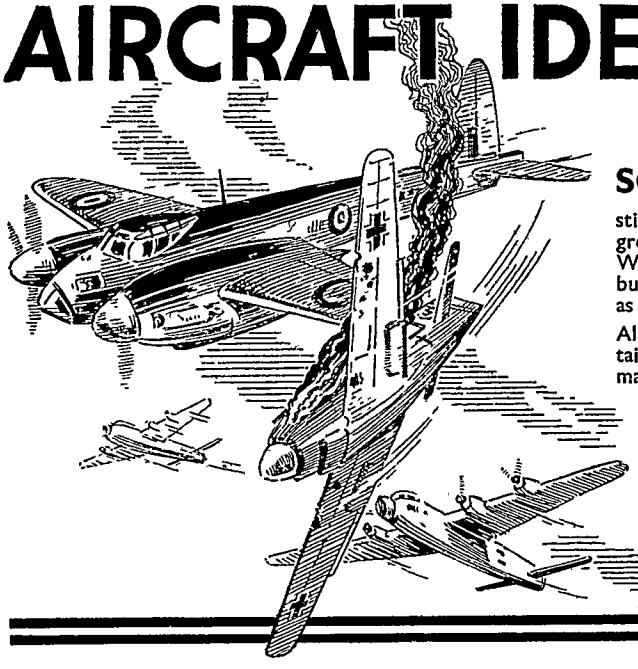
# AEROMODELLER

1/-

APRIL 1944

# AIRCRAFT IDENTIFICATION



## "SKYLEADA" 1/72nd SCALE SOLID MODEL AIRCRAFT KITS

still represent the finest value obtainable to-day and are in greater demand than ever for spotting and aircraft recognition. Wartime supplies are totally inadequate to meet the demand, but what stocks are available are being distributed as widely and as fairly as possible.

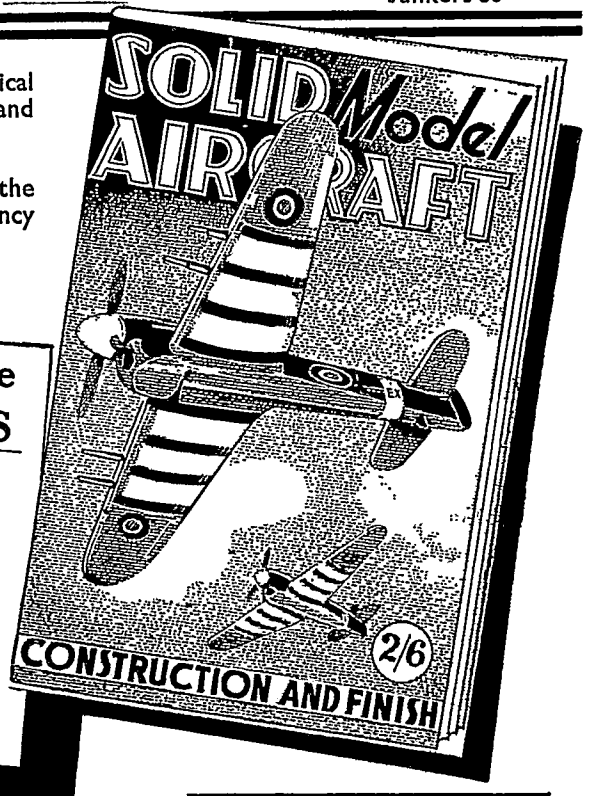
All "SKYLEADA" kits contain partly-shaped fuselage and wings, tailplane and fin, etc., propellors, wheels, turned cowlings or material for engine nacelles as necessary, ample size tube special cement, coloured transfer insignias, fully detailed drawings and complete instructions for building, etc.

Spitfire, Kittyhawk, Martlet, Thunderbolt, Mustang, Hurribomber } 1/9

Lightning, Mosquito, Whirlwind, Beaufighter } 3/-

Hudson, Boston, Airacuda, Junkers 88 } 3/9

"Solid Model Aircraft" is an up-to-date and practical book on the construction, finish, colourings and markings of solid scale model aeroplanes,
64 pages with numerous diagrams, etc.
Will repay its moderate cost many times over to the modeller as an invaluable aid to accuracy and excellency of workmanship.
Ask your local dealer for it to-day.




**9 World-Famous Warplane CONSTRUCTION PLANS**

CONTENTS:
SPITFIRE
M.E. 109F
DEFIANT
MUSTANG
MARTLET I
AIRACOBRA
KITTYHAWK
HURRIBOMBER
THUNDERBOLT
Complete with Instructions

FROM THE
**PILOT**
SOLID SCALE SERIES
**1/-**

ACCURATE PLANS MEAN ACCURATE MODELS.

Pack of nine 1/72 scale plans ... ... ... ... ... 1/-
(Sold only as a complete pack)

Separate plans are available at 4d. each of
LIBERATOR, HUDSON V, BEAUFIGHTER, JUNKERS 88K, WELLINGTON, Me-110, BOSTON III, MANCHESTER, MOSQUITO.
These plans are fully detailed with 3-view drawings and perspectives.

**A.HUNT (CROYDON) LTD**
**5&7 SOUTH END CROYDON**

# Superb Solids by C.M.A


FOR accuracy of design, completeness of kit and value for money, always insist on C.M.A. SOLID MODEL KITS. Obtainable from dealers everywhere.

If unable to procure your requirements write direct for name of nearest stockist.

## WHOLESALE ONLY

OWING TO THE SHORTAGE OF SUPPLIES WE ARE NOT ABLE AT THIS TIME TO OPEN ANY NEW ACCOUNTS.

*List of model kits not illustrated*

| | |
|---|---|
| D. H. Tiger Moth | 4/11 |
| S.E. 5 | 4/11 |
| Pfalz D.12 | 4/11 |
| Morane Saulnier 406 | 5/3 |
| Bristol Fighter F.2b | 5/3 |
| Russian Rata L.16 | 5/3 |
| Polish P.Z.L.P.24 | 5/3 |
| D.H. Dragonfly | 5/6 |
| Caproni Falcho | 6/- |
| Curtiss P.37 | 6/3 |
| Brewster Buffalo | 6/9 |
| Fokker G.I | 8/11 |

ILLUSTRATIONS ARE PHOTOS OF ACTUAL MODELS MADE FROM C.M.A. KITS.

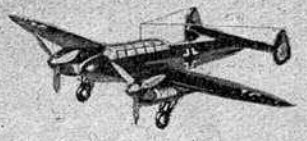
**CHINGFORD MODEL AERODROME LIMITED**

155, STATION RD. LONDON. E.4.

# 'TRUSCALE'

## 1/72 Solid Model Kits

## ROYAL AIR FORCE
## AMERICAN AIR FORCE
## and GERMAN WAR PLANES



Messerschmitt 110
Price 2/6

Westland Lysander
Price 2/6

Handley Page Hampden
Price 3/1

Blenheim
Price 2/6

Boulton Paul Defiant
Price 1/10

Spitfire Price 1/10

### LATEST MODELS

| | |
|---|---|
| TYPHOON | Price 2/- |
| THUNDERBOLT | Price 2/- |
| FOCKE WULF 190 | Price 2/- |
| MOSQUITO | Price 2/6 |

ALL KITS contain fuselage cut to outline shape, wings cut to shape, tail-plane, rudder, and where necessary nacelles printed on balsa, hardwood cowls and wheels, metal propellers, transfer insignia, cement. Also full-size detailed plan.

Hawker Hurricane
Price 1/10

Messerschmitt 109
Price 1/10

Tomahawk
Price 1/10

Heinkel H.E.111K
Price 3/1

YOU CANNOT BUILD FIRST CLASS MODELS FROM INFERIOR MATERIALS

**THEREFORE**

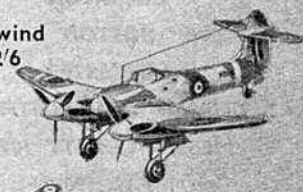
**INSIST ON**

**"TRUSCALE"**

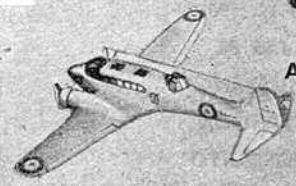
**WHEN YOU PURCHASE**

**A SOLID MODEL KIT**

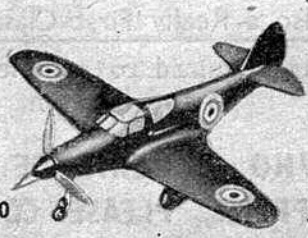
Whirlwind
Price 2/6



Buffalo Price 1/10



Avro Anson
Price 2/6



Airacobra Price 1/10

Wellington Price 3/6

# MODEL AIRCRAFT STORES (Bournemouth) LTD.

## 127b HANKINSON ROAD, BOURNEMOUTH

ADD. 3d. Postage on all Kit Prices.

Phone: 1922 WINTON

ADD 2½d. Postage on all Sundry Prices.

# AEROMODELLER

(INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR")

*The Model Aeronautical Journal of the British Empire*

*Established 1936*

VOL. IX No. 101 APRIL 25th, 1944

PROPRIETORS: MODEL AERONAUTICAL PRESS, LIMITED

Managing Editor: D. A. RUSSELL, *M.I.Mech.E.*

Editor C. S. RUSHBROOKE



ALLEN HOUSE
NEWARKE STREET
LEICESTER
Tel.: LEICESTER 65322



SUBSCRIPTIONS: INC. CHRISTMAS DOUBLE NUMBER 15/- P.A. PREPAID


## EDITORIAL

WE would explain the late publication of the AEROMODELLER on this occasion by the endeavour to present our readers with a "scoop." It will be noted that, for the first time in its history, Mr. C. Rupert Moore's painting carries round to the back of the journal, and, in fact, forms a large display painting of Taylorcraft "Auster IV" aircraft; full information of which is to be released by the Ministry of Aircraft Production as on April 6th, on which date we have endeavoured for the AEROMODELLER to be on sale throughout the country.

This original cover has been specially designed and painted by Mr. Moore, with the co-operation of Taylorcraft Aeroplanes (England), Ltd., of Leicester, with a view to introducing a National Competition for a flying scale model of the Taylorcraft "Auster," for which the Taylorcraft Company has kindly offered substantial prizes.

In the centre-spread of this issue is a two-fifth scale drawing, from which the model may be built, and a fully illustrated article follows this Editorial. Those readers who prefer to build straight off a plan showing every part drawn full-size, may obtain same from our Leicester office, price 2s. 0d., post free. The size of the plan is some 40 ins. by 23 ins. The "Auster" is the latest type in the series of Taylorcraft aircraft, and has been developed from the original "Cub," designed by Mr. C. G. Taylor, and which first appeared in 1936 and was produced by the Taylor Aircraft Corporation of America. These "Cubs" were among the most popular of America's light aeroplanes before the war and many thousands were used in schools and clubs and by private owners all over the world. No other single type of civil aircraft has been built in such large numbers.

The 1 in. flying scale model which forms the subject of this competition has been designed by the staff of Aircraft (Technical) Publications, Ltd., in collaboration with the chief designer of Taylorcraft Aeroplanes (England), Ltd., and it should prove a very attractive model to many thousands of readers. The structural design follows closely that of the full-size machine, and the power and wing loading factors have been worked out to allow for construction in material other than balsa, and yet allow of a good performance.

We acknowledge, with thanks, the co-operation of Taylorcraft Aeroplanes (England), Ltd., in providing facilities for our staff photographer to visit the Taylorcraft factories and photograph one of the latest "Austers," and also for the provision of the prizes.

The rules are simple and straightforward, and are published at the end of the article describing the model. All entries must be made on the special entry form, which may be obtained from our Leicester office upon receipt of a stamped addressed envelope.

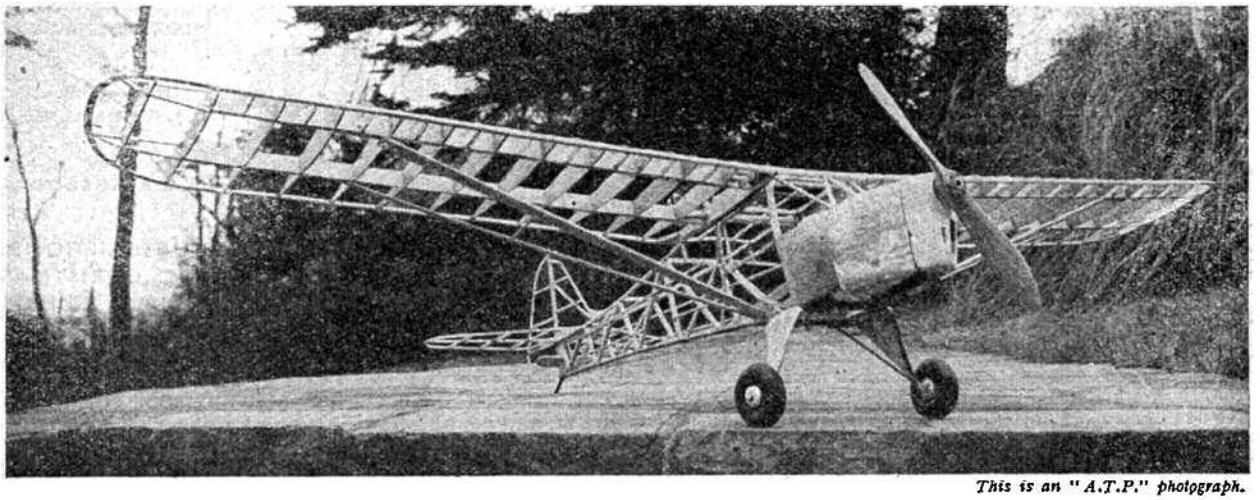
### McGillicuddy's Rise to Fame.

With the publication of Robert Jamieson's "McGillicuddy's Year Book," McGillicuddy continues his steady climb to fame as the "Grand Old Man" of aeromodelling. A number of well-known aeromodellers are referred to in the book, which is written in humorous vein; and is descriptive of all known, *and some unknown*, aspects of aeromodelling! From many readers, we have had complimentary letters praising the skill of the author and the quality of Freddie's sketches. Apart from its humour, the book is revealing in its description of aeromodelling, and is bound to serve a useful cause as "propaganda" for the aeromodelling movement. Copies may be obtained from any model shop or W. H. Smith & Son's bookstalls.

### Balsa Supplies.

From a reader in North London we have had the suggestion that, owing to the scarcity of balsa, strip and blocks should be sold only to aeromodellers who are members of the N.G.A., A.T.C., Royal Observer Corps, National Association of Spotters, members of recognised flying clubs, etc. This reader adds that he is in the Sea Cadet Corps, and has been told on numerous occasions that he cannot be sold an all balsa kit because he is not in the A.T.C. We should like to explain that the question of supplies being limited to members of the N.G.A. cannot, of course, apply, as this is an

## CONTENTS OF THIS ISSUE



*This is an "A.T.P." photograph.*

*Here is a Taylorcraft "Auster" Mark I, scale ¼ full size, span 4' 6", designed by Mr. D. A. Russell, and built in the Aeromodeller Research Department. Weight (uncovered) as shown, is 1¾ lbs., and power will be from an engine of 4 to 6 c.c. capacity.*

organisation concerned only for Third Party Insurance of aeromodellers with flying models. For the information of readers, we would explain that supplies of balsa are very limited, and, when available, are distributed to members of the Model Aircraft Trade Association for use only in "solid" kits. These kits, by arrangement with the Timber Control, used to bear a label reading as follows :—

"This kit (or model) is for sale only to members of the following Services for the member's own personal use :—

R.A.F., Air Training Corps, Royal Observer Corps, National Association of Spotters' Clubs, Anti-Aircraft units, Official Schools of Training in Aircraft Recognition."

The question of this particular reader being a member of the Sea Cadet Corps was one which arose AFTER the labels were printed, along with several other similar cases; and, following representation to the Board of Trade by the Committee of the Manufacturers' Section of the Model Aircraft Trade Association, it was agreed that model aircraft construction kits, which were to be used for training in aircraft recognition, could be sold to any members of any of the Services or Youth Organisations, PROVIDED an order signed by the would-be purchaser's Commanding Officer was handed to the model aircraft dealer from whom it was proposed to purchase the kit. Owing to supplies of material being so limited, it may still be, unfortunately, that many would-be purchasers, armed with the appropriate official orders, are unable to obtain kits; but, as and where kits are available, and the order can be backed with an "official" signature, then it does not matter to what organisation the would-be purchaser may belong.

## O.O.S.-N.G.A. Insurance.

We would remind readers of the O.O.S.-N.G.A. Insurance introduced last year in regard to the total loss of model aircraft and gliders. The premium is 2/- for each model insured, and the sum of £2 will be paid on total loss by an o.o.s. flight. Full particulars may be obtained from the Secretary, N.G.A., at our Leicester offices . . . . and Freddie's cartoon this month shows clearly what can happen to a "fly-away".

## Dr. Forster's "Spitfire."

We are pleased to announce that plans of Dr. Forster's Spitfire are now available, complete with a set of building instructions compiled by the Doctor; and, by the time this issue is published, all those readers who had placed orders on the announcement of plans in our Christmas issue should have received them. Immediate delivery can, of course, be given to further orders.

## Jet Propulsion.

A reader, Mr. E. W. Matthews, of Kent, has written us offering a prize of £10 for a competition designed to produce some method of propulsion for small models other than elastic, or, of course, petrol engines and compressed air. We are prepared to organise a competition if readers are interested, to which we would add our own prizes, and therefore invite suggestions as to how the rules might be formed.

## Twin Engine Control.

From Wing Commander J. H. M. Smith we have received the following note in regard to the recent correspondence and articles which have been published in connection with the directional stability of twin-engined petrol planes when one engine is cut off. Wing Commander Smith says :—

"I have just completed full-scale tests with fixed pitch airscrews. I used an Oxford aircraft as being most similar to a model, having fixed pitch airscrews and, what I have before advocated, a spring rudder bias. I used maximum continuous climbing power, at which the safety speed was 75 to 80 I.A.S., and with all foot load trimmed out by the spring bias, the aircraft flew straight, with feet off the rudder pedals, and laterally level, with hands off the wheel (I held the elevator trim only to adjust the speed), at all speeds, from 80 to 150 m.p.h., beyond which I did not continue the test.

"It would seem, then, that the suggestion I have made to apply a constant spring load to a free rudder, in the event of engine failure with a twin model, is at least borne out by one full-scale aircraft."

Wing Commander Smith adds the opinion that "a spring, controlled by an automatic mechanism of bell cranks and black magic, is the answer for a model" !

D. A. R.

# 1/12th Scale TAYLORCRAFT AUSTER IV

*This is an "A.T.P." photograph.*

IN the history of aviation, many attempts have been made to produce an aeroplane which would make an appeal to what may be termed the average man.

It was recognised that such a machine would have to be structurally very simple, easy to handle, and be possessed of the capacity to take hard knocks. Moreover, it would have to be produced down to a price, be economical in operation, and very simple to maintain.

Eventually, these conditions were admirably fulfilled by the little Taylorcraft. In consequence, the machine was produced in thousands, and before long it achieved the very enviable distinction of becoming the world's fastest selling aeroplane. "Everyman's aeroplane" had arrived.

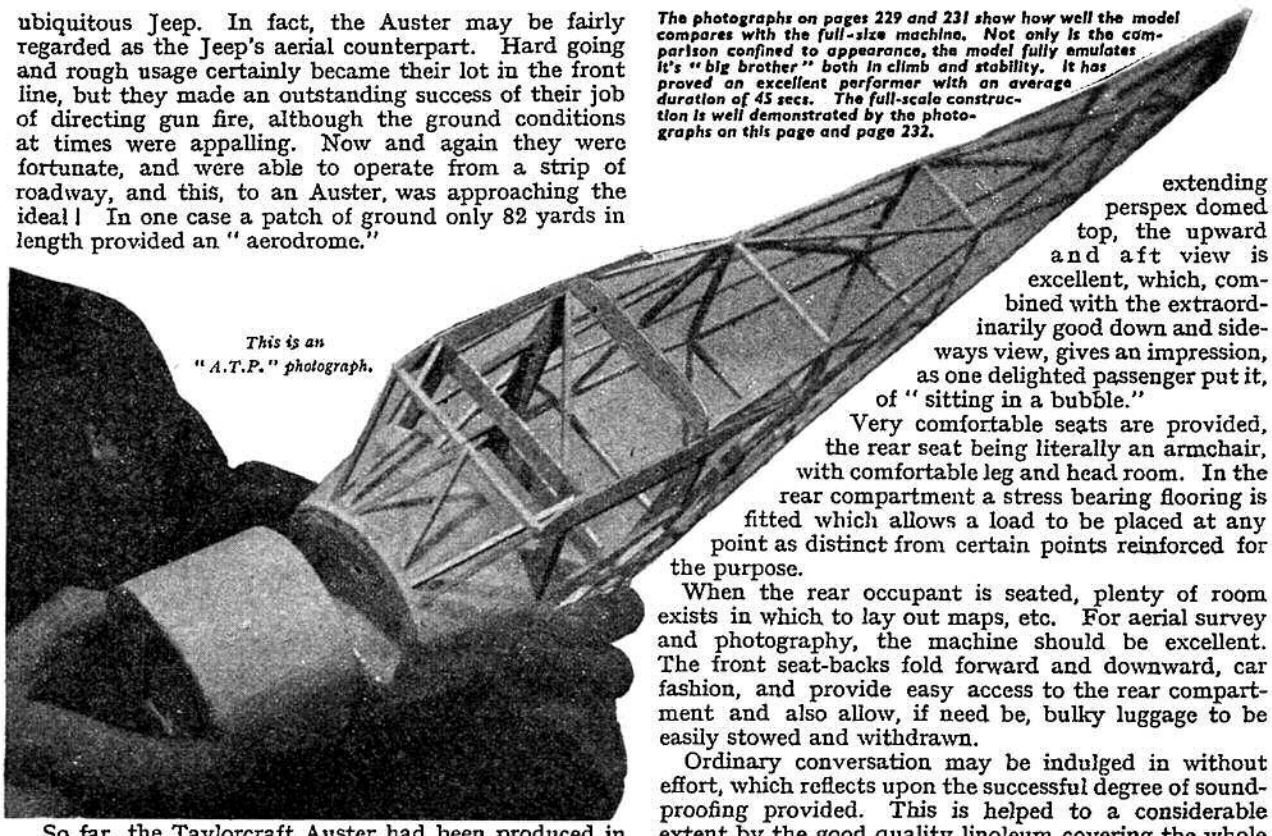
Therefore, when the present conflict broke out, and artillery came into its own again, the authorities looked round for a sturdy, simple, and reliable type of aircraft to work with the guns. It had to be a machine which could operate from any odd patch of ground, and could take all the rough and tumble which fighting in the front line would entail.

The search narrowed down to the Taylorcraft, and on the choice being made, the machine was subjected to very severe trials, which included repeated landings on a rough corner of a brick-strewn aerodrome, specially prepared for the purpose. Pilots were deliberately chosen who would themselves claim to be anything but "good" or "experienced" hands at flying. At the end of this almost unheard of treatment of an aeroplane, the machine was relegated to its operational duties as a perfectly sound machine. It was therefore proved that the machine's outstanding qualities in the matter of speed range, climb, and manœuvrability, by which the machine had built its pre-war reputation, could be made full use of in the course of operating without undue attention on the part of the ground staff, who in the main would be soldiers more concerned with the guns than with the aircraft attending them.

When the First Army went into action, the Austers (as the Army called them) went with them. No specialised personnel attended their arrival, and no more fuss was made of them than would be accorded the

*This is an "A.T.P." photograph.*

ubiquitous Jeep. In fact, the Auster may be fairly regarded as the Jeep's aerial counterpart. Hard going and rough usage certainly became their lot in the front line, but they made an outstanding success of their job of directing gun fire, although the ground conditions at times were appalling. Now and again they were fortunate, and were able to operate from a strip of roadway, and this, to an Auster, was approaching the ideal! In one case a patch of ground only 82 yards in length provided an "aerodrome."



*This is an "A.T.P." photograph.*

***The photographs on pages 229 and 231 show how well the model compares with the full-size machine. Not only is the comparison confined to appearance, the model fully emulates it's "big brother" both in climb and stability. It has proved an excellent performer with an average duration of 45 secs. The full-scale construction is well demonstrated by the photographs on this page and page 232.***

So far, the Taylorcraft Auster had been produced in two-seater form. A demand then arose for a three-seater, which could easily be converted to either the service of communications duties, or to spot for the guns as before. To meet this demand, the Taylorcraft Auster Mk. IV was produced.

A most marked feature of the new Taylorcraft Auster IV is the greatly enhanced view. With the rearward extending perspex domed top, the upward and aft view is excellent, which, combined with the extraordinarily good down and sideways view, gives an impression, as one delighted passenger put it, of "sitting in a bubble."

Very comfortable seats are provided, the rear seat being literally an armchair, with comfortable leg and head room. In the rear compartment a stress bearing flooring is fitted which allows a load to be placed at any point as distinct from certain points reinforced for the purpose.

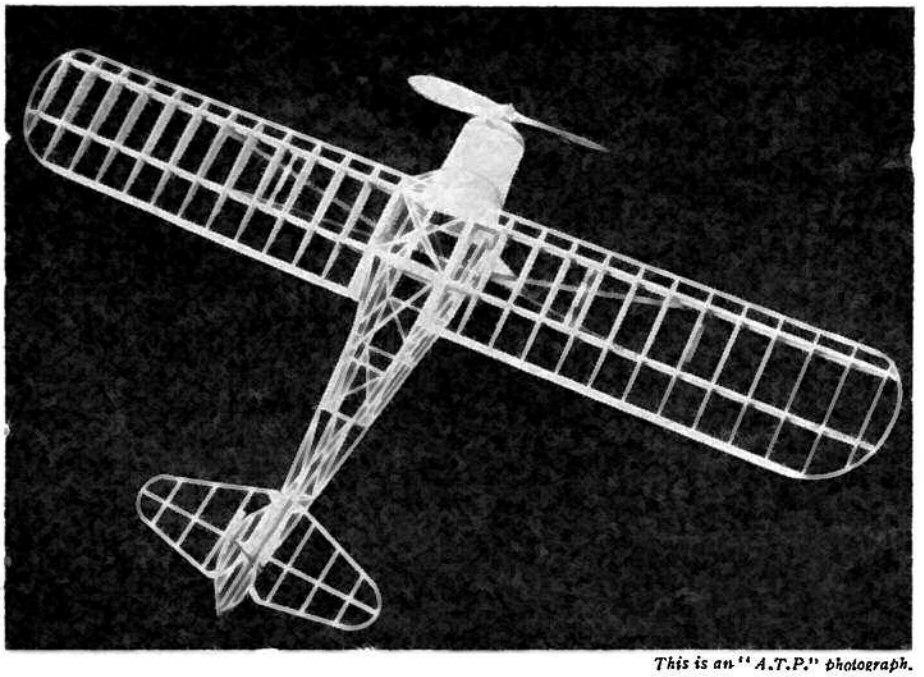
When the rear occupant is seated, plenty of room exists in which to lay out maps, etc. For aerial survey and photography, the machine should be excellent. The front seat-backs fold forward and downward, car fashion, and provide easy access to the rear compartment and also allow, if need be, bulky luggage to be easily stowed and withdrawn.

