first requirement, obviously, is the soldering-iron. In its simplest and cheapest form this merely consists of a solid copper block, suitably pointed and known as the "bit," attached via an iron shank to a wooden handle. The bit is then heated in a gas or spirit flame. The snag with this type of iron is that it continually needs reheating (except with very small jobs) and for the serious model builder an electric soldering iron is the obvious choice as it is far quicker, simpler and cleaner to work with. There remains the question of size.

For electrical work, especially when making R/C joints in confined spaces, or when working close to delicate components which may be damaged by excessive heat, a small iron of about 25-watt rating with a slim pencil bit and known as an instrument iron is the ideal choice.

For general structural work, however, especially on heavy $\frac{1}{8}$ -in. undercarriage wire or fuel tanks, an instrument iron is quite useless. Its small heat output is rapidly dissipated through the surrounding metal and it is often impossible to get the entire joint area hot enough to run the solder properly. Here, an iron of nearer 100-watt rating is the preferred choice.

In other words, the ideal set-up is two irons, but if you are obliged to make do with one iron, try to get one of about 80-watt rating, but which has a sharply pointed conical bit. This will generate sufficient heat for the bigger jobs but is not too cumbersome for the delicate electrical work.

In addition to the actual solder, a *flux* is needed in making a soldered joint. The purposes of the flux are three-fold: to clean the surfaces to be soldered; to prevent the formation of an oxide and to assist the flow of the solder. Flux is indispensable, since the essence of good soldering is absolute *chemical* cleanliness of the joint surfaces. There are many types of flux, but we need only be concerned with two of them: acid and resin-base types.

Resin base fluxes, which include the popular "Fluxite" paste, are the only fluxes which should be used for

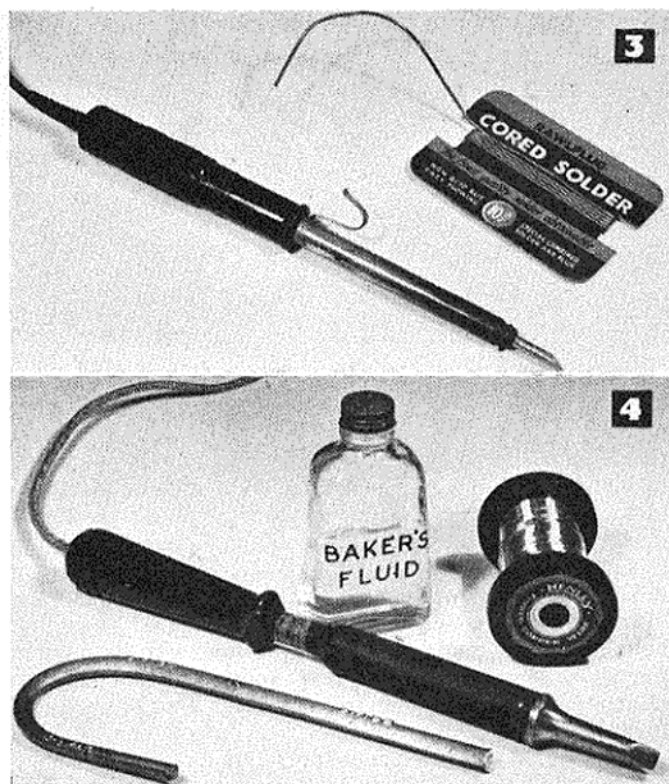
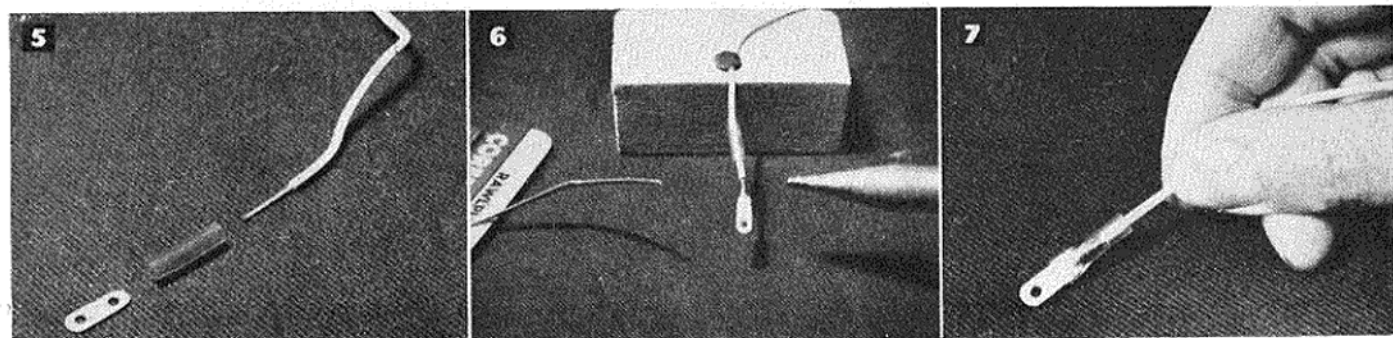


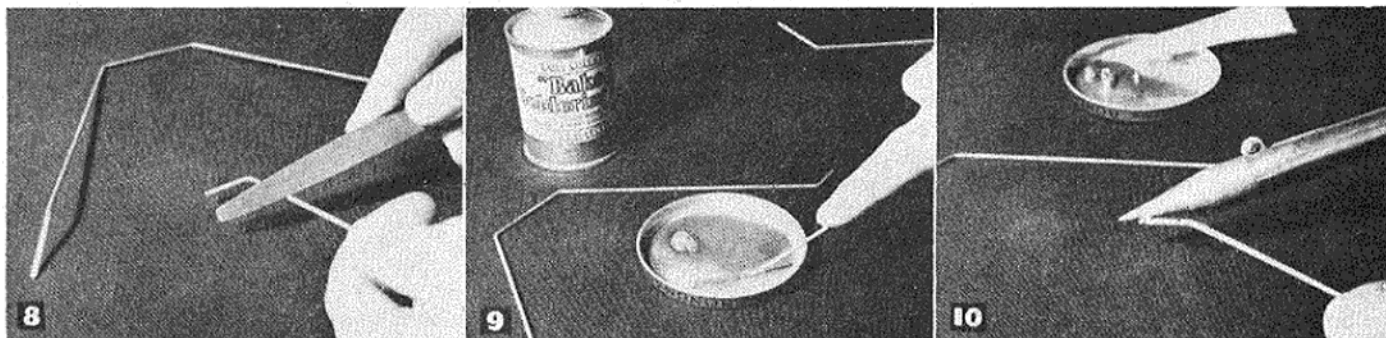
Fig. 3. For electrical work, a small iron and cored solder will generally be sufficient. Fig. 4. For undercarriages, fuel tanks, etc.: large soldering-iron, "Baker's Fluid," solder stick and tinned wire for binding joints.

electrical connections. Special brands of solder in the form of wire, instead of sticks, are now commonly used which actually contain resin flux in a core through the centre, a typical product being "Rawlplug" cored solder. These render the use of a separate flux unnecessary and are especially convenient when making small electrical joints.

For other work, however, particularly steel wire undercarriages and tinplate or brass sheet fuel tanks, the use of an acid flux is recommended, as it has a more positive cleaning action, does not leave a resinous deposit and generally results in a neater joint. Zinc chloride, known to the tinsmith as "killed spirits," is the most widely used preparation of this type and the well-known "Baker's Fluid" is a proprietary brand which can be thoroughly recommended. Never use acid fluxes on electrical joints, however, as they have a corrosive action which will corrode the adjacent wire and cause a fracture.

Figs. 5-7. Three stages in making a strong cable end.





Figs. 8-10. Cleaning and tinning wire undercarriage parts.

Incidentally, a small tin of "Baker's Fluid" will be enough for all your modelling requirements for a couple of years or more, but, in this time, the fluid will corrode the tinplate container and collect rust, and may eventually cause a leak. Therefore it is a good idea to decant it into a bottle, which, needless to say, should be clearly marked. The bottle shown in some of our photographs is an ex-"Ronsonol" lighter-fuel bottle having a retractable glass spout in the cap which is rather useful.

In addition to the items so far mentioned, it will be helpful to have some tinned copper fuse wire for binding parts together prior to soldering, emery or glass paper for cleaning the surfaces to be soldered, a smooth flat or three-square file and a piece of clean rag.

Now for the actual procedure.

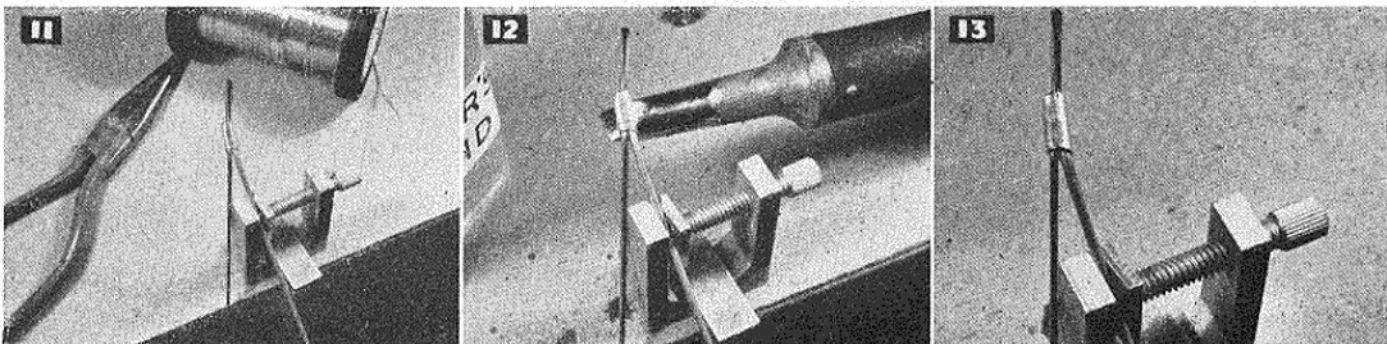
The first thing to do is to "tin" the iron if this has not already been previously done. To be properly tinned the bit must be coated, at all times, with a thin layer of solder, for about half its length back from the tip. If the iron is not properly covered, you cannot expect to do a good soldering job and also the life of the bit will be shortened.

If the iron is dirty or corroded and has not been left properly tinned from the previous job, it should first be cleaned with a few strokes of the file to remove old solder, resin or pitting. Do not file more than is sufficient to just expose a new clean copper surface.

Now plug in, switch on and allow the iron to warm up. Don't forget to support it in such a way that it will not burn the bench top. (Useful here is a crude stand such as that shown in Fig. 17. It consists merely of two 5-in. nails driven into a block of softwood 6 x 4 x 1 in.)

For tinning it is useful to have a shallow pan, such as a tin lid. Into this pour a little "Baker's Fluid" and, with the aid of a spill of blotting paper, paint the hot bit liberally while holding it in the pan. The fluxed part will appear bright. Take the solder stick, dip in flux and rub over the bit until it is completely coated.

Figs. 11-13. Binding and soldering an undercarriage joint.



Provided that the bit is clean and hot enough, the solder will run smoothly over its surface producing a bright "plating." (See heading photograph.) We are now ready to tackle our first soldering job.

Figs. 5 to 7 show the sequence in making a simple cable end such as might be used for wiring an earthing point to an engine for glowplug or spark ignition. Merely twisting the wire round the engine mounting bolt and locking it with the nut is not a very satisfactory method: eventually the wire will fray and break just in front of the insulation, due to vibration, and a far better method is to use a flat tag of copper or brass reinforced with Neoprene fuel tubing.

First, the wire should be carefully bared for not more than $\frac{1}{2}$ in. and the strands twisted together. About $\frac{1}{2}$ in. or $\frac{3}{8}$ in. of Neoprene tubing is now slipped back over the insulation. The diameter of the Neoprene should be such that it fits closely around the insulation and the tag shaped so that the other end of the Neoprene fits tightly over it after soldering.

Clean the tag with emery paper, then pass the bared wire through one hole and fold it back. Apply the hot iron from below and after a few moments, just touch the resin-cored solder to the joint. The solder will run over the wire and tag on both sides. Remove the iron after a few seconds, and when the joint has set, slide the Neoprene sleeve forward over it. (It will be found that, when still warm the tag will soften the Neoprene slightly on contact, enabling the tubing to be drawn forward easily.)

It will have been observed that in making the joint, we first heated the metal with the iron then applied the flux and solder direct to the joint and not to the bit. This is a habit that should be cultivated for it is absolutely essential that the metal is brought up to the melting point of the solder.

Many people make mistakes here, thinking that it is only necessary to apply solder to the joint with the iron and prod it about until it appears to stick. Small wires

can often be soldered together almost instantaneously merely by the application of a hot well-tinned iron, but this will never work with heavy gauge undercarriage wire or a fuel tank, for, when the iron is applied, much heat is lost in the surrounding metal before the joint becomes hot enough to keep the solder fluid.

Figs. 8 to 13 show various stages in the making of bound and soldered undercarriage joints such as are common on many power models. The first thing to do is to clean the surfaces to be soldered with emery paper. To make a neater job, some modellers prefer to file a slight "flat" on the adjoining wire surfaces. The iron, meanwhile, has been heating and is properly tinned and after fluxing the parts by immersing in "Baker's Fluid," the bit is dipped in the flux and then slowly stroked over the surfaces to be joined. As the wire is brought up to the right temperature, a very thin deposit of solder will be transferred to its surface.

The two struts are now neatly bound together with fuse wire and set up in a vice or clamped to the bench with a pair of "X-acto" clamps as shown in Figs. 11-13. Once more, "Baker's Fluid" is applied to the joint and the hot iron is then brought up *beneath* the joint (see Fig. 12). The solder stick is now applied to the *top* of the joint and a properly made joint will be assured by the fact that only when the wire is hot enough will the solder begin to flow.

Some modellers omit the initial pre-tinning operation and, provided that the solder runs under the fuse wire binding and well into the joint, this does not result in any noticeable loss of strength. When dealing with such items as fuel-tanks, however, pre-tinning is essential. This, too, is where a good heavy-duty iron is useful. Always use "Baker's Fluid" and make sure that the iron is hot before you apply it to the sheet metal. Use a minimum of solder and run the bit up and down the surface until you have a very thin fluid coating of solder. (If the surface is allowed to become too heavily coated, difficulty may be experienced in making the parts fit together properly.) After tinning, the joints are fluxed and assembled in the required position. External application of the iron (Fig. 16) will then cause the lapped joints to be "sweated" together.

When making a fuel tank, incidentally, always punch filler, delivery or vent holes before trying to solder the last seam otherwise there will be a tendency for the final seam to blow or for the tank to buckle when cooling. To finish off, solder can be run round the outside of each seam, but *do not* expect this to make up for ill-fitting parts—make sure that your tank is accurately developed, cut and bent before soldering up.

When soldering washers onto wheel axles care has to be taken to avoid damaging the wheel or tyre, but to facilitate a neat and strong job, it is worth exercising some discrimination in the selection of the type of wheel to be used. Plastic wheel hubs tend to soften and distort from heat transmitted through the axles, and aluminium or dural hubs are preferable.

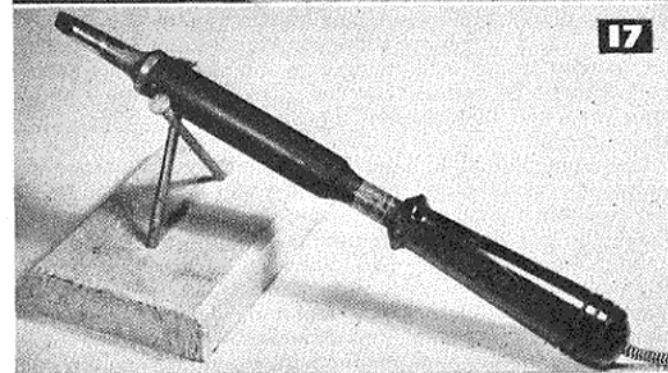
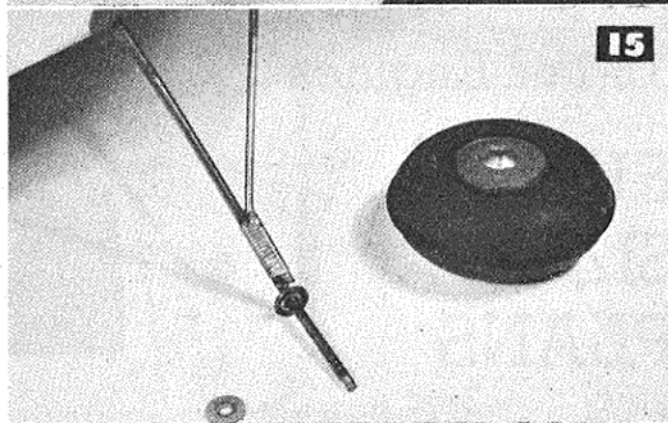
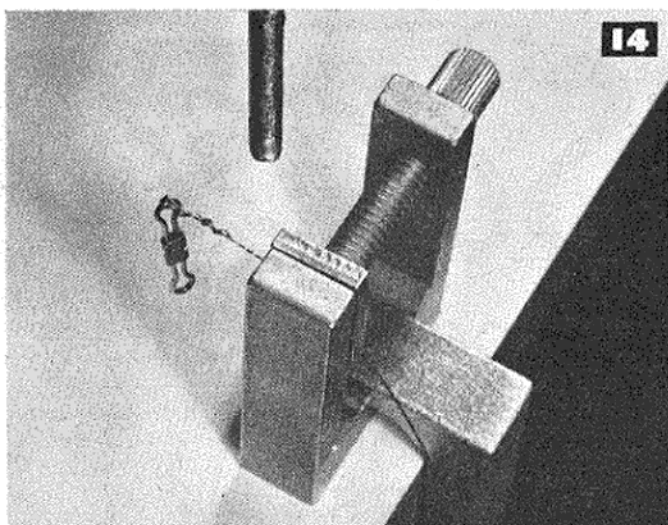
Remember, the prime essentials of successful soldering are: (a) complete freedom from grease or oxide on the metal surfaces and (b) adequate heat to the joint.

Fig. 14. For safety, control-line wire should have the ends twisted and soldered as shown. Use resin flux.