Ordinary conversation may be indulged in without effort, which reflects upon the successful degree of sound-proofing provided. This is helped to a considerable extent by the good quality linoleum covering the whole of the floor space. In fact, in the matter of comfort and appointments, the machine is more like a car than an aeroplane, an impression which is heightened by the car type door handles and parking brake lever, etc. Another refinement is an effective system of controlled cabin heating, by which ventilation and temperature may be balanced to cope with the extreme climatic conditions under which Taylorcraft machines are so often called upon to operate.

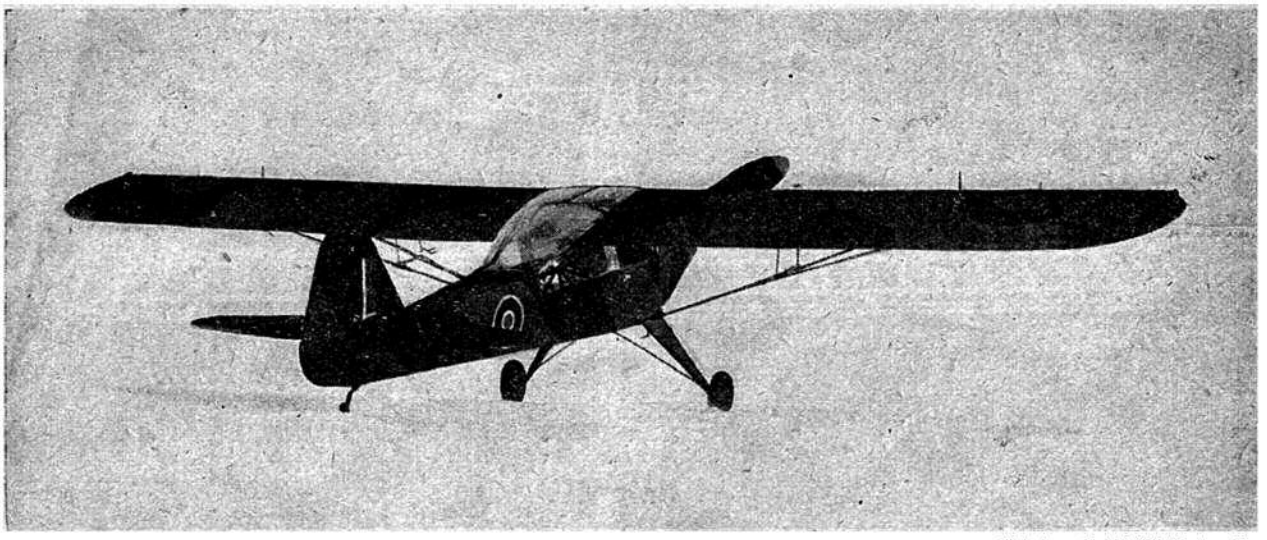
Sliding windows on either side provide, with a touch of the finger, an open "dirty weather" view, or may be used to augment the cabin temperature and ventilation under particularly trying conditions.

Foot-operated brakes for a sharp pull-up on landing, allow the already very short landing-run to be considerably reduced, while the ground steering qualities provided by the differential operation of the brakes make the 'plane almost as handy as a car in "motoring up" to any desired position on the tarmac or 'drome.

A long range tank increases the range to 250 miles. For active service conditions, the tank is self sealing, and has



*This is an "A.T.P." photograph.*



*This is an "A.T.P." photograph.*

proved itself to be capable of suffering a considerable degree of damage without the loss of its contents.

All the hard-wearing qualities which were such a notable feature of the Mk. I and III have been retained in the Mk. IV, and although the load capacity has been appreciably increased this has not been done at the expense of structural weight, which actually is an improvement on that of the Mk. III. The flap gear has been modified, which has the effect of making its manual operation a very much easier matter. Another refinement consists of a very neat and compact trim tab built into the roof structure, which is accessible to all seats.

Identification and dashboard lights have been incorporated in the Mk. IV, which increase the versatility of this very remarkable little aeroplane.

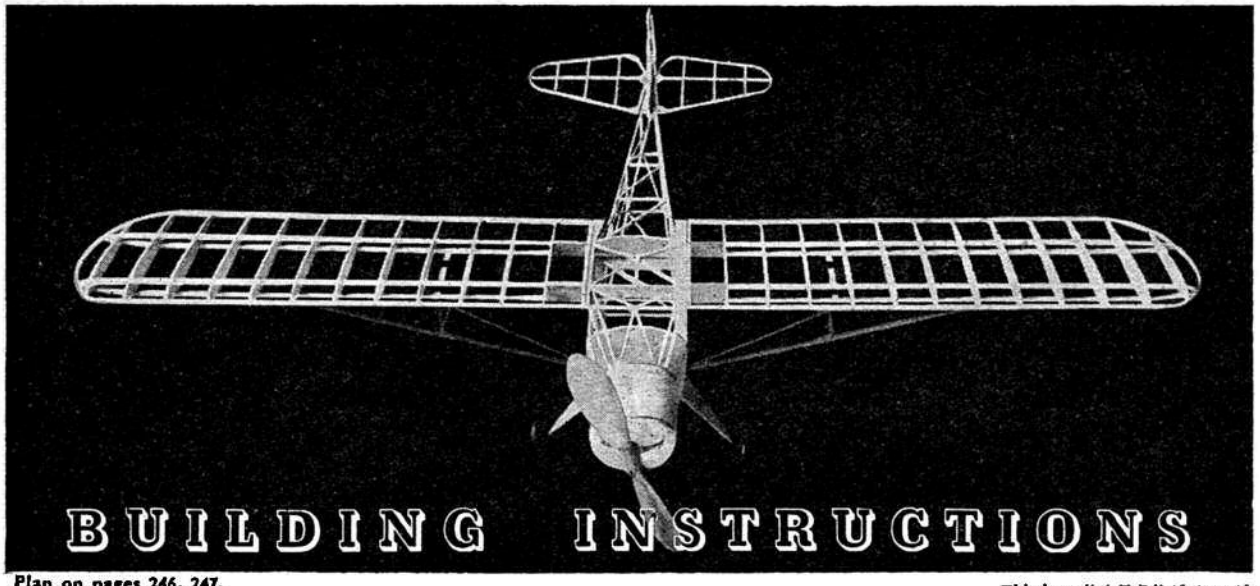
For the sterner side of its service duties, very effective armour plate is fitted below and at the back of the pilot, and a wireless transmitter permits the pilot to keep in touch and converse with ground stations when in action.

To see an Auster IV put through its paces is to see something to remember. It will jump away from the ground after a very short run and climb at an astonishingly steep angle. Hence small fields surrounded by trees may be safely negotiated, either in the take-off, or coming into land, for the very effective flaps with which the machines are fitted enhance the take-off, and provide for a very coarse angle of descent with a touch-down on landing of 30 m.p.h. A 15 m.p.h. head wind will reduce the touch down to 15 m.p.h. !

Actually the machine will leave the ground from a standing start of 75 yards, and will commence to climb at a rate of well over 1,000 feet per minute. The main characteristic of the climb, however, is the very steep angle, for whereas a very powerful aeroplane may be possessed of a climb of, say, 3,000 feet per minute, its climb would be at a very flat angle and at a very high speed. Therefore, if it could take off in the same distance as the Auster, it could not possibly climb nearby obstacles, in spite of its very much greater power.

New duties continue to be crowded on to this little machine, and hardly a day passes without a new demand being placed upon it, but consistently the Taylorcraft proves its capacity to "take it." The toughening it has received in the hard school of war will undoubtedly stand it in good stead in civil activities of the future, where hard work and ungrudging service will be the first requirement.

*This is an "A.T.P." photograph.*




Plan on pages 246, 247.

*This is an "A.T.P." photograph.*

**Fuselage.**

The construction of the fuselage, although it may look rather complicated from the drawing, is, in fact, quite simple, and at the same time very strong and light.

First, the two fuselage sides are built on the plan with the bottom longeron extending as far as former (3). The cross braces are added only as far as the rear of the cabin.

Remove the fuselage sides from the plan, add formers and cement firmly into position on the bottom longeron. The two main side stringers are then added, followed by the former immediately in front of the cabin struts. The rest of the stringers and spacers and the one remaining former may then be added.

The portion between formers (3) and (4) is covered with 1/32 in. sheet balsa. Two pieces of 3/32 in. sheet are cemented where shown, for the rubber anchorage.

The front portion of the fuselage may either be built straight on to the fuselage, or made as a separate unit and cemented to the main fuselage.

**Wing Centre Section.**

The two root ribs are cut from sheet and cemented to the sides of the main formers. The leading edge is then added, also the cabin struts and the two trailing edge fairings. The two dowels for the wing attachment should be a push fit. Runners may then be cemented in between the two ribs. After the model has been covered the centre section and cabin are covered with celluloid. If any difficulty is experienced with the curvature of the cabin, the celluloid may be heated and pressed over a mould. This method has been described in the AERO MODELLER many times previously, and the reader should refer to back issues if in doubt.

**Wings.**

The wings are of very straightforward construction, being of the multi-spar type. The ribs are cut from 1/32 in. sheet. Twenty-four off for the main rib and two off for the tip rib. The wing is laid down on the plan and built up in the usual manner. Great care should be taken when making the tip to get the spars tapering at the right angle.

When the wings are dry the boxes should be formed by cementing pieces of 1 mm. three-ply on each side of the spars between the first two ribs. They are then bound with tissue and doped. Next, the tubes to take the wing struts must be attached. This is shown quite clearly on the drawing, as are the wing struts themselves. The dihedral is formed by the wing dowels, which are steamed to the correct angle.

**Tail Unit.**

The tail unit is built up from strip, the leading and trailing edges being of 3/32 in. sq., and the cross pieces of 3/32 in. × $\frac{1}{16}$ in. balsa. The tips are 3/32 in. sheet. A piece of 18 s.w.g. wire is bound to the leading edge of the tailplane, forming a saddle, which sits on the top surface of the fuselage. A piece of 3/32 in. sheet is cemented to the top rear half of the fuselage, as shown in the drawing, for the tailplane to sit on. (NOTE.—The main spar of the fin is of 3/32 in. round birch. A paper tube to fit this birch dowel is firmly cemented to the rear cross brace.)

**Undercarriage.**

The undercarriage is made from an 18 s.w.g. wire outline, soldered at the joints. The main legs are then faired in with 3/32 in. sheet, covered with tissue and doped. The aluminium tubes upon which the undercarriage pivots are firmly bound to the cross brace and strengthened by fillets.

The wheels are of the usual 1½ in. celluloid balloon variety (if you can get them).

**Nose Block Assembly.**

The nose block itself is carved from medium hard balsa and backed with thin sheet metal. It is drilled to take the three bushes, and the shafts and gears are then soldered into position.

**Airscrew.**

The airscrew is carved from a hardwood block, 9 in. × 1⅛ in. × ⅝ in., as shown on the drawing. It is kept in position on the prop shaft by a tight-fitting coiled wire spring, or a small length of rubber tube stripped from electric flex.

**Power.**

The power consists of two skeins of six strands of $\frac{3}{16}$ × 1/30 in. rubber, one skein to each hook, 2 ft. long.

# COMPETITION PRIZES & RULES

**1st Prize** 8 guinea Silver Cup and £5 . 0 . 0, or Cup and one week's visit to the Taylorcraft Factories and Aerodrome and flights in a Taylorcraft Auster with all expenses paid.

**2nd Prize** 5 guinea Silver Cup and £3 . 0 . 0, or Silver Cup and one week's visit to the Taylorcraft Factories and Aerodrome and flights in a Taylorcraft Auster with all expenses paid.

**3rd Prize** 5 War Savings Certificates, or Books to the same value, or one week's visit to the Taylorcraft Factories and Aerodrome and flights in a Taylorcraft Auster with all expenses paid.

**22 Prizes** of one year's subscription for the Aero Modeller.

**Special Prizes** each of 5 War Savings Certificates for the best time made in Scotland, Northern Ireland, Wales and England.

## RULES

1. All entries must be received by Aeromodeller Plans Service, Ltd., at Allen House, Newarke Street, Leicester, not later than August 31st, 1944, on which date the competition closes.
2. All entries must be made on the official entry form (*a*) supplied with the plan and building instructions, or (*b*) obtainable on receipt of stamped addressed envelope from Allen House, Newarke Street, Leicester.
3. Flights must be timed by at least three persons, not counting the entrant, who must himself launch the model, and the entry form must be signed by the entrant and the witnesses (at least three) who have timed the flight, all of whom must give their addresses.
4. This competition is for the longest hand-launched duration flight: i.e., timed from the moment the model leaves the entrant's hands, until it touches the ground or any object.
5. No correspondence can be entered into in connection with this competition.
6. Taylorcraft Aeroplanes (England) Limited reserve the right to use all Prize Winning Models for display purposes in own town.
7. All models to bear the name and address of entrant.
8. The decision of the Managing Director of Aeromodeller Plans Service, Limited, and Taylorcraft Aeroplanes (England) Limited on any and all matters arising out of this competition will be final, and legally binding, and entry to the competition will be interpreted as an acceptance of the above conditions.
9. All models must be built strictly in accordance with the plans, and no parts may be omitted.

# SATURN'S RINGS


AUCHENGARGLE M.A.C. had fallen upon evil days; for it seemed the Maestro had deserted us. His absence was puzzling, for we knew his health was good, since his potman was still delivering his beer and collecting the empties as usual. Finally, McSwindle and the writer set out for his house to enquire the reason.

It was a pitch-black night, and as we approached we were startled by a loud bang and a flash from his workshop, followed by a series of angry squawks from Drambuie and a lot of bad language from the familiar voice.

McGillicuddy answered our knock, his eyebrows and whiskers were severely singed and Drambuie had several feathers missing. Neither of them was in the best of humours.

"There's nothing wrong with me!" he said angrily in response to our enquiries. "My goodness! Can a man no' get a wee bit privacy? An Englishman's home is his castle, and the same goes for Scotsmen too."

"Your manners haven't improved much, anyway," retorted McSwindle and turned to go. The Maestro called him back.

"I'm sorry, boys," he said, in a more kindly tone. "But I'm working on a new invention that will rip the aero-modelling world apart." Then he struck an attitude and proclaimed :—

"We strive to reach perfection's goal,
And though sometimes we blunder.
When this new model takes the air
The world will gape in wonder."

He would not admit us into his sanctum, and refused any further details. To my offer of assistance, he said :—

"No, no, Bob! You know the old saying about fools and half-done work." And with that we had to be content.

Meanwhile, at the club, things went from bad to worse. Lacking the Maestro's firm but kindly rule, and the spirit of high purpose that he brought to all activities, club meetings degenerated into noisy free-for alls, the younger members being particularly obstreperous.

One evening, a member introduced a shuttlecock, and in a few moments a noisy game of badminton had been organised, with a towline stretched across the room for a net, and wings from a "junked" model serving as improvised bats. The fun was at its uproarious height when the Maestro walked in, carrying a large case.

"What's the meaning of this?" he roared, and the riot was stilled at once. "Playing hooligan games."

"No, badminton," interrupted one of the players.

"We're dying to see your model, Maestro," said McSwindle, in an effort to avert the threatened explosion.

The Maestro opened his case, and the members watched while he assembled his model on the table. Then he stepped back and proudly announced :—

"Saturn II!," And added : "The first one blew up."

"That's the planet with the rings round it," said McSwindle; puzzled by the 'plane's appearance and playing for time.

"And this 'plane will put more rings round it, when we get it going," replied McGillicuddy.

Silence fell as we stared at the model. It was tailless, with a short stubby body, swept-back wings with fins at the tips, no propeller, and a tube with a sort of baffle attachment protruding from the rear of the fuselage.

"Is it a glider?" a member was beginning, when suddenly I got it and yelled "Jet propulsion!"

"Exactly," said the Maestro, and beamed. "While Group Captain Whittle, F.R.Ae.S., M.A., has been perfecting his great discovery, we have not been idle. With the present shortage of rubber, the need for an alternative power system has become imperative."

The club clamoured for details, and the Maestro slid off the cockpit cover and proceeded to lecture.

"The thing's simplicity itself," he was beginning, then suddenly he broke off and yelled, "Get out of that, ye wee imp of mischief!" snatching off his hat and

making a wild swipe at Drambuie, who had perched on the fuselage and was gazing intently into the interior.

"The trouble I've had with him," he continued, when the seagull had reached the safety of the rafters and was jeering down at him. "He seems to think I made it for him. Every time I turn my back he goes and sits in it. Where was I? Oh, aye——"

"It works on the same principle as a primus stove," he went on, resuming his platform manner. "But of course it requires a wee bit more pressure—I've been blowing it up with a stirrup pump."

"When will she be ready for a try-out?" asked McSwindle, his voice quivering with excitement.

"Weather permitting," said the Maestro, "she takes the air to-morrow."

This announcement was greeted with a roar of delight. Everyone present began talking at once, but the Maestro held up his hand for silence.

"All members present," he said sternly, "will require to take an oath of silence regarding our discovery. Premature release of the news would not serve the best interests of the club, since it is not yet perfected—and in any case we don't want those low lifes over at Teuchle Toorie to get the wind of it.

"Wright brothers, Bleriot, Whittle and Co.
To fame's golden hall have been beckoned;
But I hope to sneak in by the wee back door
With Saturn the Second."

The necessary oath of secrecy was taken, the model was replaced in its box, and in the excited discussion that followed, the shuttlecock was forgotten.

* * * *

High up on the slopes of Ben McSplurge the club assembled on the following day, a note of tense excitement prevailing. To honour the occasion we were making a field day of it, and models of all types were present. A good supply of eats had also been conveyed thence. These were parked in a sheltered nook while flying got under way.

The trials of Saturn II were, of course, the high spot, and when the Maestro's preparations were completed all members laid aside their models to watch.

"There's only one thing worrying me," he remarked to McSwindle. "I've got no de-icing apparatus—and I'm scared for ice on the wings. No saying what height this job will climb to. Will you get out of it?" he roared suddenly, making a wild swipe at Drambuie, who was again perching on the model.

Excitement was intense as the Maestro announced that all was ready. Sounding like an angry blowlamp, Saturn wriggled along the take-off board and slowly got into the air, skimming along about a foot from the ground.

"You'll no have much bother with ice on the wings at that height," said McSwindle. "Unless ground frost nips it."

But the Maestro was too deeply engaged with his model to resent the insult. "We'll try a wee bit more pressure," he said when the model had been retrieved.

This time something must have been wrong with the trim, for Saturn indulged in a wild series of stalls and violent dives that made everyone scurry for cover.

"That's more like jet convulsions, to my way of thinking," remarked one of the members; but still the Maestro was undismayed.

"We'll try a wee bit more pressure yet," he said. "I hope the tank can stand it."

This time Saturn showed her paces. Roaring like a hundred blowlamps, and emitting blue flames and smoke, she took off without a run and streaked for the heavens.

"What did I tell you?" cried McGillicuddy in happy pride. But he spoke too soon. With a tremendous report Saturn II blew up and disintegrated in mid-air. The fuselage and innards plummeted earthwards. The wings followed leisurely, and more slowly still—a small but ominous shower of white feathers.

The Maestro noticed them first, and the wreck of his model was forgotten in the shadow of tragedy.

"Drambuie—where is he, have you seen him?" he cried in anguish. But the familiar white-winged figure was missing. His fate seemed only too plain.

"What an end for the poor wee soul to get!" McGillicuddy was almost in tears. "He was that fond of sitting in the 'plane, too. He must have got in when my back was turned. Oh! If only I'd been kinder to him when he was alive."

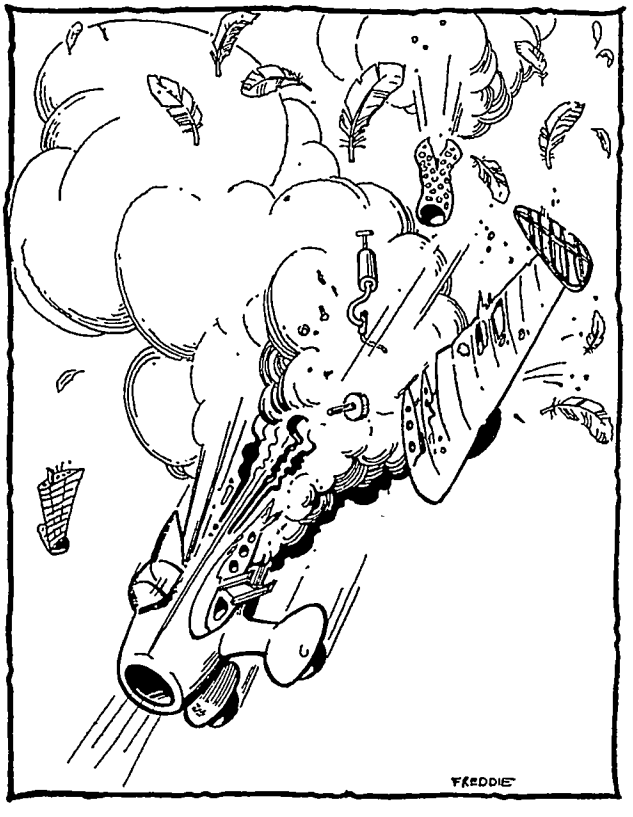
Joy had gone from the day. Saturn II was forgotten as, actuated by a common impulse, we began to pick up the feathers.

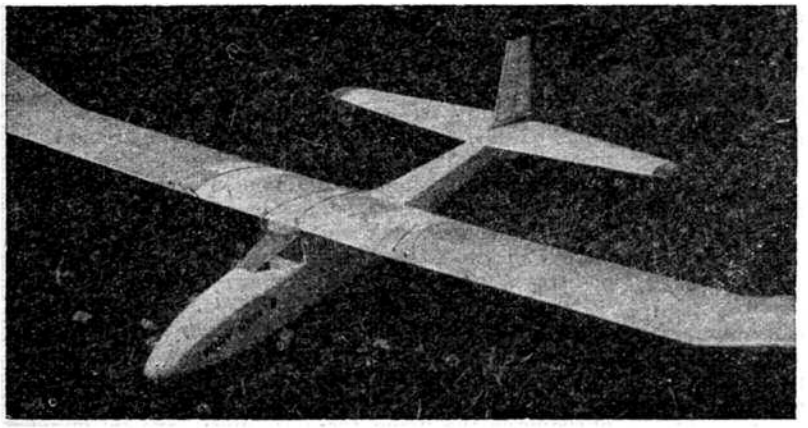
"Try and be kinda reverent like, lads, with the remains," said the Maestro. "Poor wee Drambuie; just another martyr to progress."

It was a sad and melancholy procession that wended its way back to our temporary base—the nook where our eats were parked. The Maestro swore he could eat nothing—a bite would choke him, but McSwindle insisted that he try to keep up his strength.

"And I brought some sardines for him, too," wailed McGillicuddy; unable to get his mind away from the tragedy. We gathered round and did our best to

*Continued on page* 237.





# IVORY GULL II

## (CLASS "A") SAILPLANE

MODIFICATIONS 1943

BY R · L · GOSLING

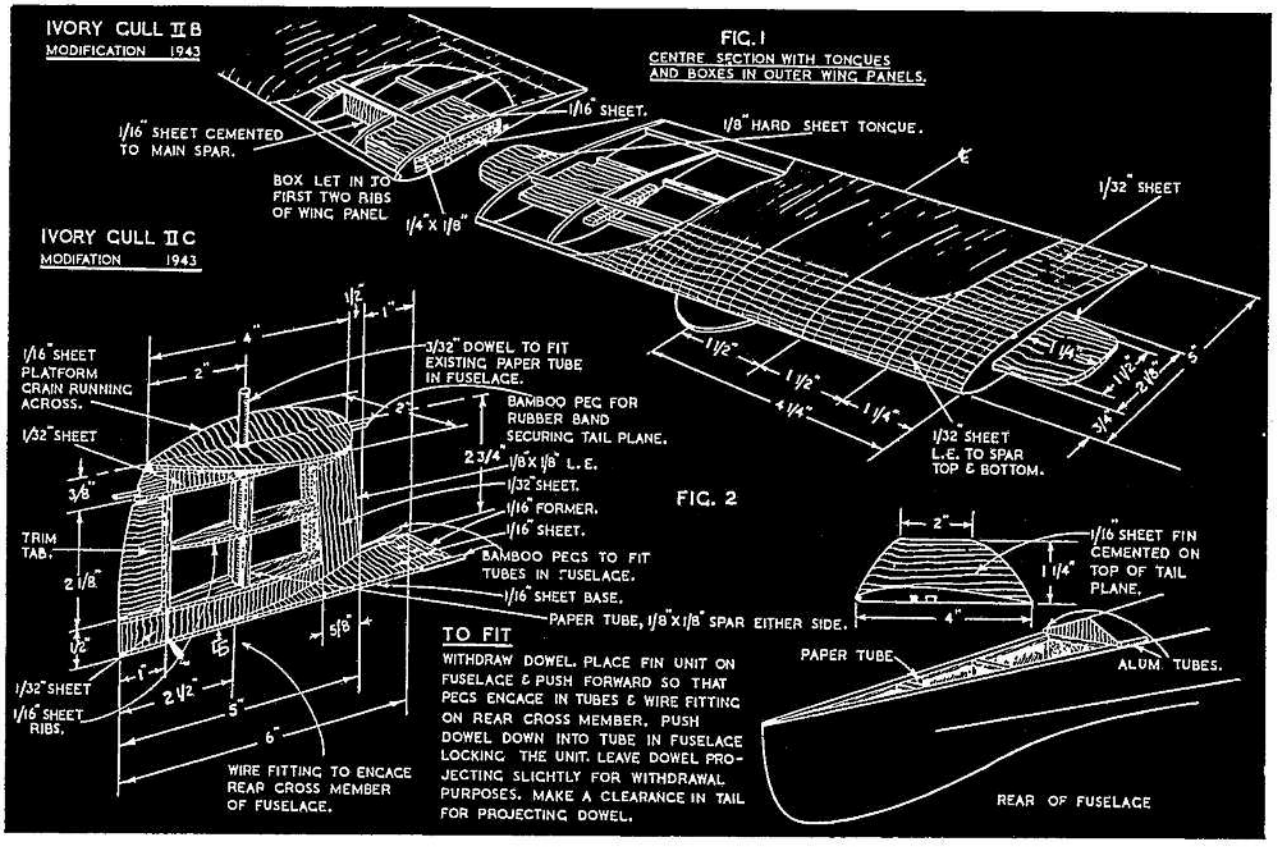
*"IVORY GULL IIB," as flown in the Pilcher Cup Competition, 1943.*

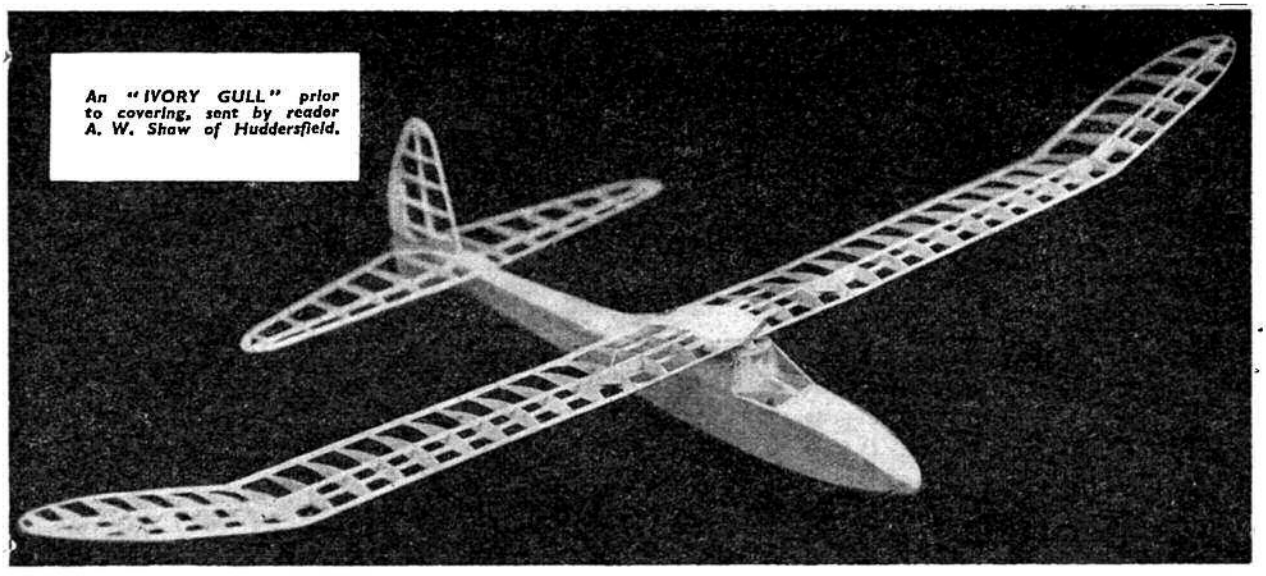
SINCE the article and plans of the Ivory Gull II were published in the AEROMODELLER of January, 1943, the original model has been flown very consistently during the season now concluded, with success to its credit. On June 6th it put up the British H.L. Record for Gliders, Class "A," with a flight of 5 mins. 35 secs., on the Clwyd Hills in North Wales. Another outstanding flight was during the decentralised competition for the Pilcher Cup, on June 27th, when a flight of 7 mins. 31·8 secs. o.o.s. was recorded from a 150 ft. T.L. The model landed at a farm three miles from the launching point.

As the model has undergone various modifications during the season, it was thought that some notes on these would interest readers, especially those who have built this model from the AEROMODELLER plans.

The fuselage has been found to be exceptionally strong, and if properly constructed will take any amount of hard knocks. One instance of this was when the wings were knocked off after the model hit one of the tall anti-invasion poles with which the Merseyside flying ground is unfortunately dotted. The fuselage dived into the ground from about 18 ft., but apart from some paint being scratched off, there was no damage.

The original wing has a tendency to flex a little under load, especially while tow-launching. So I advise builders of this model to plate with 1/16th sheet, between the spars, on the flat centre section, and as far as two ribs on either side of the dihedral break. If 1/32nd sheet is available, this could also be used to cover the





An "IVORY GULL" prior to covering, sent by reader A. W. Shaw of Huddersfield.

leading edge to the main spar on the centre section only, as an additional stiffener.

As mentioned above, various modifications have been tried out, although the model in its original form was really quite satisfactory. These modifications were as follows :—

II. 50 ins. span, 4½ ins. chord, 215 sq. ins. area, 8·0 ozs. weight.
IIa. 44 ins. span, 5 ins. chord, 209 sq. ins. area, 8·5 ozs. weight.
IIb. 52½ ins. span, 5 ins. chord, 251 sq. ins. area, 9·25 ozs. weight.
IIc. As IIb, but with raised tail plane, 10·25 ozs. weight.

It was the IIa modification which put up the H.L. record, the IIb version was used in the Pilcher Cup competition, where it was placed sixth. The latest modification IIc is still experimental and the full effects of this have not yet been completely tried out, as up to date only a few H.L. flights have been made. From these it certainly appears to further increase the stability of the model, which was already quite good, and especially from a directional point of view. It is, however, hoped that there will be considerable improvement on the tow line.

The main interest in the modification IIb is that the wing is built in three parts, with tongue and box fittings at the first dihedral break. Details of this are shown in the accompanying sketch, Fig. 1. This should further lessen the chances of damage should the model hit an obstacle.

The latest modification IIc is shown in Fig. 2. This has been designed so that it utilises the existing fittings for fixing the tail. The dowel locks the fin portion into position. The tail is held on to the platform by a rubber band in the usual way. A small fin of 1/16th sheet is cemented on the top of the tailplane.

The great attraction of this model is its semi-scale appearance. Its fuselage has a reasonably good streamline shape and is nevertheless easy to build, and its drag cannot be very much more than a pure streamliner. The wings being of parallel chord also make for ease of construction, the whole being a very stable model free from vices.

The following are the weights of the various components :—

| | II. | IIa. | IIb. | IIc. | |
|---|---|---|---|---|---|
| Fuselage | 6·5 | 6·75 | 6·75 | 7·13 | ozs. |
| Wings | 1·0 | 1·25 | 2·0 | 2·12 | ,, |
| Tail unit | ·5 | ·5 | ·5 | 1·0 | ,, |
| Total | 8·0 | 8·5 | 9·25 | 10·25 | ,, |
| Loading | 4·9 | 5·8 | 5·3 | 5·9 | ozs. per sq. ft. |

It is known that quite a number of Ivory Gulls have been built from AEROMODELLER plans, and the writer would always be pleased to hear of any outstanding performances. Also, if any difficulties have been experienced he will be glad to give advice.

---

SATURN'S RINGS—*continued from page 235.*

console him, but all hearts were saddened by the disaster.

Then, as we gained the top of the ridge and came in sight of our provisions, a familiar shape flopped out of the basket, flapped his wings, and began evacuating to a place of safety. Drambuie was very much alive, and had been making hay among the fodder.

"Look at that wee imp o' darkness!" roared the Maestro. "And me fair upsetting myself worrying about him."

With that he rushed down the slope and began swiping at the bird with his hat; at the same time calling the wrath of heaven to witness his thievery. Drambuie was too heavily loaded to take off, but by dint of vigorous wing flapping he managed to keep ground, hopping about three jumps ahead of the angry McGillicuddy.

"He's wonderfully supple for his age," said McSwindle, as we watched pursuer and pursued disappear into the middle distance—Drambuie leading by a short wing.

"Would you call that pet expulsion?" asked the club wit, but no one troubled to answer.

* * * *

Pity about the shuttlecock though—things like that are difficult to replace in war time.

# ¾in.-1ft. Semi-Scale

BY

K · H · HODGSON

# LOCKHEED LIGHTNING

MANY modellers will have made a scale flying model and probably have been disappointed at the performance, so I feel justified in saying that to make a scale model fly as well as a duration job is a fairly difficult feat, and usually duration is so poor that it makes one think: "Is a scale model really worth making?" From my experience I should say "No," but a semi-scale most certainly "Yes."

A good designed semi-scale can resemble the real thing so well that, without actually scaling up and careful measuring, the difference is hardly noticeable. This, I think, applies to this model, and trying to keep as near to scale as possible, yet bearing in mind duration, I think the alterations have been justified.

Regular flights of over a minute are easily obtained, and 100 secs. should be possible with good motors and recent weather.

Brief particulars are: Span 42 in., total overall length 27¼ in.; props. 10 in.; three blades revolving in opposite directions; total weight is 8¼ oz., power is by two motors, each of eight strands of ¼ in. elastic. The model climbs for most of the power run to approx. 80–100 feet high, flying in large circles.

Possibly the only snag is that the cabin is a permanent fixture to the wing, as no satisfactory method for making it detachable could be incorporated, and it was assumed (not incorrectly) that the cabin would take all the shock on hitting anything, in which case the fuselages slide forward as the wing has part of each fuselage built on to make a flat platform.

**Fuselage.**

All formers are prepared as per plan, rear motor hook fixed in position, and F2 riveted and cemented to F1. Commence by cementing the two side substitute stringers, having first marked former position correctly from plan. Wing platform is now built in. The top and bottom stringers are then fitted, noting downthrust, and the sheet and other stringers are then added as convenient. Hooks and brass tubing, etc., are firmly fixed in position, and lower portion of fin built on. Note that the rear motor hook cover is built in with the rest of the fuselage and then cut out afterwards. Also the wing part of fuselage is built into the wing later. The second fuselage is built just the same except that it should be remembered that the wing platform slopes the opposite way and hooks, etc., are at opposite sides.

**Wing.**

All ribs are slotted on to main spar and are constructed as usual by building on the plan; after the fuselage part is fitted, the leading and trailing edge and wing tips are shaped to aerofoil shape.

**Tail and Fins.**

The tail is also built on the plan, the top half of fins being added afterwards. Shape leading and trailing edge, etc., to section.

**Fuselage to Wing Section.**

(Should be in after cabin.)

The wing part of top stringer is cut away from fuselage, then wing and tail are fixed in position to each fuselage, keeping in place by elastic bands, the remainder of fuselage is then completed to true shape of each fuselage.

**Cabin.**

This is difficult, as the cabin has to be partly built and then the wing fitted in; care is required. The suggested way is for the cabin to be partially built by fitting a few main stringers, leaving a generous space where the wing fits in and noting that formers Nos. 6, 7 and 8 are in accurate position to fit spars of wing.

The two halves of wing are then pinned in position in cabin, care being taken to check the following: (*a*) that the wing has correct relative incidence to cabin (see drawing); (*b*) that the wing has correct dihedral at tips; (*c*) that the cabin is correctly upright to wing when viewed from the front.

All joints must be well cemented. Bear in mind that these joints have to stand the strain of all crashes of the finished model. Do not omit crossbracing inside cabin, however tedious it may be to do.

The cabin frame is painted all over with black ink and celluloid fitted over frame. The joints are joined with cement.

**Props.**

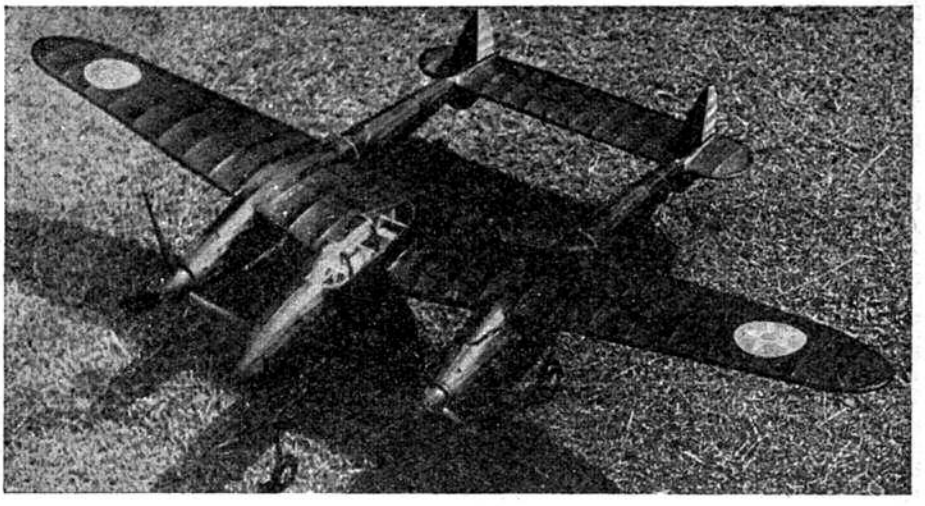
Two three-blade propellers provide power, they are made as follows:—Blanks are first cut out and shaped as plan, the centres of blanks all being the same thickness, they are then glued between the three-ply rear rings and the hardwood nose block and clamped in a vice to dry.

⅛ in. holes are then drilled at correct angle (see drawings) and the ⅛ in. dowelling is glued in position. The propellers are now carved in the usual way, not forgetting that one is left-hand and one right. Finished

propellers are then covered with one layer of black tissue grain running across blades, using mucilage glue; spinner is painted with black ink.

Propellers can be finished off with one coat of banana oil, but this is not necessary.

The whole of the original model was covered with black tissue and stars and stripes in red and white; this makes patching easy and also gives a good silhouette appearance, cabin and fuselages are covered in small pieces with grain of tissue round and not longways. The wing has the grain lengthways for top surface and crossways for underneath surface. Tail same as wing. Steam all surfaces and dope underside of wings, etc., first. This is to avoid the tissue shrinkage bending the framework upwards.



**Flying the Model.**

If the model has been correctly built it will balance level on the wing tips (at position stated on plan) and should not require trimming. However, should the model be slightly tail-heavy a positive incidence can be given to the tail (i.e., up to 3/32 in. under the leading edge), but if the model is nose-heavy small pieces of lead placed under the tail will correct.

Test for glide in the usual way, preferably on a calm day.

First flight should be with about 100 turns on each motor, on which the 'plane should climb gently to about 15 ft. to 20 ft., and then glide to the ground. Be quite sure that it is trimmed for glide and not power flights, and if satisfied increase the turns by 100 per time.

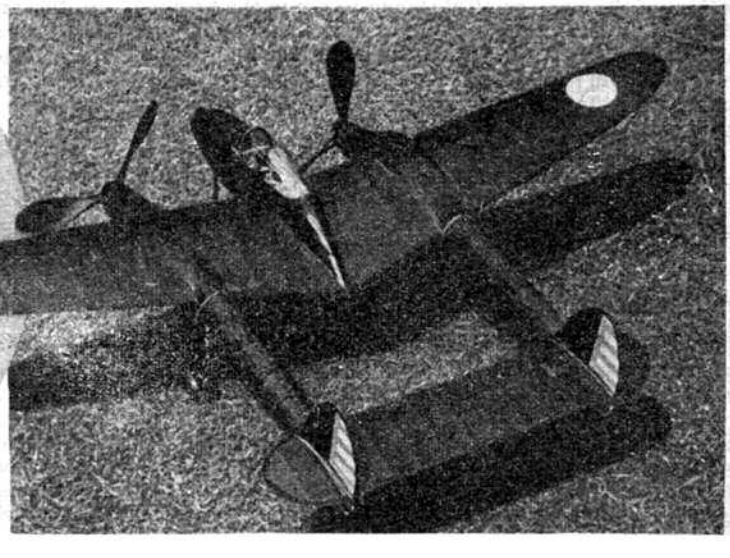
The turn tab is to make the 'plane circle, but should not be moved more than 3/32 in. out of centre, with this the model should circle in about 100 ft. diameter circles, but if not sufficient, 1/32 in. side thrust should be applied to one propeller.

As the original model is usually flown without undercarriage, tubes are provided for the fitting of wire skids under the cabin. But if desirable the model will make a perfect " take-off " from smooth surfaced ground with the wheels fitted.

**Method of Launching.**

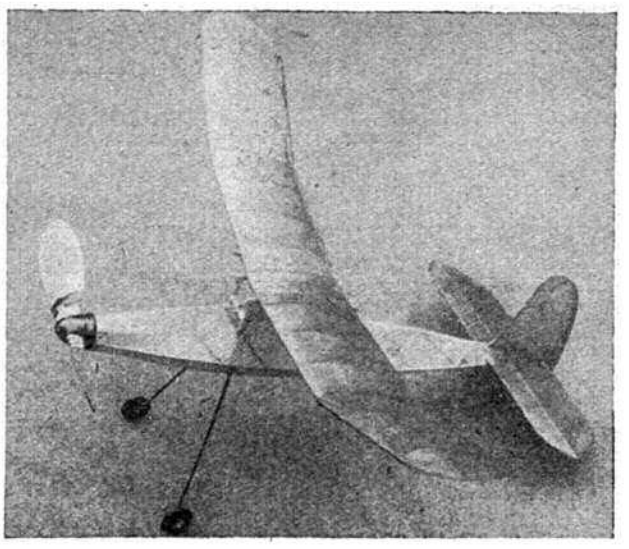
As there are two props. a method had to be arranged to release both at the same time. This is quite simple. A piece of wood 12 in. long has a short length of string tied at each end. The strings are fastened to short wires which fit into a brass tube in the nose of each fuselage. As each motor is wound up the wire is fitted between the blades into the tube. Obviously the wire stops the prop. turning, and the tension of the motor holds the wire in place. When ready to launch, and everything checked, hold with the right hand at the rear of the cabin, one finger at each side on top of the wing, and thumbs underneath the left hand grasps the piece of wood and model is pointed into wind. A sharp forward pull on the stick releases both props., and model is launched by the right hand. If the 'plane fails to climb to a reasonable height, decrease " downthrust," but if there is any sign of stalling use another 1/32 in. " downthrust."





# "RED BEETLE"

BY W · J · PRESCOTT



I STARTED building and flying model aeroplanes about five years ago and ever since I have been struck by the extreme flexibility of all the components when uncovered. I have recently experimented with a view to producing a construction which was rigid in itself—the result is the "Red Beetle."

1. The **Fuselage** is a diamond slabsider. The two sides are built on the plan as usual. Two longerons are pinned to the plan and the upright spacers are put in at the nose and tail. Then the bottom diagonal struts are fitted 1/16 in. by 3/32 in. as far back as the wing mount and to the rear 1/16 in. by 1/16 in. The top diagonal struts are then put in forming the criss-cross. They are cemented where they cross. 1/16 in. by 3/32 in. is used for the strut at the nose and all the rest are 1/16 in. by 1/16 in. The fill-ins at the nose and tail are cemented in place. The second side is built and the two sides cemented at the rear. When dry a temporary cross-strut is inserted at the widest point (A), the nose struts of 3/32 in. by 3/32 in. and another temporary cross-strut are fixed at B. The diagonal struts are inserted, bottom ones first, as when building the sides. Complete as far as possible without removing the temporary struts. When all joints are dry, remove the temporary struts at A and B and complete the fuselage. A circular former of 1/16 in. 3-ply is cemented to the nose and full-depth stringers of 3/32 in. sheet are added. The fuselage can now be cut at C and spigots fitted for location. This forms the tail extension on which the tail is assembled.

2. **The Wing Mount.** Two sides are made as per plan and then inserted into the fuselage so that the bevelled edges fit into the V formed by the cross-struts. Bracing struts are inserted at the top connecting the two separate mounts and are cemented to the bottom of the top longeron. All the projecting parts are sanded off to a streamlined section.

3. The **Undercarriage** consists of two tapered bamboo legs. These are cemented just behind the front leg of the wing mount and at the top of the longeron behind a balsa stop. Before binding the axles to the bottom of the legs a small V should be cut in the bamboo to prevent the axles from twisting. They should of course be well cemented. It is advisable to rely on cement only in fixing these legs as if bound to the fuselage considerable damage may be suffered in the event of a bad landing.

4. The **Fin is built** by cementing the top two pieces of 1/32 in. sheet and the leading edge together. A small slot is made in the end of the tail extension to fit the 1/32 in. sheet trailing edge, and a half lap joint is made where the leading edge fits the bottom longeron.

5. The **Tailplane** is built by laying the diagonal ribs of 1/32 in. by 1/16 in. on the plans. The leading edge is cemented on, as well as the mainspar and trailing edge. The tips of 1/32 in. sheet are added and then the ribs are sprung over and cemented at the leading edge, mainspar and trailing edge and held in place until dry.

6. The **Tail Unit** is then assembled. The top longeron of the tail extension is cut at the end and the tailplane inserted with the trailing edge on top of the top longeron. Don't forget the tailplane is an inverted lifting tail with camber underneath. The fin is then erected and a mainspar, which is cemented at the bottom to the tailplane spar is added. Ribs are then added in the same manner as the tailplane. Don't forget again—it's a "swerving" fin with camber on the left-hand side looking towards the nose, i.e., making the model turn to the right. The underfin is lastly cemented in place.

7. The **Wing** is of the normal construction. Ribs are sanded to shape and then slotted to take the mainspar and leading edge. The ribs, with the exception of the three at the dihedral breaks; are next fitted to the mainspar, and the trailing edge previously slotted is fitted but not the leading edge. Dihedral is the next job. V slots are cut in the mainspar and trailing edge and 1/32 in. sheet backing at the mainspar joints is used for strength. The three ribs at the dihedral breaks are next added. The leading edge and wing tips are cemented in place and the wing is completed.

The **Propeller** has so far been old Wakefield blades cut down and fitted with a hinge and a new hub and spinner. A block for a similar blade is shown and the hub and spinner are made as per plan. The hinge consists of a piece of brass tubing secured by two or three wire staples and well cemented. It should be accurately set at the angles shown. Two pieces of wire are bent as per plan so that they fit into the tubing and round the prop. blade, to which they are secured by binding with thread and strongly cemented. Care should be taken to see that the prop. folds freely. A counter-weight is of course fitted and the prop. balanced. The nose block is made up of laminated 3/32 in. sheet and either cup washers or ball race fitted. The prop. shaft is made from 18 S.W.G. piano wire.

The fuselage and fin were covered with yellow Jap tissue and the wing and tailplane with red. The covering water shrunk and given two coats of dope. The spinner and nose block are painted red as well as the undercarriage legs and wheels.

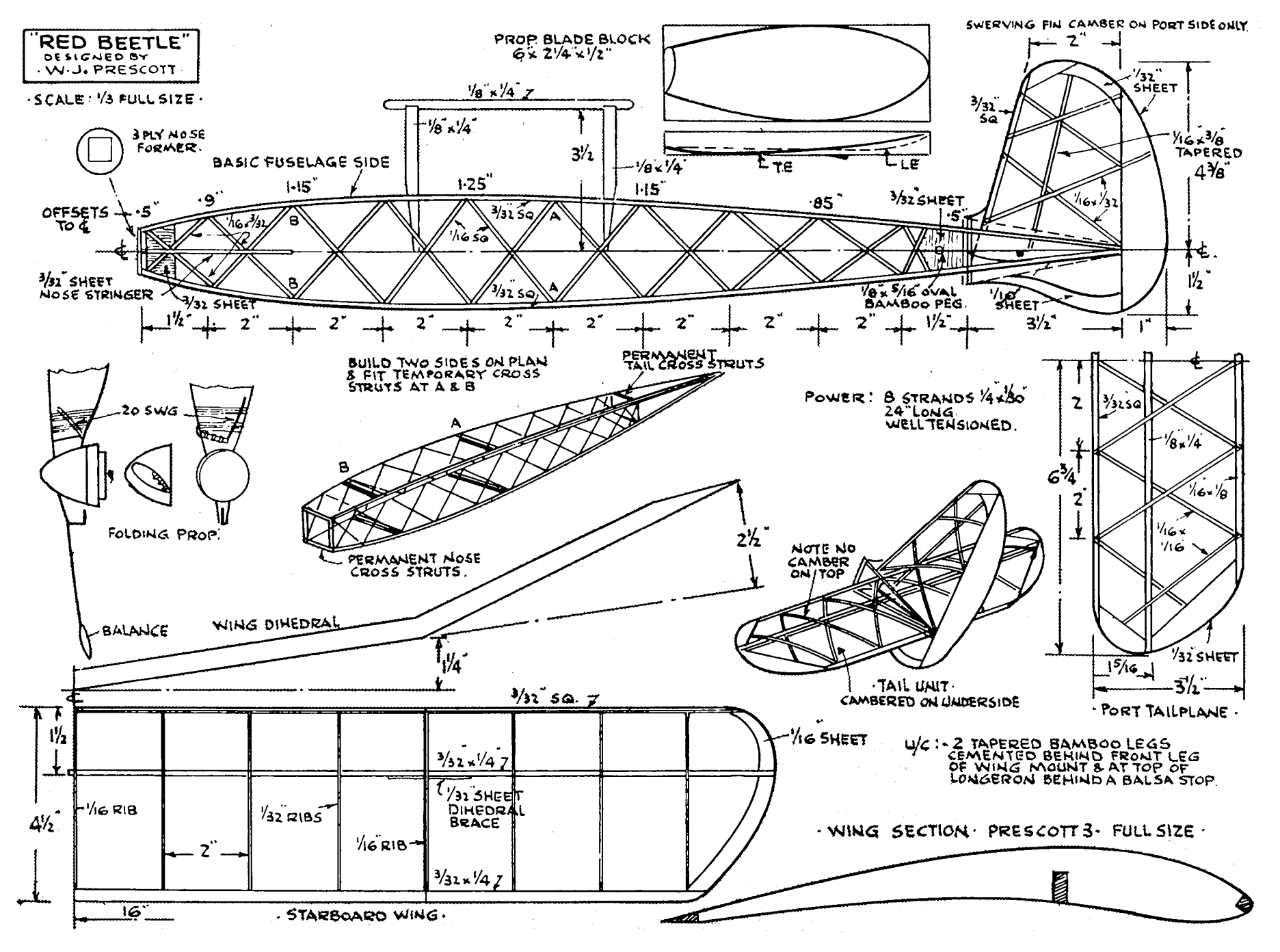
The model turns to the right under power and during glide. Adjustments should be made by packing the tail or nose block. The motor, using eight strands of ¼ in. by 1/32 in. Caton's Black 24 in. long, will take about 600 turns maximum.