Fig. 15. Wheels with aluminium, rather than plastic, hubs allow plenty of heat to be used to solder retaining washers securely.

Fig. 16. Soldering a fuel tank. Parts are first tinned, then assembled and sweated together by external application of heat.

Fig. 17. A crude, useful stand, for holding the hot soldering iron.



SCOOT

The perfect C/L
model for
beginners

0.5-1 c.c. Engines

FULL
SIZE
PLANS



If you have never flown C/L before, here is just the model to start with. You can knock it up in about two to three hours—certainly in an evening—and it will last right through your flight training. All the weak points on a simple model have been eliminated and the original has put in hundreds of flights in the hands of various novices, has been crashed dozens of times and has still suffered no real damage.

Scout is just the job, too, for flying on your front lawn, or in any space which will give you 15 to 30 ft. lines. With a Mills 0.75 for power and a fairly large prop, nobody can complain about the noise! Take-offs are possible from any reasonably smooth surface, including mown grass, and if you adjust the engine to run undercompressed, touch-and-go landings can be made, using the elevators to change the flying speed (full up and the model loses flying speed and sinks with low power). On an Allbon Merlin with a 7 x 4 in. plastic prop you can get single loops, and wingovers on 25 ft. lines. To practice inverted, fit a stunt tank and hand launch the model upside down!

Choose medium light balsa throughout for all the wood parts (except the ply pieces shown full size on the drawing). Trace the full size fuselage profile and transfer onto a sheet of $\frac{3}{8}$ in. balsa (or you can cement two $\frac{3}{8}$ in. sheet panels together). Cut out the wing and tailplane slots carefully and accurately and then shape the rear of the fuselage to

the correct taper. Leave the front end square.

Check that the motor you are going to use fits the cut out in the ply facing pieces. If not, adjust this width. Then cut out these two $\frac{1}{8}$ in. ply pieces and cement well to the front of the fuselage. When set, trim the balsa fuselage to match, including the cut out. Whilst the fuselage is still in an easily handled

Designed by
RON WARRING

state, give a coat or two of dope to "proof" and paint or draw on the canopy.

The wing is simply a panel of $\frac{1}{4}$ in. balsa. See the perspective drawing on page 381. Mark the centre of the wing (where it fits in the fuselage). Leave this centre piece square but carve and sand the rest of the wing down to a smooth aerofoil section and taper off the tips. The actual section does not really matter. Just rounding off the edges will do, but a proper aerofoil section looks much better.

The wing can now be cemented in the fuselage slot. Add the triangular blocks underneath to strengthen the joint. Then stand the fuselage vertical and drill two $\frac{3}{16}$ in. dia. holes up through the wing. Fill with cement

and push in $\frac{3}{16}$ in. hardwood dowels. You will then have a wing joint which will never break loose.

A full size pattern for the tailplane and elevator is given. Simply trace this onto $\frac{1}{8}$ in. medium light sheet balsa (preferably quarter grain) and cut out. The hinges are sewn in place, using button thread. These are simply "figure eight" loops of thread which give a very strong, but perfectly free hinge. The tailplane can then be cemented in the fuselage slot. Two pins pushed through the fuselage will reinforce this fixing.

The fin is cut from $\frac{1}{8}$ in. fairly hard sheet and cements on the right-hand side of the fuselage. Double-cementing is advised as this part of the model gets a lot of hard knocks in bad landings. Note that there is a slight step in the bottom of the fin where it fits over the tailplane.

The undercarriage is bent from 16 S.W.G. wire and clips over the bottom of the fuselage. Drilled holes through the fuselage enable it to be sewn in place. A further binding of thread around the top of the legs gives a perfectly solid fixing with the minimum amount of trouble in installing it.

The bellcrank can be a commercial item, provided it approximates to the size given on the plan. Alternatively, you can cut this from $\frac{1}{8}$ in. ply, or 16 S.W.G. aluminium or $\frac{1}{8}$ in. Paxolin. The pivot for mounting the bellcrank is a 6 B.A. screw located 1 in. out from the fuselage on the left-hand wing, and $1\frac{1}{4}$ in. back from the leading edge. Bore a hole through the wing at this point and assemble the screw through the wing with the small ply plates each side. Secure with a nut under the wing. Then put on the bellcrank and add another nut to hold this in place.

The elevator horn is bent from 20 S.W.G. wire, as shown, and bolted to the elevator with two 10 B.A. bolts and a washer each side. The push rod, connecting the bellcrank to the elevator horn, is 18 S.W.G. wire. Bend to length by trial and error. Any final adjustment can be made by bending the elevator horn backwards or forwards to give "neutral" elevator position with the bellcrank parallel to the fuselage.

The lead-out wires attaching to the bellcrank can be 20 or 22 S.W.G. wire. These pass through the ply wing guide before being cut to length and made off in the form of loops. The line guide cements into a slot scored into the undersurface of the left wing 2 in. in from the tip.

The motor is mounted with the cylinder to the right. Slip a washer between the engine lugs and the fuselage on the front bolts so that when tightened up the engine is offset slightly to the right. In the case of engines with single hole mounting, trap a washer under the front of the lug, each side.

A F/F type plastic tank is the most convenient to fit, screwing this to the

Continued on page 381

Topical Twists

by PYLONIUS

A-Broad Similarity

For some curious reason all model engines look the same to me. Perhaps because I don't happen to be an engine lover. Those with a fonder, more discriminating eye, could detect the subtle charms that distinguish an Outer Mongolian People's unit from the real McCoy. To me they seem to run to much the same vital statistics, with the same glamorous redheads and voluptuous power curves.

What they seem to lack is any sort of national character. All are completely Americanised, with crew cut pots and square lugholes, and all give vent to the same hysterical scream of surprise if started. Take, for example, the Fox and the Vltavan (said the Fox to the Vltavan, "Pronounce your name, if you can." But that is quite another fable...), the best of East and West. They might have different innards, but obviously I don't know my bearings when it comes to telling the difference between East and West.

The Female of the Species

If there is anything that the home-loving female finds more infuriating than toy aeroplanes it is the oafish menfolk who build and fly the wretched things. But even the furious female likes to catch an occasional glimpse of her elusive oaf; and, if she is fated to be a grass widow, she might as well spend her widowhood on the grass of the flying field than among the balsa chips at home. So, armed with knitting, magazines, children and other anti-model charms she settles herself in a quiet corner of the car park, where to keep a maternal eye upon the kiddies—both young and old.

Were there such a thing as feminine intuition she would be aware of the awful consequences of coming within screaming distance of a flying field, and make a wild, unladylike dash

for home. Instead of which she finds herself making a wild, unladylike dash across the field in pursuit of a silly toy plane. But this is only the beginning of her suffering. After serving a bedraggling apprenticeship in the thorn and ditch-infested outfield she graduates to the bone wrenching office of chief model holder, which, in the eyes of her ever loving, is the highest distinction to which lowly female can aspire.

At this juncture she throws all her finer womanly feelings to the winds and decides to have a go in the Ladies' Contest. And, if you think that the lady modeller is anything of a joke it is inadvisable to wax too hilarious near the husband or boy friend whose model is about to be launched backwards. But she soon learns, and so does poor old hubby when, upon returning to a supperless home, he finds the good lady hacking wing ribs out of his prize stock of balsa. Then, to make life more miserable for him, her models fly so much better than his that he daren't show so much as a wing tip on the flying field. He, in turn, assumes the office of chief holder-on, while model mad wife battles her way towards international honours.

Unfortunately, or otherwise, our gallant ladies did not quite make the international grade this year—but it was a near miss, or should I say missus. Even so, it should teach the too clever model flyer a lesson—to leave the good lady knitting happily in the car park, even if it does mean chasing the model yourself.



Talking Shop

Not so long ago a modeller would win a couple of comps, and on the strength of the reputation, open up a model shop. "Personal service from Joe Bloggs," would scream the blurb, "Twice winner of the All Britain Spectator Contest."

Model shops were springing up on every corner. In fact, you wondered where all the customers came from. Or, rather, where they didn't, for when you next casually strolled into the new model shop you found yourself asking for a tube of cement at the bacon counter.

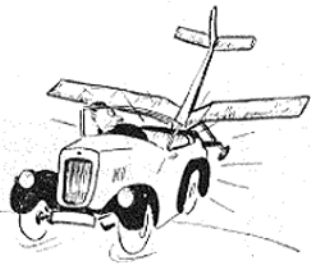
Nowadays, the model shop is a thing of the past. Quite rightly it occupies a corner of the toy counter.

Car Radio

Someone has complained that when his radio job hit a car it didn't even stop.

This seems to indicate some grave fault in design—lack of penetration, for instance. Any radio job unable to stage a really spectacular crash is likely to be sneered at by the critical spectator, and the model so lacking in destructiveness that it can't even stop a car is beneath notice.

But, perhaps we do the radio modeller an injustice. The car in question might have been one of those modeller's old jalopies, which now give our flying fields that refreshing junk heap look. In this case the driver would have welcomed a helpful push.



Do-it-yourself

Part of the glamour of the vintage era was the great do-it-yourself spirit among the eager pioneers. The V.I.P., disdainful flunkey or servant, did all the donkey work himself. This much is evident from a recent photograph in which we see a Postmaster General loading the sacks on to the plane himself—assisted only by a helpful Prince who happened to be knocking around.

This, no doubt, will lead to wild speculation among the vintage enthusiasts—did von Richthofen actually wash his own famous socks?



Model Guide

I'm afraid I cannot help the reader who wrote up for information on Bristol Scouts, but I've had a very informative letter from the 96th Bristol Wolf Cubs. They all think that model flying is jolly smashing—flying being jollier than the smashing. They also think that some of the old fogies who spend their time poring over box kite contraptions in musty old museums should try it some time.

Under the Weather

Back in antediluvian days our sun-warmed little hearts would rejoice at the coming of the flying season—or silly season as it was more generally known. Now that this once flyable part of the year is under constant deluge we modellers look with envy upon people who suffer only the minor inconveniences of ruined holidays and double pneumonia during the monsoon period. After all, why should they worry? Good weather is just a waste of time if you are not going to use it to fly models.

This thought occurred to me upon reading of the Hyde Club losing their flying field during a particularly sploshy effort on the part of our glorious English summer. I suppose the question then arose whether to call off the rally or push the boat out. No doubt they stalwartly decided on doing the latter—in the local.

Still, perhaps they are fortunate to have a flying field at all—even one that plays Hyde and seek.

INTERNATIONAL RADIO CONTEST

*Single, Multi, and Glider events
attract record entry in Antwerp*

HELD on September 7th and 8th, on the Deurne Aerodrome at Antwerp, the fifth international contest for radio-controlled model aircraft was the best attended so far. Forty-seven entries competed, including a team from the U.S.S.R.—the first time they have participated in a radio event outside their own country.

Simple arithmetic soon indicated that it would not be possible to achieve three flights for each competitor in the time available, and the team managers decided to restrict the flying to two flights per competitor.

Unfortunately the weather was not kind either to the organisers or competitors; a strong wind prevailed throughout the contest, aggravated on the second day by almost continuous rain. Nevertheless, a fair number of spectators defied the elements and saw the meeting in its entirety.

The primary contest, that for the King of the Belgians' Cup, resolved itself into a duel between Stegmaier of Germany and Gobeaux of Belgium, both using improved machines, although the welcome reappearance of Wastable of France made the running more interesting

Stegmaier of Germany won the King of the Belgians Cup for the second year running.



Reported
and photographed
By A. F. HOULBERG

and the results in doubt until the last moments of the contest. However, Stegmaier established a score of 2,120 points, to lead Gobeaux by 242 points and thus win the cup for the second time.

Wastable came in a good third but was obviously suffering from his enforced absence from contest flying during the last two years, and it is hoped that he will soon get back to his old form.

Stegmaier has now gone into business partnership with Bernhardt to market his R/C equipment. This partnership is certainly a force to be reckoned with in the future, since the machine entered by Bernhardt—a low-wing semi-scale job of excellent appearance—performed remarkably well. Bernhardt demonstrated on his second flight, and also after the contest, that with a little more experience he will be well able to hold his own with the present leaders in the art of R/C flying.

Basically, the Stegmaier equipment is as before, but the commercial version has been much cleaned up, uses eight tuned channels, and is now arranged to work in conjunction

with a twin cylinder opposed diesel engine produced by Ruppert, of Germany. This is equipped with an integral vacuum pump to operate the vacuum actuators, which are the main feature of the Stegmaier system.

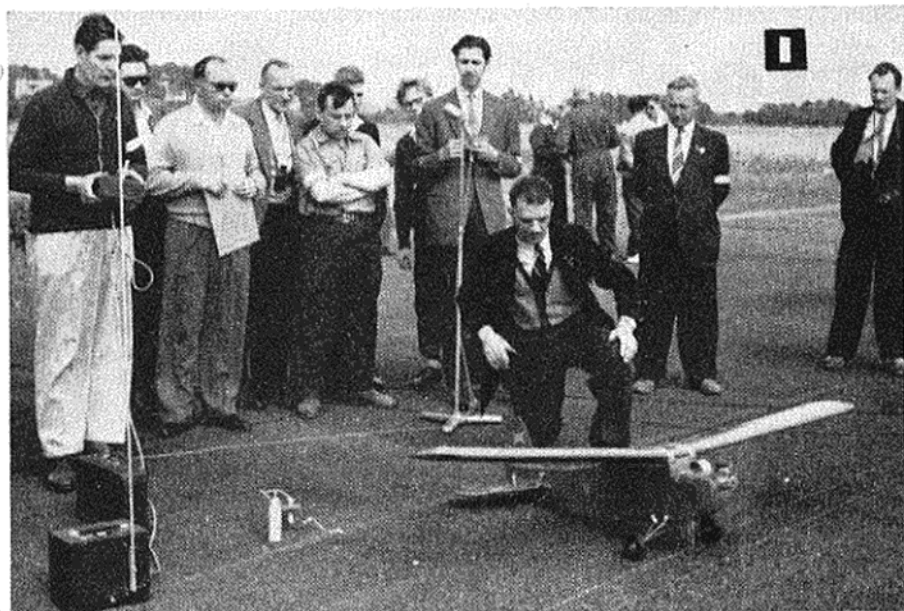
The Ruppert engine runs very smoothly—as one would expect with a twin—and gives ample power to sustain a sizeable machine through the most complicated manoeuvres. It has a two-speed throttle control pneumatically operated through the vacuum system and it is a very clean and compact unit.

Gobeaux's machine has been completely redesigned and also uses this engine, but without the vacuum throttle control. It utilises a tubby fuselage and plenty of wing area and appears to be extremely manoeuvrable—at times too much so.

The performance of the British entries was distinctly disappointing and was undoubtedly affected by the last moment modifications which had to be made to most of the models, due to insufficient area, as stipulated in F.A.I. rules. This was unfortunate, but inexcusable, as the models should have been checked before they were taken to Belgium. The addition of extensive temporary flaps to the wings quite spoilt their normal performance.



This close-up of Gobeaux's machine shows the installation of the Ruppert horizontal twin engine, which is similar to that used so successfully by Stegmaier.



Generally speaking, the performances in the multi-controlled class has improved considerably. Inverted flights, inverted figures of eight, and Imelmann turns are now being executed with considerable precision and certainly by Stegmaier, Gobeaux, Wastable and Bernhardt. Our boys will have to do a lot of practising to attain a similar degree of skill and precision.

In the single-control class the fight was between Lay, of Belgium, Schumaker, of Germany, and Bickel, of Switzerland (last year's winner) with Bocque, of Belgium, hanging on tightly, and they finished in that order.

Bickel was flying the same type of tailless model as last year but was unfortunate in having his model turned over on to its back by a gust during his first take-off. The result was that his forward fin was carried away and the rear fins damaged. He did well to repair the damage in time for a further attempt and to achieve third place.

Lay's machine is an orthodox square fuselage model but his flying technique has much improved since last year and he deserved his win.

The performance of the gliders in



1. British team member Franklin gets off to a hopeful start.

2. By far the most "Western" looking of the Russian models was Malik's tricycle u/c machine.

3. This unusual model with its pylon mounted motor and acute tip dihedral belongs to Gerber of Switzerland.

4. Christiann of Holland blows in the



the high wind and rainy weather was below the usual standard, and most contestants in this class had difficulty in attaining the maximum launching height. In addition there were no thermals in existence with one possible exception.

Most of the glider competitors made the mistake of launching too far down wind so that the model could not be brought back to the landing circle, but one enterprising launcher—going to the other extreme—nearly ran right through the aerodrome's main hangar in his attempt to achieve maximum height.

The winner of this section was Schmidt, of Switzerland, and his low total of 173 points indicates the general standard of performance in this class as a result of the poor weather conditions.

The contest was well organised and in spite of the large entry was finished to time. The Belgian Federation of Model Aviation provided, in addition, pleasant social relaxation on the Saturday and Sunday evenings in the aerodrome restaurant, which everyone enjoyed, and it was pleasing to see members of the Russian team joining in the dancing.

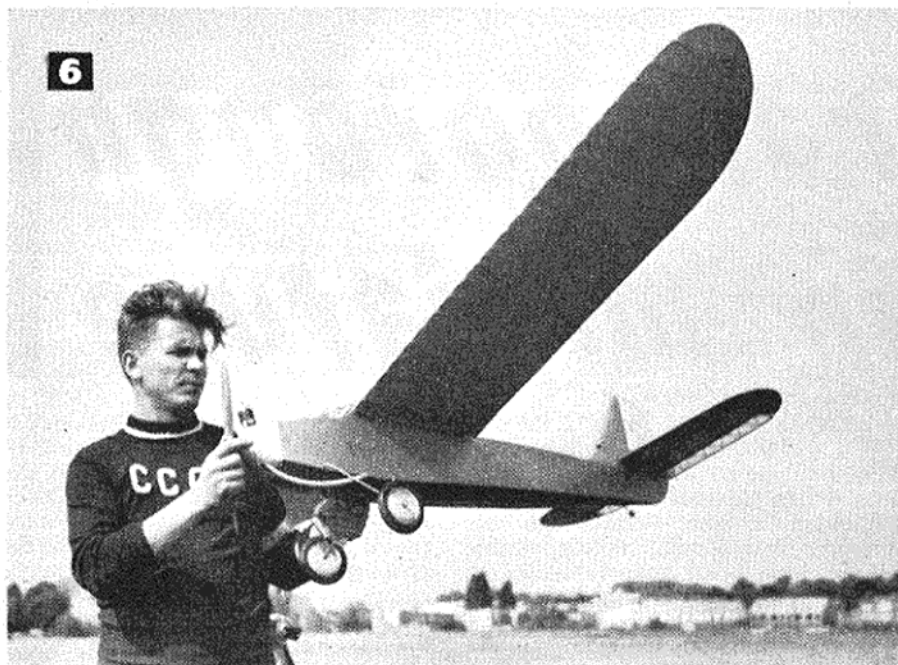
exhaust port to clear his flooded engine.