The best flight I have had on this power is 11 minutes 6 seconds o.o.s., during the National Cup Contest, when the model was lost.

# "RED BEETLE"

DESIGNED BY
W.J. PRESCOTT

SCALE: 1/3 FULL SIZE










POWER: 8 STRANDS 1/4" x 1/30" 24" LONG WELL TENSIONED.










U/C:- 2 TAPERED BAMBOO LEGS CEMENTED BEHIND FRONT LEG OF WING MOUNT & AT TOP OF LONGERON BEHIND A BALSA STOP.

·WING SECTION· PRESCOTT 3· FULL SIZE·

# THE HILLSON PRAGA

BY E · J · RIDING


DURING the summer of 1936, an interesting little machine known as the Praga B.36 arrived in this country from Czechoslovakia.

Manufacturing rights were acquired by a firm of woodworkers with no previous aircraft experience, Messrs. F. Hills & Sons, Ltd., of Trafford Park, Manchester, where production commenced towards the end of 1936. By the middle of 1937 the factory was turning out three machines per week, some forty-six being supplied to buyers both at home and abroad.

The Hillson Praga never achieved the popularity of other small cabin aircraft, possibly owing to the fact that the fully cantilever wing could not be folded—rather a drawback for the private owner with limited hangar space at his disposal. Trouble was also experienced with the power plant, a 39 h.p. Praga twin-cylinder, aircooled, horizontally-opposed engine. Since the engines were not made from A.I.D. approved materials, Certificates of Airworthiness were withheld and experiments were made with motors of different design.

The fuselage was built up from four light spruce longerons together with single stringers running down the top and bottom surfaces, giving it a hexagonal cross section. The wing consisted of the familiar twin spruce and plywood box spars used in conjunction with spruce and plywood ribs. The fuselage, wing, rudder and fin were plywood covered whilst the tailplane and elevators departed from the orthodox in that they were made from various gauges of steel tubing and afterwards fabric covered.

The engine was supported by a rubber-mounted steel tubular mounting on the nose and it was faired into the fuselage by means of a simple hemispherical cowling. The " Y " shaped exhaust manifold conducted the hot gases through a heater box and downwards underneath the machine. The most ingenious part of the structure was the springing of the streamlined steel tubular undercarriage. Landing shocks caused the axle extensions to exert compression against rubber blocks inside the axle, giving it a very neat and simple appearance.

Entrance was through the leading edge of the wing, a portion of which folded backwards, which together with hinged side screens enabled the crew to enter in the same manner as they would an open machine, the hinge portion being pulled back and locked into position afterwards.

Side-by-side dual control was fitted, employing the usual " joystick "-operated ailerons and elevators with pedal-operated rudder control.

The push-pull throttle knob was situated in the centre of the dashboard within easy reach of either occupant, and to open the throttle, the knob was pulled outwards.

Handling qualities were excellent. The machine could be flown at 35 m.p.h. I.A.S. under perfect control and it would climb quite strongly with two up at 60 m.p.h. on three-quarter throttle. Turns could be made on the ailerons alone and the stall was very gentle, and by opening the throttle it was possible to " climb over the top " and resume normal level flight without the danger of wing drop and subsequent dive.

In flight, from the pilot's point of view, the nose appeared to be about 14 in. below the horizon and it was possible literally to see the ground immediately below the machine.

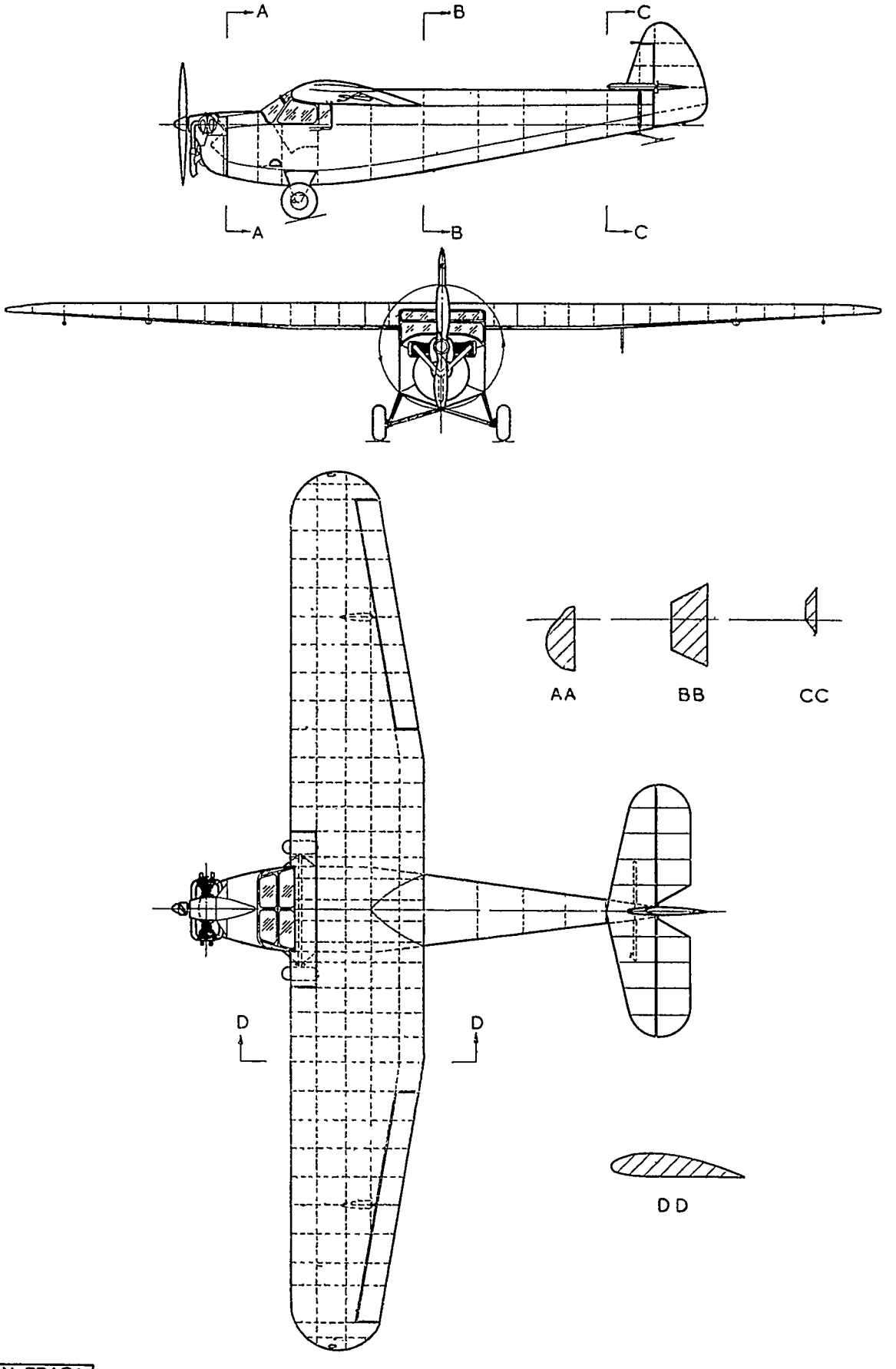
The appetites of the " Baby 'Plane " fraternity of the popular press were whetted when H. L. Brook flew a Praga to Capetown in 135 flying hours during the summer of 1936. It also hoodwinked the handicapping experts by winning the Isle of Man race in the same year.

The Praga was used by the Ipswich Aero Club, North Staffordshire Aero Club at Meir, Thanet Aero Club and the Northern Aviation School and Club at Barton-on-the-Moss, Manchester. Machines belonging to the latter concern are illustrated here. The colour scheme is blue and silver, and a fleet of these craft were maintained for instructional work, for which they were charging the astonishingly low fee of 20s. per hour.

Batches of Hillson Pragas were registered G-AEPI to G-AEPM, G-AEUK to G-AEUU and G-AEYK to G-AEYU inclusive. Thirty-three were registered in this country, many of which may be still in flying condition.

Specification :—

Span : 36 ft. 1 in. Length : 22 ft. 1 in. Height : 7 ft. 2½ in. Ceiling : 11,800 ft. Climb to 1,000 ft. : 3 mins. Wing area : 164 sq. ft. Weight empty : 625 lbs. Max. speed : 92 m.p.h. Cruising speed : 81 m.p.h.




HILLSON PRAGA

FT

# TOWLINE WITHOUT TEARS

BY ROBERT JAMIESON

HAS your experience with the towline been the same as mine? It may be that I can't run straight, or that my models are never lined up correctly, but every time I attempted to tow up a glider the result was the same. Immediately the urge was applied the model reared up like a startled horse and then hurled itself to earth with demoniacal frenzy. Altering the hook position and/or diminishing the towing speed helped a little—but it still remained a matter of hit or miss.

Then, one evening, my clubmate, J. D. Traynor, produced a pulley launching apparatus (AERO MODELLER, December, 1942) and suggested at the same time that we try the twin tow hook idea, mentioned but not described in the same article.

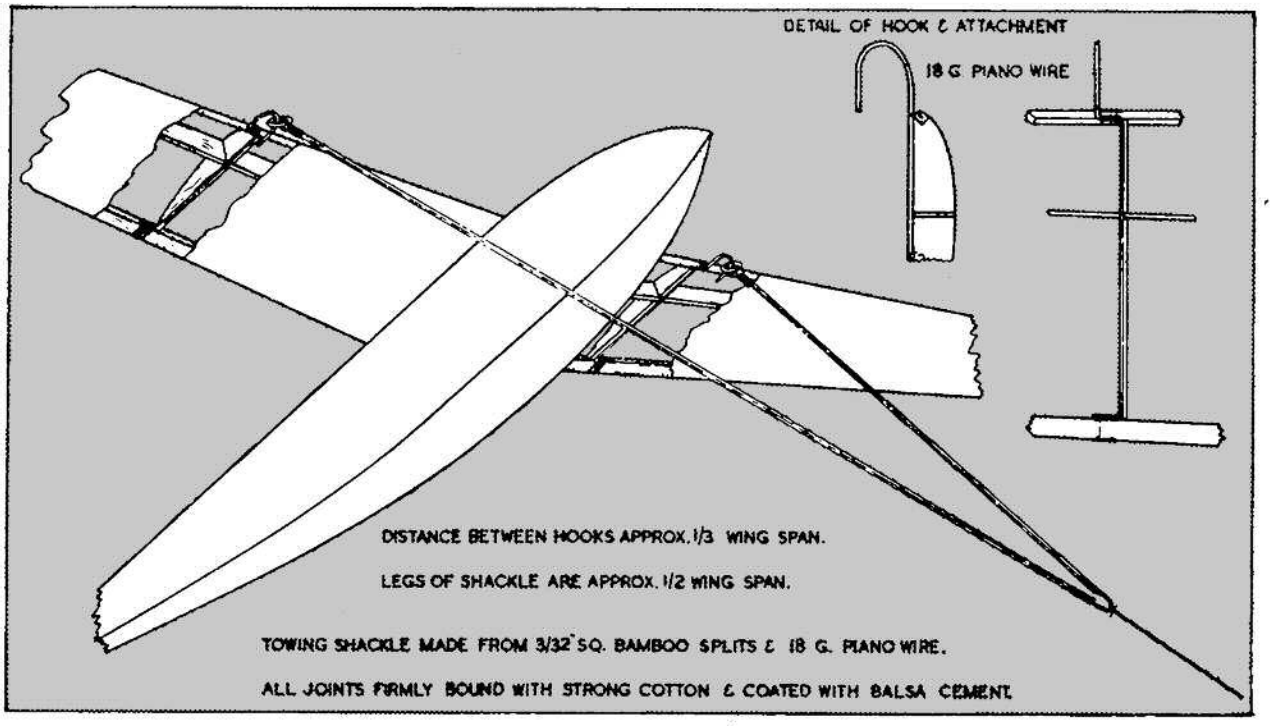
The only model airworthy at the time was an "Aegeus," built from substitute. This we prepared by removing the tissue from between two of the ribs about one-third of the span from the fuselage. Two hooks of 18 s.w.g. wire were then made and fixed in position, the shank of the hook extending right back to the trailing edge of the wing, and firmly bound and cemented to all points of contact. When finally fixed the hooks projected about 1 in. in front of the leading edge, and about ½ in. to ¾ in. below.

The original part of the scheme is the shackle or "doodah" for attachment to the towline. This consisted of a V of bamboo about one-eighth square. When the wo legs are fastened toget her the distance across the top of the V should be the same as the distance between the hooks on the wings. The length of the legs should be sufficient to clear the nose of the model with ample room to spare. To the tops of the V legs small rings (about ½ in. diameter—the ones we used came from a passe-partout outfit) were attached with a loop of soft wire bound and cemented. The rings were left free and loose. The two legs were fastened together at the opposite end to form a V by a small piece of 18 s.w.g. wire. The towline was attached to the point of the V.

Thus prepared we sallied out. Ten minutes later we were shouting "Eureka!" It worked like a charm. The day was cold with a blustering gusty wind, yet despite this, and our inexperience with the pulley gear, the job towed up *dead straight* every time. Using about a 150 ft. line we got in some half dozen flights, and then a vicious wind caught the model on its way down and smashed it broadside into a shed. When picked up the fuselage resembled a piano accordion.

Once we get into our stride with this idea some experimenting will have to be done to find out the ideal hook position; but to those who, so far, have had difficulty in towing up with the single hook this is definitely the goods. With the rudder set for straight flight, towing up is "nae bother at aw"—you simply can't go wrong. With the machine set to circle, towing up requires a wee bit knack, but it *can be done successfully*. Traynor is quite an adept. When the job attempts to yaw, he simply steps to the same side as the model is wandering, straightens it up, and then pulls it back to the original flight path.

Two points from our own experience to watch. Make sure that both legs of the V are exactly the same length; if the wing of your model is secured by rubber bands, make sure to fasten a "stop" across the top of the fuselage, to prevent the wing being pulled forward or slewed round while on the towline.



# 1 INCH TO 1 FT. TAYLORCRAFT AUSTER IV.

AN "A.P.S." DESIGN

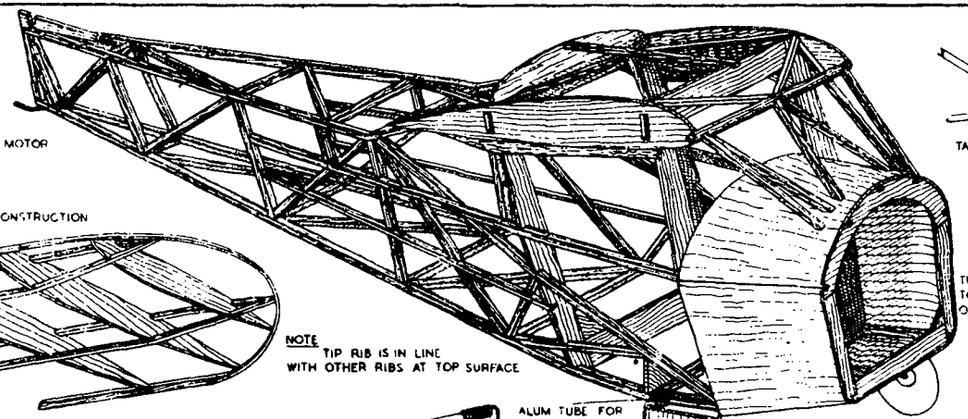
DEVELOPED IN CONJUNCTION WITH TAYLORCRAFT AEROPLANES LTD

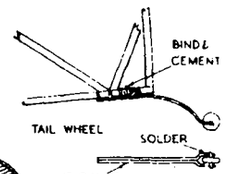
2/o

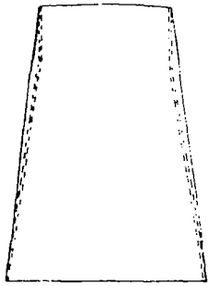
THE AEROMODELLER PLANS SERVICE LTD.

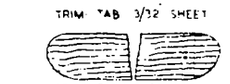
ALLEN HOUSE NEWARKE STREET LEICESTER.

INSTRUMENT PANEL
FOR FLYING PURPOSES WILL HAVE TO BE CUT AWAY TO CLEAR RUBBER MOTOR



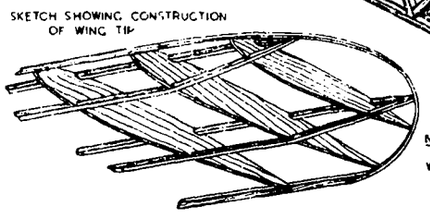


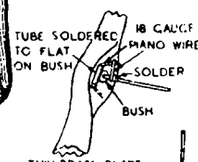


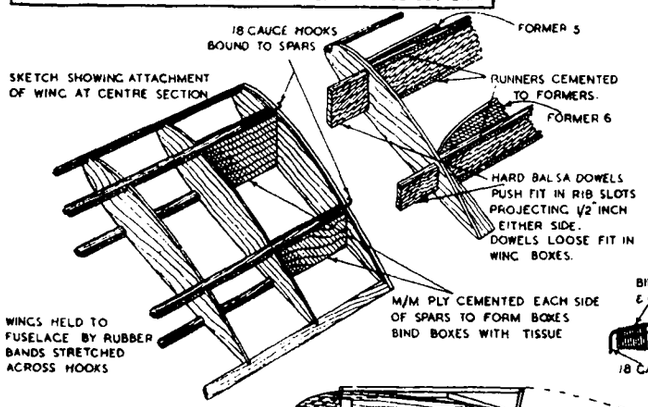

REAR CABIN PERSPEX

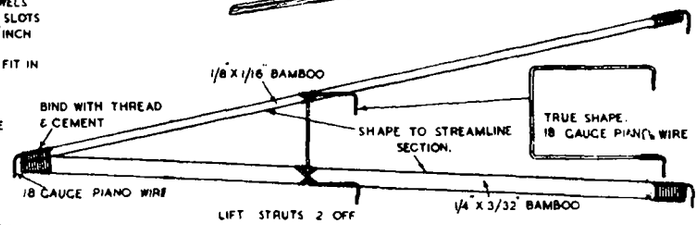
MAKE BLOCK TO SHAPE SHOWN AND STRETCH 1/32" THICK CELLULOID OVER BLOCK WHILST HEATING UNTIL REQUIRED SHAPE IS ACQUIRED



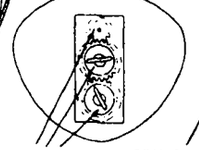

NOTE TIP RIB IS IN LINE WITH OTHER RIBS AT TOP SURFACE

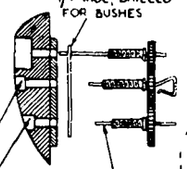


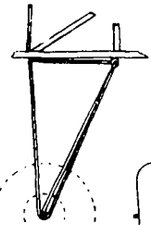



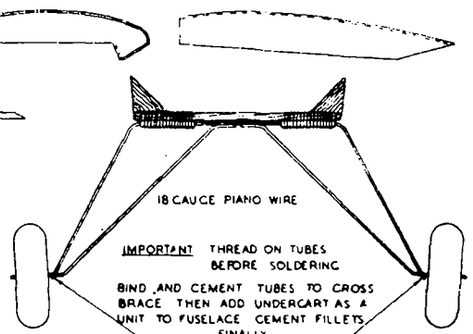



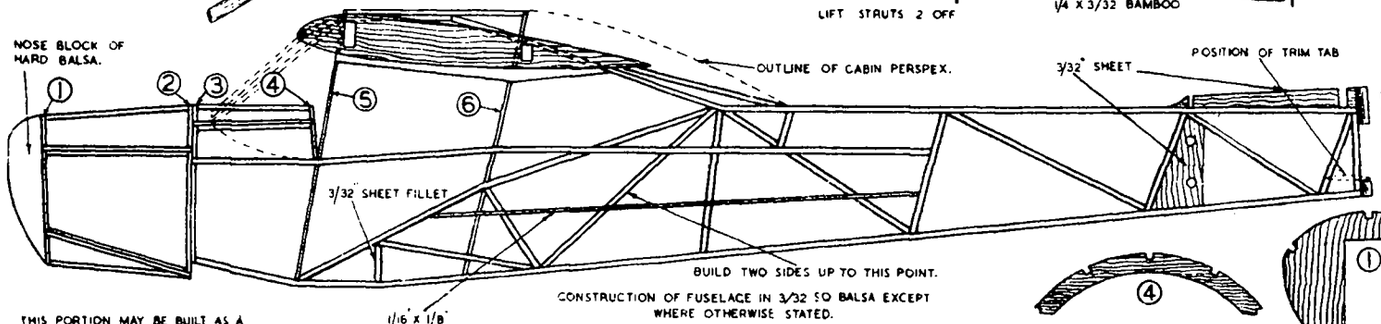

ALUM TUBE FOR WING STRUT BOUND TO LONGERON.



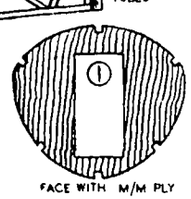



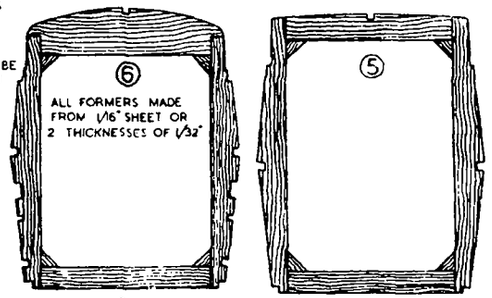





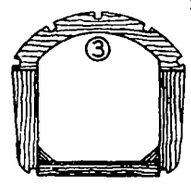


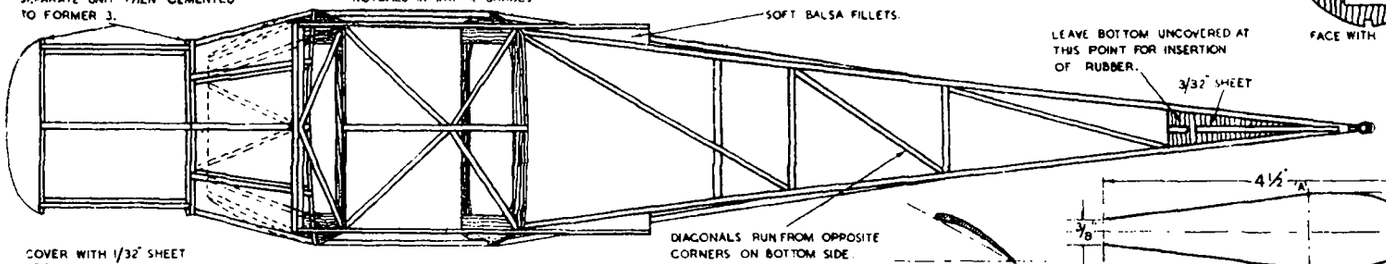


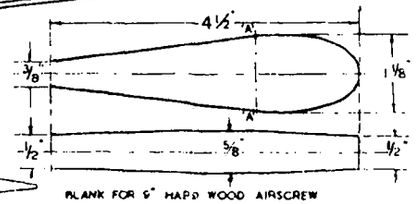



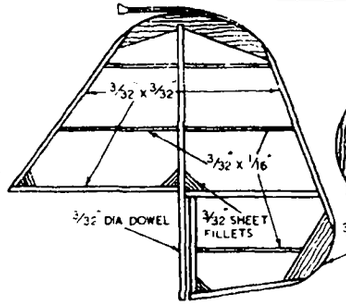


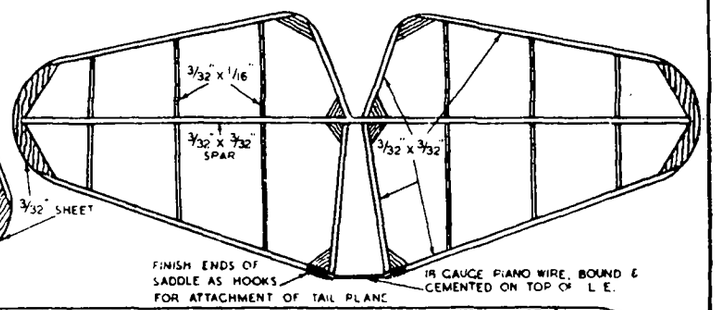


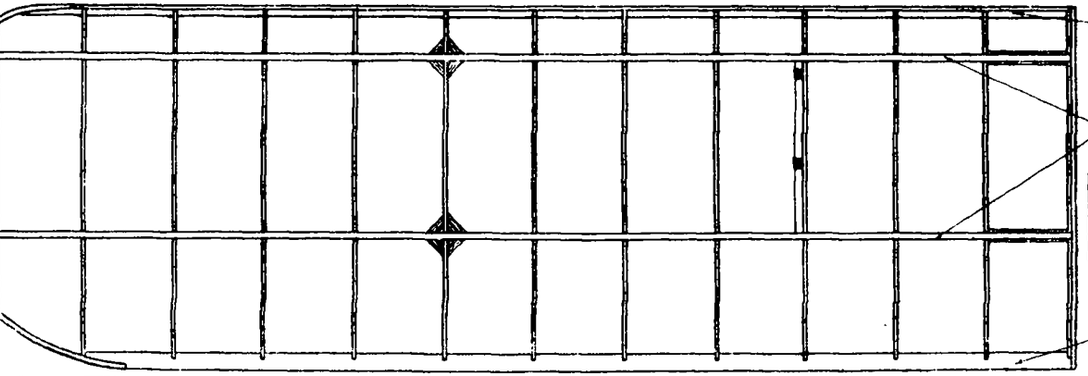


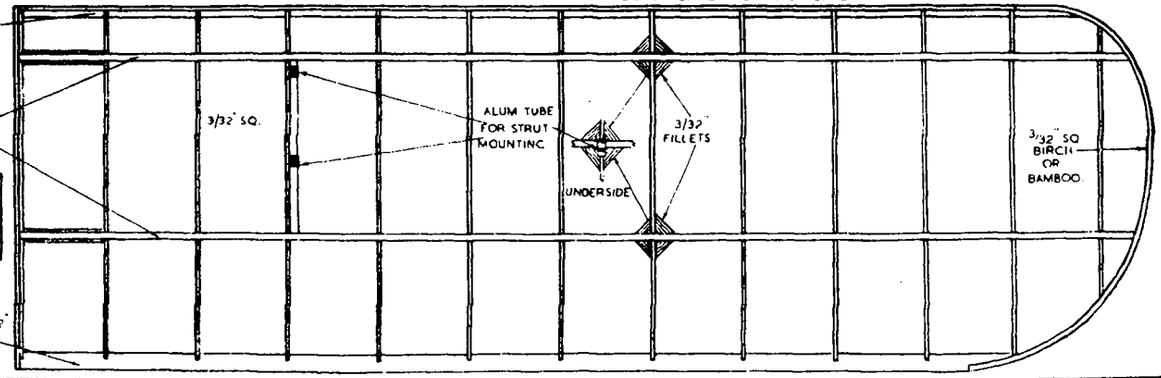




SCALE :- 2/5 FULL SIZE




WING TIP RIBS 1/32" SHEET.
2 OFF.