5. Starting up his nicely made multi-channel model is Veenhoven of Holland.

6. Russian flier Gorynin with the machine he flew into 9th place in the multi-channel class. This model is typical of the Russian designs and bears a strong resemblance to the world duration and distance record holder, which was also flown in the contest.

RESULTS

Multi-control					
1. Stegmaier, E.	Germany	2120 points	7. Schorel	Holland	216
2. Gobeaux, J. P.	Belgium	1878	8. Erler	U.S.S.R.	196
3. Wastable	France	1204	9. Hallmann	Germany	196
4. De Hertogh	Belgium	898	10. Dilot	Sweden	195
5. Klausner	Switzerland	445	11. Velitschowski	U.S.S.R.	189
6. Bernhardt	Germany	436	12. Setz	Switzerland	169
7. Malik	U.S.S.R.	401	13. Berglund, E.	Sweden	144
8. Hemsley	G.B.	240	14. Christiann	Holland	143
9. Gorynin	U.S.S.R.	195	15. Gerber	Switzerland	143
10. Honest-Redlich	G.B.	192	16. Adolfsson	Sweden	112
11. Breeze	G.B.	149	17. Soper	G.B.	112
12. Franklin	G.B.	144	18. Berglund, G.	Sweden	—
13. Donohue	G.B.	108	19. Sjogren	Sweden	—
14. Veenhoven	Holland	—			
15. Vigneaud	France	—			
Mono-control			Gliders		
1. Lay, R.	Belgium	474 points	1. Schmidt	Switzerland	173 points
2. Schumaker	Germany	410	2. Muchner	Germany	163
3. Bickel	Switzerland	408	3. Mabile	Belgium	120
4. Bocque	Belgium	379	4. Erd	Germany	83
5. Rolle	Belgium	269	5. Muller	Switzerland	75
6. Janse	Holland	222	6. Drozhin	U.S.S.R.	46
			7. Dubois	France	25
			8. Lafitte	France	—





Farnborough in miniature

"ROCKETS GALORE" is the title of a new film; it was also our first impression on approaching the mighty marquee that envelops the static exhibition at the Farnborough Air Display. We hoped that the placing of the rockets—or guided missiles to give them their proper title—just outside the marquee was purely coincidental, and did not lay emphasis on what we might find inside.

Our suspicions were allayed somewhat when we joined the throng of people gathered around the **English Electric** stand. Here, two large models of the P.1 were on view. The P.1B, built by **Westway Models**, showed how two *Firestreak* missiles will be mounted on stub fairings on each side of the fuselage, and is shown in our heading photo. One gained an impression of speed not only by the swept back wings, but also

by the nicely curved perspex mount just visible in our photo above. The P.1A model, while impressive by its size, did not match its stable mate in quality of construction, although we understand that it was built rather hurriedly for the opening of last year's show. We might add that it was not built by Westways.

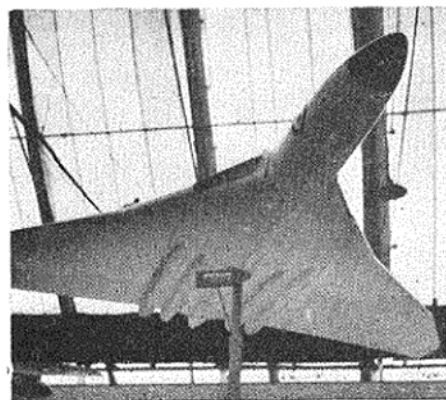
Easily the most eye-catching model on the **Hawker Siddeley Group's** stand was the all-white *Vulcan* B.Mk.2, built to 1/12th scale, and the photo below clearly shows the new wing shape of this V bomber. This was another Westway job and perhaps we had better explain now that 90 per cent. of the models featured on the stands at Farnborough were built by this company.

Also to 1/12th scale was a working exhibit of the **Armstrong Whitworth** A.W. 650 *Freightliner*, the prototype of which is expected to fly sometime next year. The model, shown below, in B.E.A. markings, certainly attracted a lot of attention. Two model lorries, one loaded with jet engines and the other with packing cases, reversed towards the

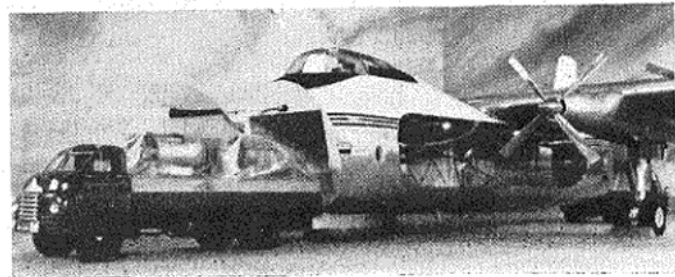
These two M.A. photos show the full size P.1B and its model counterpart. In the take-off picture, note the full tailplane deflection; on the model note the two *Firestreak* missiles.

front and rear loading doors, which swung open to reveal a cavernous freight hold, also visible through the perspex side of the model. The lorries backed right up to the floor of the aircraft and their loads automatically slid into place in the hold. When the trucks had moved away, the doors closed and the four "turboprops" started up.

For colourful models it would have been difficult to better those shown on the **Hunting Percival Aircraft** stand (opposite page). The silver finish and R.A.F. markings of the large *Pembroke* model looked almost drab compared with those sported by its civil counterpart, the *President*. One model of the latter was a six-seater version for the **Iron & Steel Corporation** of South Africa and was finished in the company's colours of green with cream trim. A



Left: The *Vulcan* B.2 in model form. The outboard wing panels are of increased span and sweepback. Right: The A.W.650 model put over well the selling points of this new cargo/passenger aircraft.



President for Hunting Aerosurveys was in silver and red, while another positively sparkled in powder blue with a grey trim line—the colour scheme of a Spanish airline.

Occupying pride of place on the **Westland** stand was a large sectional model of the *Wessex* helicopter as it will probably appear in civil guise. Wherever one turned on this Westland stand there were helicopters—dozens of them, which was really not surprising! There were the *Widgeon*, *Whirlwind* and *Westminster*, many of them sectionalised and in different colour schemes, and nearly all had their rotors turned by miniature electric motors.



The D.H. Sea Vixen.

Dominating the **Folland** exhibition were two quarter scale models of the *Gnat*, which gave them a wing span of roughly 5½ ft. One was all-yellow and the other all-blue, and both served primarily to emphasise the compact proportions of this light fighter, incorporating as they did very little detail.

Unlike most exhibitors, who had their models displayed above eye level, **de Havillands** showed two large scale models of the *Comet* in a separate "pen," (photo below, right) and being at waist level they could be examined in detail.

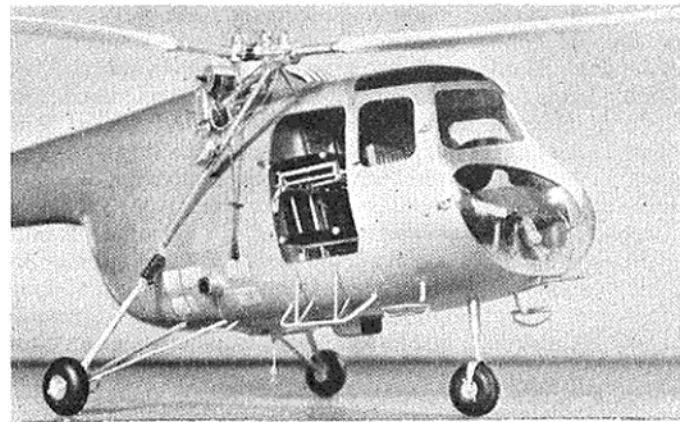


The Hunting Percival stand with, in the foreground, the Jet Provost. In the background on the left are the sectional models of the "President," while on the right is the large "Pembroke" model.

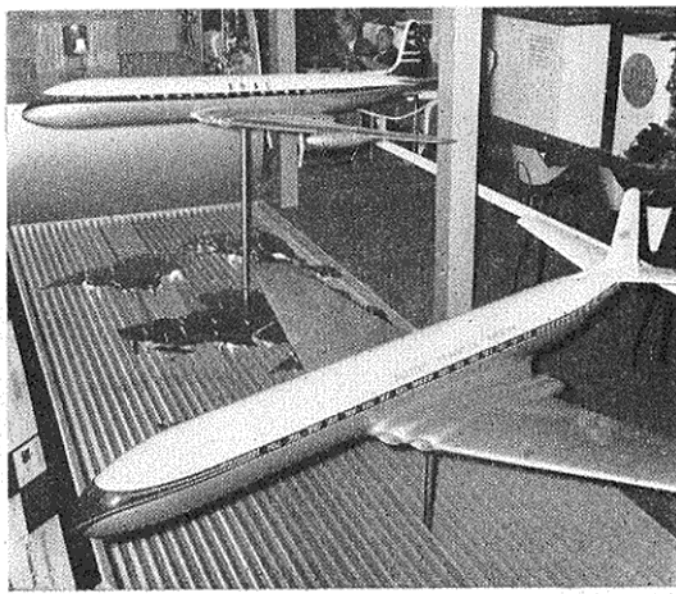
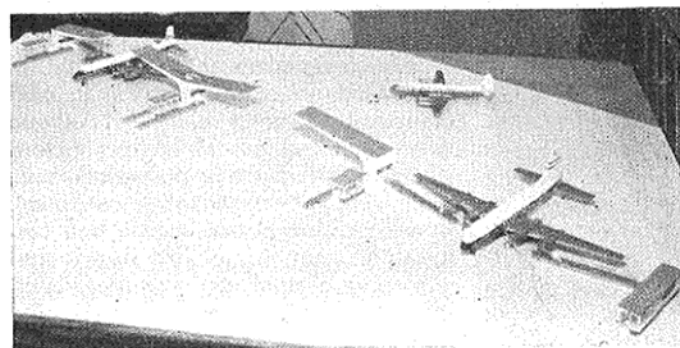
Beautifully finished, and perfect examples of the model maker's art, they ably showed off the undeniably graceful lines of this jet airliner. The fine model of the D.H. *Sea Vixen* (photo above, left) was imaginatively displayed over relief models of aircraft carriers.

In this short survey it is impossible to mention all the many beautiful models that were on view, but we did notice, particularly on the smaller stands of the accessory manufacturers, the increasing use of plastic models. The **Esso** stand was a case in point. Here, an entirely new idea in aircraft

refuelling systems was put over with the aid of the Frog DC7C and *Britannia*, and the *Lincoln Viscount*. Briefly, the system utilises refuelling docks as shown in the photo below, left. The docks would be constructed in suitable areas of an airport, and the aircraft could be towed to them after embarking passengers and freight. This is a completely new alternative to hydrant schemes or to the present system of tankers driving to the aircraft. As can be seen from the illustration, Esso were able to demonstrate their idea effectively.

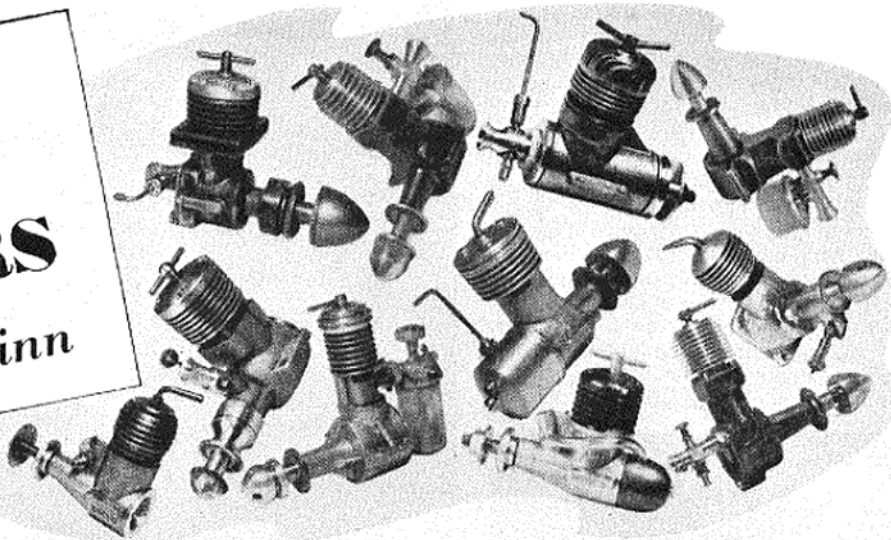


Left: A beautifully detailed Westway model of the Bristol Sycamore. Bottom left is the Esso refuelling system exemplified in model form with the aid of three models made up from plastic kits. Photo below shows the majestic Comets poised over a relief model of the five continents. We liked D.H.'s imaginative phrase—"Anywhere on Earth in 36 hours."



Accent on BRITISH MOTORS

by P. G. F. Chinn



ITS faithful followers will need no reminding that, devoted largely to the interests of model i.c. engine enthusiasts, this column features a sizeable number of foreign engines during the year. No one appears to have any complaint about this: indeed, we get many requests for information on overseas-built motors and it is obvious that there is a healthy curiosity about what the other fellow is flying. We have never hesitated to praise a foreign motor where praise is due and it has to be admitted that some of the overseas-built motors that have passed through our hands have, in fact, been highly praiseworthy. Despite all this, however, one feels the urge to beat the drum for the Old Country now and then and this month, therefore, we propose to give the stage to British motors only.

When one looks at some of the rather rough British engines that appeared on the market just after the war, it is clear that there has, in general, been a tremendous improvement in standards of finish during the past 10 years or so. One engine that has not shown much

improvement in this direction, however, is the Mills—for the simple reason that, from the start, its finish was outstanding anyway. The 1.3 c.c. Mills, first seen in 1946, is remarkable, too, for the fact that it is still in production and has not changed significantly for more than nine years. There are, indeed, few motors which (especially during a period that has seen so many advances in design and performance) can boast such a production run.

The Mills engines are certainly not the cheapest of their class and their success must be attributed mainly to their easy starting and reliability, which combine to make them an ideal choice for the newcomer to the hobby. For many years we have been advising beginners to start with a Mills 75 and, while model shop proprietors are often obliged to sell a cheaper engine, most of them report that the Mills is the least trouble afterwards. The beginner learns more quickly and is less likely to bother the dealer with "can't start it" complaints, added to which, a "dud" Mills is extremely rare.

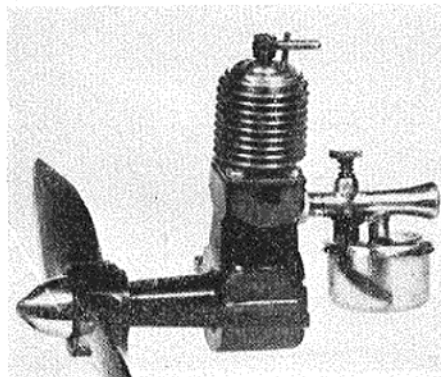
Only three main types have been offered by Mills in 11 years: the 0.75, the 1.3 and the short-lived 2.4, and there has been some surprise throughout the model movement that manufacturers have not followed up their earlier successes with new models. Every year or two, we have been in the habit of enquiring of the Woking factory whether any revisions or additions to the range are intended,

only to learn, each time, that their volume of work in other fields precluded immediate attention to new models. Recently, however, there have been some changes which may result in a new Mills in the not too far distant future. The changes referred to are the absorption of Mills Bros. (Model Engineers) Ltd. into the Ayling Industries Group.

This latter organisation is known in the engineering field for its specialised work on a wide range of precision equipment, among which may be mentioned remote handling gear for nuclear projects, electronic control cabinets and testing equipment. According to a recent Press release, Mills Bros. will continue to produce the present Mills diesels, but facilities for the development of new and more efficient models are now greatly strengthened by the additional research and production resources available within the Group.

Switching now from what might be called first-year modelling to "fifth year" stuff, the block of four photographs reproduced opposite shows an interesting British motor that has been devised especially for R/C enthusiasts. This is the 5.7 c.c. Miles spark-ignition engine first mentioned in our April and June articles and now in limited production.

The main attraction of this Miles design is its coupled throttle and contact-breaker system. Anyone who operated model engines before the war, or in early post-war years, will remember that the ordinary spark-ignition petrol engine had two qualities not found in diesel and glowplug motors: (a) an unparalleled degree of speed control via the ignition advance and retard control



Born 1946 and still going strong, the 1.3 c.c. Mills has remained virtually without modification since 1949.

and (b) much cleaner running. By retarding the ignition, one could slow the engine, still two-stroking, to less than half its normal speed on a given prop and if the mixture was slightly enriched by opening the needle-valve a fraction, the ignition could be still further retarded without risk of stalling the motor. Unlike diesels or glow motors equipped with slow-running devices, this was *not* accompanied by the ejection of buckets of unburnt fuel through the exhaust.

The main objections to the spark-ignition petrol engine are its greater weight, due to the need for carrying an ignition coil and battery, its somewhat reduced power when running on petroleum fuel, and the greater complication and potential source of trouble resulting from the use of high-tension ignition.

When we consider the characteristics of multi-channel radio-controlled models, however, these disadvantages appear in different perspective. The addition of four to six ounces for the ignition equipment means an increase in wing loading of, perhaps, no more than 5 per cent. Slightly less power than an equivalent capacity modern glow engine is not a serious matter since the latter are seldom required to deliver their absolute maximum in an R/C model and, in any case, the spark ignition engine can run on an alcohol base glowplug type fuel if extra performance is needed. As for the added attention required to keep the coil ignition system functioning properly, this is certainly no great hardship to the R/C modeller, who, after all, is used to having to check his radio equipment continuously and meticulously.