CENTRE SECTION RIBS 1/16" SHEET.
4 OFF

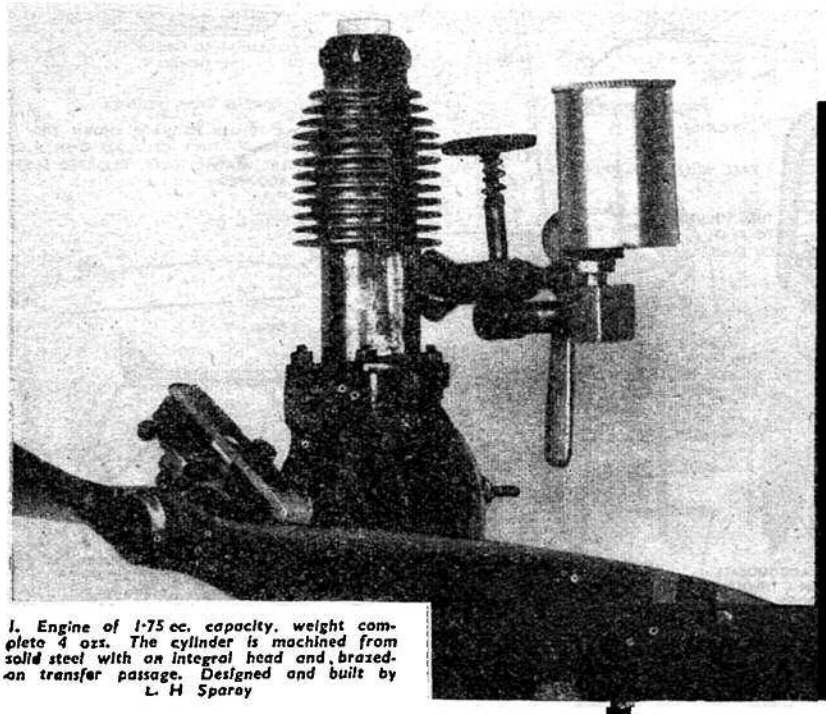
WING RIBS 1/32" SHEET.
24 OFF.

# "MY ENGINE"

BY

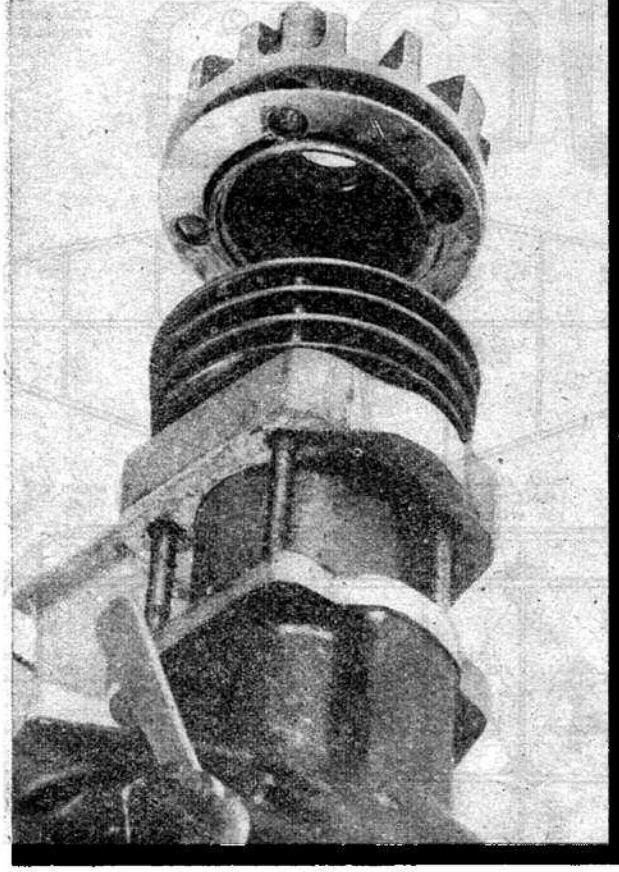
LAWRENCE H. SPAREY

These photographs are those mentioned by Mr. Sparey in his article in the February Aeromodeller. The originals were unfortunately lost in the post and could not be replaced before the magazine went to press. However, we have now been supplied with another set, and no doubt the general opinion will be "Better late than never!"

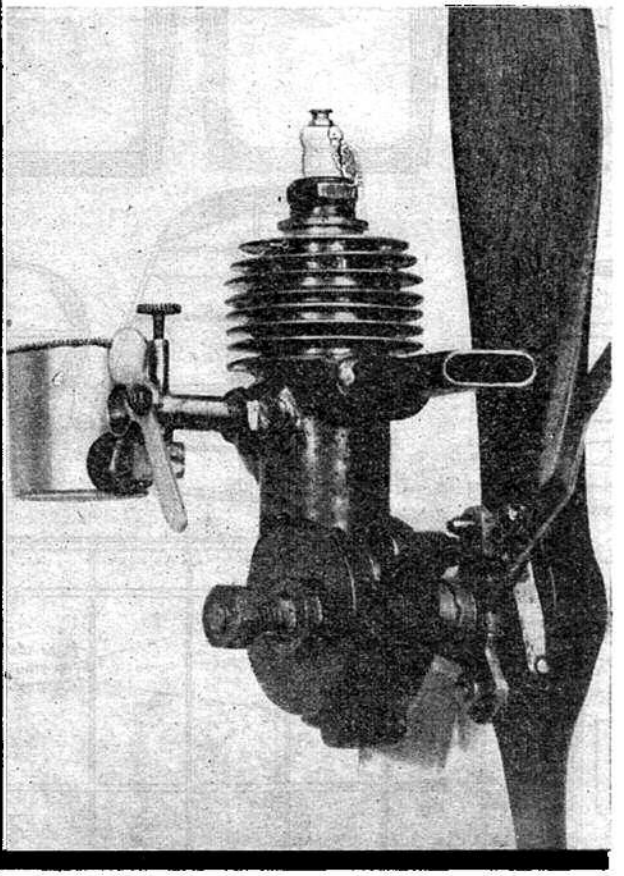


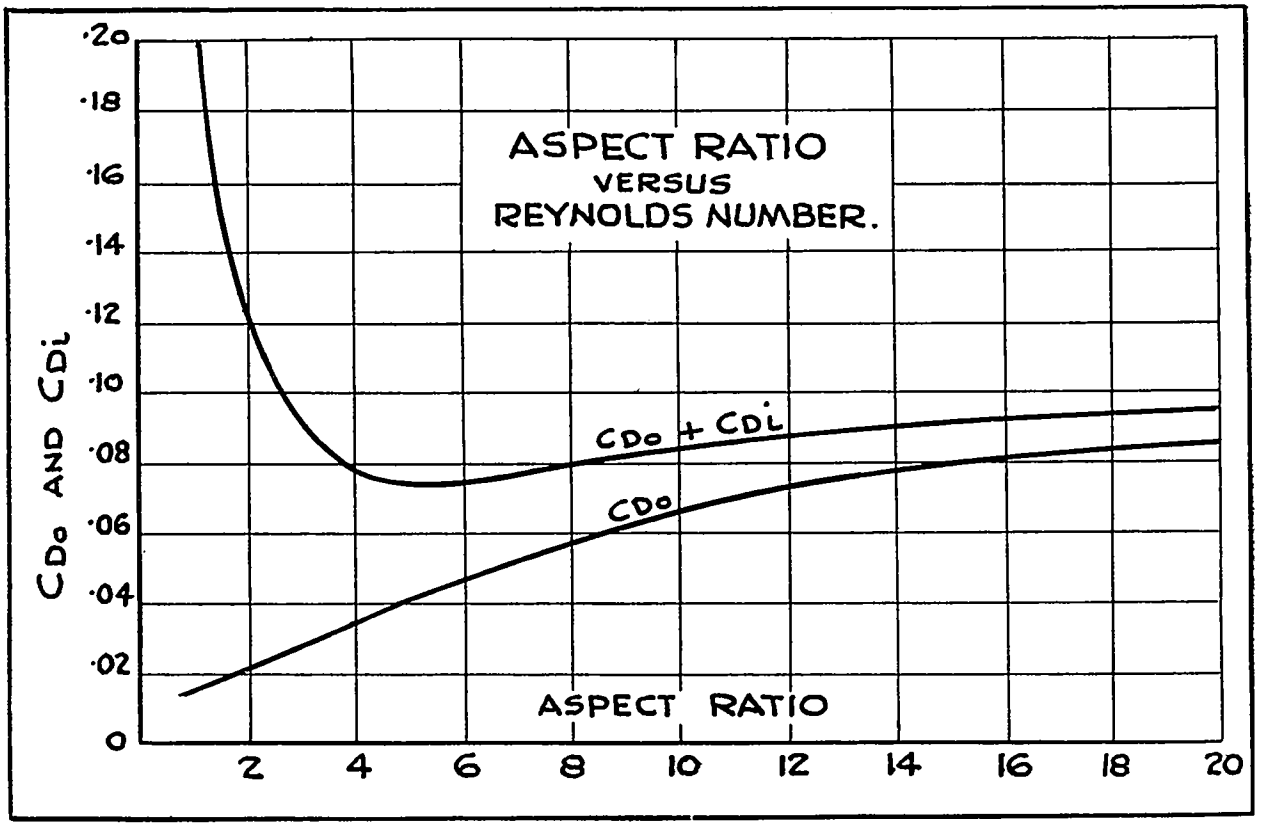
*1. Engine of 1·75 cc. capacity, weight complete 4 ozs. The cylinder is machined from solid steel with an integral head and brazed-on transfer passage. Designed and built by L. H. Sparey*

*2. Exploded view of cylinder and port-belt arrangement as fitted to a "Kestrel" engine, similar to that used on the "Sparey" engine. Designed by E. T. Westbury, built by L. H. Sparey.*



*3 3·5 cc. engine built by L. H. Sparey. This engine has a cast iron liner, detachable head held by short screws.*






BY J · H · MAXWELL

PROBABLY most aero-modellers are aware of the fact that increasing the aspect ratio of a wing tends to reduce its drag and, as a result, in high efficiency aircraft, such as sporting sailplanes, the designer's aim is to have the aspect ratio as high as practicable. It is not surprising, therefore, to find that quite a few technically-minded modellers are under the impression that a model wing also should have as high an aspect ratio as is possible, without unduly increasing the weight.

The mistake these people make lies in overlooking the other important factor—Reynolds Number.

At the high Reynolds number, at which man-carrying aircraft work, variations have very little effect on the drag, and can be usually ignored; but this is definitely not the case with model wings. Here the effect of varying Reynolds Number is most pronounced, and must be taken into consideration.

The theory may be summarized as follows:

The drag of a wing is made up of two parts, namely Induced Drag, and Profile Drag. The corresponding coefficients of drag are Cdi and Cdo.

Induced Drag is inversely proportional to the aspect ratio and is obtained from the equation:

$$cdi = \frac{Cl^2}{3.142 \times \text{Aspect Ratio.}}$$

Profile Drag, which is found from wind tunnel tests of the aerofoil section concerned, varies inversely to the Reynolds Number, but not proportionally.

Reynolds Number is given by the equation:

$$RN = \frac{V \times L}{\text{Kinematic Viscosity.}}$$

where V represents the speed and L the cord of the wing. Kinematic Viscosity is constant for all practical model work, and may be omitted. Therefore, throughout the remainder of this article, values of VL will be used in place of the awkwardly large Reynolds Numbers and the author suggests that this course should be adopted for all model purposes.

Thus, once the designer of a model wing has decided on the area, he is confronted by the rival claims of aspect, ratio and VL. High aspect ratio will give low induced drag; while low aspect ratio, resulting in a larger chord, will mean a higher value of VL and less profile drag.

The solution, of course, is to strike the best compromise between the two, but this is rather difficult due to the lack of data on profile drag at low speeds. However, the author was recently able to borrow, for a short time, a copy of R & M 1117, which gives figures for the drag of three aerofoils, including our old friend, R.A.F. 32' at values of VL as low as 2.5.

With the aid of these, the accompanying graph was produced showing the drag of a 200 square in., R.A.F. 32, Wakefield wing at 20 f.p.s., plotted at various aspect ratios. It is evident that the total drag is least when the aspect ratio is about 5—quite a startling revelation of the importance of VL.

This is not intended to be the last word on the subject, but merely a preliminary report on investigations which are still proceeding. Fuller details of figures and methods used will be given when the research is more complete.

Meantime, the results so far obtained support the opinion held for some time past by a few enthusiasts, including the author, that high aspect ratio is not all it is cracked up to be, and that probably the best aspect ratio for the average model wing is fairly low, say, in the neighbourhood of 6.

# Readers' . . . . . Letters

*The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.*

DEAR SIR,

I should like, if I may, to make some criticisms of the two thermal jet reaction plants suggested in the February issue of the AERO MODELLER.

The glaring fault of unit one, as I see it, is the placing of the engine cylinders before the compressor, as this means that the air is heated before passing through the compressor, thereby considerably reducing the efficiency of the whole unit. If, on the other hand, the cylinders were placed behind the compressor, the resulting plant would be a great improvement in that :—

(*a*) The cylinder and the exhaust gases would heat the air, making an additional heater in the form of a fuel injector unnecessary, and

(*b*) if the carburetter intake were placed behind the compressor, the engine would, in effect, be supercharged, thus giving more power.

I fail to see why this design incorporates a two-cylinder engine, these being rare objects in the field of model aircraft engines. Surely a single cylinder would be more practicable, the finished unit ejecting only one jet, which in turn would mean much easier trimming and safer flying.

The compressor may be a blower as shown, with the accompanying snags of involute casings and directional vanes, or an axial flow compressor—a more feasible project for a mono-jet model unit.

Thus then, in summing up, we may say that a model unit which utilises an internal combustion engine to drive the compressor should :—

(*a*) be a mono-jet unit, (*b*) have the engine cylinders and carburetter intake *behind* the compressor.

The second layout seems to have been evolved after studying one of Wittle's propulsion plants, and is, to my mind, too complicated for model work. Again, no unit for use in a model should make use of annular air scoops, for obvious structural reasons, but should be fed with air via an entry in the nose. The orthodox method of fuselage construction, of course, lends itself well to this layout.

In a model plant of this type, it will probably be best to omit as far as possible the numerous different tubes and passages for the air to flow through, and to use merely one central channel. Passing along this the air would first be compressed by a blower or axial flow compressor, then be heated by burning fuel in it (in a combustion chamber), followed by passing it through a gas turbine, and thence to the nozzle. If needed, supplementary fuel injectors could be used to beat the air still more after it had passed through the turbine. This layout seems to me to be infinitely more practicable than the proposed plant, and there is no reason why it should be less efficient.

Two last grouses about the proposed plants : the first is that the fuel injectors need improving and the second that the discharge nozzle should have a comparatively bold convergent-divergent restriction in it. With regard to the first point, there are many different designs for fuel injectors of high efficiency, my own personal favourite being the layout in which the supply pipe is fixed in the middle of a venturi tube placed parallel to the airflow.

Anyone who intends to try building a jet-propelled model aircraft will probably be inspired in his labours by the knowledge that at 150 m.p.h. an airscrew is twice as efficient as a jet : at 300 m.p.h. honours are equal : and at 550 m.p.h. the jet layout is twice as good as the airscrew. Thus then, for greatest efficiency we modellers must stick to airscrews, unless we intend our models to have a velocity in excess of 300 m.p.h. !

I for one prefer airscrews.

Campden, Glos. P. R. PAYNE.

DEAR SIR,

I have read with great interest Dr. Forster's article in the September, 1943, number of the AERO MODELLER.

I own an engine but have so far not flown a petrol model, so I write with some hesitation.

However, I cannot help feeling that Dr. Forster has exaggerated the difficulties of flying a twin petrol model on one engine and that his static experiment, with the model suspended, is, in fact, a red herring as it not only attempts the impossible but also fails to reproduce conditions of flight. Had he done these tests in a wind tunnel, I think that he would have reached some much more encouraging conclusions.

Apart from detail scale effect differences due to the comparatively low Reynolds' number at which models operate, surely the same general principles must apply to all aircraft, irrespective of size.

In full scale practice, the most vital factor is that of forward speed and that is the very factor absent in this static experiment.

All full scale multi-engined aircraft have their " Safety Speed." This safety speed is the *minimum* speed at which the aircraft can be kept straight by *full* rudder with *one engine stopped* and the other at *full take-off power*. Below safety speed, full rudder will not keep the aircraft straight (and a spiral dive will result) unless the power of the live engine is reduced. Therefore if an engine fails during take-off and before safety speed is reached, the pilot has no option but to throttle back the live engine and land. If, on the other hand, safety speed has been reached or passed, he can continue flight safely on the remaining engine.

The factors governing safety speed are :—

(i) Power of engines—probably power loading.
(ii) Distance outboard of engines.
(iii) Power of rudder.

Apart from safety speed, factors improving the efficiency of single-engined cruising are :—

(i) Reduction of drag on the dead side, e.g. feathering airscrew, closing gills or radiator shutters, etc.
(ii) A few degrees of bank towards the live side, thus relieving the rudder of some of the work of keeping straight.
(iii) For aircraft with a high fin and rudder, flight with the live engine turning up and inwards. Under this condition the lateral component of the top half of the spiral slip stream gives an angle of attack to the rear portion of the fuselage and the fin and rudder on the side to help overcome the yawing tendency caused by the outboard position of the live engine.

Some time ago, I did a series of full scale experiments on this very problem with some interesting results which I am sure must apply to model practice. I no longer have the figures with me, nor probably should I be allowed to publish them, but the interesting result was that while the amount of rudder (angle) required for straight flight decreased as speed increased (as one would expect), the foot load (or effort required to apply the rudder), remained fairly constant over a wide speed range from safety speed up, i.e. it required approximately the same pressure on the rudder pedals to apply the small amount of rudder required at high speed as to apply full rudder at safety speed.

In the above experiments the live engine was constant speeding but I do not think this would have much effect in model work ; also I hope in the near future to do another series of similar full scale tests with fixed pitch and also to build a twin rubber-driven model to play with. If I get any interesting results I shall be only too pleased to make them available. The rubber-driven model will be a problem, though, unless I can somehow even out the power.

Therefore, in designing our twin petrol model, which, of

course, should be a scale model, we should, I think, set about the problem as follows :—

(i) Select one with " close in " engines, plenty of keel surface and a high fin and rudder—e.g. Wellington, Dakota, Fortress (outer engines dummies), Catalina, etc.

(ii) Reverse the starboard engine so that both airscrews turn up and inwards.

(iii) Install some mechanism which :—

(*a*) (by means of a pressure plate or some such) if one engine cuts *below* safety speed, the other engine is also switched off.

(*b*) On failure of one engine *above* safety speed (pressure plate again, this time acting on elevators), prevents speed falling below safety speed.

(*c*) Allows an aperiodic spring to apply a constant load to the appropriate side of the rudder and another to the ailerons.

(*d*) On cutting of second engine, centralises controls and trims for glide.

(*e*) On cutting of either engine, feathers or freewheels its airscrew.

From a perusal of past copies of the AERO MODELLER, I see that there are many contributors far better qualified than I to design such a piece of automatic mechanism, so I shall leave that work to those who can do it. Given the mechanism, the designers should only have two problems :—

(i) To ascertain his safety speed.

(ii) To ascertain the strength of spring required.

R.A.F., Scotland. J. H. M. SMITH, Wing Commander.

* * * *

DEAR SIR,

I greatly appreciate Mr. Furze's interest in my October " Downthrust " article, and I think his query can be answered quite simply and briefly.

The model he suggests in his February letter is, of course, quite feasible, and, as a matter of fact, it is precisely the same set-up as that which I mentioned as being the single case in which the " C.G. Theory " is correct. The whole point in my reviewing the older theories was to show that most of them hold good only for isolated unusual examples. The purpose of my article, as shown by the last sentence in it, was not to recommend a particular type of model, but to give a comprehensive reason for the thrust line angle—be it downthrust or upthrust—in *any* model whatever its layout. The theory might have been illustrated through the medium of a low-wing model, or even a pusher, but the high-wing symmetrical-fuselage diagrams were chosen as being more conventional.

Perhaps my article was not sufficiently explicit, and probably other readers also have doubts concerning it. However, subject to the Editor's approval, I hope to write another in due course, when the theory will be more clearly outlined.

Bristol. J. H. MAXWELL.

* * * *

DEAR SIR,

With reference to Mr. Brock's letter on the (presumably home) production of Acetone, may I be permitted to state my results in the hope that somebody else who tries the experiment may be helped.

It is not a very difficult experiment as organic experiments go, but the amount of Acetone obtained is discouraging. This result confirmed that predicted by the Chemistry Master and the senior " Scientists."

If obtainable Calcium Oxide (Quicklime) is preferable to chalk as this only produces water besides the Calcium Acetate. The distillation takes some time, in fact several hours, and the Acetone obtained is poor reward for one's labours.

Catton College. A. L. Ross.

* * * *

***AN APOLOGY.*** *We regret that, owing to a typographical error, 600 r.m.p. was given instead of 1,600 r.m.p. in the letter concerning the Lysander by H. J. Penrose in the March issue.*

DEAR SIR,

I have read about Great Britain's A.T.C cadets in English magazines. I am a R.C.A.F. air cadet attached to one of Canada's finest squadrons, No. 61 Toronto East. Except for brass buttons, our uniforms are the same as the A.T.C. A Canadian air cadet magazine is published for us once a month. Recently the magazine published an article about A.T.C. cadets, prompting me to correspond, trade cadet information, model matters, etc., with any English cadets who might be interested.

1549, Kingston Road, W. WOOLLAM.
Toronto 13, Ontario, Canada.

* * * *

DEAR SIR,

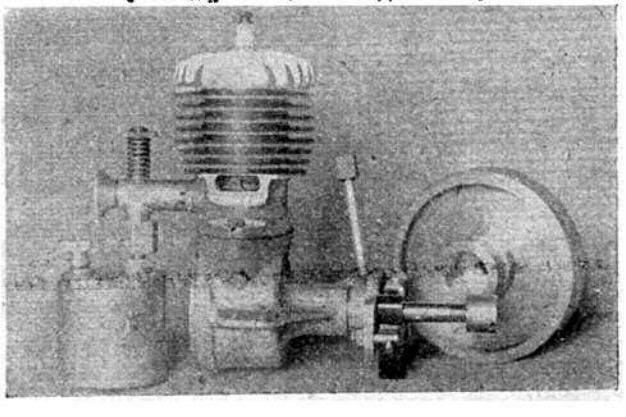
Reading Dr. Forster's comments on Mr. Sparey's petrol engine, and also Mr. Sparey's and Mr. Gray's reply in this month's issue of the AERO MODELLER, I would like to make a few observations concerning my own attempts at constructing miniature petrol engines as regards detachable heads and lapping cylinders.

I have three engines completed, and several more in different stages of construction. My first engine was built from a set of " Hallam " castings and was made exactly to drawing with the exception of fitting a bronze main crankshaft bush and dural connection rod. My second engine was made to my own design with castings in aluminium from my own patterns. Both these engines have detachable heads, steel liners, and cast iron pistons, and in both cases the liners were bored in the lathe, no reamer being used as I did not possess one, and again in both cases the pistons were lapped *directly into the liners, no* separate laps being used at all. Whether or not this method being correct, I had no trouble and both engines work. My third engine of my own design, has the head in one piece with the barrel, I, thinking as Dr. Forster, that it would be much better to do away with the joint and also the extra weight. In this case, the liner was of cast iron, and a lead lap was used for this. However, I do not think I shall make any more engines with integral heads as the trouble involved is not worth it. In my opinion, machining a spherical combustion head at the end of a blind bore would be most difficult unless one had special tools. On my last engine with integral head, this was machined square with the barrel. In this engine, a dural piston with two rings is fitted, and at first this had about half a thousandth clearance but after a few seconds running it would seize up, so I had to reduce the piston a little more. This engine with a flywheel fitted, and no cooling apart from the fins on barrel and head will run about seven minutes non-stop on a tankful of fuel. I am enclosing a photograph of this engine. You will notice that there is a coil spring fitted on the carburettor control, this is for testing purposes only, a positive lock is to be fitted. The fuel tank too is only for testing purposes.

I am, however, in agreement with Mr. Sparey and Mr. Gray when they state that the only practical way to finish blind bores is by grinding. A method I should think which is beyond the means of the majority of amateurs.

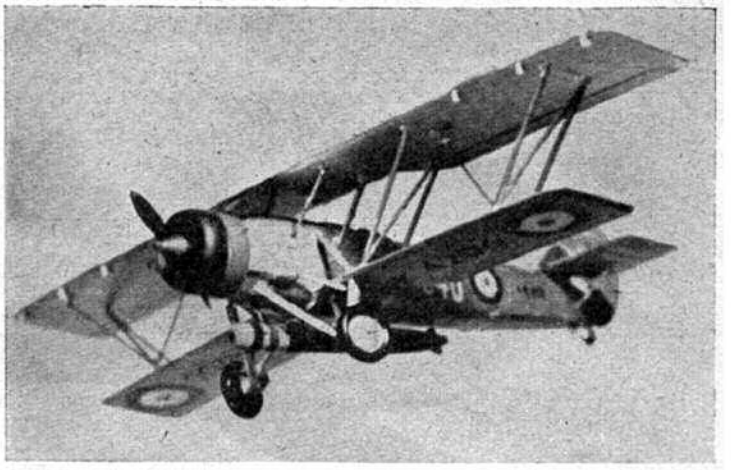
Coventry. ARTHUR C. SUTTON.