In all, therefore, there appears to be a case for reverting to spark ignition in multi-channel models, especially where smooth, variable throttling is required as distinct from a two-speed device. The only other alternative is, of course, coupled exhaust and intake restriction, such as that now being made available on Fox and O.S. glowplug engines. The success of this depends somewhat on the design of the engine, and, of course, it does not give steady firing down to a mere tickover as is possible with the Miles system.

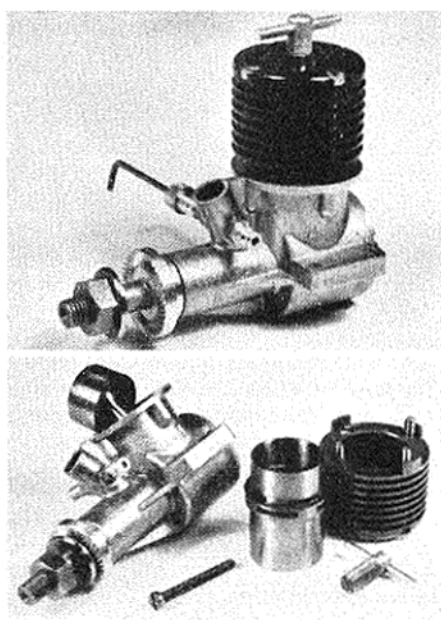
On the Miles engine, the rotary induction valve is at the back of the

motor and is of the drum valve type, the drive being taken, of course, from the crankpin. The end of the drum valve protrudes slightly from the housing and to it is attached the contact-breaker cam. Thus, by means of a simple wire linkage, it has been possible to couple the moving contact-breaker bracket to a butterfly valve in the carburettor intake to automatically reduce the air supply and enrich the mixture slightly as the spark is retarded.

The cylinder design of the Miles is virtually identical with that of the experimental Miles "35" stunt engine, described in our May issue, and the bore and stroke of the two engines are the same. The lower end, however, with crankshaft mounted in twin ball bearings and with the bearing housing integral with the crankcase casting, is based on that of the E.D. Miles-Special 5 c.c. diesel.

The choice of a drum valve was obviously the right one with this design. It allows a compact induction layout that fits in well with the use of a large, heavy-duty type contact-breaker assembly and provides an excellent, rigid drive-shaft for the cam. Added to which the drum valve probably gives a better gas seal, at low revs, than a disc valve would have done and this is important when running on petrol, which is much more sensitive to changes in mixture strength than alcohol-base fuels.

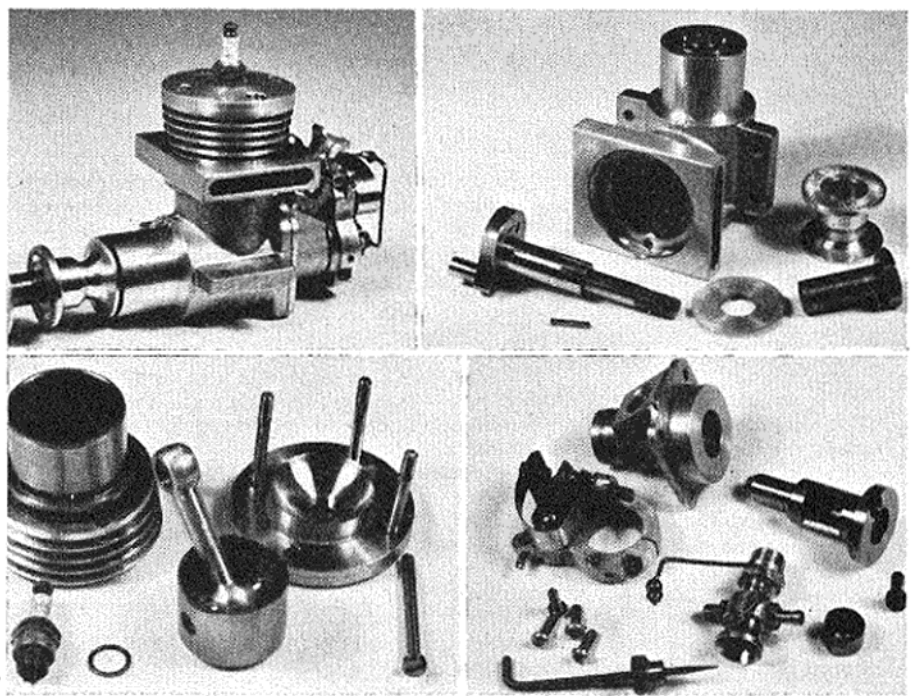
The Miles is essentially a hand-built product and has a great deal



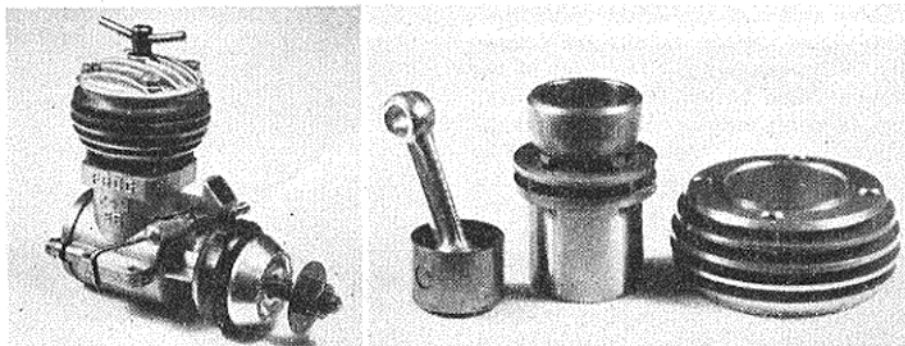
The Allen-Mercury 25 Mk. II, a high-quality, plain bearing engine, with, below, its larger bore brother, the AM-35.

more work in it than the average motor of its size. This, naturally, is reflected in a somewhat higher price, yet one which, having regard to the engine's quality construction, is reasonable.

British production of popular 2.5 c.c. diesels has taken a somewhat unexpected turn of late. When the Miles-designed E.D. 2.46 first appeared 6½ years ago, it was the only British 2½-c.c. production engine having a twin ball-bearing shaft and, with its heavier construction and disc-valve induction, broke



The Miles 5.7 c.c. petrol engine, designed especially for the multi-control R/C enthusiast, has speed control variable down to a tick-over.



The Frog "249 BB Modified" engine was described in our June issue. Shown here is the new type cylinder which distinguishes this motor from the standard 249 BB.

sharply away from the then current design trend of plain bearing, shaft induction, threaded components and light weight, as exemplified by the Elfin 2.49. Today, though the latter specification is still to be found in a number of Continental productions (e.g., Webra Winner, Taifun

Rasant, Schlosser 2.5, Alag X-3), it has virtually disappeared from Britain. E.D. 2.46, Frog 249, Oliver-Tiger, D-C Rapiet, PAW-Special all have b.b. shafts and none are exactly lightweights.

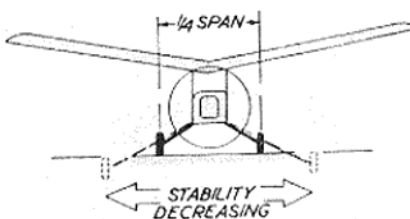
This will generally be hailed as a welcome trend, but there can be no

doubt that a demand for a simpler and cheaper type of 2.5 still exists. For proof, we have only to consider the popularity being enjoyed by the Allen-Mercury "25." The A-M reverts to the plain-bearing shaft-valve layout, but with a standard of quality not found in earlier designs and without the often troublesome screw-on cylinder barrel and screw-in liner.

The current Mk. II model Allen-Mercury 25 features a number of improvements over the original type 25 which earned such a favourable report in our Engine Tests series, and the overall result is a robust, easy-handling, hard-wearing engine of ample performance. We rate it, and its 3.5 c.c. brother, especially highly on a value-for-money basis, for neither model, so far as we can recall, has ever been beaten with regard to price.

Good Take-offs — Happy Landings!

IT is a common fallacy that a model needs a wide track undercarriage with the wheels well forward for good take-off and landing performance. Nearly all the early power models, for example, had spidery wire legs extending forward of the propeller even, and a track sometimes greater than half the wing span. With very large airwheels fitted,



these jobs usually kept upright on landing, but take-offs were rarely attempted because of the relatively low powered engines used. When similar layouts were adopted for radio controlled models and take-offs did become desirable, the limitations of these undercarriages were quickly shown up.

A wide track undercarriage is not necessarily a help in keeping a model upright, either on take-off or landing. If one wheel snags on a tuft of grass or piece of rough ground, the farther it is from the centre line of the machine the more likely it is to slew the model off course. There is no need to use a track any greater than a quarter of the wing span and for most purposes a track even smaller than this will suffice. There is some

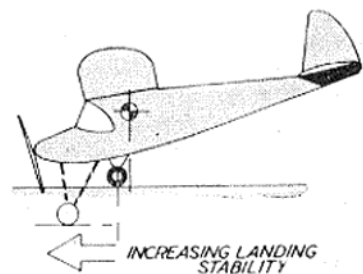
advantage in using a wide track for the rear wheels of a tricycle undercarriage because here the wheels are behind the centre of gravity.

As far as take-off characteristics are concerned, the nearer the wheels are to the centre of gravity on a two-wheel type undercarriage, the straighter the model should run. If they are too far back, of course, there is the danger that the model might tip forward and let the propeller strike the ground but, in general, increasing the distance between the wheels and the centre of gravity decreases the directional stability for take-off. Models which persistently slew off to one side on rolling and seldom get off properly can often be cured of this fault if the legs are bent to bring the wheels farther aft.

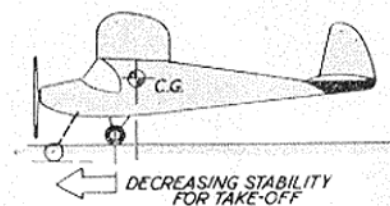
Full size machines have their wheels in a "good take-off" position, in fact usually a little farther aft than models can get away with. Thus scale models, as a class, normally have good take-off characteristics with just a slight forward rake of the undercarriage from true scale.

The picture is a little different on landings. A wide track does not help keep the model upright—the wing

lift will normally do that. But since wheel sizes are small in relation to the size of likely ground obstacles—short grass has a "scale" effect equivalent to landing a full size machine in something like a cornfield—the machine is likely to be dragged to one side off course. So keeping the track narrow will minimise this.



This time, however, the rearward position of the wheels is just asking for the model to be tipped over onto its nose and there is no cure for this other than moving the wheels forward. Thus the position of the wheels cannot be decided by either take-off or landing requirements alone. If the machine is required to perform both, then it is usually best practice to locate the wheels as far forward as possible without detracting from the take-off characteristics. In other words, some of the desirable take-off characteristics must be sacrificed to give the model a reasonable chance of staying upright in a normal landing. If no suitable compromise can be arrived at, then probably a tricycle undercarriage is best.



OVER THE COUNTER



A series of kits from a new manufacturer—Performance Kits of Coventry—was recently announced and two designs are now in the shops. The first of these, the Apex, is a somewhat orthodox, low aspect ratio machine for 0.75-1.5 c.c. engines, which can, however, in addition to normal F/F, be used for R/C, P.A.A. or Clipper Cargo events.

Not nearly so orthodox is the Ion; this is a 34 in. span flying wing for up to 0.8 c.c. engines. It has been developed from numerous prototypes, two of which hold S.M.A.E. National records.

Both kits are uniform in quality, and very good quality it is too. The plans are admirably clear and the separate introduction leaflet sorts out any queries that might arise during building. Solarbo balsa is used throughout, some parts being

die-stamped and others printed, whilst all ply parts are pre-cut. The kits are "dry," i.e., no cement is included, but there are nuts and bolts, coloured Modelspan and an attractive transfer. Prices are 33s. and 30s. each respectively.

Following their removal to larger premises, Multicraft Ltd., manufacturers of the well-known modelling tools, have issued an attractive catalogue, which should be on your hobby shop's counter now. Unusual feature of this catalogue is its pocket size— $3\frac{1}{2} \times 8$ in.—which raises an interesting point that many manufacturers are undecided what is the best format for this sort of booklet to ensure that the public keep it for reference. We would be interested to hear what our readers consider the most interesting type and size of catalogue.

LePage's balsa cement has been popular with modellers for over 20 years and now this firm have entered the plastic field with a polystyrene cement that should equal the popularity of its companion product. It is completely clear, rather more "runny" than some styrene cements, and most important it does not "string." Tests that we have conducted have been most satisfactory and shown that the cement is easy to apply cleanly. Retail price is 1s. per tube.

That the world of models is no longer the exclusive province of the male was proved at the demonstration stand at the recent "Model Engineer" Exhibition. There, invading an area that is usually reserved for "men only," was a charming lady demonstrating how to

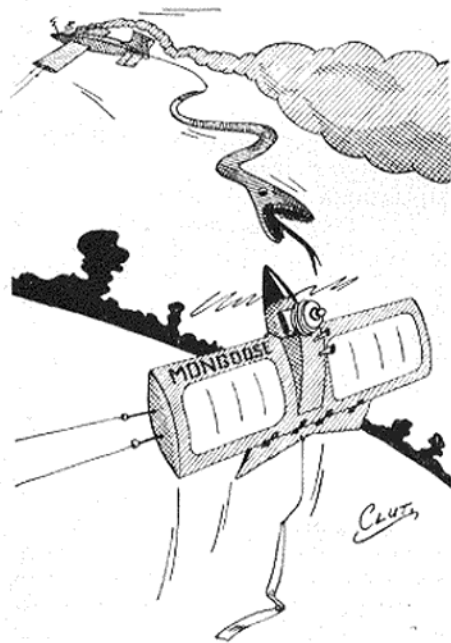
build model aeroplanes. When we add that the lady concerned was Mrs. Pat King; that the model was an Inchworm, designed and manufactured by her husband, Mike (Contest Kits) King, and that flying a similar machine she nearly ousted one of the boys from this year's A.2 team, it was not surprising that her demonstration attracted a lot of attention.

Mercury's latest stunt/combat design—the Torcador—has been such a success, the initial batch of kits selling out in record time, that they are following it up with a scaled-down version for the A.M.10, to be called the Picador. Should be ready for Christmas and by the sound of things it will be a hot little number.

Visitors to the "Model Engineer" Exhibition always expect to be able to see and buy the latest engines, kits and accessories. This year their demand was met by a newcomer, Messrs. Wings and Wheels, of 1476, London Road, Leigh-on-Sea, Essex, whose well stocked stand certainly provided most things that could conceivably be asked for, including free leaflets and advice. The service which they provided was much appreciated by the visitors to the exhibition and we understand that they did a brisk trade.

Bookshelf

AIRCRAFT have now become such an accepted part of rescue work that when dramatic incidents do make the headlines, the skill and organisation behind a rescue attempt is often forgotten. But this state of affairs is more than remedied by Elliot Arnold in a new book, **Rescue!** published by Gollancz, at 18s. Although he deals solely with the U.S.A.F. Air Rescue Service, the author's hundreds of stories cover the entire globe and feature almost every nationality, from hunters in Alaska to sailors from communist China. Just how these rescues were attempted—and in nine times out of ten accomplished—makes a story that, for sheer courage and tenacity, it would be difficult to better.



AVIATION NEWSPAGE



by J. W. R. Taylor

The Government's plan to order **NO MORE FIGHTERS** for the Royal Air Force after the English Electric P.1B will almost certainly be abandoned. Already it has been stated that use of the term "fighters" meant only interceptors, and that the R.A.F. will need another ground attack fighter, with the new Gyron-powered Hawker P.1121, the D.H. *Sea Vixen*, Supermarine *Scimitar* and Blackburn's supersonic N.A.39 naval strike fighter all in the running for a contract. Nor did the original plan mean that the Royal Navy will need no more interceptors.

'Plane in which the Navy is said to be interested is the Saunders-Roe

P.177, a larger, more powerful development of the little S-R.53 which made an impressive first appearance at this year's S.B.A.C. Display. The two prototype S-R.53's are each powered by an Armstrong Siddeley Viper turbojet and de Havilland Spectre rocket-motor, mounted one above the other in the 45 ft. long fuselage. The cropped delta wings span 25 ft. 1½ in. and carry the armament of two D.H. *Firestreak* infra-red "heat-seeking" homing missiles at the tips. Even in this form, take-off and climb are terrific: when the Viper is replaced in the P.177 by a D.H. Gyron Junior turbojet, the result should be out-

standing and the shrewd leaders of West Germany's *Luftwaffe* are considering this aircraft as their standard defence fighter.

With an estimated Mach 2—90,000 ft. performance and reasonable range, the S-R.53 makes the first-generation ground-to-air missiles look like peashooters; and there is no other guidance system so reliable as that which, typified by Saro test pilot John Booth, "weighs 200 lb. and drinks gin."

* * *

PRE-PRODUCTION JET PROVOST T.Mk.3, flown at Farnborough, featured several mods compared with earlier versions. Powered by a 1,750 lb. thrust Viper 8, it has wing-tip tanks, side-by-side ejector seats and a curved "clear-view" windscreen with only a single centre-support to meet bird-protection requirements. It will supersede the piston-engined *Provost* as the R.A.F.'s basic flying trainer under the new all-through jet training scheme.

The eve-of-the-show order for a development batch of 14 Folland *Gnat* two-seat trainers for the R.A.F. lends weight to rumours that this little aircraft may replace the *Vampire* T.11, producing a *Jet Provost-Gnat* training sequence, and giving pupils experience of transonic flight. Compared with the single-seat fighter version, the trainer is 9 in. longer, with two Folland-Saab lightweight ejector seats in tandem under a one-piece canopy, increased wing area and (to compensate for deletion of the fuselage fuel tank) new tanks in the wing bays that house guns in



Above: The Jet Provost T.Mk.3, now sporting a clear-view canopy and other mods. Below: Addition to the Convair delta family is the F-106A Delta Dart.

the fighter. Endurance is 75 min. on internal fuel or 135 min. when underwing tanks are carried.