*½" bore × ¾" stroke. 5·8 cc. approximately.*



# PHOTOGRAPHIC SECTION

BY J · A · HODGSON

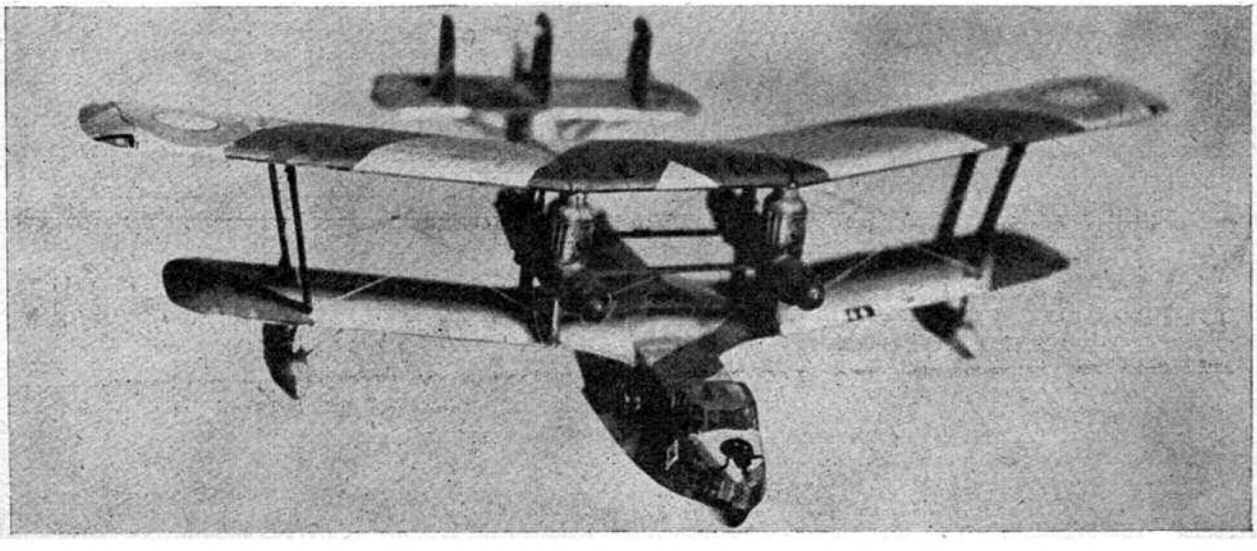


IN the March AERO MODELLER we referred to insufficient depth of field when the camera is used too close to the subject. We reproduce on this page two photographs supplied by Mr. Ian M. Erskine of Edinburgh which illustrate very clearly the points in question. In this instance the models were photographed "by a studio," and the results indicate that a portrait type lens of rather longer focal length than normal was used. Note the increasing degree of "unsharpness" from the leading wing edge to the tail fins in the view of the Short Singapore III. Mr. Erskine's models are worthy of better photographs. We have previously stated that when using a fixed focus camera it is inadvisable to approach closer than 8 feet, unless using a portrait attachment. Let us understand a little about portrait attachments, what they are, and what can be used in place of them as a stand by. A portrait attachment is a convex supplementary lens or magnifier, and its function to shorten the focus of the camera lens. Naturally, if one is using a fully corrected anastigmat lens, a properly computed auxiliary lens must be used or the optical perfection of the lens might be interfered with.

Box cameras, or simple folding cameras, are usually fitted with single achromatic lenses, and some of the older cameras with rapid rectilinear lenses. With these lenses, uncorrected spectacle glasses of the circular or monocle type give very good results. The focus of spectacle glasses is usually calculated in DIOPTERS. The rule is that the supplementary lens used must be of a focal length equal to the distance of the object photographed. Suppose we wish to photograph a small solid at, say, 2 feet distance. The nearest spectacle lens obtainable is 1·75 DIOPTERS (22½ in.) approx. The lens is placed as close to the camera as possible, and with the camera set so that the model is 22½ ins. from the supplementary lens, a sharp picture will result. Of course, stop down as much as the camera will permit and set focussing scale to infinity if your camera is of the adjustable focussing type.

Flying scale models are usually best photographed out of doors, firstly from a point of view of wing span and, secondly, because of the natural surroundings. With the better weather coming along, numbers of readers will be getting ready to take outdoor pictures, and a few early suggestions may save the wastage of film (precious thing these days). Please do not pose your model in long grass; those one or two long blades close up to the camera and well out of focus are apt to look like young forests. Unless purposely taking plan views, keep the camera well down at eye level with the model, and very carefully check the best angles at which to "shoot." It is often a good dodge to "take" slightly up hill if possible. Attempt to take natural pictures of your model. Imagine you are looking at the real thing and aim at getting the same view that would be available if you were.

Construction pictures, plan views showing frame work, etc., are favourite shots and very necessary, too. Take good care that the camera is well stopped down, using a tripod if necessary, and above all make sure your




*This is an "A.T.P." photograph.*

background is the best possible. An old grey army blanket or a similar dark tablecloth provides good contrast for white balsa wood. Varying shades of red always photograph well, and plain backgrounds are much more suitable for this type of picture. When you pose with your model, stand well away from trees, washing on the line, or brick walls; make it a golden rule to keep all outdoor backgrounds as far away as possible, remembering that buildings, well out of focus, often make a good subdued, dark-toned background ideal for light-toned models. Conversely, the sky is the best possible background for dark painted models.

Next, avoid covering up any point of the model by carelessly holding it. Do not stick your head in the way, and remember that if your picture is submitted for reproduction the editor may require an artist to clean up the background. See to it that your background requires the minimum of art work.

Later on in this series of articles we will publish one or two examples, with and without suitable backgrounds, giving exact data as to distances—and exposures. Now back to table-top photography.

In the Taylorcraft articles are two photographs of model Auster IV, matched up with two pictures of the real job. The latter were taken on a snow-covered aerodrome, so that the model had to be set up in similar surroundings. A large roll of white paper was used, and curled up behind the model with a crease line to mark the sky line well up at wing level. General lighting from a large window fell on the starboard side of the model, and a 500-watt lamp with reflector was used to balance up the port side. The model was placed 5 feet from the camera, the lens stop was F16. Exposure on Kodak P.1200 plate, 2 seconds.

The fourth illustration in this section is of a Westland Widgeon. No attempt has been made to fake in a background: it is a straight photograph taken to show the model as a model. A plain white sheet was used at one end of a billiard table, the dining-top of which was covered with a light grey-green cloth. Top lighting from two 100-watt lamps lit the table top. One lamp of 150 watts lit the background. Two 150-watt lamps were used above the camera, and a little to the left a 10 in. by 8 in. mirror picked up a little light, brightening up the heavy underwing shadows. The model was 3 feet from camera; exposure 12 seconds at F.64 on Kodak P.1200 plate. Note the very small stop needed to obtain sufficient depth of field.

By keeping the background well away from the model and using a separate light for it, an infinite variety of tone shades may be achieved by moving the light closer to or away from the white sheet. The pile on green baize makes a good foreground, and fine sand or sifted garden earth looks quite realistic, especially if rolled and cambered. Clouds may be formed by pulling pieces of cotton wool into suitable shapes and gluing on to cellophane with light greyish card or material behind it to represent blue sky.

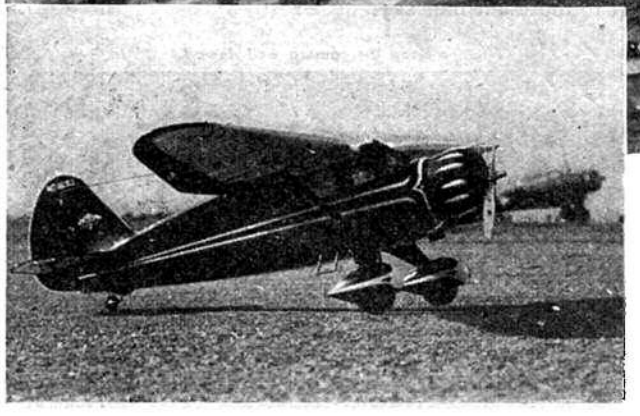
***Keep the camera well down!***

# AERO MODELLING AS AN INDUSTRY

BY

MICHAEL LO'RANT

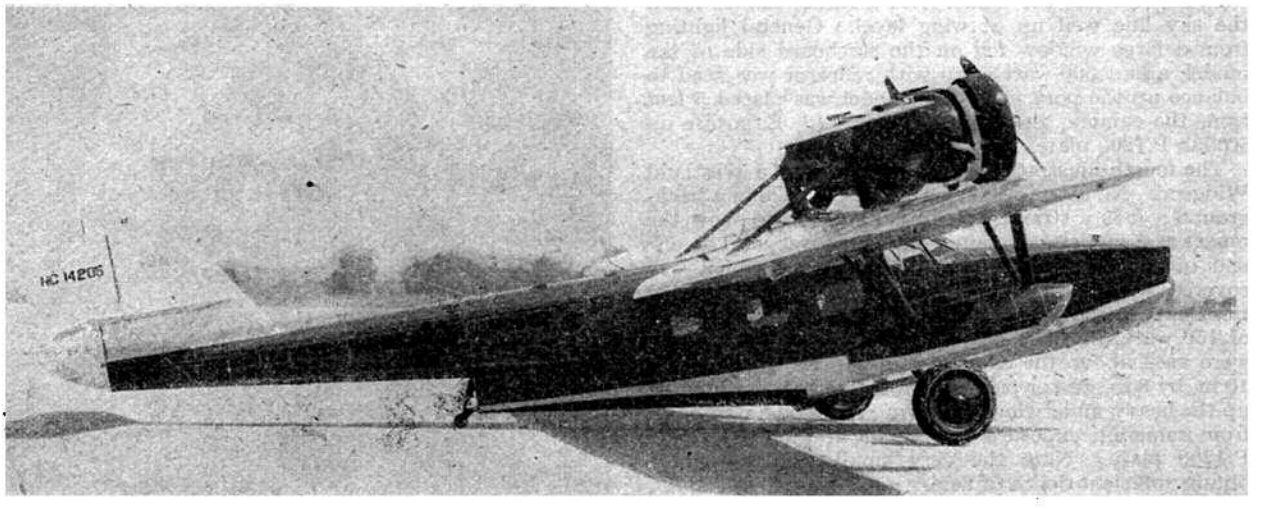
Gerald Hewit, one of the chief helpers of the Doering twins working on a P-24's with Al Jeanette working on (DB7) Vengeance in the background



BOYHOOD hobbyists, makers of 'plane models whose humble beginning boomed into a business second to none in the world, are undoubtedly Harvey and Howard Doering, two Canadian-born American youngsters.

The Doering twins have eight helpers to-day and own the world's most unique assembly line at the Consolidated Vultee plant in Downey, California, U.S.A.

They turn out miniature and larger model replicas of

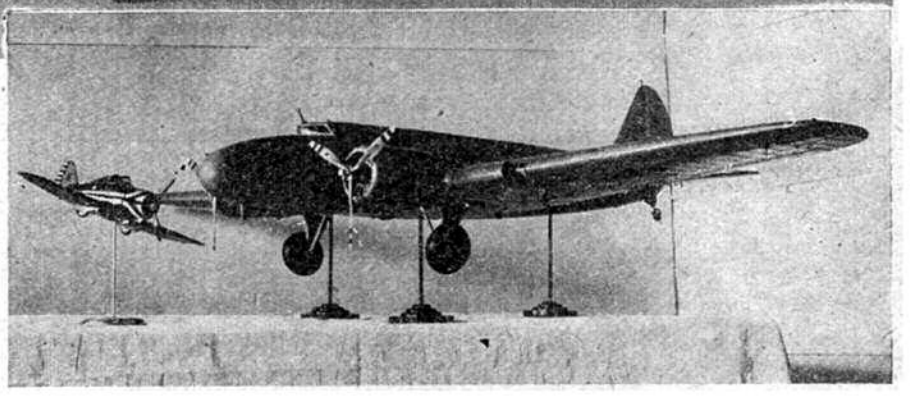



*Fox Photos.*

*Centre and bottom left are a Stinson Reliant and Douglas Dolphin respectively. Believe it or not they ARE models.*
*Now which of the machines shown in the photographs at the top and bottom of this page is the model? To save any eye strain, the top machine is full-size DC2, and that at the bottom a model of the DC3!*

*On the right is a Boeing 247 D, together with a Seversky P 35. If it was not for the stands and background, who would know they were models?*

*Left is Major H. L. Macintosh, U.S. Air Corps, inspecting models of the twins in their own workshop.*



numerous training and fighting 'planes that are sent all over the globe for demonstration and instruction purposes. At present, they concentrate only on Consolidated Vultee airplanes like the B-24 Liberator, the PBY Catalina, the PB2Y Coronado, the Vengeance, the Valiant BT and others, but formerly they built 'planes of almost every type of American-built modern flying machines.

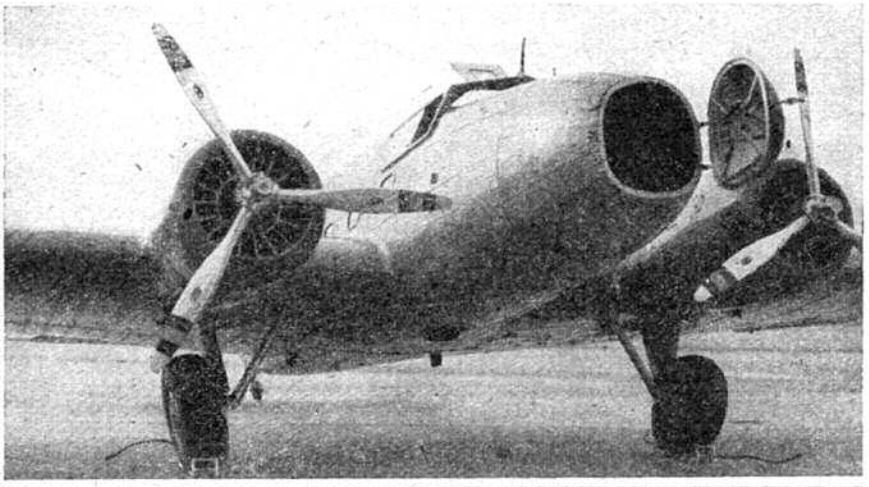
From the very beginning, the twins made every part of their models, to-day they make all the toolings necessary themselves.

First step in their work is to make a scale drawing of the 'plane in model size, then they decide on how they are actually going to construct it, step by step, how certain parts of the model should be produced, what material they will use, and—last but not least—when and which way they are going to join the various parts of the model.

Afterwards comes the most important step—making the tooling. The Doerings usually start with a wooden " mock-up " of the main parts of the model, like wing, tail and fuselage. This is used as a " master form " over which they determine the size and shape of flat patterns or " templates." Yet, some of the actual parts are formed over the " mock-up " itself.

Then a plaster cast is taken, " mock-up " serving as a pattern for it. The casts are made up into patterns which are moulded in sand. The pattern is pulled from the sand and then hot " Kirksite " is poured into its place. The Kirksite " die " is smoothed up and used to form parts of the model. (The Doerings use masonite and wood, instead of metal, in forming certain parts of their models.)

From the flat patterns, parts are traced, cut and formed. They use thin sheet of iron for a few of the largest pieces and tin-can material for the others. Tin.



offering their services in making real 'planes for them. But Vultee did not need any help just at that time. Then one of the twins showed some pictures and samples of their model work. It interested the Vultee officials; one of the Vultee's directors ordered a model of one of their own 'planes from the brothers. When the Doerings delivered it a month later, Vultee instantly gave the twins a job to build models in their plant for the company. They have been at Vultee's ever since plane forming, constructing model 'planes of all the creations of the Consolidated Vultee Aircraft Company.

*Top and centre are the Boeing 247 D and Seversky P 35 respectively. We have yet to see models of this standard in this country. British "solid" modellers had better look to their laurels.*

*Bottom right shows Gerald Hewit soldering a wing on a B-24. Under the port wing can be seen untrimmed engine nacelles. Near the nose of the model are Kirksite dies for shaping these parts. No accurate information has yet come to hand concerning Kirksite but it is possibly some form of plastic. Perhaps our readers can help in this direction?*

they consider, is best for their purposes as it is clean to work with, doesn't rust, and is easy to solder. Sheet tin is unavailable in the U.S., therefore they use large tin cans in their models.

The parts are formed by bending in a brake, also by bending over a form, pounding over a form, pressing over a form with rubber, finally by pressing in a metal die. Many times they have halves of the fuselage stamped on a metal die in a full-size aircraft drop-hammer. The formed parts are trimmed to size and soldered together in order to make the model durable.

Propellers are cast of a low melting temperature metal in a metal die. They are " cleaned-up " or filed, a hole drilled in them, painted and attached to the model after it is painted, etc. Celluloid cockpit enclosures and other details are added to make the finished model. Often the Doering twins plaster dummy pilots and put them in the cockpit.

The twins are 24 years old now. They started to build airplanes as a hobby while at school. At the age of 17, they won first and second prize in an American model contest. The prize was—flying lessons in a real 'plane. After the lessons, the two boys made a model of the 'plane in which they learned to fly and bartered it for further lessons. They repeated the same deal with other famous flyers, until they acquired the coveted knowledge of flying.

About 4½ years ago, they went to the Vultee plant,

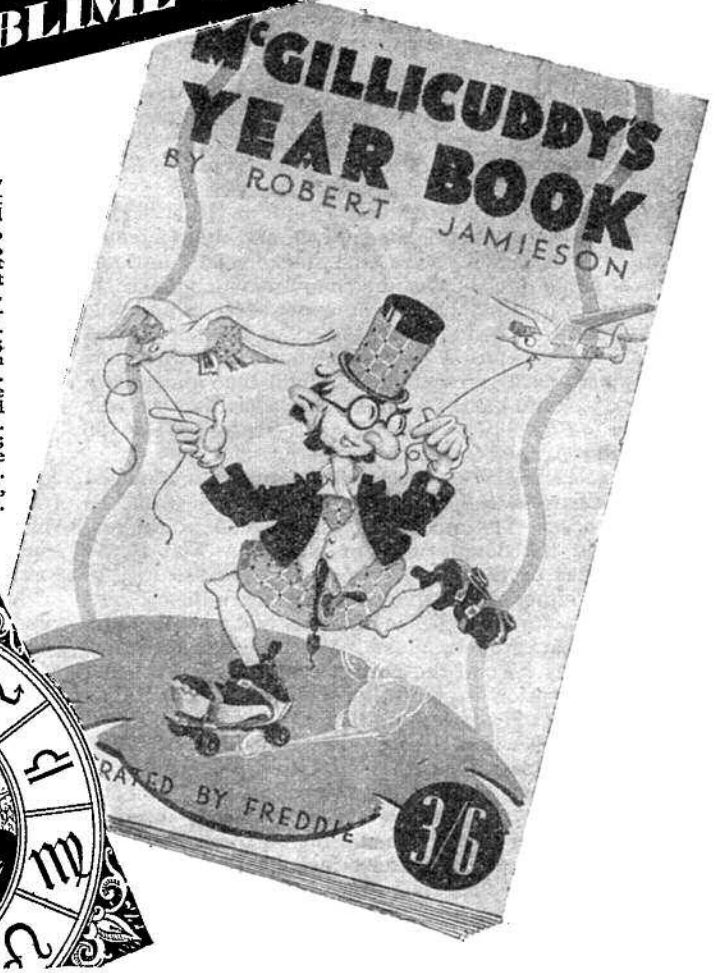
# THE HARBOROUGH PUBLISHING CO.

## Presents . . . .


Entirely re-illustrated this is a most valuable work on the design of all types of model aeroplanes. Packed with valuable data obtained as a result of practical experience in the laboratory and in the flying of models. Problems confronting would-be builders of model aircraft are approached in a simple yet scientific manner. The description of wind-tunnel tests is particularly interesting, including the results derived from a tunnel built by the author. The book contains 256 pages printed on white art paper, handsomely bound in best quality buckram covered boards, gilt blocked. Size 8½×5½ ins. Price **10/6** or **11/–** post free, direct from the Publishers at Allen House, Newarke Street, Leicester

# FROM THE SUBLIME TO THE . . . .

Ridiculous or humorous or whatever they are, McGillicuddy's adventures throughout the ages are a treat not to be missed. All the characters in this book are fictitious, and do not represent any living persons, with the exception of Mr. M. R. Knight (well known for his low wing model aircraft designs); Mr. C. Rupert Moore, A.R.C.A. (well known for his flying scale model aircraft); Mr. D. A. Russell, M.I.MECH.E. (Managing Editor of the "Aeromodeller"); Mr. L. G. Temple (well known for his high efficiency model gliders) and Mr. H. J. Towner (well known for his flying scale models) . . . . . who have been referred to in the names of Miss Emma Bright; Mr. C. Snoopert Doore; Mr. D. A. Dussell; Mr. C. S. Bushrooke; Mr. C. U. Tremble and Mr. H. J. Browner. Size 8½×5½ ins. 112 pages. Price 3/6 or 3/10½ post free, direct from our Leicester Offices . . . .




# MONTHLY • MEMORANDA •

By O · G · THETFORD

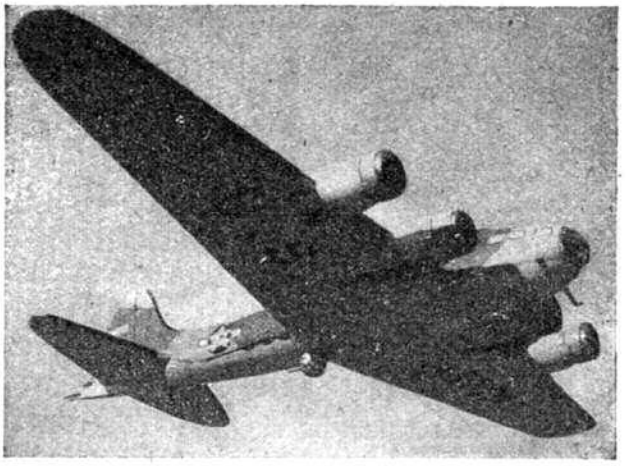
### Enemy Insignia in the Middle East.

We are indebted to Leading Aircraftsman D. W. Greenslade, now serving with the R.A.F. in the Middle East, for information concerning the enemy insignia reproduced on the opposite page. *Fig.* 1 was painted on a Messerschmitt Me 109F on the starboard side of the fuselage just below the windscreen, and was 24 inches high. The "L" was yellow and the map green. The same Me 109F carried the insignia depicted in *Fig.* 2 on the rear of the fuselage on the port side just ahead of the tailplane, and it was about 12 inches high. The machine on which both these markings appeared was itself camouflaged in patches of grey and green mottled on the upper surfaces, and was pale blue underneath. In addition to the usual national markings the machine had a yellow spinner. Another Me 109F painted in the same way as the machine just described with Fig. 1 on the starboard side had the insignia shown in *Fig.* 3 in place of the Mickey Mouse on the rear port side of the fuselage.

The insignia in *Fig.* 4 appeared in white with a thin black outline on the sides of a Me 109F and was reproduced just ahead of, and the same size as, the fuselage cross. This Me 109F was a pale pink shade on the upper surfaces and pale blue underneath. The spinner and the wing tips were painted white. *Fig.* 5 appeared on a Me 109F painted similarly to the machine bearing Fig. 4 and was reproduced at either side of the cockpit.

*Fig.* 6 appeared on another Me 109F at either side of the fuselage just beneath the cockpit, and was 12 inches high. The lion was yellow, the shield yellow and the vertical bands blue. This machine was camouflaged in green and brown patches on the upper surfaces and pale blue underneath. A Junkers Ju 88A6 bomber carried the insignia shown in *Fig.* 7 on the nose. This machine was painted dark green above, and light blue underneath and had a white band 24 inches wide encircling the rear fuselage. *Fig.* 8 was painted on a Henschel Hs 126 two-seater Army Co-operation monoplane.

A Messerschmitt Me 110 night fighter camouflaged all black carried the insignia shown in *Fig.* 9 on the extreme nose. The moon was painted yellow, the owl brown and the details were in black. A Fiat G. 50 Falco fighter of the Regia Aeronautica carried *Fig.* 10 insignia at either side of the fuselage beneath the cockpit. The insignia was 24 inches in diameter and consisted of a pale blue background, green palm and black details. The markings were of the Fascist type, this Falco being encountered prior to Mussolini's downfall and Italy's collapse. *Fig.* 11 appeared on an all-pink Me 109F and was black with white edging. It was painted at either side of the fuselage beneath the cockpit about the same size as the black cross. An Italian Savoia-Marchetti Sparviero (SM 79) bomber carried the last insignia, *Fig.* 12, at either side of the cowling on the nose motor. This Sparviero carried Fascist insignia and the usual camouflage. The insignia had a yellow ground, a silver sword and a red cross.



*A Boeing B.17F Fortress II. Built by H. Parrish, of the Ashton and District M.A.C., and photographed by W. Titterington.*

### Day and Night Albemarles.

In January, 1944, news of the Armstrong-Whitworth A. W. 41 Albemarle was released and it is now known that the type is used for special transport duties and glider-tug work. Albemarles are seen with both day and night markings. The transport versions are usually painted as day bombers with Temporate Land Scheme on the upper surfaces (green and brown) and "Sky" underneath (greenish-white). The glider-towing machines are more often painted as night bombers and have Land Temporate camouflage on the upper surfaces and the fuselage decking and the remainder of the machine painted night black. The day versions carry red, white and blue roundels beneath the wings, whereas the night versions have no markings underneath. The current regulation national markings appear on the upper surfaces.

### In Brief . . .

A fighter squadron in Italy flying *Spitfire IXs* with clipped wings carry the squadron letters "ZX." A *Kittyhawk* (*Allison*) squadron is codified "GL." Some of these Kittyhawk fighter-bombers of the R.A.F. have the top of the fin and rudder painted white, which alters the silhouette outline in some views.

The first *York transport* delivered to British Overseas Airways Corporation carries the civil lettering G-AGJA on the wings and fuselage in addition to national stripes on the fin. The letters are underlined by red, white and blue bars on the fuselage and beneath the wings and red and blue bars above the wings. Normal camouflage is carried.

A Fighting French day bomber squadron of the R.A.F. operating from this country carries the Cross of Lorraine on the nose of its *Douglas Boston III* bombers.

Canadian-built *Mosquitoes* are now in service with the U.S.A.A.F., where they are used for photographic reconnaissance duties. They carry the latest U.S. star insignia.

A *Boeing B-17G* day bomber squadron of the Eighth Air Force carries the code letters "VK" on its machines.

Some of the earlier batches of *Grumman Avenger* torpedo-bombers to go into service with the Royal Navy are serially numbered FN 795, FN 796, FN 797, etc. Avenger FN 795 carries the code letters C2Y in white on the rear fuselage.

# GERMAN & ITALIAN AIRCRAFT MARKINGS.

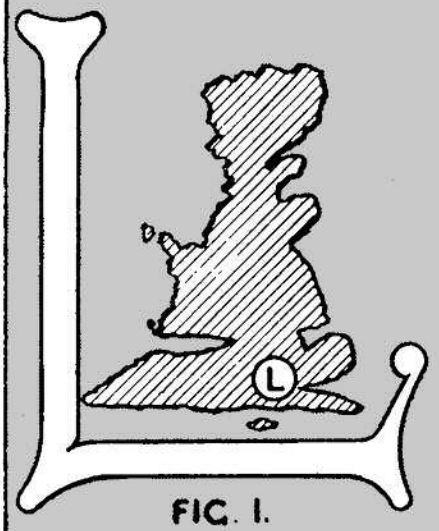



FIG. 1.

FIG. 2.

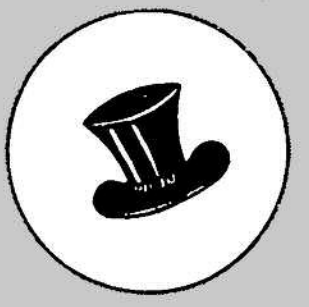


FIG. 3.

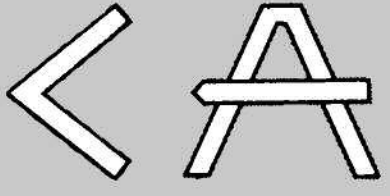


FIG. 4.

FIG. 5.

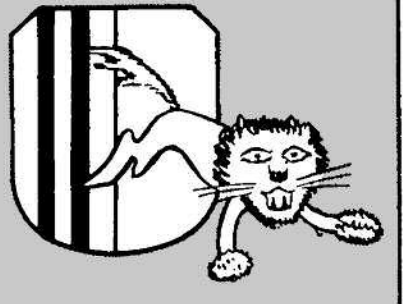


FIG. 6.

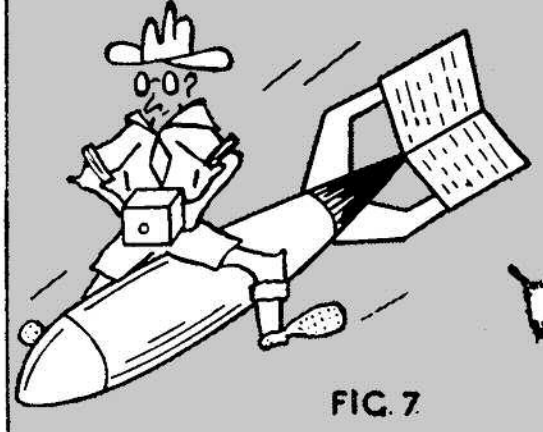



FIG. 7.

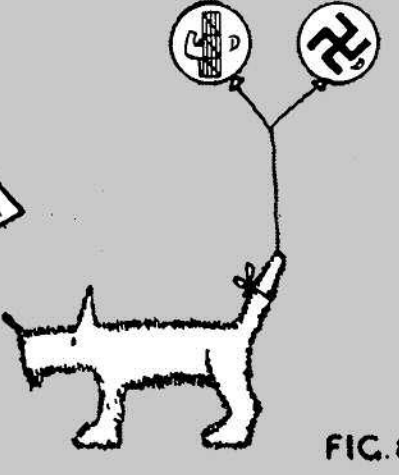


FIG. 8.

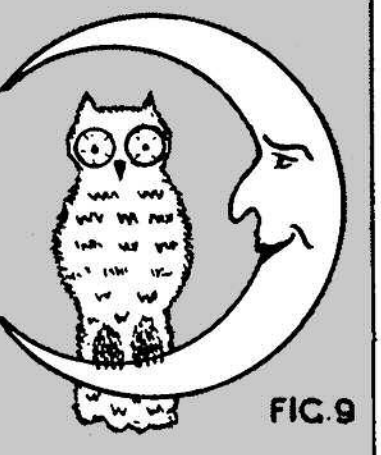


FIG. 9.


FIG. 10.

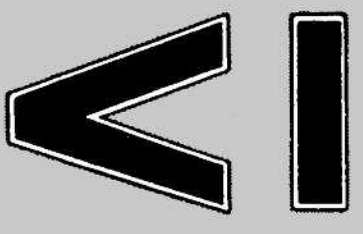


FIG. 11.

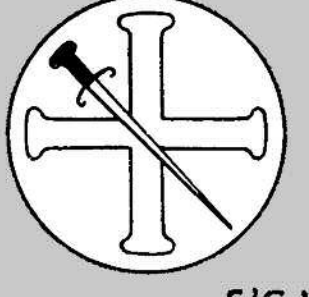


FIG. 12.

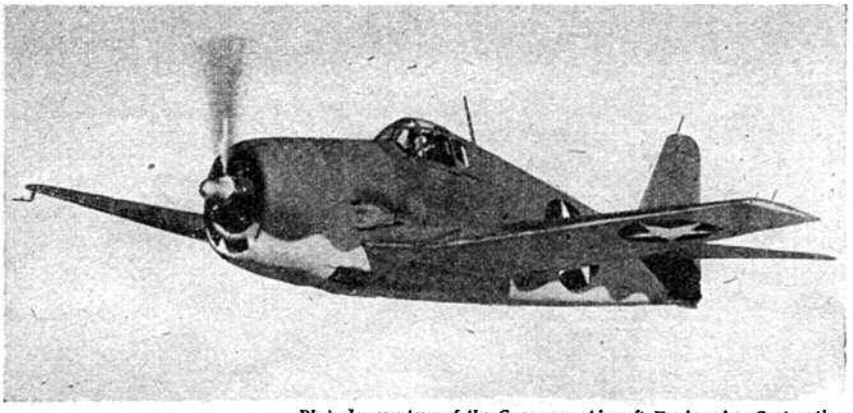


*Photo by courtesy of the Grumman Aircraft Engineering Corporation.*

AEROPLANES DESCRIBED XV

BY H · J · COOPER

# THE GRUMMAN F6F-1 HELLCAT

Next Month : The Westland Wizard I

ONE of the latest single-seat fighters to be issued to the U.S. Navy and the Royal Navy is the new Hellcat monoplane, developed from the Martlet, or Wildcat, as it is now universally known.

Its descent from the Wildcat is apparent in its appearance, but it is a completely new design and incorporates some of the features of its larger associate, the TBF–1 Avenger. (As in the case of the Wildcat, the British name for the Avenger (Tarpon), has been abolished.)

The Hellcat's performance is a great improvement over its predecessor's, and already they have brought their powers of attack into effect. They were first in action on 1st September, 1943, during the raid on Marcus Island.

The Hellcat is faster, more manœuvrable, and can climb much quicker than the Wildcat, and the pilot has the protection of more suitably arranged armour. In ceiling and range it is also superior. It is the first American aircraft to be designed according to lessons obtained by war experience.

The first flight was made in August, 1942, and the Hellcat was in production by the end of the year. The Bethpage factory of the Grumman Aircraft Engineering Corporation is now turning out Hellcats faster than any previous Grumman design, which have always maintained the lead in output figures.

The Hellcat is a low-mid-wing monoplane of all-metal construction. The wings are square-tipped in the characteristic Grumman fashion, and are of metal frame-work with stressed skin covering. The control surfaces are metal-framed and covered with fabric. The wing is constructed in five portions : the centre-section, two dihedralled outer panels and detachable tips.

The tail-unit is constructed similarly to the wing, with fabric covering on the rudder and elevators.

The fat fuselage now becoming the vogue in American fighter design is a metal monocoque. The pilot's cockpit is situated high up so that a good view can be obtained, and is covered by a sliding hood.

The Hellcat is powered by a 1,200 h.p. Pratt and Whitney Double Wasp two-row eighteen-cylinder air-cooled radial motor, enclosed in a deep tapered cowling fitted with controllable cooling gills on its trailing-edge. The motor is mounted at an angle of 3 degrees negative incidence, so that the Hellcat has a distinctive tail-down attitude in the air. A Hamilton Hydromatic constant-speed three-bladed metal airscrew is fitted.

The Hellcat's armament consists of six ·50 machine-guns mounted three in each wing outside the airscrew disc.

Royal Navy Hellcats are camouflaged on the sides and upper surfaces with dark slate grey and dark sea grey shadow-shading, and are light grey or sea grey medium underneath. The usual roundels and fin markings are carried. One machine bears the serial number FN 355. U.S. Hellcats are coloured dark blue above and are light grey underneath. The national marking consists of a white five-pointed star on a blue background, behind which is a white rectangle outlined in *blue*, not, as formerly, in red. This marking is carried above the port wing and below the starboard wing and on each side of the fuselage. The photographs on this page show a production Hellcat with pristine blue and white cockades.

No performance figures have been released in respect of the Hellcat, but according to American report the words " Hellcat " and " speed " are synonymous. Leading dimensions are as follow : Span : 42 ft. 10 in. ; root chord : 10 ft. 1 in. ; tip chord : 5 ft. 6 in. ; length : 33 ft. 7 in. ; tailplane span : 18 ft. 6 in. ; airscrew diameter : 13 ft. 6 in.

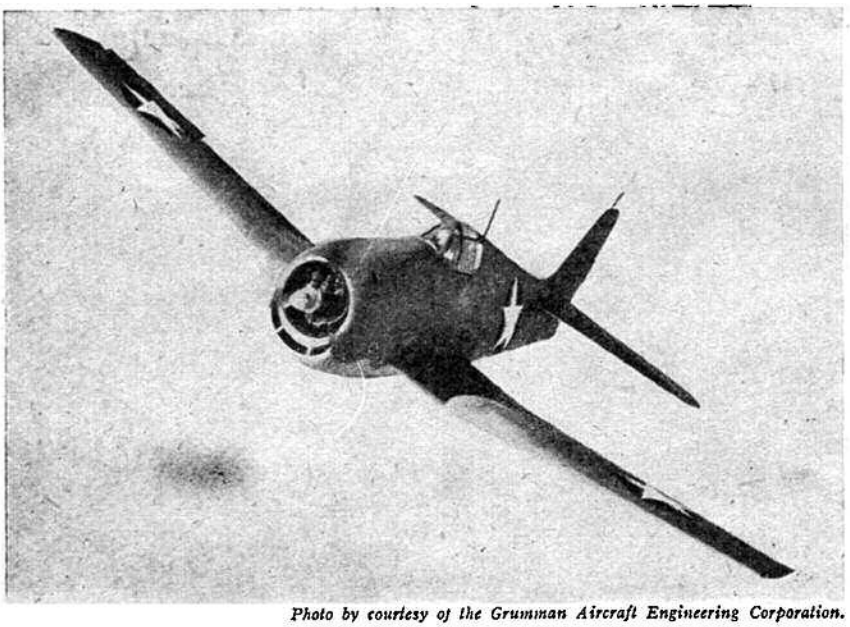
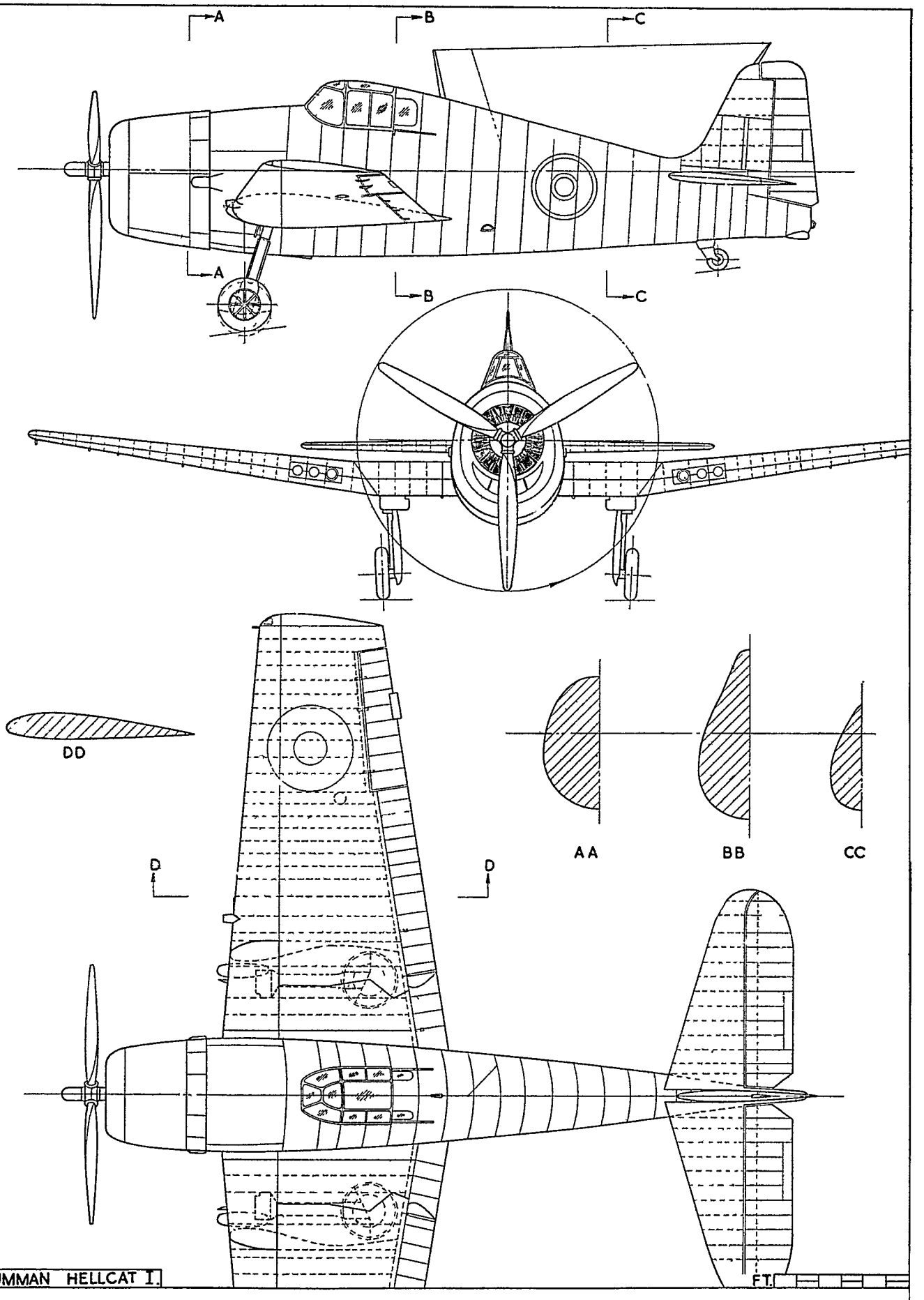


*Photo by courtesy of the Grumman Aircraft Engineering Corporation.*


A
B
C
A
B
C
DD
AA
BB
CC
D
D
GRUMMAN HELLCAT I.
FT.


# BY CLUBMAN

*Mr. V. J. G. Woodason judging the Uxbridge M.A.C. "solid" competition. He is shown handing the first prize to Mr. J. T. Latham who gained his success with a Desert Hurricane IIc.*

I AM pleased to note that the final judging of the models entered for the "Wings for Victory" contests has been completed, and would congratulate the winner—our old friend "George" Temple—on his success. Undoubtedly, his model sailplane is a masterpiece of the modellers' art, and comes as near perfection as any model I have seen. Congratulations also to the other prize winners for a fine show of models, and to the judges who had a most difficult task to perform.

The Annual General Meeting of the S.M.A.E. was a somewhat hectic affair from all accounts, lasting some six or seven hours! The trouble is always the amount of time some people will waste on discussing some minor opinion of their own, losing sight of the fact that this is a National body, with work of National importance to accomplish. I therefore protest once again at the raising of purely local and domestic matters at a meeting of this nature. Time is lost that could well be devoted to the furtherance of the movement generally, and goodness knows that time is short enough these days.

A good sign was the greater number of provincial delegates present at the meeting. As you know, this is something I have advocated for years, and I trust that more and more members will make it worth their while to travel to London occasionally to air their own views, and learn just what happens at these vital meetings. It is not enough to sit back and read press reports—clubs must take an active part in the conduct of their own affairs. I am delighted to note that Quarterly Delegate Meetings will in future be held at different venues, and trust this innovation will meet with the support it deserves. A full report of the business conducted at the A.G.M. is printed elsewhere, so it remains for me to say only that I wish the best of luck to the new Council, and may the present year see an even greater advance than the season just completed.

A. C. Brown, the 1943 champion of the CROYDON & D.M.A.C., set up a time of 3 : 54·2 with a lightweight model of his own design. As he shortly passes out of the junior section, he was apparently trying to set up a figure that other juniors will find hard to beat! On the same day, Mr. Brooks made an unofficially timed flight of over 4 mins. o.o.s. with his model "Ivory Gull," following up with an official flight (winch-launch) of 2 : 18·4 o.o.s.

The ASHFORD (KENT) M.F.C. is to hold an Open Competition on April 2nd, on the local golf course, and entry forms can be obtained from the secretary of the club, L. J. Coomber, 8, Prospect Place, Ashford, Kent. Cash prizes will be awarded, and everyone is invited.

Members of the AYLESTONE M.F.C. have started the development of built-up props., both single and double-bladed folding. (Thing is—where do they get the rubber to turn the things after they are made??). Junior members have collected a real fleet of "Mick Farthing" gliders, and are averaging 70–80 secs. regularly with them. W. Jones has been turning in some useful flying with his streamliner, best time being 2 : 10 in a strong wind, while P. Jones clocked 1 : 27 with a new 'plane on its maiden flight.

The WALTHAMSTOW M.A.S. has continued its outdoor activities in spite of recent high winds and cold spells. R. Myatt, a junior member, has beaten the old glider record by 22 secs. to set up a new figure of 2 mins., catapult launch. Triangle fuselage jobs are finding favour with these chaps, and K. Marsh has had some good times with a model of this type, best to date being 2 : 29. He also put up a time of 5 mins. with a lightweight glider, before losing it o.o.s.

The TEWKESBURY M.A.C. have found a new clubroom in an "ancient tower," the main snag being a set of narrow winding stairs which create terrible struggles with large glider wings! R.T.P. flying has received quite a lot of attention recently, and a new club record of 1 : 20·2 has just been set up.

After having beaten up the Birmingham boys on their own ground earlier this year, the LEICESTER M.A.C.

*The cup on the left goes to the prize-winner of the S.M.A.E. solids contest No. 1, and that on the right to the prize-winner of contest No. 2. These cups have been presented by the proprietors of the Aeromodeller.*

staged a return meeting at which the Brum lads had their revenge. M/s. Monk and Doughty carried off the honours in both A and B classes. With the hope of encouraging members to support S.M.A.E. comps. in the coming season, two of the club cups have been made over for contests on a points system to be awarded for the National comps.

The BIRMINGHAM M.A.C. had a very good season in 1943, putting up a very fine show in the National contests, and having on one occasion the highest number of entries in a comp.—namely, 20 contestants in the M.E. No. 2 Cup event. At a joint indoor competition run by this club and the King's Heath group, a novelty was introduced in the form of a comp. for unorthodox types. G. Bradwell flew a tail-first pusher type to win this event, and also broke the club record for free flying with a time of 2 : 40. Results were :—

| | |
|---|---|
| *R.T.P. Open :* | |
| D. Jennings (East Birmingham) | 3 : 02·5 |
| F. Chatwin (Birmingham) | 1 : 38 |
| R. Oliver (King's Heath) | 1 : 37·1 |
| *Unorthodox :* | |
| G. Bradwell (Birmingham) | 1 : 29 |
| R. Monks (Birmingham) | 1 : 03·5 |
| P. Cracknell (Birmingham) | : 53 |
| *Free Flying :* | |
| G. Bradwell (Birmingham) | 4 : 52 |
| F. Chatwin (Birmingham) | 1 : 34 |
| E. Kendrick (Birmingham) | 1 : 29 |

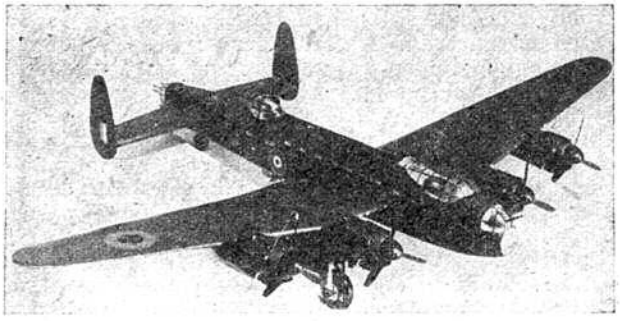
C. Westerby of the WEST YORKSHIRE M.A.S. has broken the club H.L. record with a time of 1 : 45·5, flying a " Clipper." This club hopes to stage an Open Rally in June, and clubs in the district are requested to contact the secretary with a view to co-operation. A request is also made for D. Blatch, a former member of the club, and now in the Army, to get in touch with the club.

For a number of years, the BLACKPOOL & FYLDE M.A.S. have been using the playing fields at Stanley Park as their official flying ground. This year, however, the club has been fortunate enough to obtain the use of some large fields a short distance from the town, with a much greater unobstructed area. A good, shallow pond is also available for r.o.w. work, and all important competitions will be held at this venue. Should any modeller be holidaying in Blackpool and would like to visit this club, they will be very welcome, and the secretary will be pleased to forward a small map showing the location of the ground on receipt of a stamped addressed envelope.

F. Young of the BRENTFORD & CHISWICK M.F.C. seems to have the r.t.p. situation well and truly buttoned up. He holds the club record with a time of 2 mins. r.o.g., and wins against the Blackheath and Streatham clubs. The club held a very enjoyable day when the club r.t.p. championships were run off. Results were :—

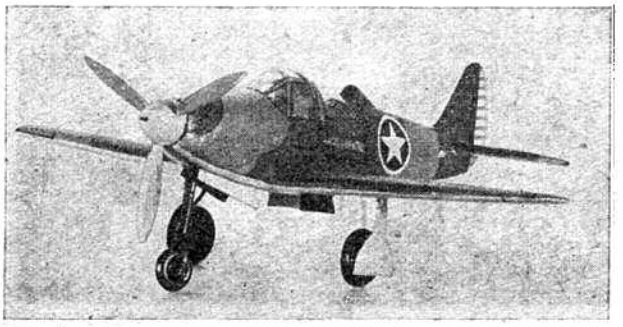
| | |
|---|---|
| F. Young | 4 : 37 |
| A. Young | 3 : 47 |
| W. Marley. | 3 : 42 |

The club's Gala Day has been fixed for July 9th with the " Ford Challenge Cup " as the chief prize.



*Above, 200 hours work by D. C. Smith of Cardiff. A Lancaster Mk. I of all whitewood construction with fitted cabin, etc.*

*Below, a 1/72nd scale Airacobra, built by P. Gough of Hounslow.*



The NORWICH M.A.C. have launched out and purchased a club house for their flying field! We are promised a photo in due course after erection. A publicity drive has been conducted recently, though it is surprising to note that only about ten adults are interested in aeromodelling in that town!! The club record stands at 11 : 20—and from the quality of rubber now available, it looks as though this will remain for the duration.

A glider contest staged by the MIDDLESBROUGH & D.M.A.C. and a close finish made the day very enjoyable. Using a 150 ft. line, the results were :—

| | |
|---|---|
| A. Raper | 2 : 01 aggregate. |
| G. B. Gillow | 1 : 58·5 ,, |
| D. Harker | 1 : 45·5 ,, |

Harker was flying a Chastenuef type glider weighing 19·4 ounces!! This says something for heavyweights, as it was a calm day.

The BRISTOL & WEST M.A.C. held its annual general meeting on Sunday, 16th January, when the prizes won during the club's 10th year of activities were distributed, prize winners being as follows :—

| | | | | |
|---|---|---|---|---|
| *Club Glider Cup :* | K. Moon | 117·8 | secs. | agg. |
| *Secretary's Cup (Flight Cup)* | M. Garnett | 119·3 | ,, | ,, |
| *Packer Cup (Wakefield) :* | A. H. Lee | 390·1 | ,, | ,, |
| *Biplane Cup :* | J. Weber | 155·5 | ,, | ,, |
| *Scale Model Trophy :* | R. T. Howse | 22·8 | ,, | ,, |
| *Novices Cup :* | F. Dorin | 127·2 | ,, | ,, |
| *Championship Cup :* | A. H. Lee | | | |

The Wilkin's Cup, awarded for the first model of over 8 oz./sq. ft. wing loading making two flights of over 90 secs. had no entries, whilst the Club Twin-float Seaplane Trophy was not awarded as no competitors were able to get off the water. The Club committee were elected for the coming season, that veteran modeller R. T. Howse being unanimously re-elected President, whilst W. J. Gould was re-elected Secretary and a hearty vote of thanks extended to him for the way he handled the local "Wings for Victory" exhibition in his first year of office. Members were pleased to hear that Pilot-Officer C. W. Needham after being posted missing is now reported safe as a Prisoner of War. That well-known modeller J. H. Maxwell recently joined the club and members look forward to an interesting, and it is hoped, educational performance from him. On reviewing club successes in the past season, it was evident that even worse weather than in previous seasons had prevented the club living up to its usual standards in National contests, wind and rain severely hindering entries on seven contest days. A. H. Lee did his best to keep the flag flying, although he had a bad run after the Gamage until the Gutteridge, when his


*Above is a 1/24th scale D.H. 84. Mk. II Dragon, built by D. O. Manning of the Scilly Isles. The machine G.A.D.I. was used on the Lands' End/Isles of Scilly Air Services.*

*Bottom left and right are a Focker D.VII and Hawker "Hind" respectively. Those are super-detail, built-up "solids" by J. L. Roberts of Yeovil.*


*Keystone Photograph.*

***Sir Archibald Sinclair opened on the 9th March an Exhibition of Polish photographs showing the progress of the Polish Air Force. The Exhibition goes as far back as the old balloon days and illustrates Poland's contribution to the Allies for freedom in the air. The exhibition is to be free to the public and times of admittance will be from 10 a.m. to 6 p.m. daily until April 10th—Sundays, 11 a.m. till 4 p.m.***

low-wing Wakefield, with 4 oz. of rubber in two skeins driving an 11 in. dia. prop. put up a fine performance averaging 150 secs. without thermal aid. His 6-year-old glider "Skylark," now covered in brown paper, also put up a consistent performance in the various glider contests. C. S. Wilkins, after viewing the disastrous effects of a broken motor in his Wakefield during the Gutteridge contest, devised a simple and effective method of winding the motor outside the fuselage.