* * *

Although **FAR FROM BEAUTIFUL**, the Aviation Traders *Accountant* incorporates many bright ideas and is attracting a lot of overseas interest. The tensioned-skin construction of the prototype is to be dropped on production aircraft which will have an unbroken top fuselage line instead of the present double-hump. And the massive spin-chute housing that projects from the tail for initial flight tests will, of course, disappear.

The rather ungainly high mountings for the two 1,740 h.p. Dart 512 turboprops help to keep the wing clear of cut-outs, and the main undercarriage legs retract forward into fairings under the engines and forward of the front spars for the same reason. The result is a simple, sturdy structure and the ability of the *Accountant* Mk. 1 to carry 28 passengers for 1,020 miles at 294 m.p.h. as a DC-3 replacement, or six passengers for 2,420 miles in a de luxe "executive" configuration, makes it an interesting project. The semi-retractable nose-wheel offers protection to the airframe in a wheels-up emergency landing.

* * *

Leaving Farnborough for nearby Blackbushe, we spotted one of Eagle Aviation's *Vikings* in a smart new colour scheme. In place of the former white top, G-AGRT now sports a red cabin and fin, with white rudder and lettering, grey window lines and a smart civil aviation flag on each side of the fin.

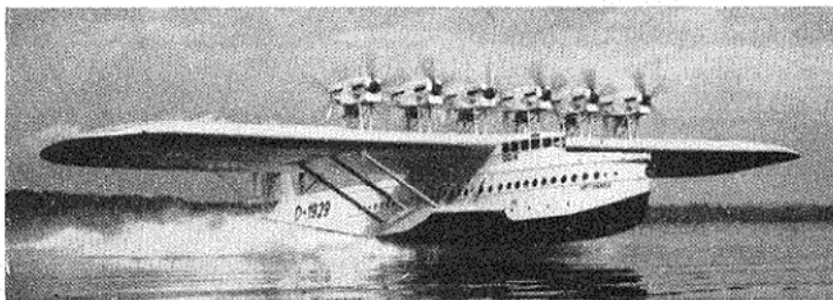
* * *

NEW FROM FRANCE is the neat little side-by-side two-seat Legrand-Simon LS.50 lightplane, designed by Paul Legrand, a young engineer of the SNECMA engine company. Of conventional braced high-wing layout, it has a 90 h.p. Continental C90 engine and will be produced in small numbers if orders are forthcoming.



FROM THE PAST No. 18

The Dornier Do X



BIGGEST flying boat of its day, the DORNIER Do X also offered an unprecedented standard of comfort for crew and passengers. The main cabin normally seated 74 persons; but the prototype set up a world record on October 21st, 1929, by flying for nearly an hour with a crew of 10, 150 passengers and nine stowaways, at a loaded weight of 52 tons. Purely experimental, it made many other famous flights, including two Atlantic crossings in 1930-32, during which it visited the U.K.

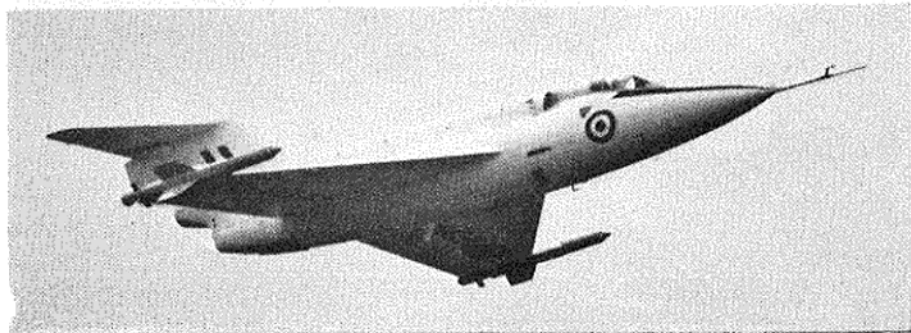
Powered initially by 12 525 h.p.

Siemens-Jupiter air-cooled engines in pusher-tractor pairs, the first Do X was soon re-engined with 615 h.p. liquid-cooled Curtiss Conquerors to cure over-heating problems. Two more, named the *Umberto Maddalena* and *Guidoni* were built in 1931 for the Italian Naval Command, each with 12 600 h.p. Fiat A.22 engines.

Span, 157 ft. 5 in. Length, 131 ft. 4 in. Height, 29 ft. 6 in. Weight empty 66,000 lb.; loaded 123,200 lb. Max. speed 130 m.p.h. Cruising speed 104 m.p.h. Ceiling 10,500 ft. Range with 6,250 gal. of fuel 1,740 miles.

FIRST PHOTOGRAPHS of Convair's new F-106A *Delta Dart* show that it differs little externally from the earlier F-102A *Delta Dagger*; but it has a Pratt & Whitney J75 turbojet, producing 23,000 lb. of thrust with afterburner, compared

with the 10,000 lb.-plus J57 of the earlier aircraft. Convair claim that this makes it the fastest all-weather interceptor in the world, and that the electronic fire control system for its *Genie* nuclear-warhead missile is the most advanced yet flown.



Top: The all-white S-R 53. Left: Gay Viking of Eagle Aviation. Right: New French light plane, the LS.50.



THE 1957 ALL

As seen by Model Aircraft's

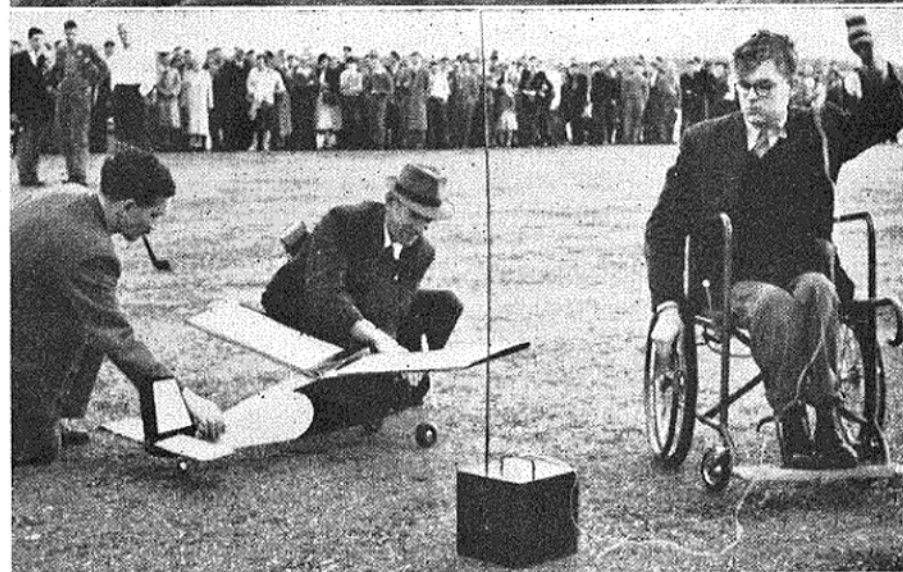


THE All Britain Rally—if not actually the climax—is certainly a rousing end to the flying season. As with all large meetings, the emphasis is on providing entertainment for the many, rather than serious events for the avid contest fan. Anyway, the latter prefers to fly in solitude, and solitude is about the only thing that will *not* be found at Radlett. This year 3,000 cars, 70 coaches and 20,000 people turned up, while a record number (105) of clubs competed in the contests that ranged from the spectators' catapult glider event to the multi-channel R/C contest.

Top: Ian Lucas of Brighton makes sure his floats are really wet, as he launches his M.A. design Clot.

Centre: Among the many radio entries was R. A. Reeves of Ashburton Secondary Modern School, Croydon, whose single-channel entry unfortunately crashed due to a jammed rudder.

Lower: The Concours, as usual, attracted many fine entries, including this C/L Bristol Super Freighter.



BRITAIN RALLY

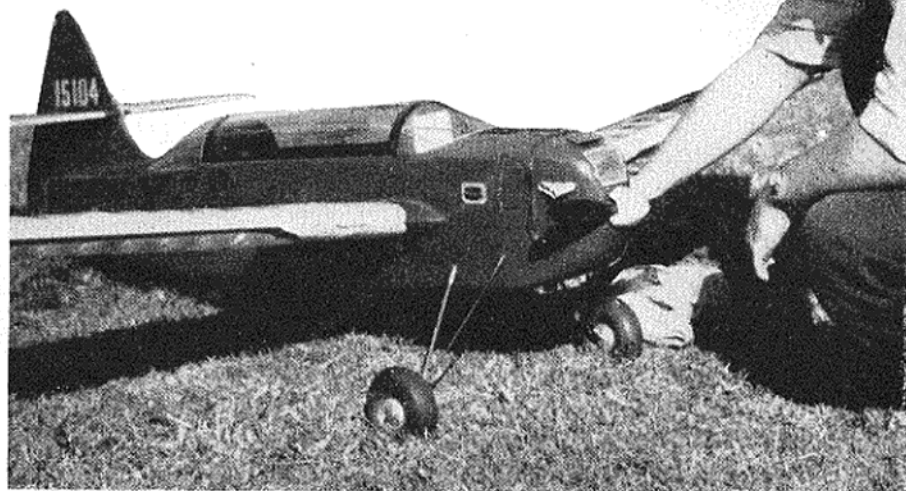
cameraman, reporter, and artist

Although the team racing and seaplane events attracted their usual quota of spectators, by far the greatest crowd was inevitably gathered at the radio. Judging by the respectful distance the onlookers kept between themselves and the actual flying area, the take-off and landing vagaries of R/C machines had been observed at previous "All Britains."

Of the other contests, the F/F events ran smoothly, no fly-off being necessary, and the new-rule Wakefield event brought forth several interesting machines for their first contest outing. Combat was hidden away at the far end of the 'drome and, true to tradition, kept going long after everything else had stopped. The Concours attracted a good collection of first class models, from which it would be invidious to single out any one for special mention.

Top right: This large Frog 500 powered free-fighter caused quite a crowd to gather. Builder is Don Baxter of Wood Green.

Lower right: Famous test pilots Peter Bugge (centre) and John Cunningham (right) judged the Concours with technical advice from gala secretary Jim Greening. Model is Vic Jay's winning Gastove.



RESULTS			
Open Rubber Duration	..	T. Chambers	.. Stockton .. 8.04
Open Glider Duration	..	R. G. Greygoose	.. Anglia .. 8.47
Open Power Duration	..	A. J. Straker	.. Springpark .. 6.56
Wakefield New Rules	..	N. P. Elliot	.. Men of Kent .. 6.54
Seaplane Rubber	..	G. Walker	.. Birmingham .. 4.33
Seaplane Power	..	M. J. Dumble	.. Epsom .. 3.01
Tailless Rubber	..	J. Marshall	.. Hayes .. 3.19
Tailless Glider	..	P. Giggie	.. Southampton .. 6.39
Tailless Power	..	O. F. Fisher	.. Coventry .. 0.46
Clipper Cargo	..	D. Poole	.. Birmingham .. 42.5
Concours Scale	..	Capt. C. Milani	.. C.M.
Concours Non-scale	..	V. Jays	.. Surbiton
Concours Unorthodox	..	G. Woolls	.. Bristol & West
Concours Champion	..	Capt. C. Milani	.. C.M.
Team Race "A"	..	G. Yeldham	.. Belfairs
Team Race "B"	..	R. J. Tuthill	.. Enfield
Radio Control Single	..	J. Soper	.. A.R.C.C.
Radio Control Multi	..	E. Johnson	.. A.R.C.C.
Combat	..	— Stevens	.. Littleover
Aeromodeler Trophy (Best Seaplane)	..	G. Walker	.. Birmingham
Model Aircraft Trophy (Rally Champion)	..	J. Marshall	.. Hayes



GENGANGAREN

A SWEDISH F.A.I.

CLASS TEAM

RACER

by

M. Hagberg

OR

THE

SPECTRE



THIS model was designed with the following ideas in mind: 1. strength and reliability; 2. smallness, for low drag; 3. complete accessibility to tank and controls; 4. tank located to ensure positive starts; 5. control of oil seepage; 6. crankcase cooling, for consistent motor runs; 7. extremely quick and easy building; 8. good looks.

Points 1, 3, 5 and 7 are met by the semi-bolted together assembly, while the high starboard tank location gives a positive feed and minimises the risk of the motor leaning out in the air. The bearers-below-engine system gives the smallest possible model, crankcase cooling is easy to arrange and as for looks, well that's for the individual to judge.

Other interesting features that have been designed into the *Spectre*, include an asymmetric wing, leadouts rigged for "clean" tangential flying, and despite the short tail moment, and rearward c.g. location (22 per cent. chord) the model is completely stable and can be flown with precision.

The construction is quite straightforward, but the following assembly sequence should be of assistance.

1. Put six coats of balsa cement

- on wing blank root for strength.
2. Add shaped bearers, landing gear and hold-together bolts.
3. Instal (tape-protected) motor. (No offset is used.)
4. Add fuselage layers sawn out for motor and cooling air. Note that air is led around cylinder.
5. Shape fuselage and wing. Cement and silk 1 oz. of lead into cutout in outer wingtip.
6. Add tailplane, fin-stab. fairing and cowl. Hold in place with pins as well as cement.
7. Sandpaper all over.
8. Silk cover lower fuselage half, and tissue-cover rest.
9. Apply filler, allow to dry, sand, clear dope, sand lightly and colour dope.
10. Cement canopy in place, and fuel-proof plane inside and out.
11. Instal tank and controls. Lead-out-guide should be placed exactly in line with centre of gravity.

Flying is simple as *Spectre* is completely stable, just use full "up" elevator until the model is airborne, then level off. However, if you want to win contests then the following points should help.

Use the best possible motor; at

the moment for Class "A" racing the Oliver Tiger III is unsurpassed. Run it in properly until it is completely free, as any friction causes overheating and loss of power. The "works" fuel formula is very effective in this racer; where the engine is well cooled, however, on hot days I add a little more ether.

When a race is due, check and clean your plane several days in advance. Double check tank, controls and carburettor needle soldering.

Before your heat commences, pre-run motor and open needle-valve two turns to clear out any accumulated dirt. Also test pull lines and wipe them. See that you have a pair of combination pliers (faster than wrench) handy, also an extra airscrew with spinner nut and the required washers already in place. During the race, it is often better to use a chipped propeller than to replace it.

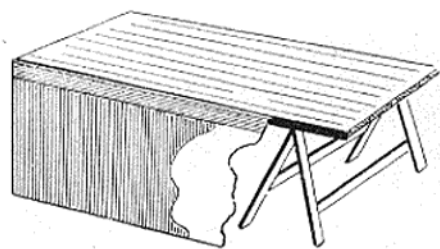
My shortest pit-stops are made in this way:

1. Squeeze filler bottle hard so that fuel is pressed into engine.
2. Prime by closing exhaust port with piston and splashing in through fuselage side port.
3. Flick twice, release immediately.

Organising a show for the Club this winter? Then read V. Sutton's hints on **RUNNING an EXHIBITION**

A WELL planned exhibition is worth trying. From this you create interest in prospective members, and impress on parents and public the value of your hobby. It must be planned and it must not compete in date with other organisations. It can be large, medium or small but let it be an exhibition and not a mass of tables with models on.

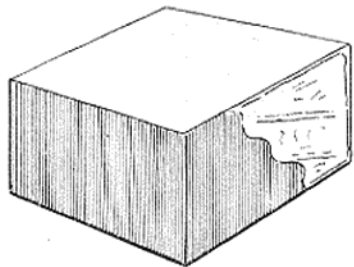
Date is absolutely important, and the start of the indoor season is most suitable. Publicity also must not be forgotten and if you cut down on this you lose on



your exhibition. Two hundred crown posters will cost about £3. Print them early and make someone responsible for seeing that they are put up over a reasonably wide area and not six in six shop windows next to each other, or on railway property, or telephone posts!

If you have a local V.I.P. to open the exhibition, then see that the name is half-way down the poster. Have a committee and make somebody responsible for all floor arrangements. Draw up a plan of stands and present as wide a front as you can to the hall entrance. Position anything really outstanding on the left as you enter because, so the successful showman tells me, we have a habit of turning left more than right so that may be a good point.

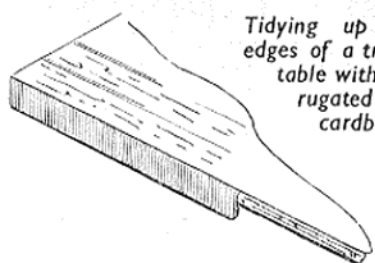
Most halls have a special clause by which you can have "preparation" time at about 3s. an hour; for the perfect job, that is the answer. You borrow tables and trestles but how seldom do we see these trimmed up nicely. Collect brown paper sheets, and paste them up



to make "skirts" for the stalls. The thicker the better because they make a stand look a block and not a trestle table. Crepe paper costs about 1s. a fold of 12 yd. by 22 in. There are over 35 shades to choose from so why not a colour scheme all round?

Lining the tables is also important and makes such a great difference. Wallpaper stores stock tinted lining paper in shades of pink, light blue, yellow, fawn, off-white and mauve. These papers are 22 in. wide and in 12 yd. rolls. (See sketch left.) Models shown on various papers can look very much more attractive.

Edges of trestle tables always look untidy and if you get some of that corrugated cardboard from the local radio dealer you can give this a coat of aluminium paint. It takes it quite well and then you can cut this in strips. You will always use cartons to build up the models on the backs of stands and here again the corrugated cardboard



Tidying up the edges of a trestle table with corrugated strip cardboard.

gives a most professional finish. (See sketch below, left.) This material will also take emulsion paint in any of the popular tints if you keep it really thick.

There are very many jobs to do before the day. What you make and create will always do for another show. Let four members look after the "decorative" side and keep all the materials in cartons. With an organised effort like this you can have an annual event and possibly rely on others to co-operate with you to make it a worth-while local attraction.