A series of monthly glider contests were arranged to take place during the winter season, and so far have been fairly well attended. The contests were alternately for F.A.I. loading and open, average winning times for F.A.I. gliders being 35 secs. and 45 secs. for open.

I am pleased to announce the formation of nine new clubs this month, a full list appearing at the end of these notes. This is a very healthy sign, and I trust they will all progress successfully. Other enthusiasts wish to get clubs going in their districts, and I have requests this month from the following, who would welcome the assistance of others in their areas to get things going :—

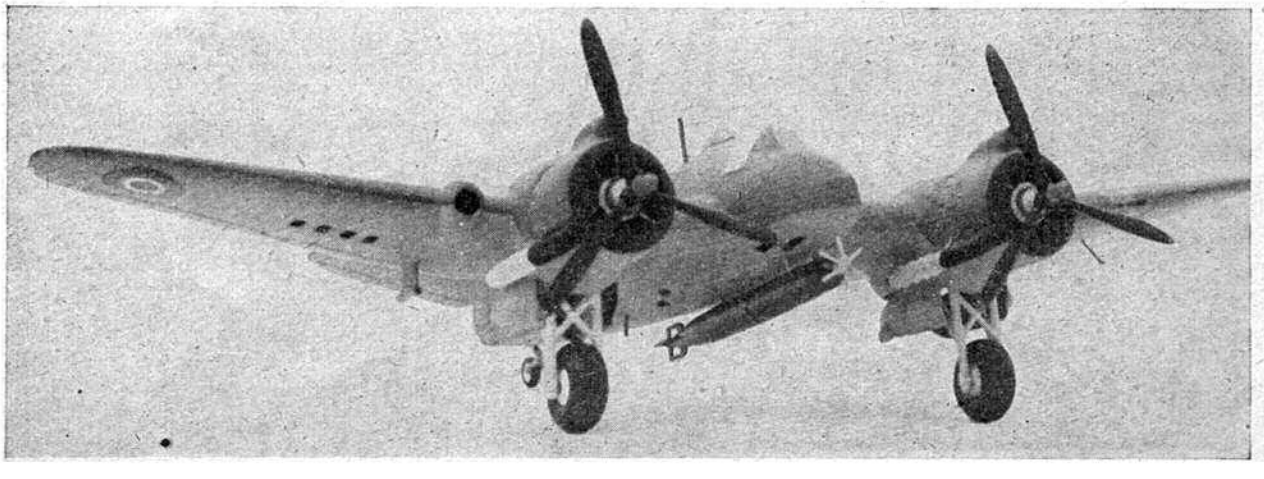
E. D. Helliwell, "Windyridge," Melton Road, Sprotborough, near Doncaster.

F. A. Bolton, 26, Lancaster Avenue, Darwen, Lancs.

And, to finish up with, a batch of Wants and Disposals. This feature has certainly proved popular with readers, so here goes for this month's little batch.

WANTED : Copies of Zaic's Year Books, also copies of the AERO MODELLER prior to May, 1942. R. A. Gray, "Tramway Villa," Upwell, Nr. Wisbech, Cambs. : bound volumes of the AERO MODELLER for 1936–37–38–39–40–41. By A. J. Cable, 2, Lynwood Cottages, Laverstock, Nr. Salisbury, Wilts. : back issues of "Model Airplane News" and "Flying," by F. Haughton, A/F JX419103 R.N. Air Section, R.A.F. Station, Hednesford, Staffs.

DISPOSALS : Special 30 c.c. engine complete with coil, tank, plugs, carburettor—suitable for radio-controlled model. 2 in. to 1 ft. flying scale model Taylorcraft, with Baby Cyclone engine, airwheels and timer. 1 in. to 1 ft. scale model Typhoon, with Brown Junior engine, designed for control wire flying. For sale, or would exchange any items (with cash adjustment) for small model maker's lathe. C: R. Jeffries, 10, Priory Crescent, Sudbury Hill, Wembley, Middlesex : copies



of " Aeronautics " from Aug., 1939, to Feb., 1943, from E. Martin, 121, Elmbridge Avenue, Surbiton, Surrey.

And again, it's time for me to wish you good flying weather and no breakages or losses. I hope to get in some flying this year (only found time for one outing last season !), so don't be surprised if you find a strange-looking bloke turning up on your ground one day, armed with a weird assortment of bits and pieces. Heath Robinson isn't in it when it comes to designing (!) model aircraft. I'm a wizard. All the best for another month, and good thermals.

The CLUBMAN.

## NEW CLUBS

BASINGSTOKE & D.M.A.C.
E. J. Alexander, 2, Norman Place, Basingstoke, Hants.

HERBERT STRUTT SCHOOL M.A.C.
D. Robotham, 317, Duffield Road, Allestree, Derby.

WELLING (358 SQUAD) M.A.C.
Cadet D. C. Bailey, 29, Welling Way, Welling, Kent.

RIDGEWAY M.A.C.
P. West, 17, Market Street, Eckington, Sheffield.

KNOTTINGLEY M.A.C.
J. E. Chapman, Police Station, Wealand Road, Knottingley.

BOURNEMOUTH & D.M.A.C.
A. L. Phelps, " Merley," Bear Wood, Winton, Bournemouth.



KINGSWOOD M.A.C.
J. Whitchurch, 14, Fairview Road, Kingswood, Bristol.

TONDU & D.M.A.C.
N. R. Alsop, " The Gables," Bryn Road, Tondu, Nr. Bridgend, Glam.

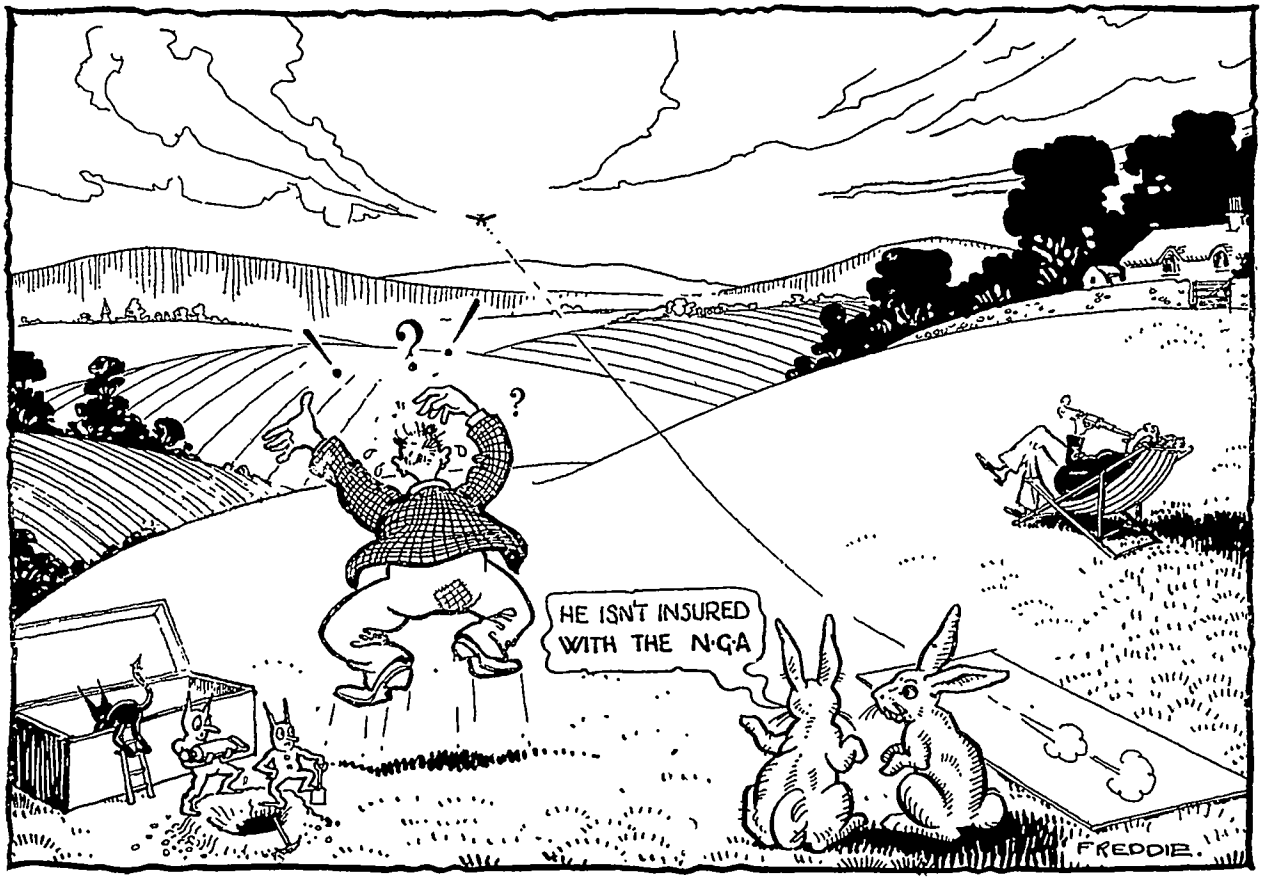
ROCHDALE (A.T.C.) M.A.C.
G. Crux, 29, Charles Lane, Milnrow, Rochdale, Lancs.

## SECRETARIAL CHANGES.

CWMBWRLA A.M.C.
K. Jones, 6, Gwilym Street, Cwmbwrla, Swansea.

TAUNTON & D.M.A.C.
R. L. Blackmore, 28, High Street, Taunton, Somerset.

We regret the following errors in Col. C. E. Bowden's article " Petrol Vapour " in the March issue :—
Page 177—line 22 " break " should have been " leak ".
Page 178—line 29 " altitude " should have been " attitude "
Page 177—line 27 should have been " If one does not require a cowled engine, and one is producing a low wing type of model with low thrust line "




" OUT OF SIGHT, OUT OF MIND ! "

# THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

## POINTS FROM THE ANNUAL GENERAL MEETING

Close on one hundred and fifty members packed into the Royal Aero Club for the A.G.M. on Sunday, February 20th. A fair representation from the provincial Clubs was present, including Messrs. R. F. L. Gosling (Merseyside), H. V. Bentley (Blackpool), Phillips (East Birmingham) and Mr. and Mrs. Germany (Leicester). All the stalwarts of the London Clubs were present in force, equally determined to contribute to the success of the meeting.

### HON. SECRETARY'S REPORT.

Mr. Bell, rising to give his third annual report as Secretary to the Society, gave some interesting details of Exhibitions organised in connection with "Wings for Victory." Over 700 were arranged all over the country, models being shown in approximately 70 per cent. of them. He could not even begin to assess the great propaganda value of the effort, and he was deeply conscious of the enthusiasm and also sacrifice which had made it possible. The Society had, furthermore, learned many valuable lessons which would guide them in future matters of this kind.

He revealed that the Scottish Clubs were well on the way to forming a National Federation under the parent wing of the Society, and that he and the Chairman, Mr. Houlberg, had agreed to go North and address their inaugural meeting.

He concluded with acknowledgments to the other officers of the Council who had made his work more easy.

### HON. TREASURER'S REPORT.

Mr. Hawkins then gave his report, and as usual was able to record a steady progress in the Society's finances. Notable increases in revenue were £31. 19s. 0d. in respect of affiliations, and £12. 14s. 6d. in competition entry fees. He expressed his surprise at the coincidence that so many clubs had exactly twenty-one members, thereby paying the minimum affiliation fee of one guinea! Messrs. D. A. Russell and E. H. Keil, the Hon. Auditors, passed his accounts, and the meeting voted their acceptance, subject to the Auditors' report that some £21 was still due on one account.

### HON. COMPETITION SECRETARY'S REPORT.

Mr. H. J. Towner, giving his first full year's report, was able to strike a very optimistic note. Entries had risen considerably in 1943, mainly, he thought, in consequence of the larger Open entries. Entries exceeding the Gamage totals in later competitions had complicated the allocation of Plugge points, but this would be avoided in future. He stressed the need for equal importance to be attached to both indoor and outdoor events, and once more reminded clubs that entering less than three members in contests was handicapping them unnecessarily.

### CUPS COMING OUT AGAIN.

In response to a general request it was agreed that the Society's Cups should once more be presented in "the flesh" to winners. The item for storage on the expense sheet would thus be saved, and members would have an opportunity of displaying the trophies they had earned. A group policy would be taken out to cover war risks.

### 1944 COMPETITION PROGRAMME.

Following lively discussion the programme as already proposed and published would be accepted, subject to slight alterations. The "Flight Cup" would continue to be flown in accordance with Mr. Rippon's well-known formula, while the two team events would also be held as usual. The Gutteridge Trophy would not count for Plugge points, nor would the Women's Challenge Cup.

The definition of "Open" Competition was discussed, and it was finally agreed that General Competition Rules would apply with the exception that the fuselage formula would not be enforced, except in those competitions laid down to comply with definite restrictions.

The Council would also endeavour to introduce a scheme whereby "Service entrants" and others unable for reasons of war work to enter all the contests, might stand a sporting chance with the rest of winning the Individual Championship.

Propositions were made by Mr. Warring and by Mr. Gosling to award certificates of merit for certain flying achievements. The suggestions were warmly received, and it was left to the Council to decide the times that members must put up to qualify for A, B and C Certificates. It was agreed also that the Trade might be officially approached to assist in putting up prizes for National winners.

Efforts to persuade the meeting to adopt hand launch were defeated after the most heated argument of the day! "Assisted" R.O.G. met a similar fate at the hands of those present.

### CARD BALLOT VOTE.

The proposition to introduce postal voting for the Officers of the Society was approved, after a long discussion on ways and means. It was agreed that the 1944 Council should work out an effective method for next year's elections.

### MEETING THE PROVINCIAL CLUBS.

In order to give provincial Clubs a greater opportunity to participate in the business of the Society, it was agreed that Quarterly Delegate Meetings should be held at different provincial cities. This would, furthermore, give them an opportunity of meeting Council members which as yet are mere names to them, and equally give them an opportunity of introducing new talent to the Society.

### ELECTION OF OFFICERS.

Some close voting demonstrated the keen interest felt in this side of the day's business, which resulted as follows:—

S.M.A.E. OFFICERS—1944 COUNCIL.

| | |
|---|---|
| President | (Certain gentlemen to be approached.) |
| Vice-Presidents | Lieut.-Col. C. E. Bowden. |
| | Capt. J. L. Pritchard. |
| | Capt. L. Plugge, M.P. |
| | Comdr. A. Perrin, Esq. |
| Newly elected | Wing-Comdr. Pelly-Fry. |
| Newly elected | D. A. Russell, Esq., M.I.Mech.E. |
| Chairman | A. F. Houlberg, A.F.R.Ae.S. |
| Vice-Chairman | H. W. Hills. |
| Hon. Secretary | A. G. Bell. |
| Hon. Treasurer | L. J. Hawkins. |
| Hon. Comp. Sec. | H. J. Towner. |
| Hon. Press Sec. | D. J. Laidlaw-Dickson. |
| Editor of Journal | D. J. Laidlaw-Dickson. |
| Records Officer | L. G. Temple. |
| Technical Sec. | R. H. Warring. |
| Hon. Auditors | Messrs. D. A. Russell and E. H. Keil. |
| Committee | R. F. L. Gosling (Merseyside). |
| | Miss M. A. Green (Croydon). |
| | C. A. Rippon (Northern Heights). |
| | D. R. Taylor (Streatham). |

### FELLOW OF THE SOCIETY.

Mr. H. W. Hills, who has been prominently associated with the movement since pre-Great War days, was elected a Fellow of the Society.

### BAN ON FLYING OF PETROL MODELS.

A report back was requested from the retiring Council as to progress made in securing a removal of the ban on the flying of petrol models and large gliders. The Hon. Secretary reported that he had made an abortive personal approach to an official of the Air Ministry. It was agreed that a priority duty of the new Council would be to reopen this matter with vigour. Mr. D. A. Russell, supported by several members, drew attention to an article in *The Aeroplane*, which stated that bomb-scarred Germany was able to announce a £1,150 contest for petrol-engined model aircraft to take place this summer, and protested that surely Great Britain was more favourably placed to permit such flying than the battered enemy!

### PAID SECRETARY—WAYS AND MEANS.

The present growth of the Society, together with the important post-war expansion envisaged, made this question of immediate interest. Mr. D. A. Russell, on behalf of the Model Aircraft Trade Association, announced that the sum of £200 had been subscribed by that body towards the initial expense of offices and equipment, to which he would add a further £100, which he had promised at the previous A.G.M., on behalf of the AERO MODELLER and its associated companies.

Feeling ran high on the question, and fighting speeches were made! A section of the meeting displayed a degree of pessimism as to post-war prospects, several speakers seeming incapable of realising that this was a matter of *national organisation*, and had little to do with individual clubs' ideas. However, keen debate convinced the majority that the matter must be explored, not from a capital standpoint, but with a view to assuring an annual income which would render this possible. The Chairman indicated that the Council were in favour of a paid Secretary and would consider all suggestions made, and publish an early report of their findings.

### AFFILIATIONS.

The following seven clubs were granted affiliation to the Society:—

Norwich & District M.A.C.
568 Squadron A.T.C. (North Watford).
King's Heath & District M.A.C. (Birmingham).
London Road (Braintree) M.A.C.
Cricklade & District M.A.C.
Middlesbrough M.A.C.
Seaham M.F.C. (Co. Durham).

Made and printed in Great Britain by Alabaster, Passmore & Sons, Ltd., London and Maidstone, for the Proprietors and Publishers, The Model Aeronautical Press, Ltd., Allen House, Newarke Street, Leicester. Trade Distributors: Horace Marshall & Son, Ltd., Temple House, Tallis Street, London, E.C.4—C1601. Sole Agents for Australia and New Zealand: Gordon & Gotch (Australasia), Ltd. Registered at the G.P.O. for transmission by Canadian Magazine Post.

## A. N. CUTLER

For Dopes, Tissues, Cements, Propellers, etc. In fact, all accessories for the Aero Modeller for solid and flying kits. Stockist of Drome, Studiette, Keil Kraft, Astral, Cloudcraft, Skyleada, Truscale, Halfax, C.M.A., etc.

**BRIDGE STREET** **WORCESTER**

'Phone : WORCESTER 4137.

---

**"The Art of Scale Model Aircraft Building."**—*By* V. J. G. Woodason *Edited by* Walter Buchler. **Price 4/11 net. 8/6 cloth.**

"In this book the author has produced the most complete and accurate account of solid model making yet published. It is to be heartily recommended to the expert and to the beginner, and to those only interested in aircraft recognition instruction."—*The Aeroplane.*

"One of the best books on modelling."—*Air Training Corps Gazette.*,

*Also Kits, Paintings and Plans of Aircraft, Ships, Galleons, Micro Models, etc. Our Giftware Dept. is interested in all manner of useful articles and curios suitable as gifts.*

**USEFUL PUBLICATIONS**

**37, ALDWYCH, LONDON, W.C.2 (TEL. : TEM. 2946)**

---

*AERO MODELLERS get your*

**KITS AND ACCESSORIES**

from

**HARPER'S CYCLE CO., LTD.**

**34 Belgrave Gate & 67 Braunstone Gate, LEICESTER**

**Also at Oakham, Melton Mowbray and Market Harborough**

---

## STOCKPORT'S AEROMODEL SHOP

*'Phone : STO 4744*

Kits and Accessories constantly in stock.

All the Harborough and Aeromodeller publications available.

**54, Wellington Road South** **STOCKPORT**

---

## JONES BROS.

LARGE STOCK OF KITS, DOPES AND ACCESSORIES.

**SPARE PARTS FOR SOLIDS**

Send 3d. for list.

**56, Turnham Green Terrace** 'Phone : CHI 0858

**CHISWICK, W.4**

---

## WILMSLOW MODEL AIRCRAFT CO.

PERSONAL ATTENTION MEANS A LOT TO THE AEROMODELLER ! **We make a point of advising as well as selling to our customers.** We have a big range of Kits and Accessories, including: Keil Kraft, Skyleada, Studiette, Elite, Club, Astral, Airyda, Britannia, Lincraft, Grenwin, Halfax, Tower and many others.

GIVE US A CALL OR DROP A LINE TO:

**WATER LANE :: WILMSLOW, CHESHIRE**

---

## GRENWYN (Regd.)

**1/72 SOLID SCALE MODEL KITS**

Will all clients please note change of address :—

**LANCASHIRE MODEL AIRCRAFT SUPPLIES**

**"Grenwyn" Works, 47 Queen St., Farnworth, Lancs.**

to where all future communications should be sent.

---

## MODEL MAKERS !

**Birch Veneer Offcuts 1/40" thick.** Packets of useful pieces, 3x3" to 4x8" About 5 sq. ft. 1/11 post paid. Double size 3/3 post paid.

| | | | |
|---|---|---|---|
| 12" Strips, 1" to 2" wide, about 7 sq. ft. | | 2/6 | " " |
| 18" | " " " 12 " | 3/9 | " " |
| 24" | " " " 16 " | 5/- | " " |

List of other Stripwood, 2d.

**A. STEPHENSON (WEST HARTLEPOOL) LTD.**

VILLIERS STREET, WEST HARTLEPOOL

---

## "TIP-TOP" MODEL AIRCRAFT STORES

**288, Lake Road, Portsmouth**

All Model Accessories in Stock.

● Waterslide Transfers of all Nations. ●

**Special Large Range of Cockpit-Covers.**

**Limited Supply. Send S.A.E. for List.**

---

## NOTTINGHAM'S AERO MODEL SPECIALISTS

POSTAL SERVICE

Add 4d. to Kit and alternative to 87, Wilford Road

All leading makes and accessories stocked.

NO LISTS.

**RADET ELECTRIC, 21, ARKWRIGHT STREET**

**NEAR MIDLAND STATION**

---

## YORKSHIRE AEROMODELLISTS

There are things to delight the hearts of all Aeromodellers at Yorkshire's "pukka" model shops.

**SKYCRAFT, LTD., 39a, Boar Lane, LEEDS**

**BRADFORD A.M. CO., LTD. Godwin Street, BRADFORD**

**NICHOLL & BROWN, Commercial St., HALIFAX**

---

## LIVERPOOL MODEL AIRCRAFT SHOP

**MODEL AIRCRAFT SPECIALISTS. EXPERT ADVICE GIVEN**

Glider Kits: Veron, Elite, Keil Kraft, Flying Scale : Aeromodels, Astral. Sold Scale; 1/72nd: Silverwings, Truscale, Skyleada, Airyda, Elite. ½" : Aeromodels, Halfax.

**Accessories for flying and solid models. Large range of Transfers.**

Aeromodeller plans and publications, also books for A.T.C.

*As no price lists are available, please state exact requirements, and enclose stamped addressed envelope.*

**402, PARK ROAD - - DINGLE, LIVERPOOL, 8**

**TRAMS Nos. 1, 3 and 20 pass the door.**

---

## HARPER OVERHEAD HEIGHT CHECK PATENT

- A simple yet effective training device carried readily in the waistcoat pocket. Over 10,000 now in use.
- Gives the height of IDENTIFIED British, American and German aircraft flying overhead or almost overhead.

Obtainable from: **FRANK HARPER** Price 4/- post free.

**SOUTHCLIFFE, SELBY ROAD, FULFORD, YORK.**

---

## THE SCOTIA MODEL CO.

*for*

**SUPER PLANS FOR R.A.F. AIR SEA LAUNCH (½ & 1/72 scale)**

All the leading books for the Model Aircraft Builder.

Enquiries must have stamped-addressed envelope.

*WE RECOMMEND ELITE GLIDER KITS.*

**40, Chambers Street, EDINBURGH, 1** *Phone* 32053

---

## GMG

**GREEN MAN GARAGE (WHETSTONE) LTD.**

**1308, High Road, Whetstone, London, N.20**

(OPPOSITE TOTTERIDGE LANE)

We hold the Largest Stock of Aero Kits and Component Parts in North London.

'Phone Hillside 3277. Stamped addressed envelope for replies.

---

## LONDON—TOY AND MODEL SHOP

Keil Kraft, Astral, Halfax, Skyleada, Skyrova, Airyda, Grace Airplanes Modelcraft Airlines, Skycraft, Silverwing. Waterline and Leyden Ship Kits.

**Plans and Aero-modeller books stocked, but no wood.**

*Postage must accompany Orders and enquiries.*

**57, SYDENHAM ROAD, LONDON, S.E.26**

**SYD 8320**

---

*SCOTLAND CALLING !*

**FRANK ROYLE, 54, South Clerk St., EDINBURGH**

IS AT YOUR SERVICE

Largest Selection of Kits, etc. in Scotland.

**OUR SPECIALITY: Cockpit Covers.**

**Send Stamped Addressed Envelope for List.**

---

**A. A. BAKER, 526, High Road, CHISWICK, W.4**

British and Foreign Transfer Insignia, Cockpit Covers, Turrets, Wheels, and other accessories.

Stockists of all leading makes. **Super-detailed "Wing" Series solid Blue Prints, including Whirlwind, Thunderbolt, Focke Wulfe 193, ME 110.C5, etc.** Stamp brings reply

---

**SYD TONGE, 92, Winchcombe St., CHELTENHAM'S MODEL AND ACCESSORIES HOUSE**

Including postage. Monthly Aeromodeller, 1/2 ; Radio Control, 2/4 ; Flying Boats, 2/4 ; McGillicuddy's Year Book, 3/10 ; Camouflage, 14–18, Aircraft, 3/10 ; Petrol Engines, 3/4 ; Airscrews, 2/4 ; Solid Scale Model, 4/4 ; Design and Construction of Flying Model Aircraft, 10/9 ; Scale Model Aircraft Buildings, 8/10 ; Building Galleons, 12/6 Cockpits, Props, Dopes, Brushes, etc. *MANUFACTURERS' ENQUIRIES INVITED*

---

## J. CHAPPELL,

**339, ECCLES NEW ROAD, SALFORD 5, LANCS.**

**1/72 SOLID KITS.** Walrus, 3/9; J.U. 87B, Lightning, Thunderbolt, 3/- ; Gladiator, Lysander, Messerschmitt 109F, 2/6

**COCKPIT AND TURRET SETS.** Fortress II, 2/6 ; Mitchell III, 2/–; Halifax, 2/– ; Marauder, 2/– ; Sunderland, 1/6 ; Mosquito, 1/– : Curtiss Helldiver, 1/2

**GALLEON BLUE PRINTS.** "H.M.S. Victory," 22", "Gulden Hind," "Santa Maria," "Cutty Sark," 22".

With Instructions. All 3/6. *Post* 3d.

TAYLORCRAFT

# AEROMODELLER 1/-

APRIL 1944