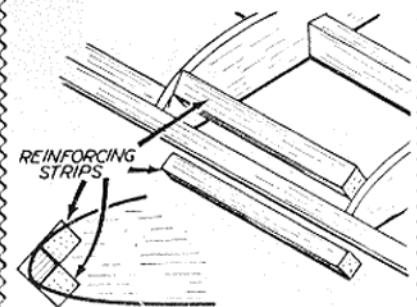
Call in other organisations. The local horticultural society will often decorate the stage and be pleased to do it. They want members also and seldom fail to see this advantage. See the local Clerk to the Council. They often come in with shows which they borrow. The Road Safety Committee, Civil Defence and County Records Office are suggestions and the inclusion of these concerns will often get many more visitors, with your show still the one of paramount importance.

TOP TIPS

Reinforced Diagonal Leading Edge

THE ordinary type of diagonal leading edge is quite weak, especially if the rib spacing is wide. A simple method of reinforcing is shown in the drawing, which does not add a great deal of weight.

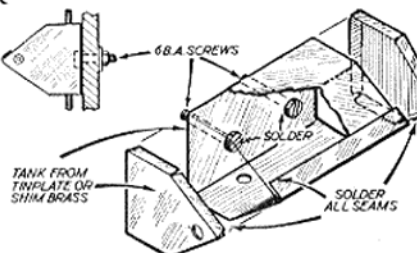
Use square section wood of the same size as the leading edge and cut pieces to fit between each rib, top



and bottom, and cemented to the diagonal (inside) faces of the original leading edge. When set, simply sand down until flush with the ribs. The reinforcing pieces are added after the wing has been built in the normal way and the ribs do not have to be slotted to fit since the extra pieces simply fit between them.

Self-mounting Control Line Tank

FOR C/L models with profile fuselages the neatest way of mounting the tank is to make this unit with integral fixing screws. The tank can be of any standard form. Pierce or drill two holes in the back face to take 6-B.A. screws, file off any burr produced and then solder two screws in place, as shown in the sketch. Complete the tank in the usual way by soldering on the end caps, then the supply and vent



tubes. The tank is mounted by drilling the fuselage to match and securing with nuts and washers, as shown in the smaller sketch.

SCOOT

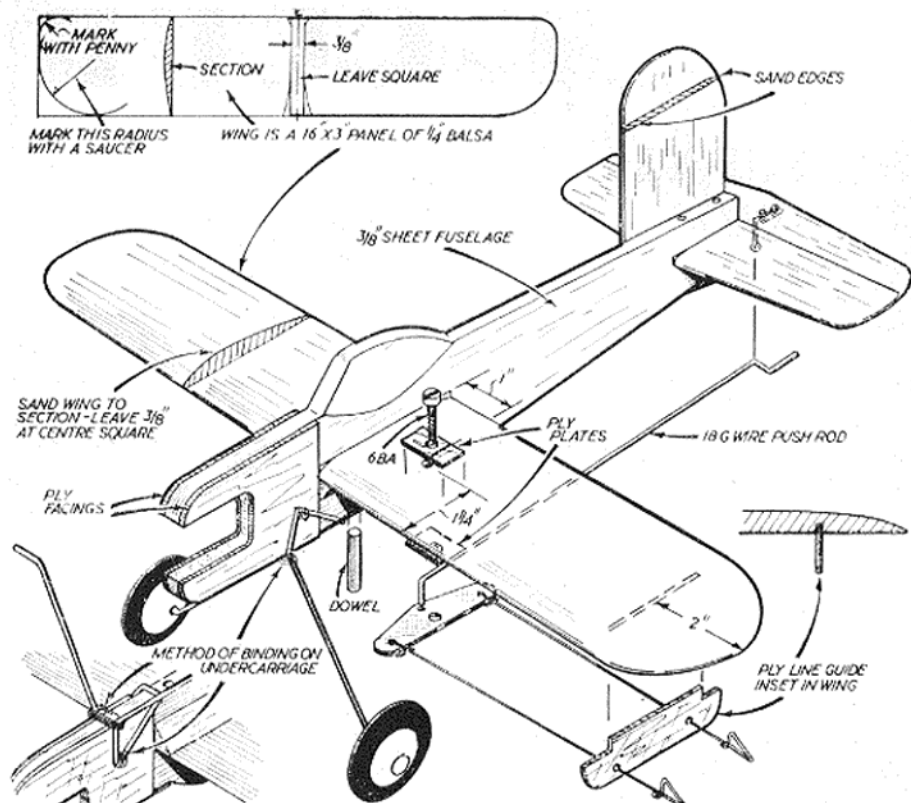
Continued from page 362

left-hand side of the fuselage. Only a short length of fuel line should then be necessary to connect to the engine. Do not position the tank too high as it will tend to flood the engine before you have started it.

For the flying lines button thread is quite adequate. You want a minimum line length of about 15 ft. The maximum line length which can be used with safety is about 30 ft.—more if you like on calm days.

Flying speed with a Mills 0.75 "tamed" with a fairly large propeller is about 30 m.p.h. Most of the flying on the original has been done on an 8 x 4 flexible plastic prop trimmed to 7 in. diameter, which is about right for general flying.

If you want to try "overhead" flying with *Scout*, i.e. high circles, wingovers, etc., then it is advisable to fit a counterweight to the right wing tip. A couple of fairly large washers cemented or bolted on will do. This will reduce the tendency for the inner wing to drop should the lines slacken off.



in MOSCOW

Continued from page 352

followed by I. Czerny of Czechoslovakia with 873 points. Team placings fluctuated during the whole of the contest, but the final scores indicated Finland as the winners of the team event with a score of 2,511 points, closely followed by Czechoslovakia with 2,486 points and the U.S.S.R. with 2,433 points.

The results were publicly displayed during the contest on two score boards which kept commendably up to date, and these served as the basis for arriving at the final score which was available very quickly following the termination of the flying.

Everyone then moved over to the rostrum for the prizegiving which was again attended with much ceremony, the individual winners taking their place on the winners' stand after being presented with their prizes and bouquets. And what prizes! A 500 c.c. motorcycle for first prize, a television set for second, and a first class 35 mm. camera for third prize.

The team winners were not quite so lavishly provided for but left with worthy souvenirs of their prowess.

Following the prizegiving the official closure of the contest was effected by the hauling down of the Soviet flag by

the new champion, Moldovearm, in slow motion while the band played the Czech national anthem.

A very pleasant, friendly, and successful contest terminated with a supper held in one of the restaurants of the permanent agricultural exhibition in the evening to the accompaniment of a first class variety show and dancing in international style.

During the whole of the time I was in Moscow, I was treated with the greatest consideration and everything possible was done to make my stay as pleasant as possible. The Central Aero Club expressed the hope that it would be possible to arrange British participation at some future contest.

Emil Fresl of Yugoslavia, as usual, was near the top in the final results, placing fifth.

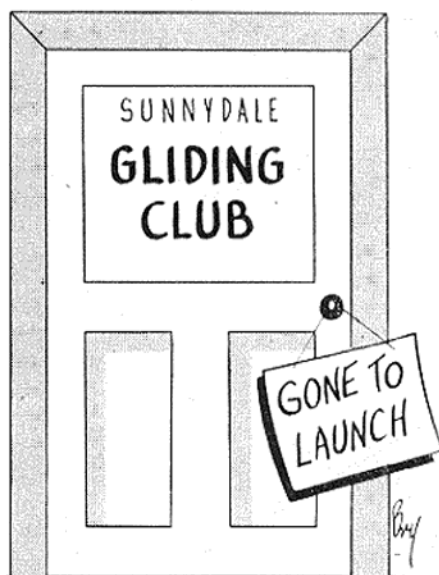


RESULTS

		Points
1. Moldovearm	Rumania	900
2. Abramov	Soviet Union	880
3. Czerny, I	Czechoslovakia	873
4. Raulio	Finland	864
5. Fresl	Yugoslavia	851
6. Chedanovich	Yugoslavia	850
7. Niemi	Finland	846
8. Kucherov	Soviet Union	818
9. Malina	Czechoslovakia	815
10. Kamenov	Bulgaria	812
11. Pemenov	Finland	801
12. Jasho	Hungary	800
13. Czerny, R.	Czechoslovakia	798
14. Schier	Poland	777
15. Pourichi, Mrs.	Rumania	767
16. Verevkin	Soviet Union	735
17. Zhurad	Poland	714
18. Vouich	Yugoslavia	713
19. Pourichi, Mr.	Rumania	693
20. Menzher	Hungary	659
21. Egervary	Hungary	599
22. Brenschneider	Poland	577
23. Hesinger	Finland	529
24. Ginalskey	Poland	525
25. Hinst	Rumania	524
26. Tinev	Bulgaria	482
27. Petukhov	Soviet Union	429
28. Kunn	Hungary	369
29. Rashkov	Bulgaria	366
30. Novta	Yugoslavia	0

TEAM PLACINGS

1. Finland	2,511 points
2. Czechoslovakia	2,486 "
3. Soviet Union	2,433 "
4. Yugoslavia	2,414 "
5. Rumania	2,360 "
6. Poland	2,068 "
7. Hungary	2,058 "
8. Bulgaria	1,660 "



CROYDON GALA

This event has, in spite of being held at Chobham Common, become popular with F/F enthusiasts as a meeting where there is no ballyhoo, no red tape, no raucous p.a. system, and above all an organisation that aims solely at pleasing competitors. This year the weather was perfect, warm and sunny, with very little wind. Large areas of lift were evident throughout the day and many models reached a very great height before descending slowly on the d.t.

The slope soaring event led to a steady trek to the top of the clump of competitors with the weirdest assortment of machines, but winner Sid Smeed flew an orthodox A/2 and turned his back on the opposition to launch downwind.

The club did a good job ensuring everything went smoothly, in fact at one period timekeepers were seen hunting for models to time.

Results

Rubber			
1st Callinan ..	Surbiton ..	12.0 + 6.24	
2nd Elliot ..	Men of Kent ..	12.0 + 3.52	
3rd Wannop ..	Edinburgh ..	12.0 + 2.40	
Glider			
1st Allsop ..	St. Albans ..	12.0 + 2.04	
2nd Barnacle ..	Leamington ..	12.0 + 1.45	
3rd Callinan ..	Surbiton ..	11.11	
Power			
1st Posner ..	Surbiton ..	12.0 + 4.50	
2nd Jays ..	Surbiton ..	12.0 + 3.22	
3rd Baguley ..	Hayes ..	11.35	
Chuck Glider			
1st Young ..	Country Member	2.54	

PORTSMOUTH D.M.A.C.

We have almost exclusive use of R.A.F. Thorney Island every Sunday and meetings every Friday evening at Copnor Road School during term periods only.

Interest in all types flourishes vigorously although the effort of one member to promote a following for rubber powered flying-boats is not meeting with much success—notwithstanding a flight 12 sec. short of the record and an abundance of water in the area!

ENGLISH ELECTRIC M.A.C.

It is proposed to organise an inter-club knock out competition for clubs in an area formed by lines joining Southport, Ormskirk, Wigan, Accrington and Morecambe.

The trophy is to be supplied by this club, and any interested clubs who have not been contacted are invited to apply for details.

WALLASEY M.A.C.

John Hannay again represented his country in the recent World Glider Championships placing overall 8th and top in the British team.

After his return from Czechoslovakia, four members journeyed to Abbotsinch for the Scottish Paa Load Rally where John placed 2nd in rubber. Stan Hinds and John Done repeated last year's successes by winning glider and American class Paa load respectively.

CLUB NEWS

September 1st saw the club at the Huddersfield Rally, only success being a 1st place in glider by John Hannay.

Current interest in the club is new rule power and Wakefield, although to date no definite policy has been adopted over the power models.

We again appeal for new members; anyone interested should contact: G. M. HUTTON, 7, Sandringham Drive, New Brighton.

ENFIELD & D.M.A.C.

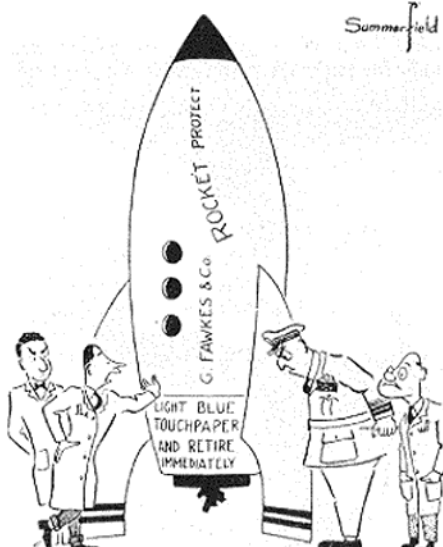
The South Midland Area Rally, at Cranfield, brought out quite a few models from the club, but after the F/F boys watched Jim Moseley make his first and last flight, and saw the results, they soon learned their lesson and put them back again. The team race chaps decided to risk it, however, and it paid off, with Pete Hartwell, who won the event last year, retaining the cup, and George Allen taking 4th in class "A". The class "B" team of Don Walker/Ray Tuthill, having lost both speed and laps, had to be satisfied with 2nd, to Sid McGoun, who finished in the fast time of 7:10.

The following week, at the West Hants do, the gremlins seemed to be well at home with the club, practically everyone having trouble on the way, to start with. Unfortunately incident was when the F/F contingent, with some pretty hot models, stopped suddenly, and discovered that getting five bobs and umpteen models in two front seats and under the dashboard, isn't good for the health of the models. Luckily, the bobs were all O.K., but the models were written off. The class "B" team, with a new liner, finished the night before, found some speed again (on one run the model did 112 until it overheated) and managed to reverse the previous week's position, according to the timekeepers, but the race was so close that it was eventually called a dead heat.

The class "A" fliers also had their gremlin quota, and only Pete Hartwell survived to the finals, in which he placed 4th. Frank Stevens, one of the younger members, did well, however, by placing 2nd to Dick Edmonds in the combat. It seems that it wasn't our day somehow, for not content with their mischief the gremlins followed us all home and tried to drown us, the F/F boys nearly driving straight over the edge into one of the docks at Southampton, and R. Tuthill collecting half-a-gallon of hot oil when a pipe burst; ah! well, I suppose these things made a good laugh when you look back at them, though, even if not very funny at the time.

STRATFORD-ON-AVON & D.M.A.C.

We now have a more permanent club room where the walls are littered with plans and the tables covered with modelling magazines.



"Who's got the matches?"

Recently, the club decided to incorporate other types of model engineering, but the name of the club will remain unchanged.

Club meetings first Tuesday of every month at Central Chambers, Stratford-on-Avon, at 7.30 p.m.

FARNBOROUGH M.A.C.

The club has diminished in size recently leaving a hard core of contest enthusiasts.

The recent club competition was flown in breezy conditions, with M. Gates and D. Sibbick fighting for 1st place, both with Oliver-powered models. M. Gates emerged victorious by a small margin. Same chap clocked 10:33 in power at the Croydon Gala. His second flight was spoiled by an uneven motor run. The only glider entry at this event was eliminated after the first flight by another competitor who saw fit to use it as a doormat!

New members, especially contest types, are welcomed at the club meetings which are held fortnightly on Thursday evenings at the British Legion Hall.

CONTEST CALENDAR

Oct. 27th HAMLEY TROPHY, U/R Power.
FROG JUNIOR CUP. U/R
Rubber/Glider. D/C.

ANGUS & DISTRICT AERO LEAGUE

The league had its August match at Montrose and we were blessed with good weather. Nearly everyone turned up with an A/1—and it bodes well for the future of this class—a use for those old Wakefield flying surfaces at last!

During the comp D. L. Petrie saw that things were going well with his *Borderline*, so later he did the three 3 min. r.o.g. flights to complete his set of times for his S.M.A.E. "C" certificate, which has just been officially confirmed, making him the first to gain a "C" in Scotland.

The Montrose team won overall and have the Strathmore Trophy safe, even with another flying day to come.

Results. A/1 Glider—W. Petrie, 6:45; K. Whyte, 6:31; D. Petrie, 6:16. A/2 Glider—R. Yule, 9:0; L. Dempster, 6:54; K. Whyte, 6:37. Open Rubber—D. Petrie, 8:39; C. Campbell, 5:54; L. Dempster, 4:2.

League members cannot understand why the S.M.A.E. ran a Scottish event at our "Land's End"—Stranraer—when they have the choice of Arbroath and Montrose airfields right on the main London-Aberdeen railway; maybe the "dyspeptics" from W. Scotland don't like our flat scenery, bless their hearts.

WIGAN M.A.C.

Wigan F/F competitors average over 3,000 miles a season travelling to fly in comps, but never have they experienced such atrocious retrieving conditions as at an advertised comp held at the beginning of last month. Power flights up to 16½ sec. run, unless attached to control lines, hadn't a hope of being retrieved in time for a second flight (if found at all). In such conditions the club lost over £30 worth of engines and timers (not counting cost of models). Competitors had to pay for the privilege of launching from a farmer's field the size of a small garden. B. Talbot won the power event with two max's, but lost two models with P.A.W. specials and autonips timers. The other members just lost models.

SOUTH MIDLAND AREA RALLY

Those who braved the winds of gale force that prevailed on Sunday, August 25th, at Cranfield, deserve special honours. It was the day when coastal steamers could not leave harbour, when fallen trees blocked roads within a few miles of the hilltop airfield, and a two minute maximum flight meant a 35 m.p.h. chase for the length of a mile long runway... to pick up pieces. Nevertheless, the Area played host to people from as

far apart as Brighton and Glasgow, and all events except R/C ran as planned.

Most successful were the raffles . . . record ticket sales, and six happy new engine owners at the end of the day.

Only two flights were needed in F/F, and combat became a battle for who could stay up longest; only five cuts were registered in over 20 heats.

Results

Glider

1. G. Lefever (S. Essex) . . . 3 : 30
2. Thorpe (Long Eaton) . . . 3 : 19
3. D. Posner (Surrey) . . . 3 : 01

Rubber

1. R. Lennox (Birmingham) . . . 4 : 00
2. Hawkins (W. Middx.) . . . 2 : 40
3. Moore (Leamington) . . . 1 : 43

Team Race A

1. Hartwell (Enfield) . . . 10 : 06
2. Stephens (Belfairs) . . . 10 : 32
3. Goodall (Burton) . . . 10 : 49

Power

1. R. Draper (Coventry) . . . 3 : 46
2. Cox (St. Albans) . . . 3 : 40
3. V. Jays (Surrey) . . . 1 : 43

Combat

1. M. Grimmett (W. Bromwich)
2. B. Sadler (Derby)
3. B. Spencer (Littleover)

Team Race B

1. McGoun (West Essex) . . . 7 : 10
2. Tuthill (Enfield)

Radio Control was postponed until a date yet to be announced.

Clubs organising this year's meeting were:—Apsley, Cowley, Henlow, High Wycombe, Luton, Oxford Ixion, Watford and Wayfarers.

GODALMING & D.M.A.C.

The few members who went to Beaulieu had a very good day. In the team racing Dave Dew has at last got through to a final and came 3rd in class "A," and junior Bobby Bell came 2nd in the "1/2A." Biggest disappointment was that there was no stunt contest as advertised, as all our money was on Mick Blundell flying a *Smoothie* type stunt-wagon with an Eta 29, and both were in cracking form. Several of our juniors flew F/F models and gained experience, if nothing else!

At the Croydon Gala it was again left to our younger members to hold the fort and although they tried hard it was a pity that no "old hands" could manage the short distance to get to Chobham and show them the way.

We have now moved into our winter quarters at Carlos Street, Godalming, and r.t.p. will no doubt claim a good deal of our members' time. New members are welcome to come along about 7 o'clock Friday nights, or get in touch with the secretary:—C. S. WEST, 72, Furze Lane, Farncombe, Surrey.

WEST BROMWICH M.A.C.

The weather this year could have hardly been worse from our point of view, and from the point of view of the organisers of local horticultural shows, for every "display day" this

Easing the Strain

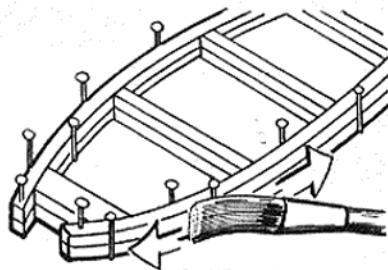
On many designs of box fuselage the curves of the longerons over the nose section are quite sharp. Usually the wood can be bent dry to the required shape when pinning out but there is always the danger of a side "springing" when taken off the building board and, if not actually pulling away from its spacers, actually distorting the frame.

Most of the "spring" stored up in a curved piece of wood can be relieved by simple treatment. Build

the frame in the normal way and let the cement set. Then paint over the sharply curved lengths of the longerons with water and leave to dry out. Do not try to remove the frame from the building board until quite dry. In the case of really sharp bends, hot water is better than cold for "relieving" internal stresses in the wood.

There are two other tips illustrated in the sketch. One is the use of pins through the longerons just in front of the actual nose. This is a very satisfactory method of holding the front in to the correct curve and since this wood is out off anyway, pins through the section here will not weaken the final frame.

The second good idea is to build two sides of a box fuselage together, one right on top of the other. In this way you can see as you go if the two sides are identical in shape. It's quicker, too, than laying down the two frames separately.



year has had contest weather: wet and windy. Just like the weather at the S. Midland Rally, where only two members braved the howling gale to fly in the combat; "Tubby" Day, who pranged, and Mac Grimmett, who won.

This year we are hoping to form an indoor league with both rubber team racing, and microfilm. Wolves M.A.C., Halesowen Y.M.A.C. and ourselves are to be the participants.

WEST OF SCOTLAND AREA

At the Scottish C/L Gala at Kirkcaldy, Prestwick did very well in team racing, coming first in class "A," and first in class "B" beating the normally all-conquering Barclay Eta and McCoy of Perth into second and third places. Glasgow Barnstormers won "1/2A" with their machine which won at the Indoor rally in Kelvin Hall, Glasgow, in March. Stunt and combat went to East of Scotland clubs.

At the P.A.A. Festival, an event which could have been one of Britain's best run contests was turned into a rather damp endurance test by the weather. The gale force winds made it very much a case of survival of the fittest, and John O'Donnell worked hard for his first place of

power and second in glider. J. Findlayson in Glasgow Society of Aeromodellers flew well to take first in rubber, his final flight taking place when the wind had risen to such a pitch that the seagulls were walking. In team racing Ardrossan came home first in impossible conditions.

One encouraging sign at this year's contest was the large Scottish entry, comprising 85 per cent. of the total this year to 75 per cent. last year and 70 per cent. in 1955. All of which, of course, makes the miserable attendance at the Scottish Gala harder to understand.

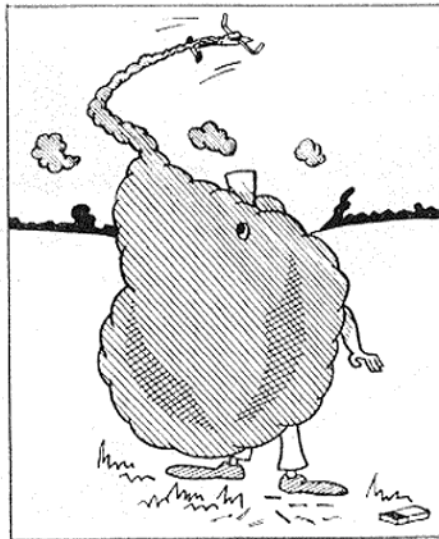
NORTH KENT NOMADS

R/C still has the strongest following, but a spate of crashes recently has reduced the number of regular flyers. Charlie Dance was seen in tears—not as might be imagined over the write-off of *Tee-Vee*, which has served him well for some seasons—but at the performance (on film) of Howard Bonner and *Smog-Hog*. As a result, Charlie has a different approach now maturing in the form of a new R/C job.

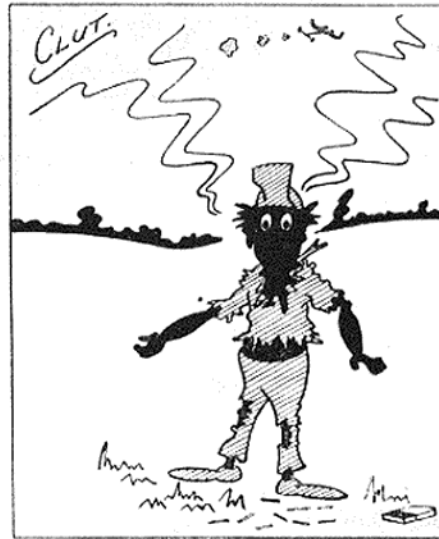
CHANGE OF SECRETARYSHIP
PORTSMOUTH D.M.A.C. W. Tinker, 5,
Barnwood Road, Fareham, Hants.



Oily, smelly diesels



give me a rocket motor



every time

GAMAGES

THE WORLD'S MOST FAMOUS CHRISTMAS BAZAAR

Don't miss this Ingenious New Mechanical Set-Piece. See the comical antics of the Amusing Mechanical Animals at the Father Christmas Jungle Jinks Puppet Show.

Have YOU Seen it? . . . GAMAGES NEW MAMMOTH WORKING MODEL RAILWAY

This marvel of ingenuity, redesigned and improved, is once again London's greatest attraction.

Many Giant "O" gauge Locos and trains of all kinds, running on approx. 1,000 sq. ft. of layout. New scenic effects include Giant working dam with real water cascading and flowing under a new model Bridge. A fascinating Mountain Railway. Calder Hall Atomic reactor and the famous "Sphere" at Dounreay Atomic Plant. Working Cranes.



Gamages 132-Page

Book on Model Trains, Boats, Planes, Cars, etc. This issue includes full particulars and prices of all models and accessories available at Gamages, INCLUDING 16-PAGE PLASTIC SCALE KITS SECTION Post 6d. SPECIALLY PRICED AT 1/-

GAMAGES, HOLBORN, LONDON, E.C.1

HOL 8484

61 FOUR POUNDS AVENUE, COVENTRY

PERFORMANCE KITS

Announce...

The first two kits of an entirely new range of model aircraft kits of advanced design. Thoroughly flight tested. Simple construction, and the finest materials available. All kits include "Solarbo" balsa, coloured "Modelspan," and balloon type sponge and duralumin wheels by "Roadway."

"APEX"

42 in. span low aspect ratio, F/F, R/C, P.A.A. or Clipper Cargo kit designed for 0.75-1.5 c.c. engines. Ideal for the Frog 1.49 c.c. Kit features two colour tissue, 2 in. wheels and pre-cut ribs, fins, etc. Price Including P.T. 33/-

"ION"

34 in. span F/F crescent wing, developed from prototypes which hold the National Open Power Driven Tailless record, National Lightweight Power Driven Tailless record, Royal Air Force M.A.A. Power Driven Monoplane R.O.G. Class B record, Royal Air Force M.A.A. Power Driven Tailless record, and have twice won the Open Powered Tailless competition at the All Britain Rally. The "Ion" can be powered by diesel or glo-plug engines from 0.46 c.c.-0.80 c.c. capacity. It is ideally suited to the "Frog 80" diesel. Kit features pre-cut endplates, elevons and three 1 1/2 in. wheels. Price Including P.T. 30/-

Puk-ka BALSA CEMENT



A colourless and extremely tough cement which penetrates deeply and possesses great adhesive strength, laminating perfectly and lastingly. Modellers everywhere use Puk-ka cement with prize winning results. Excellent also for use on materials, such as felt, cloth, paper and cardboard.

Use Puk-ka Cement for building railway sidings, carriages, etc. Excellent for building model boats of all kinds, laminates ply wood, balsa and many other soft woods with perfect results.

Supplied in tubes, Retailing at 7d., 1/-, 1/6.

Puk-ka Dope Finish.

A superior dope supplied in a wide range of authentic colours. Both gloss and matt finishes available.

1 oz. Jar Retail	10 1/2d.
2 " " "	1/6
Clear Shrinking Dope	
1 oz. Retail	9d.
2 " " "	1/3



Puk-ka Enamel Finish.

Supplied in a wide range of popular shades in both Gloss and Egg-shell finish. For use on plastic models, model ships, railways, etc.

1/4 oz. size, Retail	6d.
1/2 " " "	8d.

H.M.G. Fuel Proof Dope, 2 oz. Jar, Retail 2/-

Distributors to the trade

B. RELF and CO.
SOUTHPORT, LANCS.



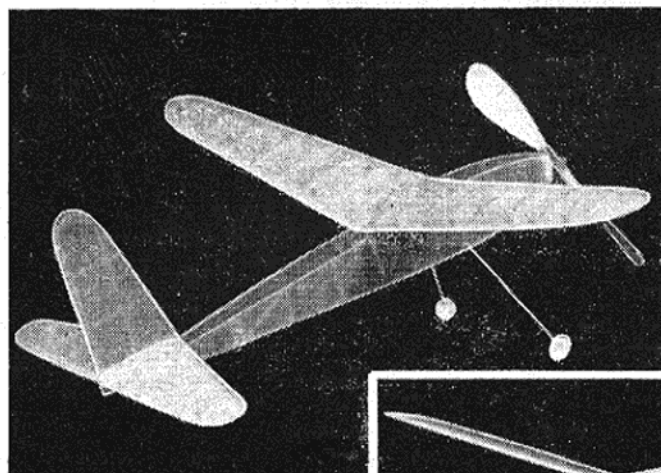
- 1 PARAGUAY 6 SOUTH AFRICA
- 2 ARGENTINE 7 INDIA
- 3 PORTUGAL 8 AUSTRALIA
- 4 YUGOSLAVIA 9 NEW ZEALAND
- 5 THE CONTINENT

Is shipped all round the world to satisfied clients—in metric and English sizes. Let us quote you for your balsawood requirements.

Trade price lists on application to Sole Manufacturers and Shippers

E. LAW & SON (TIMBER) LTD.

272-274 HIGH STREET, SUTTON, SURREY • VIGILANT 8291-2

**ASCENDER**

A 30-in. wing span rubber duration model. Adjustable pitch propeller with replaceable blades—fixed tail surfaces for positive trimming—anti-torque automatic-action rudder. **10/11**

**WATCH OUT FOR
OTHER MODELS
IN THIS RANGE**

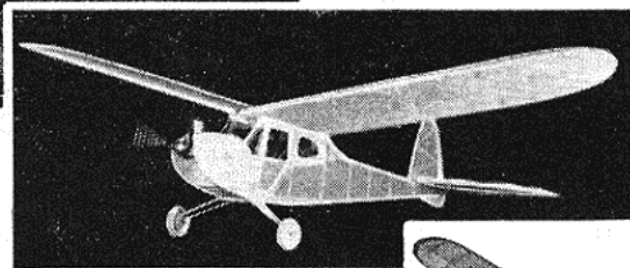
HOBBIES DEREHAM
NORFOLK

OUTSTANDING KITS

from



★ **EXCLUSIVE FEATURES**
★ **TOP PERFORMANCE**
★ **EASY TO BUILD AND FLY**
From branches and model shops

**CHAMPION**

A 36-in. wing span free flight power model. Suitable for .5, .75, .8 and 1 c.c. motors. Opening cabin door and complete cabin details—scale type light alloy undercarriage—optional polyhedral wing for high power. **18/6**

SKYSAIL

A 36-in. wing span glider for high start launching. Wing-saver 'cow hook'—printed dummy pilot—anti-warp wing bracing—jig-lock fuselage alignment. **6/6**



Branches at: London (3), Glasgow, Manchester, Birmingham, Sheffield, Leeds, Hull, Southampton, Bristol, Newcastle upon Tyne and Grimsby.



makes you an expert... easily!

It's not difficult to be an expert with H.O.C. Products... tested to the requirements of the Handyman.



A brilliant finish, suitable for handymen about the house.



Fast drying, clean and bright, smooth and easy to work with.

All-purpose adhesive. Transparent, water and heat-proof.



The new multi-purpose paint pack for the handyman.



Containing 6 intermixable colours in capsule form.



Quality polystyrene adhesive—ideal companion to Enamel.



the choice of the expert!

Send for free colour card to:

THE HUMBER OIL COMPANY LTD., MARFLEET, HULL.

YOUR BEST MODEL SHOPS



Readers

YOU CAN DEAL WITH
THESE MODEL SHOPS
WITH COMPLETE
CONFIDENCE

Retailers

ADVERTISE ON THESE
PAGES TO REACH THE
LIVE MODELLERS IN
YOUR TOWN

BIRMINGHAM

Tel.: Midland 0972

Hornton's

32, STEPHENSON STREET, BIRMINGHAM, 2
(Facing stage door Theatre Royal) and
1, NAVIGATION STREET, BIRMINGHAM, 2
(Adjoining Queens Hotel)
Stockists of Model Aircraft, Railways and Ships

BRIGHTON

Tel.: Brighton 26790

Model Aerodrome Ltd.

37, WEST STREET
Ships, Railways, Aircraft, etc.

BIRMINGHAM

Model Aerodrome Ltd.

43, TEMPLE ROW Central 1223
141, STRATFORD ROAD Victoria 0824
Ships, Railways, Aircraft, etc.

BRISTOL

Tel.: 23744

The Model Airport

51, COLSTON STREET
Get your supplies from the leading M.A. shop in the town

BIRMINGHAM

Tel.: Northern 5569

The Model Mecca

204-206, WITTON ROAD, 6
A 100% Modelling Shop. Aircraft Kits, etc.
Trix "OO" L.M.S. Co. "O" gauge. 5 and 5a buses pass door
WRITE, PHONE or CALL

CARDIFF

Tel.: 29065

Bud Morgan

THE MODEL AIRCRAFT SPECIALIST
22/22a, CASTLE ARCADE
SEND 4d. IN STAMPS FOR MY 1957 PRICE-LIST

BIRMINGHAM

Hobbies Ltd.

100a, DALE END, BIRMINGHAM 4
The firm known to Modellers throughout the world. Ask our Mr. W.
Starns for advice.

DARTFORD

Modern Models

49-51, LOWFIELD STREET, DARTFORD, KENT
Whether you call or whether you post, we claim we've got more stock
than most

BIRMINGHAM

Tel.: CALthorpe 2554

A. J. Reeves & Co. (B'ham) Ltd.

416, MOSELEY ROAD, 12
The Specialists with a world wide reputation. **EVERYTHING** for
the model maker and model engineer. By return postal service. New
showrooms now open; callers welcome.

EVERYWHERE

Tel.: Gerrard 8811

Model Aircraft

19-20, NOEL STREET, LONDON, W.1
This advertising space is available to all good retail
Model Shops. Rates may be had on application

GLASGOW

Tel.: Central 5630

Caledonia Model Co.

5, PITT STREET, C.2

THE engine repair specialists. EVERYTHING for the enthusiast, with personal attention from GEORGE LEASK, A.M.I.B.E.

LONDON

Tel.: Gulliver 1588

Martin's Model Shop

65, FORTRESS ROAD, KENTISH TOWN, N.W.5

Keilkraft and other makes of Model Aircraft, Boat Kits. Full accessories. Tri-ang Railways, Scalextric Model Motor Racing.

GLASGOW

Tel.: Central 5042

Hobbies Ltd.

326, ARGYLE STREET

The firm known to Modellers throughout the world. Ask our Mr. J. Stewart for advice.

LONDON

Tel.: Hop 3482

Model Aircraft Supplies Ltd.

171, NEW KENT ROAD, S.E.1

The oldest established model aircraft shop in London. Personal service with satisfaction

HOUNSLOW

Tel.: Hounslow 0041

Poulton's Model Shop

79, HIGH STREET
HOUNSLOW, MIDDX.

Model aircraft, boats and trains. No charge for technical advice, engine runs or radio checks

LONDON

Tel.: North 4272

Henry J. Nicholls Ltd.

308, HOLLOWAY ROAD, N.7

M.A. enthusiasts' complete stockist. Britain's No. 1 Model Shop. H.J.N. will be pleased to see you

HULL

Tel.: Hull 32959

Hobbies Ltd.

10, PARAGON SQUARE

The firm known to Modellers throughout the world. Ask our Mr. J. Mason for advice

LONDON

Tel.: GULLIVER 1818

Ripmax Limited

39, PARKWAY, CAMDEN TOWN, N.W.1
THE RADIO CONTROL SPECIALISTS

All Requirements stocked PLUS Personal Mail Order Service

IPSWICH

Tel.: 51159

East Anglian Model Supplies

37, UPPER ORWELL STREET, IPSWICH

Wakefield gears: 3s. each, post 2½d. Contest "Avenger" sailplane Nordic A/2 design. Plans and cut ribs 10s. Kit, 23s. 6d., both post free

LONDON

Tel.: Museum 2975

Hobbies Ltd.

78A, NEW OXFORD STREET, W.C.1

The firm known to Modellers throughout the world. Ask our Mr. S. Nelson for advice.

LIVERPOOL

Tel.: Central 4209

Precision Model Engineering Co. Ltd.

53, WHITECHAPEL, LIVERPOOL, 1

Liverpool's premier rendezvous for all modellers. The shop where experienced modellers offer you the benefit of their experience. North of England's leading MAIL ORDER HOUSE

MANCHESTER

Tel.: Blackfriars 3972

The Model Shop

13, BOOTLE STREET, DEANSGATE

We have EVERYTHING in stock for the aeromodeller: Kits, Engines and Accessories

LONDON

Tel.: Chiswick 0858

Jones Bros. of Chiswick

56, TURNHAM GREEN TERRACE, W.4

1 min. Turnham Green Station (Dist. Line)

THE SHOP WITH THE STOCK

OPEN SATURDAYS 9 a.m.-6-30 p.m.

MANCHESTER

Tel.: Central 1787

Hobbies Ltd.

10, PICCADILLY

The firm known to Modellers throughout the world. Ask our Mr. W. B. Cummings for advice.

NEWCASTLE ESTABLISHED 1924

The Model Shop

(NEWCASTLE UPON TYNE) LTD.
18 BLENHEIM STREET, Tel.: 22016
NEWCASTLE UPON TYNE, ENGLAND
Pioneers of modelling with 33 years' experience...
Our Expert Staff are at your Service.

SOUTH AFRICA

Greenacres

WEST STREET, DURBAN

You can obtain all your Model Aircraft requirements from Natal's
Hobby Centre

PADDINGTON

Tel.: 8827-8-9

THE COMPLETE MODEL SHOP

Burleigh's

303, EDGWARE ROAD, W.2

All your wants supplied by return
BURLEIGH, OF EDGWARE ROAD, LTD.

SHEFFIELD

Tel.: 26071

Hobbies Ltd.

4, ST. PAUL'S PARADE

The firm known to Modellers throughout the world. Ask our Mr. C.
Owen for advice.

SOUTH AFRICA

A. W. Yardley (Pty) Ltd.

31, KERK STREET, JOHANNESBURG

Model plans, model ship and model railway supplies from the leading
British and American factories

ST. HELENS

Tel.: St. Helens 3972

George Webster (St. Helens) Ltd.

THE MODELLERS' RENDEZVOUS, CORPORATION
STREET, ST. HELENS

All leading makes of kits, engines, etc., in stock. Mail order by return.
Aircraft List 6d., post free

SOUTH AFRICA

The Hobby Centre

The Modellers' Mecca

133, COMMISSIONER STREET, JOHANNESBURG

Large stockists of British, American and European supplies.
Sole distributors Super-Tigre and Telfun engines

SUTTON

Tel.: Vigilant 8292

E. L. S. Model Supplies

272, HIGH STREET, SUTTON, SURREY

Surrey's Hobby Centre. By return Postal Service

Complete stock of all M.A. requirements

CLASSIFIED ADVERTISEMENTS

3d. per word Private—Minimum 12 words. 6d. per word Trade—Minimum 12 words. Use of Box No. 2s. 6d. extra

ALAG X3 RED HOT 2.47 c.c. RACING DIESEL, 75s. Post
free spares available.—L. E. MAYALL, Flying Circus, Builth Wells,
Wales. Phone 3139.

DOOLING 29. Ex. cond. with semi finished Hell Razor alloy
pan, etc., £6 o.n.o.—BEARNE, 19, Woodgate Avenue, Rochdale.

MILLS 1.3 c.c. DIESEL, fitted 9 in. plastic prop., only 20 min.
running, 50s.—G. DEAN, 5, Whitworth Road, Ilkeston, Derbyshire.

PLASTIC KITS (Lindberg), Zero 7/11, Corsair 9/11, Hellcat 9/11;
(Revell) Thunderstreak, Skyrocket, Cougar, all 6/11; B-29, B-36,
B-52, B-47 all 8/11; (Frog) B.O.A.C. Airliner DC-7C 16 in. wing-
span 17/6. FLYING KITS, Space Ship by Jetex, motor included
48/7; Jetex Helicopter 32/2. FROG FLYING KITS, Powavan 10/6,
"45" Mk. II 30/-. Vandiver 14/6, Aerobat 25/-. New Piper kit 3/9.
New Skyjeep kit 3/9. DIESELS BY FROG, "500RG" 73/6,
"80" 45/-. "150" 49/11. Full lists 1/-, postage extra on small
orders.—FINISTERS OF COVENTRY, 173, Ansty Road,
Coventry.

New Government Release — Highest Grade

1/10 Second STOP WATCHES

Only the top Swiss makers were given the contracts for these
precision timers. The jewelled lever movement ensures depend-
ability and accuracy. Fastest in action with start, stop and
return to zero all controlled by centre button. Main dial clearly
marked to 1/10 second and minute dial recording to 15 minutes.
Tested and fully guaranteed. Cost approx. £6 10.

Money back guarantee or will sub-
mit on approval. S.A.E. for descrip-
tive leaflets.

57'6 post
free.

CHARLES FRANK

67-73, SALTMARKET, GLASGOW, C.I

Phone: BELL 2106/7

Scientific Instrument Makers and Dealers since 1907.



TRUCUT



PRECISION

AIRSCREWS

The Balsa Wood Company Ltd.

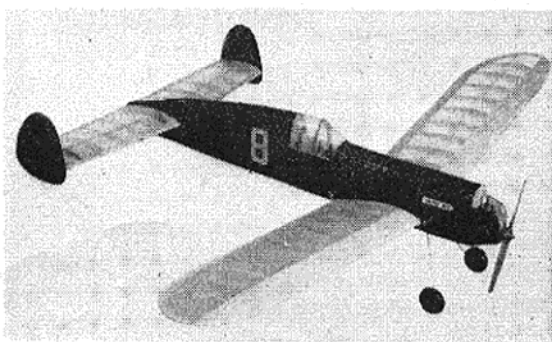


**AFRICA HOUSE
KINGSWAY
LONDON W.C.2.**

Telephone • HOLBORN 7053
Telegrams • BALSAWUD LONDON

***WE IMPORT ONLY THE VERY
FINEST SELECTED Balsa
WOOD FOR THE MODEL
MANUFACTURING TRADE**

THE SKY'S NO LIMIT WITH



CRESTA

This 38 in. span low-wing sport design is just the model for your 0.5 to 0.8 c.c. diesel. Very rugged construction takes care of any knocks, and the stability and speed of this model will ensure a thrilling flight each time.

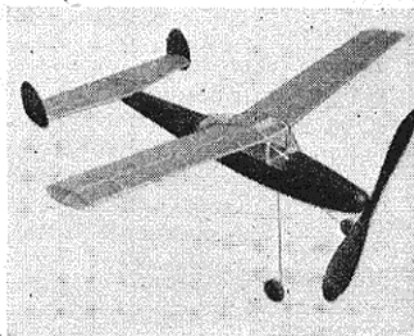
Fuselage sides, fins and all wing ribs ready cut.

Complete Kit **15/9**

CRANWELL

Although it has the elegant lines of a modern light aircraft the Cranwell is an exceptionally fine flyer. A large ready shaped propeller gives this 26 in. model a steady climb with plenty of stability, and the glide down is particularly flat.

Complete Kit **7/6**



CONTEST KITS

Contest Kits Ltd : Marine Parade : Leigh-on-Sea : England

LEPAGE'S Polystyrene Cement

**NEW FORMULA ADHESIVE
FOR THE CONSTRUCTION AND
REPAIR OF HARD PLASTICS**



★ WELDS THE JOINT

★ TRANSPARENT

★ NON-STRINGING

★ QUICK SETTING

★ EXCEPTIONAL
STRENGTH

ONLY 1/- per tube. Obtainable from
your local stockist

World Famous Manufacturers of:

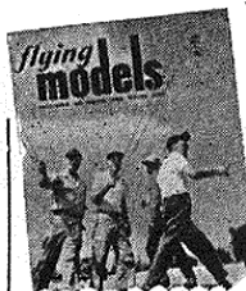
BALSA CEMENT 7½d. and 1/- Tubes

P.V.A. WHITE GLUE 2/3, 3/6 and 5/6 Plastic Bottles

STRENGTH LIQUID GLUE 5d., 9d. and 1/- Tubes

WATERPROOF AND HEATPROOF CEMENT
7½d. and 1/- Tubes

LEPAGE'S • BECKENHAM • KENT
LIMITED



How-to-do-it Magazine of U.S. Modeldom

Read FLYING MODELS, the only American magazine devoted exclusively to model aviation! Every issue includes how-to-build data on new model aeroplanes of various types (with full-size plans wherever possible) ... worth-while hints ... photographs ... how-to-do-it information ... and features for sport a-plenty!

Now published every month.

Annual subscription (12 copies) £1 9 6
Including Postage

Mail your order and remittance today to:
ATLAS PUBLISHING & DISTRIBUTING CO. LTD.
(Dept. A)
18 Bride Lane, Fleet Street, London, E.C.4

NEW ENLARGED EDITION of the



Model Aircraft Plans Catalogue

CONTAINS

- EIGHT MORE PAGES of drawings and descriptions
- FORTY MORE PLANS of rubber-driven, power-driven, control-line, gliders and solid scale models

From your model shop **6d.**

or 8d. post paid from

PERCIVAL MARSHALL
19-20, NOEL STREET, W.1



NOVEMBER
1957

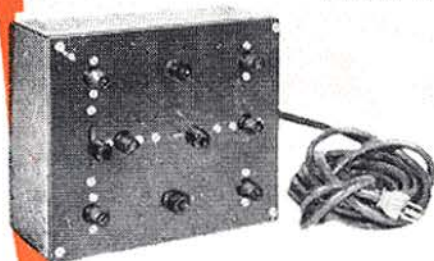
Printed in Great Britain for the Proprietors by ELECTRICAL PRESS LTD., Cordwallis Works, Maidenhead, Berks, and published by PERCIVAL MARSHALL & CO. LTD., 19-20, Noel Street, London, W.1.
Registered for transmission by Magazine Post to Canada including Newfoundland.



for REMOTE CONTROL of your models

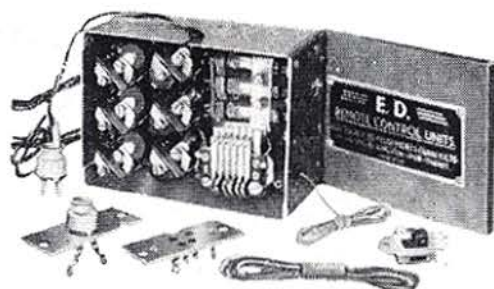
The Mk.V. "EVEREST" TUNED REED 6 CHANNELS MULTIPLE RADIO CONTROL UNIT

The crowning achievement for the remote control of all models. The prototype of this set "swept the board" at the Radio Control Competitions during the 1956 season and the outstanding qualities of the "EVEREST" have been fully demonstrated by its consistent successes in Radio Control Competitions during 1956 and 1957.



CONTROL BOX

Control Box size 6 in. x 5 1/2 in. x 2 1/2 in. giving up to six Controls with ample lead to Transmitter easily held in hand.



RECEIVER

Fitted with Standard Hard Valves with an average life of 3,000 hours, and six Standard Relays. The Receiver output will operate either Electric Motors or Escapement.



TRANSMITTER

Self-contained for housing all batteries, and with 8 ft. sectional Aerial. Fitted with two Standard Hard Valves.

PRICE COMPLETE	£29 . 3 . 11
RECEIVER	£17 . 15 . 3
CONTROL BOX	£4 . 12 . 5
TRANSMITTER	£6 . 16 . 4

The "TRANSITROL"

RADIO CONTROL UNIT

THE FIRST COMMERCIAL TRANSISTOR RECEIVER

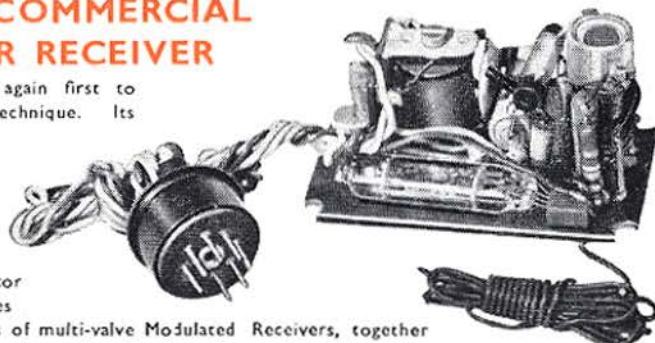
E.D., of course, were again first to introduce this new technique. Its advantages in size, weight, current capacity and quality of reception will appeal to all Radio Control enthusiasts.

This valve transistor Receiver combines all the advantages of multi-valve Modulated Receivers, together with simplicity and very low Receiver Battery size and weight.

RECEIVER

Size 2 1/2 in. x 1 1/2 in. x 1 1/2 in. Weight 2 1/2 ozs. Current change from approximately 0.2 idling up to 4 Ma. All connections via a 7-way cable and plug. It operates from any standard carrier type transmitter on the 27.12 Mc/s band.

All prices include P. Tax



RECEIVER ONLY £6 . 1 . 8

RECEIVER, TRANSMITTER & ESCAPEMENT £12 . 15 . 6

Other Models include

E.D. "BOOMERANG"

Transmitter Receiver & Escapement. Completely wired. Soft or Hard Valves. £11 . 18 . 6

E.D. Mk. IV. "MINIATURE"

Tuned Reed, 3 Channel, Hard Valve, Transmission Control Box and Receiver less Escapement £20 . 9 . 6

E.D. Diesels

Seven models available from 0.46 c.c. to 5 c.c. and suitable for use by the beginner or the expert in model aircraft boats or cars. Each engine is individually tested for accuracy and reliability up to a standard that ensures the greatest possible speed and performance for your models.

Write for our illustrated list giving details of all E.D. Engines, Radio Controls, Mechanisms, Accessories, Spare Parts, etc.



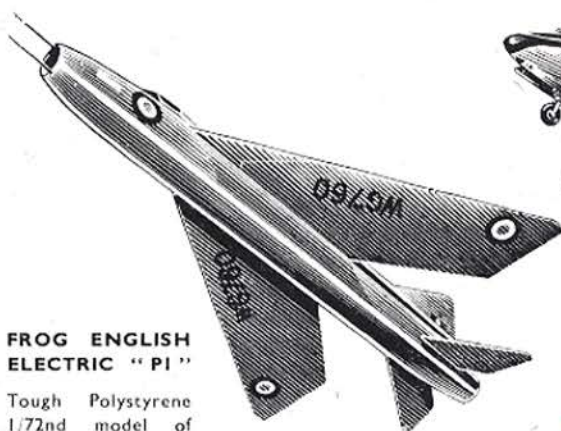
ELECTRONIC DEVELOPMENTS (SURREY) LTD

PHONE: MOLESEY 6037-6038

DEVELOPMENT ENGINEERS
ISLAND FARM RD, WEST MOLESEY, (SURREY) ENGLAND.

GRAMS: "BOOM" EAST MOLESEY

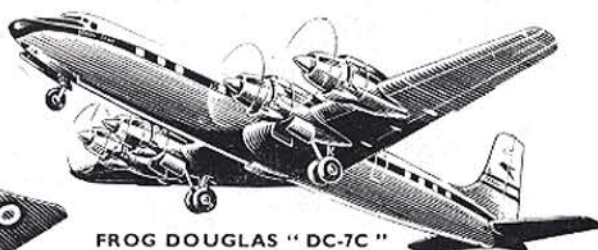




**FROG ENGLISH
ELECTRIC "PI"**

Tough Polystyrene
1/72nd model of
Supersonic Twin Jet Interceptor
Fighter. Complete kit, with stand.

6/9

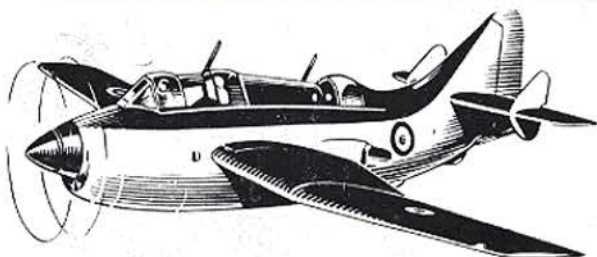


FROG DOUGLAS "DC-7C"

Plastic model kit of Jet Prop
Airliner. 1/96th scale, wing
span 16".

17/6

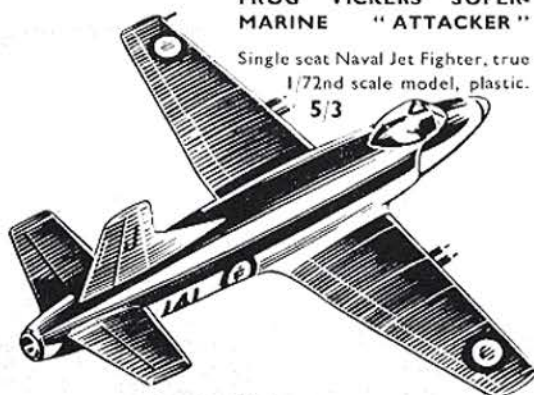
** Exciting
in every detail these*
FROG



FROG FAIREY "GANNET"

1/72nd scale Polystyrene
model Naval Submarine
Spotter. Detailed assembly
instructions.

8/6



**FROG VICKERS SUPER-
MARINE "ATTACKER"**

Single seat Naval Jet Fighter, true
1/72nd scale model, plastic.

5/3



**FROG BRISTOL "BRITANNIA
100"**

High-Impact Polystyrene
model of the "Whispering
Giant" 1/96th scale, wingspan 17 1/2".

17/6



**FROG DE HAVILLAND
"D.H. 110"**

Complete plastic kit for 1/72nd
scale Twin Jet Naval Fighter.

8/6

INTERNATIONAL MODEL AIRCRAFT LTD., MERTON, LONDON, S.W.19